Working as the Regional Planning Commission and MPO for the Southern New Hampshire Region

Regional Comprehensive Plan

for the

Southern NH Planning Commission Region

SNHPC

Adopted
November 28, 2006

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Southern NH Planning Commission Region

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SNHPC

438 Dubuque Street
Manchester, NH

Prepared by the
Southern New Hampshire Planning Commission

Regional Comprehensive Plan

Southern New Hampshire Planning Commission
438 Dubuque Street, Manchester, New Hampshire 03102-3546

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INTRODUCTION

The Southern New Hampshire Planning Commission (SNHPC) region consists of 13 communities; Auburn, Bedford, Candia, Chester, Deerfield, Derry, Goffstown, Hooksett, Londonderry, Manchester, New Boston, Raymond and Weare and is currently home to 259,521 residents (See map on following page). Located in the south-central portion of New Hampshire, this 490-square-mile region encompasses portions of Merrimack, Hillsborough and Rockingham counties.

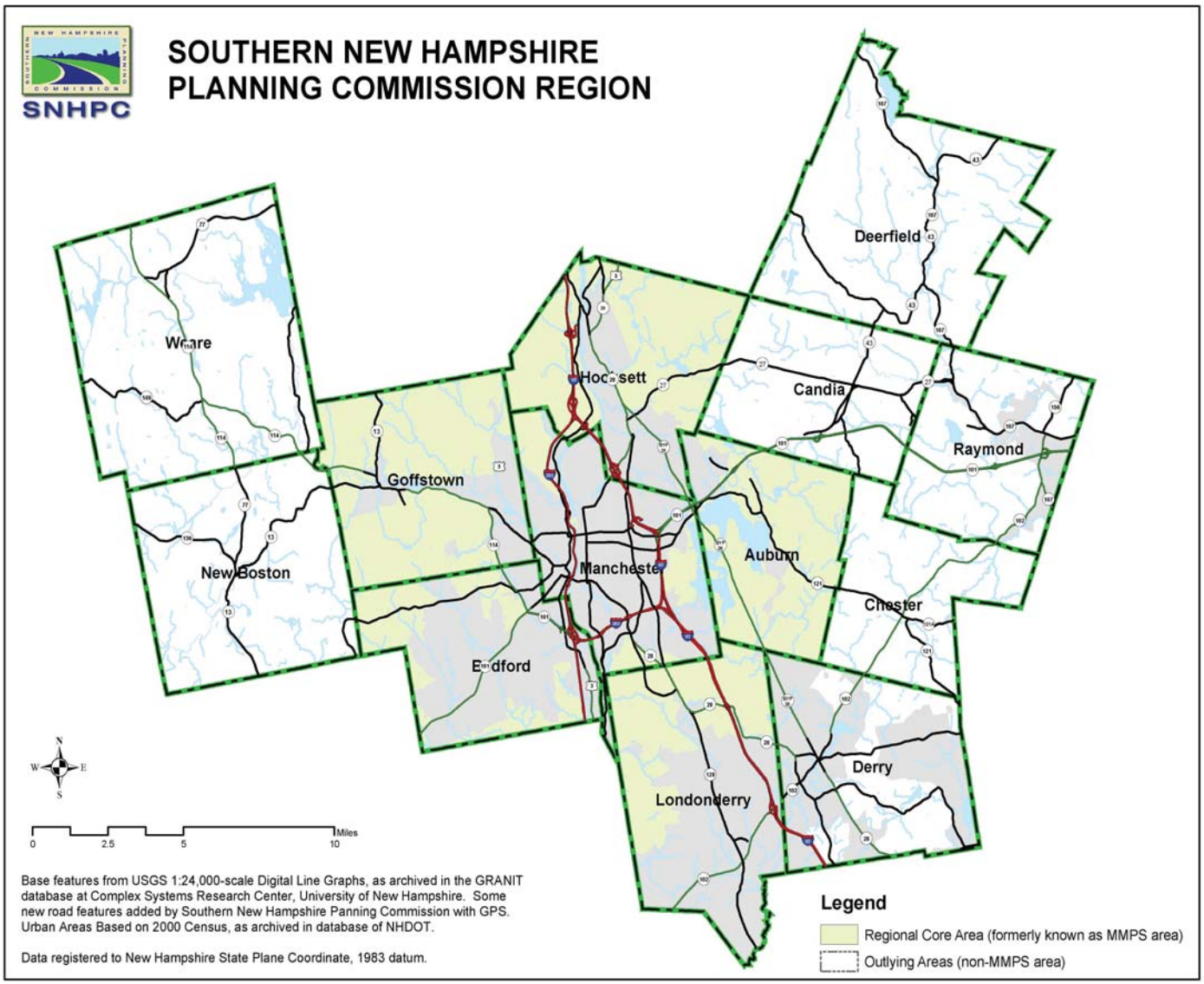
The region's towns were first settled in the early to mid 18th century. Manchester was incorporated as a city in 1846 and is the economic center of the region. It is home to 20 percent of New Hampshire's population and about 17.3 percent of New Hampshire's housing. Between the years of 1990 to 2000, the region experienced a 10 percent increase in the number of housing units.

The Southern New Hampshire Planning Commission was formally organized in August 1966. Currently the SNHPC is made up of 33 Commissioners representing each of the 13 communities within the region. These Commissioners govern the SNHPC. By working under the provisions of RSA, Chapter 36; the SNHPC strives to provide services including, but not limited to, increasing communication; promote intergovernmental cooperation and coordination between planning boards and local officials; promote coordinated development of the region; prepare and adopt regional plans, including policies and strategies for the region; and assistance with transportation.

The SNHPC also helps communities handle situations that are beyond municipal boundaries. The Commission encourages each town to think regionally, but act locally, allowing improvements and positive changes to affect the greater good of the whole region. SNHPC also acts as a liaison between towns and helps projects get completed and put into action.

Besides increasing growth and development, other concerns facing communities within the SNHPC region include preserving rural character and feel while allowing for smart growth and modern expansion. Development needs include the issue of attracting high paying jobs, improving and expanding infrastructure to support and attract commercial and industrial development, and improving and expanding the local tax base through non-residential development. The importance of economic expansion is paralleled with the need to maintain rural character and aesthetic beauty. Current projects work to preserve open space within the region to protect wildlife habitats, biodiversity, and air and water quality, to name a few. Recent events such as purchasing land for flood control are becoming pressing issues.

By maintaining a balance of rural and urban qualities, the SNHPC has and will always be a desirable place to live.


SOUTHERN NEW HAMPSHIRE
PLANNING COMMISSION REGION
SNHPC
Deerfield
Weare
Hooksett
Candia
Raymond
Goffstown
Auburn
New Boston
Manchester
Chester
Bedford
Derry
Londonderry
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E
S
0
2.5
5
10
Miles
Base features from USGS 1:24,000-scale Digital Line Graphs, as archived in the GRANIT database at Complex Systems Research Center, University of New Hampshire. Some new road features added by Southern New Hampshire Panning Commission with GPS. Urban Areas Based on 2000 Census, as archived in database of NHDOT.
Data registered to New Hampshire State Plane Coordinate, 1983 datum.
Legend
Regional Core Area (formerly known as MMPS area)
Outlying Areas (non-MMPS area)

Chapter One:

Key Issues, Goals and Policies and Action Recommendations

Agricultural Sustainability

Key Findings and Issues

1. New Hampshire and the region are experiencing a rapid loss of farmland to development. From 1997-2002, Hillsborough County lost 19 percent of its productive cropland. Rockingham County during the same time period lost one-third of its productive cropland.

2. The region's best and most productive farm and prime agricultural soils remain unprotected. In most cases, areas with the best agricultural soils have the least farmland protection.

3. The largest threat to agricultural sustainability within the region is the increasing value and price of land.

Overall Goal

Agricultural land is essential to the region for economic, environmental, cultural and aesthetic reasons. These lands provide a wide range of food and plant production, including but not limited to livestock, fruits and vegetables, annual and perennial greenhouse plants, maple syrup, honey, hay and sod, and lumber. It is important that these lands be protected for existing and future generations.

Policies

Encourage municipalities to designate and protect farms by utilizing the services of the New Hampshire Department of Agriculture and the federal Farm and Ranchlands Protection Program to establish agricultural conservation easements.

Support legislation to continue and improve the current use program and to enact and provide state and local tax credits for agriculture activities and uses, including a source of funds to purchase development rights

Encourage municipalities and Planning Boards to conduct an agricultural audit of their community identifying existing agricultural activities, local farming issues and ways to protect existing farmland. This audit should be incorporated into municipal master plans.

Increase production and marketing of agricultural products in the region and support the distribution and consumption of locally produced foods through public and farmer's markets, a "food chain," community gardens, and community supported agriculture.

Utilize best management practices to minimize development around prime and important agricultural soils so that land will continue to be available for farming.

Action Recommendations

Commission:

- Work with municipalities, the state and state legislature to develop legislation, programs and funding to support the establishment of agricultural conservation easements and land use regulations which will identify and protect important farmland soils and existing farmland.

Municipal:

- Establish a local Farmland Protection Committee who duties and responsibilities would be to conduct an agricultural audit of their community; and identify local farming issues and ways to protect important agricultural soils and existing farmland.

Transportation

Key Findings and Issues

1. Driving alone to work contributes to increased traffic volumes, risk of accidents, and pollution. In 2000, 83 percent of all residents within the region drove alone to work, with an average commute time of approximately 30 minutes.

2. Traffic volumes continue to increase and as a result levels of service continue to decrease on the region's major roads and highways. Daily traffic on the region's roads and highways is projected to increase from 2.1 million trips per day to 2.8 million trips per day in the year 2025. This amount of traffic is equivalent to an average increase of 1.3 percent annually.

3. Transportation funding is declining statewide and present funding cannot meet current needs, despite the increases in volume and resulting need for roadway improvements.

4. The I-93 widening project will likely have significant growth impacts that will be felt by most if not all communities within the SNHPC region. The consequences of this growth could be increasing traffic and decreasing levels of service on many of the region's secondary highways and intersections. Communities will need to monitor these secondary impacts.

Overall Goal

Provide a safe, economical, energy-efficient, and convenient transportation system comprised of roads and highways, bike and pedestrian ways, and rail, air, and bus services. This integrated system should provide people within the region the ability to readily access goods and services, and will support the desired regional development pattern.

Policies

Develop an effective street and highway network and multi-modal transportation facilities that meet the needs of the region.

Seek alternatives to creating more vehicle trips. Encourage the public and private sector to reduce vehicle trips.

Encourage municipalities to adopt a local comprehensive transportation plan which considers access management, street connectivity, pedestrian safety and creative

funding opportunities, including the provision adequate off-street parking for new development based on projected demand.

Partner with municipalities to develop a "local wellness" program to identify and fund small projects which can keep local roads healthy and provide common sense solutions to local transportation issues.

Continue long-range highway planning on an area-wide scale to provide the framework for regional and statewide improvement program priorities, scheduling and funding.

Monitor the Statewide Transportation Improvement Plan to ensure that the region's roadway improvement needs are met through that plan.

Broaden citizen participation in transportation planning and foster coordinated decision making with respect to the long-range plan, implementation programs and projects.

Encourage recognition of the impacts and inter-relationships of land use, public facilities and transportation activities and decisions.

Maintain existing railroad facilities where needed to support economic activities.

Expand and improve railroad facilities to meet projected needs and activities of commuters.

Improve and expand existing bus service.

Increase MTA ridership and income.

Coordinate various public transportation services currently being provided to minimize overlap, duplication and costs and to provide adequate service for the elderly and handicapped.

Support adequate airport facilities to handle the anticipated movement and interchange of people and goods.

Promote additional airport services at the Manchester Airport.

Encourage airport-related compatible land uses at the facility and in the immediately surrounding area.

Broaden the base of financial support of the airport to more equitable distribute operating costs in relation to the benefits provided by the airport within the regional area.

Engage the private sector to assist local and state government in the development of local and regional commuter ride-sharing programs.

Encourage area employer's to offer commuter tax incentives and consider the feasibility of establishing staggered work schedules.

Promote the establishment of a non-profit Transportation Management Authority (TMA) entity for the region in establishing effective ride share and commuting programs.

Support the NH Rideshare Program and encourage the public and private sector to participate.

Establish park-and-ride facilities with shuttles or other "people-mover" capabilities in strategic locations in all of the municipalities to reduce the number of SOV traveling in the region.

Promote the use of HOV highway lanes during high volume hours on I-93 and Rt. 3, where appropriate.

Promote higher residential density and mixed-use developments with transit oriented development (TOD) in appropriate locations and town centers.

Provide for safe bicycle and pedestrian traffic, both in the city/village centers and in connecting neighborhoods to schools, businesses, recreation areas and a regional system.

Ensure accessible routes throughout the city/village centers for residents who are mobility impaired.

Develop a multi-modal transportation center in Manchester and the surrounding towns.

Implement commuter rail from Manchester to Boston and Concord.

Increase investment in public transit to expand services locally and regionally, explore other funding mechanisms.

Emphasize development of town and village centers to create walkable communities.

Develop a true multi-modal transportation system with appropriate support for the pedestrian, bicycle, transit and passenger rail modes.

Regional decision making processes should have a meaningful role in selecting and prioritizing transportation improvements.

Place a high priority on transportation system safety.

Make transportation investments and land use decisions that are mutually supportive.

Support the implementation of land use codes that encourage the use of bicycle and pedestrian modes and discourage the use of the private automobile for short local trips.

Increase roadway network connectivity and provide additional route choices in new development.

Implement access management techniques that will preserve existing roadway capacity.

Support adequate investment in all modes of transportation within the system.

Action Recommendations

Commission:

- Work with municipalities, the state and state legislature to develop legislation, programs and funding to implement transportation planning at both the local and regional levels;
- Continue to facilitate the TAC;
- Continue to plan for the development of multi-modal and alternative transportation facilities, including transit, park and ride, and commuter rail;
- Assist communities in obtaining enhancement and CMAQ funding; update and monitor the TIP;
- Update and monitor the region's transportation plan;
- Update and monitor the region's transportation model; perform traffic analysis as requested;
- Promote the development of commuter ride-sharing programs; review traffic impact studies; and
- Work with the municipalities to develop a regional ITS architecture.

Municipal

- Establish a local Transportation Planning Committee who duties and responsibilities would be to develop a local transportation plan, assess local

transportation facilities and services, seek funding for improvements and enhancements; and

- Identify and develop both roadway and alternative transportation projects; and continue to participate in the regional TIP and TAC.

Housing

Key Findings and Issues

1. Available housing supplies are not meeting the region's housing needs.

2. More housing diversity is needed among the type and cost of housing available in the region. A regionally diverse housing supply would be comprised of a broad mix of single-family, two-family, multi-family, and manufactured housing that offered as owner-occupied or rented units for a cost proportionately affordable to the existing or potential future population.

3. Affordability continues to be a problem with fewer households being able to afford adequate housing in the region.

Overall Goal

Achieve an adequate and diverse supply of quality housing affordable to all households and employees in the region.

Policies

Encourage innovative and cost-effective housing development by promoting greater flexibility in the use of local controls.

Support municipal efforts to conserve existing housing stock through the rehabilitation of substandard housing.

Encourage uniformity in the use of building codes and enhance the consistency of code enforcement, including revisions that provide incentives to encourage owner investment.

Support public-private partnerships for capitalization, construction, permitting, inspection assistance to construct affordable and workforce housing.

Encourage SNHPC communities to adopt inclusionary housing and housing subsidy retention ordinances.

Provide incentives and disincentives to support minimum fair housing standards.

Work closely with the universities and colleges within the region to build additional student housing on campus and resolve neighborhood issues of noise, congestion, and parking.

Invest in rehabilitation of older housing stock while preserving its architectural integrity.

Support revisions to building codes that will provide incentives to encourage owner investment and reuse or redevelopment of existing structures.

Develop "brownfields" for use as housing construction sites when the environmental conditions are conducive to such uses.

Revise zoning regulations in targeted areas as part of the neighborhood design process to allow "building up, not out" creating an environment that is safe, accessible, and attractive.

Develop alternative models of home ownership such as cooperatives and co-housing.

Provide substantial educational opportunities for the SNHPC communities and local citizens on the regional need for affordable and diverse housing supplies.

Provide substantial educational opportunities for the SNHPC communities and local citizens to debunk the many negative myths related to providing an affordable regional housing supply.

Promote greater communication between communities when reviewing housing developments with potential regional impacts.

Promote state legislation that grants regional planning commissions the power to review and comment on Growth Management Ordinances before they can be implemented in any community to ensure that they are truly being implemented because of unusually high rates of growth. To implement Growth Controls when such conditions are not present will inflate the local cost of housing.

Work toward growth in housing to match growth in employment, and ensure that new housing includes a balance of styles, densities, and a distribution of prices that are affordable to a range of income levels.

Encourage wide ranges of housing opportunities in more urban zones, decreasing the need to look outside of the core developed areas in order to construct multi-family or affordable housing.

Ensure that those with limited means have access to affordable housing and have sufficient funds for nutrition, health care, education and other necessities.

Better understand how the rapid increase in 55 plus housing is impacting our communities and the region and what land use and service sector changes will be required to meet the needs of the changing demographics.

Action Recommendations

Commission:

- Work with municipalities, the state and state legislature to develop legislation, programs and funding to implement affordable/workforce housing at both the local and regional levels;
- Participate on local, regional and statewide housing initiatives and coalitions; continue to update and monitor the region's fair share housing needs assessment model;
- Help identify, write and administer community development block grants for various housing and other infrastructure projects;
- Provide assistance to communities in implementing affordable and inclusionary housing ordinances and regulations; and
- Monitor and keep track of building permit records and age restricted housing
- Study the need and impact of age restricted housing on the region and at the community level.

Municipal:

- Establish a local Housing Committee who duties and responsibilities would be to develop a local housing plan, assess existing housing conditions and needs, seek funding for improvements and enhancements, and identify and develop affordable housing opportunities;
- Encourage the development of local affordable housing and elderly housing projects; and
- Participate in regional affordable housing initiatives.
- Monitor the need and impact of age restricted housing at the community level.

Energy

Key Findings and Issues

1. More work and education is needed in energy conservation and efficiency to significantly decrease demand for non-sustainable energy supplies that are becoming increasingly more expensive. Communities have an opportunity to take a lead role in educating the public and encouraging energy conservation and energy efficiency at the local level. However, community participation in these efforts has been limited to date.

2. Businesses and government, two of the largest energy consumers, need to be better informed about the environmental impact of energy consumption so that they can make more informed and sustainable decisions.

2. Local supplies of sustainable energy do not exist nor does a general understanding of energy sustainability, both of which will be essential to reduce dependence on foreign energy supplies and susceptibility to global downturns and reduce demand for non-sustainable energy.

Overall Goal

Energy conservation and sustainable energy is integral to the economic and environmental well-being of our region. Access to secure, affordable supplies of energy is required for almost every activity of private citizens, business and government. This can be achieved through conservation and promoting the development of local and regional sustainable and renewable energy sources.

Policies

Encourage business and government to explore sustainable renewable energy sources and promote conservation, including incentives for reuse and recycling efforts.

Encourage all municipalities within the region to implement energy conservation measures by participating in available programs such as the Granite State Clean Cities Coalition, the Alternative Vehicles Fuel Project, Rebuild New Hampshire, Cities for Climate Protection Program, and the New Hampshire High Performance Schools initiatives.

Support and encourage local businesses to participate in PSNH retrofit and efficiency programs and the New Hampshire Industries of the Future program to achieve improvements in energy use, efficiency and management, including the installation of low-impact lighting throughout the region.

Encourage municipalities to modify building standards (Green Buildings) to make them more environmentally sound and develop sources on environmental building materials through voluntary programs offering incentives in exchange.

Encourage home builders and developers to adopt and employ the use of integrated materials technologies and energy saving construction practices in the sustainability, design and construction of commercial and residential buildings.

Track the evolution of sustainable energy sources and programs available within the region and serve as an informational clearinghouse on these topics for member communities.

Provide continued education on sustainable and energy efficient opportunities to the region's municipal employees and citizens.

Promote alternative initiatives that will reduce fuel consumption such as staggered work hours, car pooling, telecommuting, and mainstreaming biodiesel.

Action Recommendations

Commission:

- Work with municipalities, the state and state legislature to develop legislation, programs and funding to implement energy conservation and sustainable energy sources at both the local and regional levels;
- Participate on local, regional and energy conservation initiatives and coalitions; assist local municipalities in the development of local energy conservation plans;
- Identify, write and administer grants for various energy conservation projects;
- Provide assistance to communities in implementing energy conservation ordinances and regulations;
- Monitor and keep track of sustainable energy sources and programs developed within the region; and
- Achieve 50 percent sustainable energy resources by the year 2015.

Municipal:

- Participate and seek help from available energy conservation programs; develop a local energy conservation plan;
- Conduct energy audits and identify viable energy conservation measures, seek funding for improvements through CIP and other funding sources;
- Explore sustainable renewable energy sources; and
- Achieve 50 percent sustainable energy resources by the year 2015.

Cultural and Historic Resources

Key Findings and Issues

1. The need for historic preservation is an ongoing challenge despite the frequent citation in master plans to preserve our local historic or rural character. Most often historic preservation efforts do not make it beyond the pages of the master plan in practice.

2. All communities in the SNHPC region have a Historic District Commission, Heritage Commission, or Historical Society. These groups are valuable to the communities and can better help to improve preservation efforts. This value must be accentuated.

3. There is a need for increased historic preservation education if we are to preserve our historical treasures. There are many existing mechanisms and funding sources to aid in these efforts, but many of these programs are unknown at the local level.

Overall Goal

Actively promote the preservation of the region's historic and cultural resources so that our local history does not disappear and our communities can retain the historic atmosphere they all highly value.

Policies

Encourage the protection and enhancement of historically and culturally significant districts, sites, buildings, structures and objects.

Encourage and assist municipalities to conduct historic resource inventories and document those identified historic resources in an easily accessible digital data base.

Encourage municipalities to integrate innovative preservation planning tools into local planning documents:

- Consider adaptive re-use of historic structures as an alternative to historic preservation

- Consider the appropriateness of one or more historic districts in municipal zoning

- Organize local and regional economic opportunities of heritage tourism.

- Encourage municipalities to develop and promote educational in initiatives relating to historic preservation.

- Work with municipalities to foster increased cooperation, coordination, and communication among and between towns, historic preservation organizations and other related organizations.

- Promote state legislative action to allocate greater funding and resources to the region and municipalities to preserve local historic and cultural features.

- Encourage the private sector to take an active role in preserving the community they are located in.

- Identify and preserve key natural, cultural and scenic resources to help preserve the appearance and character of places even as they grow and change.

Action Recommendations

Commission:

- Work with municipalities, the state and state legislature to develop legislation, programs and funding to implement historic preservation at both the local and regional levels;
- Participate on local, regional and historic preservation initiatives and coalitions;
- Assist local municipalities in the development of local historic preservation plans;
- Identify, write and administer grants for various historic preservation projects;
- Provide assistance to communities in implementing historic preservation commissions, guidelines and ordinances; and
- Monitor and keep track of local historic preservation programs, commissions and districts developed within the region.

Municipal:

- Establish and appoint a local Heritage or Historic District Commission; develop a local Historic Preservation Plan;
- Conduct historic surveys and identify important historic properties;
- Seek funding for historic preservation from grants and other funding sources;
- Develop design guidelines which incorporates the elements of the historic character of the communities; and
- Explore becoming a Certified Local Government under the State Historic Preservation Office.

Economic Development

Key Findings and Issues

1. When it comes to attracting high paying skilled jobs, improving or expanding the local tax base or seeking a balance in quality of life and growth management, economic development planning is a necessity. However, there are only a few municipalities within the region that promote it or practice it.

2. The largest barriers to economic growth within the region is the lack of infrastructure to support development as well as access to affordable housing. Many towns within the region have limited public water and sewer services as well as affordable housing opportunities and as a result must develop innovative ways to create and pay for the infrastructure and housing they need in order to attract development and provide housing for their workforce.

3. As the region continues to grow in population, economic development will become increasingly important for two reasons. First is the provision of goods, services and jobs to sustain a greater number of residents. Second is to attract and maintain commercial and industrial businesses that provide the tax base to fund schools, roads, and other municipal services. Given the region's prime location in Southern New Hampshire and only an hour's drive from Boston, the region is an attractive area for business to locate. Additionally, New Hampshire has a variety of business-friendly tax regulations and high quality of life standards that can attract economic growth.

Overall Goal

Economic development is closely linked with other goals, including public facilities, public utilities, affordable housing, and transportation, etc. However, economic growth and development does not just happen, it requires planning and support from all sectors of society. Greater economic development planning should be implemented in order to help sustain and improve the overall economic health and well-being of the region.

Policies

Encourage the update and study of local land use regulations that will promote and sustain the type of economic development desired by the community.

Support efforts and programs to revitalize the Manchester Central Business District and to make the City of Manchester the cultural center of the region. At the same time, Manchester must recognize and support the economic development efforts of surrounding communities.

Work with municipalities to establish public/private partnerships, local economic development committees and commissions, and the adoption of comprehensive or strategic economic development plans.

Encourage inter-municipal communication and cooperation on economic issues within the region.

Encourage municipalities to develop or redevelop existing residential, commercial, and industrial areas where there is existing public infrastructure (water, wastewater, and transit) to promote smart growth and prevent sprawl. This will help communities absorb a higher percentage of future growth and development than within undeveloped areas of the region.

Support and encourage efforts to redevelop vacant former industrial areas known as brownfields to create new economic development opportunities and to absorb significant commercial and/or mixed-use growth.

Continue to redevelop of the waterfront areas of the Merrimack River as a low density, mixed-use accessible to all of the region's residents for business, housing, cultural, and recreational needs in accordance with environmental concerns

Maintain and expand the number of businesses that offer essential goods and services within the region, readily available to all residents.

Invest in new and existing infrastructure to support additional growth through a variety of private and public funding utilizing Tax Increment Financing (TIF) Districts, impact fees, community development funds, and Community Reinvestment and Opportunity Program (CROP) Zones.

Invest in and maintain an advance telecommunications system with region-wide accessibility for all.

Build on the region's strong tourism base, focusing on the environmental, historical, recreational, cultural, and commercial attractions that draw tourists.

Allocate resources to maintain and develop diverse cultural opportunities accessible to all, from art in public places to affordable studios and rehearsal spaces, teaching facilities, exhibition and performance venues, and lifelong educational opportunities.

Work with Greater Manchester Chamber of Commerce METRO CENTER and other Economic Development agencies to develop and implement additional incentives and technical support to create a dynamic business mix. Create new businesses, livable-

wage job opportunities, and economic development by providing good and services locally.

