COLRAIN COMMUNITY DEVELOPMENT PLAN

JUNE 2004

Prepared by the
COLRAIN OPEN SPACE AND RECREATION & COMMUNITY DEVELOPMENT PLANNING COMMITTEE

FRANKLIN REGIONAL COUNCIL OF GOVERNMENTS PLANNING DEPARTMENT

Prepared under Executive Order 418 in cooperation with the Massachusetts Department of Housing and Community Development, Massachusetts Executive Office of Environmental Affairs, Massachusetts Executive Office of Transportation and Construction, and Massachusetts Department of Economic Development

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COMMUNITY DEVELOPMENT PLAN

EXECUTIVE SUMMARY

Introduction

The Colrain Community Development Plan is a long-range planning document that can be used to guide development in Colrain in a way that supports its residents' vision for the future. The Community Development Plan is a comprehensive report that examines and evaluates many characteristics of Colrain, including open space and recreation, housing, economic development, and pavement management.

The Community Development Plan was developed by Colrain residents over the past two years. During summer 2002, the Open Space and Recreation /Community Development Planning Committee (from now on called the "Open Space Planning Committee") developed a survey of Colrain residents. In September 2002, open space and recreation surveys were mailed to approximately 842 households in Colrain. Of these, 184 were returned and counted as responses, which represents a 22 percent rate of return. The Committee developed a set of Open Space and Recreation Goals and Objectives from the results of the analysis. In addition, the draft goals and objectives of the Economic Development and the Housing chapters were based in part on the analysis of the survey results and on the information presented in the Open Space and Recreation Plan.

Beginning in fall 2002, the Open Space Planning Committee examined inventories and maps of Colrain's resources, discussed 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 eighty residents and town officials. Between fall 2002 and spring 2004, the Open Space Planning Committee convened ten public meetings to discuss draft chapters and geographic information systems (GIS) maps developed by the Franklin Regional Council of Governments Planning Department.

The purpose of this Executive Summary is to present highlights of the Colrain Community Development Plan. The Community Development Plan is organized into four main chapters, each of which discusses one aspect of the community's resources and infrastructure. The chapters are: Colrain 2004 Open Space and Recreation Plan, Housing, Economic Development, and Pavement Management. For the first three topics, the Executive Summary presents goals, key findings of the inventory and analysis, and recommendations. The Pavement Management Study (PMS) is an analysis of road conditions; it does not include goals and recommendations. Even so, the Executive Summary includes a section of key findings for the Colrain PMS.

Open Space and Recreation

Goals:

- Ensure that Colrain sustains its small town rural environment characterized by general peace and quiet, clean air and water, safety from crime and vandalism, affordable housing, and an abundance of recreational opportunities including access to forests, fields and unbroken trails.
- Ensure that the Town of Colrain maintains or improves the quality of its drinking water, air, lakes, streams, and ponds, farms and forestlands, scenic views, wilderness areas and other wildlife habitats, wetlands, stonewalls and historic landscapes, and the diversity and integrity of native plants and animals through the conservation of locally important natural and open space resources.
- Ensure that the Town of Colrain maintains and improves in a cost-effective manner, the quality and accessibility of all of its recreational facilities and programming.

Key Findings:

- Colrain's private forestland and farmland owners have a strong stewardship ethic-
    - Approximately two thirds of crop and pasture land are protected through the APR Program.
    - Overall, 11,000 acres of privately owned land are in Chapter 61, 61A and 61B.
- Colrain shares a 10,000-acre block of forest with Charlemont and 9,000-acre block of forest with Heath.Colrain contains several Biomap Core Habitat areas that provide for viable populations of rare species and conserve surface and ground water quality and quantity.
- The town also has a significant amount of Prime farmland soils and small farm businesses. There are at least 17 farms growing and selling dairy products, timber, beef & goat meat, apples & peaches, and irises.
- The North River and Green River provide rare species habitats, drinking water supplies, prime farmland soils, and recreational and cultural values.
- Cook and Catamount State Forests represent 2,600 acres of forest for recreation and nature appreciation that is accessible to the public. The forests are part of a State-wide Greenway Vision Plan and Map.
- Old working farms are the most common type of significant historical landscapes (in both the valleys and uplands)

- Colrain contains high yield aquifers associated with the North River. There are very few estimated high yield aquifers in the Deerfield River Watershed.

- The town's new ball field is the best site for improved recreational facilities and access to the North River.

- Local farms could benefit from local and regional promotion.

- Colrain's neighbors to the west, south and east are in action around open space and recreation planning too.

- Farm parcels remain vulnerable to development and occur over estimated high yield aquifers

Recommendations:

- Appoint an Economic Development Committee to identify appropriate areas for development and to put brownfields back to work.

- Initiate an All-Board Meeting to discuss costs in services of different land uses.

- Research grants to fund an affordable housing feasibility study by the FRHRA.

- Form an Events Committee to plan and produce eco-and heritage-based tourism events.
- Continue to hold public meetings for the purpose of discussing historical Colrain Center and other historic places, landscapes and landmarks.

- Write a series of articles in West County News on the benefits to the town and to landowners of land stewardship programs including Chapter 61, 61A, 61B and others.
- Develop, promote, and run a short series of informational talks at the library with speakers from land trusts, University of Massachusetts Extension, State Service Forestry Departments, etc.

- Produce a working woodlot open house/tour of properties in the Chapter 61 program to demonstrate benefits of forestry.
- Work with State Representatives and Legislators to ensure that the Ch. 61, 61 A, 61 B, APR, and land protection programs continue to be funded by the state. Establish a monitoring system for collecting stumpage fees and cross-referencing Chapter 132 Forest Cutting Plans.Lobby State Representatives and Legislators to allocate 30 percent of state forest stumpage fees to the town containing the trees.
- Increase the involvement of local farmers in town events. Research how to decrease taxes paid by working farmers on farm buildings
- Appoint an Open Space Committee.

- Identify target areas for protection from development.

- Discuss land conservation goals with landowners.

- Determine whether the Conservation Commission has the capacity to manage and police conservation lands that could be donated to the Town in the future.

- Identify and secure sources of funding to protect open space in town.

- Produce a promotional campaign that focuses on sustaining residents' quality of life through protected public access to natural areas via the use of conservation restrictions.

- Promote the value of conservation restrictions within the context of estate planning.

- Encourage the Recreation Committee to increase their efforts to develop additional programs and facilities.

- Host a meeting for area trail users to discuss trail issues in Colrain.

- Investigate the use of Self-Help funds to pay for trail easements.

- Participate in the State's Western Connecticut River Valley State Forest Planning Process.

- Determine which roadways and areas are appropriate for establishing bicycle/walking paths, a swimming area, and a skating pond.

- Acquire funding to develop new recreational facilities.

- Continue offering natural and cultural resource programs to children in the Elementary School, in the Library, and in the Boy Scouts.

- Acknowledge AmeriCorps for the educational work they have already accomplished with seasonal funding.

Economic Development

Goal:

- Focus business and job creation efforts within Colrain's village core area.
- Building on the community's manufacturing heritage, support existing manufacturing firms and encourage the creation of new niche manufacturers.
- Capitalize on the region's tourism economy in order to support existing local businesses
- Ensure that Colrain's land use regulations support existing businesses, encourage the development of suitable new businesses as well as retain the characteristics of town, which make it desirable to residents and visitors.

Key Findings:

- Colrain has outperformed the region in terms of attracting workers to live in town.
- Colrain is not a major employment center. The town contain provides about 1 percent of the total regional employment.
- The employment base in Colrain in 2001 was 259 jobs representing a decline of 101 jobs (28.1%) since 1995.
- The decline in local jobs contrasted sharply with the regional trend of job growth, which experienced an 18 percent increase over the same time period.
- Colrain has become a net exporter of employees to other regional communities making it a bedroom community.
- Overall, 58 percent (143 jobs) of Colrain's employment base is concentrated within the manufacturing sector with over one quarter (65 jobs) within the government sector.
- The average wages paid by Colrain firms outperformed the region in the professional and technical services and manufacturing sectors.
- Contrary to the employment base trend, the number of business establishments in Colrain has increased by a total of 7 (or 24.1%) from 29 in 1995 to 36 in 2001.
- Commercial and industrial properties account for approximately 41 acres representing less than one half of one percent of the community's total land area. However, from an assessment perspective, commercial and industrial properties by far contribute more to the Town's property tax base at $29,700 and $177,000 per acre, respectively.

Recommendations:

- Focus economic development efforts on the retention and support of existing business establishments within the community. Look at:
    - Municipal infrastructure and services.
    - High-speed telecommunications (voice and data) capacity.
    - Whether land use regulations encourage small or home-based businesses.

- Encourage the creation of home-based businesses.

- Encourage the creation of businesses within the agriculture, leisure and hospitality sectors.

- The Town should review any municipally owned parcels located along or within close proximity to the Route 112 corridor as well as the Town's village core area which may have the potential to be developed for these purposes.

- Encourage the permanent protection of environmentally significant lands in order to avoid the incremental deterioration of qualities, which make Colrain a desirable community.

- Participate with the Franklin Regional Council of Governments and other regional planning and economic development organizations to implement already established plans.

Housing

Goals:

- To preserve the rural, residential character of the Town and to provide housing opportunities to residents of all ages and income levels.

Key Findings:

- Overall, 8 percent of Colrain's existing housing stock is multi-family.

- The majority of available rental housing consists of single-family homes or mobile homes.

- The Town's housing stock, particularly rental housing, is old.
- More than 10 percent of the Town's households are headed by persons over age 75.

- Slightly more than half of families have children under 18 living at home.

- Renters in Colrain are primarily young couple families, unrelated individuals, or elderly.

- There were 122 residents in 43 households that lived in poverty in Colrain in 1999.
    - Most were young children and female heads of households.
    - Poverty is not a significant issue among the elderly.

- Chapter 40 B Status:

In 2001, there were 764 Year Round Housing Units

10% Goal:	76
Actual Chapter 40B	
Certified Units:	15
Percent of Goal Satisfied:	2.0%
40B Deficit (Units):	61

AffordabilityThe number of households with affordability needs exceeds the CH 40B deficit by a factor of more than 3 to 1.

- Overall, 88 percent of these residents already own their own home.

- Rental housing needs are limited in terms of total numbers of units.

- A high percentage of these renters have very low incomes.

- The biggest housing need is among households, with low & moderate incomes, who already own homes.
    - About a third of this group is under age 45.
    - A significant percentage are female heads of households.
    - Some are advanced elderly.
    - Suggests a more urgent need to raise household incomes rather than provide more affordable housing.

Recommendations:

These recommendations are proposed to help address Colrain's housing issues. These recommendations are also intended to help achieve the goals discussed earlier.

- Revise Colrain's zoning by-laws to allow greater flexibility to develop rental housing either within the village areas, or in close proximity to public utilities.

- Examine provisions in the Zoning By-laws that relate to accessory apartments.

- Promote the use of cluster development to enable construction on smaller lots in exchange for land being set aside as open space.

- Inventory tax exempt and undeveloped parcels and identify those that may have the potential to be developed for mixed-income or affordable housing.

- Develop a program for the town to take advantage of suitable residential tax-title property opportunities that may become available for development as affordable housing.

- Pursue participation in housing rehabilitation loan programs to enable low and moderate income seniors, non-elderly homeowners, and rental property owners, to fund home improvements and repairs including accessibility improvements and septic system upgrades.

- Use housing rehabilitation loans to secure additional subsidies to create Chapter 40B affordable units within Colrain's existing 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

- Develop strategies to reduce housing cost burdens (e.g., property taxes) for senior residents on fixed incomes.

- Work with legislators to encourage the State to continue revising Chapter 40B to provide additional flexibility and local control in the creation of affordable housing.

Pavement Management Study

Key Findings:

- The town is implementing very sound pavement management practices with the limited funds that are available.

- The town's local paved road network is currently in a Fair overall condition.

- The Town currently faces an estimated Backlog of Repair of $1.9 million.

- An analysis of future conditions indicates that if existing levels of Chapter 90 funding were combined with $1.2 million of Federal funds to rehabilitate Greenfield Road, there would be sufficient funds to keep pace with repairs only up to 2011 since soon after, roads repaired in 2004 and 2006 would be reaching a level of deterioration.

- However, if the Chapter 90 funds were brought up to their historic levels, of $150 million (and Colrain saw $765,000 more in investment over the next ten years), and $1.2 million was available for Greenfield Road, then the town could maintain their road network in a perpetually Good to Excellent condition.

- In the absence of additional Chapter 90 funds, the town should pursue alternative funding sources in the next few years.

NATURAL RESOURCES AND OPEN SPACE

TOWN OF COLRAIN

OPEN SPACE AND RECREATION PLAN 2004

Prepared by the
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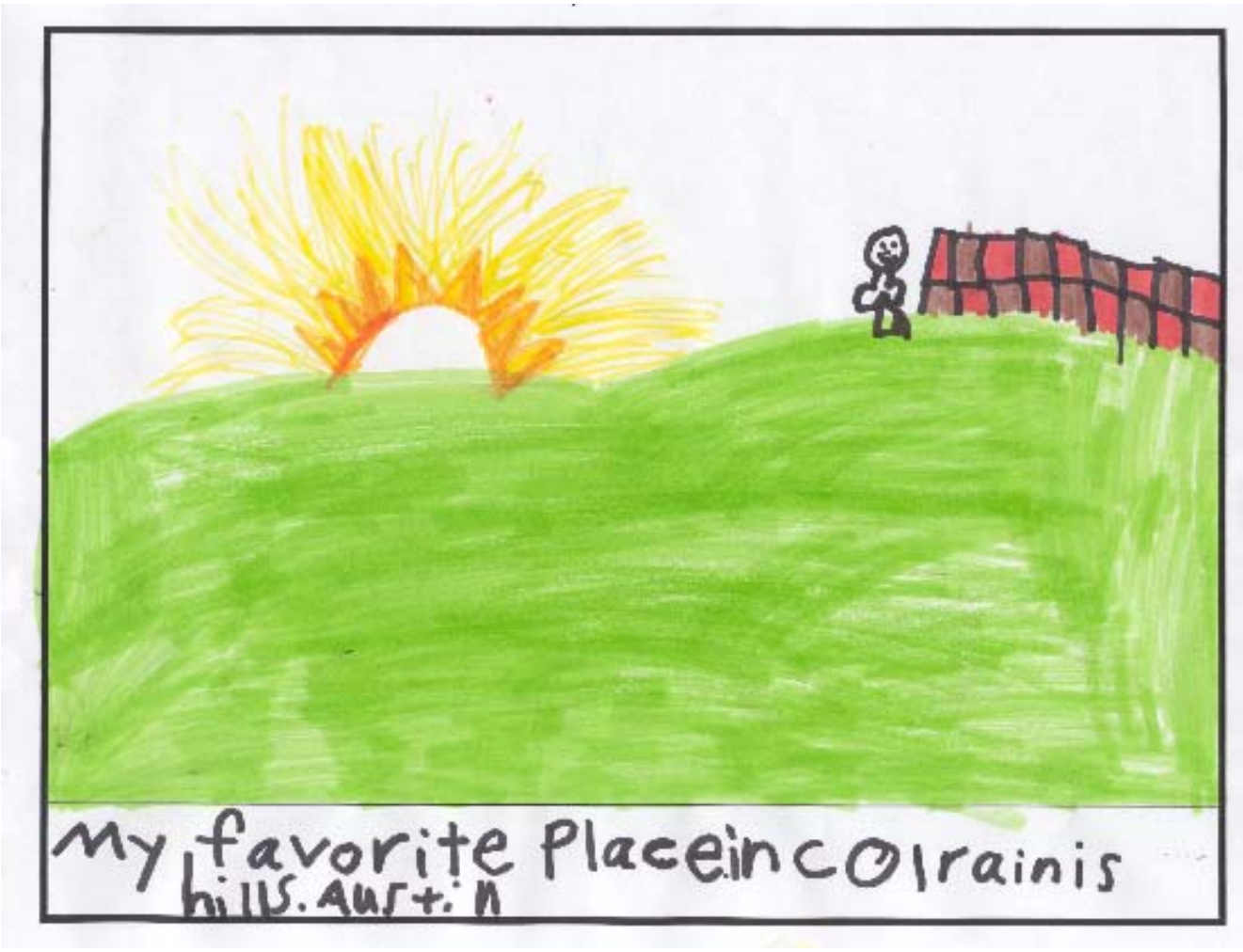

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SECTION 1

PLAN SUMMARY

The 2004 Colrain Open Space and Recreation Plan is a comprehensive inventory of the town's natural, agricultural, cultural and recreational resources and a plan for their stewardship and conservation. It contains an analysis of the town's needs plus goals and objectives designed to guide important decisions about the use, conservation and development of the town's land and resources. A five-year action plan provides real steps that the town can take towards achieving these goals.

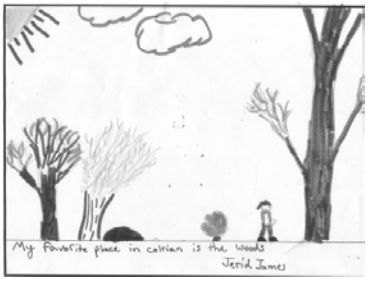
The Plan emphasizes the remarkable wealth of the town's resources, including:

- Prime farmland and seventeen working agricultural businesses;
- Large blocks of contiguous forest;
- Cook and Catamount State Forests
- BioMap Core Habitats for rare species;
- High yield aquifers under the North River;
- A great new site for a ball field; and,
- A number of scenic and historic landscapes.

These resources provide residents with clean air and water, jobs, and access to an abundance of recreational opportunities. Colrain's forests and farmland give the town its rural character, contribute to the local property tax base, and are at the heart of what residents love about living here.

Colrain is fortunate in comparison to many towns in Massachusetts, in that two thirds of the farmland in town has been protected from development through the Agricultural Preservation Restriction Program. In addition, almost one third of all the land in town is enrolled in the Chapter 61, 61A, or 61B programs. These private property owners continue to maintain their land in farms and forest and practice good stewardship. One important message contained within the plan, is that the town's natural, agricultural and recreational resources should not be taken for granted. Thousands of acres of farm and forestlands remain highly vulnerable to development. Conservation of priority lands will require increased public awareness of their value and a concerted, cooperative effort on behalf of landowners, elected officials, municipal boards and committees and resident volunteers.

SECTION 2



INTRODUCTION

In 2001, the Massachusetts Executive Office of Environmental Affairs (EOEA) sponsored-Deerfield River Basin Team secured funding for a watershed-wide open space and recreation planning effort that included the development of several municipal Open Space and Recreation Plans (OSRP). EOEA staff met with the Colrain Conservation Commission to determine residents' interest in working towards the completion of their own plan. Colrain agreed to participate and began to organize a group of people to serve on an Open Space Planning Committee. The grant to assist Colrain, Leyden, and Charlemont in the development of their own OSRP was awarded to the Franklin Regional Council of Governments (FRCOG) Planning Department.

A. STATEMENT OF PURPOSE

The purpose of this plan is to provide an accurate and thorough basis for decision-making involving the current and future open space and recreation needs of the residents of Colrain. This OSRP represents two and a half years of consensus building on the most important community and natural resource needs in town and on the best solutions for addressing them. The Five-Year Action plan, when carried out by an Open Space Committee and other town boards and commissions, will successfully implement the town's open space and recreation goals and objectives.

B. PLANNING PROCESS AND PUBLIC PARTICIPATION

An Open Space and Recreation Survey was developed and reviewed by the Colrain Open Space Planning Committee (OSPC). The survey was mailed to 842 households in town. The rate of return was 22 percent. The survey results were compiled into a report (*see Appendix*) and presented for review at the November 26, 2002 meeting of the OSPC. A draft of Section 8 – Goals and Objectives was also reviewed at the November meeting.

Including the Public Forum, which was held on March 13, 2004 and involved over twenty people, there have been fourteen public meetings of the Colrain Open Space Planning Committee. Before each meeting, members were sent drafts of sections to read. This form of work review was a significant and consistent vehicle for public participation in the development of the Open Space and Recreation Plan. Overall, fifty different residents participated in at least one meeting and members often represented different town boards and committees including:

- Select Board,
- Planning Board,
- Conservation Commission,
- Shelburne Falls Fire District,
- Zoning Board of Appeals,
- Historical Society, and,
- Historical Commission.

Any comments expressed at the public forum were recorded on flip chart paper and included in Section 10 – Public Comments as well as in the final version of the Action Plan. Any ideas, comments, and corrections pertaining to different sections of the plan and the action steps have also been included in the final version of the Colrain Open Space and Recreation Plan.

SECTION 3

COMMUNITY SETTING

The Town of Colrain contains rural landscapes that have been established, developed, and affected by its human inhabitants over the past several hundred years. Planning for open space in Colrain must account for the complex relationships between people and the open spaces and natural resources upon which they depend. Continued growth without consideration of the natural systems that need to be protected, such as drinking water supplies, will reduce the quality of life for future generations.

The information provided in this section, Community Setting, inventories and assesses the human and land use components of the landscape, moving from the present, to the past, and then to the potential future based on current development trends. The Regional Context gives a snapshot of Colrain today, and identifies the ways in which the location of the town within the region has affected its growth and quality of open space and recreational resources. History of the Community looks at the manner in which the human inhabitants settled and developed the landscapes in Colrain. Next, using statistical information and analysis, Population Characteristics shows the reader who the people of Colrain are today and how population and economic trends may affect the town in the future. Finally, Growth and Development Patterns describes specifically how the Town of Colrain has developed over time and the potential future impacts that the current zoning may have on open space, drinking water supplies, and municipal services.

A. REGIONAL CONTEXT

Regional Context concentrates on the location of the Town of Colrain relative to natural and socio-economic resources as well as conditions shared by communities in the region. It describes the significant influence a town's physical location can have on its characteristics, including the quality and quantity of open space in the town as well as its recreational resources. Regional Context also considers the impact that different land uses, located within Colrain and surrounding communities, have on regional open space and recreational resources.

The Town of Colrain is located in northwestern Massachusetts, in central Franklin County. Colrain is bordered by Halifax and Guilford, Vermont on the north; Leyden on the east; Shelburne and Greenfield on the south; Charlemont on the southwestern corner; and Heath on the west.

A.1 Natural Resources Context

In order to plan for the protection of open space and natural resources in the Town of Colrain, residents should consider the role natural resources play across the region. Two regional landscape-level natural resources important in both Colrain and in surrounding communities are abundant and contiguous forestland and watersheds (Deerfield River, North River and Green River Watersheds). The presence and relatedness of these significant resources present both opportunities and challenges to open space and recreation planning.

A.1.1 Large Blocks of Contiguous Forestland

Forests constitute one of the most important natural resources in the Town of Colrain and the region. The Commonwealth of Massachusetts owns approximately 2,745 acres of the forestland in Colrain, which is overseen by the Department of Environmental Management. These forestlands include Catamount State Forest (1,125 acres), located in southwestern Colrain and eastern Charlemont and H.O. Cook State Forest (1,620 acres), located in northwestern Colrain and northeastern Heath. The Mass. Division of Fisheries and Wildlife (DFW) owns and manages the Catamount Wildlife Management Area (WMA) located in southwestern Colrain. Catamount WMA contains a total of 256 acres in two parcels, which abut Catamount State Forest.

The Massachusetts Natural Heritage and Endangered Species Program's (NHESP) BioMap uses Estimated Habitats and other documentation to identify the areas most in need of protection in order to protect the native biodiversity of the Commonwealth. The BioMap focuses primarily on state-listed rare species and exemplary natural communities and was developed to promote strategic land protection of areas, which would 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 "road-less" areas, and undeveloped watersheds. The Core Habitat areas were identified, through field surveys, as supporting viable populations of rare plant and animal species while the Supporting Natural Landscape areas were determined through analyses using Geographic Information Systems (GIS) mapping programs.

Of the many large areas of contiguous forest in Colrain, four are considered by the NHESP to contain Supporting Natural Landscapes that buffer or link lands to Core Habitat areas:

- The southwestern forest block contains Catamount State Forest and forests west of Shattuckville and Griswoldville. It contains the largest Core Habitat area in

- town and is part of a larger forest block that stretches into eastern Charlemont to the Deerfield River.
- The southern block lies to the east of Call Road on the western slopes of Colrain Mountain. These forests are contiguous to a very large Core Habitat area in Shelburne along High Ledges and Massaemett Mountain.
- The western central block of forest that contains Supporting Natural Landscapes is located between Wilson and Adamsville Roads and Rte. 112 along the eastern slopes of Christian Hill.
- The eastern block of forest stretches from beyond the Vermont border, south along the Green River to northwestern Greenfield and east into Bernardston. Three separate Core Habitat areas exist within this block including:
    - Forestland north of Stewartsville, east of New County Road, into northwestern Leyden;
    - Forestland along the Green River; and,
    - Forestland east of East Colrain Road in the vicinity of Workman Brook and south into Greenfield.

Large blocks of contiguous forestland such as these are important regional resources for several reasons. First they represent an area with a low degree of fragmentation. Wildlife species that require a certain amount of deep forest cover separate from people's daily activities tend to migrate out of fragmenting landscapes. New frontage lots and subdivisions can often result in a widening of human activity, an increase in the populations of plants and animals that thrive alongside humans (i.e. raccoons and squirrels) and a reduction in the species that have larger home ranges and unique habitat needs. When these large blocks of forest are protected from development they help to protect and provide clean water, air, and healthy wildlife populations. In addition, areas of unfragmented forest are more suitable for active forest management.

A.1.2. Watersheds

Watersheds are the areas of land that drain to a single point along a stream or river. The Town of Colrain is located in the northeastern portion of the Deerfield River Watershed, which encompasses all or part of twenty western Massachusetts communities and sixteen towns in Vermont. From Stratton Mountain in Vermont to the confluence with the Connecticut River in Greenfield, Massachusetts, the Deerfield River drains a regional landscape that is 665 square miles in size, of which 347 are in Massachusetts (DRWA; 2002). The Deerfield's length is 70.2 miles, forty-four of which are in Massachusetts. The Deerfield River, one of the coldest and cleanest rivers in Massachusetts, has a steep gradient, dropping 46.8 feet per mile from its headwaters to the USGS gauge near West Deerfield, a distance of 69.5 river miles. This feature has made the Deerfield River a magnet for hydroelectric power generation, with ten hydroelectric developments constructed on the river since 1911. Given its gradient and excellent water quality, the Deerfield River has seen a long history of use by fishermen and whitewater enthusiasts.

The Commonwealth of Massachusetts actively stocks the river to augment native populations in addition to stocking juvenile salmon, as part of the Connecticut River restoration project.

Subwatersheds contain first and second order stream tributaries. These are the most extensive component of any watershed. They are also the most sensitive to land use, both the negative impacts of runoff and the positive effects of forest cover. Two of the most important things that result from protecting forestland are maintaining the long-term integrity of wildlife habitats and water quality within the watershed's surface and ground waters.

The Green River Subwatershed is located in southern Vermont and northwestern Massachusetts. It has a drainage area of 89.9 square miles and is comprised of numerous small streams, many of which originate in the uplands of eastern Colrain. The River itself originates in southern Vermont and flows into Massachusetts in the Town of Colrain forming the town's eastern border with the Town of Leyden. The Green River flows southeasterly through a steep narrow valley and, as it enters the Town of Greenfield, its gradient lessens. The segment of the river from the Vermont-Massachusetts border to the Greenfield Wastewater Treatment Plant is considered as a Class B, cold water fishery, with high quality water designations (Mass. DEP website, 2002).

The North River Subwatershed is located in northwestern Massachusetts and southern Vermont, draining 94.2 square miles. The East Branch and the West Branch of the North River are the two main tributaries of the North River. The East Branch originates at Ryder Pond in Whitingham, Vermont and converges with the West Branch north of Griswoldville, in south-central Colrain. The West Branch also originates in the Town of Whitingham. Smaller streams, which are also part of the North River Watershed, include Foundry Brook, Taylor Brook, Tissdell Brook, Vincent Brook, and Roberts Brook. Forests predominate the upland slopes of the Watershed while the floodplain areas are mostly agricultural. The East and West Branch, as well as the North River from the confluence of the East and West Branches to the former Veratec Treatment Plant, have all been designated as Class B, cold water fisheries with high quality water. However, the stretch of the river from the Plant to its confluence with the Deerfield River is not given a high quality water designation (Mass. DEP website, 2002). Even so, the North River's generally excellent water quality and cold water fishery habitat ensure its consideration as a key component in the Connecticut River Atlantic Salmon restoration project.

The degree of forest continuity, pattern of residential development, and the purity of the water in the Deerfield River Watershed are beyond the control of any one community. The Town of Colrain could promote the conservation of all its significant open space and natural resources, but if surrounding towns fail to protect land, plan growth, or continue to monitor and participate in the cleanup of brooks and rivers, their level of impact on the resources that disregard political boundaries (water, wildlife populations, scenic views,

trails, etc.) will be less significant. Colrain needs to take an active role in the conservation of regionally important natural resources, whether they occur in town or not.

A.2 Socio-Economic Context

Waterpower, manufacturing, and agriculture all have had an influence on the development and growth of the Town of Colrain. Like many communities along the major waterways in the region, Colrain has experienced economic decline since its manufacturing heyday. As will be described in the next section, Colrain's manufacturing centers developed due to the harnessing of the hydro-power of the North River. However, manufacturing declined across the region during the latter half of the 20th Century.

Agriculture has also played a role in the Town of Colrain throughout its history. During the late 1880s and early 1900s Colrain ranked third in Franklin County in the production of agricultural products. Dairy, sheep and poultry farming were important agricultural enterprises. Due to the suitable climate, apple orchards were planted and became a major agricultural crop.

Between 1970 and 2000, the Town of Colrain's population continued to grow and is projected to increase by approximately 10 percent in this decade. The loss of manufacturing jobs in Colrain, 1990-2000, and the associated reduction of other service and retail employment in the community, is consistent with a state-wide trend towards longer commuter travel times as fewer residents find work in their town of residence. At the same time, income levels among residents are running just under the average for Franklin County while the town's unemployment rate in 2001 was lower than the state and national average. It appears as if Colrain residents have overcome the loss of in-town employment by finding work elsewhere.

Like many of the communities in the western and eastern edges of Franklin County, there has not been the same level of pressure to develop the open spaces of Colrain for residential development as compared to communities along the Interstate 91 corridor, though according to population projections, this trend may change. Thus, the community may have a brief opportunity to protect natural, open space, and recreation resources in advance of development. Currently, due to the local economy and lower property values relative to other areas in the region, development rights may be purchased at much lower rates than would be possible if the town were to wait for the need for land protection to become more apparent.

B. HISTORY OF THE COMMUNITY

Colrain was settled in the 1740s by Presbyterian Scotch Irish during the hardships of the French and Indian Wars. Settlement was initially on the southeastern uplands of the town and along the North River alluvial lands. Fort Morrison, Fort Lucas, South Fort Morris, and McDowell's Fort were constructed by the settlers to defend the inhabitants. Several deadly Indian attacks occurred. A treaty ended the wars in 1763 and settlement proceeded rapidly due to good agricultural land, timber, and water power sites. The Town of Colrain was incorporated in 1761.

Over the next sixty years of development, the town's land use patterns were established. Forests were cleared and farms were located on the good soils. Water powered mills were set up on the North and Green Rivers, and most of the brooks, for sawmills, gristmills, and for manufacturing. Around the mills, the villages of Adamsville, Elm Grove, Foundry Village, Shattuckville, Griswoldville, and others were established. The villages were the local hubs with taverns, schools, churches, stores, and the residences of trades people. The town's civic center was located at Colrain Center.

Agriculture determined the patterns of the landscape. Livestock had relatively high value and was the basis of farm wealth. In the early 19th century, Colrain was the second highest wool producing town in Franklin County, following Ashfield. Pastures were cleared on the hillsides to support sheep and cows. The forest cover was reduced to around 20 percent by the 1850s. Large quantities of cheese and butter were produced on the farms. Cultivated acres were devoted to corn, grain, and potato production. The elevations, soils, and climate made the town very favorable for apple growing. In the 20th century, better transportation to markets encouraged egg, poultry, and milk production.

Manufacturing contributed to the development of the villages. Around 1814, Isaac Johnson and Warren Wing established the first cotton spinning mill in Franklin County at Shattuckville. Joseph Griswold established a cotton textile mill at Griswoldville in 1832 and another at Willis Place in 1865. As the century progressed, the mills expanded and attracted French Canadian and English mill worker families to live in mill owned housing. By 1837, two iron furnaces had been established, one at Foundry Village and the other at Willis Place, to cast iron products including wood stoves. The wood industries were important. There were sash and blind works in Elm Grove and Griswoldville, a furniture shop in Lyonsville, wagon shops, turning shops, box shop, cooper shop, and more than a dozen saw mills around town.

Emigration to Vermont, New York State, and the west began in the late 18th century. The population reached a peak of 2,016 around 1810 and slowly declined afterwards. The growth of manufacturing jobs offset the abandonment of some of the upland farms. The Shattuckville cotton mill closed in 1920. The population reached a low point of 1,391

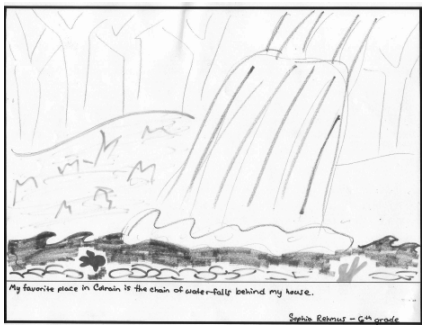
around 1930. The town's location away from railroads and interstate highways reduced economic opportunities and development.

Since the mid 20th century, land use patterns have been affected by the reduction in the number of farms and farm animals. Pastures have grown up into forests. Homes constructed outside of the villages for non-farming residents have reduced the agricultural focus of the countryside. Automobiles have increased the mobility of the residents and reduced their reliance on the local economy. The large cotton mills have closed and have recently been torn down, leaving BBA Nonwovens as the last fiber mill in town.

Colrain's significant historic resources are its agricultural and village land use patterns. The living history of productive fields, pastures and old farmsteads contributes to the town's special character. Wood lots and extensive forests continue to support the local wood industries. The villages retain interesting 19th century buildings associated with the town's personages and events. The architecture in this working landscape represents what the rest of New England once looked like.

Important historic resources that relate to open space are:

- The North River farms - the historic farm landscapes north of Colrain center to the Vermont border.
- The Catamount Hills - an old settlement area in the late 18th century, which was later abandoned. The area includes old cellar holes, stonewalls, a cemetery, bridges, and the site where the American flag was first flown over a school in 1812. Catamount State Forest has recreational history with Mcleod Pond, the cave and catamount dens as attractions.
- Cook State Forest has 1930s tree plantations and was a C.C.C. camp.
- Located throughout town are abandoned roads with double stonewalls and old house sites, which are historically significant and currently used for recreational hiking and snowmobiling.



C. POPULATION CHARACTERISTICS

In this section, Population Characteristics, Colrain's needs for open space and recreational resources are assessed based upon an analysis of demographic and employment statistics. The demographic information includes changes in total population, changes in the relative importance of different age groups in Colrain, and measures of income. The employment statistics section covers labor force, and employment by industry sector.

C.1 Demographic Information

C.1.1 Population and Population Change

Demographics are useful for forecasting the need for open space and recreational resources that may be required by residents over time. According to the U.S. Census, Colrain's population growth rate during the 1970s and the 1980s was greater than the county and state averages (See Table 3-2). In the 1990s, Colrain grew at a faster rate than the county but less than the state. Between 1970 and 2000, Colrain's population increased by 393 people (Table 3-1), equal to a growth rate of 27.7 percent. This is in contrast to Franklin County as a whole, which saw a 20.8 percent increase in population from 1970-2000 and to the Commonwealth of Massachusetts, which saw an 11.6 percent increase in population. Colrain has a population density of 42 people per square mile (Commonwealth of Mass. Dept. of Housing and Community Development).

Table 3-1: Population for Colrain, Franklin County and Massachusetts 1970-2000

	Population 1970 (# of People)	Population 1980 (# of People)	Population 1990 (# of People)	Population 2000 (# of People)	Population Increase 1970-2000 (# of People)
Massachusetts	5,689,377	5,737,037	6,016,425	6,349,097	659,720
Franklin County	59,233	64,317	70,092	71,535	12,302
Colrain	1,420	1,552	1,757	1,813	393

Sources: Growth and Estimated Growth from U.S. Census of Population and Housing, Projection data from the
Massachusetts Institute of Social and Economic Research (M.I.S.E.R.), July, 1999.

According to the Massachusetts Institute of Social and Economic Research (MISER), the town will once again experience an increase in population during the ten year period 2000-2010. MISER projects the Town of Colrain will gain 177 residents, which would be an increase of 9.8 percent. This is over three times the growth experienced in the 1990s. Again, this would be in contrast to Franklin County and Massachusetts, which are expected to have a gain in population of 7.8 percent and 5.5 percent, respectively (See Table 3-2 and Figure 3-1).

MISER's projections, released in 1999, relied heavily on 1990 U.S. Census data and intermediary population estimates produced during 1990-1999, prior to the 2000 census. MISER will be updating its projections over the next few years to reflect information gathered during the 2000 U.S. Census. The new MISER forecasts, which will likely extend to 2025, may possibly show different trends and patterns than those suggested by the current projections.

Table 3-2: Population Growth and Growth Rates for 1970-2000, and Projections for 2000-2010 for Colrain, Franklin County, and Massachusetts

	Colrain	Franklin County	Massachusetts
Population Growth, 1970-1980 (# of People)	132	5,084	47,660
Percent Population Growth, 1970-1980	9.3%	8.6%	0.8%
Population Growth, 1980-1990 (# of People)	205	5,775	279,388
Percent Population Growth, 1980-1990	13.2%	9.0%	4.9%
Population Growth, 1990-2000 (# of People)	56	1,443	332,672
Percent Population Growth, 1990-2000	3.2%	2.1%	5.5%
Population Growth, 1970-2000 (# of People)	393	12,302	659,720
Percent Population Growth, 1970-2000	27.7%	20.8%	11.6%
Projected Population Growth, 2000-2010 (# of People)	177	5,550	349,897
Projected Percent Population Growth, 2000-2010	9.8%	7.5%	5.5%

Sources: Growth and Estimated Growth from U.S. Census of Population and Housing, Projection data from the Massachusetts Institute of Social and Economic Research (M.I.S.E.R.); July 1999.

If we assume Colrain could experience a 9.8 percent increase in population by the year 2010, how would this translate into demand for open space and recreational resources? Would these additional residents be young, middle-aged, or elderly and, what would be the age distribution of the population in 2010? How could these changes in population impact demand for open space and recreational resources?

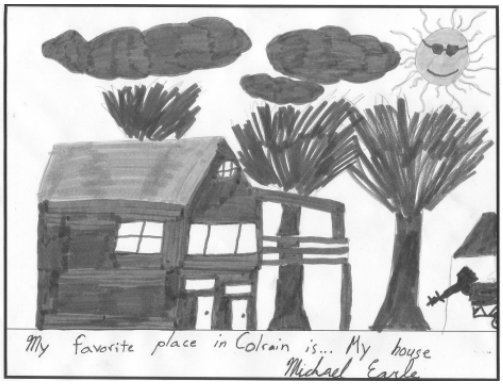
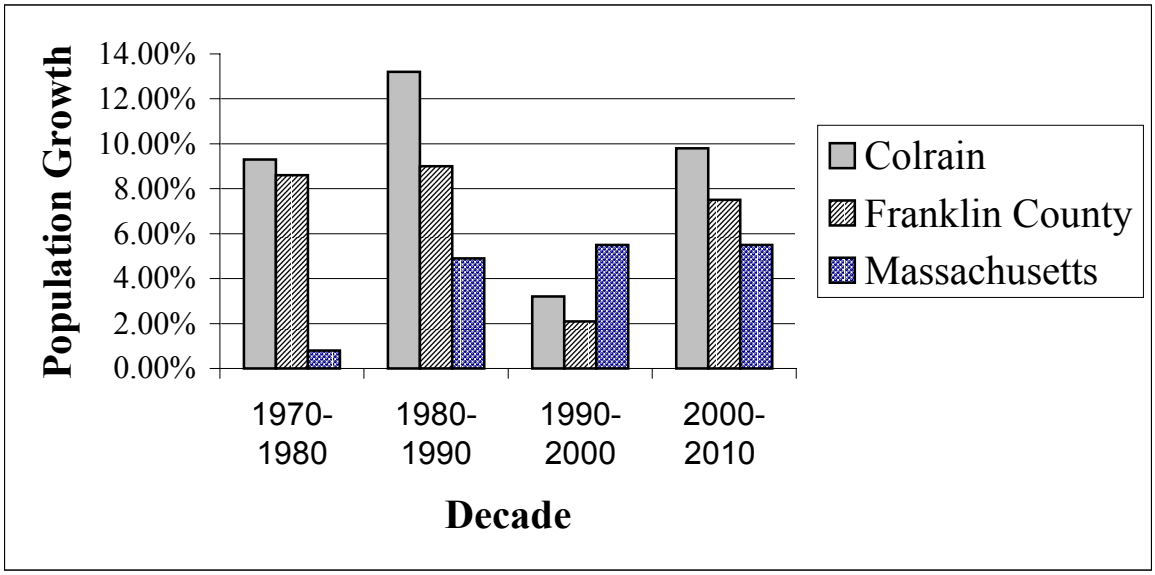


Figure 3-1: Population Growth Rates for Colrain, Franklin County, and Massachusetts 1970-1980, 1980-1990, 1990-2000 and Population Projections 2000-2010



Sources: Growth and Estimated Growth from U.S. Census of Population and Housing, Projection data from the Massachusetts Institute of Social and Economic Research (M.I.S.E.R.); July 1999.

According to the U.S. Census 2000 General Demographic Characteristics, the Town of Colrain has a relatively young population with a majority of its residents in the 0-19 and 20-44 (early working years) age cohorts (See Table 3-3). However, the 45-64 year age cohort experienced an increase in numbers with a 32.3 percent increase over the ten year period 1990-2000. Based on the Census data it would appear that residents in the 20-44 age cohort are leaving the region and to a lesser extent, the state, due possibly to better job markets elsewhere. In addition, the numbers of children (and thus younger families) have increased overall in the state, and decreased in the county and in Colrain, which seems to support the idea that young families typically go where the jobs are most prevalent. There were twenty-five more residents, who were at least 65 years of age in 2000, than there were in 1990. This is an overall increase of 12.7 percent, which is much greater than the county (0.5 percent) and the state (5.5 percent) averages.

Table 3-3: Number of People by Age Cohort Between 1990 and 2000 in Massachusetts, Franklin County, and in Colrain

	Massachusetts Population		% Change	Franklin County Population		% Change	Colrain Population		% Change
Age Cohort	**1990**	**2000**		**1990**	**2000**		**1990**	**2000**	
0-19 years	1,561,017	1,675,113	7.3%	19,038	18,502	-2.8%	567	540	-4.8%
20-44 years	2,530,390	2,394,062	-5.4%	28,635	24,303	-15.1%	671	625	-6.9%
45-64 years	1,110,013	1,419,760	27.9%	12,289	18,550	50.9%	322	426	32.3%
65+ years	815,005	860,162	5.5%	10,130	10,180	.5%	197	222	12.7%

Source: U.S. Census, 1990 and 2000.

Colrain currently has a large number of young people (0-19 years old); a shrinking younger (20-44) work force; a smaller yet growing older work force (45-64), which typically earns higher incomes than the younger worker cohort; and, a growing elderly population. If the relatively large cohort of older (45-64) working-aged residents were to continue to reside in Colrain, it could result in a significant population of individuals in the older age cohort in ten to twenty years. How will the Town of Colrain provide recreational facilities and services for all of its residents, especially the elderly, which may require accessible walking paths, arts, and leisure programs? Residents of all ages may need facilities and programs that provide safe spaces for recreating as well as access to open space.

Identifying the best location for the development of new open space and recreation resources should consider where the concentration of population will occur and which parts of the local citizenry require specific needs. As will be seen in the fourth part of Section 3, Growth and Development Patterns, future growth depends in large part on zoning, slopes, soil and groundwater related constraints, and on which lands are permanently protected from development. Town Officials could identify key parcels in town that might be future parks and walking trails that are close to the current distinct neighborhoods and/or areas that could be later developed for residential uses. Officials could be looking for opportunities to conserve land in Colrain that protects valuable scenic and natural resources and provides public access to trail networks and open spaces.

Whatever the generational make up of the future community, recreation and open space needs may change over time. What would Colrain's response be to these potential increasing and changing needs? How can these services and facilities be created in an inexpensive manner to both the town and the residents? The answers to these questions may depend in part on the current and potential economic and financial well being of Colrain.

C.1.2 Economic Wealth of Residents and Community

Measures of the income levels of Colrain residents as compared to the County and State are helpful in assessing the ability of the citizenry to pay for recreational resources and programs and access to open space.

Table 3-4 describes the earning power of residents in Colrain as compared to the County and the State. Colrain households earn incomes that are 1.7 percent below the median for the County and 20.6 percent below the median for the State. The per capita income for the town (total income for all residents divided by the total population) is lower than both the County and the State. However, the percentage of people living below the poverty line in Colrain is significantly lower than both the County and the State at 6.8 percent. It appears that the financial well-being of Colrain residents is on par with the average for households in the county, but lower than the average for the state. Colrain's lower per

capita income figure may be due to the town's having more people per household (2.64) than the county average (2.37).

Table 3-4: Median Household Income, Per Capita Income, and Percentage Below Poverty Level in 1999 for Colrain compared to Franklin County and the State

	Median Household Income	Per Capita Income	Percentage Below Poverty Level*
Colrain	$40,076	$18,948	6.8%
Franklin County	$40,768	$20,672	9.4%
Massachusetts	$50,502	$25,952	9.3%

Source: 2000 Census of Population.
*Individuals living below poverty level for whom the poverty status has been determined.

Although Colrain's resources today are clearly both its people and its natural landscapes, the status of its finances could be affected by an interdependent relationship that exists between the two. The costs of the community services provided to residents are paid for with the tax revenues generated by different kinds of property, both developed and undeveloped. Some developed uses like housing are often considered a loss because the school costs of one household are rarely made up by the revenues generated by that same property. One reason that towns encourage economic development is to have some other type of property to share the tax burden. Protected open space on the other hand costs very little, provides a meager amount of tax revenues, but reduces the amount of housing that can occur. This relationship is explored in more detail in subsection D. Growth and Development Patterns.

C.2 Employment Statistics

Employment statistics like labor force, unemployment rates, numbers of employees, and place of employment are used to describe the local economy. Labor force figures can reflect the ability of a community to provide workers to fuel incoming and expanding businesses. Unemployment rates can show how well residents are fairing in the larger economy while employment figures describe the number of employees in different types of businesses. Employment can be used as a measure of productivity that can be used to gauge, which should be encouraged in town. The town may decide to encourage business development to supply local jobs and to build taxable value, which can help pay for municipal services and facilities, including recreational parks and programming as well as protected open space.

C.2.1 Labor Force: Colrain residents that are able to work

In the year 2001, the Town of Colrain had a labor force of 922 with 893 residents employed and 29 unemployed (Mass. Division of Employment and Training) (See Table 3-5). Colrain experienced a 3.1 percent rate of unemployment, whereas Franklin County

had a rate of 3.2 percent and the Commonwealth of Massachusetts had a rate of 3.7 percent. Outside of 1997 and 1998, it would appear that Colrain residents had similar rates of unemployment over the past eight years as did residents across the county and the state.

Table 3-5: Labor Force and Unemployment Rate in Colrain 1994-2001

	1994	1995	1996	1997	1998	1999	2000	2001	1994-2001 Change	% Change
Number of People in the Labor Force and Employed	835	851	850	874	891	908	899	893	58	6.9%
Number of People in the Labor Force and Unemployed	45	45	38	56	47	29	25	29	16	-35.6%
Unemployment Rate in Colrain	5.1%	5.0%	4.3%	6.0%	5.0%	3.1%	2.7%	3.1%	-2.0%	N/A
Unemployment Rate in Franklin County	5.2%	4.7%	3.8%	3.8%	3.3%	2.9%	2.6%	3.2%	-2.0%	
Unemployment Rate in Massachusetts	6.0%	5.4%	4.3%	4.0%	3.2%	3.2%	2.6%	3.7%	-2.3%	

Source: Commonwealth of Massachusetts, Division of Employment and Training (Local Area Unemployment Statistics).

C.2.2 Employment in Colrain: People who work in town, whether they are residents or not

Table 3-6 depicts sector employment in the county and state as a percentage of total employment. The Table demonstrates that the manufacturing, trade and service sectors on both the state and the county levels produced the highest percentage of total employment in 1998, together combining for over 80 percent in the State and 85 percent in the county. It can be said that the county has a strong manufacturing sector, since it has a higher percentage, or share, of total employment in this sector than the state

average. Though it has declined some since the beginning of the decade, the sector still employed a quarter of the people in the county (25.75 percent) in 1998. Whereas, the state, which has lost many manufacturing jobs since 1990, employed only 14 percent of its total workers in that sector. Using the same comparative analysis, other competitive sectors in the county are Agriculture, and Transportation, Communication (Information), and Public Utilities (T.C.P.U). Since these sectors are employing more people in the county than the state average, they may be producing more goods and services than their counterparts in other areas of the State. Therefore, it can be said that these sectors are most likely exporting their goods and bringing money into the region.

Another important technique for determining the relative strengths and weaknesses of the county employment sectors as compared to the state is to analyze the changes in employment over time. This method also shows that manufacturing is relatively strong in Franklin County. For example, during the period from 1990 to 1998, the county's manufacturing sector lost 4 percent of its jobs, while the sector in the state as a whole lost 28 percent. Though also declining on both levels, Agriculture and Trade declined slower in the county than in the State as a whole during those same eight years. Weaker sectors in the county, construction and F.I.R.E (Finance, Insurance and Real Estate) declined at a greater rate in Franklin County than in the state. Analysis of the seven sectors most commonly analyzed found only the T.C.P.U (Transportation, Communication and Public Utilities) and services sectors demonstrating growth between 1990 and 1998 in both Franklin County and in the state. Services grew at a slightly greater pace in the state while T.C.P.U. grew slightly faster on the county level.

Table 3-6: Employment by Industry Sector for Franklin County and State of Massachusetts as a Percentage of Total Employment, 1990 and 1998

Industry Sectors	1990 Franklin County	1998 Franklin County	1990 Massachusetts	1998 Massachusetts
Agriculture	0.67%	0.45%	0.43%	0.04%
Construction	4.25%	3.23%	3.91%	3.63%
Manufacturing	26.87%	25.75%	19.40%	14.02%
T.C.P.U.	4.84%	6.86%	4.75%	6.62%
Trade	25.81%	25.20%	26.06%	24.64%
F.I.R.E.	6.05%	3.60%	8.93%	8.85%
Services	31.52%	34.85%	36.51%	41.42%

Source: County Business Patterns 1990 and 1998, Bureau of the Census.
T.C.P.U.: Transportation, Communication, and Public Utilities; Trade: Wholesale and Retail Trade; F.I.R.E.: Finance, Insurance, and Real Estate.

It is important to note that there are differences in the data sources for employment statistics. The county and state figures come from the Bureau of the Census' County Business Patterns, which does not include the government sector and which has as its most recent data, 1998 figures. The employment figures for Colrain come from the Massachusetts Division of Employment and Training, which includes the government sector and, which provides more recent data from 2001. In Table 3-7, employment statistics are presented for the years 1990 and 1998 so as to compare Colrain's statistics with the county and state figures (which use the same time period). The table also includes data for 2001 to show the most current information for Colrain.

Although Colrain's economy is linked to that of the county and state, it is different in several aspects (See Table 3-7). Based on employment, a comparison of the leading sectors can be made between town, county and the state using the 1990 and 1998 data provided by the Division of Employment and Training. However, the Open Space Planning Committee provided more accurate 2001 data reflecting a more significant share of total employment being provided by the agricultural and construction sectors. For example, in 2001 at least fifty people were employed in the agricultural sector

representing nearly 17 percent of total employment. Construction provided sixteen jobs or 5.4 percent of total employment. Using the 2001 figures, the three sectors providing the most jobs in Colrain were manufacturing, agriculture, and government, which is quite different than the dominant sectors in the county (services, manufacturing, and trade) and the state (services, trade, manufacturing).

Table 3-7: Employment by Industry Sector for Colrain as a Percentage of Total Private Sector Employment, 1990 and 2001

Industry Sectors	1990 Colrain Employed	1990 Percentage of Total	1998 Colrain Employed	1998 Percentage of Total	2001 Colrain Employed	2001 Percentage of Total
Agriculture	conf*		19	6.7%	50**	**16.9%**
Construction	7	1.9%	2	.7%	16**	5.4%
Manufacturing	241	64.3%	152	53.5%	143	**48.3%**
T.C.P.U.	conf		conf		0	
Trade	33	8.8%	15	5.3%	0	
F.I.R.E.	conf		conf		0	
Services	43	11.5%	32	11.3%	22	7.4%
Government	conf		58	20.4%	65	**22.0%**
Totals	375		284		259	

Source: Commonwealth of Massachusetts, Division of Employment and Training, 2002. *conf: DET suppresses this data due to confidentiality. **2001 employment figures provided by Open Space Committee members.

A comparison of the 1998 employment figures for Agriculture in Colrain (6.7 percent), Franklin County (0.45 percent), and in Massachusetts (0.04 percent) demonstrates another important finding. Agriculture (farmers, foresters, and loggers) is a greater employer, and therefore more competitive business in Colrain than the county and state average. According to Table 3-8, which shows employment figures for different industry sectors in Colrain, the agriculture sector employed 23 persons in 1992, which exceeded the number of people employed in the services and trade sectors in different years. Despite its decline in the past year, agriculture is still an important industry in town. Agriculture provides many public benefits beyond employment. Fresh food, retention of significant historical landscapes, scenery, and rural character are just a few of the contributions that active agricultural businesses provide to Colrain residents.

Table 3-8: Employment by Industry Sector for Colrain, 1990-2001

Year	Total	Agri-culture Forestry Fishing	Government	Construction	Manufacturing	TCPU	Trade	FIRE	Services
1990	375	conf	conf	7	241	conf	33	conf	43
1991	391	conf	conf	8	258	conf	23	conf	37
1992	393	23	conf	8	272	conf	24	conf	38
1993	350	conf	conf	4	251	conf	conf	conf	46
1994	331	conf	conf	4	245	conf	conf	conf	27
1995	360	conf	conf	conf	249	conf	6	conf	31
1996	366	conf	conf	conf	243	conf	12	conf	31
1997	307	15	55	conf	conf	conf	18	conf	32
1998	284	19	58	2	152	conf	15	conf	32
1999	309	19	60	3	189	4	9	conf	23
2000	293	21	63	4	168	4	12	conf	20
2001	259	12	65	5	143	0	0	0	22

Source: Commonwealth of Massachusetts, Division of Employment and Training. TCPU = Transportation, Communication and Public Utilities, FIRE = Finance, Insurance and Real Estate
Trade = Wholesale and Retail Trade, conf = data suppressed due to confidentiality. *In 1997, state government changed its reporting method to more accurately reflect the location of its employees. Caution is advised in comparing 1997 government employment data on the community level with prior years.

Between 1990 and 2001 there were other trends important to note:

- Manufacturing employment (and total employment) in Colrain began to decline after its peak in 1992 with 272 employees to its low of 143 in 2001; and,
- The Services sector has been on the decline since its peak of 46 employees in 1993;

These local trends are similar to county and state employment trends except for the Services sector. The Services industry sector includes hotels, personal, business, automotive, entertainment, recreation, health, legal, educational, social, managerial, and engineering services. The Services sector is growing in both numbers of employees and in its share of total employment in the County, the State, and in the Nation overall, which means that it could be a more significant part of the local economy. Town officials could strengthen the local economy by supporting existing manufacturing industries, facilitating local ownership and entrepreneurship in the services sectors, and by encouraging local agricultural businesses.

The reduction in manufacturing employment in town is likely one of the causes of another trend: increasing numbers of residents commuting outside of Franklin County to work. According to the 1990 and 2000 U.S. Census figures, the percentage of Colrain residents who worked in town decreased from 30 percent to 21 percent as did those that commuted to jobs in other towns in the county, from 62 percent to 59 percent (see Table 3-9). The greatest increase during the decade occurred with commuters traveling to jobs in other counties (from 5 percent to 16 percent). Open Space Planning Committee members suggest that this reflects the number of workers that now work at the University

of Massachusetts at Amherst and at Verizon in Springfield. There was also an increase in the number of residents that commuted out of state (from 2.8 percent to 3.8 percent). These trends were common to other communities in the county and across the Commonwealth.

Table 3-9: Place of Employment for Workers 16 Years and Over in 1990 and in 2000

	Worked in Town of Residence	Worked out of Town of Residence but in County of Residence	Worked out of County of Residence but in State of Residence	Worked out of State of Residence
Colrain in 2000	21.3%	58.7 %	16.2%	3.8%
Colrain in 1990	30.3%	62.2%	4.7%	2.8%
Franklin County in 2000	27.6%	34.9%	33.4 %	4.1%
Franklin County in 1990	35.8%	35.8%	24.9%	3.4%
Massachusetts In 2000	31.3%	35.4%	30.1%	3.3%
Massachusetts In 1990	36.5%	35.9%	24.5%	3.1%

Source: U.S. Census Bureau, Census 1990 and 2000.

Colrain's population is expected to grow by nearly 180 people over the next decade. The overall population will continue to age if older working residents continue to reside in town. A growing senior population will have implications for land use within the river valleys and villages. Residents may continue to depend on jobs in other communities and counties, yet manufacturing will likely retain its local importance as an employer. Agriculture can continue to offer Colrain residents with limited employment opportunities and all of the other benefits including scenery and access to fresh, locally grown food. Two trends that have implications for farming: increasing commuter times of Massachusetts workers and increasing population. No longer can Colrain expect its natural rural landscape to be forever outside the influence of development. On the contrary, Massachusetts is a slowly urbanizing state and Colrain, though located far west of the Route 495 beltway may experience the renewed interest of prospective homeowners looking for a quieter pace of living.

D. GROWTH AND DEVELOPMENT PATTERNS

D.1 Patterns and Trends

Over the past two hundred years, Colrain residents developed their community using the productivity of the area's forests and good grazing soils, and on the waterpower of the North River. In the 20th century, Colrain saw the closing of some of its manufacturing businesses while agriculture remained a significant part of the local economy. One result

of the overall decline in manufacturing from its peak during the Federal Period was a loss of population from 2,016 in 1810 to 1,420 in 1970.

In 1970, the predominant land use in Colrain was forest, though crop and pasture land could be found in a contiguous band along the floodplains of the West and East Branch and straddling most roads in town. Open land existed as abandoned farmland and power line easements. The most common development pattern in 1970 was single-family homes on open, road-side lots at least ½ acre in size, and on ¼ acre to ½ acre areas near villages, mostly located in the southern half of town.

Between 1971 and 1997, the predominant land use changes in the Town of Colrain were the construction of single-family homes on lots at least ½ acre in size all over town but especially in the Christian Hill area; and, the conversion of pasture and cropland to forest and residential use. Most (if not all) of the residential development has been in the form of approval-not-required lots.

D.2 Infrastructure

D.2.1 Transportation Systems

Running along the North River is the Town of Colrain's principle highway, State Route 112. This is a north-south thoroughfare linking Colrain with Shelburne Falls to the south and Jacksonville, Vermont to the north. It is an important route for tourists, most especially skiers on their way to the slopes in Vermont. Greenfield Road is considered an important link to State Route 2, a major east-west highway in Northern Massachusetts, which intersects with Interstate Route 91, a major north-south route.

There is no regular public transportation in Colrain. Transportation for the elderly and people with disabilities is provided by the Franklin Regional Transportation Authority (FRTA).

D.2.2 Water Supply Systems

The Town of Colrain is served by three community public water systems. These service a small number of the town's residents. The remainder of the town's population is serviced by private wells.

The **Colrain Fire District** serves approximately 100 people with forty-two service connections. The existing well, the main source of water, is located off Jacksonville Road (Route 112). Water is pumped to a storage tank with a 50,000 gallon capacity. Water production for 2001 was 0.665 million gallons with an average daily use of 1,800 gallons per day. The safe yield of the well, which is its capacity to pump water consistently without diminishing returns for an extended period of time, is 46,800 gallons per day.

Overall, 98 percent of the water went to residences, 1 percent to a summer camp and 1 percent to a transient residential area. This water supply will likely be sufficient for at least the next twenty years assuming the number of people it serves increases no faster than the town's projected population growth rate.

The District also maintains a surface water source consisting of an upper and lower reservoir off Greenfield Road. These reservoirs are currently for emergency supply only. The upper reservoir has a capacity of 11.5 million gallons. The lower reservoir is an intake reservoir only and has a storage capacity of 0.5 million gallons.

The Colrain Fire District has a 347-foot Zone I surrounding its wellhead off Jacksonville Road. The District does not own or control the land east of the pumping station across the North River. However, according to the Mass. Department of Environmental Protection, there does not appear to be any inappropriate land uses that might threaten the ground water quality.

The **Griswoldville Water District** is located on Route 112 in the south-central portion of town. It has a ground water source with forty-four service connections serving a population of approximately 125. In the year 2001, water production was 4.997 million gallons with an average daily use of 14,000 gallons. Ninety-eight percent of this water went to residential use and 2 percent went to commercial uses. Its safe yield is 108,000 gallons per day.

Currently, the Griswoldville Water District does not own the Zone I protective radius (333 ft.) around its wellhead. The only land use within the Zone I not related to the District is Call Road. The Interim Wellhead Protection Area (IWPA) is described as a radius of 800 feet from the well. The only land use not related to the District is a residence on Call Road.

The **Shelburne Falls Fire District** has two active wells, and an emergency supply in the Fox Brook Reservoir. The wells are located between 120 and 165 feet from the banks of the North River. Farmland on the west side of the North River and within the Interim Wellhead Protection Area is protected through the Agricultural Preservation Restriction Program. Fox Brook Reservoir has a surface area of approximately 3 acres and a total storage capacity of 12 million gallons. In 2001, the Fire District served approximately 2,200 residents of Buckland, Shelburne and to a lesser degree Colrain, and commercial businesses and industries with 66.5 million gallons of drinking water with an average annual daily withdrawal of 182,104 gallons. The registered withdrawal for the system is 310,000 gallons per day, while the approved volume for the one active well is 347,040. Roughly half of the water consumed in 2001 was by Buckland residents and businesses and half by Shelburne's. The Shelburne Falls Fire District serves fifty residents in Colrain. The Shelburne Falls Fire District has a delineated Zone II Recharge Area.

D.3 Long-term Development Patterns

Long-term development patterns will be based on a combination of land use controls and population trends.

D.3.1 Land Use Controls

The Town of Colrain has three local land use controls: zoning districts, an overlay district, and a recent amendment to the bylaws: Section VI-5 Back Lot Development with Open Space Set-Aside.

Residential development of frontage lots on existing roads will likely be the dominant short-term development pattern given current zoning. Colrain's zoning includes three use districts: Village, Commercial-Industrial, and Rural District. The Village districts in Colrain Center, Griswoldville, and Shattuckville primarily allow single-family and two-family homes, agricultural and recreational uses, community services and business uses only with special permits. The Commercial-Industrial Districts, of which there are four, Griswoldville, Lyonsville, Prolovich, and Stewartsville, allow business and professional offices with less than six employees, as well as community uses, agricultural and recreational, and residential uses by right and other commercial and industrial uses by special permit. The rest of town is located within the Rural District, which allows single-family dwellings, some community services, agricultural and recreational uses by right, and other uses by special permit.

The density of development allowed depends on the district in which the land is located. The Village Districts require lots to be 20,000 sq. ft. in size, have at least 100 feet of frontage on a way, and leave at least 30 percent of the lot in vegetation. The Rural Districts require a building lot to be 1 and ½ acres or 65,340 sq. ft. in size, have at least 300 feet of frontage on a road, and leave at least 75 percent of the lot in undeveloped use. The Commercial-Industrial District requires lots to be at least 2 acres in size or 87,120 sq. ft. in area, have 300 feet of frontage, and have at least 50 percent of the area in undeveloped use.

The overlay district is the Flood Plain District. The regulations of the Flood Plain District are designed to only restrict development within the floodway, which would result in increased flood levels for that particular river during a 100-year flood.

The Back-lot Development with Open Space Set-Aside bylaw is designed to allow for the development of up to four back lots, 1 and ½ acres in size, which do not have the required minimum frontage to access a public way via a common driveway across land of other's ownership. In exchange, the landowner or developer would have to permanently protect from development (and restrict its future use to agriculture) at a minimum, an equal amount of land (1.5 acres in size) with at least 300 feet of frontage, for every back lot developed.

D.3.2 Build-out Analysis

To illustrate some of the long-term effects of current zoning, results of a build-out study are included here. This build-out study was completed in 2001 as 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. It is important to note that the recent Zoning revisions changed the location, number, and size of the Commercial-Industrial (CI)and the Village Districts. Although, these changes would have some impact on the numbers of residential lots or commercial and industrial floor area in the build-out analysis presented here, the overall change is not significant given that the predominant amount of developable land is in the Rural District. Of the entire 16,173 acres determined to be developable (of Colrain's total 27,848 acres in land area), less than 160 acres were located in the Village and CI Districts. In comparison, there were over 16,000 acres considered developable within the Rural District.

The purpose of a build-out analysis is to determine potentially developable land areas for residential, commercial, and industrial development. The process starts with identifying existing development based on 1997 MacConnell Land Use data and new subdivisions built since that time. 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 25 percent; wetland areas identified by the National Wetlands Inventory, 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 permanently protected, such as land owned by a state natural resource agency and farmland in the Agricultural Preservation Restriction Program. Some areas that many residents would expect to be protected, such as land owned by municipal water districts to protect public water supplies, are not considered to be off-limits to development unless a conservation restriction or some other legal mechanism is in place to permanently protect the land as open space. Slopes between fifteen and twenty-five percent are considered a partial constraint, since certain types of land use typically do not occur on relatively steep slopes. For purposes of this build-out analysis, it was assumed that slopes of fifteen and twenty-five percent would prevent commercial and industrial development and residential development on small lots. However, it was assumed that large lot residential development could occur on slopes between fifteen and twenty-five percent given greater flexibility to grade and site structures. The areas that remain after the screening process are considered potentially developable.

Zoning districts are then overlain on the potentially developable areas and a "build factor" is calculated based on 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 either house lots or commercial or industrial square footage depending on the zoning district. 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 (See Table 3-10). Commercial and industrial square footage is similarly calculated and its associated demand for water is estimated.

Table 3-10 describes the results of the build-out in numerical terms. While it might take many decades to reach "build-out," it is quite clear that current zoning will not protect the community's rural character or natural resource base. Planning is needed to identify key resources to protect and the areas most suitable for development. Once completed, Open Space and Master Plans should be implemented by adopting zoning revisions and land protection programs to realize the balance desired by a community between natural resource protection and development.

Table 3-10: Summary Build-out Statistics of New Development and Associated Impacts

Potentially Developable Land (acres)	16,174
Total Residential Lots	9,767
Total Residential Units	10,055
Comm./Ind. Buildable Floor Area (sq. ft.)	1,315,573
Residential Water Use (gallons per day) [2]	2,126,633
Comm./Ind. Water Use (gallons per day) [2]	98,668
Non-Recycled Solid Waste (tons/year) [3]	10,344
Total Population at Build-out	30,168
New Residents [4]	28,355
New Students [5]	5,906
New Residential Subdivision Roads (miles)	134

Notes:

1. All wetlands removed from potentially developable land
   No development on slopes in excess of 25%
   No development in Zone I Water Supply Protection Areas
   No development in permanently 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

The Town of Colrain has zoning that is designed to promote village, commercial, industrial, and rural residential uses. However, the predominant development pattern is that of residential development in outlying rural areas of Colrain. The largest district, the Rural District, is open to large lot residential use with few constraints. According to the worst case scenario, this could result in over ten thousand (10,055) new housing units sprawled over the landscape.

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, Colrain residents could experience drinking water shortages. In addition, with over 5,900 new school children at build-out, town officials would have to build many new elementary schools. New subdivisions could result in the need for over 134 new miles of roads that would have to be built and maintained. Fire and police services would have to expand to protect the

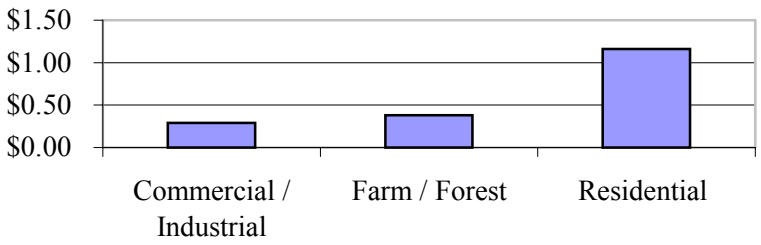
increased population. It is likely that at some point on the path towards complete build-out, the Town of Colrain would seek to control this expensive pattern of development.

There would be both ecological and economic impacts caused by this degree of population growth and development. Ecological impacts could include a reduction in available clean drinking water, decreases in the quantity and quality of wildlife and fisheries habitats, a reduction in the quality of first and second order streams, lower air quality, lower biodiversity, increases to erosion, and the fragmentation of the large areas of forest by subdivisions.

The economic impacts of this level of population growth and development would be felt well before maximum build-out was reached. Would the additional commercial and industrial property help to pay for the costs of supporting the increasing demand for municipal services like education? The challenge for Colrain will be to find a model for growth that protects vital natural resource systems like aquifers and their recharge areas and prime farmland soils and at the same time promotes a stable property tax rate. In designing the model it is important to understand the measurable fiscal impacts of different land uses. For instance, permanently protected open space (e.g. farmland/forest), residential, and commercial /industrial development each have a different fiscal impact depending on the relationship of property tax revenues generated to municipal services consumed. There is a process by which the fiscal value of these three different land uses are compared within a town to determine whether a use has a positive or negative fiscal impact. This process is called a Cost of Community Services (COCS) analysis.

In 1991, the American Farmland Trust (AFT) conducted a Cost of Community Services (COCS) analysis for several towns in Franklin County. A COCS analysis is a process by which the fiscal impacts of different land uses within a town are compared to determine whether a use has a positive or negative net fiscal impact. The results of the 1991 AFT study showed that residential uses cost more in services that they provide in tax revenues and that protection of open space is an effective strategy for promoting a stable tax base. The studies found that for every dollar generated by residential uses they cost on average $1.16 in services, while commercial and industrial uses used 29 cents and open space, an average of only 38 cents. Protected open space results in a positive fiscal impact to the town. In 1995, the Southern New England Forest Consortium (SNEFC) commissioned a study of eleven southern New England towns that confirmed the findings of the earlier AFT study. The findings were confirmed by another 47 COCS analyses conducted across the country in the 1990s. Figure 3-2 demonstrates the summary of the 58 COCS studies. For every dollar of property tax revenues received from residential property, the amount of money expended by the town to support homeowners is over a dollar, while farm/forestland and commercial/industrial property provide a positive fiscal impact.

Figure 3-2: Summary of Cost of Community Services Studies: Median Cost of Providing Public Services--Per Dollar of Property Tax Revenue Raised--by Land Use
(American Farmland Trust; 1999)



Source: American Farmland Trust; 1999.

The second component of a balanced land use plan concerns the development of other tax- generating land uses. Both the AFT and the SNEFC studies showed that for every dollar of taxes generated by commercial and industrial uses, the cost to towns for these uses resulted in a positive net gain. Patterns of commercial and industrial uses vary considerably between towns, and having a positive fiscal impact is only one of several important factors that need to be considered when encouraging this type of development. It is just as critical for communities to consider the impact of commercial and industrial development on quality of life. Viewed in this light, the best types of commercial and industrial development to encourage might have some of the following characteristics: locally owned and operated; in the Services sector; use of a large amount of taxable personal property; being a "green industry" that does not use or generate hazardous materials; businesses that add value to the region's agricultural and forestry products; and, businesses that employ local residents. It is also important to consider that successful commercial and industrial development often generates increased demand for housing, traffic congestion and pollution. Therefore, the type, size, and location of industrial and commercial development require thorough research and planning.

In conclusion, Colrain may consider:

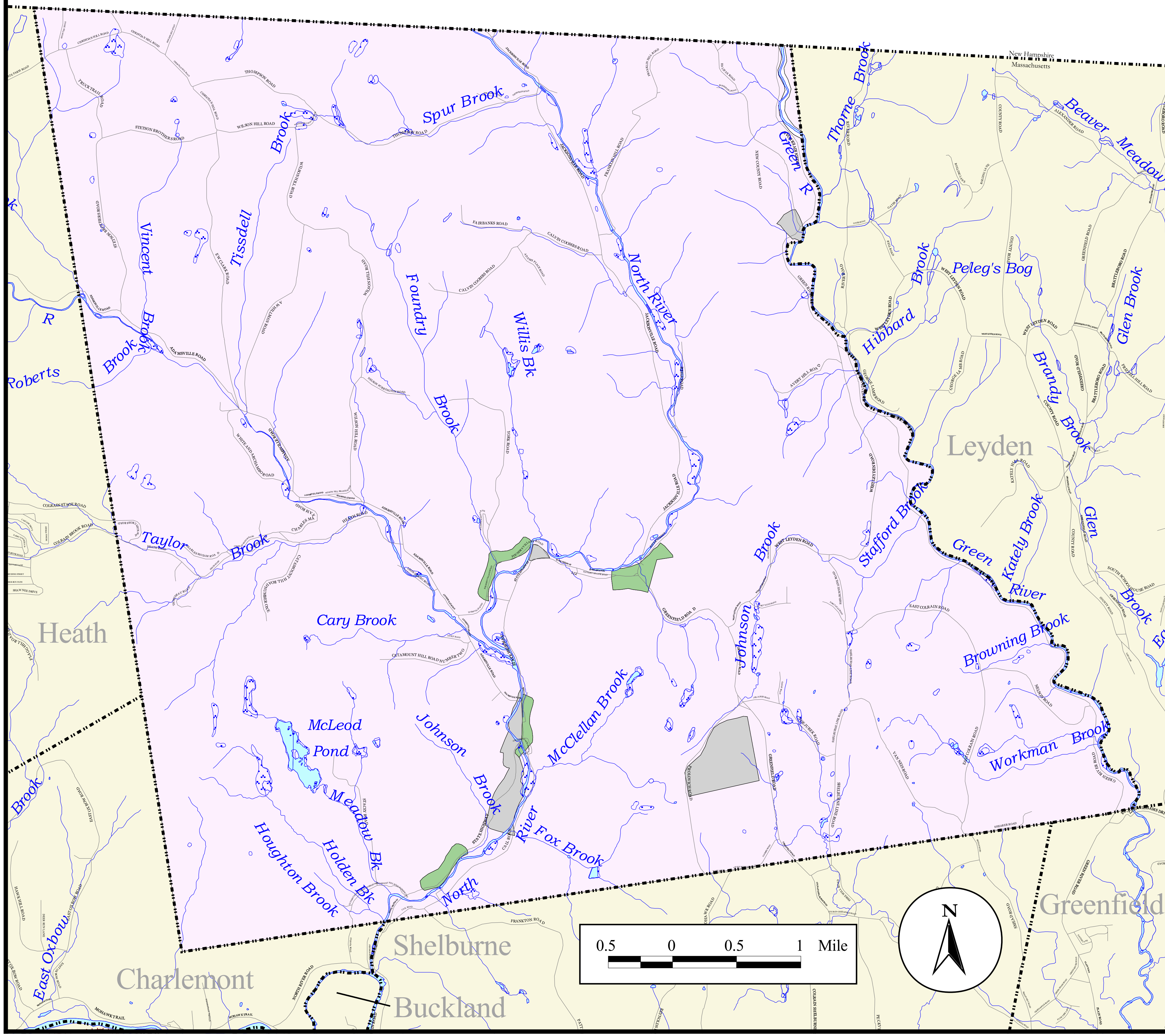
- Protecting open space near village centers to provide access to the elderly and all ages;
- Encouraging manufacturing despite its declining employment numbers in the town and in the state;
- Considering ways to direct future development where impacts to natural, open space, and recreational resources will be minimized; and,
- Supporting local businesses in the agricultural sector for their economic contribution to residents, because of the public benefits received from active farming, and to offset the costs of potential future residential development.

By continuing to pursue strategies that involve active land protection, zoning measures that direct development while protecting natural resources, and sustainable economic development, Colrain can continue to grow and stabilize its property tax rates while maintaining its rural character.

Town of Colrain

Open Space and Recreation Plan

Zoning



Legend

Town line	**Zoning**
Rail line	Commercial/Industrial District
Road	Rural District
Stream or river	Village District
Water	
National Wetlands Inventory wetland	

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 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.

Road data provided by Massachusetts Highway Department. Town line, rail line, river, stream, pond, National Wetlands Inventory data provided by MassGIS. Zoning provided by FRCOG.

Note: Depicted boundaries are a 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.

FRANKLIN REGIONAL COUNCIL OF GOVERNMENTS
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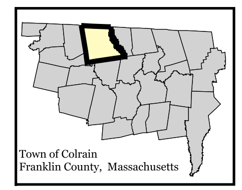
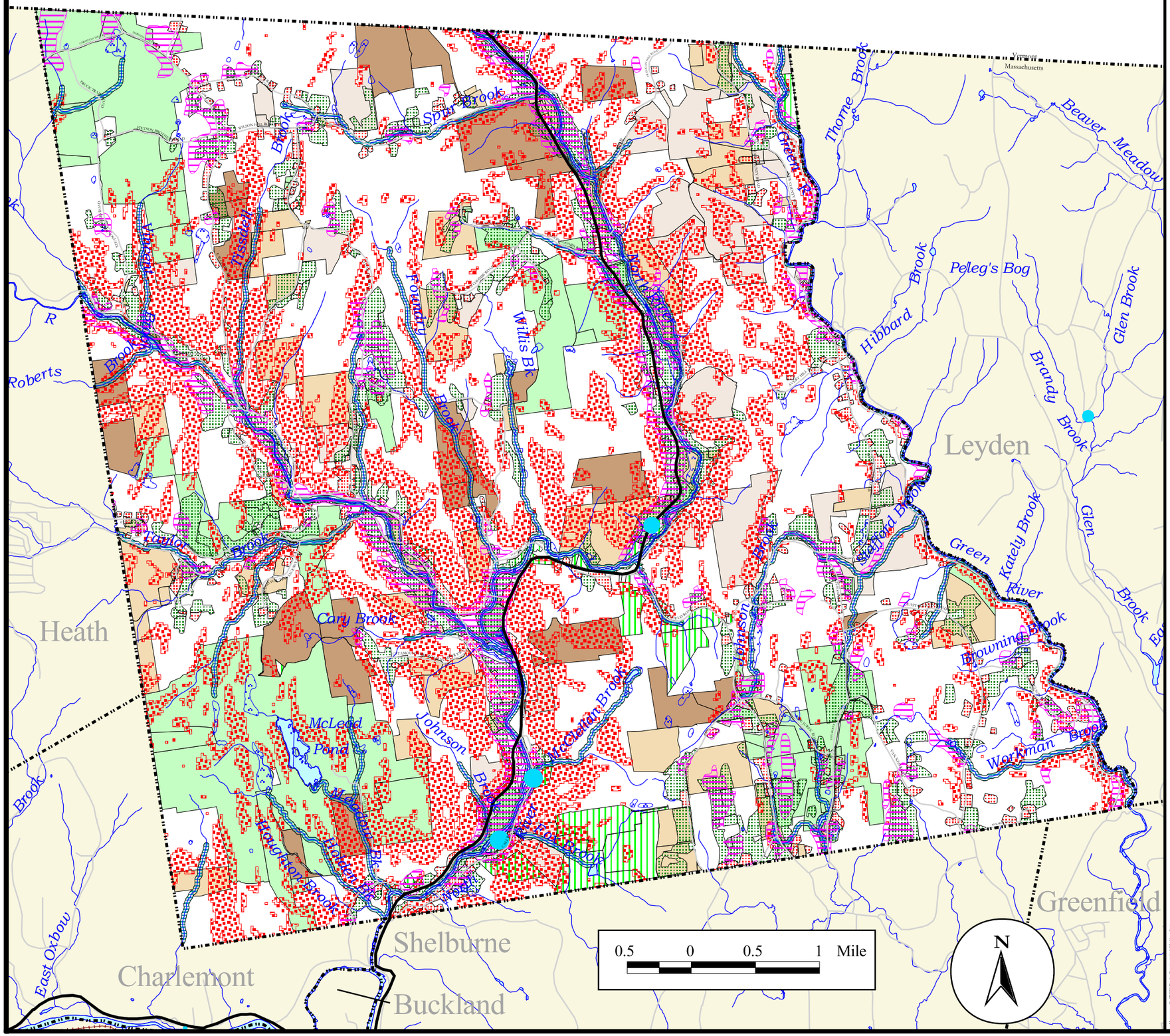


June 26, 2004

Town of Colrain

Open Space and Recreation Plan

Developable Soils and Development Constraints



Legend

- Town Line
- Rail Lines
- Roads
- Major roads
- Streams and Rivers
- Slope greater than 25%
- Prime Farmland Soils
- Zone I
- Water body
- National Wetlands Inventory wetland

Open Space

- Open Space with Permanent Protection
- Open Space with Limited Protection
- Chapter 61: Forestry (Temporary Protection)
- Chapter 61A: Agriculture (Temporary Protection)
- Chapter 61B: Recreation (Temporary Protection)

Land Use

- Crop, pasture, orchard
- Residential

River Protection Act

- 0-100 feet from river bank

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 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.

Road data provided by Massachusetts Highway Department. Town line, rail line, transmission line, river, stream, pond, National Wetlands Inventory, River Protection Act, slope, soil, zone I, and land use data provided by MassGIS. Farmland soils digitized by FRCOG planning department staff from 1979 U.S. Soil Conservation Service Map "Important Farmlands of Franklin County."

Note: Depicted boundaries are a 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.

FRANKLIN REGIONAL COUNCIL OF GOVERNMENTS
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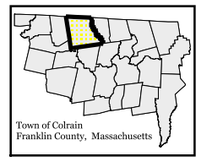
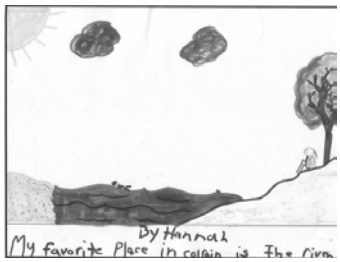
June 26, 2004



SECTION 4



ENVIRONMENTAL INVENTORY AND ANALYSIS

The scenic landscape of the Town of Colrain has been cherished by its residents for generations. This Open Space and Recreation Plan is intended to help residents protect the town's scenic value and natural resources in the face of increased development pressure, while recognizing that people need places to live, learn, work and play. These needs require infrastructure: homes, roads, power, water, wastewater systems, etc. Infrastructure, in turn, both depends upon and impacts critical natural systems like the water cycle. One way to understand the impact of development on natural resources is to study the *ecosystems* of the town and the region.

An ecosystem is a concept that describes how a group of living organisms (plants, animals and microorganisms) interact with each other and their physical environment (soil, climate, water, air, light, etc.). Ecosystems exist at different scales. A large forest can be an ecosystem and so can a decayed tree trunk. The integrity of ecosystems depends on the relationship between living beings and their environment. Wetlands, for example, are ecosystems consisting of plants and animals that depend on water from the surface and the ground. Wetland vegetation grows where soils are saturated by water for at least several weeks a year. This vegetation provides shade, food and habitat for a wide variety of insects, birds and fish.

Ecosystems provide a variety of "services" that are very important to human communities. Wetlands, for example, trap and remove sediments, nutrients and toxic substances from surface water. They store floodwaters during and after storms, preventing damage to public and private property, and recharge water to the ground, and retain it during droughts. These functions are vulnerable to the impacts of land development. Construction in and around wetlands not only displaces the animals that depend on this ecosystem, it may also result in increased flooding, storm damage, and reduction in the quality and quantity of drinking water. Colrain residents need to understand the impact of their actions and land uses on the environment and their quality of life.

The information provided in this section explores the biological and physical components of the town's ecosystems. These components include air, surface and ground water, soils, vegetation, fisheries and wildlife. *Topography, Geology, and Soils* provides a general understanding of the ways different soil characteristics can impact land use values. *Landscape Character* provides an overall scenic context. *Water Resources* describes all of the water bodies in town, above and below ground, including their recreational value, public access, and any current or potential quality or quantity issues. Colrain's forest, farmland and wetland vegetation types are documented including rare,

threatened, and endangered species. In *Fisheries and Wildlife*, wildlife, habitat, special corridors, and rare, threatened, and endangered species are discussed. Colrain's *Scenic Resources and Unique Environments* are identified and described. Finally, *Environmental Challenges* addresses current and potential problems that may influence open space or recreation planning.

A. TOPOGRAPHY, GEOLOGY, AND SOILS

Decisions relating to open space and recreation planning must take into consideration the inherent suitability of a site for different uses. Geology, soils, and topography are essential to determining potential sites for future residential, commercial and industrial development, and for new parks, hiking trails and open space.

A.1 Topography

The Town of Colrain is composed primarily of steep-walled narrow valleys and rolling hills. Gentler terrain can be found along the fertile flood plains of the East and West Branches of the North River, where much of Colrain's prime farmland soils can be found. Other prime farmland soils can be found in East Colrain. Although steep slopes can be found throughout the town, the highest elevations occur west of the East Branch. The highest elevations in this western section range between 1,451 ft. and 1,794 ft. above sea level, while elevations east of the East Branch are significantly lower with some less than 1,000 ft. above sea level.

A.2 Geology

The Town of Colrain as we know it today is the result of millions of years of geologic history: great upheavals of the earth's crust and volcanics, and the sculpting power of moving water, ice and wind. This distinctive physical base has determined the distribution of the town's water bodies, its soils and vegetation and its settlement patterns, both prior to and since colonial times. Understanding Colrain's current landscape requires a brief journey back in time and a review of some basic geological concepts.

The earth's crust is a system of plates whose movements and collisions shape the surface. As the plates collide, the earth's crust is compressed and forced upward to form great mountain ranges. In the northeastern United States, the plates move in an east-west direction, thus the mountains formed by their collisions run north to south.

The pressure of mountain building folded the earth, created faults, and produced the layers of metamorphosed rock typically found in New England. Collision stress also melted large areas of rock, which cooled and hardened into the granites that are found in some of the hill towns in Massachusetts today. Preceding the collisions, lines of

volcanoes sometimes formed, and Franklin County shows evidence of this in bands of dark rock schist metamorphosed from lava flows and volcanic ash.

Hundreds of millions of years ago, a great continent, known as Pangaea, formed through the collisions of plates. Pangaea began to break apart almost 200 million years ago, and continues to do so as the continents drift away from each other today. This "continental drift" caused earthquakes and formed large rift valleys, the largest of which became the Atlantic Ocean. The Connecticut Valley was one of many smaller rifts to develop. Streams flowing into the river from higher areas brought alluvium, including gravels, sand and silt. At the time, the area that is now the Town of Colrain was located south of the equator. The Dinosaur era had begun, and the footprints of these giant reptiles are still visible in the rock formed from sediments deposited on the valley floor millions of years ago.

By the close of the Dinosaur age, the entire eastern United States, including Colrain, was part of a large featureless plain, known as the peneplain. It had been leveled through erosion, with the exception of a few higher, resistant areas. Today, these granite mountaintops, called monadnocks, are still the high points in this region. Local examples include Mt. Wachusett, Mt. Greylock, and Mt. Monadnock in New Hampshire.

As the peneplain eroded, the less resistant rock eroded to form low-lying areas, while bands of schist remained to form upland ridges. By this time, the Connecticut Valley had been filled with sediment, while streams that would become the Deerfield, Westfield, and Farmington Rivers continued to meander eastward. The westward-flowing streams would become more significant later on.

A long period of relative quiet in geologic terms followed the Dinosaur era. Then, as the Rocky Mountains were forming in the west eight million years ago, the eastern peneplain shifted upward a thousand feet. As a result of the new, steeper topography, stream flow accelerated, carving deep valleys into the plain. Today, the visible remnants of the peneplain are the area's schist-bearing hilltops, all at about the same 1,000 foot elevation.

Mountain building, flowing water, and wind had roughly shaped the land; now the great glacial advances would shape the remaining peneplain into its current topography. Approximately two million years ago, accumulated snow and ice in glaciers to the far north began advancing under their own weight. A series of glaciations or "ice ages" followed, eroding mountains and displacing huge amounts of rock and sediment. The final advance, known as the Wisconsin Glacial Period, completely covered New England before it began to recede about 13,000 years ago. This last glacier scoured and polished the land into its final form, leaving layers of debris and landforms that are still distinguishable.

The glacier picked up, mixed, disintegrated, transported and deposited material in its retreat. Material deposited by the ice is known as *glacial till*. Material transported by water, separated by size and deposited in layers is called *stratified drift* (Natural Resource Inventory for Franklin County, University of Massachusetts Cooperative

Extension, May 1976). The glacier left gravel and sand deposits in the lowlands and along stream terraces. Where deposits were left along hillsides, they formed kame terraces and eskers. Kames are short hills, ridges, or mounds of stratified drift, and eskers are long narrow ridges or mounds of sand, gravel, and boulders.

During the end of the last ice age, a great inland lake formed in the Connecticut River Valley. Fed by streams melting from the receding glacier, Lake Hitchcock covered an area approximately 150 miles long and twelve miles wide, stretching from St. Johnsbury, Vermont to Rocky Hill, Connecticut. Streams deposited sand and gravel in deltas as they entered the lake, while smaller silts and clays were carried into deeper waters.

A.3 Soils

Soil is the layer of minerals and organic material that covers the rock of the earth's crust. All soils have characteristics that make them more or less appropriate for different land uses. Scientists classify soils by these characteristics, including topography; physical properties including soil structure, particle size, stoniness and depth of bedrock; drainage or permeability to water, depth to the water table and susceptibility to flooding; behavior or engineering properties, and biological characteristics such as presence of organic matter and fertility (Natural Resource Inventory for Franklin County, University of Massachusetts Cooperative Extension, May 1976). Soils are classified and grouped into associations that are commonly found together.

As Colrain plans for the long-term use of its land, residents should ask: 1) Which soils constrain development given current technologies? 2) Which soils are particularly suited for recreational opportunities and wildlife habitat? and 3) Which soils are best for agriculture? The answers to these questions can help lay a foundation for open space and recreation planning in Colrain. The following sub-section provides a description of the soils in Colrain based on their impact on agriculture, recreation opportunities, and wildlife habitat.

<u>Which soils constrain development given current technologies?</u>
The Lyman, Westminster, and Colrain soils are the predominant soils found on the moderate to steep slopes, while the Buckland soils are those that can be found in the nearly level to moderately steep hills in town.

The Westminster and Lyman soils are extremely rocky and are well to excessively drained. They develop in thin deposits of glacial till over bedrock. Due to their shallowness, they are droughty. Depth to bedrock is generally less than twenty inches, but can be at a depth of three feet in some places. The Colrain soils can be found in nearly level to very steep slopes, but are limited in use due to their extreme stoniness. They are moderately to well drained soils that are found in loose to compact glacial till. The Colrain soils have a moderate to high moisture holding capacity. The Buckland soils consist of moderately well drained, fine sandy loams. These soils formed in compact glacial deposits. At a level of twenty inches, the Buckland soils have a hard layer that is

difficult to dig. Although water passes through these soils rapidly, the Buckland soils are considered wet and seepy because water moves slowly through the dense substratum.

Which soils are particularly suited for recreational opportunities and wildlife habitat?
Different recreational uses are constrained by different soil and topographical characteristics. Sports fields require well-drained soils and level topography, whereas lands with slopes greater than 25 percent are attractive to wildlife and to outdoor recreation enthusiasts such as hikers, mountain bikers and snowshoers.

The soils of Colrain that support certain recreation activities are of the Westminster - Colrain - Buckland association and the Lyman soils. The Westminster - Colrain – Buckland soils are found in forested, stony and rocky, gently sloping to steep hills and the narrow valleys along the town's fast flowing streams. The Westminster soils are shallow and have many rock ledges and outcrops, the Colrain soils are deep and well drained and are more gently sloping, and the Buckland soils are moderately well drained and have a hard layer in the subsoil. The Lyman soils are also found in the forested, gently sloping to very steep, stony rocky uplands and are characterized as slightly droughty, shallow loams.

Which are the best soils for agriculture?
The Natural Resources Conservation Service (NRCS), formerly known as the Soil Conservation Service of the U.S. Department of Agriculture is responsible for classification of soils according to their suitability for agriculture. NRCS maintains detailed information on soils and maps of where they are located.

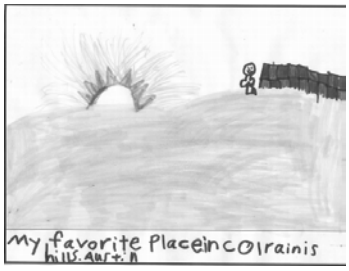
NRCS defines prime farmland as the land with the best combination of physical and chemical characteristics for producing food, feed, forage, fiber and oilseed crops and that is available for these uses (USDA, NRCS, 2001, National Soil Survey Handbook). Prime soils produce the highest yields with the fewest inputs, and farming in these areas results in the least damage to the environment. Unique farmland is land other than prime farmland used for the production of high-value food and fiber crops. Unique farmland has a special combination of soil quality, location, growing season and moisture supply. These agricultural soils are a finite resource. If the soil is removed, or the land is converted to another use, the capacity for food and fiber production is lost.

Prime farmland soils have contributed to the town's economy throughout its history and continue to be in use throughout the town today. The more common soils that constitute Colrain's prime and unique agricultural land include the Merrimac - Ondawa association and the Colrain, Buckland soils. The Merrimac - Ondawa soils are found on floodplains and terraces in narrow steep sided valleys along major fast flowing streams. The soils are well drained to somewhat excessively drained, and are sandy and gravelly. The Colrain soils are deep and well drained and are found in gently sloping areas whereas the Buckland soils are moderately well drained fine sandy loams found in nearly level to

moderately steep slopes. All of these soils are considered suitable for dairy farming and the Colrain - Buckland soils support apple orchards as well.

These prime farmland soils can be found within the floodplains of the North River and its East and West Branches; in the southeast corner of Colrain in an area bounded by Prolovich, Greenfield and West Leyden Roads, the Green River and the boundary with the Town of Shelburne; in the northwest corner of Colrain along Christian Hill Road and at the intersection of Christian Hill, Stetson and Wilson Hill Roads; an area between Foundry Brook and Wilson Hill Road; and a few small scattered area along the Green River.

Interestingly, some of the best soils for orchards and grazing in Colrain have moderate slopes. Moderate slopes provide good drainage, which is important for cultivating fruit tree orchards as well as for grazing grasses.



B. LANDSCAPE CHARACTER

The character of Colrain is rugged with steep slopes, fast flowing streams, hardwood forests and abundant wildlife. Beyond this ruggedness, the gentler floodplains of the East Branch, West Branch, and the North River have historically afforded residents the opportunity for farming as well as to take advantage of the swift waters for industrial use. The town's small villages are also located along these rivers. The Green River in eastern Colrain forms the town's boundary with the Town of Leyden. For much of its length, the Green River can boast a steep and relatively undeveloped river corridor.

C. WATER RESOURCES

C.1 Watersheds

Colrain is rich in water resources, including brooks, streams, ponds, vernal pools, wetlands, and aquifers *(See the Water Resources Map)*. As described in Section 3, land in the town is part of the Deerfield River Watershed, which is part of the Connecticut River Watershed. The North and Green Rivers are also important sub-watersheds within the Connecticut River Watershed. This section focuses on waters within the Town of Colrain, but it is important to keep in mind improvements in water quality in the North

River and Green River and other brooks and streams in town have impacts beyond town borders.

C.1.1 Connecticut River Watershed

The Town of Colrain lies in the Connecticut River Watershed. The Connecticut River has a "Class B" water quality designation from the New Hampshire-Vermont border to Holyoke and is classified as a warm water fishery. Class B waters are supposed to provide suitable habitat for fish and other wildlife, and to support primary contact recreational activities such as fishing and swimming. The water should also be suitable for irrigation and other agricultural uses. The classification of rivers and streams in Massachusetts does not necessarily mean that the river meets that classification, rather, classifications represent the State's goal for each river.

According to the "Connecticut River Basin 1998 Water Quality Assessment Report" published by the Massachusetts Department of Environmental Protection, the Connecticut River is impaired by polychlorinated biphenyls (PCBs) along its total length and by fecal coliform from its confluence with the Deerfield River to the Montague town line. A report published in January 1998 by the New England Interstate Water Pollution Control Commission (NEIWPCC) listed bioaccumulation and toxicity as water quality issues for the entire length of the Connecticut River in Massachusetts. Bioaccumulation refers to the concentration of toxins in organisms at higher levels in the food chain. The report specifically identified PCBs in fish. Also in 1998, the Massachusetts Department of Public Health issued a public health advisory for certain species of fish contaminated by PCBs in the Connecticut River (Commonwealth of Massachusetts Summary of Water Quality; Department of Environmental Protection; 1998). The general public is warned not to eat any affected fish species, which include channel and white catfish, American eel and yellow perch. Pregnant women and nursing mothers are advised not to eat any fish from the Connecticut River.

Although wastewater treatment facilities constructed throughout the watershed have been treating major pollution discharges for more than twenty years, the Connecticut River is still plagued by pollution from PCBs, chlorine heavy metals, erosion, landfill leachate, storm water runoff and acid rain. These pollutants come from both point sources, like wastewater treatment plants and manufacturing plants, and non-point sources, including failed residential septic systems, improperly managed manure pits and stormwater runoff carrying herbicides.

Atlantic salmon were believed to be abundant in the Connecticut River prior to European settlement. Salmon are anadromous fish, meaning that they spawn in fresh water. Construction of dams along the river blocked the passage of the salmon, and the species disappeared from the Connecticut shortly thereafter. The interagency Atlantic Salmon Restoration Program began its effort to restore salmon to the River in 1967. Schoolchildren in surrounding communities participate in this effort by raising juvenile salmon from eggs, and releasing them in local streams to begin their journey. Success of the restoration effort has been mixed. Between 1998 and 2000, a total of only 531

salmon traveled back to the river from the ocean (Pioneer Valley Planning Commission, *The Connecticut River Strategic Plan*, *Volume One*, July 2001).

C.1.2 Deerfield River Watershed (sub-watershed of the Connecticut River)

The Deerfield River Watershed is a sub-watershed of the Connecticut River Watershed that drains approximately 665 square miles of the Southern Green Mountains in Vermont and the Northern Berkshires in Massachusetts. Three hundred and forty-seven square miles of this land is located in all or part of twenty western Massachusetts towns. From its headwaters at Stratton Mountain in Vermont, the Deerfield River flows southeastward for approximately seventy (70.2) miles through the steep terrain of the Berkshires to its confluence with the Connecticut River.

The northern portion of the watershed from Somerset to Route 2 in Massachusetts is primarily forested and steep, accounting for approximately 78 percent of the total watershed area. Much of the land along the remaining length of the river is open and agricultural land.

The Deerfield River drops 1,000 ft. in elevation along its length in Massachusetts. This feature has resulted in the management of the Deerfield River for hydroelectric power generation with ten hydroelectric developments constructed on the river since 1911.

Despite the River's regulation by hydroelectric facilities, the Deerfield River's cold and clean waters makes it one of the best fisheries in the State. As part of the Connecticut River restoration project, the Massachusetts Division of Fisheries and Wildlife (DFW) is responsible for the Atlantic salmon restoration effort. The stocking program releases Atlantic salmon fry into tributaries of the Connecticut River. The Deerfield River Watershed (in twenty-one tributaries) is stocked with 700,000 Atlantic salmon fry each spring (Slater, DFW, 2001). The River also supports native and stocked trout, making the Deerfield River one of the premier rivers for fishing in the region.

Recreational opportunities in the Deerfield River abound. Hiking, biking, whitewater sports, hunting, fishing, cross-country skiing, and snowshoeing are some of the activities enjoyed by residents and visitors alike.

According to the Mass. Department of Environmental Protection, the Deerfield River from the Vermont-Massachusetts State Line to its confluence with the Connecticut River is given a Class B water quality designation.

The Deerfield River, from the confluence of the Cold River in the Town of Charlemont to its confluence with the North River at the Charlemont/Shelburne Falls line is one of the water bodies in the state that the Massachusetts Department of Environmental Protection (DEP) has placed on its Section 303(d) List of Waters (Segments Needing Confirmation List). A report of the DEP, Final Massachusetts Section 303(d) List of Waters, 1998, states that the "Section 303(d) of the Federal Clean Water Act requires states to identify those water bodies that are not expected to meet surface water quality standards after the

implementation of technology –based controls and, as such, require the development of total maximum daily loads (TMDL)." A TMDL is the greatest amount of a pollutant that a water body can accept and still meet water quality standards for protecting public health and maintaining the designated beneficial uses of those waters for drinking, swimming, recreation, and fishing. TMDL's also describe a report prepared by DEP for each impaired water body that identifies the steps and technologies needed to reduce the pollutant or source of impairment to meet water quality standards. The TMDL reports reflect DEP's strategy for cleanup of all of the water bodies in Massachusetts.

The Deerfield River Watershed Association (DRWA) has been monitoring the Deerfield River and several of its tributaries in Massachusetts for water quality since 1990. The results of its 2002 Volunteer Monitoring Program note that the alkalinity levels in the watershed are low which can stress the native trout fishery. Dissolved oxygen levels have been historically high and were found to continue to be so. After five years of collecting bacteria data, the DRWA has concluded that dry spells in the watershed do not pose a bacterial threat to the Deerfield River and the tributaries it monitors and thus, these waters are safe for contact recreation during times of drought. Conversely, it was found that runoff, as a result of storms, does pose a bacterial threat at several of the monitored sites, making them unsafe for swimming at those times.

Table 4-1: Summary Table of Testing Results for the Deerfield River – Massachusetts Segments

Location	Aquatic Life	Fish Consumption	Primary Contact (e.g. Swimming)	Secondary Contact (e.g. Boating)	Overall Ranking of Segment
Vt. State line to confluence with the Cold River - Length -13.3 miles	**Threatened** ***Due to habitat alteration relating to high temperatures and undetermined enrichment.***	**Non-Support - upper 0.7 miles** *Due to mercury at Sherman Reservoir.* **Not Assessed – lower 12.6 miles**	**Full Support**	**Full Support**	**Class B**
Confluence with the Cold River to the confluence with the North River. Length – 11.4 miles	**Partial Support** ***Due to unknown toxicity. Metals and chlorine may also be lesser causes. This segment is on the 1998 303d Segments Needing Confirmation List.***	**Not Assessed**	**Not Assessed**	**Not Assessed**	**Class B**
Confluence with the North River to the confluence with the Green River. Length – 16.2 miles	**Full Support**	**Full Support**	**Full Support**	**Full Support**	**Class B**
Confluence with the Green River to the confluence with the Connecticut River. Length – 2.0 miles	**Full Support**	**Full Support**	**Full Support**	**Full Support**	**Class B**

Source: Ma. Dept. of Environmental Protection, Deerfield River Watershed Assessment – Draft 1995/1996; Ma. DEP, Ma. Section 303d List of Waters, 1998; Ma. DEP, Ma. Surface Water Quality Standards, 2000.

C.1.3 North River Watershed (sub-watershed of the Deerfield River)

The North River Watershed is located in northwestern Massachusetts and southern Vermont, draining 94.2 square miles (DRWA, 2002). It is formed by the confluence of the East Branch and the West Branch. Below this confluence, the North River is impounded by a dam. The North River flows south and west, paralleling Route 112. Forests predominate the upland slopes of the watershed while the floodplain areas in the valley are mostly agricultural. Residential and industrial development in the watershed is primarily concentrated within the river floodplain. The floodplain narrows as the North flows toward its confluence with the Deerfield River, just south of North River Road at

the Buckland, Charlemont and Shelburne town lines. The North River has been given Class B, Cold Water Fishery, High Quality Water designation from the confluence of the East and West Branches to the Veratec Treatment Plant site and Class B, Cold Water Fishery for the remainder of the river to its confluence with the Deerfield River (Mass. DEP, 2000). The main stem of the North River to its confluence with the Deerfield River has been placed on the Massachusetts DEP Section 303 (d) List of Waters for 1998 for problems related to pathogens, taste, odor and color.

Given its water quality and environmental factors providing for good cold water fishery habitat, the North River is a key component in the Connecticut River Atlantic Salmon restoration project. It is also stocked with trout on an annual basis.

Historically, the North River was the site of Colrain's many mills due to the harnessing of the fast flowing River for hydropower. Manufacturing along rivers often posed an environmental threat to the rivers' health. The North River was no exception. Manufacturing in Colrain began to decline in the late 20th century. In the 1980s, the Upper Mill, located on both the east and west sides of the East Branch was closed. In 1990, fire ravaged the mill and it was subsequently abandoned. After acquiring the property by eminent domain, the Town of Colrain sought to clean up the site. In July 1998, the Environmental Protection Agency selected the Town of Colrain for its Brownfields Assessment Demonstration Pilot. The Pilot targeted the Upper Mill site as well as the former American Fiber and Finishing bleaching mill site for assessment and clean-up, and redevelopment activities. In addition to clean-up and redevelopment of the contaminated mill sites, the Pilot was also to assess the potential risks posed to the North River given the proximity of the Upper Mill site to the River. Investigations of the Upper Mill site were completed in 1999 and 2000 by Environmental Compliance Services and SEA Consultants. It was determined that should additional collapse of the Upper Mill buildings occur, building debris and asbestos contaminated runoff may drain into the North River. Given this concern the site has subsequently been cleaned and remediation completed, thus preserving the quality of the North River. One reason for maintaining water quality beyond preserving habitat is that the company BBA, relies on high water quality for its industrial processes.

Table 4-2: Summary Table of Testing Results for the North River – Massachusetts Segments

Location	Aquatic Life	Fish Consumption	Primary Contact (e.g. Swimming)	Secondary Contact (e.g. Boating)	Overall Ranking of Segment
Confluence of the East and West Branches to the confluence with the Deerfield River. Length – 3.5 miles	**Threatened** *Due to pathogens and color. Nutrients and uncertain habitat alterations also impair this segment.*	**Not Assessed**	**Partial Support** ***Due to fecal coliform count.***	**Full Support To the Veratec site – 0.8 miles.** **Partial Support Remainder of segment- 2.7 miles.** *Due to color.*	**Class B**

Source: Ma. Dept. of Environmental Protection, Deerfield River Watershed Assessment – Draft 1995/1996; Ma. DEP, Ma. Section 303d List of Waters, 1998; Ma. DEP, Ma. Surface Water Quality Standards, 2000.

Surface Water Resources in the North River Watershed

McClellan Brook

McClellan Brook is located in south-central section of Colrain with its headwaters located southeast of Mount Hope. The brook flows southwesterly to its confluence with the North River south of the village of Griswoldville.

Fox Brook

Fox Brook is located in south-central Colrain. Fox Brook originates in both Colrain and the Town of Shelburne. The Fox Brook Reservoir is a three acre emergency water supply reservoir, part of the supply that serves customers in Buckland, Shelburne, and Colrain.

Johnson Brook

Johnson Brook originates in the hills northeast of Houghton Hill. It flows southeasterly to its confluence with the North River northeast of the village of Shattuckville.

Meadow Brook

Meadow Brook has its headwaters in the Catamount Hills with the main stem of the Brook flowing out of McLeod Pond in Catamount State Forest. Meadow Brook parallels Stacy Road for much of its length and eventually flows into the North River south of Shattuckville.

Holden Brook
Holden Brook originates atop Pine Hill in Catamount State Forest. It converges with Houghton Brook near their confluence with the North River.

Houghton Brook
Houghton Brook also has its headwaters in the Catamount Hills within the Catamount State Forest. Houghton Brook parallels Meadow Brook to its west and flows into the North River at the Shelburne town line.

East Branch of the North River
The East Branch originates at Ryder Pond in Whitingham, Vermont and flows southerly to its confluence with the main stem of the North River.

Spur Brook
Spur Brook originates in the hills of north-central Colrain near the Vermont border. It parallels Thompson Road for much of its length until it reaches its confluence with the East Branch.

Foundry Brook
Foundry Brook originates near Christian Hill in the northern section of Colrain and joins the East Branch of the North River at Foundry Village.

West Branch of the North River
The headwaters of the West Branch are in Whitingham, Vermont and the river flows southwesterly through the Town of Heath to the confluence with the East Branch at Griswoldville. The North River Flood Plain Management Study states the West Branch flows southeasterly to join the East Branch while the USGS topographical map shows both branches converging at the same place to create the main stem North River.

Vincent Brook
Vincent Brook is located in Colrain's rugged northwest corner near its border with the Town of Heath. The brook originates in the uplands just east of H.O. Cook State Forest and for a portion of its length travels within the boundaries of the State Forest.

Roberts Brook
Roberts Brook is a small stream in the northwest section of Colrain, which originates in the Town of Heath.

Tissdell Brook
Tissdell Brook is located in the northwest section of Colrain. It originates in the steep uplands of the area just south of Wilson Hill Road.

Taylor Brook

Taylor Brook originates in the Town of Heath and flows easterly to its confluence with the West Branch southeast of Adamsville. Numerous small tributaries that enter the brook from both the north and south feed Taylor Brook.

Cary Brook
Cary Brook originates in the Catamount Hills in the southwest section of Colrain. It enters the West Branch just north of its confluence with the main stem.

McLeod Pond
The forty acre McLeod Pond is located in a remote, undeveloped area in the Catamount Hills within Catamount State Forest. McLeod Pond is a warm water pond with an average depth of approximately four feet. The pond's water is brown and the bottom is muddy with numerous rock outcroppings. Aquatic vegetation covers 60 percent of the pond's surface area (DFW website, 2003). Due to these noxious aquatic plants, McLeod Pond has been placed on the Massachusetts DEP Section 303 (d) List of Waters for 1998.

Access to McLeod Pond is difficult and is accomplished via a rugged dirt road off Stacey Road. An informal boat launching facility is available and suitable for car top boats and canoes.

Fishing is generally poor in McLeod Pond. Only five species were found in an assessment of fish population conducted in 1979. Chain pickerel are the only game fish found in the pond. Other fish include pumpkinseed, yellow perch, brown bullhead and golden shiners.

C.1.4 Green River Watershed

The Green River Watershed is located in southern Vermont and northwestern Massachusetts. It has a drainage area of 89.9 square miles, which includes portions of Colrain, Leyden, Bernardston, Shelburne and Greenfield as well as five communities in Vermont. The total length of the Green River is 28.3 miles, 16.3 miles of which are in Massachusetts. The River itself originates in southeastern Vermont on the south side of the Mt. Olga-Hogback Ridge in the Town of Marlboro, Vt. The Green River enters Massachusetts in the Town of Colrain and forms the town's eastern border with the Town of Leyden. It flows south and east through a steep, narrow valley for much of its length and, as it enters the Town of Greenfield, its gradient lessens and the floodplain widens. The Green River boasts an undeveloped river corridor, in part due to its steep terrain and geologic features. Most roads in the watershed remain unpaved, with minimal riverside development. Most of the watershed is forested, although along the Massachusetts section, agricultural and open land can be found as well. Only as the river reaches the Town of Greenfield does it begin to experience some urban development. Given this pristine character, it is the only river in the Deerfield River Watershed designated as an "Undeveloped River Corridor" by National Park Service standards for the purpose of a nationwide inventory of Wild and Scenic Rivers (Green River Preservation Alliance, 1996).

The Green River Watershed provides many opportunities for recreational use. Swimming, fishing, whitewater boating, hiking, biking, horseback riding, hunting, cross country skiing and snowmobiling are popular and common in the watershed.