Support micro and small business development, including women- and minority-owned enterprises.

Develop more affordable commercial and incubator spaces in designated areas throughout the region.

Combine the purchasing power of major institutions in the region to support businesses that will direct dollars to the local economy.

Encourage individuals, businesses, and organizations to invest savings in local financial institutions that reinvest funds directly back into the community.

Provide creative financial and affordable capital for business growth through public/private partnerships.

Target economic development efforts to attract higher paying skilled jobs.

Support the work of the region's colleges and technical schools and encourage businesses to employ graduates of the region's colleges and universities, especially community technical college students.

Encourage communities to participate in the NH Main Street Program.

Encourage new industrial development through the establishment of eco-industrial parks, which provide greater opportunities for community collaboration and planning.

Encourage mixed-use within existing village centers to avoid the mistakes of allowing costly sprawl and strip development to occur.

Update the Commission's GIS data base by documenting the location and extent of Tax Increment Finance Districts (TIFD) within the region.

Actively support the economic and cultural vitality of regional and local centers by channeling growth toward them and providing the ingredients needed for successful mixed use.

Work cooperatively in the region to support a sustainable diversified regional economy, and support mechanisms to share the costs and benefits of growth.

Seek opportunities to benefit from the economies of scale necessary for cost effective high quality infrastructure and services.

Conserve the working landscape of rural areas to maintain rural economy and tourism.

Develop a transportation system that supports economic development by being both financially efficient and effective at moving both people and products.

Action Recommendations

Commission:

- Work with municipalities, the state and state legislature to develop legislation, programs and funding to implement economic development at both the local and regional levels;
- Participate on local, regional, and state economic development initiatives and coalitions, including the Rockingham Economic Development Corp. and Greater Manchester Chamber of Commerce's METRO CENTER initiative and infrastructure committees;
- Assist local municipalities in the development of local economic development plans;
- Identify, write and administer grants for various economic development projects, including developing a region-wide "brownsfield" program;
- Provide assistance to communities in conducting economic development and pursuing economic development initiatives; and
- Monitor and keep track of the use of TIF Districts, impact fees, community development funds, and CROP zones developed within the region.

Municipal:

- Establish and appoint a local or regional Economic Development Committee; develop a local Economic Development Plan;
- Conduct surveys and identify important economic development projects;
- Seek funding for economic development from grants and other funding sources; and
- Participate in the METRO CENTER initiative, develop incubator space and support micro and small business development, participate in the NH Main Street Program, and actively support and encourage public infrastructure investments to promote smart growth and curb sprawl.

Public Utilities and Communication

Key Findings and Issues

1. Infrastructure and Growth. The projected growth of the region will necessitate increased accessibility and expansion of public utilities and communication facilities. Developing and expanding these facilities will be expensive, but the solutions to many of the challenges facing the region – affordable housing, economic development, transportation, energy and land use – rely on public utilities in the form of water, sewer, electricity, gas, communication, etc. Many issues will need to be addressed especially where and how such facilities can and should be expanded and what it will cost. Regional facilities could help to distribute some of the costs among neighboring communities.

2. Multiple Needs of the Merrimack River. The Merrimack River holds the key to the region's future growth. The river will be needed in the near future as both a major water supply source for the region as well as a point of increased wastewater treatment discharge. The water quality and flow of the river will ultimately determine how this important resource will be used to address the region's growth.

3. Septage Disposal, Solid Waste and Stormwater Management. These utilities are also becoming costly issues for local government. With many private hauling agreements in place among the region's municipalities, the disposal cost of septage is increasing and the number of facilities accepting this waste are decreasing. Solid waste and stormwater management pose similar burdens on local government. Both utilities must continue to meet higher standards and tougher environmental regulations, which increase costs and limit options. Recycling and source reduction will continue to be important solutions for local government. In the future, the MS4 communities within the region will continue to experience additional costs in stormwater management and stormwater discharge. Low-impact development and other best management practices will help to reduce runoff pollution, but ultimately the costs of stormwater management will continue to increase and these costs will be passed on to the discharger.

Overall Goal

Public utilities and communication are important lifelines for economic prosperity and development. The region cannot grow without adequate water systems, wastewater treatment, solid waste facilities, and communications. Support local and regional efforts to provide greater accessibility to public utilities and communication for all residences and the provision of adequate water and sewer capacity to facilitate economic development.

Policies

Work with municipalities to seek cost effective solutions and funding opportunities for the provision of necessary public utilities and communication services, including the coordination of services and regional preparedness for emergencies.

Support legislation and regulations limiting groundwater withdrawals within the region.

Encourage the establishment of a Regional Water Council or Water Authority to improve the supply, treatment and distribution of water services within the region. This could also involve combining Manchester Water Works and Pennichuck Water Works in the future to increase water supply and treatment capacity within the region

Identify and secure the water needs of the region for 50 to 100 years out into the future, including the availability of water from the Merrimack River.

Maintain a database and map showing all existing service areas and proposed service area expansions, which can be used for regional planning purposes.

Promote low impact development and best management practices, including minimizing the use of pesticides, herbicides, and chemical fertilizers by both public and private entities in the region to prevent runoff pollution and improve stormwater management practices and conditions

Implement broad education programs for people of all ages in the region, emphasizing how individuals can make a difference in their environment.

Support the development of a system for ongoing monitoring and reporting of water quality in the Merrimack River and other watershed areas.

Monitor the water supply and water quality of the region's major streams and rivers, including some of the important smaller streams and tributaries, which feed the larger systems.

Encourage water conservation during times of drought and support the creation of financial incentives for businesses to help reduce water pollution.

Continue to support the upgrade of wastewater and storm water systems and work with municipalities in seeking alternative systems to prevent both point and non point source pollution.

Coordinate water, wastewater, sewer and land use planning among municipalities within the region.

Investigate funding for conducting a regional wastewater treatment and septage disposal plan.

Seek a regional solution for septage disposal.

Seek a regional solution for household hazardous waste collection and disposal.

Encourage and support local and regional recycling programs. Encourage recycling programs that would achieve 50 percent or greater community participation.

Support and maintain existing municipal solid waste agreements and services.

Encourage the development of more power plants for the region. Co-generation and waste-to-energy facilities also need to be promoted.

Concentrate development where services and utilities are available or less costly to provide.

Promote low-impact development techniques for effective stormwater management.

Encourage municipalities to require in their land use ordinances that all new power and other utility lines be place underground in all new developments.

Promote the development of incentives to relocate existing power and other utility lines to be relocated underground.

Action Recommendations

Commission:

- Work with municipalities, the state and state legislature to develop legislation, programs and funding for the provision of necessary public utilities and communication facilities at both the local and regional levels;
- Participate on local, regional, state and federal studies to ensure adequate water and sewer services, including septage, solid waste and stormwater management;
- Identify, write and administer grants to assist communities in infrastructure investment;
- Provide support and assistance to communities in seeking regional septage and household hazardous waste solutions;

- Promote low impact development and best management practices; and
- Conduct region wide build out analysis and population projections.

Municipal:

- Participate on regional, state and federal studies related to groundwater supply, water quality and future plans for use of the Merrimack River;
- Conduct surveys, develop plans and explore ways to provide and/or expand necessary public water and sewer services;
- Develop and implement best management practices and effective stormwater management practices and ordinances;
- Participate in regional solutions to septage disposal and household hazardous waste collection; and
- Actively support and encourage public infrastructure investments to promote low impact development and smart growth and curb sprawl.

Natural Hazards

Key Findings and Issues

1. Flooding is the greatest natural hazard risk facing communities in the SNHPC region, closely followed by snow and ice storms.

2. There have been 16 federally declared disasters in the region since 1986; half due to flooding and severe storms and half due to various types of winter weather hazards.

3. All communities in the SNHPC region will have completed a Natural Hazard Mitigation Plan by 2007.

4. Communities need to implement their Hazard Mitigation Plans and some of the actions identified in the plan to reduce their risks and potential losses due to natural hazard events.

Overall Goal

In an era when natural disasters are becoming more frequent and destructive, mitigation is becoming more essential daily. The region should work to protect its citizens and guests, critical support services and essential facilities, and infrastructure from the potentially devastating effects of all natural hazards.

Policies

The policies here have been written to be consistent with the local and state hazard mitigation plans.

Improve upon the protection of the general population, the citizens of the region and guests, from all natural and man-made hazards.

Reduce the potential impact of natural and man-made disasters on the region's critical support services, essential facilities, and infrastructure.

Improve emergency preparedness within the local communities through effective emergency operations plans that meet the most current federal standards.

Improve the disaster response and recovery capabilities of the region and individual municipalities.

Reduce the potential impact of natural and man-made disasters on private property and the region's economy.

Reduce the potential impact of natural and man-made disasters on the region's natural environment.

Reduce the potential impact of natural and man-made disasters on the region's specific historic treasures and interests as well as other tangible and intangible characteristics which add to the quality of life of the citizens and guests of the region.

Identify, introduce, and implement cost-effective hazard mitigation measures to accomplish the region's goals and objectives and to raise the awareness and acceptance of hazard mitigation.

Strengthen and maintain Hazard Mitigation Plans that meet federal standards, for all communities in the SNHPC region, which may include providing update support to municipalities or developing a regional hazard mitigation plan to increase efficiency and effectiveness.

Provide continued floodplain ordinance and National Flood Insurance Program support to municipalities including maintaining up to date information on new programs, mapping initiatives and grant funding sources.

Improve communications between state and local entities on matters related to hazard mitigation, emergency preparedness, the National Flood Insurance Program, and potential grant funding sources for communities to carry out the mitigation strategies identified in their hazard mitigation plans.

Encourage and assist in the identification of regional evacuation routes to ensure the safety of the region's citizens, employees, and visitors.

Action Recommendations

Commission:

- Work with municipalities, the state and state legislature to develop legislation, programs and funding for the provision of hazardous mitigation

and emergency management programs and investments at both the local and regional levels;

- Complete all individual community hazard mitigation plans and develop a region-wide hazards mitigation plan;
- Identify, write and administer grants to assist communities in pre-disaster mitigation, emergency preparedness and operations;
- Provide continued floodplain ordinance, technical support and assistance to communities in these areas;
- Promote effective communications between state and local officials; and
- Work with state, regional and local transportation agencies to develop local and regional evacuation routes.

Municipal:

- Establish Emergency Management Directors and appoint and fund local Emergency Management and Coordination Committees to plan, monitor and implement necessary cost-effective emergency and hazard mitigation measures;
- Adopt, monitor and update local hazard mitigation plan;
- Adopt, monitor and update local emergency management plans and procedures;
- Conduct surveys and explore ways to improve effective emergency response and evacuation procedures;
- Participate in regional hazard mitigation and emergency management solutions; and
- Continue to educate public of potential threats and health risks.

Natural Resources

Key Findings and Issues

1. Water Quality and Watershed Management: Contamination of the region's rivers, lakes and ponds can be the result of many actions. Polluted runoff from the land poses one of the largest threats. Urban and suburban land uses, construction activities, septic systems, the use of lawn fertilizers all impact the region's water quality. Stormwater runoff can be best addressed from a watershed management approach. More public education is needed about the benefits of watershed management.

2. Groundwater and Aquifer Protection: Groundwater is an important natural resource and source of drinking water. In order to be productive as a water supply source, water must be allowed to flow through and infiltrate the region's underlying aquifers. As the region develops and the land becomes covered by pavement and buildings, the natural recharge and water quality of these important sources of drinking water may become threatened. There are many high risk land uses which can also threaten our groundwater. If we do not protect our groundwater sources, future growth will also be threatened. Many communities within the region have groundwater and aquifer protection ordinances, which are based on old information and need to be updated. We need to do a better job in protecting and providing safe and adequate municipal water sources.

3. Declining Forestlands and Wildlife Habitat: While New Hampshire remains the second-most forested state in the nation following Maine, forest cover has been steadily decreasing since the early 1980s. Much of this loss is driven by land development. By 2025, the Society for the Protection of New Hampshire Forest predicts the greatest loss of forestland will occur in southeastern New Hampshire. This could accelerate the demise of critical wildlife habitat and sustainable forest management. We often forget or do not fully understand the importance of our wildlife. More information and data needs to be provided to the public so our municipalities can effectively plan and protect these important habitats. Specifically we need up to date and scientific information such as that to be provided through the State's Wildlife Action Plan.

Overall Goal

Natural resources have a significant role, both in terms of ecological functions and values as well sustaining the region's overall environment and quality of life. It is important to protect the region's natural resources for existing and future generations.

Policies

Identify and protect the region's significant natural resource areas. These areas contain unique habitat and have a high priority for land conservation or are ecologically important from a regional perspective.

Support state and local officials to protect and maintain the water quality of two of the region's most important public drinking water supplies: the Merrimack River and Massabesic Lake.

Encourage municipalities and planning boards to enforce the requirements of the Shoreline Protection Act and adopt local shoreline protection standards.

Support local, regional and state efforts to develop and implement watershed protection ordinances to reduce non-point runoff and impervious surface coverage within important drinking water supply watersheds.

Encourage municipalities to update their Wetland Conservation District Ordinances and designate the Prime Wetlands within their communities.

Encourage municipalities to update their Groundwater and Aquifer Protection District Ordinances utilizing the new enhanced stratified drift aquifer maps produced by the State Geological Survey.

Continue to provide assistance to municipalities and the state in implementing the National Flood Insurance Program and the release of new digital flood insurance maps.

Encourage communities with steep slopes to develop land use regulations to preserve natural vegetative cover and manage the environmental impacts of stormwater runoff and the performance of septic system installations.

Encourage the protection of the remaining large blocks of unfragmented forests within the region by seeking support of landowners, local and state officials, including the Society for Protection of New Hampshire Forests, and other non-profit conservation organizations. This could also include the establishment of Forestry Conservation Districts in local zoning ordinances.

Advise planning boards and conservation commissions to incorporate sustainable forestry practices and forest management plans in their land use regulations, where appropriate.

Encourage communities to protect local streams and rivers through the restoration of riparian buffers and the adoption of local land use regulations.

Seek funding from state and local government to prepare a Regional Conservation Plan similar to the Coastal Lands Conservation Plan currently being prepared at the seacoast. This plan could help to prioritize and develop regional strategies for maintaining diverse wildlife habitat, abundant wetlands, clean water, productive forests and farms, and outstanding recreational opportunities in the future.

Encourage and support the development of local land and water conservation action plans and natural resource inventories. These inventories and plans can provide the necessary science-based data and information that Planning Boards can use to establish land use and other regulations needed to protect the natural environment.

Support the development of summary maps of the region's critical natural resources. Summary maps can help planners and citizens use available tools to address land protection and mitigate the impacts of development.

Support legislation to allow the Wetlands Bureau to enact an in-lieu-fee program for wetland compensation. Such a program would allow applicants to pay a fee rather than buy land for wetland protection or restoration. These fees would than be paid into a fund which could be used to generate dollars for the protection and restoration of wetlands throughout the state.

Preserve environmentally sensitive areas and link them together with other undeveloped open space into a network of beneficial corridors and large land areas for a diverse mix of wildlife and plant to flourish.

Promote best forest management practices and the development and use of forest management plans.

Implement water quality monitoring programs, develop plans to protect those resources, and protect water quantity.

In order to prevent depletion of resources, match the intensity of development with the carrying capacity of natural resources.

Seek balanced regulations that allow growth, but also protect the region's natural resources.

Action Recommendations

Commission:

- Work with municipalities, the state and state legislature to develop legislation, programs and funding to support natural resources and conservation planning at both the local and regional levels;
- Seek support for and funding to prepare a Natural Resources Conservation Plan for the region;
- Work with Planning Boards and Conservation Commissions to develop and improve wetland, groundwater/aquifer, shoreline and steep slope protection regulations;
- Identify, write and administer grants to assist communities in natural resources protection, including source water protection program grants;
- Continue to prepare and update local water resources management and protection plans;
- Promote effective communications between Planning Boards and Conservation Commission in implementing smart growth techniques and natural resources protection; and
- Update and amend the Regional Comprehensive Plan to incorporate the Natural Services Network as developed and implemented for the region as part of the Community Technical Assistance Program and the I-93 widening project.

Municipal:

- Continue to support local Planning Board and Conservation Commission efforts in natural resources protection and conservation;
- Support and utilize the information obtained through natural resources inventories, prime wetland studies, forestland evaluation and assessments, and forest management plans to further enhance local conservation planning;
- Adopt, implement and update local wetland, shoreline protection, groundwater/aquifer protection regulations as appropriate;
- Participate in regional conservation protection planning initiatives; and
- Continue to educate the public of potential threats and health risks to the environment.

Open Space and Recreation

Key Findings and Issues

1. Opportunities to protect land for open space and recreation are decreasing as the region continues to grow and develop. As the cost of land continues to increase, fewer opportunities to buy and protect land will be available in the future. The public wants open space, but how should communities determine their protection priorities? What lands need to be protected now and how should local resources be best used?

2. There is still much confusion among public officials and planning boards about the benefits of owning public open space versus the local tax revenues that are lost when these lands are removed from the tax rolls. Need to educate the public about the benefits and values of open space and natural resource protection as well as protecting land through conservation easements. For example, how long should conservation easements last and who should be responsible for monitoring and maintaining the easement?

3. For many communities, cluster or conservation open space development is still not working as it should to achieve natural resource protection. There are still many public concerns and negative perceptions about increasing density through clustering. How can communities make cluster or open space zoning viable for developers and at the same time provide adequate open space? How can communities avoid being taken advantage of and prevent the "leftover" land within these developments from being used as open space? How should density and dimensional standards be applied and more importantly how should septic systems and wastewater treatment systems be implemented? More work is needed to improve these ordinances and satisfy local concerns.

Overall Goal

Protect open space and recreation for people to enjoy the outdoors and enhance opportunities to protect land and curb sprawl. Open space and recreation is an important part of the overall quality of life of the region.

Policies

Encourage and assist communities in developing open space and recreation plans identifying local priorities for land protection and recreation.

Encourage communities to establish guidelines for accepting land for open space and recreation purposes and managing conservation easements.

Support state and local efforts to protect land for open space and recreational purposes, including efforts of non-profit organizations and land trusts.

Encourage and assist planning boards and conservation commissions to establish guidelines for public access to open space lands, particularly land deeded to the municipality as part of a conservation development.

Encourage communities to promote compact development and smart growth through "Conservation Development." Assist planning boards by improving their conservation development regulations, particularly with respect to developer incentives for open space and land protection.

Encourage planning boards to adopt conservation zoning overlay districts and agricultural friendly zoning provisions to protect environmentally sensitive lands and preserve active farms and agricultural areas.

Encourage planning boards to develop transfer of development rights (TDR) ordinances as a means of encouraging open space protection.

Assist communities in conducting Cost of Community Services Studies to assess the balance of land use revenues and expenditures.

Support continued funding for the NH Land and Community Heritage Investment Program and the federal Land and Water Conservation Fund. Encourage state and local government to continue the Current Use Program and to utilize 100-pecent of the land use change tax penalties for local conservation purposes.

Support the use of impact fees by municipalities to fund recreation development.

Support continued state funding for the Regional Environmental Planning Program and use of these funds to assist communities in open space and conservation planning efforts.

Support legislation and funding for expanding the State Park and State Forests within the region.

Promote interconnections of protected open space, recreation lands and recreational trails. From a regional perspective, open space is most effective when it is interconnected to maximize natural resource and wildlife habitat protection.

Identify and conserve a system of open space and conservation areas in the community and region to protect wildlife habitat, scenic vistas and endorse passive recreational opportunities.

Create public spaces such as town greens, markets, pocket parks, and playgrounds to provide for civic and cultural gatherings.

Action Recommendations

Commission:

- Work with municipalities, the state and state legislature to develop legislation, programs and funding to open space and recreation at both the local and regional levels;
- Seek funding to support the preparation of a Regional Conservation Plan; work with Planning Boards and Conservation Commissions to develop and implement Open Space and Recreation Master Plans for their communities;
- Identify, write and administer grants to assist communities in open space and conservation planning;
- Continue to provide ordinance, technical support and assistance to communities in conservation and recreation planning;
- Promote effective communications between Planning Boards and Conservation Commission in implementing smart growth techniques and conservation.

Municipal:

- Establish and support local Open Space Committees in identifying, acquiring and monitoring open space lands and conservation easements;
- Prepare and update local Open Space and Recreation Master Plans;
- Adopt, implement and update local conservation subdivision and open space regulations;
- Encourage and implement impact fee programs to fund recreation development;
- Prepare Cost of Community Studies to assess balance of land use revenues and expenditures;
- Participate in regional open space and conservation planning initiatives; and
- Continue to educate the public of the need and benefits of open space and recreation.

Community Facilities

Key Findings and Issues

1. With the ongoing growth and development of the region, there has been and will continue to be greater demands placed on local resources and facilities stretching local services and the use of local facilities to the maximum extent and capacity possible.

2. Many communities across the region have experienced problems in funding capital improvements. As a result, they have begun to address these needs through capital improvement programs (CIP) and by conducting basic facility needs assessments and evaluations. However, the cost of providing education, police, fire and emergency services, libraries and other basic government services continues to increase among all the communities within the region making it difficult to fully fund these elements.

3. Finding tax dollars and other sources of funding for necessary capital improvements is a difficult task. Long range planning and a strong financial commitment to specific public projects are necessary in today's economic climate.

Overall Goal

In an era when property taxes provide the primary source of funding many communities have to support basic education, police and fire, emergency services, libraries and other government facilities and services, advanced planning and capital facility programming is becoming essential. Additionally the communities within the region should continue to work together to seek and foster mutually supportive arrangements for the provision and sharing of essential services, facilities and equipment.

Policies

Continue to support and improve the provision of necessary and essential public services and facilities, including education, police and fire, emergency services, libraries and other basic government services.

Conduct facility needs assessments and evaluations to document facility problems and incorporate this information and findings into community master plans and CIPs.

Identify facility needs earlier on through advanced planning and keep these needs and issues visible within the community.

Reduce the potential impact of large expenditures and facility costs by establishing capital reserve funds and other sources of funding besides property tax revenues.

Consider employing impact fees to supplement and support the construction of necessary facilities identified in the CIP.
Encourage local government to continue to explore the availability of federal and state grants to help fund the construction of local capital projects.

Identify facility and service needs within the community in anticipation of growth.

Seek and plan for alternative sources of funding, including bonds and TIF districts where feasible and appropriate.

Keep the public informed earlier on and throughout the CIP process. Hold public hearings and update the CIP annually.

Explore privatization as a means of cost savings.

Seek shared mutual service agreements for utilizing specific services or use of equipment.

Action Recommendations

Commission:

- Work with municipalities, the state and state legislature to develop legislation, programs and funding to support the development of necessary and essential public services and facilities at both the local and regional levels;
- Assist communities in preparing capital improvement programs (CIP); identify, write and administer grants for various community development projects;
- Provide assistance to communities in pursuing impact fees and fiscal impact studies; and
- Monitor and keep track of facility needs within the region.
- Review with municipalities and school boards the population and housing impacts of the I-93 widening project within the region and at the local level.

Municipal:

- Establish and appoint a Capital Improvement Program committee to assist the Planning Board and legislative board in preparing and updating the CIP;

- Continue to conduct facility needs assessments and evaluations as appropriate to identify and plan for facility needs in advance;
- Establish and fund a capital reserve fund to help reduce facility costs and the potential impact of large expenditures;
- Seek funding for facility improvements from grants and other funding sources; and
- Keep the public informed early on and throughout the CIP process.

Existing and Future Land Use

Key Findings and Issues

1. Market and economic conditions, local zoning policies, and the availability of developable land all have influence the existing and future land use patterns.

2. The total amount of developed land within the region increased 24 percent from 1995-2004.

3. 1995-2004 change in land area devoted to individual land use classifications:
   Commercial - 35.3 percent increase in the total land area devoted to this use
   Residential - 24.3 percent increase in the total land area devoted to this use
   Public/semi-public - 11.9 percent increase in the total land area devoted to this use
   Utilities and streets - 7.3 percent increase in the total land area devoted to this use
   Industrial - 0.9 percent decrease in the total land area devoted to this use

4. While buildable land availability is becoming increasingly limited in the region, there is still significant land available within the region for continued future growth and development. With the availability of land for continued development comes the need to carefully plan for development that is consistent with our region's future development goals.

Overall Goal

Promote a cohesive regional land use pattern that is founded on sound planning principles and is regionally diverse, sustainable, and equitable to all communities

Policies

Guide growth and development to suitable areas, giving full consideration to the natural capability of the land and other resources to sustain varying types and intensities of development.

Encourage contiguous, staged and compact patterns of development with due consideration being given to the location of existing settlements and urban areas; to the economic and timely provision of public facilities and services; and to the conservation of energy resources.

Promote the maintenance and renewal of existing urban areas and settlements in order to make maximum use of existing public and private investments in utilities, institutions, commercial centers and industrial facilities.

Encourage development of diversified land use activities to achieve a balanced economy.

Support the development of community centers to include commercial, civic and cultural activities on a scale appropriate to the needs of the community.

Promote a diversity of land uses that supports and strengthens the local commercial, service sector, and industrial based economy while providing equal consideration to housing the employees necessary for such economic growth.

Support the growth of Manchester's downtown as a regional hub of financial, commercial, cultural, and private and public oriented activities while simultaneously supporting smaller satellite centers with similar resources in each of the region's communities.

Actively support the economic and cultural vitality of regional and local centers by channeling growth toward them and providing the ingredients needed for successful mixed use.

Strengthen connections and potential for inter-municipal opportunities through zoning that carefully considers zoning impact on and by adjacent municipalities.

Support informed local land use decisions that are in accordance with the vision, goals, and policy statements of the Regional Comprehensive Plan.

Continue to track and analyze land use development changes and trends across the region and disseminate this regional scale information to all SNHPC communities to assist in their land use planning efforts.

Serve as a clearing house for regional zoning, subdivision and site plan review regulations.

Concentrate development where services and utilities are available or less costly to provide and seek opportunities to benefit from the economies of scale necessary for cost effective high quality infrastructure and services. For example, the more intensive land use activities should be developed in reasonable proximity to the major transportation corridors and municipal service support systems. Conversely, in areas where public water or sewerage services are not located or planned, the land must be capable of supporting development that will have to rely upon on-site water and waste disposal systems.

Prevent costly problems in the future by carefully considering potential environmental impacts of alternative development scenarios today.

Work cooperatively in the region to support a sustainable diversified regional economy, and support mechanisms to share the costs and benefits of growth.

Conserve the working landscape of rural areas to maintain rural economy and tourism.

Encourage infill development and redevelopment in existing built areas to revitalize town centers and to maximize use of built areas.

Emphasize development of town and village centers to create walkable communities.

Encourage building size, architecture, signage and site design that enhances the aesthetics of the built environment.

Encourage appropriate mixed use in existing town centers, villages and in new planned developments to increase opportunities for residents to work close to home.

Work toward growth in housing to match projected population and employment growth, and ensure that new housing includes a balance of styles, densities, and a distribution of prices that are affordable to a range of income levels.

Preserve environmentally sensitive areas and link them together with other undeveloped open space into a network of beneficial corridors and large land areas for a diverse mix of wildlife and plant to flourish.

Encourage the preservation of areas of limited development capability such as steep slopes, wetlands, aquifers and flood hazard areas through land management regulations and site design standards.

Identify and conserve a system of open space and conservation areas in the community and region to protect wildlife habitat, scenic vistas and endorse passive recreational opportunities.

Create public spaces such as town greens, markets, pocket parks, and playgrounds to provide for civic and cultural gatherings.

Support the need for build-out analyses throughout the region that investigate the potential development impacts to communities, identify when communities may reach build-out, understand where and how natural constraints will impact future development and the amount of land that is truly available for development, and how open space preservation goals can be maximized.

Strive to have well educated boards and commissions in the region that fully understand existing and future land use trends and issues and how to better serve their communities and the region.

Action Recommendations

Commission:

- Work with municipalities, the state and state legislature to develop legislation, programs and funding to support land use planning at both the local and regional levels;
- Continue to seek funding from the State and other sources for land use planning work within the region;
- Continue to work with Planning Boards to prepare and update Master Plans, local land use ordinances, and capital improvement plans;
- Continue to provide ordinance, technical support and assistance to communities, utilizing smart growth principals;
- Continue to identify, write and administer grants to assist communities in land use planning;
- Continue to promote effective communications within the region in implementing smart growth; and
- Work with municipalities in doing a smart growth audits on local ordinances.

Municipal:

- Support and fund local Planning Board projects, including Master Plan updates and ordinance revisions, including implementation of smart growth principals;
- Prepare and update local Master Plans;
- Continue to prepare and update local land use regulations and capital improvement programs, making them consistent with the local Master Plans;
- Continue to monitor and track local land use development changes and trends;
- Encourage a balance of land use and concentrate development where services and utilities are available;
- Seek balance in economic development and environmental protection;
- Conduct build out analysis and smart growth audits; participate in regional land use planning initiatives; and
- Continue to educate the public of the need and benefits of smart growth and planning.

Chapter Two:

Future Land Use

Introduction

This chapter sets forth a Future Land Use Map for the region that reflects the goals and objectives of this Plan. The Future Land Use Map should be used as a visionary tool and in an advisory nature to guide the future growth and development of the region. It should also be used as a guide in developing and improving local land use regulations giving due consideration to adjacent municipalities and maximizing regional planning opportunities.

Creating the Future Land Use Map

Three possible future growth scenarios for the region were developed to create the Future Land Use Map for this plan. The first future growth scenario presents a composite summary of all the future land use maps and land use strategies that have been adopted by the Planning Boards of each municipality within the region.

Many of the future land use maps utilized in this composite map were obtained directly from each municipality's most recently adopted Master Plan. Bedford and Londonderry both had strategic master plans that highlighted specific goals for selected areas of their community. For those master plans, which did not contain a future land use map, new maps were developed by SNHPC and submitted to the municipality's Planning Board for review and approval. The Town of Auburn had a narrative in their master plan that identified specific "Future Planning Areas" that SNHPC mapped. The Town of Deerfield did not have a Future Land Use Map and therefore one had to be created working with the Planning Board. Both the towns of New Boston and Chester were in the process of updating their master plans and a draft version of their new, however un-adopted, future land use maps were used in the composite. Additionally, the Town of Derry did not have a future land use map, master plan narrative or other draft resource available so they chose to represent their future land use with their current zoning map.

The second future growth scenario builds upon the first scenario. It reflects those areas where the municipality's Future Land Use Map or master plan did not identify potential future land use. This was addressed by adding the municipality's zoning and conservation land data to those background areas. This was accomplished primarily for the towns of Londonderry and Bedford, with Derry using their zoning for both the first and second scenarios.

The final Future Land Use Map created for this Plan is the product of the third future growth scenario. This scenario is basically a synthesis of all the individual future land use maps aggregated to address regional concerns and opportunities. The Future Land Use Map also takes into account existing natural constraints, infrastructure, and land use trends. In addition, future transit oriented development corridors and nodes as identified in recent transportation planning initiatives have been added to the map. These corridors and nodes anticipate that high-density, multi-use development centers will be created around future transit stations, rail links, bus terminals or bus stops, and Park and Ride facilities. Some of the main transit oriented development corridors include I-93 from Manchester south which will include park and ride facilities and expanded bus service, the east – west corridor of NH Rt. 101, the US 3/NH Route 28 corridor from Manchester into Hooksett, the Elm Street and South Willow Street corridors in Manchester, the City of Manchester's Multi- Modal Transportation Center, and the US Route 3 Corridor into Bedford.

A total of twelve generalized land use categories are shown on the Future Land Use Plan. These categories are described in more detail in the next section of this chapter. By aggregating these land use categories, similar land use designations were found to cross municipal boundaries in certain areas throughout the region.

Development constraints, such as wetlands, special flood hazard areas and riparian buffers of 100 feet in width were designated as future conservation areas on the Future Land Use Map in addition to all existing and known protected and possible future conservation lands. In the future, as the Natural Services Network concept is developed for the region as part of the CTAP project, this conservation areas layer can be updated on the Future Land Use Map.[1]

Lastly, the limit of existing sewer service within the region was used to help identify future high-density residential and/or future commercial development on the Future Land Use Map in relationship with each municipality's future land use plans. The future growth scenarios and the Future Land Use Map created for this plan are shown on the accompanying maps. A more detailed description of the Future Land Use Map follows as well as a summary of the Future Land Use Maps and growth strategies adopted as part of each municipality's master plan.

Scenarios 1 and 2 - Summary of Future Land Use Maps and Growth Strategies

Provided below is a brief description of the Future Land Use Map, visions and future land use strategies of each municipality as reflected in their individual master plans and depicted herein as scenarios 1 and 2. The only substantial difference between the two scenarios, as described above, is that scenario 2 places zoning and conservation land data below the strategic future land use data for Londonderry and Bedford. A copy of the maps created for scenario 1 and 2 are provided on the following pages.

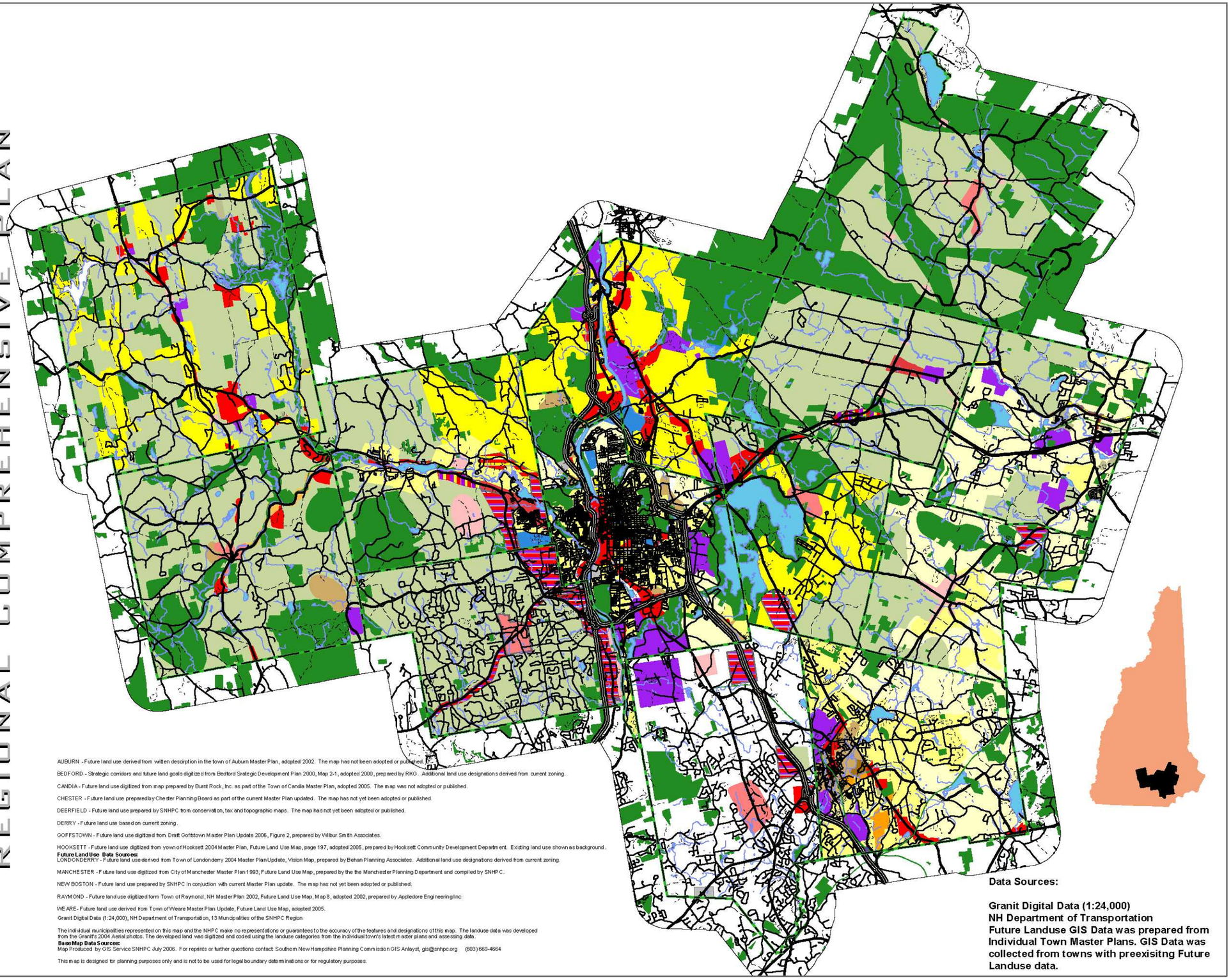
Auburn

The Town of Auburn is divided into six planning areas. These areas are: Northwest Planning Area, Route 28 Bypass Planning Area, Village Center Planning Area, Residential Planning Area, Rural Planning Area and Watershed Protection Planning Area.

The Northwest Planning Area is intended to allow for continued industrial and commercial expansion. However, the area should continue to allow single-family housing within the commercial zones.

1. For more information about the NSN concept refer to the Natural Resources chapter of this plan. The CTAP project is described in more detail in the I-93 and CTAP Project section of this chapter.

REGIONAL COMPREHENSIVE PLAN



Map # 2.1

Future Landuse Scenario 1

Legend

Political Boundaries
- Townline
- 1 mile Town Buffer

Road Network
- Interstate Highways
- State Secondary Highways
- Town Maintained Roads
- Town Unmaintained Roads
- Private Roads

Hydrography
- Water Courses
- Water Bodies

Future Landuse Scenario 1
- Rural Residential
- Low Density Residential
- Medium Density Residential
- High Density Residential
- Residential
- Multi-Family
- Manufactured Housing
- Commercial
- Office/Business Park
- Industrial
- Mixed Use Commercial/Residential
- Mixed Use Commercial/Industrial
- Mixed Use Commercial/Industrial/Residential
- Village Center
- Neighborhood Commercial
- Town Center
- Conservation
- Scenic Corridor
- Civic/Institutional
- Special Planning Area

AUBURN - Future land use derived from written description in the town of Auburn Master Plan, adopted 2002. The map has not been adopted or published.

BEDFORD - Strategic corridors and future land goals digitized from Bedford Srategic Development Plan 2000, Map 2-1, adopted 2000, prepared by RKG. Additional land use designations derived from current zoning.

CANDIA - Future land use digitized from map prepared by Burnt Rock, Inc. as part of the Town of Candia Master Plan, adopted 2005. The map was not adopted or published.

CHESTER - Future land use prepared by Chester Planning Board as part of the current Master Plan updated. The map has not yet been adopted or published.

DEERFIELD - Future land use prepared by SNHPC from conservation, tax and topographic maps. The map has not yet been adopted or published.

DERRY - Future land use based on current zoning.

GOFFSTOWN - Future land use digitized from Draft Goffstown Master Plan Update 2006, Figure 2, prepared by Wilbur Smith Associates.

HOOKSETT - Future land use digitized from yown of Hooksett 2004 Master Plan, Future Land Use Map, page 197, adopted 2005, prepared by Hooksett Community Development Department. Existing land use shown as background.

Future Land Use Data Sources:
LONDONDERRY - Future land use derived from Town of Londonderry 2004 Master Plan Update, Vision Map, prepared by Behan Planning Associates. Additional land use designations derived from current zoning.

MANCHESTER - Future land use digitized from City of Manchester Master Plan 1993, Future Land Use Map, prepared by the the Manchester Planning Department and compiled by SNHPC.

NEW BOSTON - Future land use prepared by SNHPC in conjuction with current Master Plan update. The map has not yet been adopted or published.

RAYMOND - Future land use digitized form Town of Raymond, NH Master Plan 2002, Future Land Use Map, Map 8, adopted 2002, prepared by Appledore Engineering Inc.

WEARE - Future land use derived from Town of Weare Master Plan Update, Future Land Use Map, adopted 2005.

Granit Digital Data (1:24,000), NH Department of Transportation, 13 Municipalities of the SNHPC Region

The individual municipalities represented on this map and the NHPC make no representations or guarantees to the accuracy of the features and designations of this map. The landuse data was developed from the Granit's 2004 Aerial photos. The developed land was digitized and coded using the landuse categories from the individual town's latest master plans and assessing data.

Base Map Data Sources:
Map Produced by GIS Service SNHPC July 2006. For reprints or further questions contact Southern New Hampshire Planning Commission GIS Anlaysts, gis@snhpc.org (603) 669-4664

This map is designed for planning purposes only and is not to be used for legal boundary determinations or for regulatory purposes.

Data Sources:

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SNHPC

Map Produced by GIS Service SNHPC September 2006.
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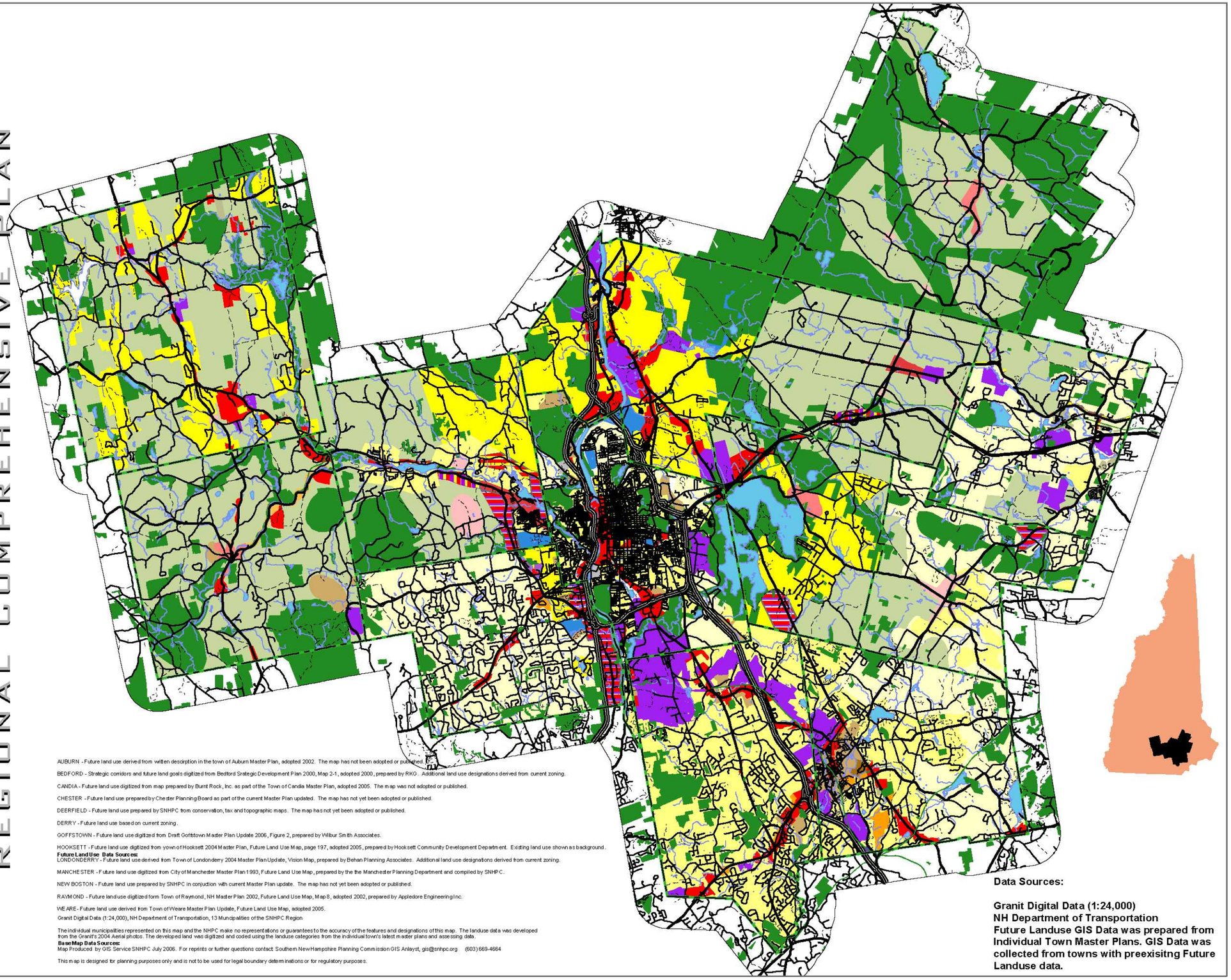
0 1.25 2.5 5 Miles

REGIONAL COMPREHENSIVE PLAN



Map #2.2

Future Landuse Scenario 2

Legend

Political Boundaries
- Political Boundaries
- 1 mile Town Buffer

Road Network
- Interstate Highways
- State Secondary Highways
- Town Maintained Roads
- Town Unmaintained Roads
- Private Roads
- Water Courses
- Water Bodies

Future Landuse Scenario 2
- Rural Residential
- Low Density Residential
- Medium Density Residential
- High Density Residential
- Residential
- Multi-Family
- Manufactured Housing
- Commercial
- Office/Business Park
- Industrial
- Mixed Use Commercial/Residential
- Mixed Use Commercial/Industrial
- Mixed Use Commercial/Industrial/Residential
- Village Center
- Neighborhood Commercial
- Town Center
- Conservation
- Scenic Corridor
- Civic/Institutional
- Special Planning Area

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The Route 28 Bypass Area supports current industrial and commercial zoning. While there is interest in expanding the extents of the zone, doing so would threaten the watershed it lies within. The Master Plan recommends that the Town investigate and pursue the installation of water and sewer service.

The Village Center Area is intended to build upon the few existing public and commercial facilities in the historic center of Auburn to create a central focus in town for social and community activities. The Village Center Area could also serve as a viable location to accommodate affordable or lower-cost forms of housing, in addition to other small-scale retail and professional establishments.

The Residential Planning Area is those areas currently zoned as Residential 1 and Residential 2 and predominantly is the area adjacent to Lake Massabesic, Little Lake Massabesic and the proposed Village Center area. While there are no changes proposed to the zoning in this area, the Town would like to explore planning tools and design techniques that would reduce the visual and environmental impacts of development and maintain the natural and rural character of the area.

The Rural Planning Area generally includes areas in the southeast and northeast corners of Town. The Master Plan recommends that techniques encouraging preservation of the Town's rural character, encourage cluster subdivision and discourage rural sprawl be pursued in this area. However, the primary intent for this area is to retain the natural environment, fields and wooded areas.

The Watershed Protection Area is an overlay that covers much of the Town. Manchester Water Works owns a significant portion of the land in the watershed and surrounding Lake Massabesic and influences land use decisions through policies in the Watershed Protection Plan.

Bedford

The Town is broken up into five main development areas: Town Center, Route 101 Corridor, Residential and Agricultural Areas, Route 3 Corridor and Route 114 (Donald Street) Area. Also shown are areas with important features including potential Priority Conservation Parcels, Gateway Entrances, Manchester Airport Connector Road and Bedford Heritage Trail, which will all impact future land use developments. The Town identified a goal and objectives for each of these development areas.

The Town Center area is ideally a place where residents can come together and meet for social and community events. It should be a "people place," serving the needs of the townspeople.

The Route 101 Corridor needs to be studied and a plan and possible design developed that would propose changes to the corridor that would prevent further division of Bedford into north and south sectors. The new plan will need to create a positive visual image for the area while re-establishing the cohesion of north and south Bedford.

The Residential and Agricultural Areas are recommended by the Master Plan to continue their pattern of low density residential development and agriculture with emphasis on conservation of valued open space, recreational facilities, and pedestrian and bicycle facilities while working to retain the quality of life in these areas.

The Bedford Master Plan recommends that the Route 3 Corridor maximize commercial and industrial development while upgrading infrastructure plans to ensure adequate capacity to support future growth. This area would ideally host economic generators of benefit to the Town supporting residents, businesses, community services, and helping to maintain a stable tax base.

The Route 114 (Donald Street) Area needs to capitalize on the potential for redevelopment opportunities, encourage affordable housing options and advance existing commercial and industrial development. This area, like the Route 3 Corridor, can be another home to economic generators of benefit to the whole Town.

Candia

In the update of their Master Plan, residents of the Town of Candia participated in numerous public forums in 2003. The last of these forums, held in November of that year, allowed residents to express their visions for the future of Candia. The Candia Master Plan Committee generally agreed that continued population growth and development pressures needed to be managed so that future growth could be guided appropriately.

Residents were given the opportunity to identify their own visions for future development in Candia. Nearly half of the land use types desired in this discussion were residential uses. The group was divided evenly three ways, with single-family, senior and work-force or multi-family housing the three top choices.

Commercial and Industrial development was identified as needed at Four Corners and the Exit 3 area off of Route 101. The “mom and pop” operations ideally would be focused at Four Corners, and the more “quality retail” developments focused around Exit 3.

The end results of these discussions were weighed and compared with the growth history of Candia. The Town of Candia Master Plan proposes that settlement and development should be focused in four areas. These areas are the development and enhancement of

mixed-use centers, moderate-density residential and limited commercial developments, surrounding countryside, and undeveloped fragile areas.

The mixed use centers ideally feature excellent vehicle access. Moderate-density residential and limited commercial development will ideally remain concentrated in the four village areas, and be accessible to good-quality roads. The surrounding countryside area is preferably characterized by low-density housing in addition to a working landscape that features scattered farms and forests. Lastly, the Master Plan recommends that undeveloped fragile areas should remain as such due to their low accessibility.

Chester

The Board aimed to create a balance throughout the community, acknowledging that while many would like to stop growth from occurring in Chester it is not possible. The focus is on where that development should occur, so that Chester can remain a rural New England community and protect the natural environment. Chester's draft Future Land Use Map contains five generalized and location based planning themes.

Conservation and Agriculture Corridor – The corridor encompasses many existing conservation lands within the town, connecting them with adjacent areas. By maintaining connections between existing conservation lands, the town can maximize the benefits of this large expanse of un-fragmented land and preserve the natural wildlife corridor. The region selected has many co-occurring natural features such as steep slopes, floodplains, wetlands, wildlife habitat, and others.

Historic Village – Historic Village area is identified as a potential future mixed-use area, permitting both commercial and higher density residential development, consistent with the existing town center instead of the current two-acre residential zoning. This new designation would allow for small scale commercial development.

Moderate Density Residential – Three locations were selected where residential development would be consistent with existing development and would not significantly impact the green, natural or rural qualities of the Town. The intent is to permit enough room for anticipated growth while preserving rural character. These areas would either function as an extension of the town center or as smaller satellite villages, channeling new growth away from valued green or rural areas.

Conservation and Agriculture with Low Density Residential – This future land use area matches the efforts and zoning in adjacent portions of Auburn and Derry to create a larger green pocket of land, transcending municipal bounds that could be retained as rural and lessen potential development pressures.

Commercial and Light Industrial – This area expands the towns existing commercial and light industrial zoning districts, increasing opportunities for such development. Additionally, proximity to Raymond and similar developed uses will allow for a larger pool of potential "customers" making commercial development more viable in this location than in others.

Deerfield

In the Town of Deerfield Master Plan, the Town is divided into the following major land use categories: Critical Resource Areas, Sensitive Natural Resources, Conservation and Recreation, Rural Forestry Areas, Agricultural Areas, Shorelands, Rural Residential, Villages, Commercial and Industrial, and Existing Public Lands.

Critical Resource Areas include wetlands, surface waters, steep slopes over 25 percent, and floodplains. These areas should be protected and not developed. Sensitive Natural Resources include slopes 15-25 percent and flood hazard areas. Flood hazard areas (100-year floodplains) are currently protected and need to remain so in the future. Lower density development, however, may take place on slopes of 15-25 percent. The town identifies three goals under slope development guidelines: minimize visual impact, retain woodland features and minimize site disturbance.

The Conservation Commission identified conservation and Recreation lands as areas that should be considered for future open space protection, conservation, and low impact recreation. It is recommended that Rural Forestry areas only be developed at a very low density, as commercial forestry operations are dependant on large tracts of land. Developing these areas could also lead to scattered and premature growth problems.

Agricultural land needs to be protected in order to prevent development. This can be done through the purchase of development rights, but more feasible could be the use of innovative land use planning and development practices. The guidelines for protecting agricultural land are to minimize visual impact, retain rural features and to minimize site disturbance. Additional measures are also needed in order to protect the agricultural land, with one option being the creation of an agricultural overlay district.

Shorelands in Deerfield are heavily developed, however potential remains for further development. The Shoreland Protection Act enables towns to adopt zoning regulations that complement the state law, providing for further protection. The goals for shoreland protection in Deerfield are to minimize visual impact, retain water quality and minimize site disturbance.

The Master Plan recommends that Rural Residential areas only be developed at a density that can support the on-site sewer and water. Also, innovative land use planning strategies, such as cluster development, are suggested. Many of the Rural Residential

lands abut Agricultural Lands. Villages are ideal for preservation and protection, and if proper land use controls are put in effect, new development can assimilate and the villages can benefit from it. The Master Plan suggests the Town encourage a compatible mix of land uses including residential, commercial, public and surrounding agricultural lands.

Commercial/Industrial development should be allowed, but in a manner that is compatible with a rural setting. The accepted place for this growth is in the current commercial zone. Future development is suggested to take place in certain sections of the village areas.

Existing Public Lands should remain in their current state of use, without any dramatic changes taking place. Creation of additional public lands is encouraged, particularly in areas adjacent to existing public lands. The Town needs to ensure that enough land is available for the expansion of public facilities, if necessary.