The Massachusetts Department of Environmental Protection has given the Green River a Class B, Cold Water Fishery, High Quality Water designation from the Vermont-Massachusetts border to the Greenfield Wastewater Treatment Plant. From the Wastewater Treatment Plant to its confluence with the Deerfield River, the Green River is designated a Class B, Cold Water Fishery (Mass. DEP website, 2002). The Green River is listed on the Massachusetts DEP Section 303 (d) List of Waters for 1998 from the Vermont border to the Greenfield Wastewater Treatment Plant due to metals, pathogens and other unknown causes.

Table 4-3: Summary Table of Testing Results for the Green River – Massachusetts Segments

Location	**Aquatic Life**	**Fish Consumption**	**Primary Contact** (e.g. Swimming**)**	**Secondary Contact** (e.g. Boating**)**	**Overall Ranking of Segment**
Vt. state line to the Greenfield Wastewater Treatment Plant Length – 15.6 miles	**Not Available**				**Class B**
Greenfield Wastewater Treatment Plant to confluence with the Deerfield River. Length – 0.5 miles	**Non –Support** *Due to metals, ammonia, and unknown factors. Chlorine also threatens to cause impairment to this segment.*	**Not Assessed**	**Non-Support**	**Partial Support**	**Class B**

Source: Ma. Dept. of Environmental Protection, Deerfield River Watershed Assessment – Draft 1995/1996; Ma. DEP, Ma. Section 303d List of Waters, 1998; Ma. DEP, Ma. Surface Water Quality Standards, 2000.

Surface Water Resources in the Green River Watershed (sub-watershed of the Deerfield River)

Johnson Brook

Johnson Brook originates in the uplands east of Prolovich Road in the southeastern section of Colrain. It flows northeastward to its confluence with the Green River.

Stafford Brook

Stafford Brook is a tributary of Johnson Brook originating near the Brick School Cemetery.

Workman Brook
Workman Brook originates in the uplands east of Van Ness Road in the southeast corner of Colrain. It flows easterly to its confluence with the Green River.

C.2 Class A Waters

In the Town of Colrain, the Fox Brook Reservoir and its tributaries have been designated as Class A water sources by the Massachusetts Department of Environmental Protection. As such, these waters can be used as public water supplies. The Fox Brook Reservoir is used by the Shelburne Falls Fire District and serves Shelburne, Buckland, and a few residents of Colrain. Class A water sources are also considered excellent habitat for fish, other aquatic life and wildlife. They have aesthetic value and are suitable for recreation purposes compatible with their designation as drinking water supplies. These waters are designated for protection as Outstanding Resource Waters under Massachusetts 314 CMR 4.04 (Mass. DEP website; 2002).

C.3 Flood Hazard Areas

Flooding along rivers is a natural occurrence. Floods happen when the flow in the river exceeds the carrying capacity of the channel. Some areas along rivers flood every year during the spring, while other areas flood during years when spring runoff is especially high, or following severe storm events. The term "floodplain" refers to the land affected by flooding from a storm predicted to occur at a particular interval. For example, the "one hundred year floodplain," is the area predicted to flood as the result of a very severe storm that has a one percent chance of occurring in any given year. Similarly, the 500-year floodplain is the area predicted to flood in a catastrophic storm with a 1 in 500 chance of occurring in any year.

Information regarding 100-year floodplains in Colrain have been obtained from: 1) the North River Flood Plain Management Study; and 2) the National Flood Insurance Map (1980).

According to the North River Flood Plain Management Study (Soil Conservation Service, 1990), major flooding occurred on the North River and its East and West Branches five times during the past 145 years, the most recent of which was in 1987. These events were of such severity that dams, structures and roadways were destroyed. Ice jams have also caused flooding along these rivers. Foundry Brook, according to the study, has also been known to experience minor flooding. The Town of Colrain does not have flood control structures within its borders and thus utilizes land use regulations, which control building in areas with risk of flooding.

The North River Flood Plain Management Study states that the 100-year floodplain covers an area of approximately 600 acres along the North River and its Branches or

about 18 percent of the river corridor. Within Colrain's Zoning Bylaws, a Flood Plain Area has been established which speaks to compatible land use and building requirements within the 100-year floodplain. This, according to the study, has been maintained and the study supported its continued use.
The National Flood Insurance Map (1980) shows that a 100-year floodplain also exists along the Green River at Green River Road.

C.4 Wetlands

Wetlands are transitional areas where land-based and water-based ecosystems overlap. Inland wetlands are commonly referred to as swamps, marshes and bogs. Technically, wetlands are places where the water table is at or near the surface or the land is covered by shallow water. Sometimes, the term wetland is used to refer to surface water as well.

Historically, wetlands have been viewed as unproductive wastelands, to be drained, filled and "improved" for more productive uses. Over the past several decades, scientists have recognized that wetlands perform a variety of extremely important ecological functions. They absorb runoff and prevent flooding. Wetland vegetation stabilizes stream banks, preventing erosion, and trap sediments that are transported by runoff. Wetland plants absorb nutrients, such as nitrogen and phosphorus, which would be harmful if they entered lakes, ponds, rivers and streams. They also absorb heavy metals and other pollution. Finally, wetlands are extremely productive, providing food and habitat for fish and wildlife. Many plants, invertebrates, amphibians, reptiles and fish depend on wetlands to survive. Wetlands have economic significance related to their ecological functions: it is far more cost-effective to maintain wetlands than build treatment facilities to manage stormwater and purify drinking water, and wetlands are essential to supporting lucrative outdoor recreation industries including hunting, fishing and bird-watching.

In recognition of the ecological and economic importance of wetlands, the Massachusetts Wetlands Protection Act is designed to protect eight "interests" related to their function: public and private water supply, ground water supply, flood control, storm damage prevention, prevention of pollution, land containing shellfish, fisheries, and wildlife habitat. To this end, the law defines and protects "wetland resource areas," including banks of rivers, lakes, ponds and streams, wetlands bordering the banks, land under rivers, lakes and ponds, land subject to flooding, and "riverfront areas" within two hundred feet of any stream that runs all year. Local Conservation Commissions are responsible for administering the Wetlands Protection Act; some towns also have their own, local wetlands regulations.

Many of Colrain's wetlands can be found in its uplands in isolated forested areas. Some of these wetlands are mapped by the National Wetlands Inventory (NWI).

Vernal Pools

Vernal pools are temporary bodies of fresh water that provide critical breeding habitat for many vertebrate and invertebrate wildlife species. They are defined as "basin depressions where water is confined and persists for at least two months during the spring and early summer of most years, and where reproducing populations of fish do not survive." Vernal pools may be very shallow, holding only 5 or 6 inches of water, or they may be quite deep. They range in size from fewer than 100 square feet to several acres (Natural Heritage & Endangered Species Program, Massachusetts Division of Fisheries & Wildlife, *Massachusetts Aerial Photo Survey of Potential Vernal Pools,* Spring 2001). Vernal pools are found across the landscape, anywhere that small woodland depressions, swales or kettle holes collect spring runoff or intercept seasonal high groundwater, and along rivers in the floodplain. Many species of amphibians and vertebrates are completely dependent on vernal pools to reproduce. Loss of vernal pools can endanger entire populations of these species.

The state's Natural Heritage and Endangered Species Program (NHESP) has predicted the location of vernal pools statewide based on interpretation of aerial photographs. NHESP believes that its method correctly predicts the existence of vernal pools in 80 to 90 percent of cases. They acknowledge, however, that the method probably misses smaller pools. In Colrain, NHESP has identified fifty-seven potential vernal pools.

In addition to identifying potential vernal pools, NHESP certifies the existence of actual vernal pools when evidence is submitted to document their location and the presence of breeding amphibians that depend on vernal pools to survive. Certified vernal pools are protected by the Massachusetts Wetlands Protection Act and by additional state and federal regulations

C.5 Potential Aquifers and Recharge Areas

Aquifers are composed of water-bearing soil and minerals, which may be either unconsolidated (soil-like) deposits or consolidated rocks. Consolidated rocks, also known as bedrock, consist of rock and mineral particles that have been welded together by heat and pressure or chemical reaction. Water flows through fractures, pores and other openings. Unconsolidated deposits consist of material from the disintegrated consolidated rocks. Water flows through openings between particles.

As water travels through the cracks and openings in rock and soil, it passes through a region called the "unsaturated zone," which is characterized by the presence of both air and water in the spaces between soil particles. Water in this zone cannot be pumped. Below this layer, water fills all spaces in the "saturated zone". The water in this layer is referred to as "groundwater". The upper surface of the groundwater is called the "water table" (Masters, Gilbert. *Introduction to Environmental Engineering and Science, Second Edition*, 1998).

The route groundwater takes and the rate at which it moves through an aquifer is determined by the properties of the aquifer materials and the aquifer's width and depth. This information helps determine how best to extract the water for use, as well as determining how contaminants, which originate on the surface, will flow in the aquifer.

Aquifers are generally classified as either unconfined or confined (EPA and Purdue U.; 1998). The top of an unconfined aquifer is identified by the water table. Above the water table, in the unsaturated zone, interconnected pore spaces are open to the atmosphere. Precipitation recharges the groundwater by soaking into the ground and percolating down to the water table. Confined aquifers are sandwiched between two impermeable layers (Masters, 1998). Almost all the public wells in Massachusetts, including those in Colrain, and many private wells tap unconfined aquifers (Mass. Audubon Society; 1985). Wells that rely on confined aquifers are referred to as "artesian wells."

According to MassGIS and US Geological Service (USGS) documents, Colrain contains two areas considered to be large high-yield aquifers, defined as an aquifer with the potential to provide a pumping volume 25 to 1,000 gallons per minute. These two areas are along the East Branch and the North River. The high yield aquifer along the East Branch extends from Fairbanks Road to Greenfield Road. The second high yield aquifer extends from the confluence of Foundry Brook with the East Branch to its confluence with the main stem of the North, and then down to the North River's confluence with Johnson Brook. *(See Water Resources Map)*.

Colrain's surficial geology has characteristics that would support low to medium yield aquifers as well. A low-yield aquifer provides a yield of between 0 and 50 gallons per minute. According to MassGIS and the USGS, the following areas support low-yield aquifers:

- The remaining sections along the East Branch and the North River;
- The entire length along the West Branch;
- Two areas along Spur Brook and two areas just north of Spur Brook;
- The length of Taylor Brook to its confluence with an unnamed stream just west of North Catamount Hill Road Number One;
- An area approximately one half mile long paralleling Foundry Brook beginning at Foundry Village and traveling north;
- From the town boundary with Shelburne Falls along Shelburne Line Road to Jurek Road; and
- A few small areas north of Johnson Brook.

The areas that contribute to public water supply wells are known as recharge areas. The Massachusetts Department of Environmental Protection strictly regulates an area within a radius of 100 to 400 feet of public water supply wells, known as the "Zone I," and land uses in this area are restricted to water supply related activities only. Primary recharge areas are determined by hydrological studies involving pump tests and wells that monitor the level of groundwater in proximity to the public water supply well. The Colrain Fire

District's well has a Zone 1 radius of 347 feet. It does not own the land west of the pumping station across the North River, however the Public Water Supply System Description (DEP files) indicates there are no land uses that pose a threat to the water supply. The Interim Wellhead Protection Area (IWPA) surrounding this well has a radius of 1,392 feet. The Zone I of the Griswoldville Water District's well on Call Road has a protective radius of 333 feet and the IWPA has a radius of 800 feet. According to DEP, neither of these areas have land uses which pose threats to the groundwater quality. The primary source of water for the Shelburne Falls Fire District is a groundwater source also located on Call Road in Colrain. The Zone I of this well has a protective radius of 400 feet and a Zone II approximately two miles in length along the North River. The Zone II begins just past Component Building Systems, Inc. to approximately 750 feet past the well at the U.S. Geological Survey gauging station. A Zone II is that area of an aquifer that contributes to a well under the most severe pumping and recharge conditions that can be realistically anticipated (180 days of pumping at approved yield with no recharge from precipitation) (Mass. DEP; 2001).

C.6 Surface Water Reservoirs

The Colrain Fire District #1 maintains a surface water source for emergency purpose only. This source consists of an upper reservoir and a lower reservoir, and is located off Greenfield Road. The upper reservoir is three acres in size with a storage capacity of 11.5 million gallons. The lower reservoir serves as an intake reservoir and has a storage capacity of 0.5 million gallons.

The Fox Brook Reservoir located north of Call Road in Colrain is an emergency water source for the Shelburne Falls Fire District. The reservoir has a surface area of three acres and a storage capacity of twelve million gallons.

C.7 Potential Sources of Public and Private Drinking Water Supply Contamination

Potential sources of contamination of public and private wells include septic systems, sub-surface fuel tanks, manure piles, improper use, storage and disposal of hazardous materials, herbicide runoff from farmland, utility rights-of-way, and state highway vegetation control, and road runoff.

D. VEGETATION

Plants are a critical component of ecosystems in Colrain. Plants convert solar energy into food, which supports all animal life. Plants cycle energy through the ecosystem by decaying, by removing carbon from the atmosphere and by shedding oxygen. Plants help moderate temperatures and act as shelter and feeding surfaces for herbivores, omnivores, and carnivores.

Plants and animals together make up *natural communities*, defined as interacting groups of plants and animals that share a common environment and occur together in different places on the landscape (NHESP, 2001). Over the past decade, ecologists and conservationists in Massachusetts have devoted increasing effort to studying and protecting these natural communities, rather than focusing on individual species. This section and the following section will address both natural communities and their component species.

Forests make up 81.2 percent of the Colrain's total land area and are one of the town's most important renewable natural resources. The town's forests are diverse, including Northern hardwoods and conifers; high-terrace floodplain forests; rich, mesic forests; and cobble bar forests. This section describes vegetated areas in town and their ecological and economic significance.

D.1 Forests

Northern Hardwood Forest

Colrain is located in the Northern Hardwoods Region (USDA, 1992). This forest type commonly occurs up to an elevation of 2,500 ft. above sea level and prefers fertile, loamy soils and good moisture conditions. In New England, the Northern Hardwoods can be found in Massachusetts in the glacial till soils west of the Connecticut River and in small portions of Maine and Connecticut, as well as most of the forested areas in New Hampshire and Vermont. The predominant species of the Northern Hardwoods are American beech (*Fagus grandifolia*), yellow birch (*Betula alleghaniensis)* and sugar maple (*Acer saccharum*). Associated species include red maple (*Acer rubrum*), white ash (*Fraxinus americana*), eastern hemlock (*Tsuga canadensis*), paper birch (*Betula papyrifera*), quaking and big tooth aspen (*Populus tremuloide*s and *P. grandidentata*), eastern white pine (*Pinus strobus*), red spruce (*Picea rubens*) and red oak (*Quercus rubra*).

High-Terrace Floodplain Forest

The high-terrace floodplain forests can also be found in Colrain. Typically, they occur on raised banks adjacent to rivers and streams, on steep banks along high gradient rivers particularly in western Massachusetts, on high alluvial terraces and on raised areas within major-river and small-river floodplain forests. The high-terrace floodplain forest is not subjected to annual spring flooding as it is above the flood zone.

The high-terrace floodplain forest in Massachusetts has a mixture of hardwoods generally associated with floodplains. These include red and silver maple (*Acer rubrum* and *saccharinum*) as well as sugar maple (*Acer saccharum*), shagbark hickory (*Carya ovata*), black cherry (*Prunus serotina*), American elm (*Ulmus americana*), and basswood (*Tilia americana*). Ironwood (*Carpinus caroliniana*) is present in the sub-canopy and is a good

indicator of this community. Within the shrub layer one can find arrowwood (*Viburnum dentatum*), nannyberry (*Viburnum lentago*) and winterberry (*Ilex verticillata*). The herbaceous layer is a mixture of forest ferns and upland herbs characteristic of floodplain forests. The Natural Heritage and Endangered Species Program (NHESP) has noted that two rare plants and two rare vertebrates can be found in the high-terrace floodplain forests in the Town of Colrain. These include the Black Maple (*Acer nigrum*) and the Barren Strawberry (*Waldsteinia fragarioides*), and the Jefferson Salamander (*Ambystoma jeffersonianum*) and the Wood Turtle (*Clemmys insculpta*). (See Tables 4-5 and 4-6.)

D.2 Unusual Natural Communities

The Natural Heritage and Endangered Species Program (NHESP) of the Massachusetts Division of Fish, Wildlife and Environmental Law Enforcement has noted the Town of Colrain as having a number of uncommon ecologically significant natural communities within its borders, which support a number of the state-listed rare and endangered species (NHESP correspondence; 2002). These communities include:

Rich, Mesic Forests

Rich, mesic forests are one type of unusual natural community known to occur in the Town of Colrain. The rich, mesic forest is nutrient-*rich*, moderately moist (*mesic*) variant of the Northern Hardwood forest. It is found in areas of calcium-rich bedrock and alkaline groundwater. In the Northeast, these forests occur at low to moderate elevations below 2,400 feet and usually on the north or east-facing, concave, middle to lower slopes. Within the Commonwealth of Massachusetts only a limited number of rich, mesic forests can be found. Sugar maple (*Acer saccharum*) and/or basswood (*Tilia americana*) are the dominant species of this forest. White ash (*Fraxinus americana*), yellow birch (*Betula alleghaniensis*), butternut-hickory (*Carya cordiformis*), and sweet birch (*B. lenta*) also occur in small numbers.

Rare plants known to occur in Colrain's rich, mesic forests include the Barren Strawberry (*Waldsteinia fragarioides*), a member of the Rose family. It prefers rich wooded areas or semi-open banks, but also does well in cool, wooded areas and in sandy, dry soil. Woodland Millet or Millet Grass (*Milium effusum L.*) occurs on steep slopes within the rich, mesic forest, where the soil has a high calcium content. The Hooded Ladies'-tresses (*Spiranthes romanzoffiana*) are also a rare species, which can be found in this community.

Acidic Graminoid Fen

The Acidic Graminoid Fen is an uncommon natural community found in Colrain, which forms along pond margins, slow-moving streams, and at the headwaters of streams or in isolated valley bottoms without inlet or outlet streams. It is a wetland community composed of incompletely decomposed organic matter. The Slender Cottongrass

(*Eriophorum gracile)*, a rare species considered to be threatened in Massachusetts, can be found in the acidic gramminoid fens.

Rocky Summit/Rock Outcrop Community

The Rocky Summit/Rock Outcrop community is found on the rocky summits of hills and mountains where bedrock is exposed or on rock outcrops of upper to mid-slope areas. Most of these communities are small in size, usually less than one-quarter acre. Grasses, sedges, herbaceous plants and shrubs dominate them. The Climbing Fumitory (*Adlumia fungosa*), a rare species known to occur in Colrain, may be found in this environment.

High-Energy Riverbank

High-energy riverbank communities are rare in Massachusetts, however they are found in steep gradient, high flood areas on fast-flowing rivers. They typically occur on riverbends and the upstream ends of islands. These communities are created by cobbles, sand and silt being deposited during spring floods. Plants associated with this community vary depending upon the composition of the substrate and the severity of annual flooding. On open cobbles, false dragonhead (*Physostegia virginiana*), cocklebur (*Xanthium strumarium*), beggar's ticks (*Bidens* spp.) and lady's thumb (*Polygonum persicaria*) are dominant. As the amount of sand increases, water horsetail (*Equisetum fluviatile*) and clasping dogbane (*Apocynum sibiricum*) occur. There is also definitive band of switchgrass (*Panicum virgatum*). In the sandiest environments, mixed grasses of switchgrass, big and little bluestem (*Andropogon gerardii* and *Schizachyrium scoparium*), Indian grass (*Sorghastrum nutans*) and goldenrods (*Solidago* spp.) are found. Due to the intense flooding, trees and/or tall shrubs are not able to establish themselves in the high- energy riverbank environment. However, short shrubs such as shadbush (*Amelanchier* spp.), silky dogwood (*Cornus amomum*), sandbar willow (*Salix exigua*) and sandbar cherry (*Prunus pumila* var. *depressa*) can be found on the sandiest sections, which typically border floodplain forests.

Cobble Bar Forest

The Cobble Bar Forest is a variant of the high-energy riverbank community. It is characterized by open forests growing on sandy cobble bars on the upstream ends of islands. These open forests are dominated by sycamore (*Platanus occidentalis*) with associated cottonwood (*Populus deltoids*) and silver maple (*Acer saccharinum*). American elm (*Ulmus americana*) is also present. Exotic species usually dominate the understory. Cobble bar forests provide habitat for riverine odonates (dragonflies and damselflies).

D.3 Agricultural Land

In 1997, agricultural land in Colrain, which includes cropland, pastureland, orchards and nurseries, comprised 11.6 percent of the town's total land area. The U.S. Census of Agriculture does not provide municipal-level data for the amount of land in farms. Colrain's agricultural land is located primarily along the Green River, the North River and its East and West Branches and in the southeastern-most corner of Colrain.

Table 4-4: Farms of Colrain, Massachusetts

Family	Farm Name	Year Established	Farm Size in Acres	Primary Products
C. & S. Hager	Hager Brothers Farm	1738	675	Maple products, dairy, timber
K. Shearer	Colrain Dairy Farm	1929	240	Dairy
R. Coombs	Coombs Hill Farms	1752	270	Dairy
S. Herzig	West Branch Farm	1900	130	Dairy
S. Sullivan	Brown Homestead Farm	1990	Using 200, owns 56	Dairy
J. & T. Maloney	West County Cider	1984	60	Hard cider
B. & C. Ramirez	Keldaby Farm	1990	14	Mohair and breeding stock, angora goats
K. Avery	Fort Morrison Farm	1855	400+	Dairy, breeding stock
D. Roberts	Dar-Ridge Farm	1940	265	Dairy
A. Emond	West Branch Organic Farm	1993	5	Cut flowers, produce, eggs
H. Purington	Woodslawn Farm	1784	370	Dairy
R. Lively	Sunrise Farms	1890	275/Heath, 175/Colrain	Maple syrup, timber, beef
D. Scranton	Windswept Valley Farm	1963	220	Dairy
D. Shearer	Pine Hill Orchards	1920	100	Apples, cider, peaches, blueberries, plants
M. & S. MacKusick	B&B and Barn	1993	650	Hay, goat meat, periodic logging, & recreation (horse riding)
D. Wheeler	Foxwood Iris Farm	1983	1	Irises
J. Hillman	Unknown	Unknown	Unknown	Unknown

Source: Contacts of local farmers by Open Space and Recreation Plan Member, Sarah Johnson, 2003.

According to the Massachusetts Department of Agricultural Resources (DAR), there are eight dairy farms in the Town of Colrain. Two of these farms have been designated Massachusetts Century Farms for having been owned or worked by the same family for at least one hundred years. They are Coombs Hill Farm in existence since 1752 and Woodslawn Farm in existence since 1784. In addition, the DAR noted there are nine farms in the Agricultural Preservation Program. Table 4-4 lists information describing seventeen farms in Colrain. The data was gathered by members of the Colrain Open Space and Recreation Planning Committee and includes the farming family, each farm's name, the year it was established, its size in acres, and the farm's primary products.

D.4 Rare, Threatened and Endangered Plant Species

The Natural Heritage and Endangered Species Program (NHESP) of the Massachusetts Division of Fish, Wildlife and Environmental Law Enforcement has designated several "Priority Habitat" areas in the Town of Colrain. A Priority Habitat is an area where plant and animal populations protected by the Massachusetts Endangered Species Act Regulations (321 CMR 10.00) may occur. These areas include:

- Along the banks of the East Branch;
- Along the banks of the West Branch from the Heath town line to Clark Road (approx.), and from Adamsville to the confluence with the East Branch;
- Along the banks of Taylor Brook from Hill Road (approx.) to the confluence with the West Branch;
- Along the banks of and land between, Holden and Houghton Brooks to their confluence with the North River;
- Along the banks of Johnson Brook from the intersection of Greenfield Road and Jurek Road to just past Shelburne Line Road; and
- Along the banks of the Green River from the Vermont border to Stewartville and from the East Colrain Church to three-fourths of a mile beyond the Stafford Brook's confluence with the Green River (approx).

(See Open Space Map).

Table 4-5: Rare Plant Species in the Town of Colrain

Scientific Name	Common Name	State Status
Hydrophyllum canadense	Broad Waterleaf	Endangered
Spiranthes romanzoffiana	Hooded Ladies'-tresses	Endangered
Carex tuckermanii	Tuckerman's Sedge	Endangered
Adlumia fungosa	Climbing Fumitory	Threatened
Cryptogramma stelleri	Fragile Rock-brake	Threatened
Eriophorum gracile	Slender Cottongrass	Threatened
Milium effusum	Wooland Millet	Threatened
Ophioglossum pusillum	Adder's Tongue-fern	Threatened
Platanthera dilatata	Leafy White Orchis	Threatened
Sanicula canadensis	Canadian Sanicle	Threatened
Acer nigrum	Black Maple	Special Concern
Alnus viridis spp. *crispa*	Mountain Alder	Special Concern
Carex hitchcockiana	Hitchcock's Sedge	Special Concern
Cypripedium reginae	Showy Lady's-slipper	Special Concern
Equisetum scirpoides	Dwarf Scouring-rush	Special Concern
Panax quinquefolius	Ginseng	Special Concern
Waldsteinia fragarioides	Barren Strawberry	Special Concern

Source: Natural Heritage and Endangered Species Program, Mass. Division of Fisheries and Wildlife, 2002.

NHESP has identified 241 native plant species as rare in the Commonwealth, and a number of rare plants have been documented in the Town of Colrain (See Table 4-5). These plants occur in some of the Priority Habitats identified above. Plants (and animals) listed as *endangered* are at risk of extinction (total disappearance) or extirpation

(disappearance of a distinct interbreeding population in a particular area). *Threatened* species are likely to become endangered in the foreseeable future. Species of special concern have been documented to have suffered a decline that could result in its becoming threatened, or occur in very small numbers and/or have very specialized habitat, the loss of which could result in their becoming threatened (NHESP and The Nature Conservancy, *Our Irreplaceable Heritage: Protecting Biodiversity in Massachusetts,* 1998).

E. FISHERIES AND WILDLIFE

Colrain's upland forests, rivers, wetlands and open farmland provide habitat for a variety of common and rare wildlife species. This section discusses wildlife species and their habitats from the perspective of natural communities, individual species, and patterns of wildlife distribution and movement across the landscape.

The BioMap Project of the Natural Heritage & Endangered Species Program has identified areas throughout the state that are critical to supporting the maximum number of terrestrial and wetland plant and animal species and natural communities. The BioMap uses Estimated Habitat and other records to identify the areas most in need of protection to safeguard the native biodiversity of the Commonwealth. It focuses primarily on state-listed rare species and exemplary natural communities and was developed to promote strategic land protection.

The BioMap divides the state into thirteen distinct ecological regions based on geology, soils and plant and animal communities. Within each region, scientists have designated "Core Habitats" and "Supporting Natural Landscapes". Core Habitat areas include the most viable habitat for rare plants and animals and exemplary natural communities. Supporting Natural Landscape includes buffer areas around Core Habitat, large undeveloped patches of vegetation, large areas without roads and undeveloped watersheds. In the Town of Colrain, there are several BioMap areas. A large area of Core Habitat is located in the southwest corner of Colrain and includes Catamount State Forest. This Core Habitat area is also buffered by Supporting Natural Landscape areas. Two areas in the northeast and southeast corners of Colrain are also areas of Core Habitat. Both of these areas include sections of the Green River, which provides habitat for the Longnose Sucker, a species of special concern (NHESP; 2002.) Much of the northern, eastern and middle sections of Colrain are Supporting Natural Landscapes.

E.1 General Description and Inventory of Wildlife and Wildlife Habitats

The Town of Colrain contains a significant amount of upland and floodplain habitat. The forests in Colrain consist of large unbroken tracts of dense forest, allowing for good species movement within the town and the surrounding region.

Individuals of the following species of wildlife have been observed in Colrain at least once as members of migrating, wintering, or breeding populations. The lists are based on information presented in New England Wildlife: Management of Forested Habitats by R.M. DeGraaf et. al., published in 1992, which correlates wildlife with the major forest type in the area. The species are listed by category (amphibians, reptiles, birds, or mammals), then by type of habitat and by size of home range. This source has been augmented with information provided by members of the Colrain Open Space Planning Committee and the general public. It is by no means a complete inventory of all species that may be found in Colrain.

E.1.1. Amphibians

These species are found in forest, wetland, and open upland habitats and require a home range 1-10 acres in size:

Red-spotted Newt, Four-toed Salamander, Red-backed Salamander, Eastern American Toad, Northern Spring Peeper, Bullfrog, Green Frog, Wood Frog, Gray Tree Frog, Northern Leopard Frog, Pickerel Frog, Jefferson Salamander, Spotted Salamander, Northern Dusky Salamander, Mountain Dusky Salamander, Northern Two-lined Salamander.

This species is found in forest habitats and requires a home range 11-50 acres in size:

Spotted Salamander

E.1.2. Fish

These species are found in Colrain:

Salmon, Yellow Perch, Pickerel, Rainbow Trout, Brook Trout, Brown Trout, Small Mouthed,
Bluegill, Bullhead/Horn Pout.

E.1.3. Reptiles

These species are found in forest, wetland, and open upland habitats and require a home range 1-10 acres in size:

Wood Turtle, Spotted Turtle, Eastern Painted Turtle, Eastern Box Turtle, Eastern Garter Snake, Northern Redbelly Snake, Eastern Ribbon Snake, Northern Ribbon Snake, Eastern Hognose Snake, Northern Ring-neck Snake, Eastern Smooth Green Snake, Northern Black Racer, Northern Brown Snake.

This species is found in forest, wetland, and open upland habitats and requires a home range 11-50 acres in size:

Common Snapping Turtle, Midland Painted Turtle.

This species is found in forest, wetland, and open upland habitats and requires a home range >50 acres in size:

Eastern Milk Snake, Black Rat Snake

E.1.4. Birds

These species are found in forest /nonforested habitats and require a home range 1-10 acres in size:

Common Goldeneye, Hooded Merganser, Common Merganser, Ruby-throated Hummingbird, Yellow-bellied Sapsucker, Downy Woodpecker, Hairy Woodpecker, Northern Flicker, Eastern Wood-Pewee, Yellow-bellied Flycatcher, Willow Flycatcher, Least Flycatcher, Eastern Phoebe, Black-capped Chickadee, Tufted Titmouse, House Wren, Carolina Wren, Winter Wren, Golden Crowned Kinglet, Ruby Crowned Kinglet, Blue-gray Gnatcatcher, Eastern Bluebird, Bobolink, Veery, Hermit Thrush, Wood Thrush, American Robin, Brown Thrasher, Cedar Waxwing, Solitary Vireo, Yellow-throated Vireo, Warbling Vireo, Philadelphia Vireo, Red-eyed Vireo, White-eyed Vireo, Blue-winged Warbler, Pine Warbler, Tennessee Warbler, Nashville Warbler, Northern Parula, Yellow Warbler, Chestnut-sided Warbler, Black-throated Blue Warbler, Yellow-rumped Warbler, Black-throated Green Warbler, Blackburnian Warbler, Prairie Warbler, Blackpoll Warbler, Black-and-White Warbler, American Redstart, Worm-eating Warbler, Ovenbird, Louisiana Waterthrush, Northern Waterthrush, Song Sparrow, Lincoln Sparrow, White-throated Sparrow, Dark-eyed Junco, Common Grackle, Brown-headed Cowbird, Northern Oriole, Rufous-sided Towhee, Purple Finch, Scarlet Tanager, Northern Cardinal, Rose-breasted Grosbeak, Indigo Bunting, Great Crested Flycatcher, Eastern Kingbird, Tree Swallow, Blue Jay, Mourning Warbler, Common Yellowthroat, Wilson's Warbler, Hooded Warbler, Canada Warbler, Chipping Sparrow, Field Sparrow, Grasshopper Sparrow, Henslow's Sparrow, American Goldfinch, Gray Catbird, Great Blue Heron, Green-backed Heron, Wood Duck, American Black Duck, Green-winged Teal, Mallard, Northern Pintail, Blue-winged Teal, Northern Shoveler, Common Egret, American Wigeon, Canvasback, Ring-necked Duck, American Goldfinch, Evening Grosbeak, American Redstart, Red Crossbill, White-winged Crossbill, European Starling, Sora, Killdeer, Spotted Sandpiper, Common Snipe, Northern Mockingbird, Eastern Pheoebe, Mourning Dove, Pine Siskin, Northern Waterthrush, Virginia Rail, Eastern Kingbird, Pine Siskin, House Finch, House Sparrow, Fox Sparrow, Red-winged Blackbird, Great-crested Flycatcher, Pied-billed Grebe, Red-breasted Merganser, American Bittern, Least Bittern, Black-crowned Night Heron, Northern Bobwhite.

These species are found in forest/nonforested habitats and require a home range 11-50 acres in size:

Ring-necked Pheasant, Ruffed Grouse, Upland Sandpiper, Black-billed Cuckoo, Yellow-billed Cuckoo, Common Nighthawk, Whip-poor-will, Northern Rough-winged Swallow, Bank Swallow, Barn Swallow, Purple Martin, Red-breasted Nuthatch, White-breasted Nuthatch, Pine Grosbeak, Brown Creeper, American

Woodcock, Horned Lark, Muted Swan, Canada Goose, Eastern Meadowlark, Swainson's Thrush.

These species are found in forest/nonforested habitats and require a home range >50 acres in size:

Turkey Vulture, Bald Eagle, Sharp-shinned Hawk, Cooper's Hawk, Northern Goshawk, Red-shouldered Hawk, Broad-winged Hawk, Red-tailed Hawk, Golden Eagle, American Kestrel, Peregrine Falcon, Wild Turkey, Great Horned Owl, Eastern Screech-Owl, Great Gray Owl, Barred Owl, Northern Saw-whet Owl, Pileated Woodpecker, American Crow, Common Raven, Chimney Swift, Belted Kingfisher, Northern Harrier, Gray Partridge, Spruce Grouse, and Osprey.

These species are found in forest/nonforested habitats with unknown home ranges:

American Tree Sparrow, Bohemian Waxwing, Northern Shrike, Common Redpoll, Snowy Owl, Snow Bunting, White-crowned Sparrow, Boat-tailed Grackle, Snow Goose, Rough-legged Hawk.

E.1.5. Mammals

These species are found in forest habitats and require a home range 1-10 acres in size:

Eastern Cottontail, New England Cottontail, Snowshoe Hare, Eastern Chipmunk, Gray Squirrel, Red Squirrel, Northern Flying Squirrel, Beaver, Deer Mouse, White-footed Mouse, Shrew, Northern Short-tailed Shrew, Least Shrew, Masked Shrew, Smoky Shrew, Hairy-tailed Mole, Meadow Jumping Mouse, Woodland Jumping Mouse, Meadow Vole, Star-nosed Mole, Eastern Mole, Muskrat.

These species are found in forest habitats and require a home range 11-50 acres in size:

Virginia Opossum, Porcupine, Ermine, Long-tailed Weasel.

These species are found in forest habitats and require a home range >50 acres in size:

Woodchuck, Coyote, Red Fox, Grey Fox, Black Bear, Raccoon, Marten, Fisher, Striped Skunk, River Otter, Lynx, Bobcat, White-tailed Deer, Moose, Mink, Mountain Lion.

These species are found in forest/nonforested habitats with unknown home ranges:
Little Brown Myotis, Big Brown Bat, Red Bat, Hoary Bat, Keen's Myotis.

E.2 Rare, Threatened and Endangered Wildlife Species

NHESP has mapped several "Priority Habitats of Rare Species" and "Estimated Habitats of Rare Wildlife" in the Town of Colrain. The Estimated Habitats of Rare Wildlife are located in the same areas as noted for the Priority Habitats earlier in this section, with the exception of the section on the Green River from the East Colrain Church to just beyond Stafford Brook's confluence with the Green River.

Table 4-6: Rare, Threatened and Endangered Wildlife Species found in Colrain

Scientific Name	Common Name	State Status
Invertebrates		
Boyeria grafiana	Ocellated Darner	Special Concern
Gomphus borealis	Beaverpond Clubtail	Special Concern
Vertebrates		
Phoxinus eos	Northern Redbelly Dace	Endangered
Ambystoma jeffersonianum	Jefferson Salamander	Special Concern
Catostomus catostomus	Longnose Sucker	Special Concern
Clemmys insculpta	Wood Turtle	Special Concern
Gyrinophilus porphyriticus	Spring Salamander	Special Concern

Source: Natural Heritage and Endangered Species Program, Mass. Division of Fisheries and Wildlife, 2002.

These habitats provide for wildlife species that are endangered, threatened and of special concern. Colrain's rare, threatened and endangered wildlife species are listed in Table 4-6.

E.3 Conserving Colrain's Biodiversity

There are two concepts that can be used to help explain Colrain's options for pursuing the conservation of the town's biodiversity: Island Biogeography and landscape ecology.

The theory of Island Biogeography is based on observations that biodiversity is greater on large islands than on small ones, and greater on islands that are close to the mainland. The concept of islands surrounded by water has been applied to the idea of "islands" of protected open space surrounded by developed areas. Based on this theory, ecologists predict that increasing the size of a protected area increases its biodiversity (MacArthur and Wilson; 1967). Therefore, connecting two protected areas via a protected corridor to create one large area should also increase natural biodiversity (Wilson and Willis; 1975).

Another model for wildlife habitat protection aggregates similar land uses while allowing other uses in discrete areas (Forman; 1997). This model is reflected in Colrain in that the several villages and the floodplain areas concentrate development, agriculture is concentrated where prime farmland soils occur along river corridors, and large blocks of forest remain intact.

Individual animals move within a landscape. When and where wildlife and fish species move is not well understood by wildlife biologists. However, we do know that animals pay little attention to political boundaries. Wildlife seek natural cover for shelter and food, but some species willingly forage where human uses, such as farm fields, gardens and even trash cans, provide browse or food. As the land within Colrain continues to be fragmented by development, it is reasonable to expect that remaining large blocks of undeveloped forest and the parcels of land connecting them will become more important to area wildlife, and that conflicts between the needs of wildlife and residents will become more common.

Many species of wildlife in Colrain have home ranges greater than fifty acres in size. Even those species with smaller home ranges move across the landscape between sources of shelter, water, food and mating areas. Some animals, including white-tailed deer and black bear, seek both interior forest habitat and wetland edges where food sources may be more abundant.

Roads are a form of connection for humans but they can be an impediment to some wildlife movement. Wildlife benefit from having land to move within that is isolated from human uses. Conservation planning that recognizes this need often focuses on the development of wildlife corridors. Permanently protected wildlife corridors are particularly critical in a landscape which is experiencing development pressures to ensure that animals have the ability to travel across vegetated areas between large blocks of habitat.

Connections between bodies of water and sub-watersheds are also important for wildlife and fisheries species. Some of the more common animals that use river and stream corridors are beaver, muskrat, raccoon, green heron, kingfish, 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 proximity to each other. With this in mind, the protection of all habitat types is vital for maintaining and enhancing biodiversity in Colrain.

How will the Town of Colrain determine the most appropriate conservation strategies for wildlife habitat? There are three general paths to follow in conserving the health of wildlife populations. One is to protect the habitat of specific species that are rare, threatened, or endangered. It is thought that other species will also benefit from this strategy. A second path is to conserve landscape-level resources such as contiguous forest or riparian areas. This helps to protect the habitats of a large number of species, but it might not meet the needs of all rare and endangered species. The third method is a combination of the first two. Maintaining the biodiversity of Colrain over the long term will likely require the protection of both unique habitats for specific species and networks of habitat across the landscape. Conservation strategies for the town to consider include monitoring of species locations, numbers, and movements; the protection of core habitat areas as identified by the NHESP BioMap (*see Open Space Map*); the continued protection and linkage of large blocks of contiguous forestland; the retention of early successional habitats like fields and grasslands; and the protection of vernal pools, wetlands, and riparian corridors that sustain the greatest diversity of life in Colrain.

F. SCENIC RESOURCES AND UNIQUE ENVIRONMENTS

The characteristics that allow a stranger to distinguish Colrain from other towns in the region may be different than the unique qualities and special places that only residents

can really know. This section identifies the scenic resources and unique environments that most Colrain residents would agree represent the essence of Colrain's character.

In many ways the history of Colrain--how people came to settle the land, use its resources, and enjoy its forests, streams, and bodies of water--can be seen in the landscapes that have retained a sense of the past.

The unique environments in Colrain play a very important role in providing residents with a sense of place. Brooks, mountains, wetlands, and village centers provide markers on the landscape within which we navigate our lives.

Scenic landscapes often derive their importance from location relative to other landscape features. The purpose of inventorying scenic resources and unique natural environments in Colrain is to provide a basis for setting resource protection priorities. To this end, this section includes information about the different values associated with each scenic resource and natural environment, and indicates areas where multiple values are represented in one landscape (See Table 4-7). Those landscapes that contain, for example, scenic, wildlife, and cultural values may be given higher priority for protection than a landscape that contains only one value.

These documented resources include historic landscapes and special places. This inventory is based on a formal survey done in 1992 for the Franklin County Rural Historic Landscape Preservation Plan Report. This document distinguishes between types of landscapes, identifies in general terms the locations of rural historic landscapes in each town, and provides examples of different preservation strategies. The methodology for identifying significant historical landscapes was based on National Park Service criteria including area of significance, period of significance and historical integrity. NPS classifies landscapes into four different categories: landscapes that reflect major patterns of a region's history (e.g. agricultural landscapes), landscapes that are associated with historically significant individuals (e.g. institutional grounds and buildings), landscapes that are important due to their design or physical characteristics (e.g. an 18th century Colonial Period Connecticut Valley rural farm), and landscapes that yield or have the potential of yielding significant information on pre-history or history (e.g. a native American encampment site).

It should be noted that within the Town of Colrain there are several old Native American trading routes and military highways. Due to the fact that they cross predominantly private lands, the Open Space and Recreation Committee felt it would be inappropriate to display them on the Scenic Resources and Unique Environments Map at this time. However, if the town became interested in protecting the historical and recreational value of these trails by purchasing easements from willing landowners, a first step towards protection would entail mapping and more detailed documentation.

Table 4-7: Significant Scenic/Ecological/ Recreational/and Historic Landscapes/Environments in Colrain

Map #	Scenic Resources	Ecological/ Geological Resources	Recreational Value	Historical Value
	Stream Corridors			
1	North River	Public Drinking Water Supply; Endangered Species	Swimming, Fishing, and Kayaking	Historic mills and bridges; a source of process water for BBA Non-Wovens
2	McClellan Brook	Recharge Area for a Drinking Water Supply		
3	Fox Brook	Public Drinking Water Supply	Fishing	Works Progress Administration and the Civilian Conservation Corps built stonewalls and foundations in the area
4	Johnson Brook (North River)	Yes	Hiking	
5	Meadow Brook	Yes	Hiking	Historic mill site
6	Holden Brook	Vernal Pools		
7	Houghton Brook	Long Nose Sucker Fish (endangered); Drains Large Swamp System	Fishing	The "Sheep-dip," an area historically used to wash sheep before shearing
8	East Branch of the North	Endangered Species	Important fishery, Fishing, Kayaking, and swimming	Historic mills
9	Spur Brook	Yes	Important fishery	Nice stone dam and grist mill
10	Foundry Brook	Yes	Important fishery, Hiking	Historic mills
11	West Branch of the North River	Yes	Important fishery, Fishing, Swimming	Old mills and industries
12	Vincent Brook	Yes	Trout fishing	
13	Willis Brook	Beavers		
14	Roberts Brook North	Yes	Fishing	
15	Roberts Brook South	Public Drinking Water Supply--Water Runs into Lower Reservoir		
16	Tissdell Brook	Yes	Fishing and Swimming	Dam and old mill sites
17	Taylor Brook	Yes	Swimming	Dam and old mill site
18	Cary Brook	Yes	Hiking	200-yr. old stone bridges, old milk house and old dam
19	Green River	Drinking Water Supply for Greenfield; Endangered Species	Fishing and Swimming	Dams and old mill sites
20	Johnson Brook (Green River)	Beaver Ponds and Native Trout	Fishing	
21	Stafford Brook	Yes		
22	Workman Brook	Yes		
	Ponds and Lakes			

Map #	Scenic Resources	Ecological/ Geological Resources	Recreational Value	Historical Value
23	McLeod Pond	Undergoing Eutrophication; Diverse Habitats	Picnicking, Swimming Sunbathing, Fishing and Canoeing.	Old cellar holes; used to be a haying meadow
24	Beaver Ponds	Yes		
25	Swamp (No name)	Yes		
26	Ash Swamp	Yes		
	Recreation Areas			
27	H.O. Cook State Forest	Yes	Hiking, Hunting, Fishing, Snowmobiling, and Camping.	Historic Recreational Landscape; a C.C.C. Forest Camp
28	Catamount State Forest	Unique Caves; Beaver Ponds; Endangered Species; Vernal Pools	Hiking and Hunting	Historic Recreational Landscape; Site of the first flag flown over a schoolhouse; Traversed by Native American trade routes and old military roads; An historic settlement of 70 families
29	Catamount Wildlife Management Area	Unique Caves; Beaver Ponds; Endangered Species; Vernal Pools	Hunting	
30	Green River Access Area	Yes	Potential	
	Historical Agricultural Landscapes			
31	Nelson Road			Yes
32	Route 112			Yes
33	Adamsville Road			Yes
34	EW Clark Road and Christian Hill Road			
35	Shelburne Line			Yes
36	Wilson Hill Road			Yes
37	Nelson Purington Road			Yes
38	Heath Road			Yes
39	Coombs Hill Road			Yes
	Historical Religious Landscape			
40	East Colrain Chapel			Yes
41	Methodist Church			Yes
42	St. John's Church			Yes
43	First Baptist Church			Yes
44	Second Baptist Church			Oldest church in Colrain, established in 1799.

Map #	Scenic Resources	Ecological/ Geological Resources	Recreational Value	Historical Value
45	Brick Meeting House		Yes	Formerly a Congregational Church and also served as town office
	Historical Community Development/ Conservation/ Science/ Industrial Landscape			
46	Red Mill			Made boxes
47	Colrain Center		Museum, Restaurant and Beautiful Library	Still active old commercial center; historic buildings; the end of the trolley line
48	Allegedly a commemorative site for Native Americans attacked by Europeans			
49	Factory Village, Adamsville			Cider mill, sawmill, fulling mill and gimlets
50	Foundry Village	Along North River.		Site of early cider and vinegar mill, foundry and smith shops
51	Factory Village, Stewartville, Green River Rd.			Yes
52	Factory Village, Griswoldville, Rte.112	Along North River.		Early mill site
53	Factory Village, Shattuckville	Along North River.		Early mill site
54	Factory Village, Lyonsville, Rte.112	Along North River.		Some 19th century buildings remain
55	Brick School		Yes	Yes
56	Elm Grove Factory Village			Yes
	Historical Transportation Landscape			
57	Route 112	Scenic Corridor along the North River		Yes
58	Trolley Line from Buckland to Colrain Center			Yes
	Unusual Geologic Features			
59	Road cut, York Road	Yes		
60	Road cut, Greenfield Road	Yes		

Map #	Scenic Resources	Ecological/ Geological Resources	Recreational Value	Historical Value
61	Catamount cave and dens	Yes	Hiking Destination	Historic use – Methodists used cave for revival meetings; Used for church meetings
	Scenic Views			
62	Views from Ridgetops			
63	North River Valley from Colrain Center north to Vermont line.			
64	View to the west from top of Colrain Mountain.			
	Other			
65	Old Abutments for York Road across Foundry Brook			Yes
66	Dude Ranch			Yes
67	Fort Morrison, French and Indian War			Yes
68	Fort Monument, French and Indian War			Yes
69	South Fort Morris, French and Indian War			Yes
70	Fort Lucas, French and Indian War			Yes

Source: Franklin County Rural Landscape Preservation Plan Report, Franklin County Commission, 1992; Town of Colrain Residents.

G. ENVIRONMENTAL PROBLEMS

According to the Open Space and Recreation Planning Committee, there are two main types of environmental problems in Colrain: non-point source pollution and the impacts of development. Non-point source pollution occurs when pollutants are generated not by a single source like an outflow pipe from a factory but from improper land use across landscapes both suburban and rural. For example, Colrain residents can unknowingly contaminate groundwater by failing to update their private septic systems to limit leaching into rivers and streams and by improperly disposing of household hazardous materials like petroleum products, wood preservatives, and pesticides.

Agricultural activities can also produce pollutants. When manure is spread on fields in the spring months, runoff from snow melt and spring rain can result in overland flow of nutrients into brooks and streams at levels that can interfere with normal ecosystem processes. There is more of a chance of runoff pollution from spread manure than there

is from leaching, which can happen when piles of manure are left on permeable soil for extended periods of time in warmer months. Spreading manure on frozen, snow-covered ground has the greatest potential for runoff pollution. Incorporation of manure within twelve hours of application on the soil decreases the likelihood of lost nutrients through leaching, runoff and volatilization. Improper disposal of livestock manure by backyard farmers has increased in the watershed. Many of these individuals have limited land to get rid of their manure on, so it tends to accumulate in the least desirable land on their property, namely wetlands or along stream banks (Rita Thibideau, Natural Resource Conservation Services, personal communication, 2003).

Other pollution problems come from road runoff directly impacting watercourses through curb cuts. Gravel operations can have negative impacts on groundwater when permitted to harvest materials too close to the groundwater table. Logging operations can also contribute to erosion problems in the woodlands if Best Management Practices are not followed (Rita Thibideau, personal communication, 2003).

Erosion is a water shed-wide type of non-point source pollution that is impacted by local land use decisions. A brief summary of a Soil Conservation Service (now Natural Resource Conservation Service) study conducted back in the late 1980s indicated that erosion and sedimentation is occurring through out the Deerfield River Watershed. The extensive accumulation of sediment under the Rt. 112 bridge is the result of the North River's high velocity channel empting its bed load in the floodplain. The North River has lost some of its pools and riffles above the bridge, which had helped to control the sediment buildup. A few problem areas were studied and addressed. Installations of bioengineering techniques were used to address erosion along stream banks. Most of this work has survived. Some of the problems contributing to the erosion are the practice of mowing, grazing and tilling land directly adjacent to the stream. Another example involves the erosion of the clay bank of Taylor Brook, which flows into the West Branch. Removal of vegetation along streams has a negative impact on the stability of the stream bank. A vegetative buffer helps to stabilize the stream bank and provides shade for the stream (Rita Thibideau, personal communication, 2003).

The most recent study that is about to be undertaken by the USDA Natural Resources Conservation Service Interdisciplinary Resource Team (NRCS IRT) will look at stream bank erosion, sediment accumulation under the bridge, surface runoff from the Colrain school parking lot and existing buffers. A combination of measures may be used to control some of these issues such as bioengineering, re-establishment of a vegetative buffer and in stream deflectors in the area of the Rt. 112 bridge (Rita Thibideau, personal communication, 2003).

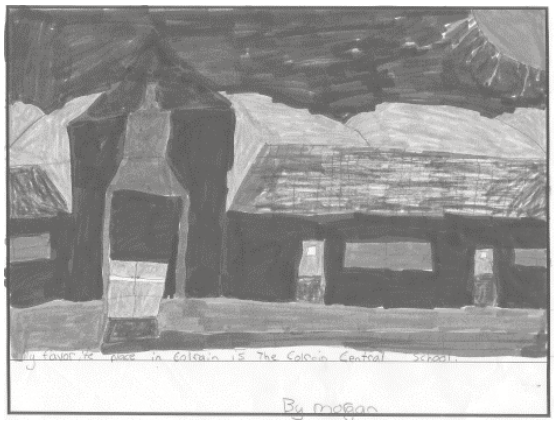
Two other land use practices and activities that can also increase non-point source pollution are road salt and off-road vehicle use. The use of wintertime de-icing materials can result in road salt runoff and groundwater contamination. For example, the Deerfield Fire District has lost use of its Wapping Well due to sodium contamination from road salt use along Rte. 5/10. Finally, off-road vehicle use in areas with shallow, wet, and unstable

soils can result in serious erosion and sedimentation of wetlands and streambeds, which results in habitat alteration and a reduction in local biodiversity.

Another type of environmental problem relates to development of the built environment. Unplanned development along back roads is seen as potentially threatening to the rural character that many Colrain residents have come to cherish. Although Colrain's zoning is designed to promote village residential, commercial and industrial centers, rural agricultural areas, and forested landscapes, sprawl of roadside frontage lots is the current development pattern occurring in town today. Over time, this development pattern would diminish the differences between the villages and rural areas of town and could result in a reduction in available clean drinking water, in the town's biodiversity, and in active agricultural businesses.

Buildings in the village centers in need of serious repair are considered to be a visual blight and as such, an environmental problem. In addition, cleanup and redevelopment of abandoned industrial sites known as "brownfields" is an important element of restoring economic viability and environmental health of the town's villages.

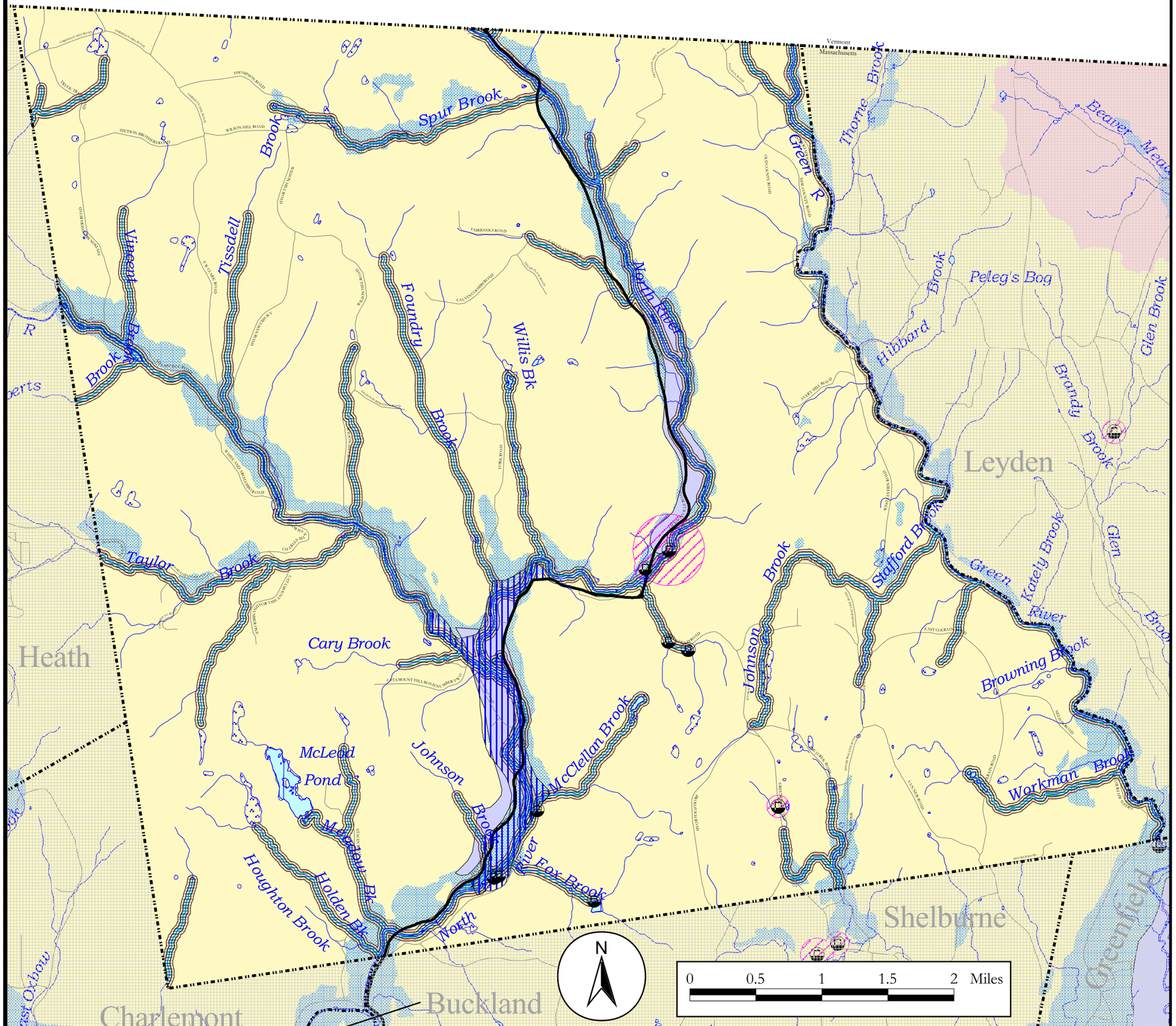
The success of efforts to address urban blight and promote revitalization in village areas is important to the future of the town's open space and natural resources. Colrain's villages have many natural and cultural resources that make them attractive places to live: historic buildings, a mix of residential and commercial spaces, and proximity to rivers and forests. Improving infrastructure and the appearance of buildings within the villages can help draw people to these historic settlements, and possibly reduce some of the pressure to develop more rural areas of town. Use of these areas for further development would need to resolve any existing septic problems that are currently an issue.