Derry

Only about a quarter of all land in Derry is vacant *and developable*, with a large majority of the growth that has taken place residential. As a result, there is a relatively large imbalance between development, services and the environment in Derry. The overwhelming imbalance of residential development had placed a strain on the Town's municipal resources, leading to a temporary moratorium on growth in Derry in 1994.

A Growth Management Plan emerged following this moratorium, and in 1999, a Growth Management Ordinance (GMO) was adopted by the Town to regulate the timing and phasing of major development proposals.

Derry has established four goals for land use and growth in their Master Plan. These goals are:

- Preserve Derry's overall patters of land use that concentrates development in the Downtown and west-central sections of the Town, with open lands and sparser development in the east section of the community, avoiding the tendency toward suburban sprawl.
- Continue to guide the amount of growth that is sustainable, given Derry's environment, level of service, and to its desired character, as outlined in its growth management ordinance.
- Integrate Town goals for open space, recreation, economic development and downtown revitalization with land use policies and regulatory tools where appropriate.
- Continue to review zoning regulations to assure consistency with Town objectives and evolving policies on land use.

Derry also came up with numerous implementing actions during the 2000 Planning Process. They are grouped into the categories of residential land use, business land use, open space, recreation, and agriculture and the land use planning and management process. Each of these categories, outlined in the Town's Master Plan, has a series of implementing actions complementing them that are designed to aid Derry's land use planning in the future.

Goffstown

The Town of Goffstown is broken up into eight possible planning districts. These districts are: Parker Station, Pattee Hill, Northeast, Grasmere Village, Goffstown Village, Uncanoonuc Mountains, Bypass Area, and Pinardville Village. While these districts are the ones identified within the Master Plan, it should be noted that these eight districts are just a sample and are not necessarily the end result. Other districts could still emerge, or the districts that are outlined within the Master Plan could be altered. In any case, each district area would ideally share comparable characteristics or a common history.

The Parker Station area contains mostly conservation subdivisions. These are smaller clustered lots, developed as open space subdivisions. They are high priority areas for preserving natural resources and creating functional open spaces.

Pattee Hill shares conservation subdivision area with suburban residential, which are two-acre lots that are developed as open space subdivisions. These areas have private water and sewer, as well as public recreation facilities.

The Northeast area features a suburban residential area along with conservation open space, which consists of large lots that encourage open space uses. There is a low density of development, and these areas are high priority for conservation easement or public ownership.

Grasmere Village mainly features village residential, which is an area of a village design context. These are small lots with public water and sewer service, and single-family or attached single-family homes that are integrated into the neighborhood. In addition to this, Grasmere Village also contains a small area of village commercial mixed-use. This consists of a village design with small lots, public water and sewer service with village scaled single-family, single-family attached and apartment uses that are mixed with village scaled service and retail uses.

Goffstown Village has some village residential uses, as well as some village commercial mixed-use and also a small residential mixed-use area, which is single-family, attached single-family and multi-family homes in small projects mixed with retail or office uses, serviced by public water and sewer.

The Uncanoonuc Mountain area is simply a mixture of conservation open space alongside conservation subdivisions. The Bypass Area features a combination of conservation subdivision area with a village residential mixed-use area, which is an area of village design having small lots that is served by public water and sewer service. The area features single-family and single-family attached and apartment areas that are mixed with village scaled service and retail uses.

Pinardville Village contains a healthy mix of village residential, commercial mixed-use, and also a campus mixed-use area that is comprised of institutional and college uses with compatible commercial and residential areas.

Hooksett

The Town of Hooksett is not divided into sectors or planning areas for the Future Land Use map in its Master Plan. Rather, the Town identified a number of goals, strategies and implementation actions that should be pursued in order to attain the greatest success with future land use planning. Recommendations were made in a series of nine specific categories, with each category detailing specific items that should be acted upon as opportunities arise. Areas in which recommendations were made are:

- Potential Preservation of Open Space (passive recreation)
- Potential New Active Recreation Areas
- Potential Zone Changes
- Potential New Public Roadways
- Potential Bridge Locations for Crossing the Merrimack River
- Potential New Public Safety Locations
- Potential New School Sites
- Potential Commercial/Retail Sites
- Potential New Industrial Sites

In addition to these, more specific recommendations were made for an additional eight areas. These were:

- Natural Resources and Conservation Lands
- Community Facilities
- Recreation
- Transportation
- Economic Development
- Housing
- Education
- Population

The Town's Future Land Use map is based upon the recognition of four guiding principles. These are the acquisition and protection of open space lands; location of intensive land uses with access to major arterial highways; implementation of transportation solutions; and formalizing economic development. Each of these guiding principles is explained, and suggestions provided as to what could be done to set forth each principle.

Londonderry

The Town of Londonderry is divided into seven planning areas. These areas are the Airport Area, Northwest of Route 28 (Jack's Bridge); Exit 4a; Exit 5; Town Center; Exit 4 (Route 102); and the Paige Road Area.

The Airport Area is undeveloped for the most part, however upon completion of the airport connector road, this is likely to change. Completion of the road will open up approximately 800 acres of industrial-zoned land to development. The Town held an Airport Area Charrette regarding the future use of this land and that vision should be adhered to.

The area northwest of Route 28 (Jack's Bridge) is also a largely undeveloped area. The Master Plan recommends that the Town review their current zoning designations in order to ensure that the desired type and amount of development occurs. Incorporating a mix of uses with a low environmental impact could serve this area well.

The completion of Exit 4a off of Interstate 93 will open up new opportunities for the lands that are located in the central portion of Londonderry. These lands are currently characterized by forests that are surrounded by pockets of residential development located in the vicinity of nearby apple orchards. Once highway access is provided, the value of these lands will likely increase for commercial and industrial development. As a result, the Town should begin to plan and create a vision for this area, as recommended by the Master Plan.

The Exit 5 area is already a commercial hotbed, and is continuing to develop and grow. Currently, this area features a wide array of development that includes light industry, office, warehouse and hotel uses. The Londonderry Master Plan suggests the Town should persuade the continuation of mixed-use development in this area.

The Town Center area is likely to remain stable in the future, however it would be wise for Londonderry to add a town center zoning district to their zoning ordinance. Any development that is to occur here ought to maintain and reflect the character of the area.

The Exit 4 (Route 102) area is the primary retail and commercial district in Town. As a result, the Master Plan recommends that increased pedestrian measures be explored

(sidewalks, crosswalks, benches, lighting, etc). The Master Plan also recommends that the Town should be willing to explore development proposals that utilize compact site designs, integrate mixed-uses and include pedestrian amenities.

The Page Road Area is located just east of Route 28. This area is viewed as a great economic development opportunity for the Town to explore. The Master Plan recommends the establishment of a new residential/mixed-use growth center with design elements that are based on traditional New England hamlets be investigated.

To help facilitate future growth along Route 28 within the Jack's Bridge area, the Town recently adopted a Tax Increment Financing District (TIFD) to provide necessary public services and utilities. The town is also considering establishing TIFDs in the future for the Exit 5 gateway commercial district and within the airport area at Exit 4a.

Manchester

The City of Manchester is currently in the process of updating its Master Plan. Therefore, the main source of information on the City's Future Land Use visions and goals comes from the last version of the Master Plan, which was updated in 1993. However, recent conversations between SNHPC and the City's Planning Department were held in an effort to obtain information that is more up-to-date. While there are not any new visions or goals available to report at this time, the City has done an exceptional job at implementing visions from the 1993 plan. These visions included a continued revitalization and transition for the Amoskeag Millyard from manufacturing to mixed-use, core neighborhood revitalization projects and completion of both the Verizon Wireless Arena and the Fisher Cats Ballpark to name a few.

The Future Land Use Map for Manchester in 1993 was divided into 12 planning districts. These districts are the Central Business District, Inner-city Transitional Area, Core Residential, Commercial Centers, South Willow Commercial, Medium Density Residential (divided into duplex and single-family districts), Suburban Multi-family, Low Density Residential, Industrial Areas, Special Development Area, Recreation/ Open Space and Civic/Institutional. Rather than summarize and describe goals, visions and zoning ideas that are over 10 years old, the few suggested changes that were raised in discussions with the Planning Department will be highlighted here.

A large area located in the northwestern part of the City was previously labeled as a Special Development Area. This location has now been split into three parts. The northernmost part along the Hooksett border has been labeled as Medium Density Residential as well as Suburban Multi-Family. The area just south of this has been re-designated as Recreational/Open Space, and finally, the remainder of the area will retain the Special Development Area designation.

The Planning Department suggests that the Millyard and Elm Street areas continue to be the Central Business District (CBD), with the borders expanding further south to the Queen City Bridge area. Currently, these areas are designated as Inner-city Transitional Areas. The Planning Department is proposing to shift these designations to areas just outside of the newly expanded CBD.

The third innovation is the neighborhood revitalization project areas located on Kelley Street, Second Street, Massabesic Street and Wilson Street. Each of these locations has been identified as Special Development Areas to reflect the revitalization efforts that are taking place. All four areas are planned to strengthen the existing mixed-use neighborhood and neighborhood downtown feel.

The last of the highlighted areas is the location around the Mall of New Hampshire. Previously planned as an Industrial Area, the Planning Department further expanded the South Willow Commercial designation into this area.

New Boston

The Town of New Boston is nearing completion of updating their Master Plan. The Master Plan Steering Committee identified seven Land Use Districts in the Town for the future.

These Land Use Districts are: Village District; Residential, Agricultural, Open Space District; Small Scale Planned Commercial District; Scenic Corridor Overlay; Limited Light Industrial; Multi-Family Residential; and Conservation District.

Creation of a Village District would help to regulate development in the Village Center area in order to preserve its rural character. In order to attain this goal, new zoning provisions would have to be established that promote a planned mix of uses in the area. Also, the Steering Committee recommended that the Town seek involvement in the New Hampshire Main Street Program.

The establishment of one Residential, Agricultural, Open Space District would eliminate the Town's current Residential and Agriculture District as well as the Residential One District. This new district would encourage development patterns that preserve open space through cluster development as opposed to large lot zoning practices.

A Small Scale Planned Commercial District would replace the Town's existing Commercial District. The purpose of the new district would be to designate specific areas that would be suitable for commercial development. In addition, architectural guidelines would be designed to ensure any new development resembles the traditional rural New England style. The new district area's ideal location is in the same area as

the current district, along Routes 77 and 114. It could also be considered along parts of Route 13, and near the southern entrance to Town.

Establishment of a Scenic Corridor Overlay District would preserve the Piscataquog River corridor. Any existing development would be grandfathered, however, no new development would be allowed in this area so that future generations can enjoy the same scenic beauty as residents today.

A Limited Light Industrial District would replace the current Industrial District in the Town. The goal of the new district is to only allow light industry that does not require any additional transportation amenities and that does not compromise the Town's architectural character. A set of guidelines would have to be created to compliment this new district.

A Multi-Family Residential Overlay District would provide affordable housing options in New Boston while also preserving open space and wildlife corridors. The Town would have to identify locations where such development could occur. The Town also needs to include incentives for developers to participate in such development within the Town's Cluster Ordinance.

The new Conservation District would replace the existing Forestry and Conservation District. The sole intent of this district would be the protection and preservation of New Boston's natural resources. The Town would need to identify and inventory areas they believe to be of natural, environmental and scenic importance and then an ordinance must be created that would establish this district, thus protecting those areas.

Raymond

The Town of Raymond considered existing zoning, topography, developable acreage, roadway corridors, housing diversity and infrastructure, as well as the existing land use pattern, when formulating their Future Land Use map. The result is eight land use categories for the Town's future land use. These categories are: Open Space and Recreation, Rural Residential, Low Density Residential, Medium Density Residential, Commercial and Residential, Highway Commercial, Village Mixed-Use and Industrial.

Open Space and Recreation lands are either town or publicly-owned, and are generally concentrated in the northern half of Town, to the north of the Route 27 corridor. Other large open areas can be found to the west of Onway Lake as well as in the southwest corner of Town close to the Candia and Chester borders.

Rural Residential lands are associated with the open space areas in northern Raymond from Route 27 to the borders with Nottingham, Deerfield and Candia. In addition, there

is an area in southern Raymond to the west of the current Coastal Materials operation and south to the Chester border.

Low Density Residential areas include much of the existing residential areas that are located outside the village district. Also, this includes areas north of Route 27 in the northeastern quadrant of Town.

Medium Density Residential areas are located to the west of Route 102, just to the south of the intersection of Route 102 and 107. Commercial and Residential areas are located along the major roadway corridors of Route 102 and 107 as well as Route 27. This area would allow for low and medium density residential as well as low density commercial areas that are compatible with residential used located in the area. Also, these uses would not generate traffic safety concerns.

Highway Commercial areas consist of commercial nodes located both at the junction of Route 102 and Route 107 and the area associated with the Route 102/107 intersection with Route 27 southward to the Exit 5 interchange of Route 101.

The Village Mixed-Use area integrates the current village area. Also, it is proposed to border Route 27 to the north, the Lamprey River to the east, Lamprey River Elementary School to the west and would extend close to Route 101 to the south.

The Industrial area incorporates the Wal-Mart and Coastal Materials sites, current gravel operations along Route 27 (except for the pit currently owned by the Town), an area located to the south and west of the village extending along Route 101 including the Exit 4 area, and also the existing industrial area formerly called the Raymond Industrial Park located to the north of Exit 5 behind the Raymond Shopping Center on Route 107.

Weare

There are four components on which the Town of Weare's Future Land Use map is based. These are expanding and connecting the villages; protecting the rural character and natural environment of the community; enhancing opportunities for planned future commercial and industrial development; and implementing the principles of smart growth.

There are four main villages that were identified in the Town. These are the Integrated Town Center, Clinton Grove, Tavern Village and Riverdale Village. The Master Plan recommends that each of these village areas feature several characteristics:

- Walkability
- Civic Core and Mix of Neighborhood Uses
- Interconnected Street Network

- Sensitivity to the Human Scale
- Neighborhoods
- Efficient Land Use
- Encourage Mixed Use
- Address People's Needs
- Promote Good Design
- Enhance Environmental Benefits

The residents of Weare have had a long commitment to protecting their natural environment. As such, the Town would be wise to seek out ways of continuing to promote the protection of their valuable natural resources. Some options for pursuing this effort include completion of the Open Space Plan, acquisition of conservation easements, either through donation or other means, altering the current zoning to better protect the natural areas, or initiating a study to identify and designate prime wetlands in Weare.

The Town also has a need to enhance opportunities for commercial and industrial development. Currently, there is little developable land that is zoned commercially or industrially. Options for addressing this problem can include the expansion of existing industrial zones in appropriate locations, creation of a planned business/office park zone, or the creation of a gateway transition overlay district, which would encourage appropriate commercial or small business development.

Scenario 3 - Future Land Use Map

Scenario 3, the final Future Land Use Map draws heavily on scenarios 1 and 2 in an effort to preserve individual community's future land use visions, but at the same time portrays a more unified vision of the region. A copy of the Future Land Use Map is provided on page 2-26.

In general, two general types of modifications have been made in generating this map. First, any potential inconsistencies across municipal boundaries that may have had potential negative impacts on the adjacent community have been smoothed. Conversely, in locations where regional opportunities could be promoted by inter-municipal cooperation those modifications have been made. Second, a reduced and more generalized set of land use categories was generated to create a more unified vision of the region.

The 12 land use categories developed as part of the Future Land Use Map are described below. While these categories are not meant to be all-inclusive, they attempt to identify the range, type and intensity of the possible arrangement and distribution of future land use patterns in the region.

Rural, Agriculture, and Low Density Residential Development

This land use category includes agricultural uses, such as scattered farmland and related activities, and low-density residential development, primarily single-family. In comparing the existing land use patterns and zoning ordinances within the region, an overall density or minimum lot size of greater than two acres should be encouraged within these areas. Typically these areas fall within the outer communities and reaches of the SNHPC region.

Moderate Density Residential

Moderate density residential refers to lot sizes ranging from one to two acres in size. This type of development can include both detached and attached single-family, duplex and multi-family development. Most moderate density residential is located in the communities and land surrounding I-93 and Manchester. Limited moderate density residential is found within Manchester, but outside the I-93 and 293 loops.

High Density Residential

High-density residential includes both detached and attached single-family, duplex and multi-family development much like Moderate Density Residential development. However, lot sizes are typically less than one acre or density is less than one acre per dwelling unit. High density residential is restricted to areas that have access to municipal water and sewer systems. This land use classification is primarily located in Manchester with some areas in the surround communities, such as Bedford, Derry, Hooksett and Londonderry.

Commercial

This generalized designation includes all types of commercial and business land uses ranging from neighborhood and limited commercial areas to more intensive highway commercial corridors and shopping centers. All communities in the region have some area designated as commercial. Generally, areas identified are near municipal centers or along major corridors.

Industrial

All types of industrial land use from light industrial to heavy industrial development are included in this generalized land use classification. Not all of the thirteen communities in the region was allocated industrial land. The areas designated as industrial are consistent with existing industrial areas and include some expansions or plans for future industrial development based on infrastructure developments such as the Airport Connector Road and the proposed Exit 4A in Derry and Londonderry.

Commercial and Residential Mixed-Use

This category reflects a mix of commercial and residential land uses commonly found in town centers, along a major corridor, a central business district, or transitional areas between predominantly commercial and residential areas. These areas typically feature small lots with mixed residential and commercial uses, allowing for a very livable, walkable, close-knit environment.

Commercial, Public and Residential Mixed-Use

This mix of uses includes commercial, public and residential land uses commonly found in or immediately adjacent to municipal centers, along a major corridor, or areas in transition. The largest area designated as such in the region is the land surrounding Manchester's downtown and central business district. This is predominantly characteristic of the fine grain existing land uses.

Commercial and Industrial Mixed-Use

These areas reflect a mix of primarily commercial and some industrial related uses commonly found adjacent to highway corridors or other non-residential areas. Those communities that do not have a purely industrial area designated do have a commercial and industrial mixed-use district. Typically, these areas would feature larger scale commercial, warehousing, office or industrial parks, and other light industrial uses.

Village and Neighborhood Centers (Small Centers)

Village and Neighborhood Centers represents many of the existing smaller villages or centers located throughout the region where, locally, growth in general should be focused and encouraged. Containing or encouraging growth in or around these village or neighborhood centers represents one of the smart growth principles of this plan. Manchester has identified four neighborhood centers and Goffstown has its Grasmere Village that are all planned to be neighborhood scale community centers. These centers are typically mixed-use in nature with commercial, residential, and occasionally public uses side by side.

Town and City Centers (Larger Centers)

The larger centers include existing and planned major town and city centers, which are much larger centers of development activity. These centers may already host municipal offices and other public facilities such as schools, but also function as the local downtown or central business district. Often times these areas are also served by higher density housing. Infill, redevelopment and adaptive reuse are desirable within these areas.

Conservation and Agriculture

The Conservation and Agriculture areas represent all existing conservation or protected lands as well as municipally planned areas. These areas are augmented in the Regional Future Land Use Map to include existing wetlands (based on the National Wetlands Inventory), special flood hazards areas (100-year floodplains), and riparian buffers of 100 feet in width. These areas, however, are not designated in any way to depict future protection priorities for any one community or the region as a whole.

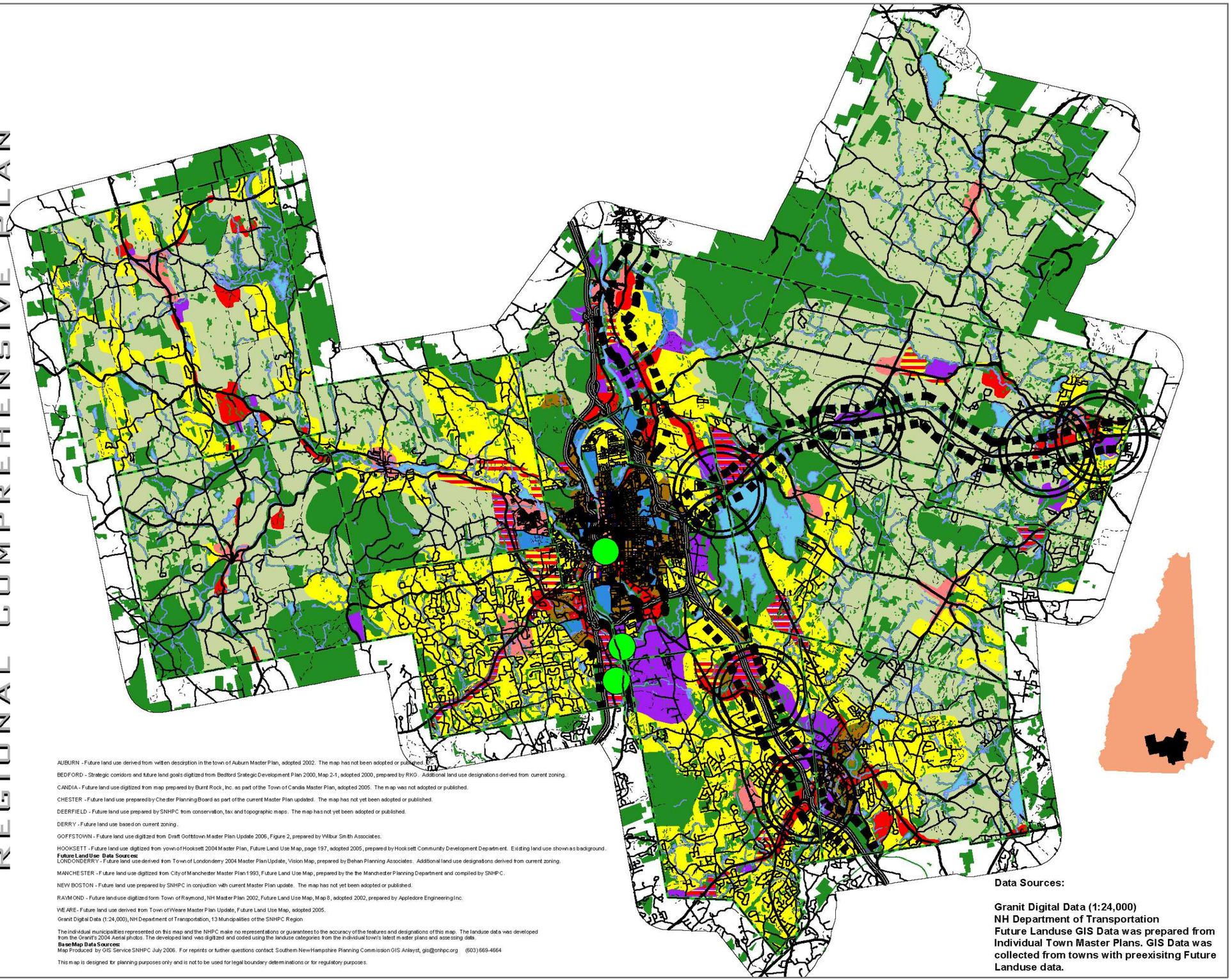
Public, Institutional, and Semi-Public

This generalized grouping of public uses represents significant existing features such as municipal lands, colleges and universities, as well as future lands devoted to the development of new municipal services. While most future public areas are contained within the community centers and other mixed-use districts, there are a few isolated locations across the region that will exist exclusively as public lands and are large enough to be identified on a regional scale.

Population, Housing and Land Use Changes

Assuming Future Land Use Scenario 3 is build out by the year 2015, it is projected that the region could contain a population of approximately 293,898 and a total of approximately 124,979 housing units. The projected 2015 population and total number of housing units for the region and each municipality is provided in the following table. The 2015 population projections for the region were updated by SNHPC in January 2005 as part of the transportation model. The housing projections were calculated by extrapolating data from the 2000-2010 Comparative Dwelling Unit Projections Averages from 2005 Regional Housing Needs Assessment. A percentage change was calculated and compounded to find the housing data for each year up 2015. Percent change for housing units was calculated from the extrapolated data as well as figures from the 2000 US Census.

REGIONAL COMPREHENSIVE PLAN



AUBURN - Future land use derived from written description in the town of Auburn Master Plan, adopted 2002. The map has not been adopted or published.

BEDFORD - Strategic corridors and future land goals digitized from Bedford Srategic Development Plan 2000, Map 2-1, adopted 2000, prepared by RKG. Additional land use designations derived from current zoning.

CANDIA - Future land use digitized from map prepared by Burnt Rock, Inc. as part of the Town of Candia Master Plan, adopted 2005. The map was not adopted or published.

CHESTER - Future land use prepared by Chester Planning Board as part of the current Master Plan updated. The map has not yet been adopted or published.

DEERFIELD - Future land use prepared by SNHPC from conservation, tax and topographic maps. The map has not yet been adopted or published.

DERRY - Future land use based on current zoning.

GOFFSTOWN - Future land use digitized from Draft Goffstown Master Plan Update 2006, Figure 2, prepared by Wilbur Smith Associates.

HOOKSETT - Future land use digitized from yown of Hooksett 2004 Master Plan, Future Land Use Map, page 197, adopted 2005, prepared by Hooksett Community Development Department. Existing land use shown as background.

Future Land Use Data Sources:

LONDONDERRY - Future land use derived from Town of Londonderry 2004 Master Plan Update, Vision Map, prepared by Behan Planning Associates. Additional land use designations derived from current zoning.

MANCHESTER - Future land use digitized from City of Manchester Master Plan 1993, Future Land Use Map, prepared by the the Manchester Planning Department and compiled by SNHPC.

NEW BOSTON - Future land use prepared by SNHPC in conjuction with current Master Plan update. The map has not yet been adopted or published.

RAYMOND - Future land use digitized form Town of Raymond, NH Master Plan 2002, Future Land Use Map, Map 8, adopted 2002, prepared by Appledore Engineering Inc.

WEARE - Future land use derived from Town of Weare Master Plan Update, Future Land Use Map, adopted 2005.

Granit Digital Data (1:24,000), NH Department of Transportation, 13 Muncipalities of the SNHPC Region

The individual municipalities represented on this map and the NHPC make no representations or guarantees to the accuracy of the features and designations of this map. The landuse data was developed from the Granit's 2004 Aerial photos. The developed land was digitized and coded using the landuse categories from the individual town's latest master plans and assessing data.

BaseMap Data Sources:

Map Produced by GIS Service SNHPC July 2006. For reprints or further questions contact Southern New Hampshire Planning Commission GIS Anlayst, gis@snhpc.org (603) 669-4664

This map is designed for planning purposes only and is not to be used for legal boundary determinations or for regulatory purposes.

Data Sources:

Granit Digital Data (1:24,000)
NH Department of Transportation
Future Landuse GIS Data was prepared from Individual Town Master Plans. GIS Data was collected from towns with preexisitng Future Landuse data.