Town of Colrain

Open Space and Recreation Plan

Water Resources



Legend

- Town Line
- Rail Lines
- Roads
- Major roads
- Streams and Rivers
- Water body
- Deerfield River Watershed
- Connecticut River Watershed
- Public water supply sources
- National Wetlands Inventory wetland
- Interim Wellhead Protection Area
- Surficial Geology: sand/gravel, floodplain alluvium (low yield aquifer)
- Aquifer yield >200 gpm
- Zone II - Conceptual Delineated Water Supply Recharge Area

River Protection Act

- 0-100 feet from river bank
- 100-200 feet from river bank

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 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.

Road data provided by Massachusetts Highway Department. Town line, rail line, river, stream, pond, National Wetlands Inventory, zone II, interim wellhead protection area, public water supply, surficial geology, major basin, River Protection Act data provided by MassGIS.

Note: Depicted boundaries are a 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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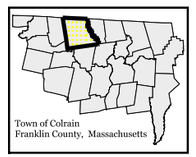
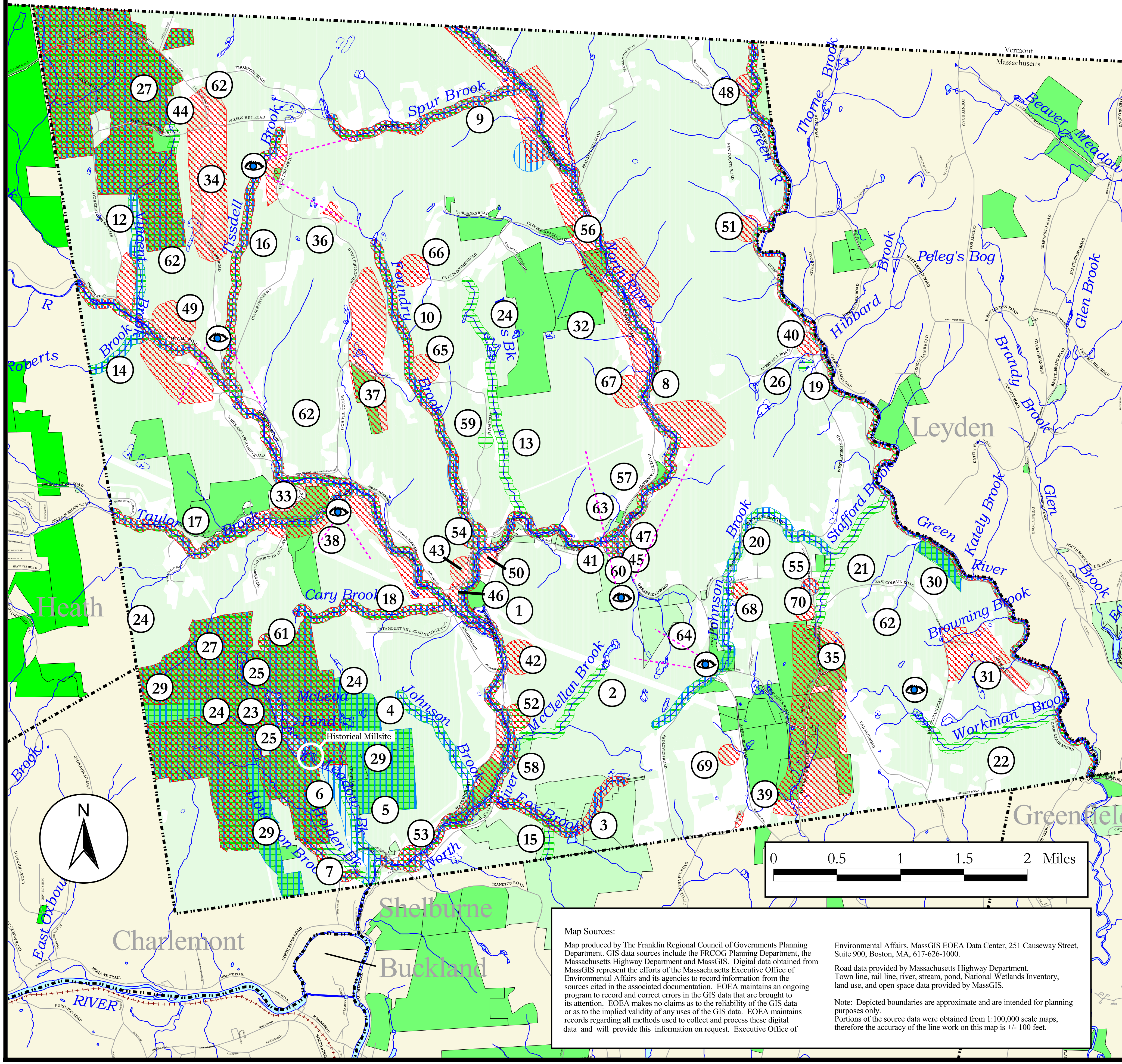


June 26, 2004

Town of Colrain

Open Space and Recreation Plan

Scenic Resources and Unique Environments



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2	McClellan Brook
3	Fox Brook
4	Johnson Brook (North River)
5	Meadow Brook
6	Holden Brook
7	Houghton Brook
8	East Branch of the North
9	Spur Brook
10	Foundry Brook
11	West Branch of the North River
12	Vincent Brook
13	Willis Brook
14	Roberts Brook North
15	Roberts Brook South
16	Tissdell Brook
17	Taylor Brook
18	Cary Brook
19	Green River
20	Johnson Brook (Green River)
21	Stafford Brook
22	Workman Brook
	Ponds and Lakes
23	McLeod Pond
25	Swamp (No Name)
24	Beaver Ponds
26	Ash Swamp
	Recreation Areas
27	H.O. Cook State Forest
28	Catamount State Forest
29	Catamount Wildlife Management Area
30	Green River Access Area
	Historical Agricultural Landscapes
31	Nelson Road
32	Route 112
33	Adamsville Road
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	Historical Religious Landscape
40	East Colrain Chapel
41	Methodist Church
42	St. John's Church
43	First Baptist Church
44	Second Baptist Church
45	Brick Meeting House
	Historical Community Development/ Conservation/Science Industrial Landscape
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49	Factory Village, Adamsville
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51	Factory Village, Stewartville, Green River Rd.
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62	Views from Ridgetops
63	North River Valley from Colrain Center north to Vermont line.
64	View to the west from top of Colrain Mountain.
	Other
65	Old Abutments for York Road across Foundry Brook
66	Dude Ranch
67	Fort Morrison, French and Indian War
68	Fort Monument, French and Indian War
69	South Fort Morris, French and Indian War
70	Fort Lucas, French and Indian War

Map composed by FRCOG Planning Department g:\prj\418colr\a_scen.apr

Legend

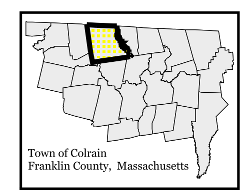
- Town Line
- Rail Lines
- Roads
- Major roads
- Streams and Rivers
- Water body
- National Wetlands Inventory
- Forest

Scenic and Unique

- Scenic vista with directional indicator
- Historic area
- Recreational area
- Ecological area

Open Space

- Open Space with Permanent Protection
- Open Space with Limited Protection



FRANKLIN REGIONAL COUNCIL OF GOVERNMENTS
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June 26, 2004

SECTION 5

INVENTORY OF LANDS OF CONSERVATION AND RECREATION INTEREST

Open space in the Town of Colrain consists of farms, forests, parks, and recreation areas under both public and private ownership and management. This section provides a summary of all lands that provide open space, wildlife habitat, agricultural and forest products, watershed protection, scenic landscapes and recreational opportunities that have some level of protection from development. An Open Space Map is located at the back of this section.

In general terms, 'open space' is defined as undeveloped land. In an Open Space and Recreation Plan, the focus is on undeveloped land, which is valued by residents because of what it provides: actively managed farm and forestland; wildlife habitat; protection and recharge of groundwater; public access to recreational lands and trail systems; important plant communities; structures and landscapes that represent the community's heritage; flood control; and scenery. The term 'natural resource' describes the biological and physical components of an ecosystem that people depend on for their existence and for some, their livelihood. These components are surface and ground water, soil nutrients, vegetation, fisheries, and wildlife. Recreational facilities can include open space, parks, and developed areas like tennis courts and swimming pools. Open space and recreation plans typically identify areas of undeveloped land that contain precious natural and recreational resources and prioritizes them for protection.

Open space can be protected from development in several ways that differ in the level of legal protection they provide, the method by which they are protected, and by the type of landowner. When land is considered to be "protected," it is intended to remain undeveloped in perpetuity. This level of protection is ensured in one of two ways: ownership by a state conservation agency, a not-for-profit conservation land trust, or the local Conservation Commission, or attachment of a conservation restriction or similar legal mechanism to the deed.

Land is considered to be "protected" from development when it is owned by the Commonwealth of Massachusetts and managed by a state conservation agency, including the Division of Fisheries and Wildlife (DFW) or the Department of Conservation and Recreation (DCR). Land is also considered "protected" when it is owned by a town and is under the authority of the Conservation Commission, or when it is owned by a land trust for conservation purposes.

A conservation restriction is a legally binding agreement between a landowner (grantor) and a holder (grantee) - usually a public agency or a private land trust, whereby the

grantor agrees to limit the use of his/her property by forfeiting interests in the land (development being one type of interest) for the purpose of protecting certain conservation values. The conservation restriction may run for a period of years or in perpetuity and is recorded at the Registry of Deeds. Certain income, estate or real estate tax benefits may be available to the grantor of a conservation restriction.

There are several types of conservation restrictions. Some protect specific resources, such as wildlife habitat, or surface water. Actively farmed land with prime soils or soils of Statewide Importance may be eligible for enrollment in the state's Agricultural Preservation Restriction (APR) Program. The APR program purchases the development rights and attaches a restriction to the deed, which legally bars development, keeping land available for agriculture.

To develop any parcel of land that is in the APR Program, has a conservation restriction, is owned by a state conservation agency, or is owned by a land trust or 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 Open Space and Recreation Plan, cemeteries will also be considered to be permanently protected from development.

This "protection" conveyed by Article 97 does have its limits. The state legislature has, on dozens of occasions, voted to release this protection at the request of local communities, so that conservation land can be used for schools, roads, economic development, or other public projects not related to resource protection. Reforms have been proposed to make this process more difficult. It is important for local advocates of conservation to be vigilant of attempts to remove the "protection" status from open space in the Town of Colrain.

Land in Massachusetts owned by towns or water districts may be considered to have limited protection from development. If a town-owned parcel of land is under the legal authority of the Select Board rather the Conservation Commission, it is considered to have limited protection from development. The parcel could be called a wildlife sanctuary or a town forest, but not have the long-term protection afforded by Conservation Commission lands. In this case, converting a town forest to a soccer field or a school parking lot could be decided by the Select Board or at Town Meeting. A parcel of land used for the purposes of water supply protection is considered in much the same way. Unless there is a legal restriction attached to the deed or if the deed reads that the land was acquired expressly for water supply protection, the level of protection afforded these types of parcels varies depending on the policies of each community. In most cases the 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. The Town of Athol recently took their surface drinking water supplies off-line after developing a productive well field. A change in land use around the reservoir from water supply protection to active recreational use may occur. Parcels enrolled in Massachusetts Chapter 61 tax abatement programs are considered to be "temporarily protected" from development. This program offers landowners reduced

local property taxes in return for maintaining land in productive forestry, agricultural or recreational use for a period of time. These "chapter lands" provide many public benefits, from maintaining wildlife habitat and recreational open space to sustaining rural character. Another benefit of the Chapter 61 programs is that they offer towns the opportunity to protect land. When a parcel that has been enrolled in one of the Chapter programs is proposed for conversion to a use that would make it ineligible for the program, the town is guaranteed a 120-day waiting period during which it can exercise its right of first refusal to purchase the property.

The total land area of the Town of Colrain is 27,861.56 acres. The portion of the total land area that is protected as open space is summarized in Table 5-1. The table is divided into two main sections based on type of ownership: private and public. Within each of these major categories, parcels are differentiated by use (farm or forestland), by ownership and management, and by level of protection: "protected," limited, and temporary.

Table 5-1: Summary Areas of Farmland and Forest Open Space by Ownership and Level of Protection from Development

PRIVATELY OWNED OPEN SPACE	Area in Acres	% Of Total Land Area in Colrain
Farmland		
Protected by Agricultural Preservation Restriction	1,899.02	6.8%
Temporarily Protected under Ch. 61A	5,372.96	19.3%
Forestland		
Protected by Conservation Restriction	30.89	0.1%
Temporarily Protected		
Chapter 61	2,843.77	10.2%
Chapter 61B	2,944.65	10.6%
TOTAL PRIVATELY OWNED OPEN SPACE WITH SOME LEVEL OF PROTECTION	**13,091.29**	**47%**
PUBLICLY OWNED OPEN SPACE		
Forestland		
Protected by State Conservation Agencies		
State Department of Conservation and Recreation	2,243.70	8.1%
State Division of Fisheries and Wildlife	416.58	1.5%
Other Publicly Owned Protected Land in the Town of Colrain		
Cemeteries	20.45	0.07%
Land with Limited Protection & Owned by Town of Colrain	105.74	0.3%
Land with Limited Protection & Owned by Fire and Water Districts	444.17	1.6%
TOTAL PUBLICLY OWNED OPEN SPACE WITH SOME LEVEL OF PROTECTION	**3,230.64**	**12%**
TOTAL OPEN SPACE WITH SOME LEVEL OF PROTECTION	**16,321.93**	**59%**

Source: Colrain Assessors Records and Maps, 2003; and MassGIS Open Space data, 2003.

B. PRIVATELY OWNED PARCELS

Approximately 80 percent of the undeveloped land with some level of protection from development in Colrain is privately owned. Most of this land is owned by private individuals and is either forested or in use for agriculture. There are many advantages to private ownership of open space. Privately owned open space contributes to the town's tax base. When used for farming or forestry, land also generates revenue, jobs, food, and forest products. Some landowners allow access to their property for recreational purposes. Most take pride in their land, which favors good stewardship. Finally, owning land gives people a sense of place. This is particularly true of residents whose families have owned land in Colrain for generations. Land ownership encourages a sense of community and helps contribute to community stability over time.

The major disadvantage of private ownership of open space is that most privately owned land can easily be converted to other uses. Only 6.9 percent of privately owned open space with some level of protection in Colrain has been protected in perpetuity. The remainder is vulnerable to development. Some landowners acquire land specifically for the purposes of development, but others are forced to sell property due to circumstances beyond their control. Aging, the death of a parent or spouse, financial needs of family and rising costs or declining profits of farming and forestry are common reasons why landowners decide to put their property on the market. The high value of land for residential development is both a powerful incentive to sell property, and a formidable obstacle to people who might otherwise want to buy it for agriculture or forestry.

This section provides a detailed inventory of privately owned land in the Town of Colrain and discusses the value of this land for conservation and recreation. Privately owned land provides many public benefits, but it is important to respect private property rights and to remember that use and disposition of this land is ultimately determined by landowners. While many landowners choose to keep their property in farms and forests, it is critical to respect the rights of those who make different choices.

B.1 Privately Owned Agricultural Land

"Protected" farmland constitutes approximately 12 percent of the open space (with some level of protection from development) in Colrain, and 7 percent of the town's total land area. Tables 5-2 and 5-3 display information on those farms in Colrain which have achieved a level of protection from development, including their ownership, management, and farm size.

Approximately 26 percent of Colrain's farms with some level of protection include land "protected" by the Agricultural Preservation Restriction (APR) Program. These restrictions are overseen by the Massachusetts Department of Agricultural Resources (DAR). Information on "protected" farmland in the APR Program in Colrain is included in Table 5-2. Both the owner and manager of the APR properties are the same entity. Their use continues as farmland with state funds (DAR) used to pay farmers for the

development rights to their land. APR properties may have the potential for passive recreational use or for activities such as fishing or hunting, but this is dependent upon the wishes of the landowner. It is important to note that public access to APR properties cannot be assumed, as they are privately owned. All of the APR's in Colrain lie within the town's Rural District, which allows single-family dwellings, some community services, agricultural and recreational uses by right, and other uses by special permit.

Table 5-2: Privately Owned Agricultural Land Protected from Development

Owner/Manager	Holder of the Conservation Restriction	Map-Lot	Acres	Recreational/Other Value
Brigham, H., A., & B.	Dept. Agricultural Resources (DAR)	128-1; 129-7	215	Prime Farmland Soils
Hager Bros.	DAR	403-7, 8, 45, 47, 48, 50.1, 51	377	Prime Farmland Soils
Potts, J.B.	DAR	408-20	86	Prime Farmland Soils
Potts, J.B.	DAR	408-18, 22; 417-1, 2, 10, 13	542	Prime Farmland Soils
Franklin Land Trust	DAR	409-4	45	Prime Farmland Soils
Shearer, K. & C.	DAR	414-9.1	13.02	Prime Farmland Soils
Sylvester, S.	DAR	417-3, 36, 36.1	21	Prime Farmland Soils
Jurek, J. & P.	DAR	413-37, 40.1, 41.11	114	Prime Farmland Soils
Scranton, D. & N.	DAR	123-2.1, 2.2; 414-21.1, 24, 25; 421-32	192	Prime Farmland Soils
Sessler, F.	DAR	422-28	62	Prime Farmland Soils
Shearer, D.	DAR	413-24, 26, 27, 28; 414-9.22	86	Prime Farmland Soils
Shearer, K. & C.	DAR	105-8; 413-29, 36, 38.1	146	Prime Farmland Soils
TOTAL			**1,899.02**	

Source: Town of Colrain Assessor's Records and Maps, 2003; MassGIS Open Space data, 2003; Mass. Dept. of Agricultural Resources, 2003; and Franklin Land Trust, 2003.

Land enrolled in Chapter 61A is considered to be "temporarily protected." Approximately 48 percent of Colrain's open space with a temporary level of protection is farmland, including many large parcels with prime farmland soils (see Table 5-3). Land in Chapter 61A can be devoted to the growth of Christmas trees, fruit tree orchards, and sugar maple trees for the production of maple syrup. In some cases, farmland enrolled in Chapter 61A abuts protected land. Conversion of even a small percentage of this land to residential use could affect the viability of farming on the remainder. Location of new homes in proximity to active agricultural operations often results in conflict between new

residents and farmers over the noise, dust, odors, and use of chemicals that are part of normal agricultural practices. Increased commuter traffic on roads in agricultural areas also makes it difficult for farmers to move their equipment between fields.

Much of the land enrolled in Chapter 61A also abuts rivers and streams. While agriculture can have negative impacts on water quality, these impacts can be reduced or avoided through the use of best management practices. When best management practices are observed, agriculture is compatible with watershed protection because it keeps the land open, while development results in conversion of land to impervious surfaces with negative impacts on water quality.

Agricultural lands enrolled in the Chapter 61A program continue to be used as farmland and all lie within the town's Rural District. No state, town or private funds are necessary to enroll the land in the program. Chapter 61A lands offer much value to the town, even if the farmlands are only "temporarily protected." The agricultural parcels often contain prime farmland soils, which should be preserved for continuing use. These privately owned open spaces also contribute to the town's tax base and generate revenue, employment, and food products. In addition, some landowners may allow access to their property for recreational purposes, such as hiking or snowmobiling, however, access should not be assumed as the land is privately owned. Most Chapter 61A landowners take pride in their land, while practicing good stewardship. They help to define a sense of place for Colrain and contribute to community stability over time.

Table 5-3: Privately Owned Agricultural Land Enrolled in Chapter 61A

OWNER	MAP	LOT	ACRES
Shearer, L.E., Jr.	105	9	1.00
Slowinski, J. & M.	107	1	11.20
Slowinski, E. & T.	107	4	235.00
Slowinski, E. & T.	108	2	14.50
Slowinski, E. & T.	108	3	14.00
Slowinski, J., N., M., & J.	109	8	70.00
Herzig, S. & P.	110	9	7.80
Lively Irrevoc. Real Estate Trust	111	1	44.00
Lively Irrevoc. Real Estate Trust	111	2	36.00
Herzig, S. & P.	112	7	14.00
Herzig, S. & P.	112	8	87.50
Slowinski, M. & J.	113	2.2	13.94
Slowinski, M. & J.	113	3	25.74
Slowinski, M. & J.	113	5	22.81
Slowinski, M. & J.	113	6	13.03
Emond, A.N.	114	4	1.20
Sullivan, J.D.	115	4	13.60
Sullivan, J.D.	115	6	39.50

OWNER	MAP	LOT	ACRES
Emond, A.N.	118	1	2.60
Ramirez, R. & Herbert, C.	119	3	10.20
Mutch, D.D.	119	6	6.60
Ramirez, R. & Herbert, C.	119	7	2.00
Herzig, S. & P.	119	8	12.50
Emond, A.N.	119	9	0.22
Purington, H. & B.	121	6	43.00
Parsons, M.	129	6	15.00
Roberts, D.	130	7	103.50
Avery, K. & E.	132	3	245.50
Avery, K. & E.	132	6	54.00
Healy, J. & E.	401	2	51.00
Maloney, T. & J.	403	10	1.30
Maloney, T. & J.	403	11	10.50
Pelletier, G. & Hogan, K.	403	12	20.50
Maloney, T. & J.	403	14	26.00
Maloney, T. & J.	403	15	7.00
Maloney, T. & J.	403	16	6.10
Hager Bros.	403	21	2.50
Thibodeau, R.	403	33.1	199.38
Lively, R. & M.	403	34	32.00
Hager Bros.	403	35	13.00
Hager Bros.	403	36	2.60
Lively, R. & M.	403	37.2	14.00
Lively, R. & M.	403	37.11	107.80
Lively, R. & M.	403	37.12	6.40
Lively, R. & M.	403	38	7.30
Hager Bros.	403	46	6.70
Hager Bros.	403	49	24.50
Ryan A., F., & R.	404	2.11	8.30
Ryan A., F., & R.	404	4.1	140.00
Purington, H. & B.	404	11	54.00
Purington, H. & B.	404	20	72.00
Giard, D. & R.	404	28	107.00
Bowen, M. Living Trust	405	7.1	80.50
Bowen, M. Living Trust	405	13	2.60
Pascale, R.W.	405	21	20.50
Griffin, T.W. & H.C.	405	33	32.00
Griffin, T.W.	405	33.1	40.00
Ives, D. & N.	405	34	30.00
Ives, D. & N.	405	36	29.00
Ives, D. & N.	405	41	0.49
Ives, D. & N.	405	42	0.28
Griffin, T.W. & H.C.	405	43	104.50
Jameau, M.B.	406	51	10.60

OWNER	MAP	LOT	ACRES
Wang, P. et al	406	56.1	50.30
Cromack, C.	407	2	1.90
Purington, W. & L.	407	13	15.00
Purington, W. & L.	407	15.1	2.50
Cromack, C.	407	30	2.80
Cromack, C.	407	33	10.10
Cromack, C. & R..	407	36	152.50
Standish, J.	407	37	0.64
Cromack, C. & A.	407	47	21.50
Humphreys, L.	408	6	105.00
Purington, H. & B.	408	8	103.00
Purington, H. & B.	408	9.1	105.50
Humphreys, L.	408	15	80.50
Jaffurs, A.	409	2	12.90
Giard, D. & R.	409	6.1	69.50
Dunning, H.	409	11	36.00
Dunning, H.	409	16	96.50
Dunning, H.	409	17	7.90
Call, C.D.	409	19	12.50
Lively Irrevoc. Real Estate Trust	410	3.1	28.00
Lively Irrevoc. Real Estate Trust	411	1	21.00
Slowinski, M. Et Al	411	3	99.00
Slowinski, J., N., M., & J.	411	4	44.00
Wheeler, L. & L.	413	1	0.57
Coombs, R. & S.	413	2.1	43.40
Loveday, G. & D.	413	3	47.00
Coombs, R. & S.	413	8	108.00
Wheeler, L. & L.	413	13.1	186.50
Sweeney, G.	413	16.1	11.61
Shearer, K. & C.	413	17.1	30.23
Shearer, D.	413	22	7.70
Sweeney, G.	413	30	0.75
Weller, L.	413	32	34.97
Weller, L.	413	33	4.62
Valley Community Land Trust Inc.	413	35.3	4.31
Valley Community Land Trust Inc.	413	49	58.50
Graves, J. & E.	414	3	77.00
Nims, D. & J.	414	13	96.40
Nims, D. & J.	414	15	9.40
Shearer, K. & C.	414	17	24.78
Nims, D. & J.	415	17	54.45
Johnson, B.J.P.	415	24	31.50
Moyer, P.	415	26.2	28.78
Nims, D.	416	2	62.00

OWNER	MAP	LOT	ACRES
Roberts, D.	416	4	7.00
Roberts, D.	416	5	10.50
Cromack, C. & A.	417	15	4.00
Cromack, W. & Menard, D.	417	16	68.50
Cromack, W. & Menard, D.	417	20	19.00
Standish, J.	418	1	62.00
Cromack, C. & A.	418	2	3.20
Potts, B. J.	418	9	9.57
Barber Hill Reat Estate Trust	418	18	45.00
Barber Hill Real Estate Trust	418	19	43.00
Barber Hill Real Estate Trust	418	20.1	35.00
Cromack, W.	418	24	43.00
Cromack, W.	418	25	10.70
Cromack, W.	418	27	16.00
Roberts, D.	419	1	131.00
Barber Hill Real Estate Trust	419	10	3.70
Barber Hill Real Estate Trust	419	11	41.00
Barber Hill Real Estate Trust	419	12	6.20
Williams, V.	420	2	89.00
Galvin, E.	420	8	38.00
Galvin, E.	420	9	39.00
Galvin, E.	420	12	8.60
Eckstein, M. & J. Trustees	420	31	22.00
Eckstein, M. & J. Trustees	420	36	3.70
Galvin, E.	420	47	44.50
Galvin, E.	420	61	5.30
Foster, S.	421	1	33.26
Galvin, E.	421	21	25.00
Foster, S.	421	40.3	75.93
Spring Farm Limited Partnership	422	1	5.77
Graves, J. & J.	422	4	100.00
Spring Farm Limited Partnership	422	19.7	13.66
Wheeler, C.	422	20.11	6.00
Wheeler, C.	422	21.1	75.50
Kasky, A. & F.	422	25	70.00
Schneider, W. & B.	422	27	11.70
Schneider, W. & M.	422	29	26.50
Schneider, W. & M.	422	36	2.80
Schneider, W. & M.	422	38	2.20
Schneider, W. & M.	422	59	11.00
Sessler, L.	422	60	0.10
Schneider, W. & M.	422	61	6.50
Kasky, A. & F.	422	62.1	34.50
Weber, F. & A.	422	63.2	5.00
Weber, F. & A.	422	64.1	21.10

OWNER	MAP	LOT	ACRES
Randall, G. & E.	422	73	7.40
Valley Community Land Trust Inc.	422	82	133.50
TOTAL			**5,372.96**

Source: Town of Colrain Assessor's Records and Maps, 2003; MassGIS Open Space data, 2003.

B.2 Privately Owned Forested Land

Approximately 35 percent of Colrain's open space with some level of protection from development is privately owned forest in one of the Chapter 61 tax abatement programs, accounting for approximately 5,788.4 acres, or 20.8 percent of the town's area. Table 5-4 indicates that only 30.89 acres of privately owned forested land are protected from development in Colrain with two conservation restrictions.

Both the owner and manager of properties with conservation restrictions are the same entity. Their use continues as forested land with private funds used to create the conservation restriction. Properties with conservation restrictions may have the potential for passive recreational use or for activities such as fishing or hunting, but this is dependent upon the wishes of the landowner. It is important to note, however, that public access cannot be assumed, as properties with conservation restrictions are privately owned. Both of the parcels with conservation restrictions noted in Table 5-4 lie within the town's Rural Zoning District.

Table 5-4: Privately Owned Forested Land Protected from Development

Owner	Holder of the Conservation Restriction	Map	Lot	Acres
Sherburne, P.	Franklin Land Trust	414	16.2	27.79
Bennett	Franklin Land Trust	405	46, 47	3.10
TOTAL				**30.89**

Source: Town of Colrain Assessor's Records and Maps, 2003; Franklin Land Trust, 2003.

Privately owned forestland with temporary protection is shown in Table 5-5 and Table 5-6. In addition, many of the temporarily protected farms shown in Table 5-3 include farm woodlots. Approximately 49 percent of privately owned forest with temporary protection in Colrain is enrolled in the Chapter 61 tax program for Forestry, while 51 percent is enrolled in the Chapter 61B program for Recreational Open Space. Two of the owners of the Chapter 61 Forestry lands are lumber companies who manage their lands for timber.

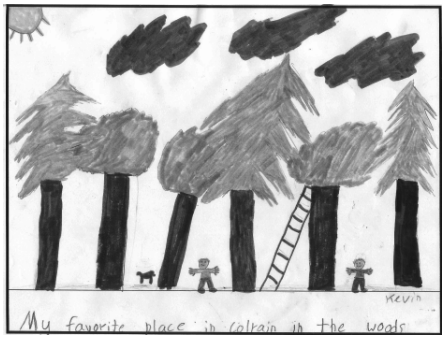
All of the parcels in Table 5-5 and Table 5-6 are temporarily protected in the Ch.61 Forestland and the Ch. 61B Recreational Open Space Classification and Taxation Program and the degree of protection of these parcels is short term. There are no public grants awarded as a result of the program, however, the owner agrees not to change the land's use for ten years while paying reduced property taxes during that time period. No state, town or private funds are used to convert a parcel to either Ch. 61 Forestland or Ch. 61B Recreational Open Space. Both the owner and manager of these properties are the same entity. While the majority of the Ch. 61 and Ch. 61B

parcels are located in Colrain's Rural District, a few lie within the Griswoldville and Prolovich Commercial-Industrial Districts, which allow business and professional offices with less than six employees, as well as community uses, agricultural and recreational, and residential uses by right and other commercial and industrial uses by special permit.

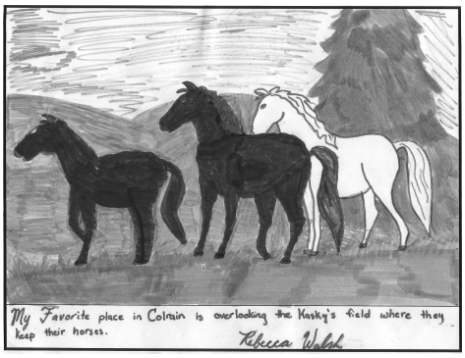
Privately owned forestlands offer many values to the community and are important resources for several reasons. First, many forestlands are large parcels with a low degree of fragmentation, so wildlife and plant habitats are preserved. When these forestlands are protected from development, they help to protect and provide clean water, air, and healthy wildlife populations. Forest soils have a high infiltration capacity, so they absorb moisture and permit very little surface runoff. Once absorbed, water is released gradually so flooding is reduced during large rain events and streamflow is maintained during low water months. Forests recycle nutrients, so the nutrients do not pass into waterways, and water quality is preserved. Because forest soils are absorptive, soil erosion is reduced and fish habitat is preserved. Forestlands also have a thermal impact on brooks. When trees are removed from stream banks, water temperatures rise and cold water-dependent aquatic species like trout are adversely affected. Many forested lands may also provide recreational value such as hunting, fishing, hiking, and bird watching for Colrain residents, if access is allowed by the owner. The Chapter 61and 61B forested landscapes help to preserve the character of the wooded landscape prized in Colrain.

Table 5-5: Privately Owned Forestlands with Temporary Protection from Development Enrolled in the Ch. 61 Forestland Open Space Taxation Program

Owner	MAP	LOT	ACRES
Silver Birch Farm	103	16	73.60
Hammer, M.	130	4	17.00
Obrien, D.	401	7	18.00
Forrest, N.	401	8	12.10
Commonwealth.Of Mass.	401	15	72.00
Cowls, W.D., Inc.	402	2	93.00
Cowls, W.D., Inc.	403	3	123.00
Cowls, W.D., Inc.	403	4	52.00
Peck Realty Trust	404	12	62.00
Peck Realty Trust	404	14	56.00
Johnson, J. & L.	405	2	39.20
Johnson, J. & L.	405	12	35.50
Greenburger, P.	405	17	49.50
Fisher, L. & L.	405	27	18.92
Fisher, L. & L.	405	28	12.63
Greenburger, P.	405	31	49.00
Cromack, C. & A.	407	1	206.00
Purington, W. & L.	407	13	173.10
Purington, W. & L.	407	14	124.60
Griswold, G.	407	28	51.00
Isles, O. & S.	407	38	1.10
Isles, O. & S.	407	45	28.00



OWNER	MAP	LOT	ACRES
Potts, J.B.	408	18	41.00
Potts, J.B.	408	22.1	139.17
Cowls, W.D., Inc.	409	8	30.00
Cowls, W.D., Inc.	409	9	24.00
Cowls, W.D., Inc.	409	14	105.00
Cowls, W.D., Inc.	409	18	25.70
Cowls, W.D., Inc.	410	1	53.00
Mann, T.S., Lumber Co.	411	7	125.00
Sherburne, P. & J.	414	5.1	83.00
Sherburne, P. & J.	414	5.2	39.86
Sherburne, P. & J.	414	12	0.35
Hammer, M.	416	1	114.00
Cromack, C. & A.	417	19	67.00
Standish, J.	417	23	13.00
Standish, J.	418	1	186.50
Cromack, C. & A.	418	7	70.00
Clough, W.	419	6	89.17
Eckstein, M. & J. Trustees	420	31	65.00
Jordan, R. & G.	421	9	45.09
Jordan, R. & G.	421	34	12.00
Spring, W.J.	422	11	106.25
Logan, N. & K.	422	18	9.13
Logan, N. & K.	422	19.1	33.30
Total			**2,843.77**

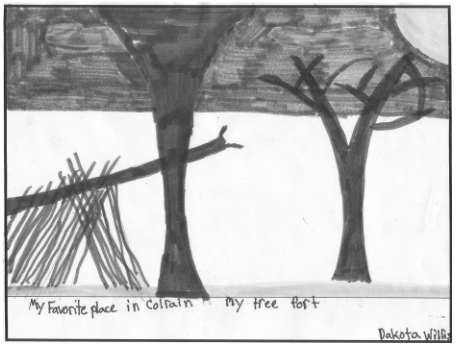


Source: Town of Colrain Assessor's Records and Maps, 2003; MassGIS Open Space data, 2003.

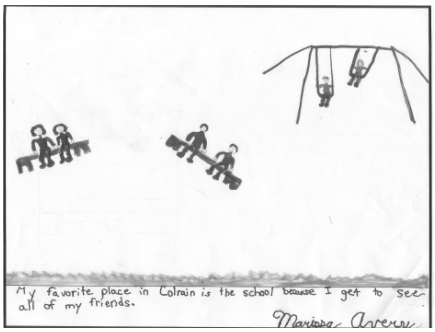
Table 5-6: Privately Owned Forestlands with Temporary Protection from Development Enrolled in the Ch. 61 B Recreational Open Space Taxation Program

Owner	MAP	LOT	ACRES
Stafford, M.	103	8	3.10
Stafford, M.	104	10	1.40
Stafford, M.	104	11	43.50
Stafford, M.	105	11	0.75
Stafford, M.	105	12.1	1.60
Donelson, W. & S.	106	4	58.00
Giard, R.	112	5	85.50
Koscinski, M. & L.	113	1	16.75
Boyd, W. & L.	116	7	5.90
Stamas, E. & E.	118	7	33.50
Shaw, J.	121	14	63.50
Hillman, A.	128	11	40.00
Hillman, P. & J.	128	12	6.50
Brooks, R. & Davis, B.	403	13	43.50

Owner	MAP	LOT	ACRES
Barnes, R. & J.	404	7	18.50
Boyd, W.	404	9	137.00
Truesdell, D.	404	27	46.00
Hillman, A.	405	18	42.00
Johnston, J. & G.	405	37	18.00
Griswold, D. & C.	406	40	40.50
Silva, M. & C.	406	54.2	5.10
Purington, E.	406	54.3	23.40
Purington, E.	406	55	23.50
OWNER	**MAP**	**LOT**	**ACRES**
Hager, S.B., Jr.	407	16	94.00
Hager, S.B., Jr.	407	17	11.30
Dumas, L.	408	4	17.95
Truesdell, C. & D.	408	12	48.00
Truesdell, C. & D.	408	13	140.50
Truesdell, D.	409	7	13.10
Waldron Family Trust	409	12	8.30
Waldron Family Trust	409	13	4.80
Waldron Family Trust	409	15	58.50
Stanley, L. & E.	411	5	40.00
Stafford, M.	412	5	21.00
Beauregard, W. & L.	414	18	88.50
Smith, P. & S.	415	20	18.00
Oneto, S., Trustee	415	22	151.00
Prosser, D. & E.	415	31.1	48.26
NRA Foundation, Trustee	416	3	99.00
Potts, J.B.	417	13	13.84
Dodge, R. & A.	417	26	69.00
NRA Foundation, Trustee	418	14.1	106.00
Johnson, A.H. & L.	418	15.1	67.00
Spencer, G. & S.	418	22	34.50
NRA Foundation, Trustee	418	23	2.00
Spencer, G. & S.	418	28	53.00
Yanishevsky, R. & Tasgal, D.	418	31	3.49
NRA Foundation, Trustee	418	32.1	21.00
Yanishevsky, R. & Tasgal, D.	418	32.2	5.40
Yanishevsky, R. & Tasgal, D.	418	32.3	1.03
St. Clair, S.	418	38	53.50
NRA Foundation, Trustee	418	39	10.20
Sullivan, J.	419	2	133.50
Roberts, R. & S.	419	3	81.00
Bartlett, R., Jr. & J.	419	4	132.00
NRA Foundation, Trustee	419	5	57.00
NRA Foundation, Trustee	419	15	0.50



OWNER	MAP	LOT	ACRES
NRA Foundation, Trustee	419	17	2.10
Barber Hill Real Estate Trust	419	19	10.20
Roberts, R. & S.	420	1	27.50
Cutting, B.	420	3	28.00
NRA Foundation, Trustee	420	4	21.00
NRA Foundation, Trustee	420	5	44.00
NRA Foundation, Trustee	420	6	10.90
NRA Foundation, Trustee	420	75	27.00
Devine, K. & L.	421	11	9.50
NRA Foundation, Trustee	421	18.1	41.00
Devine, K. & L.	421	24	39.00
Devine, K. & L.	421	25	142.00
Gangne, C. & K.S	421	31.2	28.00
Devine, K. & L.	421	46	1.50
Drew, R. & B.	422	33	3.90
Drew, R. & B.	422	34	2.00
Drew, R. & B.	422	51.1	42.00
Drew, R. & B.	422	55.2	1.38
Total			**2,944.65**



Source: Town of Colrain Assessor's Records and Maps, 2003; MassGIS Open Space data, 2003.

C. PUBLIC AND NON-PROFIT PARCELS

State conservation agencies and the Town of Colrain own a significant portion of Colrain's land. Almost all of this land is permanently protected from development. However, the town-owned parcels have a low level of protection because they are not under the authority of the Colrain Conservation Commission. The following inventories include those parcels that are owned by the Commonwealth of Massachusetts and the town.

C.1 Publicly Owned Open Space

There are approximately 3,230 acres of publicly owned open space in Colrain, accounting for about 20 percent of all open space with some level of protection in Colrain and 11.6 percent of the town's land area. Publicly owned open space includes land owned by state conservation agencies, municipal fire and water districts, school districts, the federal government and the Town of Colrain. These lands are described in Tables 5-7, 5-8, and 5-9. For the purposes of this section, both public and privately owned cemeteries are included in this category. Cemeteries are listed in Table 5-10.

The Massachusetts Department of Conservation and Recreation (DCR) is the largest single property owner in the Town of Colrain. The agency owns 2,243.7 acres in two

large blocks. The largest, the Catamount State Forest, contains 1,310 acres and is located in the southwest sector of town. The H.O. Cook State Forest, with 933.7 acres, is located in the northwest quadrant of Colrain. The Catamount Forest receives use by hikers, bikers, swimmers, picnickers, and snowmobilers. The State Division of Fisheries and Wildlife (DFW) owns approximately 417 acres in Colrain. Most of this land is located adjacent to the Catamount State Forest. DFW also maintains 29.9 acres of land along the Green River.

Table 5-7: Publicly Owned State Land Protected from Development

Property Manager	Site name	Map	Lot	Acres	Current Use	Recreation Value	Public Access
DFW	Catamount Wildlife Management Area	401	6, 9	117.50	Wildlife Management Area	High	Gated. One road with car access on the south. All others walking access only.
DCR	Catamount State Forest	402	3	1310.00	State Park	High	Gated. One road with car access on the south. All others walking access only.
DFW	Catamount Wildlife Management Area	402	4, 6	184.14	Wildlife Management Area	High	Lot 4 is on town line with Charlemont and is accessible via DCR land. Lot 6 is accessible via Stacy Rd.
DCR	H.O. Cook State Forest	405	19, 20	112.00	State Park	Good for hunting. Potential for logging problems re: trails.	Not Gated Good access
DCR	H.O. Cook State Forest	406	14, 16,17, 24, 25, 26, 27, 32	821.70	State Park	Good for hunting.	Good access via several roads
DFW	Catamount Wildlife Management Area	412	1	85.00	Wildlife Management Area	High	Access via Stacy Road
DFW	Green River Access Area	421	40.4, 47	29.94	River Access	High	Access via South Green River Road
TOTAL				**2,660.3**			

Source: Town of Colrain Assessor's Records and Maps, 2003; MassGIS Open Space data, 2003.

The Town of Colrain owns approximately 106 acres of undeveloped land with limited protection (*see Table 5-8*). All of these parcels are under the authority of the Select Board and are therefore considered to have limited protection from development. If residents wanted to sell town land for development, the Select Board or a Town Meeting vote could provide the authority. If the land was held by the Conservation Commission,

it would take a majority vote by the Massachusetts State Legislature to convert open space to another non-conservation use.

Table 5-8: Town-Owned Land with Limited Protection from Development in Colrain

Owner/Property Manager	Site Name/Use/Condition/Access	Map	Lot	Acres
Town of Colrain	Land across from transfer station. Used to be a three-story house. The town bought it to ensure residents would not be affected by potential pollution from the landfill./Now used as storage for town construction materials (fill, rocks)/Good condition for stated purpose though people dump refuse there./ Access is off public way.	101	3	3.10
Town of Colrain	Land across from transfer station / Open space/Could be used as access to the North River.	101	4	0.37
Town of Colrain	Ballpark/Reconditioned open field will be used in future as a ball field/ Needs parking and improved access to make accessible.	125	1.1	9.15
Town of Colrain	Old Mill Site/Vacant built landscape/Unknown condition/Access prohibited.	125	1.21	5.64
Town of Colrain	Tower/Civil Defense Horn Site/Located off of a dirt road up a steep incline/Area opened by way of a timber harvesting operation/Access may need to be more constrained if status as a civil defense structure continues.	125	11	5.61
Town of Colrain	Colrain Elementary School /Playground and Play field spaces/ Mixed condition/ Access is good /For details see ADA Inventory in Appendix B.	127	14	6.50
Town of Colrain	Town Common/This is a triangular piece of land at the intersection of Rte. 112 and Greenfield Rd./Used for town beautification.	127	34	0.07
Town of Colrain	Arthur Streeter Lot	127	43	0.54
Town of Colrain	G. William Pitt House/Forty-two acres of open space in back of Historical Society's structure in center with access off of Main Rd.	127	55	42.00
Town of Colrain	Catamount Cave/Recreational site/Good condition/Public access via North Catamount Hill Rd.	403	2	2.76
Town of Colrain	Wooded land on Green River/Taken for back taxes/Open Space and Boy Scout Camp/ Inaccessible from Colrain except by way of the Green River.	418	42	30.00
Total				**105.74**

Source: Town of Colrain Assessor's Records and Maps, 2003;
MassGIS Open Space data, 2003.

It is not unusual for a community to set aside land for future expansion of schools, sports fields, police and fire stations, and drinking water supplies. Open space planned for these purposes
might be used as open space today and placed under the authority of the Select Board. It may also be sensible to place town-owned land that clearly contains wetlands or wildlife habitat, but which does not provide for easy development, under the authority and protection of the Conservation Commission.

The town-owned land on Charlemont Road across from the transfer station entrance (Map 101, Lot 3) borders on Meadow Brook and the North River. It is a gently sloping

lot, which has been used for a some time as a storage site for till and construction material. There are trails and a woods road on this parcel. It is well-maintained with the exception of some debris along its frontage. Currently, its recreational value is low, but it has good potential for maintained walking trails. Paved access for parking could be made available off Charlemont Road, which would provide access to the parcel as well as the North River.

The town owns a smaller parcel (Map 101, Lot 4) adjacent to the one noted above. It is woodland, which also borders on both Meadow Brook and the North River. The parcel is in good condition. While its current recreational value is low, it has high potential for access to the North River. Potentially, parking could be made available off Charlemont Road at the parcel noted above.

There are two town-owned parcels on Foundry Village Road. The first parcel (Map 125, Lot 1.1) with frontage on the North River is a wooded site with a field currently being groomed for a ballpark. It is in good condition and has access via a gravel road. The other parcel (Map 125, Lot 1.21) is across the North River. It is a former mill site with cement foundations remaining. This level parcel is surrounded by fencing.

The Colrain Elementary School (Map 127, Lot 14) is a modern building with adjacent playground, basketball court, baseball diamond, miscellaneous sports field and picnic tables. The playground, with modern equipment, is in good condition. The basketball court is a full court made of asphalt with two baskets and is also in good condition. The remaining area, which includes the baseball diamond, picnic tables and park benches scattered on the site, are in fair condition. The baseball diamond has team fences and benches, and a small amount of stadium seating. There are three picnic tables on the site, none of which are handicapped accessible. The park benches have backs and armrests. A parking lot is located at the front and side of the school building. Recreational access is via a gated cement walkway at the front of the school as well as an unofficial access via a dirt road adjacent to the side parking lot. The official access is not fully handicapped accessible nor are the grounds themselves.

The Shelburne Falls Fire District, Colrain Fire District and the Griswoldville Water District together own approximately 444 acres of open space with limited protection. These lands are used for water supply protection and distribution. These lands provide public benefits to residents in addition to sustaining clean drinking water supplies. Forest provides wildlife habitat, limited passive recreation opportunities, and scenery (*see Table 5-9*).

Table 5-9: Water and Fire District Land with Limited Protection from Development in Colrain

Owner/Property Manager	Map	Lot	Acres
Shelburne Falls Fire District	104	8	7.7
Shelburne Falls Fire District	104	9	7.08
Shelburne Falls Fire District	104	13	0.06
Shelburne Falls Fire District	412	7	96
Shelburne Falls Fire District	412	8	20
Shelburne Falls Fire District	412	9	64
Shelburne Falls Fire District	412	10	15
Shelburne Falls Fire District	413	5	100
Shelburne Falls Fire District	413	6	1.2
Colrain Fire District	127	44	0.33
Colrain Fire District	128	3	11.80
Griswoldville Water District	412	3	14.30
Shelburne Falls Fire District	412	10	15.00
Colrain Fire District	414	28	59.00
Colrain Fire District	415	1	18.00
Colrain Fire District	415	2	14.70
Total			**444.17**

Source: Town of Colrain Assessor's Records and Maps, 2003; MassGIS Open Space data, 2003.

Table 5-10 lists the cemeteries in Colrain, which are owned by the town and by private associations, which are protected from development. Most cemeteries represent well-maintained open space areas that are sometimes appropriate for walking and bird watching.

Table 5-10: Parcels of Land Protected from Development in Colrain

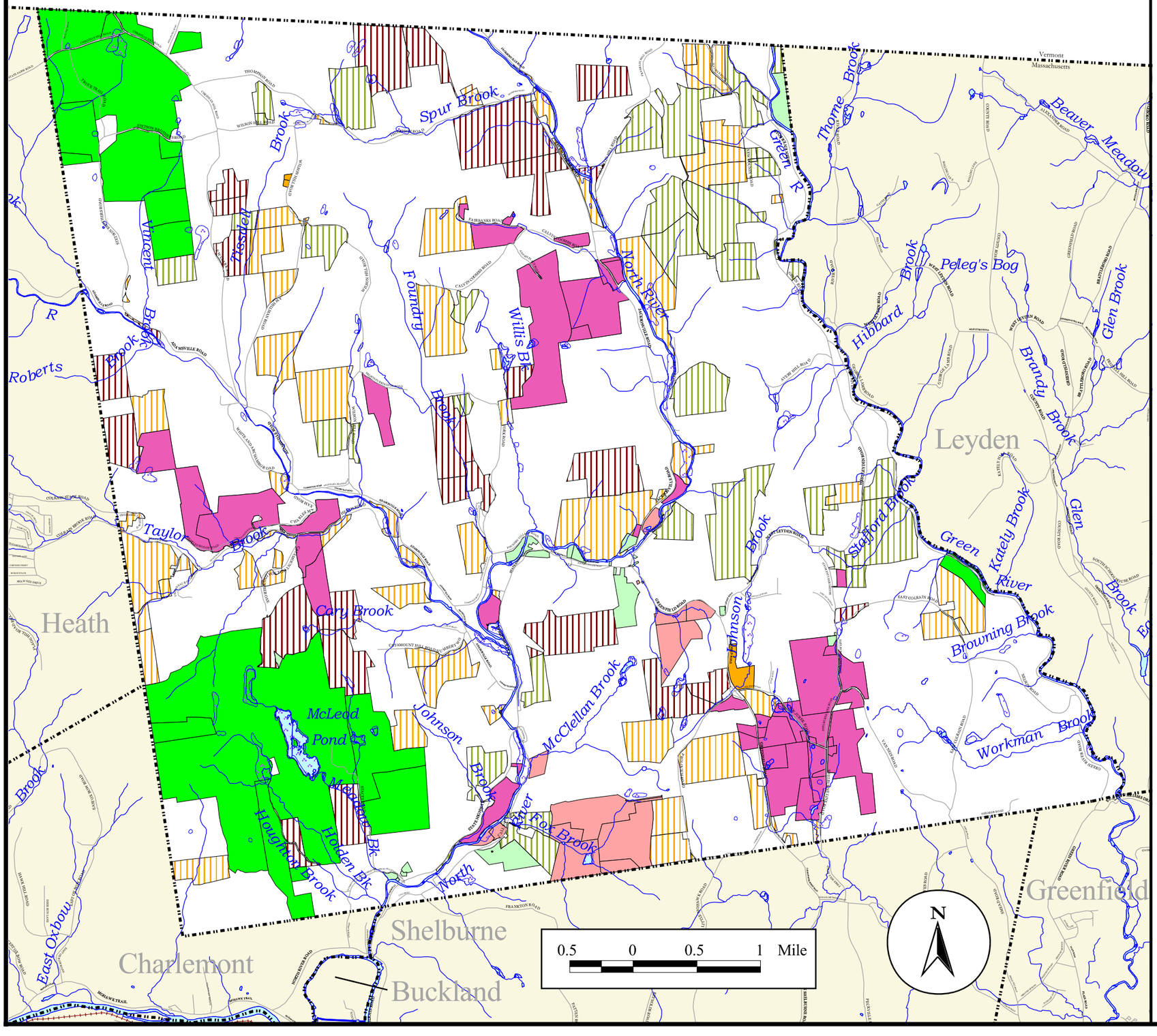
Owner/Property Manager	Site Name	Map	Lot	Acres
Christian Hill Cemetery	Christian Hill Cemetery	405	24	0.61
East Colrain Cemetery	East Colrain Cemetery	414	22	2.60
Colrain Cemetery Assoc.	West Branch Cemetery	110	8	8.9
Colrain Cemetery Assoc.	North River Cemetery	130	1, 2, 3.2, 3.12,	6.34
Chandler Hill Cemetery	Chandler Hill Cemetery	415	18	2.00
TOTAL				**20.45**

Source: Town of Colrain Assessor's Records and Maps, 2003;

Town of Colrain

Open Space and Recreation Plan

Protected Open Space



Legend

- Town Line
- Rail Lines
- Roads
- Streams and Rivers
- Water
- National Wetlands Inventory wetland

Open Space

Land Protected from Development

- Agricultural Preservation Restriction
- Conservation Restriction
- Commonwealth of Massachusetts (DCR and DFW)

Land with Limited Protection from Development

- Town Owned Land
- Fire and Water Districts

Land Temporarily Protected from Development

- Chapter 61: Forestry
- Chapter 61A: Agriculture
- Chapter 61B: Recreation

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 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.

Road data provided by Massachusetts Highway Department. Town line, rail line, river, pond, stream, National Wetlands Inventory, open space (Chapter 61 & Protected Open Space) data provided by MassGIS.

Note: Depicted boundaries are a 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.

FRANKLIN REGIONAL COUNCIL OF GOVERNMENTS
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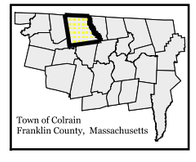
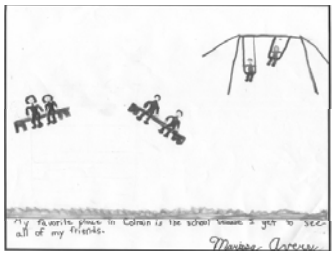


June 26, 2004

Map prepared by FRCOG Planning Department
413-774-3167

SECTION 6



COMMUNITY GOALS

A. DESCRIPTION OF PROCESS

The Town of Colrain's open space and recreation goals were developed through the following planning process:

- In September of 2002, open space and recreation surveys were mailed to 842 households in Colrain. Of these, 184 were returned and counted as responses, which represents a 22 percent rate of return. (See Appendix A for a copy of the survey). Although the responses may not reflect the opinions of all residents, they do represent a significant source of community input, which was used to develop the preliminary draft Section 8-Goals and Objectives.

- From September 2002 to February 2003, Franklin Regional Council of Governments Planning Department staff developed this Open Space and Recreation Plan under the supervision of the Open Space Planning Committee. The planning process used several methods for involving public participation:
    - The results of the 2002 Open Space and Recreation Survey were used as the basis for the development of goals and objectives as well as the overall open space and recreation vision.
    - Ten public meetings were held by the Open Space Planning Committee.
    - Several drafts of each section of the plan were mailed to approximately eighty-five people representing key town boards, community groups, and residents.
    - Elementary School students were encouraged to draw pictures of their favorite places in Colrain. These will be used to adorn the cover and pages of the Plan.
    - A public forum was held on March 13, 2004, where residents reviewed and discussed the major findings and five-year action plan. All public comments were recorded and considered for incorporation into the plan.

B. STATEMENT OF OPEN SPACE AND RECREATIONAL GOALS

Colrain residents appreciate the town's historic villages, rural character, and expansive scenery. They value Colrain's diverse landscapes, which include a mix of working farms, extensive forests, steep hillsides and river floodplain corridors that provide many scenic views. They like living in a town with clean air and water and a great diversity of

native plants and animals, that is relatively safe from crime and vandalism, has affordable housing, and offers abundant opportunities for outdoor recreation.

Residents who responded to the Open Space and Recreation Survey and participated in the process of developing this plan have a vision for the future of Colrain's natural, historical, and recreational resources. In this ideal world, the town's large blocks of forests and active farmland will be protected as a result of cooperative efforts between private landowners, and local and state agencies and private non-profit organizations. These lands will remain in private hands and control, and continue to contribute property taxes. The town's rivers and streams will be clean enough for fishing and swimming. Residents will continue to enjoy clean drinking water from sources and aquifers that have been protected from contamination.