Map #2.3

Future Landuse Scenario 3

Legend

Political Boundaries
- Townline
- 1 mile Town Buffer

Road Network
- Interstate Highways
- State Secondary Highways
- Town Maintained Roads
- Town Unmaintained Roads
- Private Roads

Hydrography
- Water Courses
- Water Bodies

Future Landuse Scenario 3
- Commercial
- Conservation
- High Residential
- Industrial
- Medium Residential
- Mixed Use Commercial / Industrial
- Mixed Use Commercial / Residential
- Mixed Use Commercial / Residential / Public
- Public
- Rural Residential
- Town Center
- Village Center

Transit Oriented Development
- Proposed Commuter Rail Stations
- Nodes
- Corridors

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SNHPC

Map Produced by GIS Service SNHPC September 2006.
For reprints or furthur questions

Contact: SNHPC, gis@snhpc.org or (603) 669-4664

0 7,500 15,000 30,000 Feet

0 1.25 2.5 5 Miles

Table 2.1
Population and Housing Unit Projections
Southern New Hampshire Planning Region

	2000		2005		2015		Percent Change 2000 - 2015	
	Population	Housing	Population	Housing	Population	Housing	Population	Housing
Auburn	4,682	1,622	5,177	1,766	5,863	2,142	25%	76.0%
Bedford	18,274	6,401	20,738	7,215	24,150	8,594	32%	74.0%
Candia	3,911	1,384	4,110	1,449	4,983	1,831	27%	76.0%
Chester	3,792	1,247	4,617	1,487	5,552	1,694	46%	74.0%
Deerfield	3,678	1,406	4,272	1,432	5,204	1,730	41%	81.0%
Derry	34,021	12,735	34,655	12,677	38,831	16,283	14%	78.0%
Goffstown	16,929	5,798	17,804	6,013	20,323	7,578	20%	77.0%
Hooksett	11,721	4,307	13,240	4,709	15,912	5,784	36%	74.0%
Londonderry	23,236	7,718	24,673	8,218	29,483	10,177	27%	76.0%
Manchester	107,006	45,892	109,966	46,167	114,952	58,780	7%	78.0%
New Boston	4,138	1,462	4,968	1,743	5,834	1,977	41%	74.0%
Raymond	9,674	3,710	10,639	3,896	11,996	4,754	24%	78.0%
Weare	7,776	2,828	8,854	3,031	10,815	3,648	39%	78.0%
SNHPC Region	248,838	96,510	263,713	99,803	293,898	124,974	18%	77.0%

Source: 2000 US Census & SNHPC

In terms of future land use, the following tables provide an estimate of the total amount of developed land area (acres); the total amount of non-residential developed land area (acres); and the total amount of residential land area (acres) by municipality and the region assuming the Future Land Use Scenario 3 is built out in the year 2015. These estimates were calculated utilizing the land use data collected for each municipality within the region from the Land Use Update – 2004 Report. An annualized percentage change was then calculated based on the region's land use trends between 1995 and 2004 and compounded forward to estimate the amount of developed, non-residential developed and residential land for each municipality in 2015.

The results indicate that roughly an additional 165,000 acres or an increase of 19 percent of the region will be developed by 2015. Of this total developed land within the region, there will be approximately 63,000 acres of non-residential developed land and 102,821 acres of residential developed land.

Table 2.2
Total Developed Land Area (Acres) 1995, 2004 and 2015 and Percent Change
Southern New Hampshire Planning Region

Municipality	Total Developed Area 1995	Total Developed Area 2004	Total Developed Area 2015	Percent Change 1995-2004	Percent Change 2004-2015
Auburn	7248.8	8272.0	9469.8	12.4	12.6
Bedford	9452.0	16667.2	26565.5	43.3	37.3
Candia	6332.2	7919.7	9851.9	20.0	19.6
Chester	3145.1	5729.9	9309.6	45.1	38.5
Deerfield	6689.1	8328.6	10320.5	19.7	19.3
Derry	10587.7	11845.8	13305.6	10.6	11.0
Goffstown	7817.1	9290.4	11045.8	15.9	15.9
Hooksett	8011.8	9630.9	11569.4	16.8	16.8
Londonderry	11057.3	12994.9	15292.5	14.9	15.0
Manchester	15563.8	17362.4	19446.6	10.4	10.7
New Boston	5798.2	7386.0	9333.0	21.5	20.9
Raymond	5528.0	6862.3	8481.4	19.4	19.1
Weare	10251.0	11202.2	12294.1	8.5	8.9
SNHPC Region	107482.1	133492.2	165060.1	19.5	19.1

Source: SNHPC Land Use Reports and Projections

Table 2.3
Total Non-Residential Land Area (Acres) 1995, 2004 and 2015 and Percent Change, Southern New Hampshire Planning Region

Municipality	Total Non-Residential 1995	Total Non-Residential 2004	Total Non-Residential 2015	Percent Change 1995-2004	Percent Change 2004-2015
Auburn	4618.7	4775.4	6822.4	3.3%	30.0%
Bedford	2187.2	4602.8	8079.4	52.5%	43.0%
Candia	2211.5	2862.4	3665.6	22.7%	21.9%
Chester	655.7	2139.3	4472.9	69.3%	52.2%
Deerfield	2968.7	3016.9	3070.3	1.6%	1.7%
Derry	2615.4	2793.1	2994.9	6.4%	6.7%
Goffstown	2878.4	2961.5	3054.2	2.8%	3.0%
Hooksett	5411.9	5819.9	6284.8	7.0%	7.4%
Londonderry	4751.5	5180.5	5672.4	8.3%	8.7%
Manchester	9722.5	10261.6	10870.4	5.3%	5.6%
New Boston	3318.5	3620.7	3967.3	8.3%	8.7%
Raymond	1152.0	1266.9	1399.2	9.1%	9.5%
Weare	5531.2	5604.7	5686.1	1.3%	1.4%
SNHPC Region	48023.2	54905.5	62968.8	12.5%	12.8%

Source: SNHPC Land Use Reports and Projections

Table 2.4
Total Residential Land Area (Acres) 1995, 2004 and 2015 and Percent Change Southern New Hampshire Planning Region

Municipality	Total Residential 1995	Total Residential 2004	Total Residential 2015	Percent Change 1995-2004	Percent Change 2004-2015
Auburn	2630.1	3496.1	4577.1	24.8%	23.6%
Bedford	7264.8	12064.4	18530.0	39.8%	34.9%
Candia	4120.7	5057.3	6188.5	18.5%	18.3%
Chester	2489.4	3590.6	5005.9	30.7%	28.3%
Deerfield	3720.4	5311.7	7349.4	30.0%	27.7%
Derry	7972.3	9052.7	10314.7	11.9%	12.2%
Goffstown	4938.7	6328.9	8037.6	22.0%	21.3%
Hooksett	2599.9	3811.0	5376.4	31.8%	29.1%
Londonderry	6305.8	7814.4	9643.7	19.3%	19.0%
Manchester	5841.3	7100.8	8615.9	17.7%	17.6%
New Boston	2479.7	3765.3	5447.4	34.1%	30.9%
Raymond	4376.0	5595.4	7092.9	21.8%	21.1%
Weare	4719.8	5597.5	6642.3	15.7%	15.7%
SNHPC Region	59458.9	78586.1	102821.8	24.3%	23.6%

Source: SNHPC Land Use Reports and Projections

I-93 and the CTAP Project

In addition to the population, housing and land development estimates prepared for Future Land Use Scenario 3, there are two major transportation improvements slated for construction by 2010 in the New Hampshire Department of Transportation's Ten-Year Transportation Improvement Plan; the I-93 widening and construction of Exit 4A on I-93 in Londonderry and Derry. Both of these projects will have significant impacts on the region in terms of population, housing, and employment growth, and increased traffic. The New Hampshire Department of Transportation (NHDOT) has been planning the widening of 19.8 miles of I-93, from the Massachusetts border to the I-293 split in Manchester. The intent is to increase efficiency and safety and reduce congestion along this section of the highway. To do this the project will expand the existing two lanes in each direction to four lanes, redesign and reconstruct Exits 1 through 5, construct new park and ride facilities at Exits 2, 3, and 5, expand bus and rideshare opportunities, and reserve median space for a possible future train or mass transit system.

While the direct impacts of the project will be felt in the area immediately surrounding the construction site, secondary impacts will be felt throughout the region. As a result, a total of 26 towns and cities have been identified by NHDOT as being located within the area that will be influenced by the I-93 project. All of the towns and cities located within the Southern New Hampshire Planning Commission region, except the towns of Weare and New Boston are included as part of these 26 communities. The secondary impacts most likely to be felt will be an anticipated increase in population growth, including housing growth, land use changes, and environmental impacts. All of these growth related impacts could affect the future land use of the region.

To help mitigate the impacts of the I-93 widening, the NHDOT has launched the Community Technical Assistance Program (CTAP), a five-year program designed to provide technical assistance to the 26 communities within the area identified to be impacted by growth as a result of the I-93 reconstruction. The purpose of the CTAP project is to provide municipalities within the study area with the tools required to deal with the impacts of the proposed highway widening. It will also provide advanced training for local officials, technical assistance, public information, education resources and innovative demonstration project to enable the implementation of sound land use planning practices in preparation for future growth. This initiative will be a joint effort between communities, state agencies, and nonprofit organizations focusing on the region, raising awareness of growth related issues, and developing innovative smart growth tools and techniques.

Because of the significance of these growth related impacts, it is recommended that all the communities within the region stay involved in the I-93 widening and planning process through the Southern New Hampshire Planning Commission. The SNHPC

will host informational sessions and disseminate critical information to the impacted communities as the CTAP program is implemented in the near future.

Chapter Three:

Agricultural Sustainability

Introduction

The purpose of this study is to identify and describe the current and future status of agriculture within the region. The study outlines goals and objectives for agricultural sustainability in the region based on the region's unique history and farmland trends for the future.

What is Agricultural Sustainability and Why is it Important to the Region?

Agricultural sustainability allows agricultural producers to meet the needs of their operations, their environments, and their communities. While specific techniques and approaches vary by farmer, common goals include:

- Providing a more profitable farm income
- Promoting environmental stewardship
- Promoting stable, prosperous farm families and communities (See Sustainable Agriculture through Research and Education; www.sare.org/publications/explore/index.htm)

Farm in Chester

Agriculture encompasses a wide range of food and plant production, including but not limited to, livestock, fruits and vegetables, annual and perennial greenhouse plants, nursery stock, maple syrup, honey, hay and sod, and lumber. The definition of agriculture in New Hampshire Statute RSA 21:34-A gives a more comprehensive list of included activities (see Appendix 1).

Agricultural land is integral to the region economically, ecologically, aesthetically, and culturally. All towns in the region were originally settled as agricultural establishments, with much of the current forested areas once existing as farmland. At the height of New Hampshire's agricultural industry, 50 percent of the state was farm or pasture land. Today, most of those farm jobs have been converted to jobs in industry and commerce; only five to seven percent of the land in the state is in agricultural use (GRANIT 2004). Southern New Hampshire still contains a wealth of prime farming soil, and its agricultural heritage helps to establish the rural character of many of the towns surrounding Manchester.

Farms in New Hampshire bring in nearly $750 million in sales annually from 3,400 farming operations (New Hampshire Farm Bureau 2004). Within local communities, farming supports government budgets and enables the creation of wealth locally, without outside developers. Farming facilitates job creation, support services and businesses, and secondary markets such as food processing. Environmental benefits of farmland preservation include protected wildlife habitat, clean air and water, flood control, groundwater recharge, and carbon sequestration. Finally, the farmlands of the SNHPC region are an integral part of the area's heritage and identity, founded on the principle of living off the land.

Main Issues and Concerns

Despite the importance of agriculture to the region's economy and culture, land is being developed significantly. Rockingham County lost one-third of its productive cropland in just five years (1997-2002). Hillsborough County lost 19 percent in the same time period (Society for the Protection of New Hampshire Forests 2005). Much of New Hampshire's most productive farmland remains unprotected from development. A key issue in New England is the stark contrast between urban and rural lands, which are extremely close in proximity. This encourages more developmental threats to farmland in the region.

The largest threat to agricultural sustainability is the increasing price of land. This has led to land being more economically valuable as development rather than farmland. As a result, the amount of farmland and the number of family operated farms has been steadily declining. By nature, it is difficult to attain profit margins in an agricultural enterprise comparable or greater than those of commercial or residential development. Furthermore, the soils that are desirable for agriculture are also the easiest to develop. Municipalities in the SNHPC region recognize the value of agriculture to their local economies and identities. However, the wide array of roadway improvement projects planned for the next few decades promise increase land values, which will further augment the problem.

Within the SNHPC region, no municipalities have adopted a zoning district designed specifically and exclusively for agriculture (see Table 3.1). Goffstown has a district entitled "Agricultural District" and Weare has a district entitled "Rural/Agricultural District," but both of these zones have been established with the purpose of encouraging low or limited density residential development and maintaining the rural character of the towns. Additionally, Bedford, Chester, Deerfield, Londonderry, New Boston, and Raymond all have Agriculture/Residential districts. These districts generally permit all types of agriculture, yet they are overwhelmingly occupied with low-density residential developments rather than agricultural operations. The town of Candia only permits unrestricted commercial agriculture in its Industrial District. The remaining municipalities (Auburn, Derry, Hooksett, and Manchester) allow agriculture in rural or low-density residential zones. Many of the towns also offer limited or special exception agricultural operations, such as forestry, farm stands, and pesticide-free farming, in commercial, industrial, conservation, and other residential districts (for specific zoning regulations, refer to each municipality's individual Zoning Ordinances).

The lack of agriculture-specific zoning contributes to one of the most pressing issues for New Hampshire's agriculture industry - the rapidly diminishing supply of farmland. With no land exclusively zoned for agricultural use, the current zoning ordinances of the region do nothing to ensure the preservation of farmland. Some municipalities have

taken steps towards preserving local farmland through land purchases, conservation easements, tax exemptions, and increased regulations. Many of these farmlands become community centers and recreation sites.

Local agriculture grapples with several other pressing issues. Multi-generational family farms are decreasing, the average size and acreage of farms in Rockingham and Hillsborough Counties are down significantly in the last decade, and farmers who rent land for their farms increasingly risk the sale of their farms in favor of more profitable development ventures. Due to the increasing challenges of profitable farming operations, young people are less likely to enter agricultural professions. There are more beginning farmers over the age of 55 than under the age of 55 (New Hampshire Public Radio 2005). Farmers also face the continuing threat of invasive species and the challenge of pesticide use without environmental detriment. Agriculture in the region looks towards local support for revitalization; this support can come in the form of farmer's markets, buy-local campaigns, agricultural tourism, and agriculture-friendly zoning and regulations.

Table 3.1
Primary Zoning District for Unrestricted Agriculture

Municipality	Agricultural District	Agriculture/ Residential District	Rural/Low Density District	Industrial District
Auburn			X	
Bedford		X		
Candia				X
Chester		X		
Deerfield		X		
Derry			X	
Goffstown	X			
Hooksett			X	
Londonderry		X		
Manchester			X	
New Boston		X		
Raymond		X		
Weare	X			

Source: SNHPC

Existing Conditions

Regional Agricultural Activities

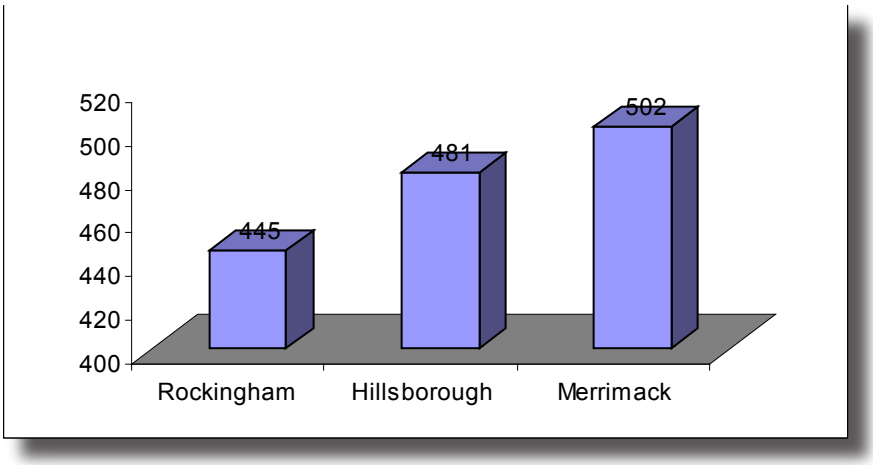
Agriculture in the Southern New Hampshire Planning Region includes an abundance of fruits and vegetables, ornamented agriculture, livestock, milk, dairy, and value added products. Environmental horticulture is perhaps the fastest-growing agricultural activity in the area, particularly in the form of ornamental greenhouse plants. Plant production and sales generate an estimated $210 million annually, 81 percent of which comes from sales and services within the state (New England Environmental Horticulture Economic Industry Survey 2003). The region also specializes in sheep, goats, poultry, dairy, horses, and pigs. Included in the agriculture industry of the region are forestry (logging), maple syrup production, and honey. Additionally, more eclectic specialties such as elk and llama farms represent a truly diverse agricultural industry in the region.

Much of the region was settled as farmland and remained so until industrialization in the mid-1800s. Some towns maintain a strong farming heritage and have developed their agricultural operations to reflect this identity. For example, the town of Londonderry created "Apple Way" to highlight their apple orchards and attract tourism with related commercial developments. Londonderry is also home to Stonyfield Farm, the nation's fastest growing yogurt company with all natural and certified organic yogurt and ice cream products distributed nationwide. Deerfield hosts the annual Deerfield Fair, New England's oldest family fair, started in 1876 and featuring an array of agricultural showcases and competitions.

Key Statistics

The United States Census Bureau collects agricultural data by county. The SNHPC region lies primarily in Hillsborough County, containing the municipalities of Bedford,

Figure 3.1
Number of Farms

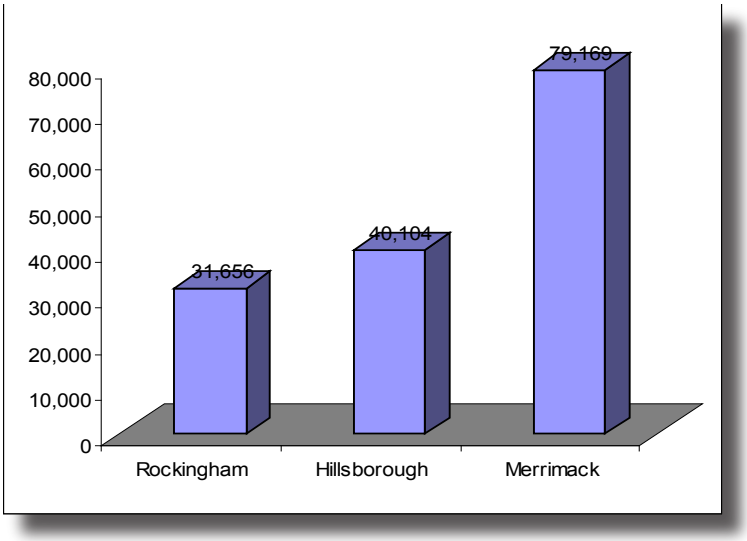


Source: USDA

Goffstown, Manchester, New Boston, and Weare, and Rockingham County, containing the municipalities of Auburn, Candia, Chester, Deerfield, Derry, Londonderry, and Raymond. The town of Hooksett lies in Merrimack County. From the 2002 agricultural census data, there are approximately1,428 farms and 141,920 acres of farmland in the three counties. In 1997 there were approximately 1,653 farms and 155,762 acres of farmland in the same area. This shows approximately a 14 percent decrease in the number of farms and a 9 percent decrease in acreage over the five-year period.

Rockingham County ranks second in the state for value of crops (including nursery and greenhouse crops) sold with $13,256,000 in 2002. Their total market value of production was $16,955,000 in 2002, third highest in the state. Other significant products include vegetables, fruits and berries, greenhouse crops, sheep, goats, and horses.

Figure 3.2
Land in Farms (Acres)



Source: USDA

Hillsborough County ranks third in the state for value of crops sold with $11,228,000 in 2002. Their total market value of production was $14,767,000 in 2002, fourth highest in the state. Other significant products include vegetables, fruits and berries, hogs and pigs, and horses. Hillsborough County also leads the state in farm acreage of vegetables, apples, and sweet corn.

Merrimack County ranks first in the state for total value of agricultural crops sold with $41,162,000 in 2002. They also rank first in value of crops with $34,054,000. Merrimack County is a top state producer of sheep, goats, greenhouse plants, grains, horses, cattle, sod, and hay.[1] (NASS 2005).

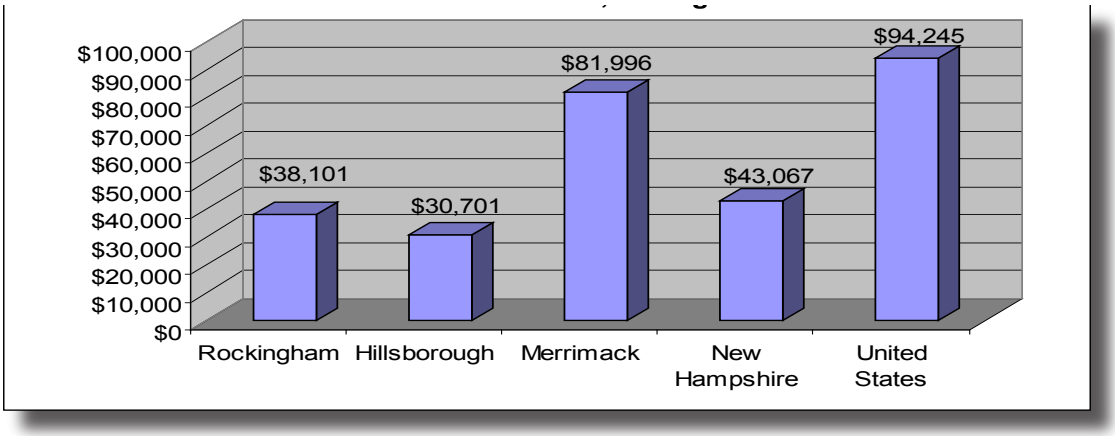
Recognizing the need for direct client interface in order to boost sales, the region's agricultural producers are already national leaders in terms of direct sales. Rockingham County is ranked 35th in the nation for the total market value of agricultural products sold through direct sales. Hillsborough County is ranked 37th in the nation (NEAS 2002).

1. Hooksett is the only town in the SNHPC region in Merrimack County. Hooksett has a very small agriculture industry and is not representative of the county as a whole.

As agricultural producers operating in urbanized areas, direct client sales are crucial to the economic success of the farm and integration of agriculture into communities.

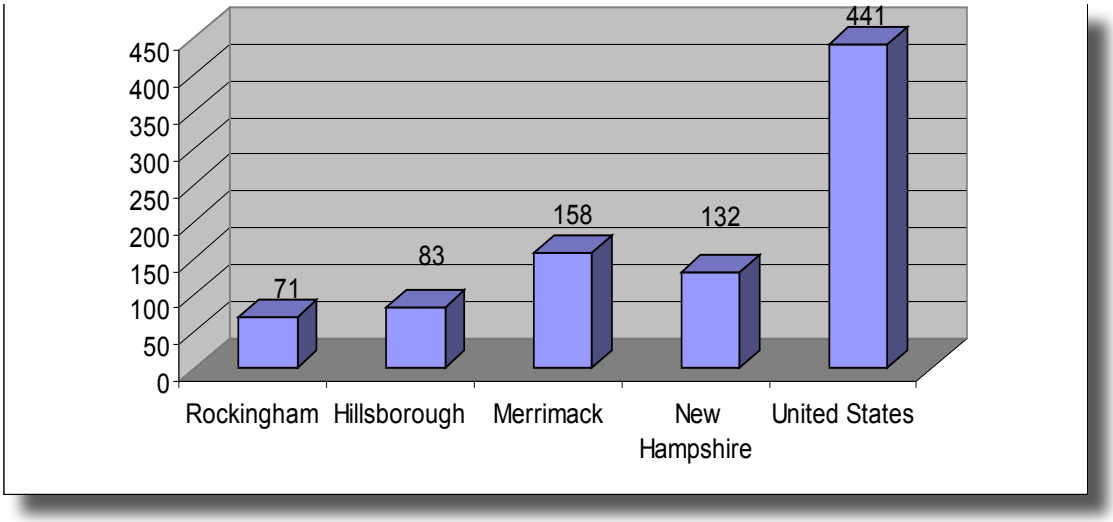
According to the Economic Research Service of the United States Department of Agriculture, 102,831 people were employed in agriculture or an agriculture-related field in New Hampshire in 2002, which was approximately 13 percent of the total state workforce, as seen in Table 3.1. Of that number, nearly 5,000 were employed directly on farms as farm proprietors or salaried workers. Over 11,000 people worked in the closely related fields of agricultural services, agricultural input industries, and agricultural processing and marketing. Finally, approximately 87,000 people were employed in agriculture retail and wholesale trade as well as indirect agribusiness. The steady number of farmers evidences the cultural importance of farming in the past three decades despite development pressures (ERS 2005).

Figure 3.3
Market Value of Production, Average Per Farm



Source: USDA

Figure 3.4
Average Size of Farm (Acres)



Source: National Agricultural Statistics Service; http://www.nass.usda.gov/census/

Table 3.2
Farm and Farm-related Employment in New Hampshire, 20012

Farm industries	Employment	Percent of total
Farming:	4,956	0.62 %
Farm production		
Closely related:	3,992	0.5 %
Agricultural services		
Agricultural input industries--	316	0.04 %
Agricultural processing and marketing--	6,784	0.85 %
Peripherally related:	84,389	10.59 %
Total farm & farm-related employment	102,831	13 %
All other employment	694,034	87 %
Total employment	796,865	100 %

Source: USD

2Source: http://www.ers.usda.gov/Data/FarmandRelatedEmployment/ViewData.asp?GeoAreaPick=STANH_New+Hampshire&YearPick=2001

Existing Trends

Farm stands and farmers' markets, traditional sales operations that allow agricultural producers to sell directly to community members, are increasingly important to the success of the region's agriculture. Dozens of markets and individual farm stands already exist, but local experts suggest that there remains a greater demand for local food and not enough publicity for current operations. Agricultural producers and agencies are looking to expand advertising and signage for farmers' markets and farm stands and to increase overall visibility of local food sales.

Community Supported Agriculture (CSA) is an emerging concept bringing community members into direct participation in the local agricultural industry. Participants buy a subscription or share in the harvest prior to the start of the growing season. In exchange, they regularly pick up a portion of the produce throughout the season, subject to the success of the harvest. CSAs can range in level of participation, with some operations requiring labor or pick-your-own for some produce, as well as availability of foods. Table 3.3 shows some of the various foods available through local CSA farms. Several of the farms in the area cannot keep up with the demand for shares, demonstrating a greater need for expansion of CSA operations.

Table 3.3
Community Supported Agriculture in SNHPC Region

Name	Description	Town	Number of Shares	Website/Phone
Shirley Farm CSA	Small-scale operation producing vegetables, herbs, flowers, pick-your-own berries, and organic eggs	Goffstown	30	www.shirleyfarm.com
The Educational Farm at Joppa Hill	Chemical-free farm including beef, pork, poultry, eggs, dairy, and produce	Bedford	N/A	www.theeducationalfarm.org
Middle Branch Farm	Certified organic farm with a variety of fruits, vegetables, livestock, and processed foods.	New Boston	50	603-487-2540

Source: USDA

Several existing programs through the New Hampshire Department of Agriculture address the integration of agriculture into community life. One such program, the New Hampshire Farm to Restaurant Connection, aims to increase the purchase of local foods for use in restaurant preparation. This project includes chef surveys, a directory of

Apple orchard in Londonderry; photo courtesy of Town of Londonderry.

supplier farms, a directory of restaurants using local foods, and "Grower Dinner" promotional events. Another state-run program is the New Hampshire Farm to School Program, which integrates local produce—particularly apples—into school cafeterias and classroom curricula.

In 2004, there were three certified organic farms in the SNHPC region with dozens more in surrounding areas. However, almost all local farmers markets feature organic produce, indicating that outside organic farmers supply the region. As public demand for organic foods has increased in recent years, there is a need to encourage and promote more organic farming in the SNHPC region.

In the SNHPC region, Londonderry successfully operates tourism around "Apple Way," a route of orchards supplemented by bed-and-breakfasts and other commercial establishments. Agriculture tourism can be an integral part of the region's agriculture industry; farm tours, field trips, and "pick-your-own" operations can better integrate agriculture into the community.

Finally, a new statewide grant program focusing on rural development helps agricultural operators to develop business and marketing plans. Currently there are 20 farms in New Hampshire being served by this program, including several in the SNHPC region.

Existence of Agricultural Easements

Senator Bell Farm in Chester

Conservation Easements are currently one of the most feasible solutions for farmland preservation in the region. Landowners sell conservation easements to a government or private conservation agency, which pays them the difference between the value of the land for agriculture and the value of the land for its "highest and best use" (generally residential or commercial development). Land value is determined by professional appraisals or a numerical scoring system developed for the purpose. The land remains privately owned and on tax roles, and the owner maintains the right

to use the land. Conservation easements are also an important tool for the protection of forested land for lumber operations.

The New Hampshire Department of Agriculture manages an Agricultural Land Preservation Program to purchase development rights on prime agricultural lands. Currently, they hold and monitor easements on 32 farm properties totaling 2,922.76 acres (NH Dept. of Agriculture 2005). They also work with local and federal agencies, trusts, and conservation organizations to protect farmland throughout the state.

The Farm and Ranchlands Protection Program (FRPP), a program of the Natural Resources Conservation Service (NRCS) of the USDA, has helped acquire several agricultural conservation easements in Rockingham County. Among these are 371.5 acres of orchard land in Londonderry, the 20.5-acre Root Farm in Chester, and the 25-acre Robert R. Corneliusen Trust property in Derry (Eagle Tribune 2004). Currently there are no federally funded agricultural conservation easements in Hillsborough County, which holds potential for easements in the future

Twin Gate Farm in Londonderry

Definitions of Soils

Prime farmland: "Land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is also available for these uses" (Natural Resources and Conservation Service)

Prime farmland soils: "Cropland, pasture land, forest land, or other land exclusive of urban built-up and water areas, has the soil quality, growing season, and moisture supply needed to produce sustained high yields of crops economically, when treated and managed according to modern farming methods" (SOURCE???)

Farmland of statewide importance: "Soils which are considered to be important to agriculture in New Hampshire. Although these soils exhibit such properties as erodibility and droughtiness, they can produce fair-to-good crop yields when properly managed."
Source: Town of Chester 1997, definitions derived from NRCS USDA standards

REGIONAL COMPREHENSIVE PLAN

Agriculture		
Town	Landcover	
	Active Agriculture	
	Acres	Percentage
Auburn	1705.932	4.95%
Bedford	2644.408	7.67%
Candia	2015.598	5.85%
Chester	2082.238	6.04%
Deerfield	2433.46	7.06%
Derry	4697.143	13.63%
Goffstown	2135.214	6.20%
Hooksett	1966.643	5.71%
Londonderry	5347.232	15.52%
Manchester	3008.88	8.73%
New Boston	1304.949	3.79%
Raymond	3149.148	9.14%
Weare	1972.256	5.72%
TOTAL	34463.101	100.00%

Map #3.1

AGRICULTURAL RESOURCES

Legend

Political Boundaries

- Town line

Road Network

- Interstate
- State Route
- Major Roads

Hydrography

- Streams
- Rivers/ Lakes

Farm and Soil Class

- Active Agricultural Lands
- Prime Agricultural Soils
- Soils of Statewide Significance

Data Sources:

Granit Digital Data (1:24,000)
NH Department of Transportation
NH Department of Environmental Services
NH Fish and Game Habitat Features data

The individual municipalities represented on this map and the SNHPC make no representations or guaranties to the accuracy of the features and designations of this map.

This map is prepared for planning purposes only and is not to be used for legal boundary eterminations or for regulatory purposes.

SNHPC

Map Produced by GIS Service SNHPC April 2006.
For reprints or furthur questions

Contact: SNHPC, gis@snhpc.org or (603) 669-4664

0 7,500 15,000 30,000 Feet

0 1.5 3 6 Miles

Future Conditions

Changes in agricultural lands and employment have been significant and non-linear in the last decade (e.g. Strong decrease in farms in the last five years but increases in farms in the five years prior to that), making statistical predictions rare. Most experts in the field suggest the following items as the future of regional agriculture

.

While specific regulations and measures can help facilitate agricultural operations in the SNHPC region, overriding ingrained attitudes and techniques have the greatest potential for real change in bringing about sustainable agriculture. These new perspectives and practices require the participation and support of agricultural operators as well as municipal leaders, planning and zoning boards, and community residents. Cooperation and understanding between all three groups can provide mutually beneficial results for the entire community.

Direct Sales to Clients

Mac's Apples in Londonderry

According to farmers and those who work most directly with them, the single best action farmers can take towards sustaining agricultural activity in the region is direct involvement with clients. This can range from the simple step of manning a booth at a farmers' market to bottling milk on site at a dairy farm to create the ability to sell directly to the community. Especially in urbanizing areas, where residential neighborhoods lie adjacent to agricultural operations, the farmer who can serve the community the best will be the most successful. According to Bill Wilson of the Hillsborough County Farm Service Agency, "In urbanized areas, 'wholesale' has been termed 'no-sale.'" Customers want to see where their food comes from and are eager to buy local foods from a known source. Farmers who can make the transition to direct customer sales will see a difference in their bottom line.

Agricultural operators cannot make this switch alone. With more involvement by community leaders, agricultural dollars can have an even greater impact within the local economy. Residents can participate by buying directly from farmers and learning more about agricultural operations. If farmers can purchase equipment and supplies

locally and market their products to local consumers, all of the financial agricultural benefit can be felt within the town's economy as opposed to other counties, states, or countries.

Community Supported Agriculture (CSA) farms are one solution that can facilitate the direct sales of produce to local residents. The success of current operations in the region as well as the unmet demand for shares in CSAs demonstrate the need to expand shareholder farms.

Conservation Easements

Conservation easements have been promoted in the region as a response to the continuing loss of farmland to development. While a few easements have been created in Rockingham County, there still remains a vast potential for saving thousands of acres of farmland through easements. There are a variety of government programs and non-profit agencies that provide grants and matching funds for easements (see Section F. Existing Local, State, and Federal Programs). The challenge for towns is to educate taxpayers on the benefits of conservation easements. Town planners can also help by adding regulations that prevent development on prime farmland soil and soil of statewide importance and working with agricultural producers to enact agriculture-friendly ordinances. Municipalities can also preserve wooded lands on prime agricultural soil, as these may someday be reverted back to farmland.

Municipalities should make every effort to assist all agricultural operators who wish to continue producing upon their land through zoning regulations and facilitation of community programs. However, farmers should always have the option to sell their land and operations at their highest value, should they choose to cease production. The community must recognize that conservation easements are an important tool in farmland preservation, yet in some cases, the value of an easement may not be high enough to meet farmers' needs. A municipality supportive of farmland preservation must also respect the individual farmer's property rights.

A new committee of New Hampshire legislatures, called the Farm Viability Committee, is considering a new land conservation program based on a Massachusetts model. In this program, farmers agree to keep a specific amount of land open and undeveloped for at least 10 years in exchange for maintenance money for their farms. After 10 years, they could choose to develop the land, in which case they would pay back part of the subsidy money. This can give farmers a short-term boost without the intimidation of permanent conservation easements.

The next few decades may see the emergence of agricultural commissions in municipal governments. These advisory boards would consider agriculture in the way that conservation commissions focus on natural resources. Planning or zoning commissions could refer projects to the agricultural commission, who would then

make a recommendation based on the agricultural impact of the project. Several towns have had success with these commissions in Massachusetts, leading to an interest in developing them in New Hampshire.

Diversification of Agricultural Production

Another emerging trend that offers promise for agricultural sustainability in the future is the diversification of agricultural operations. Small, part-time farmers have increased in the past few years, and they have focused on diversifying their types of operations as well as the ways in which they market their products. Some farmers take on multiple small-scale operations, such as honey and soap from goat's milk. Agricultural operators are becoming wiser about diversifying their products in general, with techniques such as rotational breeding and cutting hay on dormant fields. One dairy farm, for example, bottles milk, produces ice cream and beef, and maintains an on-site hunting operation, all in addition to traditional milk operations. The added creativity of diversification results in greater efficiency and profits.

Another trend suggested by the Farm Viability Committee is the encouragement of the use of biofuels, such as biodiesel, by government agencies and private consumers. This increases the market for agricultural products, from which the fuel is made.

Community Education and Involvement

Even as communities value the "rural character" that agriculture provides in their towns, many residents are unaware of the diversity of operations in modern agriculture and the benefits agriculture brings to the local economy. Citizens living in close proximity to agricultural operations should learn more about the tax benefits of open spaces provided by agricultural land, practices such as manure-spreading (a natural alternative to fertilizers), the health and economic benefits of eating locally produced food, the availability of locally produced foods and goods, and the threat development poses to farmlands. Almost all state and federal grant programs require cost-sharing with local municipalities, and therefore farmland will continue to be threatened until taxpayers are willing to pay for farmland preservation directly.

Nearly all agricultural specialists agree that the greatest hope for revitalization of New Hampshire's agricultural industry lies with community involvement. The best way to involve community members and educate them about local agriculture is through an on-site event at a local farm, where residents can see for themselves the type of production that occurs. Residents also tend to mobilize around major issues that affect the community, so events should be geared around those, if possible. One example to model is that of Stonewall Farm in Keene, which is a fully operational farm with livestock, produce, dairy, and flowers open to the public seven days a week. The farm includes a year-round learning center, a summer camp, and special community events, such as workshops and Contra-dances.

In addition, experts highlight a proliferation of farmers' markets and farm stands, CSAs, Buy Local campaigns on a town level, an expansion of agricultural tourism and other businesses that support agriculture, and the purchase of farm equipment and supplies within the community as evidence of New Hampshire's agricultural revitalization. The few programs and markets in operation should be promoted and serve as examples for others. These changes are best facilitated through community education programs and agriculture-friendly planning and regulations.

Existing Local, State, and Federal Agricultural Programs

A variety of state and federal programs exist to help farmers and landowners preserve farmland and maintain successful agricultural operations. More emphasis is needed on educating local municipalities about these existing programs and funding sources for farmland preservation in order to make conservation and protection efforts cost-efficient.

The 2002 Farm Bill contains a "regional equity" provision, which more than doubled federal conservation funds for New England. The programs with the largest increases are the Farm and Ranch Lands Protection Program (FRPP), Wildlife Habitat Incentives Program (WHIP), Grassland Reserve Program (GRP), and the Environmental Quality Incentives Program (EQIP). New Hampshire is slated to receive at least $12 million for funding in Natural Resources Conservation Service programs, such as the ones listed above.[3]

Federal Programs

- Agricultural Management Assistance (AMA): Provides cost-share payments to producers who voluntarily address issues of water quality, water management, and erosion control through the incorporation of conservation. Contact your local conservation district office at 603-679-2790 in Rockingham County, 603-673-2409 in Hillsborough County, or 603-223-6023 in Merrimack County.
- Environmental Quality Incentives Program (EQIP): Voluntary cost-sharing program with the USDA for projects such as erosion control, pasture management, watering systems, and Integrated Pest Management. As one of New Hampshire's largest sources of federal conservation funding, EQIP can provide up to 75 percent of project cost as well as technical assistance. Contact your local conservation district office at 603-679-2790 in Rockingham County, 603-673-2409 in Hillsborough County, or 603-223-6023 in Merrimack County or visit http://www.nrcs.usda.gov/programs/eqip/.
- Conservation Innovation Grants: Awards grants using EQIP funds to non-governmental organizations and individuals for innovative conservation programs and technologies that address natural resource concerns. For more information, contact Kim McCracken, Resource Conservationist, at 603-868-9931, ext. 123, or Gary Domian, Assistant State Conservationist, at 603-868-9931, ext. 105.
- Farm and Ranch Lands Protection Program (FRPP): Establishes partnerships with state and local governments and non-profit agencies to purchase conservation easements on farm and ranch land. Requests for proposals go out in December with proposals due in April. Contact Steve Hundley, FRPP

3. For more information see American Farmland Trust; http://www.farmland.org/northeast/index.htm; 7/29/2005

Program Manager at 603-868-7581 or visit www.nrcs.usda.gov/programs/frpp/.

- Wildlife Habitat Incentive Program (WHIP): Provides assistance to restore or improve wildlife habitats on agricultural property with up to 75 percent financial support. Contact Priscilla Johnston at 603-868-7581 or visit www.nrcs.usda.gov/programs/whip/.
- National Conservation Buffer Initiative (NCBI): Provides technical and financial support for farmers to create buffer zones on their properties to maintain healthy, productive farms. Visit www.nrcs.usda.gov/feature/buffers/ for more information.
- NH Conservation Security Program (CSP): Provides financial and technical assistance to promote the conservation and improvement of soil, water, air, energy, and plant and animal life on agricultural operations. Visit http://www.nrcs.usda.gov/programs/csp/ for guidelines, deadlines, and workbooks about the CSP.
- Conservation of Private Grazing Land (CPGL): Provides technical, educational, and related assistance to protect, sustain, and innovate privately owned grazing lands. This is not a cost-share program. Contact Rick Ellsmore at 679-1587, ext. 101, or Deb Weymouth at 603-673-2409, ext. 4.
- Grassland Reserve Program (GRP): Provides permanent and temporary easements, rental agreements, and restoration agreements for grasslands and shrublands to help landowners to protect, restore, and enhance their property. Contact Jim Spielman, NRCS Program Specialist, at 603-868-7581 or visit www.nrcs.usda.gov/programs/GRP/.

State Programs

- Agricultural Promotion Mini-Grant Program: Marketing grant for agricultural organizations wishing to promote some segment of agriculture in New Hampshire. Provides a matching grant of up to $500 for an organization (http://www.agriculture.nh.gov/programs/index.htm).
- Agricultural Nutrient Management Program: Applicant can get up to 2500 for projects that involve best management practices to prevent or mitigate water pollution (http://www.agriculture.nh.gov/programs/index.htm).
- Integrated Pest Management Program: Awards up to $5000 to applicant projects that best utilize an approach to pest management in a way that minimizes economic, health, and environmental risks (http://www.agriculture.nh.gov/programs/index.htm).
- New Hampshire Cooperative Extension: This federal, state, and county-funded agency provides a representative to each county and offers workshops and technical assistance for local agricultural producers (http://www.extension.unh.edu).

- New Hampshire Farm to School Program (NH FTS): Connects NH farms and schools by integrating agricultural production, school food procurement, and school curriculum. Farmers can participate by selling food to school Food Service Directors, offering tours to school groups, and participating in Harvest Celebrations (www.nhfarmtoschool.org).
- New Hampshire Farm to Restaurant Connection (NHFRC): Promotes partnership between farms and restaurants to strengthen agricultural communities and educate consumers about locally grown food. Also sponsors Growers' Dinner events at restaurants throughout the state serving local food (www.nhfarmtorestaurant.com).
- New Hampshire Coalition for Sustaining Agriculture: A virtual organization of agricultural agencies and non-profit organizations, the Coalition promotes sustainable agriculture through projects that help agricultural operations and municipalities. Contact Nada Haddad at 679-1616.
- New Hampshire Stories, Inc.: With over 600 members statewide, this company focuses on cost-effective marketing, selling, and business support services including common brand identity marketing, website advertising on nhmade.com, establishment and promotion of two retail stores, and a consumer guide of member products and services.
- New Hampshire Farmers' Market Association (NHFMA): Promotes farmers' markets in the state and facilitate the production and sales of local food (http://www.nhfma.org/).

Local Programs

- Beginning Farmers of New Hampshire: This is a network of farmers with the goal of helping small and beginner farmers, connecting farmers with the community, sharing ideas and information, accessing technical assistance and agricultural education, and boosting the agricultural industry and economy of New Hampshire. The organization has chapters in Hillsborough, Rockingham, and Merrimack Counties (www.beginnerfarmers.org).

Recommendations

Municipalities within the SNHPC region can take specific actions to support agriculture and enhance community life in three areas: reducing development pressure for productive agricultural land, integrating agriculture into the local economy, and ensuring the farmer's right to farm. The actions listed below are some of the most important actions that can be undertaken directly at the local level. For further details on any of these recommendations or to take additional steps towards sustaining agriculture, consult the Resources section of this chapter.

1. Reduce development pressure on agricultural lands currently in use by:
   - Purchasing development rights
   - Limiting infrastructure improvement (sewer and water) in agricultural areas
   - Using zoning to guide growth away from farms
   - Creating zoning regulations to protect prime farmland soils and soils of statewide importance.
   - Budgeting money for agricultural conservation easements, supplemented with funds from state and federal programs.
   - Increasing efforts to protect farmland through conservation easements in Hillsborough County, and applying to grants for financial assistance.

2. Enhance integration of agriculture in local economy by:
   - Supporting farmers and enable legislation regarding state tax issues that directly impact their operations (tax credits for working agriculture)
   - Including opportunities for agricultural expansion in future economic development initiatives
   - Establishing a "buy local" program
   - Establishing a community education program to teach the social and economic benefits of agriculture.
   - Promoting and supporting the establishment of a farmers' market in a commercially attractive location to help create new markets for locally grown agricultural products.
   - Encourage the expansion of current Community Supported Agriculture operations to meet existing demand.
   - Enhancing and encouraging agriculture-related tourism such as Apple Way.
   - Increasing signage for farms, farm stands, and farmers' markets, and reduce restrictions for temporary or seasonal signage for these purposes.
   - Working directly with farmers and agricultural property owners to enhance viability of agriculture in the town.

3. Ensure the Right-to-Farm by:
   - Removing impediments to agriculture in zoning ordinances through measures to
     i. Encourage agricultural activity anywhere in the community unless a specific safety or health hazard can be documented
     ii. Provide flexibility in zoning, subdivision, and site plan review regulations for agricultural uses.
     iii. Permit wide-range of farm-based enterprises by removing impediments to home-based business or other subordinate or accessory farm activity.
   - Exempting agriculture or clearly differentiate subdivision and site-review requirements for agricultural enterprises from those regulating commercial, industrial, and residential.
   - Requiring developers to buffer new non-agricultural development from existing or potential farm locations to prevent or minimize negative interactions.
   - Educating town officials and farmers about existing grant money and facilitate the application process.

The New Hampshire Coalition for Sustaining Agriculture (NHCSA) and the University of New Hampshire Cooperative Extension has produced a comprehensive resource kit for planners entitled "Preserving Rural Character through Agriculture" that specifically addresses the needs of New Hampshire agricultural operators and local governments. The kit contains specific zoning guidelines to help planners encourage agriculture in their municipalities. Some of these guidelines include:

- Allow agriculture in more than one zoning district
- Allow simpler designs for Site Plan Review and flexible restrictions on seasonal agricultural businesses
- Allow off-site signs to attract customers
- Have a consistent policy approach for local land use procedures dealing with agriculture
- Allow roadside stands or pick-your-own operations
- Use zoning definitions of agriculture in a broad and inclusive manner
- Allow farm stands to sell products produced elsewhere
- Allow non-traditional or retail-based farm business in agricultural zones
- Properly assess specialized agricultural structures and address them in building codes
- Encourage conservation easements, discretionary easements, and purchase of farmland
- Have visible demonstration of value of agriculture
- Ease local restrictions and tax assessments on greenhouses

The NHCSA also reports the following guidelines as "Best Agricultural Planning Practices" for specific areas of municipal planning:

- **Signage**: Master Plan should indicate value of signage to agriculture, including exempt or reduced standards for signage and permission for seasonal and off-site signage.
- **Agricultural Structures:** Waivers from building and site requirements, exemption from site plan review process, follow but not exceed national code requirements for agricultural structures
- **Housing:** Master plan should include a policy statement on agricultural housing that allows clustering of farm dwellings and houses on site for non-related farm employees. Zoning should allow flexible provisions for accessory units on farms, and municipalities should keep farm housing separate from standard multi-family operations such as apartment buildings.
- **Nuisance**: The right to farm should not be "unreasonably limited by use of municipal planning and zoning power" and a farm cannot be a nuisance after it has been operational for one year (assuming no previous complaints or change in operations).
- **Transportation:** Town should use signage to indicate roads used by farm equipment for public relations and safety reasons. There should also be a policy statement to have several access points on agricultural lands.
- **Parking:** Farm roadside operations should not be considered commercial (if at least 35% of sales come from farm production). Local planning boards should consider waiving standards for parking lot design and construction for seasonal or pick-your-own farms.
- **Animal density:** Follow state recommendations for best practices of manure handling.
- **On-Farm Retail Sales:** Communities should be flexible in site plan review regulations and exempt seasonal farm stands from municipal regulations (except proof of safe site access). Year-round operations should have reduced standards from commercial and industrial uses.
- **Buffers:** Planning boards should consider buffering requirements on bordering non-agricultural land. Requiring developers to build buffers releases the burden from agricultural operators.
- **Prime Agricultural Lands:** Inventory prime agricultural lands in the master plan and adopt policies to protect this land from development.
- **Cluster**: Recognize agricultural land not only as open space but also as farmland.

Conclusion

"We need to emphasize that agricultural producers need everybody," says Linda Langdell of the USDA Farm Service Agency. Agricultural operations can benefit greatly from farm-friendly zoning regulations, local food marketing, and community involvement. A community educated about the local agricultural industry will understand the economic and social benefits of agriculture well beyond the success of individual farmers. The SNHPC region already ranks high in community involvement in agricultural sales, as evidenced by Hillsborough and Rockingham Counties' high national ranking of direct sales. The continued integration of agriculture in the community will ensure the agriculture's place at the heart of the region's identity, despite the loss of farmland. It will be up to communities in the region to protect and encourage a variety of sustainable agriculture practices.

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Master Plans Addressing Agricultural Sustainability

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Deerfield Master Plan, November 10, 1999
Town of Derry Master Plan Update, December 30, 2002
Goffstown Master Plan, October 9, 1997

Town of Londonderry Master Plan, November 10, 2004
Town of Weare Master Plan Update, March 24, 2002

Additional Contact Information

Natural Resources Conservation Services
NRCS and Hillsborough County Conservation District
Chappell Professional Center
#468, Route 13, South
Milford, NH 03055-3476
Phone 603-673-2409 Ext. #4
Fax 603-673-0597

Rockingham County Conservation District
110 North Road
Brentwood, NH 03833-6614
Phone 603-679-2790
Fax 603-679-2860

New Hampshire NRCS
243 Calef Highway, Telly's Plaza
Epping, NH 03042-2326
Phone 603-679-1587
Fax 603-679-4658

New Hampshire Department of Agriculture, Markets & Food
www.agriculture.nh.gov
PO Box 2042
Concord, NH 03302
State House Annex
25 Capitol Street, 2nd Floor
Concord, NH 03301
Telephone: (603) 271-3551
Department Fax: (603) 271-1109

UNH Cooperative Extension
http://www.extension.unh.edu

Hillsborough County
Suite 101
329 Mast Road
Goffstown, NH 03045-2422
Phone: 603-641-6060

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Chapter Four:

Cultural and Historic Resources

Introduction

Situated in New England, one of the first areas of America to be settled by the English, the Southern New Hampshire Planning Commission region's history goes back to the 17th century. From barns, farmlands and meandering stonewalls, to bridges, dams, and massive millworks, the area's history is captured in those remnants. Through preservation we can tell stories of the past while ensuring resources are available for the future.

New Hampshire's history is as diverse as its people. The SNHPC region's history can be generally described in terms of economic pursuits. In the 18th century, the region's residents pursued farming, fishing, and timber trades. The Merrimack River provided rich farmlands along its banks, a plentiful fishery, and access to the ocean and European markets for timber.

The SNHPC region's towns were all first settled in the early to mid-18th century. As settlements spread outwards from the Seacoast, tensions between early settlers and Native Americans increased and a number of wars broke out. The towns that were settled before 1740 experienced the violence associated with displacing the Native Americans. These towns included Londonderry, Chester, Manchester, Raymond, and Bedford.

The Town of Londonderry was first settled as Nutfield, in 1719 by Scots-Irish immigrants. This original land grant included present-day Derry, parts of Windham, Manchester, Salem, and Hudson. The town was re-named Londonderry in 1722 and incorporated in 1740. In 1827, the Town of Derry was incorporated and separated from Londonderry.

The Town of Chester, incorporated in 1722, was one of the earliest settlement grants to accommodate Seacoast area growth. Auburn, Candia, and Hooksett, part of the original Chester land grant, were eventually cleaved off to form the towns we know today. Auburn was first settled in 1734 and incorporated in 1845. Candia was first settled in 1748 and incorporated in 1763. Hooksett was the first settled in 1749. The town was not incorporated until 1822, despite having been called Hooksett for the past 50 years.