In an ideal Colrain, there will be a diverse local economy, anchored by existing manufacturing and agricultural operations, including a form of heritage-based eco-tourism that takes advantage of tourist traffic between Rte. 2 and Vermont. Residents will speak proudly of their successful efforts to maintain and restore historic buildings in each of the villages. Town officials will have measured the cost and benefits of increasing levels of tourism and may, as a result, focus their efforts on increasing local farmers' farm-based revenue streams. A result of supporting local agricultural and forestry businesses, will be access to fresh vegetables, dairy products, fruit and meat produced close to home, as well as the opportunity to buy forest products raised by their neighbors. Promoting these agricultural enterprises helps farms stay viable and maintains open space.

Residents of all ages and abilities will enjoy a system of well-maintained trails, most of which will be on private property. Town officials and trail enthusiasts will have been successful at organizing and facilitating trail use among residents to only those trails open to the public with the express permission of the landowners. Landowners that were interested in providing access might be offered incentives for providing public access to their land. In the same way, pedestrian and bicycle trails will be developed to connect villages to each other as well as to conservation areas and state forests. Trails, riverfront parks and watercraft put-ins will provide public access to the North and Green Rivers. In addition, the town will have been successful at attracting state and federal grants towards the development of recreational programs for both youth and adults that support residents' understanding, respect and appreciation of, and for, their heritage and the natural world.

SECTION 7

ANALYSIS OF NEEDS

The Colrain Open Space and Recreation Plan incorporates the inventory of all the land-based natural, scenic, and cultural resources that are available in town (Section 4), identifies the areas that contain these resources (Section 5), and based on the community's general goals (Section 6), makes comparisons between the supply of resources and the demand (Section 7). In the following subsection A, Summary of Natural Resource Protection Needs, the most important environmental issues are highlighted. In subsection B, Summary of Community's Needs, the recreation and open space needs of the residents are discussed. Finally, in subsection C, Management Needs, the obstacles to the effective resolution of these needs are addressed.

A. SUMMARY OF NATURAL RESOURCE PROTECTION NEEDS

Colrain residents value their town's natural environment, clean drinking water and air, expansive forests, diverse wildlife habitats, farmland, and long-range scenic views. They appreciate all of the ways their town still feels rural and want to keep it that way. According to the 2002 Open Space Survey, at least 90 percent of survey respondents stated that it was important to conserve clean drinking water, clean air, lakes, streams, and ponds, forests, scenic views, wilderness and wildlife habitat, open fields, and farmland. The main environmental issues include non-point source pollution, erosion, unplanned development, the loss of farmland, the need for protecting large blocks of forest, and access to the North and Green Rivers.

Generally speaking, people need to become more aware of how their actions may negatively impact water quality of rivers, streams, ponds, and groundwater. Non-point source pollution happens when organic and inorganic pollutants enter soil or water from other than a single point, like a pipe. One example of potential non-point source pollution generation is home construction on an unprotected slope because rain may wash topsoil into abutting wetlands. Other examples where non-point source pollution can threaten valued resources include, spreading manure on frozen ground, especially near streams where no vegetative buffer exists; improper disposal of household hazardous materials including motor oil; road salt use near a private or public well; and stream bank erosion caused by the removal of vegetation.

Unplanned development, which can increase the amount of stormwater runoff (another form of non-point source pollution), is a way of describing what can occur in a community that has minimal zoning, land use regulation, or protected land. With unplanned development, houses appear on building lots easiest to develop. Most

residential development in this situation would likely be a combination of approval-not-required lots and traditional, "cookie-cutter" subdivisions. Unplanned development can increase the threat, over time, to large blocks of forest habitat, aquifers, and clean and plentiful drinking water by fragmentation, exploitation, and non-point source pollution.

The challenge for many rural towns in the Commonwealth is to grow in population without diminishing natural resources like clean drinking water and contiguous forests beyond the capacity of local ecosystems. Although exact capacity thresholds for water supplies and forest habitat acreage are not yet known, most Colrain residents would probably agree that poorly planned development can detract from their town's rural character and erode the quality of the environment over time.

Of course, some types of residential, commercial, and industrial development can be very beneficial to a community especially if it is consistent with a town plan that balances growth with natural resource protection. Well-planned economic development, for example, could help provide jobs for low and moderate-income households. According to housing research by RKG Associates conducted as part of Colrain's Community Development Plan, the biggest housing need in town is among low and moderate income households that already own their homes. Housing is considered affordable when a household spends 30 percent or less of gross income on housing costs. The data shows that there are low and moderate-income households in Colrain that spend more than 30 percent on their housing costs. These residents are homeowners not renters. This implies that the town does not need to create new units for low and moderate-income households. Instead, the town should work to increase the wealth of its residents so that existing housing costs would become a smaller percentage of householders' larger gross incomes. The 2002 Survey results agree with this finding by identifying the three most significant threats to Colrain's sense of community and rural character as being lack of job opportunities, loss of agricultural land, and rising property taxes.

Interestingly, these threats are all related. For example, if job opportunities increased in the next decade through traditional industrial and commercial development, the town could see an increase in population beyond the MISER projection of 10 percent (see page 3-8). While fewer people would be moving away to seek employment outside the county, others might move in to enjoy a high quality of life. Generally, as more families move in to Colrain, a greater level of municipal services would be required to serve the population, including schools and road infrastructure. Based on regional trends, the average residential tax bill will likely rise as the population of Colrain increases because services costs are greater than the revenues generated by residential property. In addition, residential development would likely reduce the number of acres in agricultural uses over time since farmland often represents the most developable soils.

Clearly, not all development is undesirable, nor could the town over-control land development, even if this was the consensus of residents and officials. Most Colrain residents understand the need for balance and respect the rights of property owners, including their right to develop land. Ideally, through zoning and non-zoning techniques the town could provide incentives to developers so that all development in Colrain would

contribute as much as possible to the residents' shared vision for their town. For example, by using existing mill sites for new industrial development, forest or farmland would remain undeveloped. Another way the town could promote and preserve active farmland, help stabilize local residential property tax bills, and create jobs, is by developing a heritage-based eco-tourism sector in the town and the region, which could combine residents' interest in historic preservation, bicycle and hiking trail systems, active farmland, and home-based information businesses. This could help to increase revenue from farms' direct sales and create local jobs. A town with a greater number of its residents working locally feels different than a bedroom community. Local workers can support stores and other services with their purchases.

One of the most important natural resource needs is for a continuing discussion on how residents want their town to develop over time, and which areas should be protected from development so that water, forests, habitat, and farmland can be conserved for the next year, and the next 100 years.

B. SUMMARY OF COMMUNITY'S NEEDS

Planning for a community's open space and recreation needs must satisfy the present population's desires for new facilities, spaces, and services, and also must interpret and act on the available data to prepare for the future needs of Colrain residents. Although the Colrain Open Space and Recreation Plan will be updated in five years, the types of actions identified in Section 9 will take into account the needs of the next generation as well.

The 2002 Open Space and Recreation Survey, and discussions at Open Space Committee meetings, helped to identify several potential community needs relating to open space and recreation resources: additional recreational programming for all ages; safe pedestrian and bicycle paths between village centers and areas of interest; maintenance and development of recreational facilities in Colrain, including new swimming areas and a skating pond; the support of existing Library programming; programs in the schools promoting awareness of local ecology and history; more community events; and public access to the North River.

Small towns interested in increasing the amount of recreational programs available to children, adults, and seniors have four main options: funding the programs themselves, depending on volunteers, providing programs in collaboration with other towns, or a combination of the first three. Library programs might best be funded through town appropriations and grants. Volunteers may already organize and lead limited recreational events or programs. Some towns have active Recreation Committees that are responsible for running a set number of events per year. When the economy is stronger, Colrain officials might consider working with other towns like Leyden and Heath to hire a part time recreation coordinator. This person could coordinate the efforts of volunteers,

attract state and federal grants to develop and maintain recreational facilities, and organize and produce recreational and community-wide events for residents year round.

Trails and access to rivers are two other needs expressed by residents in the 2002 Open Space and Recreation Survey. Residents voiced a desire to have pedestrian and bicycle trails connecting some of the villages in Colrain. Road right-of-way bike lanes and paths might be more easily designed and implemented than a system of trails, which go between roads and across private land. Either way, permanent trail systems are a long-term project dependent in large part upon the presence of leadership. There needs to be a person or persons willing to move the project from beginning to end, independent of town staff.

Access to the North River for swimming, fishing, boating, and other recreational activities, is also identified as a need in the plan. One town property that might be potentially developed for access to the North River is the most northern part of the nine-acre lot, which is being developed for a ball field (Assessors Map 125/Lot 1.1).

C. MANAGEMENT NEEDS

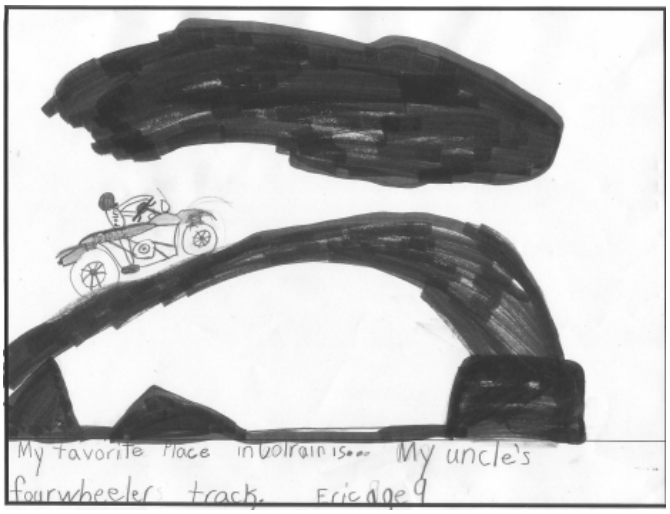
Colrain has several management needs with respect to open space and recreation, all of which are dependent in part on a prioritization of the most important problems and the best solutions. As is mentioned in the Natural Resources Needs section, the most important management need for local officials and community leaders may very well be the importance of building consensus on a vision for the future of land use, development and conservation in town. This process has been initiated in earlier open space and recreation planning, through the recent zoning revisions, and continues with this open space and recreation planning process, and the Community Development Planning process. Consensus is needed to determine the land that should be protected and the land that should be developed. Without consensus, the town will be less equipped to protect its existing resources (water supplies, farmland, and large blocks of forest habitats), its rural character, as well as to develop future recreational facilities (trail networks).

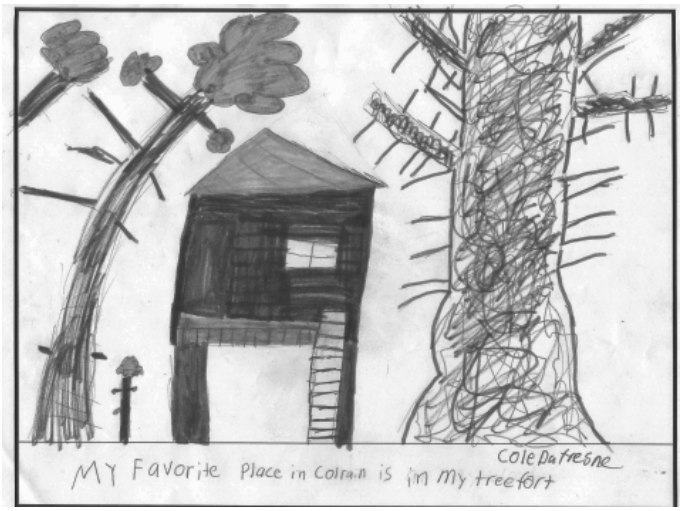
The Town of Colrain would be well served by working closely with the three water supply districts in town to help develop strategies to protect against groundwater contamination. Contaminants can originate from non-point source pollution generators like improper pesticide use by farmers, homeowners, utility companies, and highway departments; and road salt use by local and state highway departments. None of these districts have long–term emergency water supplies, so the loss of one well to pollution could be extremely inconvenient to residents using public water. Zoning can be designed to include overlay districts that seek to protect aquifer integrity by restricting the amounts and types of hazardous materials that can be stored, used and disposed of, and the density and types of development allowed. This level of protection cannot happen without the collaboration of town and district officials.

Although farmland is at risk throughout New England, as markets and other forces often work against small family farms, there are a multitude of strategies available to a town committed to preserving its local and regional agricultural industry. Local volunteer leadership must continue to work with regional land conservation and farm promotion efforts. However, to be truly effective, the town may need to continue to ensure that its policies are friendly to farm and forest-based businesses. In addition, farmers may need to be consulted in advance if the town is considering the development of strategies or zoning which might affect their bottom line.

To protect large blocks of forest from fragmentation might require both land protection efforts and strategies similar to those that would support agriculture. Overall, 58 percent of the privately owned forestland in Colrain is owned by non-residents. Land protection work may begin with providing landowners (residents and non-residents) with information about the benefits and risks of enrolling in the Chapter 61 programs, in protecting their land with a conservation restriction, and with estate planning in general.

To develop a town-wide trail system that takes advantage of historical roads and Native American trade routes, Colrain officials might begin by organizing a well-represented trails committee. The purpose of the committee would be to develop a coordinated plan for trail development, maintenance, and promotion in town. The plan could be a long-term action-based plan, which would require the collaboration of willing private landowners, and would focus on the trails they support the most. As part of this effort, trails committee members could meet with Department of Conservation and Recreation (DCR) officials to discuss access issues on both the Cook and the Catamount State Forests.





SECTION 8

GOALS AND OBJECTIVES

The following Goals and Objectives were formulated from the results of the Colrain Open Space and Recreation Planning Survey, which was conducted in September of 2002. Overall, 842 surveys were mailed households in town. Of these, 184 were returned and counted as responses. The survey responses represent a 22 percent rate of return. Although the responses may not reflect the opinions of all residents, they do represent a significant source of community input, which was used to identify the open space and recreation resources most important to Colrain residents. It is expected that additions and deletions will be made to the goals and objectives through discussions of the Open Space Planning Committee.

Goal: Ensure that Colrain sustains its small town rural environment characterized by general peace and quiet, clean air and water, safety from crime and vandalism, affordable housing, and an abundance of recreational opportunities including access to forests, fields and unbroken trails.

Objectives:

- Encourage economic development in appropriate areas.
- Encourage a discussion amongst all Town Boards, Commissions, and residents on the costs of municipal services associated with different land uses including commercial, industrial, and residential development and farm and forestland.
- Continue to work with the Franklin Regional Housing and Redevelopment Authority to determine the feasibility of developing affordable senior housing within walking distance of Colrain Center.
- Utilize Colrain's natural beauty and historic rural charm and develop strategies for encouraging eco-tourism and heritage-based tourism.
- Support local tourism by preserving and restoring historical buildings and other structures or places of historical significance.

Goal: Ensure that the Town of Colrain maintains or improves the quality of its drinking water, air, lakes, streams, and ponds, farms and forestlands, scenic views, wilderness areas and other wildlife habitats, wetlands, stonewalls and historic landscapes, and the diversity and integrity of native plants and animals through the conservation of locally important natural and open space resources.

Objectives:

- Promote the Massachusetts Chapter 61, 61A, and 61 B Land Classification and Taxation Programs to local landowners to help keep undeveloped lands in active farming, forestry, and recreational uses.

- Continue to set aside municipal funding each year to be used as a town match to continue to protect local farmland through the Agricultural Preservation Restriction (APR) Program.

- Support local agriculture to strengthen the long-term viability of agricultural businesses and to help ensure the retention of the town's most significant scenic and historic agricultural landscapes.

- Protect from development lands that contain productive farmland, groundwater resources, large blocks of contiguous forestland, wildlife habitat, and lands that expand public access to the North and Green Rivers.

- Encourage the investment of state, municipal, and private dollars for the purposes of land protection and recreational facilities in Colrain while maintaining property on the tax rolls.

- Determine whether the Conservation Commission has the capacity to manage and police conservation lands that could be donated to the town in the future.

Goal: Ensure that the Town of Colrain maintains and improves in a cost-effective manner, the quality and accessibility of all of its recreational facilities and programming.

Objectives:

- Develop additional recreational programming for children, adults, and seniors.

- Facilitate discussions with trail users, including the Colrain Sno-Drifters, towards developing a plan to coordinate trail development, maintenance, and promotion for activities such as hiking, horseback riding, snowmobiling, jogging, skiing, and nature/bird watching throughout town.

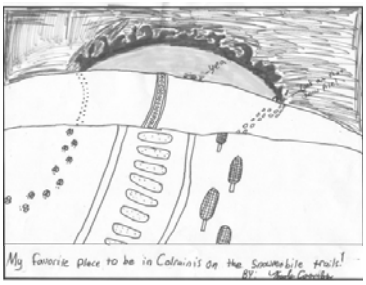
- Develop a working relationship with the state agency personnel who oversee the management of Catamount and Cook State Forests to address town concerns relating to their access and use.

- Explore cost-effective methods for developing a safe network of walking and bike paths, a new swimming area, and a skating pond.

- Sustain the existing level of programming offered by the Library.

- Continue to encourage educational programs in the schools that promote ecological awareness, preservation of natural resources, historical awareness, and historic preservation.

SECTION 9



FIVE YEAR ACTION PLAN

The Five-Year Action Plan is intended to provide concrete steps towards implementing the objectives of the Open Space and Recreation Plan. The Open Space and Recreation Planning Committee developed the action steps outlined below with input from the public.

The objectives are listed in the far left column of the foldout Table 9-1 in the same order as they appear in Section 8. They are followed in the same row by recommended actions, the number of the action as identified on the Action Plan Map at the back of this section, the board or group responsible for implementation, and start dates. By implementing the recommended actions, each of the objectives will begin to be realized.

Successful implementation will require the participation of existing town boards, committees and staff, including but not limited to the Board of Selectmen, Planning Board, Conservation Commission, Board of Health, Historical Commission, Fire and Water Districts, Town Administrator, and others.

Accomplishing the actions identified in this section will require time and commitment from dedicated volunteers. Where money is required, it may be sought from state and federal governmental agencies, private non-profit conservation agencies, foundations, and individual donations in addition to municipal funds. A broad base of community support for the Open Space and Recreation Plan should facilitate fundraising to achieve its goals and objectives.

Table 9-1: Recommended Action Steps to Implement the Open Space and Recreation Plan

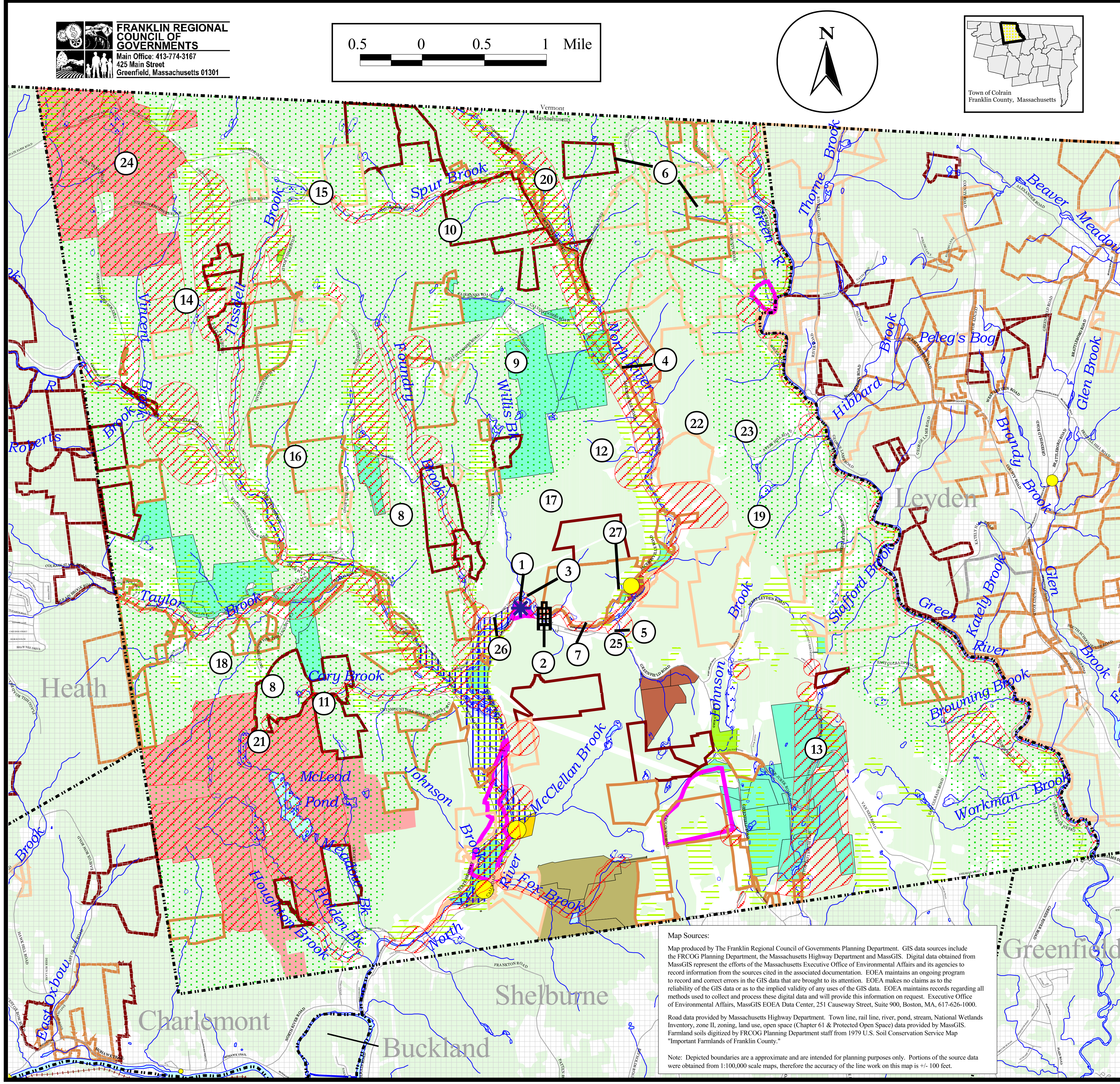
OBJECTIVE	ACTION	MAP #	RESPONSIBLE BOARD /GROUP	START DATE
Encourage economic development in appropriate areas.	Appoint an Economic Development Committee to identify appropriate areas for development and to put brownfields back to work.	1	Select Board	2005
Encourage a discussion amongst all Town Boards, Commissions, and residents on the costs of municipal services associated with different land uses.	Initiate an All-Board Meeting to discuss costs in services of different land uses.	2	Select Board	2004
Continue to work with the Franklin Regional Housing and Redevelopment Authority (FRHRA) to determine the feasibility of developing affordable housing in appropriate locations.	Research grants to fund an affordable housing feasibility study by the FRHRA.	3	Select Board	2005
Utilize Colrain's natural beauty and historic rural charm and develop strategies for encouraging eco-tourism and heritage-based tourism.	Form an Events Committee to plan and produce eco-and heritage-based tourism events.	4	Town Administrator	2004
Support local tourism by preserving and restoring historical buildings and other structures or places of historical significance.	Continue to hold public meetings for the purpose of discussing historical Colrain Center and other historic places, landscapes and landmarks.	5	Historical Commission	2004
Promote the Massachusetts Chapter 61, 61A, and 61 B Land Classification and Taxation Programs to local landowners to help keep undeveloped lands in active farming, forestry, and recreational uses.	Write a series of articles in West County News on the benefits to the town and to landowners of land stewardship programs including Chapter 61, 61 A, 61 B and others.	6	Deerfield River Watershed State Forester	2004

OBJECTIVE	ACTION	MAP #	RESPONSIBLE BOARD /GROUP	START DATE
	Develop, promote, and run a short series of informational talks at the library with speakers from land trusts, University of Massachusetts Extension, State Service Forestry Departments, etc.	7	Open Space Committee	2005
	Produce a working woodlot open house/tour of properties in the Chapter 61 program to demonstrate benefits of forestry.	8	Open Space Committee / Forest Stewards Guild	2006
	Work with State Representatives and Legislators to ensure that the Ch. 61, 61 A, 61 B, APR, and land protection programs continue to be funded by the state.	9	Open Space Committee/Select Board/Franklin Regional Council of Governments Regional Planning Board	Ongoing
Continue to set aside municipal funding each year to be used as a town match to continue to protect local farmland through the Agricultural Preservation Restriction (APR) Program.	Establish a monitoring system for collecting stumpage fees and cross-referencing Chapter 132 Forest Cutting Plans.	10	Select Board	2004
	Lobby State Representatives and Legislators to allocate 30 percent of state forest stumpage fees to the town containing the trees.	11	Select Board/Open Space Committee/Franklin Regional Council of Governments	2005
Support local agriculture to strengthen the long-term viability of agricultural businesses and to help ensure the retention of the town's most significant scenic and historic agricultural landscapes.	Increase the involvement of local farmers in town events.	12	Events Committee and Community Involved in Sustaining Agriculture (CISA)	2004
	Research how to decrease taxes paid by working farmers on farm buildings.	13	Select Board/Economic Development Committee	2005

OBJECTIVE	ACTION	MAP NUMBER	RESPONSIBLE BOARD/GROUP	START DATE
Protect from development lands that contain productive farmland, groundwater resources, large blocks of contiguous forestland, wildlife habitat, and lands that expand public access to the North and Green Rivers	Appoint an Open Space Committee.	14	Select Board	2004
	Identify target areas for protection from development.	15	Open Space Committee	2004
	Discuss land conservation goals with landowners.	16	Open Space Committee	2005
	Determine whether the Conservation Commission has the capacity to manage and police conservation lands that could be donated to the Town in the future.	17	Conservation Commission	2005
	Identify and secure sources of funding to protect open space in town.	18	Open Space Committee	Ongoing
Encourage the investment of state, municipal, and private dollars for the purposes of purchasing conservation restrictions (development rights) on privately owned open space so that the land remains under private ownership and continues to contribute real estate property taxes.	Produce a promotional campaign that focuses on sustaining residents' quality of life through protected public access to natural areas via the use of conservation restrictions.	19	Open Space Committee	2005
	Promote the value of conservation restrictions within the context of estate planning.	20	Open Space Committee	2005
Develop additional recreational programming for children, adults, and seniors.	Encourage the Recreation Committee to increase their efforts to develop additional programs and facilities.	21	Recreation Committee	2005

OBJECTIVE	ACTION	MAP NUMBER	RESPONSIBLE BOARD/GROUP	START DATE
Facilitate discussions with trail users towards developing a plan to coordinate trail development, maintenance, and promotion.	Host a meeting for area trail users to discuss trail issues in Colrain.	22	Recreation Committee, Colrain Sno Drifters, local horseback trail groups, Deerfield River Watershed Association (DRWA), and Open Space Committee	2005
	Investigate the use of Self-Help funds to pay for trail easements.	23	Recreation Committee and Open Space Committee	2004
Develop a working relationship with the state agency personnel who oversee the management of Catamount and Cook State Forests to address town concerns relating to their access and use.	Participate in the State's Western Connecticut River Valley State Forest Planning Process.	24	Select Board	2004
Explore cost-effective methods for developing a safe network of walking and bike paths, a new swimming area, and a skating pond	Determine which roadways and areas are appropriate for establishing bicycle/walking paths, a swimming area, and a skating pond.	25	Recreation Committee	2006
	Acquire funding to develop new recreational facilities.	26	Recreation Committee	2006
Continue to encourage educational programs in the schools that promote ecological awareness, preservation of natural resources, historical awareness, and historic preservation.	Continue offering natural and cultural resource programs to children in the Elementary School, in the Library, and in the Boy Scouts.	27	Historical Commission/Elementary School/Library	Ongoing
	Acknowledge AmeriCorps for the educational work they have already accomplished with seasonal funding.	28	Select Board/School Principal	2004

Source: Colrain Open Space and Recreation Planning Committee Members; 2004.



June 26, 2004

Town of Colrain

Open Space and Recreation Plan

Action Plan

ACTION	MAP #	ACTION	MAP #
Appoint an Economic Development Committee to identify appropriate areas for development and to put brownfields back to work.	1	Identify target areas for protection from development.	15
Initiate an All-Board Meeting to discuss costs in services of different land uses.	2	Discuss land conservation goals with landowners.	16
Research grants to fund an affordable housing feasibility study by the FRHRA.	3	Determine whether the Conservation Commission has the capacity to manage and police conservation lands that could be donated to the Town in the future.	17
Form an Events Committee to plan and produce eco- and heritage-based tourism events.	4	Identify and secure sources of funding to protect open space in town.	18
Continue to hold public meetings for the purpose of discussing historical Colrain Center and other historic places, landscapes and landmarks.	5	Produce a promotional campaign that focuses on sustaining residents' quality of life through protected public access to natural areas via the use of conservation restrictions.	19
Write a series of articles in West County News on the benefits to the town and to landowners of land stewardship programs including Chapter 61, 61 A, 61 B and others.	6	Promote the value of conservation restrictions within the context of estate planning.	20
Develop, promote, and run a short series of informational talks at the library with speakers from land trusts, University of Massachusetts Extension, State Service Forestry Departments, etc.	7	Encourage the Recreation Committee to increase their efforts to develop additional programs and facilities.	21
Produce a working woodlot open house/tour of properties in the Chapter 61 program to demonstrate benefits of forestry.	8	Host a meeting for area trail users to discuss trail issues in Colrain.	22
Work with State Representatives and Legislators to ensure that the Ch. 61, 61 A, 61 B, APR, and land protection programs continue to be funded by the state.	9	Investigate the use of Self-Help funds to pay for trail easements.	23
Establish a monitoring system for collecting stumpage fees and cross-referencing Chapter 132 Forest Cutting Plans.	10	Participate in the State's Western Connecticut River Valley State Forest Planning Process.	24
Lobby State Representatives and Legislators to allocate 30 percent of state forest stumpage fees to the town containing the trees.	11	Determine which roadways and areas are appropriate for establishing bicycle/walking paths, a swimming area, and a skating pond.	25
Increase the involvement of local farmers in town events.	12	Acquire funding to develop new recreational facilities.	26
Research how to decrease taxes paid by working farmers on farm buildings.	13	Continue offering natural and cultural resource programs to children in the Elementary School, in the Library, and in the Boy Scouts.	27
Appoint an Open Space Committee.	14		

Legend

- Town Line
- Rail Lines
- Roads
- Streams and Rivers
- Water
- National Wetlands Inventory
- Zone II
- Historic Scenic Landscapes
- Contiguous forest blocks
- Industrial Zoning
- Prime farmland and active agriculture
- Agricultural Preservation Restriction
- Conservation Restriction
- Greenway
- Town hall
- Zone I
- Brown field

Land Protected from Development

- H. O. Cook and Catamount State Forests

Land Temporarily Protected from Development

- Chapter 61: Forestry
- Chapter 61A: Agriculture
- Chapter 61B: Recreation
- Chapter 61 & 61A: Forestry & Agriculture
- Chapter 61A & 61B: Agriculture & Recreation

Limited Protection

- Colrain Fire District
- Griswoldville Water District
- Shelburne Falls Fire District

SECTION 10

PUBLIC COMMENT

Public feedback was sought throughout the entire open space and recreation planning process. The text and maps included in the Plan reflect these enhancements. A more direct request for feedback on the Five-Year Action Plan was made at the public forum held March 13, 2004, which resulted in changes to the final drafts of the Five-Year Action Plan.

Copies of the final version of the Colrain Open Space and Recreation Plan were also sent to the following boards and organizations for review and comment:

- Massachusetts Division of Conservation Services (DCS)
- Colrain Board of Selectmen
- Colrain Planning Board
- Colrain Conservation Commission
- Franklin Land Trust

Letters of comment are inserted into the plan at the end of this section. The letters reflect a broad base of support for the research, analysis, outreach and recommendations developed by the Open Space Planning Committee.

SECTION 11

REFERENCES

American Farmland Trust Information Center. Summary Cost of Community Service Studies Fact Sheet. 1991.

Colrain Long-Range Planning Committee and the Franklin County Planning Department. Town of Colrain Master Plan. 1990.

Commonwealth of Massachusetts Department of Environmental Protection. Bureau of Resource Protection – Drinking Water Program. 310 CMR 22.00 Drinking Water Regulations. 2001.

_____. Colrain Fire District #1. Comprehensive Compliance Evaluation, System Description. No date.

_____. Colrain Fire District #1. Public Water Supply Annual Statistical Report. 2001.

_____. Shelburne Falls Fire District. Comprehensive Compliance Evaluation, System Description. No date.

Commonwealth of Massachusetts Department of Environmental Protection, Division of Watershed Management. 314 CMR 4.00: Massachusetts Surface Water Quality Standards. 2000.

_____. Connecticut River Basin Water Quality Assessment Report. 1998.

_____. Deerfield River Watershed 1995 Assessment Report for Review. 1996.

_____. Massachusetts Section 303(d) List of Waters. Worcester, Massachusetts. 1999.

_____. Massachusetts Year 2002 Integrated List of Waters. 2002.

Commonwealth of Massachusetts Department of Housing and Community Development. Community Profile - Town of Colrain. Website. 2002.

Commonwealth of Massachusetts Department of Public Health. Freshwater Fish Consumption Advisory List. 2002.

Commonwealth of Massachusetts Division of Fisheries and Wildlife. Catamount Wildlife Management Area – Colrain. DFW Website. 2003.

_____. Classification of Massachusetts Palustrine Natural Communities - Draft. 2000.

_____. Massachusetts Trout Stocked Waters. 2001.

_____. Ponds Map Online. 2003.

Commonwealth of Massachusetts Division of Fisheries and Wildlife. Natural Heritage & Endangered Species Program. BioMap Initiative. 2003.

_____. Fact Sheets on Species of Special Concern, Rare and Endangered Wildlife, and Threatened Plants in Colrain, Massachusetts. 2003.

_____. Massachusetts Aerial Photo Survey of Potential Vernal Pools. 2001.

_____. Natural Heritage Atlas. 2003 Edition.

Commonwealth of Massachusetts Division of Employment and Training. Employment and Wages in Colrain. 2002.

_____. Labor Force, Employment and Unemployment in Colrain. 2002.

Commonwealth of Massachusetts Executive Office of Environmental Affairs. Connecticut River Watershed. Website. 2001.

_____. Deerfield River Watershed. Website. 2003.

_____. The Open Space Planner's Workbook. 2001.

Commonwealth Research Group, Inc. Cost of Community Services in Southern New England. Executive Summary. Commissioned by Southern New England Forest Consortium, Inc. Chepachet, Rhode Island. 1995.

Connecticut River Forum. The Health of the Watershed. 1998.

Connecticut River Watershed Council. Watershed Map and Information. Website. 2001.

Deerfield River Watershed Association. Website. 2003.

DeGraaf, Richard M., Mariko Yamasaki, William B. Leak, and John W. Lanier. New England Wildlife: Management of Forested Habitats. Northeast Forest Experiment Station. Radnor, Pennsylvania. 1992.

Department Landscape Architecture and Regional Planning, Studio IV. A Foundation for an Open Space and Recreation Plan for Orange, Massachusetts. 1996.

Eyre, F. H. (ed.) Forest Cover Types of the United States and Canada. Society of American Foresters. Washington, D.C. 1980.

Forman, Richard T.T. Land Mosaics: The Ecology of Landscapes and Regions. New York: Cambridge University Press. 1995.

Franklin County Chamber of Commerce and County Commissioners of Franklin County. State Forests and Parks in Franklin County. No date.

Franklin County Commission. The Franklin County Rural Historic Landscape Preservation Plan. 1992.

Franklin County Planning Office. Preliminary Data Report: Deerfield River Management Plan. 1989.

Franklin Regional Council of Governments. Town of Colrain Build-out Analysis. 2001.

Green River Preservation Alliance. Draft Petition to Designate the Green River as an Outstanding Resource Water in the State of Vermont. 1996.

Hines, J. Commonwealth of Massachusetts Department of Agricultural Resources. Personal Communication. 2003.

Holm, Lass, Rogers. The Changing Landscape of Massachusetts Agriculture. Massachusetts Benchmark. Winter 1999 - 2000.

Hornbeck, J. and W. Leak. Ecology and Management of Northern Hardwood Forests in New England. 1991.

Hubbard, R. Commonwealth of Massachusetts Department of Agricultural Resources. Personal Communication. 2003.

Journal of Forestry. Ecosystem Management: Capturing the Concept for Woodland Owners. 1998.

MacArthur, R.H. and E.O. Wilson. The Theory of Island Biogeography. Princeton University Press. 1967.

Massachusetts Association of Conservation Commissions. Environmental Handbook for Massachusetts Conservation Commissioners. 1991.

Massachusetts Audubon Society. Groundwater Information Flyer #1. 1985.

Massachusetts Department of Public Health, Bureau of Environmental Health Assessment. Freshwater Fish Consumption Advisory List. 1998.

Massachusetts Geographic Information System. 1985 and 1999 Land Use Data. 2003.

Massachusetts Institute of Social and Economic Research. Population Projections. 2000.

_____. 1997 MISER Population Age Breakdown. 1999.

_____. 1990 Census Population Age Breakdown. 1999.

_____. Estimates of Population Age Breakdown. 1999.

_____. Population Projections. 1999.

Masters, Gilbert. Introduction to Environmental Engineering and Science, Second Edition. 1998.

Mingori, C. and H. King. The Deerfield River Watershed: Landscape, Lifeform and Human Impact. 1994.

Nature Conservancy and the Massachusetts Natural Heritage and Endangered Species Program. Our Irreplaceable Heritage: Protecting Biodiversity in Massachusetts. 1998.

New England Interstate Water Pollution Control Commission. Source Protection Summaries. Source Water Assessment Program, Interstate Data Gathering Grant. Website. 2001.

Patrie, Lois McClellan. A History of Colrain, Massachusetts. Salem, Massachusetts. 1974.

Pioneer Valley Planning Commission. The Connecticut River Strategic Plan, Volume One. 2001.

Rogers, D. Personal Communication. 2003.

Ryan, R., D. Bacon et al. The Connecticut River Watershed Action Plan for the Massachusetts
Section of the Watershed – Draft. 2002.

Slater, C. Anadromous Fish Restoration in Massachusetts. Connecticut River Salmon Association Newsletter. Winter 2001-2002.

Soil Conservation Service in cooperation with Mass. Division of Water Resources, Franklin

County Conservation District. North River Floodplain Management Study, Colrain, Massachusetts. 1990.

Szocik, C. Commonwealth of Massachusetts Department of Agricultural Resources. Personal
Communication. 2003.

Thibideau, R. Personal Communication. 2003.

Town of Colrain. Assessors Records and Maps. 2003.

_____. Colrain Brownfields Upper Mill, Above-Ground Hazardous Waste Remediation and Clean Up Loan Application. 2000.

_____. Open Space and Recreation Survey. 2002.

_____. Zoning By-Law. 2001.

U.S. Bureau of the Census. Census 2000 Population Data. 2001.

_____. Census 2000 General Demographic Characteristics. 2001.

_____. County Business Patterns Massachusetts. 1990, 1998.

_____. Decennial Census of Population and Housing. 1990, 2000.

_____. Franklin County Poverty Status. 2000.

_____. Franklin County Towns Journey to Work Tables. 1990.

_____. Per Capita and Median Household Income. 2000.

_____. Preliminary U.S. Population Data for Redistricting. 2001.

_____. U.S. Census of Population. 1970, 1980, 1990.

United States Department of Agriculture. Natural Resources Conservation Service. National Soil Survey Handbook. 2001.

United States Department of Agriculture Soil Conservation Service. Soil Survey Franklin County Massachusetts. 1967.

United States Department of Housing and Urban Development, Federal Insurance Administration. Flood Insurance Rate Map – Town of Colrain, Massachusetts. 1980.

United States Environmental Protection Agency. Brownfields Assessment Pilot Fact Sheet – Colrain, Ma. EPA Website. 2003.

_____. Brownfields Cleanup and Redevelopment. Brownfields Cleanup Revolving Loan Fund Pilot Fact Sheet – Colrain, Ma. EPA Website. 2003.

_____. Brownfields Cleanup and Redevelopment. Brownfields Supplemental Assistance Fact Sheet – Colrain, Ma. EPA Website. 2003.

_____. Brownfields Cleanup and Redevelopment. Franklin Regional Council of Governments, BCRLF Pilot Fact Sheet – Colrain, Ma. EPA Website. 2003.

_____. Environmental Protection Agency Region 5 and Agricultural and Biological Engineering at Purdue University. Groundwater Primer, Version 1.0. Website. 1998.

University of Massachusetts Cooperative Extension Service. Natural Resource Inventory for Franklin County. 1976.

Walk, MF. Deerfield River Volunteer Monitoring Program, 2002 Final Report. 2002.

Wheeler, G. Shelburne Falls Fire District. Personal Communication. 2003.

Wilson, E.O. and E.O. Willis. "Applied Biogeography," in Cody, ML and JM Diamond, editors, Ecology and Evolution of Communities. Belknap Press, Cambridge, Massachusetts. 1975.

Zenick, M. Franklin Land Trust. Personal Communication. 2003.

My favorite place in Cdrain is my land.

Morgan

ECONOMIC DEVELOPMENT

ECONOMIC DEVELOPMENT ELEMENT

Introduction

During the community development plan process, many residents expressed concern relative to the strength of Colrain's economic base. Residents felt that although it was important to pay attention to the qualities that make Colrain a great place to live, efforts should also be put forward to retain and enhance the business establishments and jobs the community already has. The purpose of the Economic Development Element is to provide a baseline of information from which informed decisions can be made, and to offer recommendations to improve Colrain's employment, establishment and property tax bases.

This element begins with a summary of Colrain's economic development vision statement, goals and objectives. The second section summarizes current economic conditions in Colrain and discusses regional economic issues that are important to the community. The third section outlines the community's non-residential land use conditions. The final portion of the Economic Development Element then offers recommendations to achieve the town's goals of expanding and retaining the business establishment, employment and property tax base in a controlled manner.

1. Economic Development Vision, Goals and Objectives

Economic Development Vision Statement

Promote an Expanded Local Economy Without Compromising the Characteristics and Qualities which Make Colrain a Desirable Community

Goals and Objectives

1. Focus business and job creation efforts within Colrain's village core area.

Building upon the fourth goal outlined in the *Greater Franklin County Comprehensive Economic Development Strategy 2003 Annual Report (CEDS)*, Colrain's village core area offers an established and historical base of businesses, homes and institutions from which to build future investment. In order to reduce sprawl and potentially impact the qualities which make Colrain attractive to residents and visitors, priority should be given to the village core area for suitable economic development activities.

2. **Building on the community's manufacturing heritage, support existing manufacturing firms and encourage the creation of new niche manufacturers.**

3. **Capitalize on the region's tourism economy in order to support existing local businesses**

4. **Ensure that Colrain's land use regulations support existing businesses, encourage the development of suitable new businesses as well as retain the characteristics of town which make it desirable to residents and visitors.**

Arguably, the primary factor which motivates most residents and visitors to Colrain is the high scenic quality associated with the expanses of rolling hills, open space, and access to the variety of natural resources within the town. It should be the goal of the Town to encourage the permanent protection of environmentally significant lands in order to avoid the incremental deterioration of qualities which make Colrain a desirable community.

2. Profile of Existing Economic Conditions

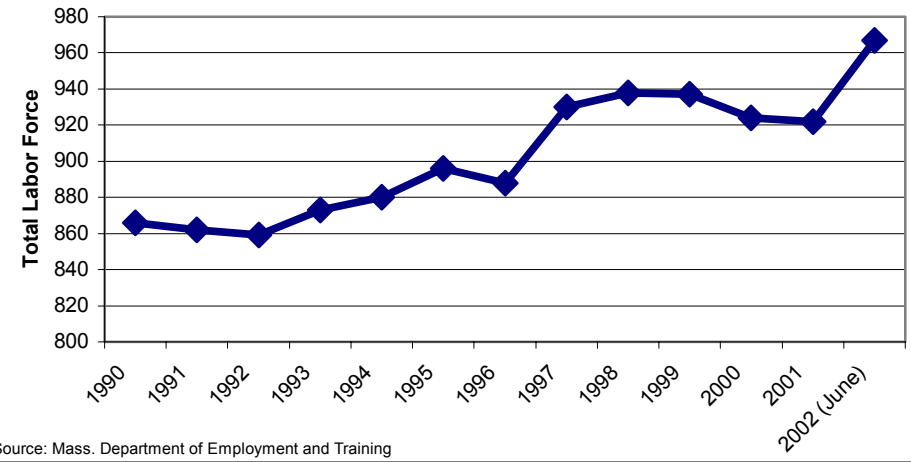
General Economic Characteristics

The following section summarizes general economic conditions within Colrain and the surrounding region. The information provided includes labor force and employment trends, characteristics of the local and regional economies and a profile of existing non-residential land uses in the town. The majority of this information is taken from published secondary sources, including the Massachusetts Department of Employment and Training and the 2000 U.S. Census. Due to the wide variety of topics discussed, information is presented graphically and the implications are summarized in bulleted form.

Labor Force and Unemployment

- Growth in the size of the labor force is an important indicator of job creation needs in a community. The overall size of Colrain's labor force increased by 101 between 1990 and 2002 (June) representing an increase of 11.7%. The growth in labor force is consistent with local population trends, which showed an increase in total household formations and an increase in the working aged population (20 to 64) between 1990 and 2000. Labor force growth in Franklin County has matched the growth experienced in Colrain, totaling 3,683 over the same time period and representing an increase of 10%. The increase in the local and regional labor force reflects an in-migration of workers over the period. Figure 1-1 shows the growth in labor force in Colrain between 1990 and 2002 (June).

Figure 1-1. Resident Labor Force Trends: 1990-2002
Town of Colrain

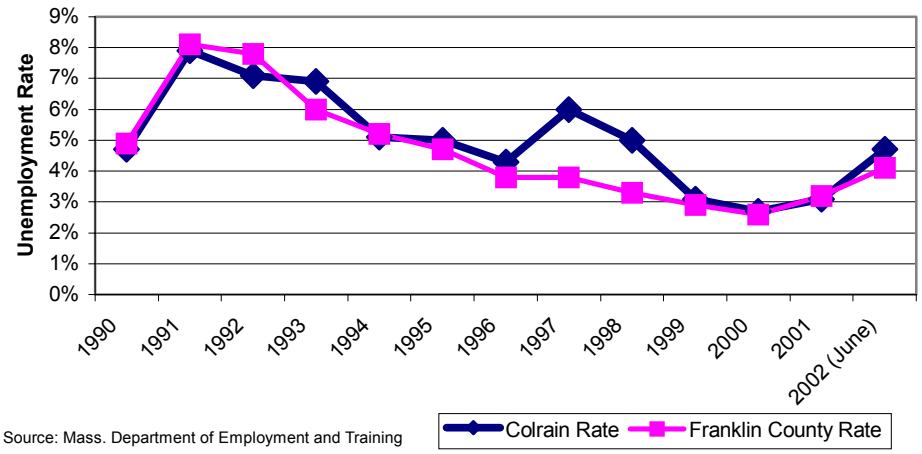


Source: Mass. Department of Employment and Training

- The number of employed Colrain residents increased by 97 over the period between 1990 and 2002 representing an increase of 11.8%. At the same time, the number of employed Franklin County residents increased by 2,995 (8.5%). This trend suggests that Colrain has outperformed the region in terms of attracting workers as a place of residence.

- Figure 1-2 shows that the local (with the exception of 1997) and regional unemployment rates have experienced steady declines throughout the 1990s. Colrain's unemployment rate has historically been in-line with the Franklin County rate averaging 0.4 percentage points above the County rate between 1990 and 2002. Colrain and Franklin County's unemployment rates modestly increased in 2001 and 2002. The most recent resident unemployment rate in Colrain (4.2%) was slightly above the region (3.8%) but below the statewide average of 5.1% in November of 2003.

Figure 1-2. Unemployment Rate Trends: 1990-2002
Town of Colrain and Franklin County



Source: Mass. Department of Employment and Training

Industry Employment and Wages

- In terms of the total regional employment base, Colrain is not a major employment center with the community containing about one percent of the total regional employment. The employment base in Colrain in 2001 was 259 jobs representing a decline of 101 jobs (28.1%) since 1995[1]. The decline in local jobs was opposite to the regional trend of an increase of 3,722 jobs (18%) over the same time period. With the decline in the number of jobs in Colrain coupled with the steady increase in the local labor force, Colrain has become a net exporter of employees to other regional communities.

- Employment change by industry group for Colrain is presented in Table 1-1. Although much of the 1995 employment data is suppressed, Colrain's job losses between 1995 and 2001 were heavily concentrated in the manufacturing (106 jobs) and service (9 jobs) sectors.

Table 1-1. At-Place Employment Trends: 1995-2001
Town of Colrain, MA

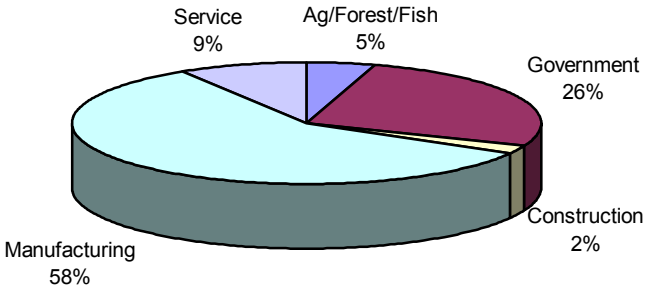
	1995	2001	# Change	% Change
Ag/Forest/Fish	N/A	12	N/A	N/A
Government	N/A	65	N/A	N/A
Construction	N/A	5	N/A	N/A
Manufacturing	249	143	-106	-42.6%
TCPU [1]	N/A	0	N/A	N/A
Trade	6	0	N/A	N/A
FIRE [2]	N/A	0	N/A	N/A
Service	31	22	-9	-29.0%
Total [3]	360	247	-113	-31.4%

Note: [1] Transportation, Communications, Public Utilities
[2] Finance, Insurance and Real Estate
[3] 2001 does not include some suppressed employment
Source: Mass. Department of Employment and Training

- As shown in Figure 1-3, 58% (143 jobs) of Colrain's employment base is concentrated within the manufacturing sector with over one quarter (65 jobs) within the government sector.

[1] The employment figures used here represent covered employment as reported to the Massachusetts Department of Employment and Training by employers. Non-covered workers (those for whom taxes are not withheld or reported), which may include some self-employed individuals and part-time or casual labor, are not included.

Figure 1-3. Distribution of At-Place Employment by Industry: 2001
Town of Colrain, MA



Source: Mass. Department of Employment and Training

- Colrain's business establishment base paid about $7.5 million in wages in 2002. The average annual wage ($29,601) paid by Colrain firms was on par with the average wage of the Franklin County area ($28,941). A detailed distribution of Colrain's employment and wage base is provided in Table 1-2.

- Among local industry groups, the highest wage sectors in 2002 were the manufacturing ($40,357), professional and technical services ($39,874) and construction ($20,164).

- Although Colrain's employment base represents a very small portion of the county employment base, the average wages paid by Colrain firms outperformed the region in two of the four sectors provided including professional and technical services and manufacturing.

- Contrary to the employment base trend, the number of business establishments in Colrain has increased by a total of 7 (or 24.1%) from 29 in 1995 to 36 in 2001.

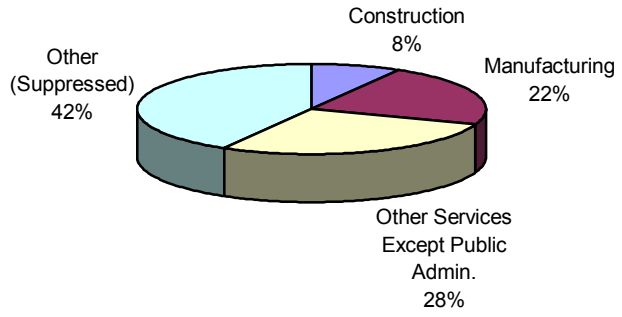
Table 1-2. Employment and Average Wages by NAICS Industry Category: 2002
Town of Colrain and Franklin County

Description	Total Employment		Avg. Annual Wage		Percent of County Total	
	Colrain	Franklin County	Colrain	Franklin County	Avg. Wage	Employment
ALL INDUSTRIES	***253***	***27,570***	***$29,601***	***$28,941***	***102.3%***	***0.9%***
Agriculture, Forestry, Fishing & Hunting		288		$19,111		
Mining						
Utilities		144		$72,829		
Construction	9	1,064	$20,164	$34,410	58.6%	0.8%
Manufacturing	116	5,394	$40,357	$38,588	104.6%	2.2%
Wholesale Trade		721		$38,399		
Retail Trade		3,081		$19,510		
Transportation and Warehousing		645		$31,746		
Information		857		$38,071		
Finance and Insurance		547		$49,499		
Real Estate and Rental and Leasing		144		$22,691		
Professional and Technical Services	6	361	$39,874	$34,501	115.6%	1.7%
Management of Companies and Enterprises		489		$36,577		
Administrative and Waste Services		806		$22,396		
Educational Services		4,747		$29,198		
Health Care and Social Assistance		3,279		$27,552		
Arts, Entertainment, and Recreation		572		$13,050		
Accommodation and Food Services		1,667		$10,747		
Other Services, Ex. Public Admin	15	1,186	$16,274	$16,453	98.9%	1.3%
Government		1,575		$27,703		

Source: Massachusetts Department of Employment and Training

- Figure 1-4 shows the distribution of Colrain's business establishments by industry sector for 2001. Unfortunately, due to the relatively small establishment base and confidentiality issues, a significant portion of the establishment data has been suppressed by the Massachusetts Department of Employment and Training. The suppressed data represents 42% of Colrain's business establishment base. However, based on the available data, Colrain has its highest concentrations of firms in the other services (except public administration) (10 firms or 28%), manufacturing (8 firms or 22%) and construction (3 firms or 8%) sectors.

Figure 1-4. Distribution of Firms by Industry Sector: 2001
Town of Colrain, MA



Source: Mass. Department of Employment and Training

3. Current Non-Residential Land Use Conditions

Current non-residential land use conditions in Colrain include the following six major categories:

- Undeveloped Land
- Commercial
- Industrial
- Agriculture and Forest
- Recreation
- Tax Exempt

The undeveloped land category includes raw vacant land that may be zoned for various purposes, but is currently undeveloped. It should be noted that although parcels have been identified as undeveloped, some of these parcels may not be developable due to constraints such as topography and wetlands, etc.

The commercial and industrial categories include all business establishments. These establishments represent manufacturers, retail stores, restaurants, automotive services, gas stations, and hospitality services etc.

The agriculture and forest category includes parcels that are used for farming and forest production. These parcels include those designated under M.G.L. Chapter 61[2].

The recreation category includes parcels that used for recreation purposes such as camping, hunting, fishing and hiking areas.

[2] Massachusetts General Law Chapter 61 outlines the classification and taxation of forest lands and forest products.

Tax exempt parcels are those that are exempt from taxation and are owned by government, quasi-government (fire and sewer districts) and institutions (churches).

Based on property data provided by the Town of Colrain's Assessment Department, the total land area within the town is estimated at 23,500 acres. It should be noted that this land area estimate does not include water bodies and roads. As shown in Table 1-3, non-residential land accounts for approximately 13,380 acres, representing 57% of the Colrain's total land area.

As noted in the table, the two largest amounts of Colrain's land area are agriculture/forest (4,600 acres or 34%) and undeveloped (4,133 acres or 31%) which combined account for over 8,700 acres or 65% of the total land area.

Table 1-3. Distribution of Non-Residential Parcels by Use
Town of Colrain

	# Acres	% of Total	Avg. Parcel Size (Ac.)	Total Assessment	% of Total	Assessment per Acre
Commercial	20.1	0.2%	3.3	$596,100	3.7%	$29,701
Industrial	21.1	0.2%	3.0	$3,736,700	22.9%	$176,843
Agriculture/Forest	4,602.3	34.4%	39.0	$1,015,200	6.2%	$221
Recreation	1,670.3	12.5%	38.8	$452,400	2.8%	$271
Tax Exempt	2,931.1	21.9%	48.9	$6,358,000	38.9%	$2,169
Undeveloped	4,133.7	30.9%	14.9	$4,166,700	25.5%	$1,008
Non-Residential Total	13,378.5	100.0%	26.1	$16,325,100	100.0%	$1,220
Colrain Total	23,476.7			$84,400,600		$3,595

Source: RKG Associates, Inc.

Interestingly, commercial and industrial properties account for approximately 41 acres representing less than one half percent of the community's land area. However, from a total assessment perspective, commercial and industrial properties by far contribute the most to the Town's property tax base at $29,700 and $177,000 per acre. Should the Town set a goal of complimenting its property tax base with higher valued land uses, the commercial and industrial sectors would be the most productive sectors to target.

As shown in Table 1-4, Colrain's commercial and industrial property base is small and, with the exception of manufacturing uses and camping facilities, the town's business establishments generally serve local residents. It should be noted that the information presented in Table 1-4 was provided by the Town of Colrain's Assessment Department with building square footage and zoning information not available at the time of analysis. Furthermore, mixed use properties were not included within the analysis.

Table 1-4. Distribution of Commercial and Industrial Uses by Property Classification

Town of Colrain

Use Classification	# Parcels	# Acres	Total Ass. Value
Small Retail	1	0.18	$96,000
Food Service	1	0.27	$93,600
Auto Repair	1	6.00	$221,000
Fuel Service	1	1.00	$44,100
Postal Services	1	0.19	$90,700
Camping Facilities	1	12.43	$50,700
Manufacturing	5	19.95	$3,571,600
Office (Manufacturing)	1	0.96	$74,800
Telephone Exchange	1	0.22	$90,300
Potentially Developable Land (Man.)	3	8.80	$14,100
Undevelopable Land (Man.)	4	7.83	$20,600
Total	20	57.83	$4,367,500

Source: RKG Associates, Inc.

4. Recommended Actions and Improvements

The following recommendations are offered to begin to address Colrain's current and future economic development needs, as identified above. These recommendations relate primarily to measures that stimulate and encourage additions to the community's employment, business establishment and property tax base, and are sensitive to the unique identity, economic scale and character of the town. The recommendations provided are not in order of priority.

1. Focus economic development efforts on the retention and support of existing business establishments within the community.

Due to the relatively small scale of Colrain's business establishment base, limited transportation access and locational challenges, attracting new establishments to the area will be challenging. Too often economic development efforts emphasize the attraction of new firms while existing businesses are not given an equal amount of support and effort. To that end, it is suggested that economic development efforts in Colrain should be targeted at both attracting new firms *and* supporting and retaining existing business within the town. Two particular initiatives that should be considered in order to accomplish this goal include:

- Ensure municipal infrastructure and services are adequate to meet business establishment needs. More specifically, municipal infrastructure capacity and services should be reviewed periodically (every two years) to meet business needs – manufacturers in particular.

- Working with local and regional service providers, work towards the creation of a high-speed telecommunications (voice and data) infrastructure within the town
- Review land use regulations to encourage small or home-based niche-manufacturers, manufacturing support businesses and service providers, agriculture and crafts
- Establish an annual workshop, meeting or open house between the Town and local business establishments to identify issues and mechanisms to support local firms. This may come in the form of a reconstituted Colrain Business and Industry Association.

2. Encourage the creation of home-based businesses.

With the area being a destination for seasonal residents and visitors, and with home based businesses becoming a larger segment of local establishment bases, the Town should encourage the creation of new home-based firms as well as retaining existing home-based businesses. In order to support these types of businesses, the Town should review its land use regulations to ensure that they support these types of uses without compromising the characteristics which make the town attractive to residents. Such measures may include the creation of performance based zoning standards. These types of standards create a flexible development environment by setting a minimum set of land use controls based on measuring development "impacts" rather than establishing development restrictions.

3. Encourage the creation of businesses within the agriculture and leisure and hospitality industry sectors.

As Colrain and the entire Franklin County region is attractive to seasonal residents and visitors, the Town should encourage the creation of businesses within the agriculture, leisure and hospitality industries. These types of industries typically lend themselves to attract visitors and encourage spending. The Town should review any municipally owned parcels located along or within close proximity to the Route 112 corridor as well as the Town's village core area which may have the potential to be developed for these purposes. Map 1-1 (located at the end of this element) shows potentially developable land which is zoned for commercial and industrial uses within Colrain. Should a number of parcels be identified, the Town's Board of Selectmen should decide the most appropriate action(s) relative to these properties. Potential actions include:

- Hiring a engineer, surveyor and/or development consultant to determine the development constraints and marketability of the respective properties;
- Obtain Town Meeting authorization for the sale of any respective properties[3]
- Appoint a task force to establish and potentially monitor a disposition process for any respective properties

[3] It is also assumed that the disposition process will be conducted in accordance with State regulations governing the disposition of surplus public property.

4. Encourage the permanent protection of environmentally significant lands in order to avoid the incremental deterioration of qualities which make Colrain a desirable community.

The Town should work with the Nature Conservancy and similar organizations and foundations was well as private landowners in the acquisition of development rights, conservation land and open space areas throughout Colrain.

5. Participate with the Franklin Regional Council of Governments and other regional planning and economic development organizations to implement already established plans

Representatives from the Town have been working with the Franklin Regional Council of Governments' Economic Target Area program and helped prepare the *Comprehensive Economic Development Strategy* (CEDS) for the Greater Franklin County region. Due to the small scale of the town's economic base, Town representatives should continue to work with regional agencies and neighboring communities to implement the work items contained in the CEDS.

Insert Map 1-1 (Potentially Developable Land Zoned for Commercial and Industrial Uses) here

HOUSING

HOUSING ELEMENT

Introduction

Although all Massachusetts communities have a responsibility to meet their fair share of regional housing needs, an underlying assumption of this analysis is that Colrain should develop housing strategies that are appropriate to the needs of its own low and moderate income population, before attempting to satisfy regional needs. This approach is particularly appropriate in light of the Town's comparatively small economic base, modest residential growth rate and limited supply of available/suitable building sites to accommodate housing development on a large scale.

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% of their gross income on housing costs. Fortunately, under this definition, housing in Colrain is currently affordable for most residents.

Executive Order 418 also defines housing affordability based on spending no more than 30% of income on housing, and under this definition too, most housing in Colrain is considered to be affordable. Executive Order 418 (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

The Housing chapter of the Community Development Plan presents an overview of housing characteristics and affordability in Colrain. It discusses how well the current housing supply is meeting demand, evaluates housing affordability, and assesses which areas of Colrain may potentially be the most suitable for new residential development to address any present or projected housing needs.

The Housing chapter is organized into the following sections:

- A discussion of the planning and legislative context for affordable housing;
- Recommended housing goals and objectives;
- A summary of Colrain's current housing characteristics;
- A review of population characteristics which influence housing demand, and a comparison between the housing supply and housing demand to identify potential housing shortfalls;

- An assessment of housing affordability in Colrain and an analysis of how well Colrain's housing supply provides adequate affordable housing choices for residents of different incomes; and
- Recommendations and strategies for helping the town meet the housing goals and objectives.

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 and Chapter 40B. It also discusses Colrain's community housing strategy and current activities.

1. 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 Community Development (CD) Plans, such as this one, to help communities consider the ways they would like to grow in the future, and help them establish options and strategies for addressing future development. Each CD Plan typically contains the following four elements: housing, economic development, open space and resource protection, and transportation.

In addition, EO418 establishes a new affordable housing certification process. Municipalities must obtain housing certification to become 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). In Fiscal Year (FY) 2003 (which ended June 30, 2003), the rolling application grant programs requiring housing certification provided a total of $35 million in funding to communities statewide, and the competitive grant programs, which gave a rating bonus for housing certification, provided $367 million. To receive housing certification, communities must demonstrate that they are working to increase their supply of housing that is affordable to individuals and families across a broad range of incomes. Housing certification is obtained on an annual basis. To achieve certification, Colrain must demonstrate 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.

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% of its total housing stock. Under Chapter 40B and Executive Order 215 which accompanied it, communities in which less than 10% of the housing units have guaranteed long-term affordability 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 an affordable housing development that does not adhere local zoning. This application is acted upon by the local Zoning Board of Appeals (ZBA). If the ZBA turns down the permit, the developer may be able to appeal the decision to the State Housing Appeals Committee, which can overrule the local ZBA 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% of household income. In determining a town's total number of affordable housing units for Chapter 40B, the State has historically only included State or Federally subsidized units with a guaranteed long-term affordability for low and moderate-income households. Rents or sales prices in these housing units must restricted to affordable levels for at least 30 years after construction. All unsubsidized units have been excluded from Chapter 40B status, even if their monthly costs are less than 30% of the median household income. This restriction has been 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% of income spent on housing), 75% of Colrain homeowners and 80% of renter households have housing which is affordable based on their incomes. Under the Chapter 40B definition of "affordable," as of the latest reporting period Colrain had only 15 units or 2% of its housing stock certified as affordable housing. This number leaves the community roughly 60 units short of the 10% goal, and 56 units below the actual number of local households with identified housing needs according to the 2000 Census. As of 2001, only two communities in Franklin County had achieved 10% affordable housing: Greenfield and Orange.[1]

It is also 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. The State has recently begun to revise Chapter 40B to provide communities with more

[1] The latest DHCD Chapter 40B housing inventory (April 2002) indicates that Wendell also has over 10% affordable housing. However, Wendell's affordable housing count may be overstated, as some of the counted units do not guarantee long-term affordability for low and moderate-income households. As a result, DCHD is in the process of revising Wendell's affordable housing figures. The new numbers may show Wendell to have significantly fewer affordable housing units, and less than 10% in total.

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% 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 ZBAs can now refuse to issue permits for large-scale housing projects that are inappropriately sized for their community.

Further revisions to Chapter 40B are now under consideration. Governor Romney established a Chapter 40B Task Force to review the current law and suggest changes. The Task Force's final report and recommendations were released in the spring of 2003, and are under review. These changes may further help to increase the Town's percentage of affordable housing under Chapter 40B, and will provide more flexibility in reaching the 10% affordable housing level.

2. Regional and Town Initiatives and Policies to Create Affordable Housing

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). 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.

HRA and its regional affordable housing partner, RDI, have worked with Colrain 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. Colrain appears to possess a supply of available privately-owned lots, which may be suitable for the construction of affordable homes for first-time homeowners and/or affordable rental housing for seniors or families. The Town should continue to encourage RDI to investigate acquisition opportunities of land or existing multi-family dwellings as properties come on the market.

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

Colrain works with the local and regional public housing authority, the Franklin County Regional Housing and Redevelopment Authority (HRA), to address local housing 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 development projects, 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 the Town 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. 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.

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 single-family homes are built each year by RDI in varying communities, and approximately 60 have been constructed in the past six years countywide.

3. Housing Vision, Goals and Objectives

Housing Vision Statement

The vision is to preserve the rural, residential character of the Town and to provide housing opportunities to residents of all ages and income levels.

Housing Goals and Objectives

1. Work to increase Colrain's inventory of affordable housing units which qualify under Chapter 40B.

Although housing values within Colrain and its neighboring communities are generally more affordable than other communities throughout the state, issues of availability and affordability are also in Colrain. It is the goal of this plan to make significant progress towards Massachusetts' "fair share" standard for affordable housing units. It should be noted that due to the modest scale of residential development activity in Colrain, progress toward meeting the State's "fair share" standard should realistically be considered an incremental and a long-term process.

2. Focus priority on rehabilitation of existing dwellings for affordable housing.

Due to the limited scale of development in Colrain, in order to work towards meeting the 10% affordable housing level, efforts should focus primarily, but not exclusively, on rehabilitation of existing dwellings to increase the town's inventory of affordable units. This is primarily due to housing values generally falling at or below the cost of replacement. There could be opportunities for a housing agency or body to purchase comparatively large single family dwellings and rehabilitate these dwellings into two or more affordable units. There also exists a need for a potential program assist elderly home owners with limited income but with equity in a home, to move into a smaller affordable or market rate unit while their transferring ownership (at fair market value) of their home to a non-profit housing agency or group. While the elderly resident could leverage equity in their home for living expenses, the dwelling could potentially be rehabilitated and reconfigured as an affordable single or multi-family dwelling. Additionally, the Town should encourage private investment to maintain and upgrade existing multi-family and single family homes within the village core area.

3. Identify municipally or privately owned undeveloped and underdeveloped parcels which could be considered suitable sites for the development of affordable residential units.

Although there are potentially developable private parcels within the village core area, it should be the goal of the Town to identify all municipally (and privately) owned parcels that are currently undeveloped, underdeveloped[2] or could be developed for residential purposes. The Town should establish a partnership with development professionals in order to determine the feasibility of developing the identified parcels for residential purposes.

[2] A parcel that may have excess land capacity that could be improved with a greater density of development or an improved parcel that is significantly undervalued relative to its neighbors.

4. **To encourage a mix of housing types, densities, prices, and ownership patterns that help to maintain a stable demographic base within the Town and serve the needs of low and moderate income households, while preserving those characteristics of the community that are desired by most residents.**

Currently, only 10% of Colrain's housing stock is multi-family units. The Town should encourage the development of smaller, affordable housing units and accessory apartments to meet the needs of the town's seniors and other identified populations with housing needs. Furthermore, the Town should support the regional approach to housing issues through collaboration with the Franklin Regional Housing and Redevelopment Authority and other regional agencies.

5. **Preserve the rural character and scenic integrity through the permanent preservation of open space.**

Arguably, one of the primary assets associated with Colrain is the high scenic quality associated with the expanses of rolling hills, open space, and access to the variety of natural resources within the town. It should be the goal of the Town to encourage balanced residential development with the protection of environmentally significant lands in order to avoid the incremental deterioration of qualities which make Colrain a desirable community.

6. **To reduce the number of non-elderly residents with affordable housing needs by raising income levels through local economic development initiatives, in addition to lowering housing costs.**

The Town should encourage State agencies to recognize that existing affordable housing needs in Colrain are more attributable to a lack of economic opportunity and resulting lower income levels for some local residents, than they are to high housing costs. Work to gain recognition of local economic development initiatives as a legitimate alternative strategy for obtaining housing certification under EO 418.

4. Profile of Colrain's Existing Housing Stock

General Housing Characteristics

The following information summarizes general housing characteristics and conditions within the Town of Colrain. The majority of information provided is taken from the 2000 U.S. Census, supplemented by data extracted from the Town's property tax assessment database and The Warren Group Information Services. The information presented profiles the town's housing supply by type, tenure, age, value and related characteristics.

Housing by Tenure and Type of Structure

There is a distinct lack of diversity within Colrain's housing stock. According to the 2000 Census, the town's available housing supply totaled 781 units. Of that total, roughly 78% (611 units) of the housing stock consisted of conventional single family detached dwelling units. About 10% (80 units) were in 2 to 4 unit structures with the remaining (10.5%) 82 units consisting of mobile homes. There were no structures that contained five or more units. Table 1-1 indicates the distribution of housing units in Colrain by type in 2000.

Table 1-1. Distribution of Housing Units by Type: 2000
Town of Colrain

	# of Units	% of Total
Single Unit (detached)	611	78.2%
Single Unit (attached)	8	1.0%
2 Units	60	7.7%
3 or 4 Units	20	2.6%
5 or More Units	0	0.0%
Mobile Home	82	10.5%
Total	781	100.0%
Source: U.S. Census		

According to the 2000 U.S. Census, 63% (393 units) of the town's housing units were reported to be owner-occupied. Another 24% (148 units) were classified as renter occupied. A total of 90 units were classified as vacant with half of those units classified as vacant for seasonal, recreational or occasional use. Owner and renter vacancy rates were relatively low, estimated at 3.4% and 1.3% respectively. Vacancy rates below 5% are generally representative of a housing and rental market with tight supply.

Table 1-2 shows the distribution of Colrain's housing supply by tenure and occupancy in 2000. As indicated, over 73% of Colrain's housing stock is owner occupied which is well above the national average.

Table 1-2. Housing Supply by Tenure and Occupancy Status: 2000 Town of Colrain		
	Total units	% of Total
Owner Occupied	573	73.4%
Renter Occupied	111	14.2%
Vacant for Sale	29	3.7%
Vacant for Rent	2	0.3%
Vacant for seasonal, recreational or occasional use	40	5.1%
All Other Vacant	26	3.3%
Total Units	781	100.0%
Homeowner Vacancy Rate	4.8%	
Renter Vacancy Rate	1.8%	
Source: U.S. Census 2000		

Age of Housing Stock

According to information provided by Census respondents, 38% of the town's housing supply was constructed before 1939, compared to approximately 25% constructed between 1980 and 2000. As shown in Table 1-3, the number of housing units constructed each decade between 1960 and 1989 remained fairly consistent at between 101 and 118 units per decade. The reported rate of new construction from 1990 to 2000 was significantly lower at only 74 units. It should also be noted that the age distribution reported in Table 1-3 is based upon information provided by respondents and may not always be accurate. For example, the number of units reported as being constructed between 1990 and 2000 (74), greatly exceeds the total increase in the town's housing supply from 1990 to 2000 (51) as reported in Table 1-4. Regardless of which table is more accurate, it is clear that the rate of housing development in Colrain has slowed significantly over the past decade.

Table 1-3. Housing Supply by Age of Structure Town of Colrain						
Dwelling Units by Year Built	Owner Occupied	Renter Occupied	Total Units	Percent of Total Units		
				Owner Occupied	Renter Occupied	Total Units
1999 to March 2000	4	0	4	0.7%	0.0%	0.5%
1990 to 1998	62	4	70	10.8%	3.6%	9.0%
1980 to 1989	102	7	118	17.8%	6.3%	15.1%
1970 to 1979	72	21	101	12.6%	18.9%	12.9%
1960 to 1969	75	15	101	13.1%	13.5%	12.9%
1940 to 1959	60	14	90	10.5%	12.6%	11.5%
1939 or earlier	198	50	297	34.6%	45.0%	38.0%
Total	573	111	781	100.0%	100.0%	100.0%
Median Year Built	1964	1945	1960			
Source: U.S. Census						

Change in Housing Supply

Comparative data showing changes in the local and regional (Franklin County) housing supply between 1990 and 2000 is presented in Table 1-4. Highlights of that table include the following:

- The net percentage increase in housing units constructed in Colrain during the past decade (7%) was slightly higher than the increase experienced in Franklin County (5.1%) over the same time period.

- Between 1990 and 2000, the number of vacant units in Colrain, used for seasonal or recreational purposes, declined by 34 units or 46%. The same trend was experienced throughout Franklin County, which experienced a 90-unit (7.2%) reduction in vacant/seasonal housing. Based on growth rates in other housing types, it appears that most of the reported "loss" in vacant/seasonal dwelling units between 1990 and 2000 resulted from the conversion of those units to rental or owner occupancy, rather than demolition.

- The number of renter occupied units in Colrain actually declined over the time period by 19 units representing a decrease of almost 15%. This is opposite to the regional trend which added 220 rental units (an increase of 2.3%).

Table 1-4. Change in Housing Supply by Tenure and Occupancy: 1990-2000
Colrain and Franklin County

	1990	2000	Change: 1990-2000	
			Number	Percent
Colrain				
Owner Occupied	493	573	80	16.2%
Renter Occupied	130	111	-19	-14.6%
Vacant for seasonal, recreational or occasional use	74	40	-34	-45.9%
All Other Vacant	33	57	24	72.7%
Total	730	781	51	7.0%
Franklin County				
Owner Occupied	18,123	19,729	1,606	8.9%
Renter Occupied	9,517	9,737	220	2.3%
Vacant for seasonal, recreational or occasional use	1,247	1,157	-90	-7.2%
All Other Vacant	1,507	1,316	-191	-12.7%
Total	30,394	31,939	1,545	5.1%
Source: U.S. Census				

Presence of Substandard Units

The U.S. Census Bureau defines "substandard" housing as units which are overcrowded (more than once occupant per room), or lack complete plumbing or

kitchen facilities. Among owner and renter-occupied units, only five units (less than 1%) were occupied by more than one person per room. In terms of lack of adequate kitchen and bathroom facilities, a total of twenty units (2.6%) lacked either complete plumbing or kitchen facilities. It is anticipated that these dwellings would be seasonal units. Although the Census does not collect information relative to the physical condition of housing units, there does not appear to be evidence that many Colrain residents are living in severely overcrowded or substandard housing.

Housing Turnover

Although Colrain experienced very modest population net growth during the past decade (56 residents), approximately 301 (44%) of the town's current households moved into their current residence after 1990 – indicating considerable turnover activity within the local housing supply. For example, the 2000 Census reported that more than 177 (roughly 26%) of Colrain's householders moved into their current residence between 1995 and 2000. Because very little new residential construction (only 22 units) occurred during that time period, the movement of new households into the town must have resulted from the "turnover" (resale or lease) of existing housing.

Table 1-5 shows the year 2000 distribution of Colrain owner and renter households by the year they moved into their unit. As shown, 20% of homeowners and 55% of renters had lived in their current units for less than five years prior to 2000. Renter households exhibited particularly high turnover rates, with more than 25% of those households indicating that they had lived in their present unit for less than a year at the time the Census was taken.

Table 1-5. Distribution of Owner and Renter Households by Year Householder Moved Into Unit
Town of Colrain

	Number			Percent of Total		
	Owner Occupied	Renter Occupied	All Occupied Units	Owner Occupied	Renter Occupied	All Occupied Units
Moved in 1999 to March 2000	31	28	59	5.4%	25.2%	8.6%
Moved in 1995 to 1998	85	33	118	14.8%	29.7%	17.3%
Moved in 1990 to 1994	104	20	124	18.2%	18.0%	18.1%
Moved in 1980 to 1989	155	13	168	27.1%	11.7%	24.6%
Moved in 1970 to 1979	99	12	111	17.3%	10.8%	16.2%
Moved in 1969 or earlier	99	5	104	17.3%	4.5%	15.2%
Total	573	111	684	100.0%	100.0%	100.0%
Median Year Moved Into Unit	1986	1996	1988			
Source: U.S. Census						

While slightly less than half of local households had occupied their current housing for less than a decade, 15% of Colrain households (104 in total) have lived in their current homes for thirty years or more. This suggests that although Colrain has experienced considerable turnover in households, there are a significant number of "empty nester"

and/or elderly residents who have lived in the community for a very long period of time. It can be reasonably assumed that most of these long-time residents will choose to remain in the community as long as suitable housing is available for them.

Characteristics of Low and Moderate Income Households

Household Income Levels

The first step involved in estimating the number and characteristics of households with affordable housing needs, is to quantify the number of low, moderate and middle-income households that reside in Colrain. The definitions used are based on up to 50%, 80% and 150% of the "area wide" median household income. For the purposes of this analysis, the geography used to determine area wide median household income, was Franklin County. In 1999, the median household income in the County was $40,768, while in Colrain the median was slightly lower at $40,076. Using this measure, a low income household in Colrain would have an annual income of below $20,384, a moderate income household would range from $20,384 to $32,614, and a middle income household would earn from $32,614 to $61,152. The remaining households with incomes above 150% of the area wide median and are classified as upper-income and are assumed to have to have no affordable housing needs.

From household income distributions reported in the 2000 Census, it is possible to approximate the number of Colrain households which fell within the low, moderate and middle income ranges established by the area wide median. This information appears in Table 3-6. As shown, an estimated 114 or 16% of Colrain households fell under the low-income threshold in 1999. Another 121 households or 17% fell within the moderate income range and 39% or 275 households could be characterized as middle income. The remaining 187 households (27%) were in the upper income group. In total, an estimated 235 or 34% of Colrain's total households met the definition of low or moderate income in 1999. Given the relatively slow growth in the local economy and housing market since the 2000 Census was taken, these percentages are likely to be similar today.

Table 1-6. Household Income Distribution: 1999 Town of Colrain			
Household Income	# Households	% of Total	
Less than $10,000	31	4.5%	**Low Income**
$10,000 to $14,999	54	7.8%	114
$15,000 to $19,999	29	4.2%	16.4%
$20,000 to $24,999	59	8.5%	**Moderate Income**
$25,000 to $29,999	38	5.5%	121
$30,000 to $34,999	47	6.8%	17.3%
$35,000 to $39,999	89	12.8%	**Middle Income**
$40,000 to $44,999	58	8.3%	275
$45,000 to $49,999	35	5.0%	39.4%
$50,000 to $59,999	69	9.9%	
$60,000 to $74,999	109	15.7%	
$75,000 to $99,999	43	6.2%	**Upper Income**
$100,000 to $124,999	16	2.3%	187
$125,000 to $199,999	16	2.3%	26.9%
$200,000 or More	3	0.4%	
Total	696	100.0%	
Med. Colrain Household Income	*$40,076*		
Avg. Colrain Household Income	*$49,768*		
Med. County Household Income	*$40,768*		
Total Low-Mod Income H'holds	*235*		
% Low/Moderate Income	*34%*		
Source: U.S. Census 2000			

Characteristics of Households by Poverty Status

Designing appropriate strategies to meet the housing needs of low and moderate income residents first requires an understanding of the nature of those households and the types of housing they might desire. Unfortunately, the organization of Cenus information makes it difficult to isolate age, household type and other important demographic characteristics of low and moderate income households. However, limited information can be obtained for the lowest income segments of the population, by examining the characteristics of persons living below the poverty level.

Table 1-7 profiles selected characteristics of Colrain residents with incomes above and below the poverty level. Information in this table indicates that there were 122 Colrain residents living in poverty at the time of the 2000 Census, representing approximately 7% of the Town's total population. At that time, 115 or 94% of all residents living in poverty were under the age of 65, and nearly 37% of the Town's poorest residents were children. In fact, only 7 Colrain residents over age 65, representing about 3% of the Town's elderly population, had incomes below the povery level. By comparison, 45 children or 9% of the Town's population under the age of 17, lived in poverty.

Table 1-7. Selected Characteristics of Population Below the Poverty Level: 1999 Town of Colrain				
	Income At or Above Poverty	Income Below Poverty	Total Population	% Below Poverty
Total Persons	1,672	122	1,794	6.8%
Population by Age Group				
Under 5	103	18	121	14.9%
Persons Aged 5-17	343	27	370	7.3%
Persons Aged 18-64	1,016	70	1,086	6.4%
Persons Aged 65 to 74	121	2	123	1.6%
Persons Aged 75 or Older	89	5	94	5.3%
Population Under Age 65	1,462	115	1,577	7.3%
Living In Married Couple Families	1,099	63	1,162	5.4%
Male Householder, No Wife Present	83	2	85	2.4%
Female Householder, No Husband Present	116	24	140	17.1%
Unrelated Individuals	164	26	190	13.7%
Population Over Age 65	210	7	217	3.2%
Living In Married Couple Families	116	0	116	0.0%
Male Householder, No Wife Present	9	0	9	0.0%
Female Householder, No Husband Present	14	0	14	0.0%
Unrelated Individuals	71	7	78	9.0%
Source: U.S. Census				

Table 1-7 also shows that poverty rates among single female households were significantly higher than the Town as a whole, averaging 17% - the highest among any group. “Unrelated individuals” or persons living alone or in non-family households, experienced the second highest poverty rate at 13.7%. Among the Town’s few elderly residents with incomes below the poverty level, all were classified as unrelated individuals or persons living alone.

The data in Table 1-7 suggests that if Colrain wishes to satisfy the affordable housing needs of its own poorest residents, then priority needs are clearly among the non-elderly population. Based on the information presented above, there are three groups which represent the greatest need – non-elderly couples, single parent households, and unrelated individuals. From a housing strategy perspective, non-elderly couples represent the most likely candidates for conventional single family home ownership, while a combination of other housing types would most likely be appropriate for single parent households and unrelated individuals. These factors will be considered when recommending specific affordable housing strategies for the community.

Indicators of Housing Cost and Affordability

Not all low or moderate income households have housing needs. Therefore, the next step in identifying households with needs involved analyzing the current value and monthly cost of owner and rental housing within the Town. The following sections

profile the housing value and cost characteristics of homeowner and rental housing in Colrain, as reported in the 2000 Census Summary 3 File. Although now somewhat dated, the 2000 Census still represents the most comprehensive and reliable source of information concerning prevailing rents and homeownership costs in the community. The Census is particularly useful in that the data covers all housing in the town, rather than units which are currently available for sale or rent. Cost information for owner-occupied housing is presented first, followed by a similar presentation of rental market characteristics.

Home Ownership Costs

Table 1-8 provides the distribution of owner-occupied housing units in Colrain by market value, as estimated by respondents to the 2000 Census.[3] According to that data, the median home value reported by Colrain homeowners in 2000, was $114,000. This median owner-occupied home value in Colrain was $7,400 (6.1%) below the median reported value for Franklin County and almost $73,500 (39%) below the median home value for Massachusetts as a whole. The distribution of reported home values did not cover a very broad range, with about 74% of all units reportedly valued at less than $150,000 and approximately 11% valued above $200,000. Over 220 or 39% of Colrain homeowners estimated their homes to be worth less than $100,000 in early 2000.

Table 1-8. Housing Values for Owner-Occupied Units: 2000
Town of Colrain

Housing Value	# Units	% of Total
Under $100,000	224	39.1%
$100,000 to $149,999	200	34.9%
$150,000 to $199,999	84	14.7%
$200,000 or More	65	11.3%
Total	573	100.0%
Median Value	$114,000	
Source: U.S. Census		

An indicator of more recent trends in home values is residential sales statistics reported by the Warren Group Information Services. This provider of real estate sales data reports that the median price for single family units[4] sold in Colrain during 2002 was $110,000, or $4,000 lower than the median reported by all homeowners in the US Census, two years earlier. According to the Warren Group's own trend data, the median sale price of homes in Colrain has actually decreased by almost $85,000 (43%) since 2000 but increased modestly by $2,575 (2.4%) since 1997. This information appears in Figure 1-1.

[3] Values are based on a sample as reported by resident homeowners. Reported values are what residents believed their homes to be worth at the time and may not reflect actual market value.
[4] Due to the limited number of condominium sales in Colrain over the time period, only single family home sales estimates have been provided.

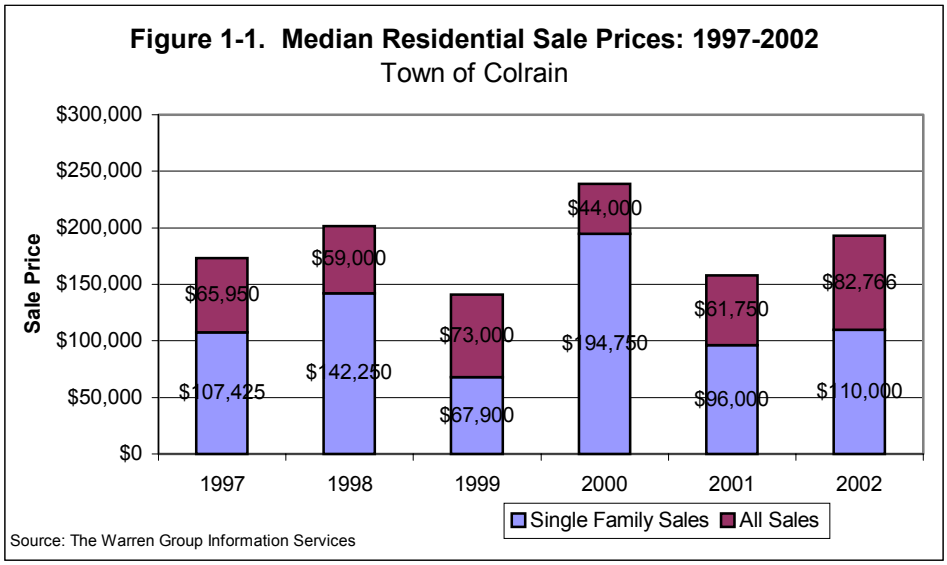
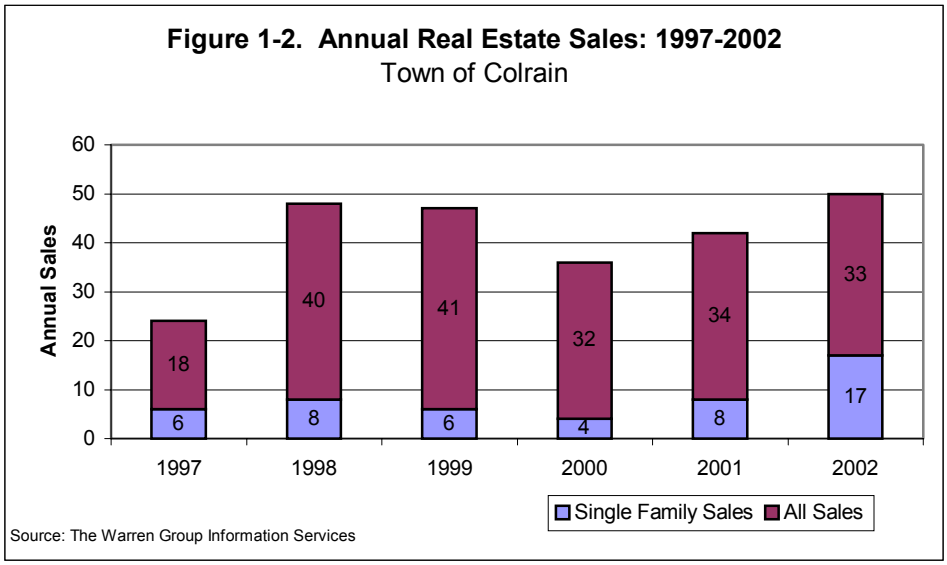


Figure 1-2 addresses the number of properties sold in Colrain during the same 1997 to 2002 time period. This figure shows that the number of home sales occurring each year is relatively small, averaging only 8 per year over the past six years. This number (8 sales) represents a 1.4% annual resale rate among all owner-occupied housing units in the Town, and is indicative of a stable, albeit slow real estate market.[5] The number of single family home sales has remained constant throughout the late 1990s even during the economic upturn of 1999 and 2000. Lately (as of 2002), the number of homes changing hands has incresed significantly to 17 representing more than double the average number of sales since 1997. It is assumed that historically low interest rates and relatively affordable prices in Colrain have fuelled the increase in sales.

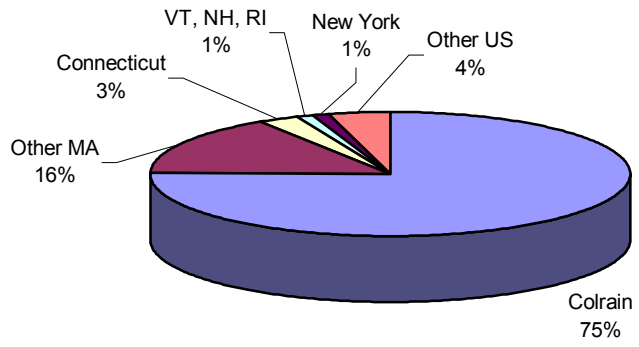


[5] It is not unusual for 5% to 7% of existing homes to sell each year during “active” real estate cycles.

However, with fewer than 10 home sales in Colrain during five of the past six years suggests a market with very limted demand. With very limited housing market demand locally, it makes it very difficult for developers to market significant numbers of affordable units at one time to local residents, or enable large numbers of residents to sell their homes in order to move into lower-cost housing. From examining property tax records, there appears to be an active demand for land in the Town. For example, between 2000 and 2002, a total of 81 parcels containing 1,733 acres of undeveloped land changed hands – representing an average of 577 acres per year.

The influence of non-local property ownership on the Town is illustrated in Figure 1-3, which shows the distribution of tax parcels by the state indicated on the owner's billing address. Although billing addresses on tax cards do not always reflect the owners' place of residence, they are a reasonably accurate indicator of non-resident ownership in a community.[6] Of the 1,192 property tax parcels in Colrain (including publicly owned and tax exempt properties), 75% (896) have owners with local billing addresses. Another 188 (16%) tax bills are mailed to other Massachusetts' locations and the balance of 108 parcels have owners with out-of state billing addresses.

Figure 1-3. Distribution of Tax Parcels by Owner's Mailing Address
Town of Colrain



Source: RKG Associates, Inc.

Property owners with "non-local" billing addresses own 9,983 acres and nearly 31% of all privately owned residential property and undeveloped land in the Town.[7] These non-resident owners are also acquiring real estate at a significant rate. Between january 2000 and December 2002 for example, non-resident owners have acquired nearly 273 acres of residential property within Colrain, representing roughly 15% of the total acreage which changed ownership over the period. The sizable amount of sales that have involved non-resident buyers may suggest a future increase in the construction of

[6] In some cases property owners may instruct Towns to mail their property tax bills directly to banks, attorneys, accountants or other third-parties. Therefore, a non-local billing address does not always indicate that the property owner is a non-resident.
[7] These totals apply to residential, mixed-use, Chapter 61 and other vacant land. Commercial, industrial and tax exempt property in Colrain also has a high proportion of non-local ownership.

seasonal or retirement homes. These trends may also make it more difficult to for the Town or other non-profit agencies to acquire and preserve property for the development of affordable housing.

Owner Housing Affordability

Housing is generally considered to be "affordable" when households spend no more than 30% of their gross income on housing costs. In the case of owner-occupied housing, monthly housing costs include mortgages, insurance, utilities, property taxes, and, in some cases, homeowner or condominium fees. Table 1-9 provides a distribution of Colrain, Franklin County and Massachusetts homeowners by the percentage of household income that was spent on monthly housing costs in 1999.

Table 1-9. Monthly Home Ownership Costs* as a Percent of Household Income: 1999
Selected Owner Occupied Housing Units**
Town of Colrain, Franklin County, and Massachusetts

	Colrain		Franklin County		Mass.	
	#	% of Total	#	% of Total	#	% of Total
29.9% or Less	244	74.8%	11,449	78.8%	911,912	76.8%
30.0% to 34.9%	28	8.6%	1,016	7.0%	76,471	6.4%
35% or More	54	16.6%	2,006	13.8%	192,836	16.2%
Not Computed***	0	0.0%	49	0.3%	6,652	0.6%
Total	326	100.0%	14,520	100.0%	1,187,871	100.0%

Notes:

*Ownership costs include the sum of all payments for mortgages, deeds of trusts, contracts to purchase, or similar debts on the property; real estate taxes, fire, hazard and flood insurance on the property; utilities; and fuels. It also includes, where appropriate, the monthly condominium fees or mobile home costs.

**Selected owner occupied housing excludes mobile homes, SF homes on more than 10 acres, owner households in mixed commercial properties and condominiums in multi-unit buildings

***Note: Not computed includes households with no income or a net loss.

Source: U.S. Census

As shown, about 75% of Colrain homeowners fell below the maximum 30% threshold in 2000, indicating that their monthly ownership costs were considered affordable at the time. The remaining 82 households (25%), including 54 households who spent more than 35% of their income on housing, were above the affordability threshold. This range of 54 to 82 households provides a general indicator of the total number of Colrain homeowners who were likely to have struggled with housing costs in 2000, and thus have affordable housing needs.

Despite the fact that Franklin County's 2000 median home value was $7,400 (6.1%) higher than Colrain, and the County's median household income was essentially equal compared to the town, affordability issues among homeowners were less prevalent for the County as a whole. Slightly less than 21% of Franklin County homeowners had

affordable housing needs, compared to 25% for the town. Despite substantially higher housing costs statewide, a smaller percentage of Massachusetts' homeowners (23%) had affordability issues than did Colrain residents. This suggests that affordable housing issues among Colrain homeowners may be more related to a possible lack of diversity in the nature of supply available to lower-income households, rather than to high housing costs.

Table 1-10 presents a more detailed distribution of monthly homeowner costs, including households with and without mortgages. As shown, 216 households (over one third) in Colrain had no mortgage in 2000, and the median monthly housing cost for these homeowners was only $327. Of the remaining 357 homeowners with mortgages, the median monthly cost was $934, or 186% higher than the cost for households without mortgages. Among those 82 local homeowners who payed more than 30% of their monthly income on housing costs in 1999, it can be reasonably assumed that many had expenses above $1,000.

Table 1-10. Monthly Owner Costs by Mortgage Status
Town of Colrain

Monthly Owner Costs	With a Mortgage		No Mortgage		All Owner Occupied	
	Number	% of Total	Number	% of Total	Number	% of Total
Less than $300	-	0.0%	65	30.1%	65	11.3%
$300 to $499	15	4.2%	127	58.8%	142	24.8%
$500 to $599	26	7.3%	14	6.5%	40	7.0%
$600 to $699	18	5.0%	6	2.8%	24	4.2%
$700 to $799	30	8.4%	-	0.0%	30	5.2%
$800 to $899	52	14.6%	4	1.9%	56	9.8%
$900 to $999	45	12.6%	-	0.0%	45	7.9%
$1,000 to $1,499	143	40.1%	-	0.0%	143	25.0%
$1,500 or More	28	7.8%	-	0.0%	28	4.9%
Subtotal	357	100.0%	216	100.0%	573	100.0%
Median Monthly Cost	$934		$327			
Source: U.S. Census						

Table 1-11 contains additional detail concerning the income and age distribution of owner households with housing needs. This table shows that not all Colrain homeowners who payed more than 30% of their monthly income on housing costs in 1999, are actually low or moderate income. Roughly 65% (53) of the 82 Colrain homeowners with affordability issues, earned less than 80% of the area wide median household income, while 35% (29) households earned more than 80% of the area wide median income per year. This data shows that many Colrain residents voluntarily choose to allocate a higher percentage of their incomes to housing, and do not necessarily need public initiatives to assist them with ownership costs.

The age data in Table 1-11 also show that the majority of Colrain homeowners with high housing costs are non-elderly. Over 70% of the 82 households with affordability issues in 1999 were headed by householders under the age of 65, compared to 29% who were

over age 65. Relatively few Colrain homeowners (31 in total) were under age 35, the age groups associated with first time homebuyers, and only five of those households had affordability issues. This finding may simply reflect the aging demographic characteristics of the community, or indicate a lack of existing suitable housing products for young homeowners.

Table 1-11. Monthly Owner Costs as a Percentage of Household Income By Household Income Level and Age of Householder: 1999 Specified Owner Occupied Housing Units* Town of Colrain

Income Category	Monthly Homeowner Costs as a % of Household Income				All Owner Households		With Affordability Needs	
	Less than 29%	30-34%	35% or More	Not Computed	Number	% of Total	Number	% of Total
Under $10,000	0	0	8	0	8	2.5%	8	9.8%
$10,000 - $19,999	15	6	14	0	35	10.7%	20	24.4%
$20,000 - $34,999	37	11	14	0	62	19.0%	25	30.5%
$35,000 - $49,999	52	6	18	0	76	23.3%	24	29.3%
$50,000 - $74,999	94	5	0	0	99	30.4%	5	6.1%
$75,000 - $99,999	28	0	0	0	28	8.6%	0	0.0%
$100,000 +	18	0	0	0	18	5.5%	0	0.0%
Total	244	28	54	0	326	100.0%	82	100.0%
Percent of Total	74.8%	8.6%	16.6%	0.0%	100.0%			
Age of Householder								
Householder Aged 15-24	0	0	0	0	0	0.0%	0	0.0%
Householder Aged 25-34	26	0	5	0	31	9.5%	5	6.1%
Householder Aged 35-44	72	8	18	0	98	30.1%	26	31.7%
Householder Aged 45-54	47	3	4	0	54	16.6%	7	8.5%
Householder Aged 55-64	37	3	17	0	57	17.5%	20	24.4%
Householder Aged 65-74	39	8	8	0	55	16.9%	16	19.5%
Householder Aged 75+	23	6	2	0	31	9.5%	8	9.8%
Total	244	28	54	0	326	100.0%	82	100.0%
Percent of Total	74.8%	8.6%	16.6%	0.0%	100.0%			

Note: Shaded area represents low/moderate income households with housing needs
Source: U.S. Census

Rental Housing Costs

The following section provides similar information on the cost and affordability of rental housing in Colrain. For purposes of measuring rental housing costs and affordability, the U.S. Census uses “gross rent” rather than “contract rent”. Gross rent includes heat, utilities, and other costs that may or may not be included under the terms of the contract rent. The Census also counts renters who pay no cash rent. The distribution of the town’s renter households by the gross rent paid in early 2000 and number of bedrooms, appears in Table 1-12. As shown, the median monthly gross rent paid by 80 Colrain renter households at that time, was $577. The local median was $36 (6%) above

Franklin County as a whole, but $107 (16%) below the Massachusetts statewide median gross rent of $684.

Table 1-12. Monthly Gross Rent By Number of Bedrooms
Town of Colrain

Gross Rent	1-Bedroom	2-Bedroom	3+Bedrooms
No Cash Rent	0	8	3
With Cash Rent			
Less than $200	0	0	0
$200 to $299	0	2	0
$300 to $499	11	7	8
$500 to $749	9	6	20
$750 to $999	2	0	15
$1000 or More	0	0	0
Subtotal	22	15	43
Median Gross Rent		$577	
Total Renter Households		91	
Source: U.S. Census			

As is also shown in the table, Colrain has a significant number of three-bedroom rentals which comprise slightly more than half of the town's rental housing stock and contribute to the rent level which is modestly above the County median. At the same time, there are a total of 11 units (including 3 three-bedroom units) in Colrain's housing supply which had no cash rent in 2000. Although no renter households paid more than $1,000 per month in rent, interestingly, of the renter households who paid a monthly gross rent of more than $750 in 2000, 2 (representing 13% of the units in this rent price range) rented one-bedroom units. Among three-bedroom units which comprise the majority of Colrain's rental housing stock, 76% had monthly gross rents between $500 and $999 in 2000.

Renter Housing Affordability

A similar measure of affordability applies to rental housing. Renters households who spend more than 30% of their monthly income on gross rent are considered to have affordable housing needs. Table 1-13 contains a distribution of renters by the percentage of household income that is spent on gross monthly rent. Unlike owner-occupied housing, renter affordability is less of an issue in Colrain when compared to either Franklin County or Massachusetts. The 2000 Census estimated that 18 Colrain households (20% of all renters), spent more than 30% of their incomes on gross rent, and the vast majority of these renters (15 out of 18) spent more than 35% of their income on rent. Although one-fifth of Colrain renters had affordable housing needs, the percentage was significantly lower than either Franklin County (35.2%) or Massachusetts as a whole (36.3%).

Table 1-13. Gross Rent as a Percentage of Household Income: 1999 Colrain, Franklin County and Massachusetts						
	Colrain		Franklin County		Massachusetts	
	#	% of Total	#	% of Total	#	% of Total
Less than 20%	41	45.1%	2,981	31.4%	309,118	33.2%
20.0% to 29.9%	19	20.9%	2,432	25.6%	226,551	24.3%
30.0% to 34.9%	3	3.3%	714	7.5%	71,917	7.7%
35% or More	15	16.5%	2,633	27.7%	266,864	28.6%
Not Computed [1]	13	14.3%	743	7.8%	57,623	6.2%
Total	91	100.0%	9,503	100.0%	932,073	100.0%
Note: [1] Not computed includes households with no income or a net loss. Source: U.S. Census 2000						

Table 1-14 further segments Colrain renters by household income and age of householder, as well as by the percentage of household income paid for housing. Unlike homeowners, all Colrain renters with affordability needs earned below $35,000 in 1999, and are thus likely to be low or moderate income households. About 72% of those renters with affordablility needs earned incomes below $20,000, suggesting that their housing issues were probably more related to inadequate incomes than high rental housing costs.

The distribution of Colrain renters by age of householder also shows that 20 elderly households were renters in 2000, including only 5 renters who paid more than 30% of their income for housing. Among the 18 renter households with affordability needs, slightly more than half (10) were headed by persons under the age of 35 and only 17% (3 households) were between the ages of 35 and 64. The small number of existing elderly Colrain renters suggests that if the Town were to develop affordable rental housing for the elderly, the majority of prospective tenants would have to come from either current homeowners or non-residents of the community. Similarly, the larger number of young rental households indicates a potential need for subsidized/assisted family rentals, or affordable homes for first-time buyers.

Table 1-14. Monthly Rental Costs by Income, Age of Householder and Percentage of Household Income Paid in Gross Rent: 1999

Town of Colrain

Income Bracket	Monthly Gross Rent as a % of Household Income					Total with Affordability Needs	Percent of Total
	Less than 29%	30-34%	35% or More	Not Computed	All Renters Total		
Under $10,000	0	0	0	2	2	0	0.0%
$10,000 - $19,999	0	0	13	5	18	13	72.2%
$20,000 - $34,999	19	3	2	2	26	5	19.2%
$35,000 - $49,999	26	0	0	0	26	0	0.0%
$50,000 +	15	0	0	4	19	0	0.0%
Total	60	3	15	13	91	18	19.8%
Householder Age	Monthly Gross Rent as a % of Household Income					Total with Affordability Needs	Percent of Total
	Less than 29%	30-34%	35% or More	Not Computed	All Renters Total		
Householder Aged 15-24	4	0	0	0	4	0	0.0%
Householder Aged 25-34	33	0	10	2	45	10	22.2%
Householder Aged 35-44	7	0	0	0	7	0	0.0%
Householder Aged 45-54	7	3	0	1	11	3	27.3%
Householder Aged 55-64	4	0	0	0	4	0	0.0%
Householder Aged 65-74	2	0	2	7	11	2	18.2%
Householder Aged 75+	3	0	3	3	9	3	33.3%
Total	60	3	15	13	91	18	19.8%

Note: Shaded area represents low/moderate income households with housing needs
Source: U.S. Census

Existing Supply of Affordable/Assisted Housing

The Massachusetts Department of Housing and Community Development (DHCD) maintains documentation of individual communities' progress toward meeting the State's 10% goal for the provision of affordable housing under M.G.L. Chapter 40B[8]. Although there are units in Colrain which are affordable without subsidies, only those units which receive direct subsidies from the State and/or Federal government are counted toward the 10% goal. According to DHCD, Colrain had 15 Chapter 40B units, representing 2% of the town's total housing stock.

Table 1-15 presents comparative information for Colrain and selected nearby communities, concerning to the total number of existing subsidized/assisted affordable housing units and percentage of affordable housing in each community. Of the seven

[8] A unit qualifies as affordable under Chapter 40B if it has (a) received a subsidy approval from the federal or state government, (b) the subsidy enables the units to be affordable to people or families with incomes no higher than 80% of the PMSA, MSA or County in which the unit is located, and (c) restrictions or resale controls guarantee preservation of the subsidy beyond the minimum established time requirements.

communities in the table, only the Town of Greenfield has achieved the 10% affordable housing goal under Chapter 40B. According to DHCD, Colrain would need approximately 60 more affordable units in order to meet the 10% goal.

Table 1-15. Chapter 40B Inventory: 2002
Colrain and Selected Communities

Community	2000 Year Round Units	Chapter 40B Units	% Subsidized
Greenfield	8,274	1,147	13.86%
Shelburne	873	46	5.27%
Colrain	*749*	*15*	*2.00%*
Charlemont	576	9	1.56%
Buckland	812	9	1.11%
Leyden	288	2	0.69%
Heath	416	2	0.48%

Source: Mass. Department of Housing and Community Development

Estimated Existing and Future Affordable Housing Needs

Characteristics of Households with Housing Needs

The final task in this section is to summarize the number existing/future Colrain low and moderate income homeowners and renters who have affordable housing needs. If it is assumed that the Town's first responsibility under M.G.L. 40B is to work toward meeting the housing needs of its own population, then appropriate housing strategies would be directed to supplying the types of housing products that are suitable for existing low and moderate income residents. The total number of income-eligible owner and renter households with affordable housing needs is estimated from the preceding sections and summarized in Table 1-16.

Table 1-16. Estimate of Low/Moderate Income Households with Housing Needs: 2000

Town of Colrain

Age Group	Owners	Renters	Total Households	% of Total
Non-Elderly	37	13	50	70.4%
Elderly	16	5	21	29.6%
Total	53	18	71	100.0%

Source: U.S. Census and RKG Associates, Inc.

An estimated 53 owner an 18 renter households in Colrain had low or moderate incomes and paid more than 30% of their monthly income on housing costs during 1999. The analysis also indicates that 50 of the estimated 71 Colrain households with housing needs in 2000 were non-elderly, with almost 75% being homeowners.

Similarly, almost 76% of existing elderly residents with housing needs were homeowners.

The above estimate of 71 households with affordable housing needs is about 4 less, but comparable to the number of affordable units required to achieve the Town's 10% goal under M.G.L. 40B. While it may not be feasible to construct 71 affordable housing units in Colrain, the analysis clearly shows that many income-eligible local residents could benefit from whatever housing initiatives the Town may undertake.

After establishing a realistic baseline of existing housing needs, it is necessary to forecast future housing growth requirements based on projected local population growth and a reasonable allowance for regional demand. Accurately forecasting population growth for small rural communities can be particularly difficult. For example, population estimates prepared by the Massachusetts Institute of Social and Economic Research (MISER), a year prior to the 2000 Census, underestimated Colrain's 2000 population by 135. Consequently, MISER's 2000 to 2010 population forecasts for Colrain projects an increase of 177 (9%) over the decade.[9] At the same time, MISER overestimated Franklin County's 2000 population by 2.7%. Therefore, county-wide projections, which anticipate a population increase of more than 5,500 (7.5%) over the next decade, are likely to be overstated. Another source used for this report, Woods & Poole Economics, Inc., forecasts Franklin County's population to increase by a modest 1.6% (1,160) by 2010, with a comparable increase in households. This forecast was prepared in 2001 and uses a 2000 base year estimate that is comparable to the Census.

Relying on this limited available data, it is estimated that Franklin County's population growth will result in an additional 1,200 new households by 2010. Based on Colrain's current share of County population, approximately 30 households could also be added to the town over the same time period. This estimate would be approximately half the increase of 63 households experienced over the past decade, and is also below the number of units (between 50 and 74) added during the 1990s.

The estimate of households with housing needs appearing in Table 1-16, represents 13% of all Colrain households and roughly 43% of the estimated 235 low and moderate income households who lived in the community in 2000. Applying these same ratios to future households, it is reasonable to assume that the number of households with affordable housing needs would grow by about 4 units by 2010. Added to estimated existing housing needs in 2000, the number of households needing affordable housing could be approximately 75 by 2010. It is also assumed that the nature of these households by age and tenure would be similar to the distribution shown in Table 1-16.

[9] MISER's population projections were developed in 1999 and understated Colrain's 2000 Census population by 177. Consequently, projections showing future population declines are based on inaccurate growth trends.

Recommended Types of Affordable Housing

The previous section estimated the number and characteristics of existing/future low and moderate income resident households with housing needs. The next step in developing an affordable housing strategy for Colrain involves determining the types of housing units which may be attractive to or suitable for these households. Because 71 to 75 units represent 10 to 20 years of total residential construction activity in the town based on historical trends, it is not realistic to expect that all of these identified needs for low and moderate income residents can be satisfied over the next decade, particularly through new construction. The fact that much of the existing housing stock in Colrain is valued below the cost of new construction further favors strategies aimed at the rehabilitation and preservation of existing units, rather than new development. Therefore, the data presented in Table 1-17 should **not** be viewed as a projection of affordable units to be built in the community over the next decade (or two), but rather as a reasonable representation of how future resources could be allocated as they become available, based on identified local needs.

Table 1-17: Recommended Colrain Affordable Housing Strategy by Households Type and Project Component
Town of Colrain

Housing Type and Income Level	Household Status				All Households	% of Total
	Non-Elderly Owners	Non-Elderly Renters	Elderly Owners	Elderly Renters		
Low/Moderate Income Households	*37*	*13*	*16*	*5*	*71*	*100.0%*
1. Housing/Neighborhood Rehabilitation	26				26	36.6%
2. Affordable/Assisted Family Rentals		10			10	14.1%
3. Affordable Elderly or Assisted Living			8	5	13	18.3%
4. Single-Family Starter Homes	11	3			14	19.7%
5. Market Rate Rental Housing			8		8	11.3%
Middle Income Households [1]	*0*	*0*	*0*	*0*	*0*	*0*
1. Housing/Neighborhood Rehabilitation	0	0	0	0	0	0.0%
2. Affordable/Assisted Family Rentals	0	0	0	0	0	0.0%
3. Affordable Elderly or Assisted Living	0	0	0	0	0	0.0%
4. Single-Family Starter Homes	0	0	0	0	0	0.0%
5. Market Rate Rental Housing	0	0	0	0	0	0.0%
All Income Levels	*37*	*13*	*16*	*5*	*71*	*100.0%*
1. Housing/Neighborhood Rehabilitation	26	0	0	0	26	36.6%
2. Affordable/Assisted Family Rentals	0	10	0	0	10	14.1%
3. Affordable Elderly or Assisted Living	0	0	8	5	13	18.3%
4. Single-Family Starter Homes	11	3	0	0	14	19.7%
5. Market Rate Rental Housing	0	0	8	0	8	11.3%

Note:
[1] Middle income households are assumed to require no housing assistance due to the comparatively low real estate values and overall housing costs in the Town of Colrain.