The land area that became the City of Manchester was originally granted by Massachusetts in 1722 and encompassed land granted by New Hampshire to the towns of Chester and Londonderry in the same year. This happened often until King George settled the boundary dispute between Massachusetts and New Hampshire in 1740. Called Harrytown, Old Harrytown, and Tyngstown, it was incorporated in 1751 as the town of Derryfield. In 1810, it was renamed Manchester and was incorporated as a city in 1846.

The Town of Raymond was first settled in 1725 as a parish of Chester. It was called Freetown initially and was incorporated in 1764. The Town of Bedford was first granted in 1730 to soldiers who fought against the Narragansett Indians in Rhode Island. Originally called Narragansett No. 5, it was incorporated in 1750 as Bedford.

The Town of New Boston was first settled in 1742 and was called Lanestown. It was re-granted in 1748 to families from Londonderry, and was incorporated in 1763. The Town of Goffstown was originally established as Narragansett No. 4 by Massachusetts. It was re-granted in 1748 by New Hampshire, re-named Goffstown, and incorporated in 1761. The Town of Weare was granted to soldiers of the Canadian wars in 1735 by Massachusetts and called Beverly-Canada. The town has also been known as Halestown, Robiestown, and Wearestown. It was incorporated as Weare in 1764. The Town of Deerfield was first settled in 1756 as a parish of Nottingham. Despite being one of the last towns to be settled, it was incorporated in 1766 prior to other towns.

Due to the North-South flow of the major rivers in the state, communication with Boston was more likely and easier than with Portsmouth, the provincial capital. This familiarity caused New Hampshire to play an important role in the events of the Revolutionary War and the subsequent formation of the new Republic. Troops from New Hampshire fought in the Battles of Bunker Hill and Lexington and Concord. New Hampshire was also the first to draft a state constitution, instruct their delegates to vote for independence at the Continental Congress in Philadelphia, and the ninth and deciding state to ratify the new U.S. constitution in 1788.

The 19th century brought a transition to textile manufacturing and the boom of the mill towns. Situated along the Merrimack River, the SNHPC region, particularly Manchester, was an international center for mill technology. The rise of manufacturing and westward national expansion resulted in a decline in farming pursuits in New Hampshire during this time. The textile boom brought in an influx of immigrants to the Manchester area. By the beginning of the 20th century, the percentage of foreign-born residents in New Hampshire was higher than the national average, a fact that remains true today.

New Hampshire was a dominant player in the manufacturing trade at the beginning of the 20th century, but at the end of World War I, New Hampshire's hegemony of the textile mill industry began to decline and continued through the depression of the 1930s. Manufacturing pursuits shifted to shoes and electronics, while smaller towns took advantage of the New Hampshire scenery and began to promote themselves as tourist destinations. The mid-20th century saw continuing declines in economic growth, but by the 1960s efforts to attract businesses, combined with the urban sprawl of Boston, transitioned New Hampshire into one of the fastest growing states in the Northeast.[1]

1. www.nh.gov/markers/brief.html

Preserving this historic legacy can be a challenge amid current and projected population and economic growth trends in Southern New Hampshire. Local communities can work together with regional, state and federal agencies to accomplish successful preservation. The establishment of a historical society, historic district commission, or heritage commission is an important first step in the preservation process. Once established, these committees can serve as advisors for planning boards and can help facilitate the listing of properties on various national and state registers. These registers raise awareness of the importance and value of historic preservation and can foster civic pride.

Historic Preservation Tools

The Southern New Hampshire Planning Commission region is a rich and vibrant repository of cultural and historic resources. Many of these sites have been preserved, but there are still many more, which the communities would like to see preserved. Historic preservation planning is proactive and successful accomplishment of preservation goals requires careful consideration. There are tools available to help communities with preservation efforts. These include, but are not limited to, zoning regulations, easements, grants, loans, and tax credits.

Historic Resources Survey and Inventory

The most important historic preservation-planning tool is the historic resources survey and inventory. Less than 25 percent of New Hampshire's communities have completed this step. The SNHPC has compiled a 'wish list' of properties in the region that are historically and culturally significant to its member communities as part of the 2004 New Hampshire Department of Environmental Services' Regional Environmental Planning Program. This list of Local Resource Protection Priorities, while providing a starting point, is by no means all-inclusive and cannot substitute for a detailed inventory. At the same time, in some cases, it is too inclusive and cannot substitute for a prioritized survey of the most important or endangered sites. A town-wide comprehensive survey and inventory can accomplish both of these aims. Once complied, such a list can guide future planning decisions and provide a starting point for historical societies and heritage commissions in nominating decisions for the National and State Registers of Historic Places.

Historic District Overlay Zoning

Historic zoning or historic district overlay zoning is a tool for preservation. Typically, this type of zoning is a layer that is applied over the existing zoning regulations in designated historic districts. The heritage commission, historic district commission or a design review board reviews building permits and demolition requests within the district. In some cases, the heritage commission or historic district commission may only review demolition requests, while an independent design review board reviews permits. In either cases, the efforts of the preservation groups and the zoning board need to be coordinated for best results, otherwise, problems can arise without coordination. For instance, zoning in historic districts could be incompatible with current uses, or there could be density, lot size, or off-street parking issues.

To determine the need for historic zoning overlays or revised zoning ordinances, communities should map historic districts, properties and landmarks, along with the boundaries of existing zoning ordinances to determine potential conflicts and areas of

compatibility. Additionally, historic zoning ordinances may allow historic properties special exceptions for uses typically not permitted by the general zoning ordinance. One example is to allow historic residences, which can be large and expensive to maintain, to be used as office space or multi-family housing. Another consideration is the use of existing mill buildings for residential or commercial purposes. By providing for mixed uses in historical districts, communities can facilitate revitalization.

Another zoning tool is transfer of development rights (TDR). TDRs allow the development rights for low-density historic buildings, or the "air" above a historic building or site where zoning allows for more stories to be sold or transferred to another location where higher-density development is allowed or desired. Density bonuses can also be utilized to preserve open space with archeological potential.

Conditional zoning is a preservation tool in which zoning change requests are granted only if certain conditions are met. The conditions might be preservation of open space or built structures, among others. These zoning tools require a willingness to cooperate between zoning boards and preservation groups and knowledge of zoning regulations, potential historic and archeological areas in need of preservation, and development objectives.

Historic Preservation Easements

Historic preservation easements allow a property owner to grant a portion of the rights of the property to a group that commits to preservation. The property owner retains the right to sell the property, however all subsequent property owners forever relinquish the development, demolition, alteration, or other rights waived as part of the easement. Historic preservation is not inexpensive. Easements provide property owners with a mutually beneficial alternative. Not only does the property owner retain ownership, along with any potential financial benefits, but there is also the possibility of a federal tax deduction. These benefits are balanced by the knowledge that the owner has contributed to the preservation of a historic or culturally significant place.

Owners can claim a federal tax deduction of the value of the easement up to 30 percent of their adjusted gross income. The balance of the easement tax benefit can be carried forward up to five years. The value of the easement, as determined by an appraiser, is typically the difference between the appraised fair market value of the property and the value with the easement in effect.

Properties must meet certain qualifications set by the IRS in order to qualify for tax benefits. To be eligible, properties must be on the National Register of Historic Places or be located within a historic district and certified by the U.S. Department of the

Interior as historically significant to the district.[2] Certification must come prior to the easement, or before the owner files a tax return for the year the easement was granted. Additionally, qualified properties must be accessible to the public. Depending on the nature of the site, this could mean as few as a couple of hours or days per year, or even the ability to view the site from a distance.

Historic preservation easements generally prohibit the destruction or alteration of the property without review and approval by the easement holder. Development and subdivision restrictions are also common. Additionally, some easements require the owner to maintain or restore the property to certain conditions. Historic preservation easements provide ownership of the property, thereby alleviating the financial burden of maintaining the property alone.

As of 2003, there were four organizations that provided historic preservation easements in New Hampshire. These include: the New Hampshire Division of Historical Resources, the Manchester Historic Association, the New Hampshire Land & Community Heritage Investment Program (LCHIP), and the New Hampshire Preservation Alliance.[3]

Discretionary Preservation Easements

The New Hampshire Division of Historical Resources (NHDHR) has recently been focusing on barn preservation. NHDHR, in conjunction with the New Hampshire Historic Agricultural Structures Advisory Committee, began a barn survey project in 1999. The survey attempts to catalog all existing barn structures in the state to assist in grant determinations and technical assistance.

New Hampshire state law also provides for the preservation of barns through RSA 79-D. This law allows municipalities to provide tax breaks to barn owners that meet certain requirements. The owners' barns must provide a public benefit with the preservation of their barn and agree to maintain the barn or structures throughout the minimum 10-year discretionary preservation easement. The barn owners are granted tax relief, enabling them to repair and maintain their barns. The easement also provides that the town will not increase the assessed after the repair work has been completed and tax relief can be equivalent to a 25 to 75 percent reduction of the structure's full-assessed value. To qualify as a "historic agricultural structure," the structures, including the land it was built on must be or have been used for agricultural purposes and also be at least 75 years old.[4]

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2. For a description of historically important land areas, as defined by the IRS visit www.cr.nps.gov/hps/tps/easement.htm
3. For the full report, listing organizations by state visit http://www.cr.nps.gov/hps/tps/tax/download/easements.pdf
4. For more information on New Hampshire's barn preservation efforts, visit the New Hampshire Division of Historical Resources at www.nh.gov/nhdhr

Funding

Clearly, the largest impediment to historic preservation is financing. Most people would agree that the preservation of their town or region's historic and cultural resources is desirable and important. There are many funding programs to assist historic preservation efforts.

The National Trust provides both grants and loans to non-profit organizations and public agencies. Some of the grants require that the property be designated a National Historic Landmark to qualify. Grant opportunities range from $500 to $10,000 and the money typically must be used for professional advice, public outreach, educational materials, preservation planning and land-use planning.[5]

The New Hampshire Preservation Alliance sponsors a Historic Barn Assessment Grant Program. This program provides matching grants of $250 to $400 to barn owners for the hiring of a barn assessment consultant, who will determine the required steps to stabilize, repair, and reuse the barn.[6]

Another local resource is the New Hampshire Land and Community Heritage Investment Program (LCHIP). This organization provides matching grants to NH communities and non-profit organizations for the preservation of local natural, cultural, and historic resources. Currently, five municipalities in the SNHPC region – Bedford, Derry, Hooksett, Londonderry, and Manchester – have taken advantage of this program, with grants ranging from $109,000 to $300,000. Unfortunately, the State has reduced the allocated budget for LCHIP by 85 percent; meaning that over the next two years, only three percent of approved projects will be financed through the organization.[7]

The Federal Historic Preservation Tax Credit Program allows a 20 percent tax credit for the preservation of historic buildings. The tax credit is only available for income-producing structures, not individual private residences. To qualify for the tax credit, the structure has to be listed, or at least be eligible to be listed on the National Register of Historic Places, as an individual structure or as part of a historic district. The structure must meet the ten Standards for Rehabilitation, set by the Secretary of the Interior and the rehabilitation efforts must be substantial. This means that the cost of the rehabilitation must exceed the pre-rehabilitation value of the structure. The National Park Service, along with the Internal Revenue Service and State Historic Preservation Offices, administer the tax credit.[8]

5. Visit the National Trust at www.nationaltrust.org for more information.
6. Visit www.nhpreservation.org/html/gettomgstarted.htm for more information.
7. Visit www.lchip.org for more information.
8. For more information visit www.cr.nps.gov/hps/tps/tax/

Local Actions To Encourage Historic Preservation Efforts

There are different levels of local organization that can encourage historic preservation. The most basic level is the formation of a historical society. Historical societies can be organized by historic preservation minded individuals or the towns. It is important to note that historical societies can be formed with no affiliation with the municipality. New Hampshire RSA 673:4 and 673:4a allows communities to form historic district commissions (HDC) and heritage commissions (HC). Once formed, communities can vote to allow historic district commissions to take on the duties and responsibilities of a heritage commission and vice versa. Historic district commissions are concerned solely with historic districts. HDCs can regulate the appearance within a designated historic district, such as review building permits, site plan review applications, and demolition requests. Heritage commissions are non-regulatory bodies that focus on the entire town. The purpose of heritage commissions is to identify, preserve, protect, and enhance the historic character of the municipality. Considered the 'town's preservation experts,' heritage commissions are empowered to do surveys and advise planning boards on preservation issues.

Table 4.1
Local Historic Preservation Organizations
in the Southern New Hampshire Planning Commission Region

Municipality	Historical Society	Heritage Commission	Historic District Commission	Certified Local Government Program
Auburn	X			
Bedford			X	
Candia	X	X		
Chester	X			
Deerfield		X		
Derry	X	X		X
Goffstown	X	X	X	X
Hooksett	X	X		
Londonderry		X	X	Applied
Manchester	X	X		
New Boston	X			
Raymond	X	X	X	
Weare	X			

Source: SNHPC

According to RSA 674:45, historic districts are designed to showcase the cultural, social, economic, political, and architectural history of an area, while conserving property

values, fostering civic beauty, and strengthening the local economy.[9] Historic district commissions can assist local planning boards with technical and historic advice. The citizens of the municipality generally formulate the powers and responsibilities of historic district commissions. Thus, citizens should not fear that a historic district commission would impart severe rules or restrictions. The only requirement that historic district commissions must complete is a local historic resources survey. The following municipalities have historic district zoning: Bedford, Goffstown, Londonderry, Manchester, Raymond, and Weare. Communities that have established historic district or heritage commissions, a historic district ordinance, and have completed the local historic resources survey can then apply for Certified Local Government status.

The designation as a Certified Local Government (CLG) can provide additional preservation funding and resource opportunities for communities. In order to be granted CLG status, municipalities must meet specific state and federal standards. These standards pertain to the entire community, not only a historic district. Once certified, communities are members of a network made up of the National Division of Historic Resources and other CLGs. Additionally, there are federal matching grant funding opportunities reserved exclusively for CLGs. Currently, two communities in the region – Derry and Goffstown – are certified local governments. The Town of Londonderry applied for Certified Local Government status in 2005.

9. New Hampshire Division of Historic Resources, "What are Historic Districts Good for, Anyway?" 2003.

Types Of Preservation

There are a number of state and federal programs that provide designations, which can assist in preservation efforts. Such designations can also make communities more attractive to businesses and tourists, providing an economic boost to the area. It is important to note that a designation does not guarantee permanent preservation of a site, but most citizens and communities would rather maintain the designation, rather than allow such a site to be lost.

The National Register of Historic Places

When individuals think about historic designations, the National Register of Historic Places is perhaps the most commonly known. The National Register is maintained by the National Park Service and contains nearly 79,000 listings. Listings on the National Register are eligible for special federal tax benefits, preservation assistance, and acknowledgement that the property has national, state or community significance. Properties must meet certain criteria to be considered for designation. Essentially, properties are generally at least 50 years old and are associated with significant events or people in the past, or exhibit distinctive characteristics of a historical time period or architectural style. National Register designation does not, however, equal preservation. Properties on the list can be privately owned, and the designation does not limit the owner's right to change or demolish the property. The National Park Service has created a publication that guides communities through the application process; communities considering nominating properties for National Register designation should consult this document.[10]

There are fifty-three properties listed on the National Register of Historic Places in the SNHPC region. These properties represent a diverse mix of structure types, including town halls, churches, cemeteries, factories, and homesteads. Also represented are historic districts, schoolhouses, and public buildings. Communities with properties listed on the Register include: Bedford, Chester, Deerfield, Derry, Goffstown, Hooksett, Londonderry, Manchester, Raymond, and Weare.

The New Hampshire State Register of Historic Places

Properties listed on the State Register of Historic Places are eligible for the same types of benefits as the National Register, only the source of the funding, planning assistance, and tax benefits are at the state level, rather than federal. The criteria for properties to be considered for inclusion on the State Register are also similar to the National Register. In general, properties must be at least 50 years old and must tell a historically significant story. Eligible property types include buildings; districts; sites – such as parade grounds or a village green; landscapes; structures – such as stonewalls or bridges; and objects.

10. Visit www.cr.nps.gov/nr/publicaions/bulletins/nrb39/

The New Hampshire Division of Historical Resources offers guidance to communities that desire to apply to the State Register.[11] Currently, there are ten properties from six towns in the region listed on the State Register of Historic Places.

The New Hampshire Barn Survey

The New Hampshire Division of Historical Resources has been administering a barn survey, in an attempt to identify and record the locations of historically significant barns in the State. As previously stated, the first step for any large-scale preservation effort is the completion of a survey of the historic resources. The completion of a town-wide barn survey can help both town and state preservation efforts. Deerfield conducted such a survey from November 2000 through July 2002. Chester and Hooksett are, as of 2005, working on town-wide barn surveys. New Boston has compiled an informal survey of town barns, chicken houses, school houses and old mills as well.

National Historic Landmarks

National Historic Landmarks are places that have meaning for all Americans. They are designated by the Secretary of the Interior and nominated by the National Park Service. Landmarks can be buildings, districts (villages or communities), sites without built structures, uninhabited structures, or objects. There are fewer than 2,500 designated landmarks nationally and only about 20-25 new landmarks are designated per year. To be designated a National Historic Landmark, areas must be associated with historic events, people or ideals, be prime examples of design or construction, or exhibit a way of life. New Hampshire is home to 22 National Historic Landmarks. Two of these are in the SNHPC region – the Robert Frost Homestead and the Matthew Thornton House – both of which are in Derry.

New Hampshire Heritage Landmarks

Pursuant to RSA 227-C:25, all National Historic Landmarks owned by the state, as of July 1, 1993, were designated New Hampshire heritage landmarks. The program is not active, but the Robert Frost Homestead in Derry qualifies under this designation.

Local townwide markers are also being established. In Hooksett, the first along Route 3 commemorating the establishment of the Burbank Family Ketchup factory has been installed.

State Historic Markers Program

The New Hampshire Historical Markers Program commemorates New Hampshire's places, people, or events of historical significance. The New Hampshire Division of Historic Resources, with the help of the New Hampshire Department of Transportation,

11. Visit www.nhdr.gov for more information.

administers the program. Marker requests can be made by communities, organizations, or individuals and must be accompanied by accurate documentation including footnotes, a bibliography, copies of supporting research and a petition signed by at least twenty citizens.

The SNHPC region is home to 14 historic markers in ten of the 13 towns in the region. These markers commemorate people, places, and events such as an early clockmaker, poets, war heroes, early settlers and settlements, engineering works, manufacturing buildings, cemeteries, and landscapes.[12]

Preserve America

Created by the White House and led by Laura Bush, Preserve America Communities are recognized for celebrating their heritage. Designated communities are allowed to display the Preserve America logo, are included in the Preserve America directory, and receive a Preserve America Community road sign. Additionally, some communities are eligible to receive funding to support planning, development, implementation or enhancement of heritage programs. To date, 247 communities have been designated Preserve America Communities, including Hooksett and Keene in New Hampshire.[13]

Historic Landscapes

The National Historic Landscape Initiative is not a list of designated properties, but rather a resource for the preservation of landscapes. It provides publications, workshops, technical assistance and national policy direction. Landscapes are an essential part of how New Englanders identify with the region and the image of the New England village would be incomplete without landscapes. By protecting landscapes, communities can provide enjoyment for their citizens and an improved quality of life. Landscapes are more than just open space; they include residential sidewalks, lawns, and trees, as well as agricultural fields, forests, and stones. Currently no towns in the region have preserved historic landscapes, but historic landscape preservation is a method that can work well in concert with existing open space conservation efforts in the region.

Historic American Buildings Survey

The Historic American Buildings Survey is a program that works toward preservation through documentation. The program documents important architectural sites throughout the U.S. Begun in the 1930s; it was originally performed by professional architects. Today, college students complete the fieldwork and documentation during the summer months.

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12. Visit www.state.nh.us/markers/ for the complete list of state markers.
13. State of New Hampshire, Department of Cultural Resources, Division of Historical Resources, "The Old Stone Wall," Volume XIV, Number 1, (Fall 2005).

Currently, there are 30 buildings in Manchester listed on the survey. These include residential homes, commercial and industrial buildings, bridges, and even portions of the Manchester Airport.

National Underground Railroad Program

The National Underground Railroad Program is a National Park Service project to record and map the locations of the highly secretive network of stations providing safe haven on the road to freedom in the North or Canada. Locations that are part of the network can display the network logo, receive technical assistance and participate in program workshops. Many communities in New Hampshire contain properties with a folklore connection to the Underground Railroad. The Moses Sawyer Homestead is one of four known stops in Weare along the Underground Railroad. The Network provides an opportunity for local historical societies or heritage commissions to preserve these traditional stories, while garnering national recognition as important historic places. Sites are not limited to buildings or 'stations' but can also be river crossings, routes, or hiding places. [14]

Scenic Byways Program

There are currently two National Scenic Byways in New Hampshire and 14 State Scenic Byways. A scenic byway is a designation that showcases the state's most beautiful vistas and landscapes. There are two state scenic byways in the region. The Amoskeag Millyard Scenic and Cultural Byway in Manchester is only one mile long, but historic and cultural attractions are abundant along its route. Londonderry's Apple Way is ten miles long and provides visitors with a snapshot of Londonderry's agricultural history.

New Hampshire RSAs 231:157 and 231:158 allow towns to make scenic road designations.[15] Any town road, other than a Class I or II highway, can be designated a scenic road by petition of 10 or more people. A local scenic road designation can be useful for the protection of natural landscapes, since roadway repair or maintenance cannot disturb or harm trees or stone walls without written consent of the responsible board.

Archaeological sites and programs

There has been human habitation in New Hampshire for at least the past 10,000 years. Our knowledge of settlements and archaeological sites is limited, however, because most

14. For more information on the National Underground Railroad Network, visit www.cr.nps.gov/ugrr.
15. For the locations of the National and State scenic byways in New Hampshire, visit www.byways.org/browse/states/NH/.

of the State has not been fully explored. This explains why a map of archaeological sites cannot be produced. The New Hampshire State Conservation and Rescue Archaeology Program (NH SCRAP) is hesitant to describe known archaeological sites on a map because people have a tendency to assume that blank space on a map equates to the absence of archaeological significance. This is not the case in New Hampshire; the blank space simply means it has not been explored yet.

There are a few generalizations about potential archeological sites that communities can use to determine preservation efforts. Generally, SCRAP has found that sites tend to be within 300 feet of rivers or other water bodies. Areas near a waterfall or rapids pose a good chance of hosting former settlements. Certain soil types, such as well-drained alluvial soils are also indicators. Settlements have also been known to occur on high ground near wetlands or swamps because these areas provided good resources for hunters and gatherers. A slope grade of 20 percent or greater could rule out a site, since steep slopes are not attractive for habitation. These environmental guidelines are imprecise indicators of settlement because the environmental landscape of the State has changed many times over the last 10,000 years. Unfortunately, there is no predictable model to determine settlement areas in New Hampshire.

The New Hampshire Main Street Program

The New Hampshire Main Street Program is designed to improve the economic vitality of a downtown center, while supporting historic preservation. The program is open to all New Hampshire towns and cities, and provides at least three years of technical support to participants, which are competitively selected. A successful Main Street Program requires both public and private cooperation, and relies on four principles to accomplish revitalization, these are: organization, promotion, design, and economic restructuring. Participants in the program need to understand that results are incremental. The focus is limited to central business districts; however, an economically vibrant downtown can impact the overall vitality of the town. Currently, Goffstown is a member of the New Hampshire Main Street Program.[16]

Design Guidelines

Design guidelines outline locally acceptable site and architectural design and can be formulated to identify desirable community characteristics. They focus on the aesthetic and promote new development and substantial improvements to existing structures that is harmonious with the surrounding area, town center, or historic district. The guidelines can specify locally desired architectural styles, construction materials, building scale, window and door design, sign size and design, awnings and canopies, lighting fixtures, landscaping, fencing, and screening methods.

16. For more information on the New Hampshire Main Street Program, visit www.nhcdfa.org/mainstreet.html.

In the SNHPC region Chester, Goffstown, Hooksett, Londonderry and Manchester have established design guidelines to ensure that future growth and development in their historic centers is compatible with its surroundings. These guidelines are typically incorporated within the communities' Site Plan Review or Land Use Development Regulations. Within the SNHPC region, these regulations range from providing a general clause requiring the preservation and protection of historic features to location specific guidelines for new development.

Future Preservation Efforts

With the exception of Bedford and Londonderry, all communities in the SNHPC region have ten percent or more of their homes built prior to 1940. This indicates there is great preservation potential. While not all of these structures should be preserved, the general age of the building stock is illustrative of patterns or clusters of development within historic neighborhoods. These areas could potentially be analyzed and grouped as historic districts in the future.

A review of municipal master plans indicates little preservation work has occurred in the SNHPC region. While most communities recognize the importance of maintaining their historic character, there are few goals or objectives established to ensure that this character is not lost. At best, existing efforts include some sort of inventory or zoning ordinances. While every town in the region has important historic or cultural resources to protect, the towns are at different stages in effecting preservation. Some examples of identified future preservation goals in the towns' master plans include:

- Establish a Heritage Commission, Historic District Commission or Historical Society
- Designate historic areas as historic districts
- Establish zoning and land use regulations that recognize the value of historic resources and strive to preserve those features
- Organize public group walks through local historic districts
- Prepare educational brochures about the local historic district, town center or areas of historic pride and importance
- Prepare informational materials or a website to promote local resource management and protection
- Incorporate historic landmarks and cultural resources into school field trips and curriculum
- Promote private voluntary preservation
- Develop cohesive town centers within the historic setting
- Promote town center development consistent with historic character

The New Hampshire Department of Environmental Services during 1998 and 1999 contracted SNHPC, along with the other regional planning commissions, to collaborate with representatives of the member communities to identify and map Local Resource Protection Priorities (LRPP). This data was then reviewed and updated in 2004. These mapped priorities are unprotected natural and cultural resources that communities would be interested in preserving. Features that had since been preserved were removed during the 2004 update. The project's intent was to gain an understanding of local priorities for two purposes – to assist the LCHIP program to identify projects to fund and to assist planners, regional planning commissions, and state agencies in their planning efforts.

Within the SNHPC region there are 256 cultural and historic features identified in the most recent LRPP as future preservation priorities by 12 of the 13 communities; Deerfield did not participate in the LRPP effort. Features listed include historic homes, barns and farms, mills, cemeteries, schools, stores and taverns, and many other sites unique to the region's communities. Six of the cultural features identified in the original 1998-99 listing were removed from the LRPP in 2004 due to successful preservation efforts. Of those, three were added to the National Register of Historic Places, two were protected through new private development that included preservation of the historic structures, and the Town of Chester protected the last through outright purchase. No properties were removed from the list due to new development that negatively impacted the historic feature or for demolition. By comparison, 22 of the natural features identified in 1998-99 were preserved as of 2004 and removed from the list and another five natural features were removed due to recent growth and development.