Source: RKG Associates, Inc.

The following points highlight the recommendations contained in Table 1-17.

- It is recommended that approximately 37% of projected future needs (26 units) should be met through the rehabilitation and subsidy of existing units through neighborhood revitalization efforts, rather than new construction. Based on information provided by property tax assessment records, there appears to be a total of 25 duplexes within Colrain (for a total of 50 units). It appears that most of these units are located in or within close proximity to the town's core area. In addition, there are roughly 80 single family homes located within and near the core area, which have an average 2003 assessed value of roughly $107,000. A portion of these units may also be involved in efforts to provide affordable resale housing for first-time home-buyers.

- It is recommended that the Town work to develop 10 units of affordable rental units for families, focusing primarly on the needs of single-parent households. Although there appears to be approximately 100 acres of privately owned undeveloped land located near the village core area which could offer potential locations for assisted family housing or a mix of family and elderly units. It should be noted that a portion of this land may not be suitable for development due to environmental factors and other development constraints.

- It is recommended that the Town work to provide up to 13 units of subsidized elderly housing or assisted living units for low and moderate income elderly residents, either within Colrain or as part of a regional initiative. As it may not be economically feasible to operate such a facility on a small scale, supporting a regional approach may be the most practical solution to provide options for the town's advanced elderly population.

- It is recommended that the Town work to provide up to 14 affordable home ownership opportunities for non-elderly owners and renters, through a combination of rehabilitation and new construction.

- Finally, it is probable that some portion of housing needs for both non-elderly and elderly residents could be satisfied through the provision of reasonably priced market rate rental housing within the town, regardless of whether the units are subsidized. It is recommended that the town consider measures to encourage the development on one or two new market rate rental projects over the next decade, providing for a minimum of three to four rental units. It is possible that these market rate units could be developed in conjunction with affordable family rentals.

- Given the comparatively reasonable cost of housing throughout Colrain, we do not believe it is necessary for the Town to undertake any initiatives to provide housing opportunities for middle-income households at this time. While some middle-income households in Colrain do allocate more than 30% of their incomes

in housing costs, it is likely that many have chosen to do so voluntarily, for lifestyle or other reasons.

Furthermore, Map 1-1 (Housing Suitability Map), located at the end of this element, provides a general indication of areas within the community which may be suitable for future housing development.

5. Housing Recommendations

Based on the discussion, the following recommendations and strategies are proposed to help address Colrain's housing issues and needs, and to achieve the goals and objectives outlined earlier.

Zoning Recommendations

- Consider revising the Town's zoning ordinances to allow greater flexibility for property owners to develop rental housing either within the village core, or in close proximity to public utilities. Such provisions should be approached with a long-range perspective, because local development economics may make it impossible for the private sector to feasibly build market rate rentals in Colrain for the next several years.

- Examine provisions in the Zoning Bylaws which relate to accessory apartments. Accessory apartments could provide lower cost housing for seniors, young couples and single parent households and could offer an income stream for fixed-income households. Although, many of the single family homes in and around the village core area have finished areas of less than 2,000 square feet, there may be a few dwellings could be suitable candidates for the development of accessory units. Furthermore, there may be opportunities for the development of accessory units in larger outbuildings (such as barns, etc.) on larger single family and multi-family parcels.

- Promote the use of cluster development to enable construction on smaller lots in exchange for land being set aside as open space.

- Perform a comprehensive inventory on the supply of tax exempt and undeveloped parcels in Colrain and identify those that may have the potential to be developed for mixed-income or affordable housing. The inventory should evaluate the supply and development potential of tax exempt and undeveloped parcels for mixed-income or affordable residential units. Additionally, it is suggested that performance based development guidelines which reflect smart growth principles be adopted for non-conforming (due to limitations in parcel size, frontage, etc.) undeveloped parcels should an affordable housing unit or units be proposed for development on such respective parcels.

Other Strategies

- Develop a program for the Town to take advantage of suitable residential tax-title property opportunities that may become available for development as affordable housing. In order to increase the supply of affordable housing units in Colrain, the Town should partner with housing agencies, organizations and financial institutions to develop and implement a program to take advantage of suitable residential tax-title properties. The program and partnership should utilize the assets of the Town and each organization to redevelop suitable tax-title residential properties into affordable units.

- Pursue participation in housing rehabilitation loan programs to enable low and moderate income seniors, non-elderly homeowners and rental property owners, who do not have the financial resources to fund home improvements and repairs on their own, including accessibility improvements and septic system upgrades. Use housing rehabilitation loans to help secure additional subsidies to create Chapter 40B affordable units within Colrain's existing 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. Work to identify one or more sites within/near the village core area that could be appropriate for the construction of assisted housing for either elderly or non-elderly residents.

- Develop strategies to reduce housing cost burdens for senior residents on fixed incomes. Such strategies could include allowing residents to volunteer for the Town in exchange for a partial abatement of property taxes. The Massachusetts General Laws (Chapter 59, Section 5K) allows communities to establish such a program for residents age 60 and over, and a number of Massachusetts communities have established them. Residents who volunteer through such a program can have a property tax abatement of up to $750 per year.

- Work with legislators to encourage the State to continue revising Chapter 40B to provide additional flexibility and local control in the creation of affordable housing. In particular, seek to gain flexibility for rural communities with comparatively low housing costs and limited development activity, to count existing low-cost dwellings toward their 10% allocation, regardless of whether the units are subsidized.

- The large majority of existing Colrain households with affordable housing needs are non-elderly. For many of those households, housing costs are burdensome not because housing costs are unreasonably high, but because their household income levels are very low. Based on the preceding analysis, it is apparent that much of Colrain's affordable housing needs could be more efficiently addressed through efforts to provide greater economic opportunities to local residents and

thus raise their income levels, rather than building a larger supply of deeply subsidized units.

- Finally, this report has identified an increasing pattern of acquisition of land and buildings in Colrain by non-residents of the town. Although this activity has not yet resulted in the construction of large numbers of dwelling units, there is the potential that Colrain could become a more attractive seasonal, retirement home community over the next decade. The Town should closely monitor this sale activity in an effort to understand and plan for its future implications.

The preceding section summarized potential strategies and recommendations to expand Colrain's affordable housing supply. These strategies will help to increase housing affordability in Colrain, for low and moderate -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 open space, scenic, and historic resources. The strategies presented above focus on using the existing housing stock to the extent possible to meet housing needs, and on developing new and infill housing primarily within or near the village core area.

As noted above, the number of housing units sold and/or built in Colrain is relatively small, averaging roughly 8 home sales and approximately 5 new dwelling units constructed on an annual basis (based on the number of units added during the 1990s). In this limited market context, the construction of large numbers of assisted dwelling units in a single year would likely make it difficult for income-eligible residents to sell their homes in order to take advantage of the opportunity of "trading down" into more affordable units. Construction of a large number of assisted rentals at one time could also raise vacancy rates within the limited number of existing rental units and create undesired consequences in the form of declining property values or more substandard housing.

For these reasons, it is recommended that the Town focus on rehabilitation activities first, in an effort to improve market conditions and values within the existing housing supply. It is also recommended that the Town support regional initiatives to provide subsidized units for single parent households and subsidized or assisted living units for its advanced elderly population, because it is unlikely that a facility could be feasibly developed within Colrain for the foreseeable future. In light of local real estate market conditions and assuming that a minimum of 50% of identified near-term needs can be satisfied though rehabilitation or regional solutions, we believe it is reasonable for Colrain to add a maximum of 10 to 20 affordable units over the next decade. This would raise the percentage of affordable housing in Colrain to approximately 4% to 4.7% of total supply by 2010 (from a current level of 2%) depending upon the overall level of residential construction that occurs over the same period.

Due to the primarily rural character of county and the Franklin County Regional Housing and Redevelopment Authority (HRA) being the primary conduit for affordable housing

policy and programs, Colrain's housing policy should reflect existing regional housing policies. That being said, it is important that Colrain's housing element reflect the content, in particular the goals and recommendations, of HRA's regional housing policy so as create a document that leverages resources that are available through the HRA. The following are the goals and recommendations of the HRA's regional housing plan.

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 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's and local housing authorities' 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 authorities' 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's and local housing authorities' 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.

Insert Map 1-1 (Housing Suitability) here

TRANSPORTATION

TOWN OF COLRAIN

PAVEMENT MANAGEMENT STUDY

FRANKLIN REGIONAL COUNCIL OF GOVERNMENTS
425 Main Street, Greenfield, MA 01301
413-774-3167

JUNE 2004

TOWN OF COLRAIN

PAVEMENT MANAGEMENT STUDY

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 and the FRCOG continues its commitment to assist Franklin County communities who are interested in establishing a Pavement Management System for their community. The Town of Colrain 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.

Based on the pavement surface survey conducted in the Spring of 2004, the paved road network maintained by the Town of Colrain is currently in a "Fair" condition with an average pavement condition index (PCI) of 81. The distribution of the mileage by repair type indicates that the Town's highway department has been practicing excellent pavement management practices with the limited funding that have been available. The Town currently faces an estimated Backlog of Repair of just over $1.9 million. Two funding scenarios were analyzed to predict their potential impacts on the paved road conditions over a ten-year period.

The first scenario used the existing Chapter 90 funding levels, plus $1.2 million of Federal Funds to Rehabilitate Greenfield Road. It was shown that there would be sufficient funds to keep pace with the majority of repair needs through 2011. By 2012, roadways repaired in 2004 and 2006 would be reaching a level of deterioration where repairs would be once again be required. The resulting accelerated increase in the Backlog of Repair and the decline in the average PCI indicates that near the end of the ten years analyzed that the funding levels will not be sufficient to keep pace with all these repair needs.

The second scenario used Chapter 90 funding levels as if the statewide program had been increased from the present $100 million back to a $150 million, plus $1.2 million of Federal Funds to Rehabilitate Greenfield Road. This scenario showed that by 2011, the paved road network would have been improved to a perpetual Good to Excellent condition and for each year after that there would likely be sufficient funds to keep pace with all the prescribed repairs needs.

Between the two scenarios there is a difference of $765,000 in investment over the ten years analyzed, resulting in a $940,000 reduction in the Backlog of Repairs by 2013. The more significant difference between the scenarios is that with the increased Chapter 90 funds, it is likely that the Good to Excellent conditions achieved in 2013 would continue to be maintained, whereas the Good conditions achieved with existing Chapter 90 funds would likely not be maintained after 2011 when the average condition of the paved road network would begin to decline.

This analysis indicates in the absence of additional Chapter 90 funds, that the Town should pursue alternative funding sources in the next few years to ensure that roadways do not deteriorate to a point where more expensive repairs would be required.

The Town now has the base data that it needs to monitor pavement conditions over time and continue to prioritize repairs in the most cost effective way. The FRCOG will continue to provide support to the extents 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 Ashfield, Buckland, Heath, Gill, Orange, Shelburne, Shutesbury and Whately. The Town of Colrain 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.

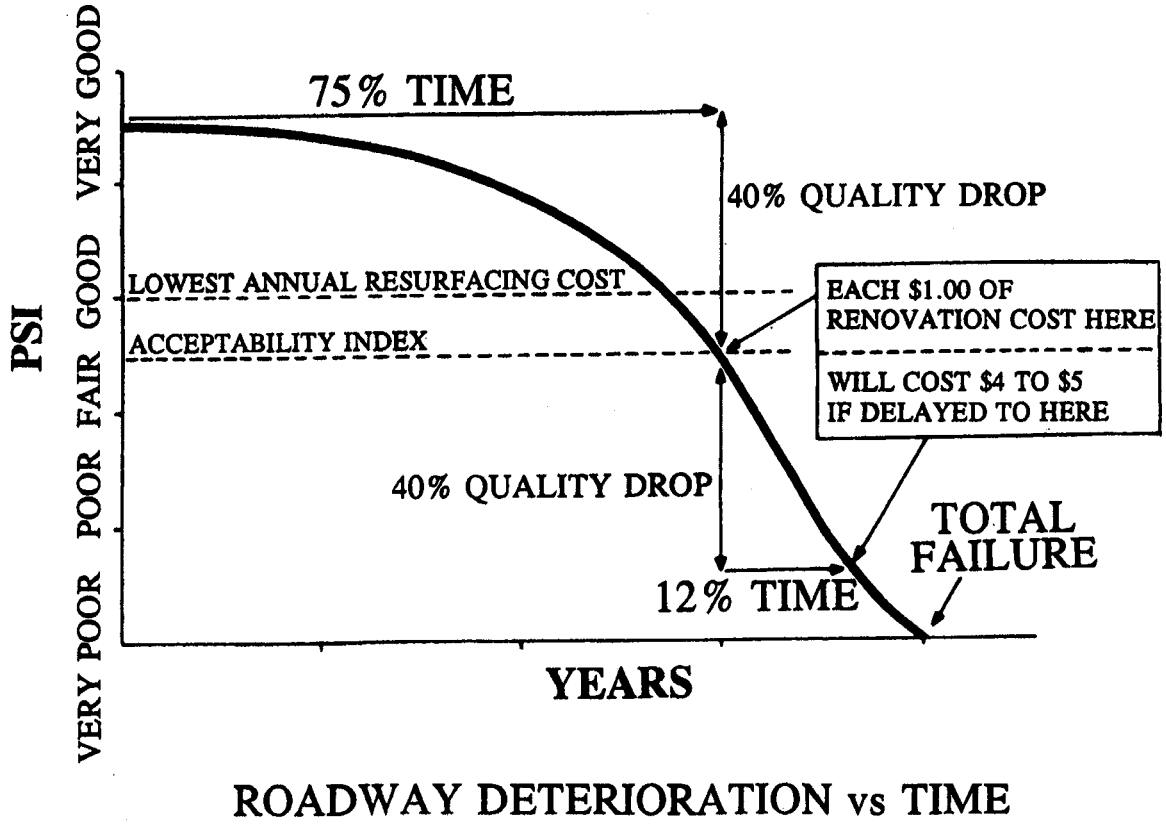
A Pavement Management System (PMS), as defined by the American Public Works Association (APWA), is "a systematic method for routinely collecting, storing, and retrieving the kind of decision-making information needed (about pavement) to make maximum use of limited maintenance and construction dollars." 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 to formalize a pavement management system for the Town.

Figure 1: Life Cycle of Asphalt Pavement



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. For Colrain, this amounted to some road name corrections and the additions of sections of town roadway that are no longer maintained. 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 Colrain is comprised of both paved and gravel surfaced roadways. According to the 2002 year-end release of the RIF with the subsequent updates, the Town currently maintains 78.51 miles of roadway. In addition, there is approximately 3.75 miles

of roadway that the Town has not officially discontinued, but no longer maintains (it should be noted that this mileage an estimate based on an approximation of the road alignment identified from aerial photographs). These unmaintained sections of roadway are between North and South Catamount Hill Roads, between Maxam Road and Dwight Cross Road, the middle section of Fort Lucas Road, the Middle section of Barber Hill Road, and the removed bridge on Lyonsville Road. MassHighway is responsible for the maintenance of 3.92 miles of roadway (Route 112), State Park authorities maintain 2.16 miles of roadway and unaccepted (abandoned or privately maintained) roadways account for an additional 1.81 miles. This produces a total of 86.4 miles of paved and gravel recognized roadways in the Town of Colrain. It should be noted that these mileages are provisional until MassHighway has accepted the submitted updates. Map 1 shows the Colrain 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.

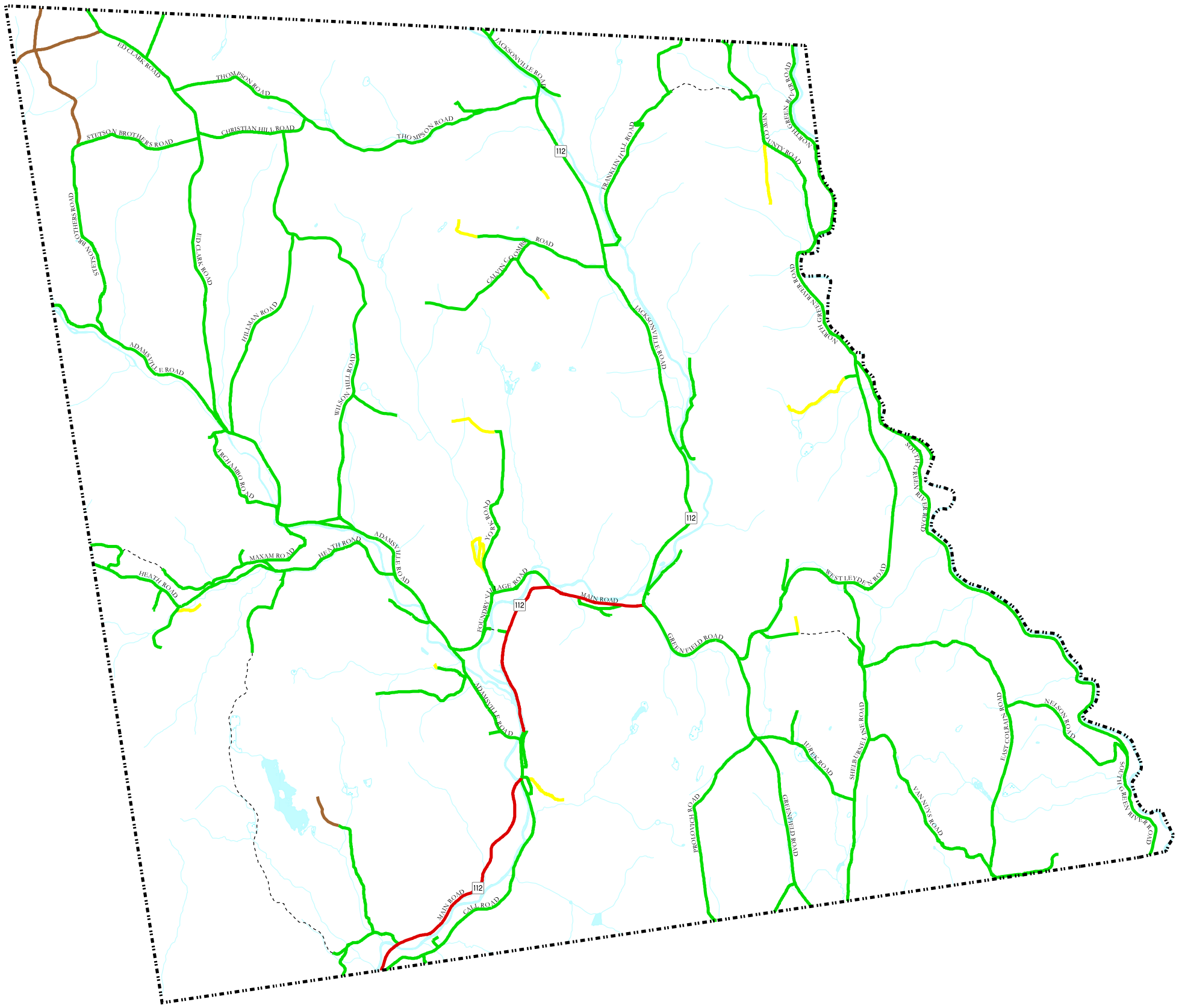
Arterials and Collectors have further sub-classifications of "Urban" or "Rural", and "Major" or "Minor" based on population density characteristics. All roadways in Colrain are termed "Rural".

Colrain's road network is made up of Arterial, Collector and Local classified roadways. Map 2 shows the road network and the assigned functional classifications. Of the 78.51 miles of roadway actively maintained by the Town, 7.86 miles are classified as Rural Minor Arterial, 5.66 miles are classified as Rural Major Collector, 6.19 miles are classified as Rural Minor Collector and 58.80 miles as Rural Local. Town maintained roadways functionally classified as Rural Minor Arterial and Rural Major Collector, are eligible for Federal Aid and STP funds for reconstruction or rehabilitation through the Transportation Improvement Program (TIP) process. The Town maintained roadways eligible to apply to the TIP process are Greenfield Road,

[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 COLRAIN PAVEMENT MANAGEMENT STUDY

Map 1 - Maintenance Authority



N

0 1 2 Miles

Maintenance Authority

- MassHighway
- Town Road
- Unmaintained Town Road
- State Park or Forest
- Unaccepted Road
- Town Boundary
- River or Stream
- Water Body
- Wetland

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.

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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425 Main Street
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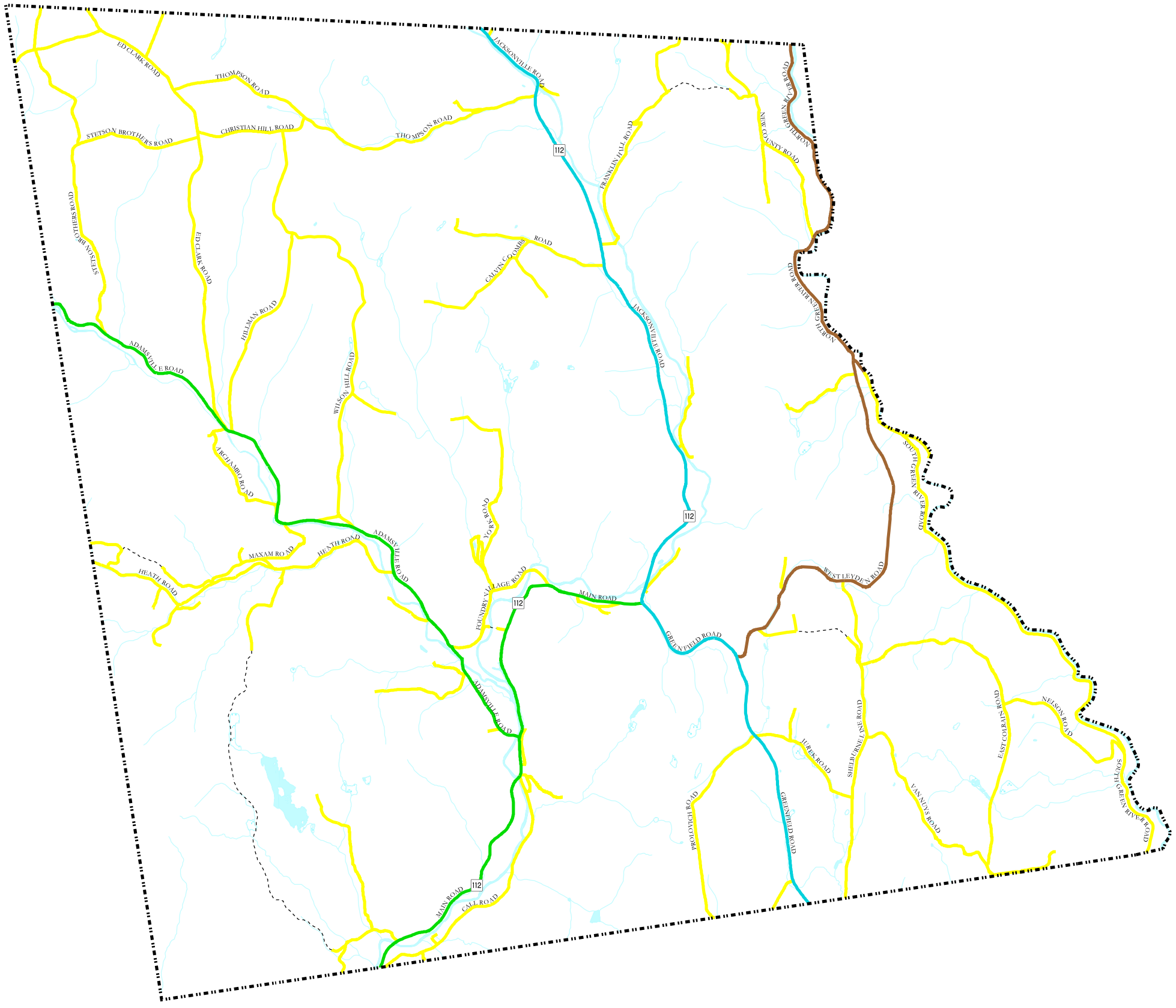
JUNE 2004

Map composed by FRCOG Planning Department. c:\My Documents\Pms\E0418MapFiles\pavement\a_colr_pave.apr

TOWN OF COLRAIN PAVEMENT MANAGEMENT STUDY

Map 2 - Functional Classification



N

0 1 2 Miles

Functional Classification

- Minor Arterial
- Major Collector
- Minor Collector
- Local Road
- Unmaintained Town Road
- Town Boundary
- River or Stream
- Water Body
- Wetland

Data Sources:

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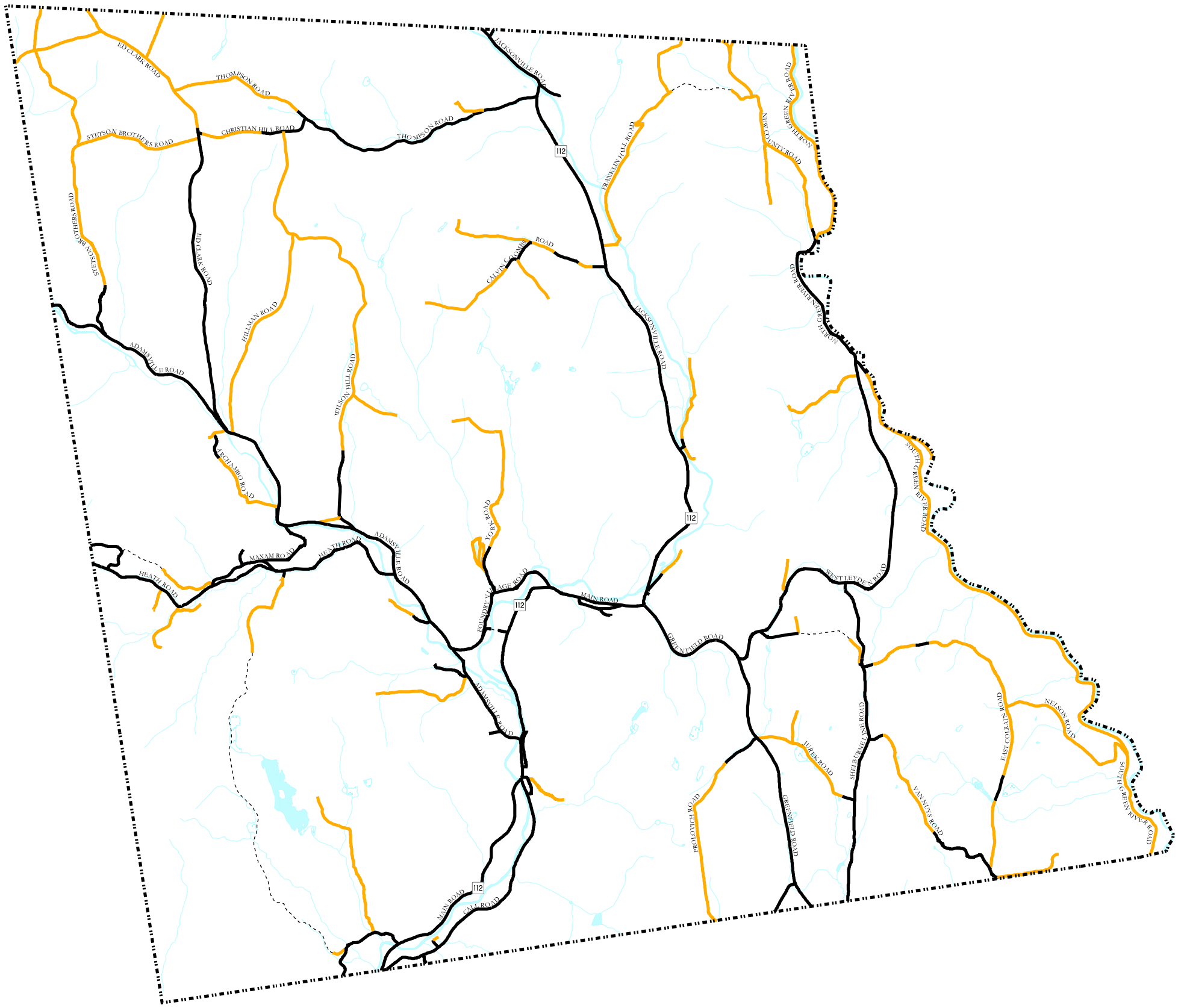
TOWN OF COLRAIN PAVEMENT MANAGEMENT STUDY

Map 3 - Surface Type



N

0 1 2 Miles

Surface Type

- Paved Road
- Gravel Road
- Unmaintained Town Road
- Town Boundary
- River or Stream
- Water Body
- Wetland

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.

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Jacksonville Road (Route 112), Main Road (Route 112) between Call Road and Adamsville Road. West Leyden Road and North Green River Road are classified as Rural Minor Collector. Main Road (Route 112) between the Shelburne Town Line and Call Road and between Adamsville Road and Greenfield Road is maintained by MassHighway and is functionally classed as Rural Major Collector. All the unaccepted roadways are functionally classified as Rural Local.

As mentioned previously, there are 78.51 miles of Town paved and gravel roads currently being maintained. This report deals only with the paved road network. This study identified 40.85 miles of paved roadway and 37.66 miles of gravel roads currently maintained by the Town. Map 3 distinguishes the paved road network from the gravel surfaced roadways. The 3.92 miles of MassHighway maintained roadways are all paved, but these roadways were not 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 representative width were recorded along with the pavement type. The second pass was made at low speed (5 mph) during which the average pavement distresses seen on the surface 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 no immediate to preventative maintenance 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.

$$BV = \frac{\textbf{365 x ADT x Section Length x Estimated Life of Repair}}{\textbf{Current Cost of Repair x Pavement Condition Index}}$$

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.. Appendix A contains a table of the ADT volumes collected in Colrain from 1992 through 2003 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 spring of 2004. 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 initially conducted during June 2003 and then updated in May 2004 to identify any improvements or deterioration that may have occurred after the initial survey.

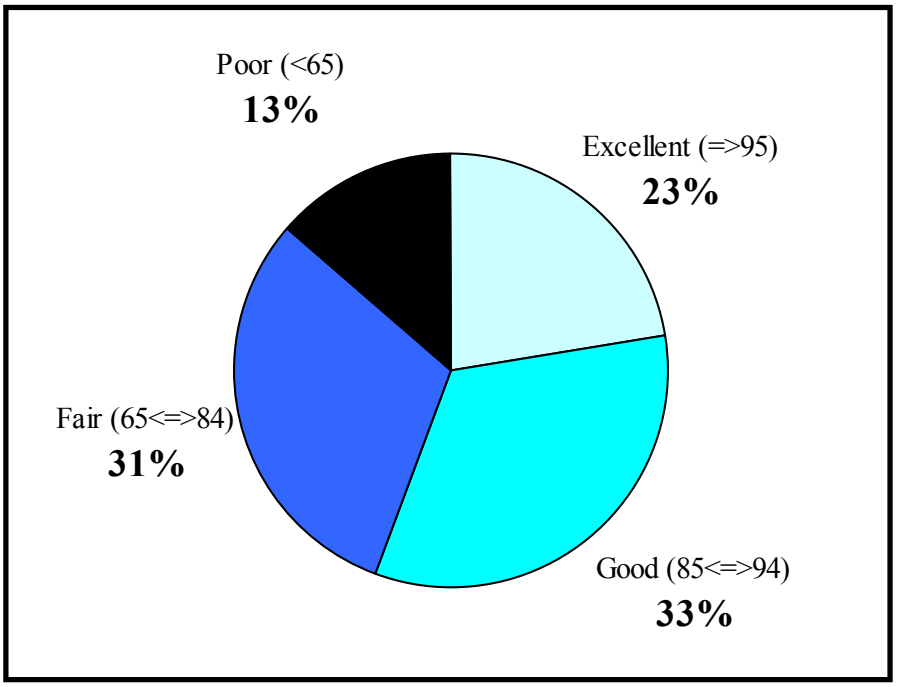
Appendix B contains detailed information on the existing conditions of the paved road network. Table 1 and Figure 2 summarize the results of the pavement management analysis of existing conditions for Town maintained paved roadways, while Map 4 shows the existing conditions broken down into the four condition categories: Excellent, Good, Fair, and Poor for all the surveyed Town maintained paved roadways.

Overall, the conditions of the Town maintained paved road network in Colrain could be considered as Fair, with an average PCI equal to 81. Just over half (56%) of the Town maintained paved road network is currently in an Excellent or Good condition. Prominent roadway in excellent condition includes sections of Adamsville Road west of Route 112 and between Stetson Brothers Road and Maxam Road, the northern portion of Ed Clark Road and all of Call Road. Around 30% of the paved road network is currently in a Fair condition and 13% (5.54 miles) of roadway is in a Poor condition. Prominent roadway in Poor condition includes sections of Greenfield Road, Ed Clark Road, Heath Road and North Green River Roads. The remaining mileage of roadway in poor condition are primarily low volume minor roadways.

Table 1: Summary of Existing Pavement Conditions for Town Maintained Paved Roads

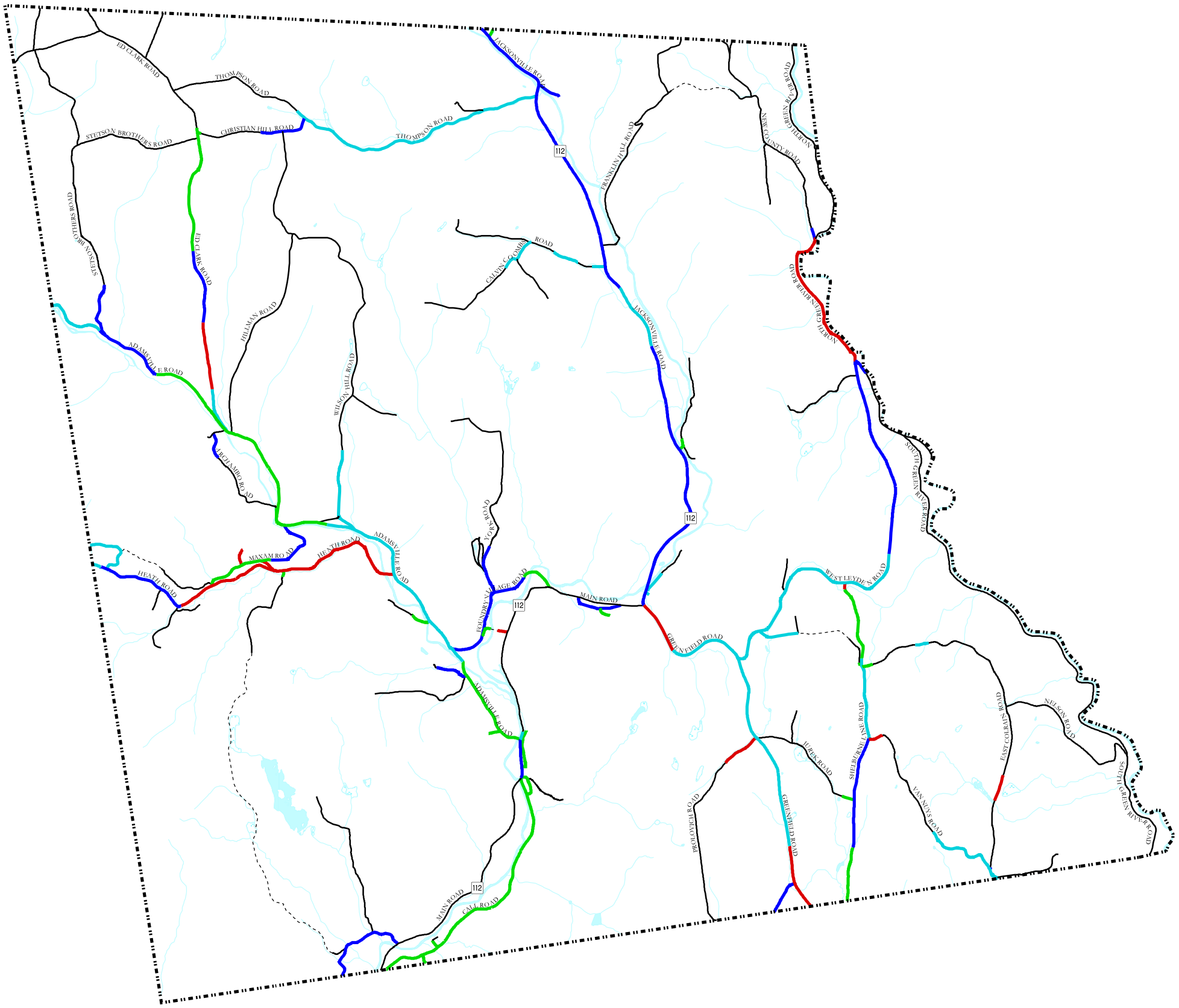
PAVEMENT CONDITION (PCI Range)	Number of Miles	% of Total Mileage
Excellent (=>95)	9.22	23%
Good (85<=>94)	13.50	33%
Fair (65<=>84)	12.59	31%
Poor (<65)	5.54	13%
Total Mileage	**40.85**	

Figure 2: Summary of Existing Pavement Conditions for Town Maintained Paved Roads



TOWN OF COLRAIN PAVEMENT MANAGEMENT STUDY

Map 4 - Existing Pavement Conditions [2004]



N

0 1 2 Miles

Pavement Conditions

- EXCELLENT
- GOOD
- FAIR
- POOR
- Not Surveyed
- Unmaintained Town Road
- Town Boundary
- River or Stream
- Water Body
- Wetland

Data Sources:

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Assignment of Repair Strategies

With the existing conditions documented and the road segments grouped into the four condition categories, a breakdown of the assigned repairs and their estimated costs are presented. This information is summarized in Table 2 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 $1,933,163 for Town maintained paved roadways. The Fair overall condition of the Town maintained paved road network in Colrain is reflected in the size of the Backlog of Repair total. Almost fourteen miles (34%) of the road network currently require no immediate maintenance and an additional twenty miles (49%) have been prescribed lower cost Routine or Preventative Maintenance. The 6.90 miles of roadway prescribed a Rehabilitation Repair accounts for just under half of the Backlog of Repair total.

The distribution of the mileage across the assigned repair strategies that show 67% of the mileage has been prescribed either No Immediate Action or Routine Maintenance repairs indicates that the Town has been following excellent pavement management practices with the limited dollars that have been available.

Table 2: 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	13.98	34%	$0
4. Routine Maintenance	13.41	33%	$388,564
3. Preventative Maintenance	6.56	16%	$570,728
2. Rehabilitation	6.90	17%	$973,871
1. Reconstruction	0.00	0%	$0
Total Mileage	**40.85**		**Backlog of Repair = $1,933,163**

Calculation of a Benefit Value

Of the 115 Town maintained road sections surveyed, 66 (27 miles) sections are prescribed some form of repair. The remaining 49 (14 miles) sections require No Immediate Maintenance at this time. 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 66. Appendix B contains this information for all surveyed road sections. Table 3 on the next page shows the Top 10 ranked road sections for repair in prioritized order according to the calculated Benefit Value.

Table 3: Top 10 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
Main Road	1	Adamsville Road	State Highway	317	80	3	$6,868	1	2500	05/17/04
Greenfield Road	1	Jacksonville Road	WMECO Pole 72	2112	61	2	$72,747	2	2800	05/17/04
Greenfield Road	6	House #265	Shelburne Town Line	2904	62	2	$103,253	3	2800	05/17/04
Greenfield Road	2	WMECO Pole 72	House #78	1901	68	2	$65,479	4	2800	05/17/04
Greenfield Road	4	WMECO Pole 14	Morrell MetalSmith	2904	67	2	$103,253	5	2800	05/17/04
Greenfield Road	3	House #78	WMECO Pole 14	3168	67	2	$112,640	6	2800	05/17/04
Jacksonville Road	1	Greenfield Road	House #58	2904	89	4	$20,973	7	1500	05/17/04
Greenfield Road	5	Morrell MetalSmith	House #265	2904	68	2	$103,253	8	2800	05/17/04
Jacksonville Road	6	House #268	Franklin Hill Road	2270	89	4	$15,133	9	1250	05/17/04
Jacksonville Road	3	NET Pole 41/38	WMECO Pole 60	2640	89	4	$18,333	10	1250	05/17/04

Street Name - Street Name. * Indicates the road section is eligible to receive Federal Aid or Non-Federal Aid for Reconstruction or Rehabilitation.

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)

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.

The top ranked road section is the short section of Town maintained Main Road (Route112) north of Adamsville Road that has been prescribed a Preventative Maintenance repair. The six sections of Greenfield Road, prescribed a Rehabilitation repair are next on the list and above the three sections of Jacksonville Road that have been prescribed a Routine Maintenance repair. The Benefit Value calculation does provide a higher weight to Routine and Preventative Maintenance repairs to reflect the principles of good pavement management practices, but this can be nullified if a road requiring a Rehabilitation or Reconstruction Repair carries a significantly higher traffic volume. This means that Rehabilitation of Greenfield Road, which carries approximately twice the traffic volume on Jacksonville Road, receives a higher ranking. It should be noted the Town has applied for Federal Funds through the Transportation Improvement Program (TIP) for the Rehabilitation of Greenfield Road.

Budgetary Analysis

The primary source of funding for road repairs and reconstruction in the Town of Colrain 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.

Under the $100 million dollar statewide program, the Town of Colrain's allocation of Chapter 90 funding for FY2004 totaled $170,140. Even though Massachusetts is currently facing a budget crisis where many programs are facing cuts in funding, when this analysis was conducted in May 2004 there was no indication that the current Chapter 90 program would be reduced below $100 million statewide.

Roadways that are functionally classified as a Minor Arterial or Major Collector are eligible to receive Federal Aid and Non-Federal Aid for reconstruction or rehabilitation projects through the Transportation Improvement Program (TIP). An explanation of the TIP process appears later in this report. Greenfield Road, Jacksonville Road, Adamsville Road and Main Road are all Town maintained roadways that are eligible for funding under the TIP process. The Town applied to this program to fund the Rehabilitation of Greenfield Road and it has been programmed to receive $1.2 million in funding in FY 2005 and which would likely result in the project being completed during the 2006 construction season.

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.

Existing Funding Levels

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 2004 and 2013, a budgetary analysis was run using the following assumptions:

- Due to the late release of Chapter 90 funding in FY2003 and early release in FY2004, plus a small amount left over from FY1999, there is currently $375,000 available during the 2004 construction season for paved road maintenance. The Highway Superintendent has determined that resurfacing sections of the following three roadways is the most appropriate use of this money.
  - Adamsville Road, between Cemetery Branch and Wilson Hill Road
  - Ed Clark Road, 1.1 miles north of Adamsville Road.
  - West Leyden Road, from Greenfield Road to the Leyden Town Line
- Greenfield Road will be Rehabilitated at a cost of $1.2 million in 2006 using Federal Funds through the TIP process.
- Chapter 90 funding will remain at existing levels through 2013. With the exception of the assumptions noted above, this would be the sole source of funding available to the Town for paved road maintenance. Therefore, $170,000 was allocated each year for pavement maintenance.
- To account for the increasing costs of asphalt products, fuel and labor, an inflation rate of 3% per year has been applied to the analysis.

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 4 provides a general estimate of the future condition of the paved road network as a whole that could be expected under the above funding assumptions. It can be seen that with the initial injection of funds in 2004 the average PCI increases slightly from 81 to 82 and the Backlog of Repairs reduces an equivalent amount to the investment. A more significant jump in the average PCI is seen following the completion of the $1.2 million Rehabilitation of Greenfield Road when the average PCI increased from 82 to 87, taking the average PCI from Fair to Good. From 2007

though 2012 the average PCI is maintained at the 87 level before dropping slightly in 2013. The Backlog of Repair from 2006 through 2011 is maintained between $1 and $1.2 million dollars, before beginning to increase to over $1.4 million in 2013. The increase in the Backlog of Repair and small reduction in the average PCI in 2012 and 2013 is due to the roadways repaired in 2004 and 2006 reaching the point where Routine Maintenance repairs would be required.

Table 4: Projected Backlog of Repair and Average PCI to 2013 with Existing Funding Levels.

Future Year	Funding Level	Backlog of Repair	Average PCI
	Existing Conditions	$1,933,163	81
2004	$375,000	$1,614,376	82
2005	$170,000	$1,973,536	82
2006	$1,370,000	$1,308,683	87
2007	$170,000	$1,204,606	87
2008	$170,000	$1,112,147	87
2009	$170,000	$1,188,421	87
2010	$170,000	$1,096,602	87
2011	$170,000	$1,067,354	87
2012	$170,000	$1,231,806	87
2013	$170,000	$1,436,690	86

Total Funding allocated over ten years equals $3,105,000

Table 5 provides a comparison between the existing conditions and the projected conditions of the paved road network in 2013 under the existing funding assumptions. This comparison shows an increase of just over one mile of roadway in Poor condition and a decrease of eight and a half miles of roadway in Fair condition, while road mileage in Good and Excellent condition would increase by six miles and one mile respectively. This pattern indicates that with the repairs to be made in 2004 and the Rehabilitation of Greenfield Road in 2006 using Federal Funds, that existing Chapter 90 funding levels would be sufficient to keep pace with the majority of the repair needs, but the increase in mileage, although small, in Poor condition indicates that not all the repair needs can be met and some roadways will not receive the prescribe repairs in a timely manner and will decline in condition to where more expensive repairs will be required making it more unlikely they will be completed.

It should be noted at this point that there is not a direct correlation between the general pavement condition categories and the prescribed repairs, because in addition to the PCI, the type of observed distresses are used to assign a repair strategy. Tables 6 and 7 show the projected change in assigned repair strategies and estimated Backlog of Repair for the road sections analyzed between spring 2004 and fall 2013 under expected existing funding levels. It can be seen that roadways requiring No Immediate Action would increase by over eight miles, while roadways requiring Routine and Preventative Maintenance would decrease by over one and a half miles and five miles respectively. Additionally, roadways requiring Rehabilitation would decrease by just over one mile. The Rehabilitation of Greenfield Road in 2006 would have reduced by three miles the amount of roadway requiring a Rehabilitation repair, but by 2013 this

reduction was on one and a quarter miles. This indicates that under this funding scenario, not all the repair needs are being met and roadways will be left to deteriorate. This results in the reduction of the Backlog of Repair amounting to only $500,000 in 2013 over the existing amount.

Table 5: Comparison of Existing and Projected Pavement Conditions for Town Maintained Paved Roads in 2013 with Existing Funding Levels.

PAVEMENT CONDITION (PCI Range)	Existing 2004 Mileage	Projected 2013 Mileage	Change in Mileage
Excellent (=>95)	9.22	10.41	+1.19
Good (85<=>94)	13.50	19.49	+5.99
Fair (65<=>84)	12.59	4.09	-8.50
Poor (<65)	5.54	6.86	+1.32
Total Mileage	**40.85**	**40.85**	

Table 6: Comparison of Existing and Projected Required Repairs for Town Maintained Paved Roads in 2013 with Existing Funding Levels.

REPAIR TYPE	Existing 2003 Mileage	Projected 2013 Mileage	Change in Mileage
5. No Immediate Action	13.98	22.27	+8.29
4. Routine Maintenance	13.41	11.72	-1.69
3. Preventative Maintenance	6.56	1.20	-5.36
2. Rehabilitation	6.90	5.66	-1.24
1. Reconstruction	0.00	0.00	0.00
Total Mileage	**40.85**	**40.85**	

Table 7: Comparison of Existing and Projected Backlog of Repairs for Town Maintained Paved Roads in 2013 with Existing Funding Levels.

REPAIR TYPE	Existing 2003 Backlog	Projected 2013 Backlog	Change in Backlog
5. No Immediate Action	$0	$0	$0
4. Routine Maintenance	$388,564	$518,506	+$129,942
3. Preventative Maintenance	$570,728	$102,519	-$468,209
2. Rehabilitation	$973,871	$815,665	-$158,206
1. Reconstruction	$0	$0	$0
Total Backlog of Repair	**$1,933,163**	**$1,436,690**	**-$496,473**

This analysis shows that under this funding scenario, that the condition of the Town maintained paved road network as a whole would see an improvement over existing conditions from a

current Fair condition, to a Good condition in 2013 and resulting in a $500,000 reduction in the Backlog of Repairs. Much of this improvement can be attributed to the completion of the Rehabilitation of Greenfield Road using Federal Funds and the additional injection of funds in 2004. A closer look at the analysis results indicates that the funding levels would be sufficient to keep pace with the majority of the repair needs through 2011, but there is an indication that in 2012 and 2013 that there would not be sufficient funds to continue to make improvements to the paved road network.

Increased Chapter 90 Funding

In the late 1990s, the statewide Chapter 90 program was funded at a $150 million level statewide, which equated to approximately $255,210 in Chapter 90 funding to the Town of Colrain. Since this program was reduced to the $100 million level there have been many efforts to restore the program to the previous $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 conditions of the paved road network, a new analysis was conducted using the following assumptions:

- Due to the late release of Chapter 90 funding in FY2003 and early release in FY2004, plus a small amount left over from FY 1999, there is currently $375,000 available during the 2004 construction season for paved road maintenance. The Highway Superintendent has determined that resurfacing sections of the following three roadways is the most appropriate use of this money.
  - Adamsville Road, between Cemetery Branch and Wilson Hill Road
  - Ed Clark Road, 1.1 miles north of Adamsville Road.
  - West Leyden Road, from Greenfield Road to the Leyden Town Line
- Greenfield Road will be rehabilitated at a cost of $1.2 million in 2006 using Federal Funds through the TIP process.
- In FY2005, the Chapter 90 program will increase to the $150 million Statewide levels and continue at this level through 2013. With the exception of the assumptions noted above, this would be the sole source of funding available to the Town for paved road maintenance. Therefore, $255,000 was allocated each year for pavement maintenance.
- To account for the increasing costs of asphalt products, fuel and labor, an inflation rate of 3% per year has been applied to the analysis.

Table 8 summarizes the projected conditions of the paved road network using the above funding assumptions that reflect an increase in Chapter 90 funding to the former $150 million level. It can be seen that with the initial injection of funds in 2004 the average PCI increases slightly from 81 to 82 and the Backlog of Repairs reduces an equivalent amount to the investment. A more significant jump in the average PCI is seen following the completion of the $1.2 million Rehabilitation of Greenfield Road when the average PCI increased from 82 to 89, taking the average PCI from Fair to Good. From 2007 though 2013 the Average PCI continues to improve leveling of at an almost Excellent average condition of 93 from 2009 onwards. The Backlog of Repair consistently declines each year and by 2011 has reduced to the point where the funding

levels are almost sufficient to complete all the required repairs the following construction season. As the roadways repaired in 2004 and 2006 reach the point where Routine Maintenance repairs would be required, the Backlog of Repairs increases slightly ending at almost $500,000 in 2013. Since these repairs would not all have to be completed in one year, it is likely that at this level of funding that paved road network could continue to be maintained in a perpetual Good to Excellent condition.

Table 8: Projected Backlog of Repair and Average PCI to 2013 with Increased Chapter 90 Funding.

Future Year	Funding Level	Backlog of Repair	Average PCI
	Existing Conditions	$1,933,163	81
2004	$375,000	$1,614,376	82
2005	$255,000	$1,854,798	83
2006	$1,455,000	$932,261	89
2007	$255,000	$805,652	90
2008	$255,000	$614,668	91
2009	$255,000	$543,810	92
2010	$255,000	$342,084	93
2011	$255,000	$258,883	93
2012	$255,000	$358,746	93
2013	$255,000	$497,000	93

Total Funding allocated over ten years equals $3,870,000

Table 9 provides a comparison between the existing conditions and the projected conditions of the paved road network in the fall of 2013 under the above funding assumptions. This comparison shows that the mileage of roadways in Poor conditions would be eliminated and the mileage in Fair condition would be reduced from and existing twelve and a half miles to just over a mile in 2013. The substantial increases in mileage in Good and Excellent condition in 2013 indicate that the whole paved road network would likely be maintained in a perpetual Good to Excellent condition. This pattern confirms that the funding levels in this scenario would be sufficient to clear the Backlog of Repairs and keep pace with all the maintenance needs of the paved road network.

Table 9: Projected Backlog of Repair and Average PCI to 2013 with Increased Chapter 90 Funding.

PAVEMENT CONDITION (PCI Range)	Existing 2003 Mileage	Projected 2013 Mileage	Change in Mileage
Excellent (=>95)	9.22	15.48	+6.26
Good (85<=>94)	13.50	24.12	+10.62
Fair (65<=>84)	12.59	1.25	-11.34
Poor (<65)	5.54	0.00	-5.54
Total Mileage	**40.85**	**40.85**	

Tables 10 and 11 show the projected assigned repair strategies and Backlog of Repair for the road sections analyzed to the fall of 2013 under the above funding assumptions. These tables show zero mileage requiring Preventative, Rehabilitation and Reconstruction repairs confirming that there would be sufficient funding to meet all the repair needs. In 2013, almost three-quarters of the paved road network would be in a condition where no repairs would be required and around a quarter of the paved road network would require low cost Routine Maintenance activities. This results in the dramatic $1.4 million reduction in the Backlog of Repairs.

Table 10: Projected Backlog of Repair and Average PCI to 2013 with Increased Chapter 90 Funding.

REPAIR TYPE	Existing 2003 Mileage	Projected 2013 Mileage	Change in Mileage
5. No Immediate Action	13.98	29.74	+15.76
4. Routine Maintenance	13.41	11.11	-2.30
3. Preventative Maintenance	6.56	0.00	-6.56
2. Rehabilitation	6.90	0.00	-6.90
1. Reconstruction	0.00	0.00	0.00
Total Mileage	**40.85**	**40.85**	

Table 11: Projected Backlog of Repair and Average PCI to 2013 with Increased Chapter 90 Funding.

REPAIR TYPE	Existing 2003 Backlog	Projected 2013 Backlog	Change in Backlog
5. No Immediate Action	$0	$0	$0
4. Routine Maintenance	$388,564	$497,000	+$108,436
3. Preventative Maintenance	$570,728	$0	-$570,728
2. Rehabilitation	$973,871	$0	-$973,871
1. Reconstruction	$0	$0	$0
Total Backlog of Repair	**$1,933,163**	**$497,000**	**-$1,436,163**

This analysis indicates that if the Chapter 90 funding levels were raised back to the $150 million statewide level, the average condition of the whole paved road network in Colrain would be improved to a perpetual Good to Excellent condition and the Backlog of Repairs would be reduced to minimal levels.

Conclusion

Based on the pavement surface survey conducted in the Spring of 2004, the paved road network maintained by the Town of Colrain is currently in a "Fair" condition with an average pavement condition index (PCI) of 81. The distribution of the mileage by repair type indicates that the Town's highway department has been practicing excellent pavement management practices with the limited funding that have been available. The Town currently faces an estimated Backlog of Repair of just over $1.9 million. Two funding scenarios were analyzed to predict their potential impacts on the paved road conditions over a ten-year period.

The first scenario used the existing Chapter 90 funding levels, plus $1.2 million of Federal Funds to Rehabilitate Greenfield Road. It was shown that there would be sufficient funds to keep pace with the majority of repair needs through 2011. By 2012, roadways repaired in 2004 and 2006 would be reaching a level of deterioration where repairs would be once again be required. The resulting accelerated increase in the Backlog of Repair and the decline in the average PCI indicates that near the end of the ten years analyzed that the funding levels will not be sufficient to keep pace with all these repair needs.

The second scenario used Chapter 90 funding levels as if the statewide program had been increased from the present $100 million back to a $150 million, plus $1.2 million of Federal Funds to Rehabilitate Greenfield Road. This scenario showed that by 2011, the paved road network would have been improved to a perpetual Good to Excellent condition and for each year after that there would likely be sufficient funds to keep pace with all the prescribed repairs needs.

Between the two scenarios there is a difference of $765,000 in investment over the ten years analyzed, resulting in a $940,000 reduction in the Backlog of Repairs by 2013. The more significant difference between the scenarios is that with the increased Chapter 90 funds, it is likely that the Good to Excellent conditions achieved in 2013 would continue to be maintained, whereas the Good conditions achieved with existing Chapter 90 funds would likely not be maintained after 2011 when the average condition of the paved road network would begin to decline.

This analysis indicates in the absence of additional Chapter 90 funds, that the Town should pursue alternative funding sources in the next few years to ensure that roadways do not deteriorate to a point where more expensive repairs would be required.

The Town now has the base data that it needs to monitor pavement conditions over time and continue to prioritize repairs in the most cost effective way. The FRCOG will continue to provide support to the extents possible.

Alternative Funding Sources

Transportation Improvement Program

Approximately thirteen miles of the Town maintained paved road network is functionally classified as Rural Major Collector making these road sections eligible for Federal Funds for reconstruction or rehabilitation 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 that 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. Based on current traffic volumes, all eligible roadways in Colrain would qualify for the Low Speed/Low Volume Design Standards.

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. Additionally, this program allows for the use of Federal Funds, previously limited to reconstruction, for resurfacing and rehabilitation projects also. The Footprint Road Program Guidelines have been included in Appendix C. 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 can not 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 such as the TIP to ensure that the existing conditions can be maintained and possibly improved.

Appendices

Appendix A

Average Annual Daily Traffic (AADT) Count Data 1991-2003 For the Town of Colrain

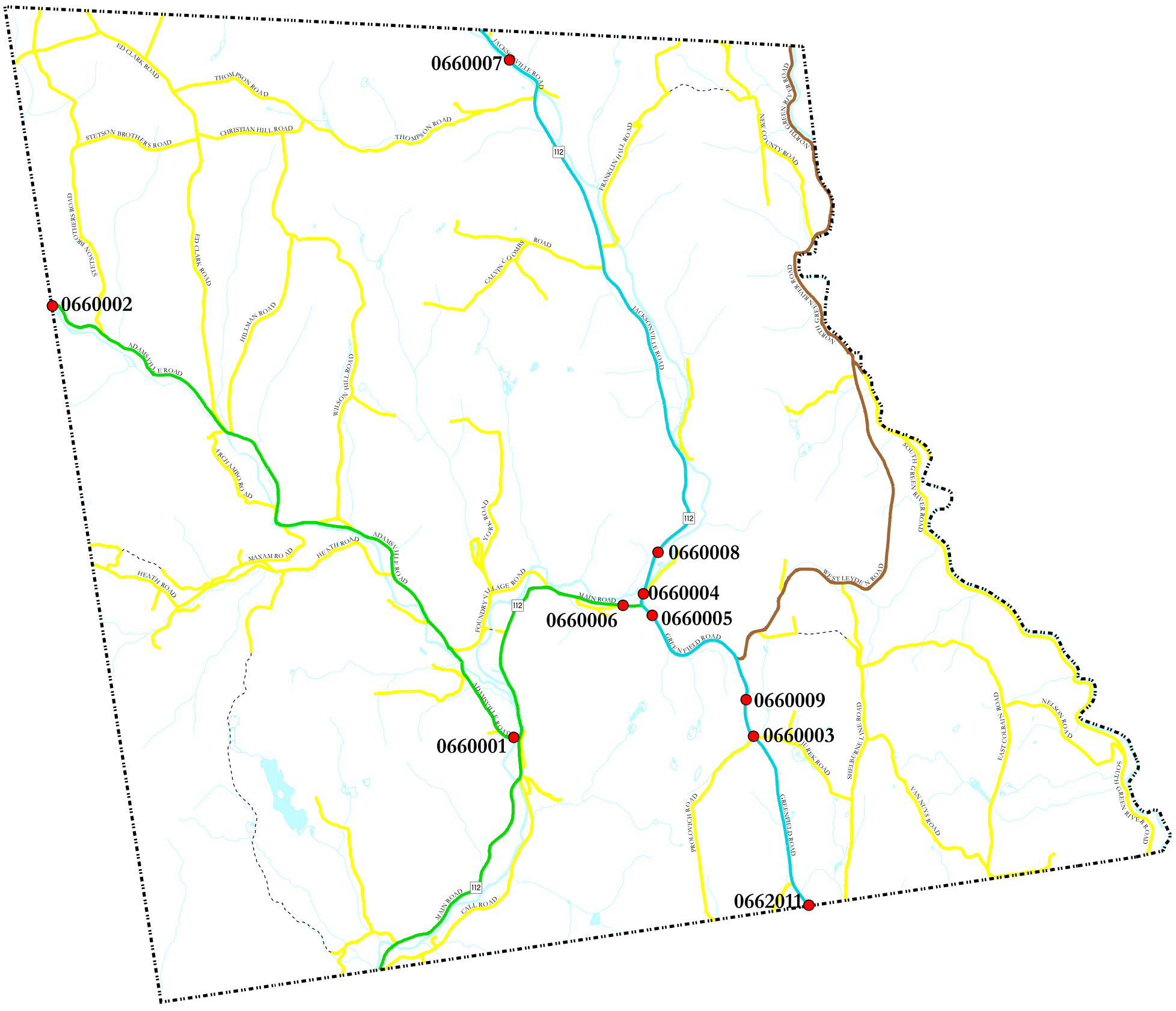
Appendix A: Average Annual Daily Traffic (AADT) Count Data 1991-2003

StationID	Street/Route	Location	Average Annual Daily Traffic (AADT) Volumes												
			1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
0660001	Adamsville Road	300ft West of Route 112					1410								620
0660002	Adamsville Road	Heath Town Line					210								270
0660009	Greenfield Road	$^{3}/_{10}$ Mile North of Provolich Road													2500
0660003	Greenfield Road	At Provolich Road		2000											
0662011	Greenfield Road	Shelburne Town Line		2200		2100		2200	2200	2700	2700	2700	2700	2600	2800
0660005	Greenfield Road	South of Route 112				2600									
0660008	Route 112	$^{3}/_{10}$ Mile North of River Street													1500
0660007	Route 112	$^{3}/_{10}$ Mile South of Stark Mountain Rd													990
0660004	Route 112	North of Greenfield Road		1770		1700									
0660006	Route 112	South of Greenfield Road				2300									

Source: Franklin Regional Council of Governments Traffic Count Database

TOWN OF COLRAIN PAVEMENT MANAGEMENT STUDY

Appendix A - Traffic Count Locations



N

0 1 2 Miles

Functional Classification

- Minor Arterial
- Major Collector
- Minor Collector
- Local Road
- Unmaintained Town Road
- Traffic Count Location
- Town Boundary
- River or Stream
- Water Body
- Wetland

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.

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.

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

Map composed by FRCOG Planning Department. c:\My Documents\Pme\EO418\MapFiles\pavementia_colr_pave.apr

JUNE 2004

Appendix A: Average Annual Daily Traffic (AADT) Count Data 1991-2003

Appendix B

Existing Pavement Conditions Analysis Results

Appendix B: Glossary of Terms for Data Format

Street Name - * Indicates the road section is eligible to receive Federal Aid for Reconstruction or Rehabilitation.

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 34 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 <u>preliminary</u> evaluation and prioritization of the paved road network as a whole.

Appendix B: Existing Pavement Conditions (Spring 2004)
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
ADAMSVILLE ROAD	1	HEATH TOWN LINE	STETSON BROTHERS RD	2376	78	3	$37,620	20	300	5/17/04
ADAMSVILLE ROAD	2	STETSON BROTHERS RD	HOUSE #446	2904	90	4	$16,133	18	300	5/17/04
ADAMSVILLE ROAD	3	HOUSE #446	WMECO POLE 100	3168	95	5	$0	-	400	5/17/04
ADAMSVILLE ROAD	4	WMECO POLE 100	HOUSE #361	2904	95	5	$0	-	500	5/17/04
ADAMSVILLE ROAD	5	HOUSE #361	MAXAM ROAD	2640	99	5	$0	-	500	5/17/04
ADAMSVILLE ROAD	6	MAXAM ROAD	CHANGE IN PAVEMENT	1584	99	5	$0	-	500	5/17/04
ADAMSVILLE ROAD	7	CHANGE IN PAVEMENT	HOUSE #221	2112	68	2	$42,240	17	750	5/17/04
ADAMSVILLE ROAD	8	HOUSE #221	WMECO POLE 34	3168	65	2	$63,360	15	800	5/17/04
ADAMSVILLE ROAD	9	WMECO POLE 34	CHANGE IN PAVEMENT	2904	66	2	$58,080	16	800	5/17/04
ADAMSVILLE ROAD	10	CHANGE IN PAVEMENT	HOUSE #46	2112	95	5	$0	-	600	5/17/04
ADAMSVILLE ROAD	11	HOUSE #46	MAIN ROAD	2112	95	5	$0	-	600	5/17/04
ARCHAMBO ROAD	1	WHITE ROAD	CHANGE TO GRAVEL	1056	87	4	$2,933	61	15	5/17/04
ARCHAMBO ROAD	3	CHANGE FROM GRAVEL	ADAMSVILLE ROAD	792	100	5	$0	-	15	5/17/04
BENNET AND GALIPO DR	1	ADAMSVILLE ROAD	DEAD END	528	100	5	$0	-	10	5/17/04
CALL ROAD	1	SHELBURNE TOWN LINE	HOUSE #172	2640	95	5	$0	-	100	5/17/04
CALL ROAD	2	HOUSE #172	HOUSE #121	2376	95	5	$0	-	100	5/17/04
CALL ROAD	3	HOUSE #121	NET POLE 11	2640	95	5	$0	-	150	5/17/04
CALL ROAD	4	NET POLE 11	MAIN ROAD	3062	95	5	$0	-	150	5/17/04
CALVIN COOMBS ROAD	1	JACKSONVILLE ROAD	CHANGE TO GRAVEL	528	78	4	$2,640	53	50	5/17/04
CALVIN COOMBS ROAD	3	CHANGE FROM GRAVEL	CHANGE TO GRAVEL	1056	71	3	$15,840	63	25	5/17/04
CALVIN COOMBS ROAD	5	CHANGE FROM GRAVEL	CHANGE TO GRAVEL	1531	72	4	$7,655	60	25	5/17/04
CHARLEMONT ROAD	1	MAIN ROAD	HOUSE #32	1848	89	4	$7,187	50	50	5/17/04
CHARLEMONT ROAD	2	HOUSE #32	CHARLEMONT TOWN LINE	1795	89	4	$6,981	51	50	5/17/04
CHRISTIAN HILL ROAD	1	ED CLARK ROAD	CHANGE TO GRAVEL	158	95	5	$0	-	50	5/17/04
CHRISTIAN HILL ROAD	3	CHANGE FROM GRAVEL	THOMPSON ROAD	2059	89	4	$10,295	56	50	5/17/04
CHURCH STREET	1	HIGH STREET	DEAD END	686	99	5	$0	-	50	5/17/04
COBURN STREET	1	MAIN ROAD	MAIN ROAD	1795	90	5	$0	-	50	5/17/04
COOMBS HILL ROAD	1	GREENFIELD ROAD	SHELBURNE TOWN LINE	1426	93	5	$0	-	50	5/17/04
DWIGHT CROSS ROAD	1	HEATH ROAD	HEATH TOWN LINE	2323	71	4	$9,034	36	75	5/17/04
EAST COLRAIN ROAD	1	SHELBURNE LINE ROAD	CHANGE TO GRAVEL	422	99	5	$0	-	100	5/17/04
EAST COLRAIN ROAD	3	CHANGE FROM GRAVEL	CHANGE TO GRAVEL	528	75	4	$2,787	38	100	5/17/04
EAST COLRAIN ROAD	5	CHANGE FROM GRAVEL	CHANGE TO GRAVEL	1056	56	3	$14,080	37	100	5/17/04
EAST COLRAIN ROAD	7	CHANGE FROM GRAVEL	VAN NUYS ROAD	53	90	5	$0	-	100	5/17/04
ED CLARK ROAD	2	CHANGE FROM GRAVEL	HOUSE 208	1690	99	5	$0	-	50	5/17/04
ED CLARK ROAD	3	HOUSE #208	HOUSE #157	2640	99	5	$0	-	50	5/17/04
ED CLARK ROAD	4	HOUSE #157	CHANGE IN PAVEMENT	2904	94	5	$0	-	50	5/17/04
ED CLARK ROAD	5	CHANGE IN PAVEMENT	YELLOW HOUSE	2640	60	3	$39,600	47	75	5/17/04
ED CLARK ROAD	6	YELLOW HOUSE	ADAMSVILLE ROAD	2376	77	4	$11,880	45	75	5/17/04
FORT LUCAS ROAD [18]	1	SHELBURNE LINE ROAD	CHANGE TO GRAVEL	158	95	5	$0	-	25	5/17/04
FORT LUCAS ROAD [59]	1	WEST LEYDEN ROAD	END OF ROADWAY	1848	65	3	$23,100	54	50	5/17/04

Appendix B: Existing Pavement Conditions (Spring 2004)
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
FOUNDRY VILLAGE ROAD	1	STATE HIGHWAY	HOUSE #31	1373	95	5	$0	-	200	5/17/04
FOUNDRY VILLAGE ROAD	2	HOUSE #31	FOUNDRY VILLAGE ROAD	2323	85	4	$10,970	19	200	5/17/04
FOUNDRY VILLAGE ROAD	3	FOUNDRY VILLAGE ROAD	ADAMSVILLE ROAD	2323	88	4	$10,970	21	200	5/17/04
FRANKLIN HILL ROAD	2	CHANGE FROM GRAVEL	JACKSONVILLE ROAD	1003	99	5	$0	-	50	5/17/04
GREENFIELD ROAD	1	JACKSONVILLE ROAD	WMECO POLE 72	2112	61	2	$72,747	2	2800	5/17/04
GREENFIELD ROAD	2	WMECO POLE 72	HOUSE #78	1901	68	2	$65,479	4	2800	5/17/04
GREENFIELD ROAD	3	HOUSE #78	WMECO POLE 14	3168	67	2	$112,640	6	2800	5/17/04
GREENFIELD ROAD	4	WMECO POLE 14	MORRELL METALSMITHS	2904	67	2	$103,253	5	2800	5/17/04
GREENFIELD ROAD	5	MORRELL METALSMITHS	HOUSE #265	2904	68	2	$103,253	8	2800	5/17/04
GREENFIELD ROAD	6	HOUSE #265	SHELBURNE TOWN LINE	2904	62	2	$103,253	3	2800	5/17/04
GRISWOLDVILLE STREET	1	CALL ROAD	MAIN ROAD	1003	99	5	$0	-	25	5/17/04
HAGER CROSS ROAD	1	HEATH ROAD	MAXAM ROAD	634	56	2	$10,567	62	25	5/17/04
HEATH ROAD	1	ADAMSVILLE ROAD	HOUSE #55	2640	55	2	$58,667	39	150	5/17/04
HEATH ROAD	2	HOUSE #55	N CATAMOUNT HILL RD	2640	62	3	$44,000	32	150	5/17/04
HEATH ROAD	3	N CATAMOUNT HILL RD	NO LANDMARK	2112	63	3	$33,440	30	150	5/17/04
HEATH ROAD	4	NO LANDMARK	CHANGE IN PAVEMENT	2429	51	2	$51,279	34	150	5/17/04
HEATH ROAD	5	CHANGE IN PAVEMENT	DWIGHT CROSS ROAD	3696	89	4	$19,507	28	150	5/17/04
HEATH ROAD	6	DWIGHT CROSS ROAD	HEATH TOWN LINE	686	81	4	$2,668	22	150	5/17/04
HERZIG STREET	1	COBURN STREET	DEAD END	528	95	5	$0	-	10	5/17/04
HIGH STREET	1	MAIN ROAD	MAIN ROAD	1056	95	5	$0	-	50	5/17/04
JACKSONVILLE ROAD	1	GREENFIELD ROAD	HOUSE #58	2904	89	4	$20,973	7	1500	5/17/04
JACKSONVILLE ROAD	2	HOUSE #58	NET POLE 41/38	3062	94	5	$0	-	1500	5/17/04
JACKSONVILLE ROAD	3	NET POLE 41/38	WMECO POLE 60	2640	89	4	$18,333	10	1250	5/17/04
JACKSONVILLE ROAD	4	WMECO POLE 60	SPEED LIMIT 40/35	2376	94	5	$0	-	1250	5/17/04
JACKSONVILLE ROAD	5	SPEED LIMIT 40/35	HOUSE #268	2640	79	3	$52,800	14	1250	5/17/04
JACKSONVILLE ROAD	6	HOUSE #268	FRANKLIN HILL ROAD	2270	89	4	$15,133	9	1250	5/17/04
JACKSONVILLE ROAD	7	FRANKLIN HILL ROAD	NO PASSING SIGN NB	3168	89	4	$22,000	12	1250	5/17/04
JACKSONVILLE ROAD	8	NO PASSING SIGN NB	THOMPSON ROAD	3326	89	4	$23,097	11	1250	5/17/04
JACKSONVILLE ROAD	9	THOMPSON ROAD	VERMONT STATE LINE	3221	89	4	$22,368	13	1000	5/17/04
JESSE WOOD LANE	1	JACKSONVILLE ROAD	DEAD END	950	92	5	$0	-	10	5/17/04
JUREK ROAD	1	GREENFIELD ROAD	CHANGE TO GRAVEL	53	80	4	$309	58	50	5/17/04
JUREK ROAD	3	CHANGE FROM GRAVEL	SHELBURNE LINE ROAD	792	99	5	$0	-	50	5/17/04
LEON HERZIG DRIVE	1	ADAMSVILLE ROAD	CHANGE TO GRAVEL	792	95	5	$0	-	15	5/17/04
LIVELY LANE	1	ADAMSVILLE ROAD	CHANGE TO DRIVEWAY	1267	87	5	$0	-	10	5/17/04
LYONSVILLE ROAD	1	FOUNDRY VILLAGE ROAD	CLOSED BRIDGE	528	100	5	$0	-	1	5/17/04
LYONSVILLE ROAD	3	CLOSED BRIDGE	STATE HIGHWAY	528	55	2	$10,560	65	25	5/17/04
MAIN ROAD [39]	1	CALL ROAD	ADAMSVILLE ROAD	1584	94	5	$0	-	2500	5/17/04
MAIN ROAD [40]	1	ADAMSVILLE ROAD	STATE HIGHWAY	317	80	3	$6,868	1	2500	5/17/04
MAXAM ROAD	1	HEATH ROAD	NET POLE 64	2640	95	5	$0	-	75	5/17/04
MAXAM ROAD	2	NET POLE 64	ADAMSVILLE ROAD	2851	93	5	$0	-	75	5/17/04
MERRIFIELD LANE	1	MAXAM ROAD	DEAD END	686	28	2	$10,671	64	10	5/17/04
NEW COUNTY ROAD	1	NORTH GREEN RIVER RD	CHANGE TO GRAVEL	475	90	5	$0	-	25	5/17/04

Appendix B: Existing Pavement Conditions (Spring 2004)
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
NORTH CATAMOUNT HILL	1	HEATH ROAD	CHANGE TO GRAVEL	264	100	5	$0	-	15	5/17/04
NORTH GREEN RIVER RC	1	WEST LEYDEN ROAD	WMECO POLE 267M	3168	57	3	$52,800	48	75	5/17/04
NORTH GREEN RIVER RC	2	WMECO POLE 267M	CHANGE TO GRAVEL	2904	56	2	$64,533	55	75	5/17/04
PATTON HILL ROAD	1	CALL ROAD	SHELBURNE TOWN LINE	264	95	5	$0	-	25	5/17/04
PROVOLICH ROAD	1	GREENFIELD ROAD	CHANGE TO GRAVEL	1584	45	2	$26,400	52	50	5/17/04
REILS LANE	1	JACKSONVILLE ROAD	CHANGE TO GRAVEL	528	100	5	$0	-	20	5/17/04
RIVER STREET	1	JACKSONVILLE ROAD	CHANGE TO GRAVEL	898	72	4	$3,492	46	50	5/17/04
SHATTUCKVILLE ROAD	1	CALL ROAD	SHATTUCKVILLE CROSS	317	95	5	$0	-	15	5/17/04
SHELBURNE LINE ROAD	1	SHELBURNE TOWN LINE	HOUSE #246	2112	95	5	$0	-	150	5/17/04
SHELBURNE LINE ROAD	2	HOUSE #246	JUREK ROAD	1848	90	5	$0	-	150	5/17/04
SHELBURNE LINE ROAD	3	JUREK ROAD	VAN NUYS ROAD	2534	90	5	$0	-	150	5/17/04
SHELBURNE LINE ROAD	4	VAN NUYS ROAD	FORT LUCAS ROAD	3168	78	4	$18,480	27	150	5/17/04
SHELBURNE LINE ROAD	5	FORT LUCAS ROAD	CHANGE IN PAVEMENT	2904	95	5	$0	-	150	5/17/04
SHELBURNE LINE ROAD	6	CHANGE IN PAVEMENT	WEST LEYDEN ROAD	264	63	3	$4,180	30	150	5/17/04
SOUTH GREEN RIVER RC	2	CHANGE FROM GRAVEL	WEST LEYDEN ROAD	528	86	4	$2,933	25	200	5/17/04
STARK HILL ROAD	1	JACKSONVILLE ROAD	VERMONT STATE LINE	264	100	5	$0	-	10	5/17/04
STETSON BROTHERS RO	1	ADAMSVILLE ROAD	CHANGE TO GRAVEL	2165	90	4	$10,825	57	50	5/17/04
STREETER LANE	1	JACKSONVILLE ROAD	DEAD END	158	72	4	$658	66	5	5/17/04
THOMPSON ROAD	1	JACKSONVILLE ROAD	WMECO POLE 60	2640	79	4	$13,933	40	100	5/17/04
THOMPSON ROAD	2	WMECO POLE 60	SMALL BRIDGE	2534	79	4	$13,374	41	100	5/17/04
THOMPSON ROAD	3	SMALL BRIDGE	WMECO POLE 60/32	2640	67	3	$39,600	44	100	5/17/04
THOMPSON ROAD	4	WMECO POLE 60/32	CHANGE TO GRAVEL	2640	67	3	$39,600	49	75	5/17/04
VAN NUYS ROAD	1	SHELBURNE TOWN LINE	CHANGE TO GRAVEL	3590	74	4	$16,953	43	75	5/17/04
VAN NUYS ROAD	3	CHANGE FROM GRAVEL	SHELBURNE LINE ROAD	950	37	2	$16,889	42	75	5/17/04
WEST LEYDEN ROAD	1	GREENFIELD ROAD	WMECO POLE 44	3168	77	3	$58,080	33	200	5/17/04
WEST LEYDEN ROAD	2	WMECO POLE 44	CHANGE IN PAVEMENT	3432	79	3	$62,920	35	200	5/17/04
WEST LEYDEN ROAD	3	CHANGE IN PAVEMENT	HOUSE #206	2640	75	3	$46,200	29	200	5/17/04
WEST LEYDEN ROAD	4	HOUSE #206	HOUSE #245	2640	89	4	$15,400	26	200	5/17/04
WEST LEYDEN ROAD	5	HOUSE #245	HOUSE #310	2640	86	4	$13,200	23	200	5/17/04
WEST LEYDEN ROAD	6	HOUSE #310	NORTH GREEN RIVER RD	2640	89	4	$13,200	24	200	5/17/04
WEST LEYDEN ROAD [89	1	LEYDEN TOWN LINE	SOUTH GREEN RIVER RD	53	90	5	$0	-	250	5/17/04
WILSON HILL ROAD	2	CHANGE FROM GRAVEL	ADAMSVILLE ROAD	3643	79	4	$22,263	59	50	5/17/04
YORK ROAD	1	FOUNDRY VILLAGE ROAD	CHANGE TO GRAVEL	1954	90	5	$0	-	50	5/17/04

Appendix B: Existing Pavement Conditions (Spring 2004)
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
MAIN ROAD [40]	1	ADAMSVILLE ROAD	STATE HIGHWAY	317	80	3	$6,868	1	2500	5/17/04
GREENFIELD ROAD	1	JACKSONVILLE ROAD	WMECO POLE 72	2112	61	2	$72,747	2	2800	5/17/04
GREENFIELD ROAD	6	HOUSE #265	SHELBURNE TOWN LINE	2904	62	2	$103,253	3	2800	5/17/04
GREENFIELD ROAD	2	WMECO POLE 72	HOUSE #78	1901	68	2	$65,479	4	2800	5/17/04
GREENFIELD ROAD	4	WMECO POLE 14	MORRELL METALSMITHS	2904	67	2	$103,253	5	2800	5/17/04
GREENFIELD ROAD	3	HOUSE #78	WMECO POLE 14	3168	67	2	$112,640	6	2800	5/17/04
JACKSONVILLE ROAD	1	GREENFIELD ROAD	HOUSE #58	2904	89	4	$20,973	7	1500	5/17/04
GREENFIELD ROAD	5	MORRELL METALSMITHS	HOUSE #265	2904	68	2	$103,253	8	2800	5/17/04
JACKSONVILLE ROAD	6	HOUSE #268	FRANKLIN HILL ROAD	2270	89	4	$15,133	9	1250	5/17/04
JACKSONVILLE ROAD	3	NET POLE 41/38	WMECO POLE 60	2640	89	4	$18,333	10	1250	5/17/04
JACKSONVILLE ROAD	8	NO PASSING SIGN NB	THOMPSON ROAD	3326	89	4	$23,097	11	1250	5/17/04
JACKSONVILLE ROAD	7	FRANKLIN HILL ROAD	NO PASSING SIGN NB	3168	89	4	$22,000	12	1250	5/17/04
JACKSONVILLE ROAD	9	THOMPSON ROAD	VERMONT STATE LINE	3221	89	4	$22,368	13	1000	5/17/04
JACKSONVILLE ROAD	5	SPEED LIMIT 40/35	HOUSE #268	2640	79	3	$52,800	14	1250	5/17/04
ADAMSVILLE ROAD	8	HOUSE #221	WMECO POLE 34	3168	65	2	$63,360	15	800	5/17/04
ADAMSVILLE ROAD	9	WMECO POLE 34	CHANGE IN PAVEMENT	2904	66	2	$58,080	16	800	5/17/04
ADAMSVILLE ROAD	7	CHANGE IN PAVEMENT	HOUSE #221	2112	68	2	$42,240	17	750	5/17/04
ADAMSVILLE ROAD	2	STETSON BROTHERS RD	HOUSE #446	2904	90	4	$16,133	18	300	5/17/04
FOUNDRY VILLAGE ROAD	2	HOUSE #31	FOUNDRY VILLAGE ROAD	2323	85	4	$10,970	19	200	5/17/04
ADAMSVILLE ROAD	1	HEATH TOWN LINE	STETSON BROTHERS RD	2376	78	3	$37,620	20	300	5/17/04
FOUNDRY VILLAGE ROAD	3	FOUNDRY VILLAGE ROAD	ADAMSVILLE ROAD	2323	88	4	$10,970	21	200	5/17/04
HEATH ROAD	6	DWIGHT CROSS ROAD	HEATH TOWN LINE	686	81	4	$2,668	22	150	5/17/04
WEST LEYDEN ROAD	5	HOUSE #245	HOUSE #310	2640	86	4	$13,200	23	200	5/17/04
WEST LEYDEN ROAD	6	HOUSE #310	NORTH GREEN RIVER RD	2640	89	4	$13,200	24	200	5/17/04
SOUTH GREEN RIVER RO	2	CHANGE FROM GRAVEL	WEST LEYDEN ROAD	528	86	4	$2,933	25	200	5/17/04
WEST LEYDEN ROAD	4	HOUSE #206	HOUSE #245	2640	89	4	$15,400	26	200	5/17/04
SHELBURNE LINE ROAD	4	VAN NUYS ROAD	FORT LUCAS ROAD	3168	78	4	$18,480	27	150	5/17/04
HEATH ROAD	5	CHANGE IN PAVEMENT	DWIGHT CROSS ROAD	3696	89	4	$19,507	28	150	5/17/04
WEST LEYDEN ROAD	3	CHANGE IN PAVEMENT	HOUSE #206	2640	75	3	$46,200	29	200	5/17/04
HEATH ROAD	3	N CATAMOUNT HILL RD	NO LANDMARK	2112	63	3	$33,440	30	150	5/17/04
SHELBURNE LINE ROAD	6	CHANGE IN PAVEMENT	WEST LEYDEN ROAD	264	63	3	$4,180	30	150	5/17/04
HEATH ROAD	2	HOUSE #55	N CATAMOUNT HILL RD	2640	62	3	$44,000	32	150	5/17/04
WEST LEYDEN ROAD	1	GREENFIELD ROAD	WMECO POLE 44	3168	77	3	$58,080	33	200	5/17/04
HEATH ROAD	4	NO LANDMARK	CHANGE IN PAVEMENT	2429	51	2	$51,279	34	150	5/17/04
WEST LEYDEN ROAD	2	WMECO POLE 44	CHANGE IN PAVEMENT	3432	79	3	$62,920	35	200	5/17/04
DWIGHT CROSS ROAD	1	HEATH ROAD	HEATH TOWN LINE	2323	71	4	$9,034	36	75	5/17/04
EAST COLRAIN ROAD	5	CHANGE FROM GRAVEL	CHANGE TO GRAVEL	1056	56	3	$14,080	37	100	5/17/04
EAST COLRAIN ROAD	3	CHANGE FROM GRAVEL	CHANGE TO GRAVEL	528	75	4	$2,787	38	100	5/17/04
HEATH ROAD	1	ADAMSVILLE ROAD	HOUSE #55	2640	55	2	$58,667	39	150	5/17/04
THOMPSON ROAD	1	JACKSONVILLE ROAD	WMECO POLE 60	2640	79	4	$13,933	40	100	5/17/04
THOMPSON ROAD	2	WMECO POLE 60	SMALL BRIDGE	2534	79	4	$13,374	41	100	5/17/04
VAN NUYS ROAD	3	CHANGE FROM GRAVEL	SHELBURNE LINE ROAD	950	37	2	$16,889	42	75	5/17/04

Appendix B: Existing Pavement Conditions (Spring 2004)
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
VAN NUYS ROAD	1	SHELBURNE TOWN LINE	CHANGE TO GRAVEL	3590	74	4	$16,953	43	75	5/17/04
THOMPSON ROAD	3	SMALL BRIDGE	WMECO POLE 60/32	2640	67	3	$39,600	44	100	5/17/04
ED CLARK ROAD	6	YELLOW HOUSE	ADAMSVILLE ROAD	2376	77	4	$11,880	45	75	5/17/04
RIVER STREET	1	JACKSONVILLE ROAD	CHANGE TO GRAVEL	898	72	4	$3,492	46	50	5/17/04
ED CLARK ROAD	5	CHANGE IN PAVEMENT	YELLOW HOUSE	2640	60	3	$39,600	47	75	5/17/04
NORTH GREEN RIVER RC	1	WEST LEYDEN ROAD	WMECO POLE 267M	3168	57	3	$52,800	48	75	5/17/04
THOMPSON ROAD	4	WMECO POLE 60/32	CHANGE TO GRAVEL	2640	67	3	$39,600	49	75	5/17/04
CHARLEMONT ROAD	1	MAIN ROAD	HOUSE #32	1848	89	4	$7,187	50	50	5/17/04
CHARLEMONT ROAD	2	HOUSE #32	CHARLEMONT TOWN LINE	1795	89	4	$6,981	51	50	5/17/04
PROVOLICH ROAD	1	GREENFIELD ROAD	CHANGE TO GRAVEL	1584	45	2	$26,400	52	50	5/17/04
CALVIN COOMBS ROAD	1	JACKSONVILLE ROAD	CHANGE TO GRAVEL	528	78	4	$2,640	53	50	5/17/04
FORT LUCAS ROAD [59]	1	WEST LEYDEN ROAD	END OF ROADWAY	1848	65	3	$23,100	54	50	5/17/04
NORTH GREEN RIVER RC	2	WMECO POLE 267M	CHANGE TO GRAVEL	2904	56	2	$64,533	55	75	5/17/04
CHRISTIAN HILL ROAD	3	CHANGE FROM GRAVEL	THOMPSON ROAD	2059	89	4	$10,295	56	50	5/17/04
STETSON BROTHERS RO	1	ADAMSVILLE ROAD	CHANGE TO GRAVEL	2165	90	4	$10,825	57	50	5/17/04
JUREK ROAD	1	GREENFIELD ROAD	CHANGE TO GRAVEL	53	80	4	$309	58	50	5/17/04
WILSON HILL ROAD	2	CHANGE FROM GRAVEL	ADAMSVILLE ROAD	3643	79	4	$22,263	59	50	5/17/04
CALVIN COOMBS ROAD	5	CHANGE FROM GRAVEL	CHANGE TO GRAVEL	1531	72	4	$7,655	60	25	5/17/04
ARCHAMBO ROAD	1	WHITE ROAD	CHANGE TO GRAVEL	1056	87	4	$2,933	61	15	5/17/04
HAGER CROSS ROAD	1	HEATH ROAD	MAXAM ROAD	634	56	2	$10,567	62	25	5/17/04
CALVIN COOMBS ROAD	3	CHANGE FROM GRAVEL	CHANGE TO GRAVEL	1056	71	3	$15,840	63	25	5/17/04
MERRIFIELD LANE	1	MAXAM ROAD	DEAD END	686	28	2	$10,671	64	10	5/17/04
LYONSVILLE ROAD	3	CLOSED BRIDGE	STATE HIGHWAY	528	55	2	$10,560	65	25	5/17/04
STREETER LANE	1	JACKSONVILLE ROAD	DEAD END	158	72	4	$658	66	5	5/17/04
ADAMSVILLE ROAD	3	HOUSE #446	WMECO POLE 100	3168	95	5	$0	-	400	5/17/04
ADAMSVILLE ROAD	4	WMECO POLE 100	HOUSE #361	2904	95	5	$0	-	500	5/17/04
ADAMSVILLE ROAD	5	HOUSE #361	MAXAM ROAD	2640	99	5	$0	-	500	5/17/04
ADAMSVILLE ROAD	6	MAXAM ROAD	CHANGE IN PAVEMENT	1584	99	5	$0	-	500	5/17/04
ADAMSVILLE ROAD	10	CHANGE IN PAVEMENT	HOUSE #46	2112	95	5	$0	-	600	5/17/04
ADAMSVILLE ROAD	11	HOUSE #46	MAIN ROAD	2112	95	5	$0	-	600	5/17/04
ARCHAMBO ROAD	3	CHANGE FROM GRAVEL	ADAMSVILLE ROAD	792	100	5	$0	-	15	5/17/04
BENNET AND GALIPO DR	1	ADAMSVILLE ROAD	DEAD END	528	100	5	$0	-	10	5/17/04
CALL ROAD	1	SHELBURNE TOWN LINE	HOUSE #172	2640	95	5	$0	-	100	5/17/04
CALL ROAD	2	HOUSE #172	HOUSE #121	2376	95	5	$0	-	100	5/17/04
CALL ROAD	3	HOUSE #121	NET POLE 11	2640	95	5	$0	-	150	5/17/04
CALL ROAD	4	NET POLE 11	MAIN ROAD	3062	95	5	$0	-	150	5/17/04
CHRISTIAN HILL ROAD	1	ED CLARK ROAD	CHANGE TO GRAVEL	158	95	5	$0	-	50	5/17/04
CHURCH STREET	1	HIGH STREET	DEAD END	686	99	5	$0	-	50	5/17/04
COBURN STREET	1	MAIN ROAD	MAIN ROAD	1795	90	5	$0	-	50	5/17/04
COOMBS HILL ROAD	1	GREENFIELD ROAD	SHELBURNE TOWN LINE	1426	93	5	$0	-	50	5/17/04
EAST COLRAIN ROAD	1	SHELBURNE LINE ROAD	CHANGE TO GRAVEL	422	99	5	$0	-	100	5/17/04
EAST COLRAIN ROAD	7	CHANGE FROM GRAVEL	VAN NUYS ROAD	53	90	5	$0	-	100	5/17/04

Appendix B: Existing Pavement Conditions (Spring 2004)
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
ED CLARK ROAD	2	CHANGE FROM GRAVEL	HOUSE 208	1690	99	5	$0	-	50	5/17/04
ED CLARK ROAD	3	HOUSE #208	HOUSE #157	2640	99	5	$0	-	50	5/17/04
ED CLARK ROAD	4	HOUSE #157	CHANGE IN PAVEMENT	2904	94	5	$0	-	50	5/17/04
FORT LUCAS ROAD [18]	1	SHELBURNE LINE ROAD	CHANGE TO GRAVEL	158	95	5	$0	-	25	5/17/04
FOUNDRY VILLAGE ROAD	1	STATE HIGHWAY	HOUSE #31	1373	95	5	$0	-	200	5/17/04
FRANKLIN HILL ROAD	2	CHANGE FROM GRAVEL	JACKSONVILLE ROAD	1003	99	5	$0	-	50	5/17/04
GRISWOLDVILLE STREET	1	CALL ROAD	MAIN ROAD	1003	99	5	$0	-	25	5/17/04
HERZIG STREET	1	COBURN STREET	DEAD END	528	95	5	$0	-	10	5/17/04
HIGH STREET	1	MAIN ROAD	MAIN ROAD	1056	95	5	$0	-	50	5/17/04
JACKSONVILLE ROAD	2	HOUSE #58	NET POLE 41/38	3062	94	5	$0	-	1500	5/17/04
JACKSONVILLE ROAD	4	WMECO POLE 60	SPEED LIMIT 40/35	2376	94	5	$0	-	1250	5/17/04
JESSE WOOD LANE	1	JACKSONVILLE ROAD	DEAD END	950	92	5	$0	-	10	5/17/04
JUREK ROAD	3	CHANGE FROM GRAVEL	SHELBURNE LINE ROAD	792	99	5	$0	-	50	5/17/04
LEON HERZIG DRIVE	1	ADAMSVILLE ROAD	CHANGE TO GRAVEL	792	95	5	$0	-	15	5/17/04
LIVELY LANE	1	ADAMSVILLE ROAD	CHANGE TO DRIVEWAY	1267	87	5	$0	-	10	5/17/04
LYONSVILLE ROAD	1	FOUNDRY VILLAGE ROAD	CLOSED BRIDGE	528	100	5	$0	-	1	5/17/04
MAIN ROAD [39]	1	CALL ROAD	ADAMSVILLE ROAD	1584	94	5	$0	-	2500	5/17/04
MAXAM ROAD	1	HEATH ROAD	NET POLE 64	2640	95	5	$0	-	75	5/17/04
MAXAM ROAD	2	NET POLE 64	ADAMSVILLE ROAD	2851	93	5	$0	-	75	5/17/04
NEW COUNTY ROAD	1	NORTH GREEN RIVER RD	CHANGE TO GRAVEL	475	90	5	$0	-	25	5/17/04
NORTH CATAMOUNT HILL	1	HEATH ROAD	CHANGE TO GRAVEL	264	100	5	$0	-	15	5/17/04
PATTON HILL ROAD	1	CALL ROAD	SHELBURNE TOWN LINE	264	95	5	$0	-	25	5/17/04
REILS LANE	1	JACKSONVILLE ROAD	CHANGE TO GRAVEL	528	100	5	$0	-	20	5/17/04
SHATTUCKVILLE ROAD	1	CALL ROAD	SHATTUCKVILLE CROSS	317	95	5	$0	-	15	5/17/04
SHELBURNE LINE ROAD	1	SHELBURNE TOWN LINE	HOUSE #246	2112	95	5	$0	-	150	5/17/04
SHELBURNE LINE ROAD	2	HOUSE #246	JUREK ROAD	1848	90	5	$0	-	150	5/17/04
SHELBURNE LINE ROAD	3	JUREK ROAD	VAN NUYS ROAD	2534	90	5	$0	-	150	5/17/04
SHELBURNE LINE ROAD	5	FORT LUCAS ROAD	CHANGE IN PAVEMENT	2904	95	5	$0	-	150	5/17/04
STARK HILL ROAD	1	JACKSONVILLE ROAD	VERMONT STATE LINE	264	100	5	$0	-	10	5/17/04
WEST LEYDEN ROAD [89	1	LEYDEN TOWN LINE	SOUTH GREEN RIVER RD	53	90	5	$0	-	250	5/17/04
YORK ROAD	1	FOUNDRY VILLAGE ROAD	CHANGE TO GRAVEL	1954	90	5	$0	-	50	5/17/04

Appendix C

Footprint Roads Pilot Program Guidelines

"FOOTPRINT ROADS PILOT PROGRAM"

Implementation Plan (June 4, 2003)

The "Footprint Roads Pilot Program" was generated as a result of the efforts of the multi-disciplined, interagency Design Issues Working Group. This three year Pilot Program will help to balance community, historic and environmental needs while performing roadway work in settings of community significance.

The following schedule has been established for implementation and follow-up:

- Roll out the Program on June 4, 2003
- Make applications available June 6, 2003 (MassHighway District Offices and Regional Planning Agencies)
- Accept applications through August 31, 2003 for inclusion on the FY 04 Transportation Improvement Plan (TIP)
- Establish Selection Committee by July 31, 2003
- Establish Program Success Criteria for follow-up action by August 31, 2003
- Select FY 04 projects by September 30, 2003
- Accept applications for FY 05 TIP
- Select Projects for FY 05 TIP by April 15, 2004
- Accept applications for FY 06 TIP through March 1, 2005
- Select Projects for FY 06 TIP by April 15, 2006

Funding

There is no designated funding category for this Program. Surface Transportation Program (STP) eligible funds from regional targets will be used for the selected projects for this Pilot Program. Funding levels will be limited to a statewide total of $15 million for years 1 – 3 of the Program (TIP years 04 – 06) to ensure continued expenditures to promote statewide improvements under currently funded programs.

Project Distribution

In order to target geographic equity, a minimum of one project will be considered for each region per year of the Pilot. Should there be a remaining balance in the statewide funding limit, additional projects will be considered and selected based upon merit, within existing targets.

Due to time constraints, projects considered for the FY 04 TIP will not be required to have Project Review Committee (PRC) approval for initial inclusion. Projects for the FY 05 and FY 06 TIPs should have PRC approval prior to inclusion on the TIP. Also, it is recognized that project selection for this Pilot Program most likely will not occur prior to endorsement of the 2004-7 TIPs. Therefore, MPOs may wish to program proposed projects with the understanding that it may not be selected as part of the Pilot Program. If it is not selected, the MPO could choose to keep it on the TIP or conduct an amendment process to substitute other projects.

FOOTPRINT ROADS PILOT PROGRAM

PROGRAM GUIDELINES AND CANDIDATE PROJECT APPLICATION FORM

PROGRAM INTENT, PARAMETERS AND GUIDELINES

Design criteria for projects on existing roadways must often be viewed from a different perspective than design criteria for new roadway construction projects. Many projects on existing roadways are initiated for reasons other than geometric design deficiencies (e.g. pavement deterioration), and, many of these projects are also located within limited rights of way, on main streets in city or town centers, or adjacent to natural resources, public lands or historic resources. Often, projects on existing roadways are initiated in communities where land use and cultural characteristics are already well established. For projects like this, project proponents should consider applying the Footprint Roads Pilot Program guidelines to accomplish identified project goals.

The Footprint Roads Pilot Program guidelines allow project proponents to preserve and enhance historic and community character, extend the service life of the existing facility, enhance safety for all users, reduce maintenance costs, and protect the environment. Work under this program should consist primarily of roadway improvements that follow the existing horizontal and vertical alignments of the project roadways, generally within the existing "footprints" of the project roadways. Additional work may also include elements such as drainage improvements, signing, pavement markings, roadside improvements, guardrail installation or improvements, pedestrian and bicycle improvements, edging installation or adjustment, ADA/AAB elements, and other incidental improvements.

The Footprint Roads Pilot Program is not intended as a replacement or expansion of the Local Aid (Chapter 90) program or as a replacement program for state highway resurfacing and maintenance projects. It is intended to improve and protect roads that contain one or more of the following assets:

a) Serve as a main street in city or town centers
   - Located in a mixed use community, village, neighborhood, downtown or government service center

b) Contain historic assets
   - Listed on State or National Register

- Eligible for inclusion in the National Register by the Massachusetts Historic Commission
- Identified by the local historic commission as an area containing historic resources

c) Pass through or adjacent to public lands
- Conservation lands
- Recreational lands
- Other public lands

d) Pass through or adjacent to natural resources
- Wetlands
- Coastal resources
- Bodies of water
- Trees of 14" dbh (diameter at breast height) or larger

e) Are designated as a scenic road or byway
- State or federally designated scenic byway or highway
- Proposed scenic byway that has a completed corridor management plan or a corridor management plan underway
- Locally designated scenic road

f) Pass through or adjacent to agricultural lands
- Prime
- Unique
- Other than prime or unique that is of statewide importance
- Other than prime or unique that is of local importance

Qualified projects under this program are exempt from all of the 13 AASHTO controlling criteria.

PROGRAM ELIGIBILITY CRITERIA

To be eligible under this program, projects must meet all of the following criteria:

1. All project roadways must be part of the Federal Aid System.

2. All project roadways must be Non-National Highway System roadways.

3. All project roadways must have a pavement structure that, through resurfacing, restoration or rehabilitation techniques, can be expected to provide an acceptable level of structural adequacy for a minimum design life of 10 years.

4. All project intersections must have average or lower-than-average crash rates when compared to averages for similar locations (signalized or unsignalized) in similar areas of the state (MHD District regions). Current crash rate averages are available from the Safety Management/Traffic Operations Unit of MHD.

5. All project roadways must not contain high-hazard locations that have been documented to have adversely affected the safety of any user. Any roadways that have experienced at least one fatality attributable to existing substandard design elements shall not be eligible under this program.

ELIGIBLE SCOPE OF WORK

The project scope must include pavement overlay, restoration or rehabilitation. Full-depth or partial-depth roadway reconstruction may also be included in some situations. Roadways should be reconstructed within their existing footprints, generally matching their existing horizontal and vertical alignments, and their existing widths. Pavement widths may be expanded or narrowed in limited areas to allow for a uniform pavement width within the project limits.

The project scope may also include any of the following:

- Drainage improvements,
- Signing,
- Pavement markings,
- Roadside improvements,
- Guardrail installation or improvements,
- Pedestrian improvements (such as sidewalks, crosswalks and public transportation waiting areas),
- Bicycle improvements (such as signs, improved pavement markings and improved shoulders as defined under these guidelines),
- ADA/AAB elements (such as wheelchair ramps),
- Edging installation or adjustment,
- Traffic signal system upgrades (if improvements are incidental to the project),
- Landscaping, street lighting, or other enhancements.

DESIGN CRITERIA

Qualified projects under this program are exempt from all of the 13 AASHTO controlling criteria and from the curb lane width requirements of Engineering Directive E-98-003 (*In Response to MGL Ch 87 Acts of 1996, Bicycle and Pedestrian Accommodation*).

All other relevant MassHighway standards, policies and procedures will apply. Projects must comply with the *Americans with Disabilities Act*, the requirements of the Massachusetts Architectural Access Board, and MassHighway handicapped accessibility standards and policies. Projects must also comply with the *Manual on Uniform Traffic Control Devices* and with Federal Highway Administration and MassHighway requirements for conformance with *National Cooperative Highway Research Program Report 350* and its subsequent revisions (for guardrails, work zone traffic control devices,

sign supports, etc.) No project is exempt from local, state and federal environmental requirements.

PROJECT DOCUMENTATION REQUIREMENTS

Each project under this program must be properly documented in the format outlined in the "Candidate Project Application Form" section of this document.

If the District Highway Director and the Regional Planning Agency both recommend the project for inclusion in this program, they will forward the application materials to the Footprint Roads Pilot Program Selection Committee for prioritization in the selection process. In order to receive construction funding, an approved project must be included in the appropriate Transportation Improvement Program (TIP) and State Transportation Improvement Program (STIP). Any projects not approved for inclusion under this program may still be advanced under the normal procedures outlined in the *Highway Design Manual*. Project proponents/designers must maintain the project application/documentation and any subsequent approval letters in the permanent project file.

FOOTPRINT ROADS PILOT PROGRAM
CANDIDATE PROJECT APPLICATION FORM

This form should be completed providing as much detailed information as possible to evaluate the merits of your project. Where necessary, attachments should be labeled and provided for review.

Completed forms should be submitted to the appropriate MassHighway District Office and Regional Planning Agency for concurrent review.

I. Project Identification

City/Town: _____

Street: _____

Physical Limits (stations and coordinates or distances from town lines and/or intersecting streets): _____

Total Length of Project: _____

Project Locus: (Provide attachment)

II. Project Purpose and Scope of Work

Discuss the purpose of the proposed project and the specific proposed elements of work, including the type of improvements and all incidental elements of work. Also, discuss the existing targeted deficiencies with the project roadways and how the proposed scope of work will correct those targeted deficiencies. Any special roadway and/or community characteristics may be included here to enhance the project description and to support the project purpose.

_____
_____
_____
_____
_____
_____
_____

III. Project Proponent Information

Applicant: _____

Primary Contact Person: _____

Title: _____

Telephone Number: _____

Designer/Consultant (if known): _____

IV. Roadway Description

Functional Classification: _____

Number and Types of Lanes: _____

Existing Lane, Shoulder and Sidewalk Widths: _____

Existing Geometry (in general terms): _____

Existing Pavement Condition: _____

Existing Land Use (in general terms): _____

Existing Right of Way: _____

Description of Cultural and/or Natural Resources (applicable assets as identified in "Program Intent, Parameters and Guidelines" section of this document): _____
_____
_____
_____

V. Traffic Data

Current Average Annual Daily Traffic Volume (AADT): _____
Future AADT for 10-year design life: _____
Current Peak Hour Traffic Volume: _____
Current Directional Distribution (D): _____
Current Percentage of Truck Traffic (T): _____
Turning Movements at Major Intersections: (Provide attachments)

VI. Vehicular Level of Service Analysis

Complete Level of Service Analyses in accordance with the guidelines set forth in the *Highway Capacity Manual*. Separate analyses must be completed for the mainline and for each major intersection within the project limits. All analyses should be completed using current-year traffic data and existing conditions. Include any necessary attachments.

Also, document any substandard Levels of Service. This should include a discussion of any locations that have existing Levels of Service of "E" or "F". Document reasons why improvements to Level of Service are not warranted or practical, and describe any proposed elements of work that will relieve the existing congested conditions. In general, a proposed project should not diminish the existing Level of Service for any project roadways.

VII. Bicycle and Pedestrian Accommodation Analysis

Address bicycle and pedestrian accommodation within the project limits relative to the intent of Chapter 87 of the Acts of 1996. This analysis should include a description of existing bicycle and pedestrian features/conditions and reasonable efforts to improve accommodation for bicyclists and pedestrians. A proposed project should not diminish existing accommodation for bicyclists or pedestrians.

VIII. Crash Data and Crash Analysis

Complete crash (accident) analyses for the mainline and for each major intersection within the project limits. All analyses should be completed using crash data from the most recent 3-year period. Attach any necessary pages. The following information should be collected and documented:

Number and percentage of crashes by type:

- **Run-off-road:** _____
- **Head-on:** _____
- **Sideswipe:** _____
- **Rear end (intersection only):** _____
- **Angle (intersection only):** _____
- **Left-Turn (intersection only):** _____
- **Fixed Object:** _____
- **Overturn:** _____
- **Pedestrian:** _____
- **Other:** _____
- **Unknown:** _____

Collision Diagrams for intersections (Provide attachments)
Intersection crash rates for each major intersection (Use Crash Rate Worksheets, attached)
Statewide crash rates for similar facilities: (Available from MassHighway Safety Management/Traffic Operations Unit) _____
Identify specific high-hazard locations (crash analysis by location): _____
_____
_____
_____

IX. Estimated Cost

Provide a reasonable estimate of all construction costs. Factor in any necessary adjustments to present-day costs to account for the anticipated time periods of the programming and design phases.

_____
_____
_____

MassHighway

CRASH RATE WORKSHEET

STANDARD PROCEDURES

The Traffic Operations & Safety Unit of the Massachusetts Highway Department (MassHighway) has been working on developing a database of accident rates since the fall of 1997. The calculation of the accident (crash) rate for an intersection is an effective tool to measure safety hazards. The goal of this effort is to develop standard crash rates for both signalized and unsignalized intersections throughout the Commonwealth. Added functions will allow detailed analyses by District, City or Town, and for specific roadways.

Crash Rate Worksheet Standard Procedures :

1) The MassHighway Crash Rate Worksheet will be provided to all consultants for use in any, and all design report documents that will be reviewed by the Department. This includes, but is not limited to, Environmental Impact Reports, Functional Design Reports, Traffic & Safety Analyses and Mitigation Projects.

2) Please specify the City/Town and District that the subject intersection is located in. The date of the volume count data that is used in the project report should be listed as well. Use the most appropriate date should there be multiple years of data utilized. Finally, check off the type of traffic control that exists at the intersection.

3) Identify the major street at the subject intersection, along with each of the corresponding minor streets intersecting it. If there is more than one major street, label it as such.

4) Sketch out a diagram of the intersection, carefully labeling each approach. Identify north with an arrow in the box provided.

5) From the peak hour volume counts collected for the intersection, sum the totals by each approach and fill in the table provided. MassHighway prefers to use the PM Peak hour volumes, however the AM Peak is acceptable if it is the only data available. Please circle "AM" or "PM" to indicate the time period referenced. For a multi-leg intersection (4+ legs) it would be helpful to show the approach numbers on the *Intersection Diagram*.

6) Compute the "K" Factor for the intersection or dominant roadway, by reviewing the ATR counts collected. Use the same time period, preferably the PM Peak, that was used in determining the hourly approach volumes. A default value of 0.09 can be assumed for insufficient ATR data. Mark the "K" Factor in the box provided.

7) Calculate the intersection approach ADT by summing the directional approach volumes and dividing by the "K" Factor. The result is a measure of the daily entering vehicles for the subject intersection.

8) Review the accident (crash) data provided and determine the quantity of accidents occurring at the intersection over the time period presented. The accidents considered valid should occur at the intersection, or within the immediate vicinity. MassHighway requires a minimum of 3 years of accident data for traffic studies. Thus for the calculation of the accident rates, the average number accidents over the length of the study period is used.

9) Note that the year of the traffic volumes collected does not usually match the year of the crash data. The MassHighway accident database usually runs about 12 to 18 months behind the actual date due to processing time. We recognize that this creates inconsistencies, however it was deemed acceptable in order to keep an "active" database on *Crash Rates*. Use of more current City and Town accident data is acceptable, and encouraged.

10) The *Crash Rate* calculation is the last step in the process. The formula for calculating the accident rate for an intersection is presented below. The "Rate" (R) is expressed in **M**illion **E**ntering **V**ehicles (MEV), which is standard to the Traffic Engineering profession.

$$R = \frac{A \times 1{,}000{,}000}{V * T}$$

Where;

A = Average number of accidents at the study location, during a given time period (usually 1 year = 365 days)
V = Intersection ADT (all approach legs)
T = Time, expressed in the number of days in the study period (365)

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : _____ COUNT DATE : _____

DISTRICT : _____ UNSIGNALIZED : _____ SIGNALIZED : _____

MHD USE ONLY

Source # _____

~ INTERSECTION DATA ~

MAJOR STREET : _____ ST # _____

MINOR STREET(S) : _____ ST # _____

_____ ST # _____

_____ ST # _____

_____ ST # _____

INTERSECTION DIAGRAM
(Label Approaches)

North

INTERSECTION REF # _____

Peak Hour Volumes

APPROACH :	1	2	3	4	5	Total Entering Vehicles
DIRECTION :						
VOLUMES (AM/PM) :						0

" K " FACTOR : _____ APPROACH ADT : **#DIV/0!** **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : _____ # OF YEARS : _____ AVERAGE # OF ACCIDENTS (**A**) : **0.00**

CRASH RATE CALCULATION : **#DIV/0!** RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Comments : _____

Project Title & Date: _____