Table 4.2
Local Resource Protection Priorities in
the Southern New Hampshire Planning Commission Region

Municipality	Cultural Resources	Cultural and Natural Resources
Auburn	23	0
Bedford	10	0
Candia	13	0
Chester	1	1
Deerfield	N/A	N/A
Derry	27	0
Goffstown	12	1
Hooksett	71	4
Londonderry	50	6
Manchester	5	3
New Boston	1	2
Raymond	0	0
Weare	24	2
SNHPC Region	237	19

Source: SNHPC

Conclusion

The Southern New Hampshire Planning Commission region's history spans centuries and encompasses many facets. From agricultural legacies seen in the region's farms and orchards to manufacturing traditions evidenced in the many mills and dams, the region is home to a variety of potential preservation gems. The towns in the region recognize the importance of preserving the historic character of the region, but this is not enough. To transition from the goal of preservation to the execution of preservation, towns should organize a Historic District Commission or a Heritage Commission. Once established, these organizations can utilize the tools for preservation, such as the historic resources survey and inventory, historic district overlay zoning, various preservation easements, grants and loans.

Towns that have created a Historic District Commission or Heritage Commission, and have utilized the various preservation tools, may find it easier to apply for the various state and federal designations outlined previously in the types of preservation. By garnering various designations, communities can showcase their unique heritage. Such designations can provide education – not only to visitors of the sites, but also to their own citizens on the value of preservation, thereby encouraging future preservation efforts. Historic and cultural resources can attract visitors, which can add dollars to the community's economy.

Despite the advantages of designation, it is important to realize that sites are still vulnerable to loss. Timing is critical in terms of historic preservation. Rapid increases in population and the accompanying developmental pressures on our historic and cultural resources continue to put properties and districts at risk. Communities should educate themselves and their citizenry about the advantages and disadvantages of historic preservation and implement the types that are most suited to their historic resources.

Table 4.3
Southern New Hampshire Planning Commission Region
National Register of Historic Places

Town	Place	Address
Bedford	Bedford Town Hall	70 Bedford Center Rd.
Chester	Chester Congregational Church	4 Chester St.
Chester	Chester Village Cemetery	NH 102 and NH 121
Chester	Stevens Memorial Hall	Jct. NH 121 and NH 102
Deerfield	Deerfield Center Historic District	1 Candia Rd., 1-14 Old Center Road South
Deerfield	Town House	Old Centre Rd.
Derry	Adams Memorial Building	West Broadway
Derry	Robert Frost Homestead	2 mi. SE of Derry
Goffstown	Goffstown Congregational Church	10 Main St.
Goffstown	Goffstown Covered Railroad Bridge	NH 114 (Main St.) over Piscataquog River
Goffstown	Goffstown High School	12 Reed St.
Goffstown	Goffstown Public Library	2 High St.
Goffstown	Grasmere Schoolhouse #9 and Town Hall	87 Center St.
Goffstown	Kennedy Hill Farm	Kennedy Hill Rd.
Goffstown	Parker's Store	W of Goffstown on NH 114
Hooksett	Robie's Country Store	8 Riverside St.
Londonderry	Gen. Mason J. Young House	4 Young Rd.
Manchester	Alpheus Gay House	184 Myrtle St.

Source: State Historic Preservation (SHPO)

Table 4.3
Southern New Hampshire Planning Commission Region
National Register of Historic Places (Cont.)

Town	Place	Address
Manchester	Ash Street School	Bounded by Ash, Bridge, Maple, and Pearl Sts.
Manchester	Athens Building	76--96 Hanover St.
Manchester	Building at 418--420 Notre Dame Ave.	418--420 Notre Dame Ave.
Manchester	Carpenter and Bean Block	1382-1414 Elm St.
Manchester	Currier Gallery of Art	192 Orange St.
Manchester	District A	Bounded by Pleasant, State, Granite, and Bedford Sts.
Manchester	District B	Bounded by Canal, Mechanic, Franklin, & Pleasant Sts.
Manchester	District C	Bounded by NH Lane, Hollis, Canal, and Bridge Sts.
Manchester	District D	Bounded by Canal, Langdon, Elm, and W. Brook Sts.
Manchester	District E	258--322 McGregor St.
Manchester	Dunlap Building	967 Elm St.
Manchester	Frank Pierce Carpenter House	1800 Elm St.
Manchester	Harrington--Smith Block	18--52 Hanover St.
Manchester	Hill--Lassonde House	269 Hanover St.
Manchester	Hoyt Shoe Factory	477 Silver and 170 Lincoln Sts.
Manchester	Kimball Brothers Shoe Factory	335 Cypress St.
Manchester	Manchester City Hall	908 Elm St.
Manchester	New Hampshire State Union Armory	60 Pleasant St.
Manchester	Old Post Office Block	54--72 Hanover St.
Manchester	Smith and Dow Block	1426-1470 Elm St.
Manchester	Smyth Tower	718 Smyth Rd.
Manchester	St. George's School and Convent	12 Orange St.
Manchester	Stark, Gen. John, House	2000 Elm St.
Manchester	Thomas Russell Hubbard House	220 Myrtle St.
Manchester	Valley Cemetery	Pine and Auburn Sts.
Manchester	Varney School	84 Varney St.
Manchester	Victory Park Historic District	405 Pine, 148 Concord, 111 & 129 Amherst Sts.
Manchester	Weston Observatory	Oak Hill, Derryfield Park
Manchester	William Parker Straw House	282 N. River Rd.
Manchester	Zimmerman House	223 Heather St.
Raymond	Boston and Maine Railroad Depot	Main St.
Weare	Amos Chase House and Mill	NH 114 West
Weare	Caleb Whittaker Place	Perkins Pond Rd.
Weare	North Weare Schoolhouse	Old Concord Stage Rd.
Weare	Weare Town House	NH 114

Source: SHPO

Table 4.4
Southern New Hampshire Planning Commission Region
State Register of Historic Places

Town	Place	Address
Derry	Moore-Scott House	29 Windham Depot Road
Goffstown	Horace Richards House/Aiken Academy	3 Lamson Avenue
Hooksett	Robie's Country Store	9 Riverside Street
Londonderry	Bethany Chapel	43 Newberry Road
Londonderry	Londonderry Grange #44	260 Mammoth Road
Manchester	District #2 Schoolhouse/Old High School	88 Lowell Street
Manchester	Grace Episcopal Church	Grant Street
Manchester	The 1937 Terminal	East Perimeter Road
Manchester	Valley Cemetery	Pine and Auburn Streets
Weare	Clinton Grove Academy	Hodgdon Road

Source: SHPO

Table 4.5
New Hampshire Historical Markers in the
Southern New Hampshire Planning Commission Region

Town	Marker	Location
Bedford	John Goffe	US 3
Candia	Sam Walter Foss	Junction of NH 43 & Business NH 101
Chester	Chester Village Cemetery	NH 102
Chester	Early American Clocks	NH 121
Deerfield	Deerfield Parade	NH 43 & 107
Deerfield	Major John Simpson	NH 107 & 43
Derry	General John Stark 1728-1822	NH 28
Derry	Robert Frost 1874-1963	Frost Farm - NH 28
Derry	Scotch-Irish Settlement	East Derry Village
Hooksett	NH Canal System	Merrimack Street
Manchester	Amoskeag Mills	Intersection of Canal and W. Penacook Sts.
New Boston	Home of the Molly Stark Cannon	Intersection of NH 13 & Meetinghouse Hill Road
Raymond	Nottingham - Chartered 1722	Business NH 101
Weare	East Weare Village	NH 77

Source: SHPO

Table 4.6
Properties in the Southern New Hampshire Planning Commission Region
Listed on the Historic American Buildings Survey
(All locations are in Manchester, NH)

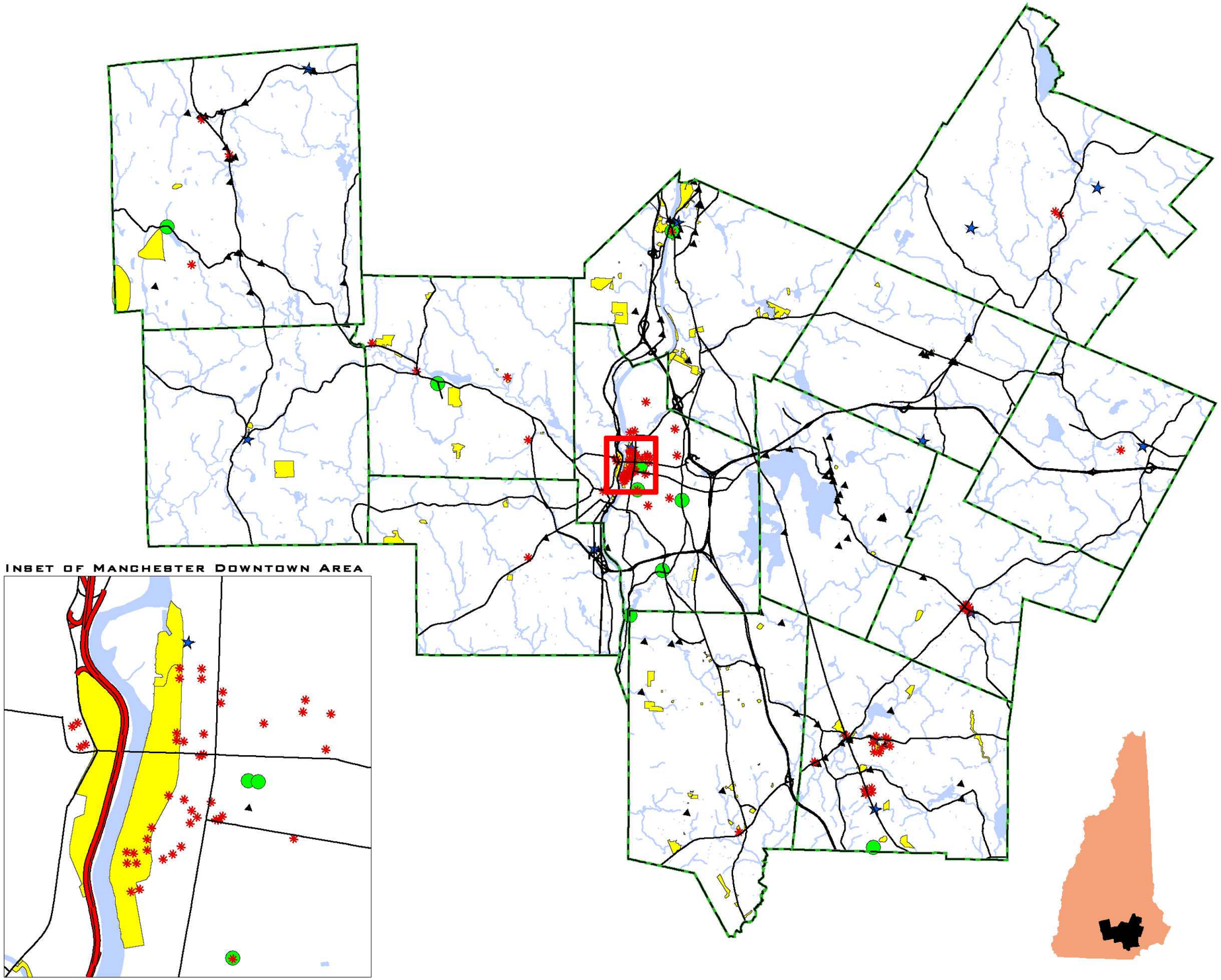
Building	Location
Administration-Terminal Building, Manchester Airport	South of North Perimeter
Amoskeag Counting Rooms, Cloth Rooms and Archway	Canal Street
Amoskeag Manufacturing Company, Mill #9	Arms Street
Amoskeag Manufacturing Company, Paper Mill	Canal Street
Amoskeag Mills, River Dye House & Bleach House	Bridge Street at Merrimack River
Amoskeag Millyard	Canal Street
Apartments	241 Cedar Street
Apartments	298 Cedar Street
Apartments	299 Cedar Street
Brick Hangar, Manchester Airport	South of North Perimeter
Cavanaugh Brothers Sales Stable	58 West Central Street
Cohas Brook Bridge	Highway 28 (South Willow Street)
Commercial Buildings	1143-1167 Elm Street
First Methodist Episcopal Church	Valley & Jewett Streets
Harrington-Smith Block	18-52 Hanover Street
House	191-193 Merrimack Street
Kearns Block	15-17 Bridge Street
Large Hangar, Manchester Airport	Between East Apron & Kelly Avenue
Manchester Airport	South of Downtown Manchester
Manchester Mills, Counting House	Commercial Street
Manchester Mills, No. 1 Mill	Commercial Street
Manchester Mills, No. 2 Mill	Commercial Street
Manchester Mills, No. 3 Mill	Textile Court
Monadnock-Upton Block	1140-1160 Elm Street
Moses Fellows House	2968-2970 Brown Avenue
Notre Dame Bridge	Bridge Street at Merrimack River
Shea Block	50 West Central Street
Stark Mills, Mill No. 4, South Half	Canal Street
Stark Mills, Mills No. 2, 3, & 4	Canal Street
T. L. Thorpe Building	19 Traction Street

Source: SHPO

REGIONAL COMPREHENSIVE PLAN

Map #4.1

HISTORIC RESOURES



Legend

Political Boundaries

- Townline

Road Network

- Major Roads

Hydrography

- Streams
- Rivers/ Lakes

HISTORIC RESOURES

Designated Properties

- NH Historical Marker
- State Register of Historic Places
- National Register of Historic Places

Local Resource Protection Priorities

- Individual structures and features
- Districts, landscapes and other large features

Data Sources:

Granit Digital Data (1:24,000)
NH Department of Transportation
NH Department of Environmental Services
NH Divisionof Historical Resources
LRPP Data - Mapped by SNHPC and Individual towns but owned by State DES office

The individual municipalities represented on this map and the SNHPC make no representations or guaranties to the accuracy of the features and designations of this map.

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Map Produced by GIS Service SNHPC April 2006.
For reprints or furthur questions

Contact: SNHPC, gis@snhpc.org or (603) 669-4664

SNHPC

0 7,500 15,000 30,000 Feet

0 1.5 3 6 Miles

Chapter Five:

Economic Development

Introduction

As the Southern New Hampshire Planning Commission (SNHPC) Region continues to grow in population, economic development becomes increasingly important for two reasons. First is the provision of goods, services and jobs to sustain a greater number of residents. Second, is to attract and maintain commercial and industrial businesses that provide the tax base to fund schools, roads, and other municipal services. Given the SNHPC region's prime location in Southern New Hampshire and only an hour's drive from Boston, the region is an attractive area for businesses to locate. Additionally New Hampshire has a variety of business-friendly tax regulations and high quality of life standards that can attract economic growth.

Weare Center Store

Regional Economic History and Background

Economic development of the SNHPC region revolves around the City of Manchester as its economic center, due to its large population and diversity of commerce and industry. Over time, the majority of the towns surrounding the City have developed as bedroom communities.

Prior to 1810, Manchester was primarily an agricultural community. The arrival of the Amoskeag Cotton and Woolen Manufacturing Company transformed the character of the city, employing up to 16,000 people at its peak after World War I. By the 1960s, the Amoskeag Millyard was in serious disrepair. An Urban Renewal Plan, a joint effort between federal and local governments, preserved and revitalized the industrial area into large manufacturing facilities with amenities and transportation improvements appropriate to modernize 19th century mills.[1] The region experienced a rise in business in the 1980s, earning recognition in U.S. News and World Report and Inc. Magazine. Due to a recession in the late 1980s and early 1990s, manufacturing jobs continued to decline, resulting in a loss of 19,600 jobs in New Hampshire's manufacturing sector from 1990 to 2005 (FDIC New Hampshire State Profile, 2005: http://www.fdic.gov). Today the economy has shifted from primarily manufacturing to increasing reliance on financial, retail, technology, and business services.

1. For more information, see Manchester Master Plan 1993 and the Manchester Housing Authority Redevelopment Office 1982

The towns surrounding Manchester have experienced significant increased residential development over the past decade. This new residential growth has in turn increased the demand for commercial and industrial development within the region for several reasons. Many towns are eager to create a more balanced and diversified tax base from a mixture of residential and non-residential development. Throughout the 1980s, the region's civilian workforce increased by more than 30 percent. Towns that experienced significant increases include Weare (91.6. percent), New Boston (66.7 percent), Raymond (59.8.percent), Deerfield (57.9 percent), Derry (56.8 percent), Londonderry (45.5 percent), Auburn (41.7 percent), Chester (34.1 percent), and Goffstown (29.2 percent) (ELMI Factbook on New Hampshire's Counties and their Cities and Towns, 1993).

The late 1980s and the 1990s witnessed increased commercial and industrial development, often in the form of retail strip development on previously rural roads. Large retailers have reached out beyond Manchester and the process of expansion continues today as major supermarkets, department stores, and discounters have all located in the SNHPC region.

Key economic development needs and concerns in the region are:

1. Attract high paying skilled jobs.
2. Improve and expand infrastructure to support and attract commercial and industrial development.
3. Improve and expand the local tax base through non-residential development.
4. Seek a balance in quality of life and growth management.
5. Provide housing and childcare
6. Encourage Green Building

Local experts often look to soft industry to replace the manufacturing that once dominated the region. Software development, corporate headquarters, and legal and financial business support services all show signs of growth throughout the next few decades. Other recent developments in Manchester, as well as surrounding areas, include new opportunities in the arts, culture, and sports as well as related support industries and businesses. The diverse ethnic populations immigrating to the area through the United States Refugee Resettlement Program will also color the region's economy. Many ethnic populations are opening new shops and restaurants. Also, growth in the transportation sector, particularly the airport development and the I-93 widening, will enhance the region's potential to host larger national or international businesses.

While Manchester is a viable economic center for the SNHPC region and the State economy, surrounding towns within the region need diversified economic development to provide for financial well-being and establish a more diversified tax base. In general, most residential development increases the cost and demand for public services, while business development promotes better tax revenues to service cost ratios. The

development of a diverse, vibrant economic base in smaller towns, if properly planned, can enhance quality of life, alleviate transportation problems, and provide greater tax revenues. Many innovative economic development strategies, such as compact village development and eco-parks, can also lead to new business growth that can help to preserve the rural character of many SNHPC towns.

One of the greatest challenges facing these communities is maintaining the rural character and identity of the town while at the same time promoting economic growth. Most towns within the region have, in the past, restricted strip development, commerce, or industry to areas away from their most valued open spaces or resisted development altogether. Future development embracing New Hampshire's Smart Growth Principals might include, for example, mixed-use commercial zones with an array of services within walking distance that would utilize less valuable open space. Another solution is Eco-Industrial Parks in which industries collaborate for maximum efficiency and minimum pollution. The region should look towards creative, innovative ideas to maintain rural character and achieve financial prosperity.

Economic development is also closely linked with other goals, including infrastructure development, affordable housing, and recreational facilities. All of these features can help attract businesses. For the region to promote and maintain successful economic development, local officials need to work together to develop infrastructure (water and sewer) and other quality-of-life amenities. A large part of this challenge is finding the funding to accomplish this. This chapter identifies potential grants and funding resources to help guide towns in financing economic development. It also identifies potential economic development tools and strategies.

The intersection at Merrimack and Elm Street remains busy with downtown workers.

Existing Conditions

New Hampshire consistently ranks high in terms of national quality of life standards. The state ranked second in health care in the United States in 2004 while finishing in the top two for the past seven years.[2] New Hampshire had the fourth lowest crime rate in the nation in 2004, with 167 violent crime incidents per 100,000 inhabitants (FBI 2004 Crime in the United States, Table 5.5; http://www.fbi.gov). In addition, the state had the lowest poverty rate in the nation

2. Based on low infant mortality, low child poverty rates, high prenatal care, and low premature death. See the United Health Care Foundation at www.unitedhealthcarefoundation.org.

(7.6 percent) and ranked in the top ten in terms of income, with a median household income of $55,580 in 2004 (US Census Bureau 2004; R1701, B19013_1_EST).

Commuting Patterns

One of the major economic development concerns facing the region is the large number of residents who commute to jobs outside of the region. The average daily commute time (one-way) for SNHPC residents was 29.35 minutes in 2000, as illustrated in Table 5.1. Figure 5.1 shows the percentage of residents in each town who commute out of state. This illustrates the drain on the potential workforce in the region and state. One-third of Derry's residents work out of state, with significant populations in Londonderry, Chester, and Raymond also working outside of New Hampshire (New Hampshire Employment Security Community Profiles 2003).

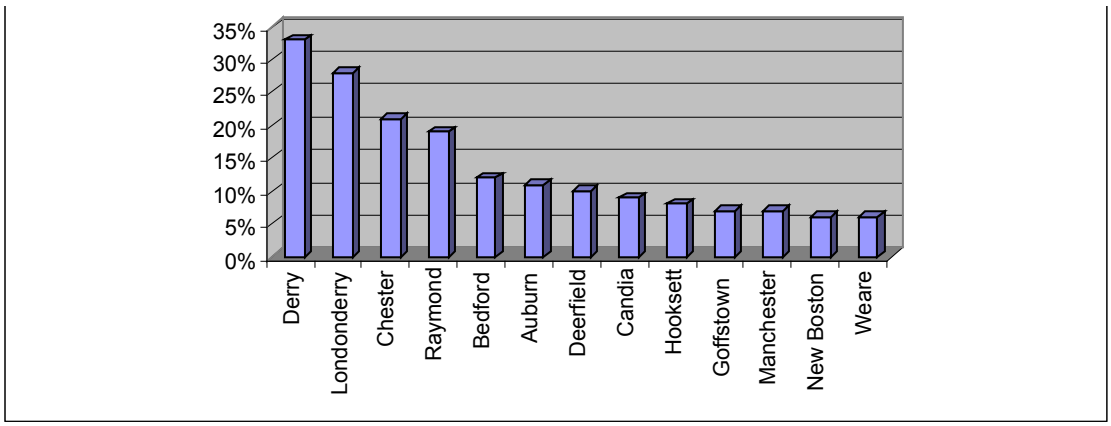
Table 5.1
Commuting Methods and Times for the SNHPC Region (1990-2000)

	Drove Alone		Carpooled		Public Transportation (Including Taxi)		Bicycled or Walked		Motorcycle or other means		Mean Travel Time to Work	
Municipality	1990	2000	1990	2000	1990	2000	1990	2000	1990	2000	1990	2000
Auburn	79.3	87.9	15.4	6.8	0.5	0.4	1.5	0.3	0.4	1.3	25.6	26.7
Bedford	85.5	86	7.5	5.4	0.4	0.3	1.2	0.5	0.5	1.5	21.4	27.2
Candia	79.6	86.5	12.1	9.4	1.1	0.5	2.1	0.5	0.8	0	25.8	28.3
Chester	79.9	84.2	10.4	6.8	0.6	1.2	2.4	0.6	1	0	32.3	32.2
Deerfield	82.6	86.6	9.7	7.8	0.3	0	1.4	1	1	0.3	33.6	33.9
Derry	83.3	84.9	12.1	9.7	0.6	0.8	1.3	1.4	0.5	0.6	29.6	31.1
Goffstown	78	81.7	11.5	8.5	0.1	0.1	6	5.1	0.5	1	22.6	26.1
Hooksett	87.8	82	6.9	8.8	0.5	1.6	1.6	3.6	0.2	0.4	20.7	25.7
Londonderry	82.8	86.3	12.1	7.9	0.8	1.3	1.7	0.7	0.5	0.6	28.3	29.7
Manchester	76.9	81	14.2	11.9	1.5	1.4	4.8	3.1	0.6	0.4	18.8	21.3
New Boston	79.1	82.4	14.1	10.5	0	0.5	3	1.3	0.5	0.6	29.3	32.7
Raymond	81.2	83.7	14.4	12.3	0.6	0.2	1.3	1.5	0.5	0.2	31.2	31.6
Weare	82.4	81.6	13	11.5	0	0.4	0.4	2.1	0.6	0.4	31	35.1
SNHPC Region	80.0	83.0	12.7	10.0	0.9	1.0	3.3	2.3	0.5	0.6	26.94	29.35
State of New Hampshire	78.2	81.8	12.3	9.8	0.7	0.7	4.4	3.1	0.8	0.6	21.9	25.3

Source: 2000 Census Transportation Planning Package

Another critical concern is that single-trip vehicle use has increased while carpooling and other alternative commuting methods have generally decreased in the past decade (see Table 5.1). This commuting population creates significant strain on the roadways

Figure 5.1
Percent of Residents Working Out of State, 2003



Source: 2003 New Hampshire Employment and Labor Market Information Community Profiles

and draws commercial dollars out of the region. Over the past few years, local governments are realizing the necessity of bringing more businesses into their towns in order to create livable, workable communities.

Income, Labor Force, and Unemployment

Most of the towns in the region have Per Capita Incomes (PCIs) above the state and national averages. The average PCI in the SNHPC region is $24,856, which is well above the PCI of $21,587 in the United States and the state's PCI of $23,844. The highest PCI in the region belongs to Bedford with $37,730, and the lowest belongs to Raymond with $18,430. Bedford also has the region's lowest unemployment rate (3.1 percent) and Raymond has the highest (6.8 percent) (US Census 2003). The PCI for Hillsborough County in 2004 was $28,216 and the PCI for Rockingham County in the same year was $30,022 (US Census 2004 American Community Survey, B19301).

Table 5.2
Per Capita Income, Labor Force, and Unemployment by Town (1990-2003)

Municipality	Per Capita Income (1999)	Civilian Labor Force (1993)	Civilian Labor Force (2003)	Unemployment Rate 1993)	Unemployment Rate (2005)
Auburn	$ 28,405	2,411	2,917	5.3%	2.8%
Bedford	$ 37,730	7,437	11,563	4.0%	3.0%
Candia	$ 25,267	2,004	2,433	7.0%	3.0%
Chester	$ 23,842	1,694	2,554	6.4%	3.5%
Deerfield	$ 24,160	1,829	2,429	6.3%	3.7%
Derry	$ 22,315	18,487	20,535	8.4%	4.5%
Goffstown	$ 21,907	8,703	9,950	4.3%	2.9%
Hooksett	$ 24,629	5,192	7,359	5.5%	3.0%
Londonderry	$ 26,491	11,929	14,715	6.5%	4.0%
Manchester	$ 21,244	52,960	62,761	6.9%	3.7%
New Boston	$ 26,488	1,908	2,575	4.7%	2.5%
Raymond	$ 18,430	5,006	5,267	9.4%	4.3%
Weare	$ 22,217	3,762	4,828	5.1%	3.2%

Source: US Census 2000 SF 3 and New Hampshire Employment Security's Economic and Labor Market Information Bureau 2005.

Table 5.3
Number of Households by Income in the SNHPC Region, 2000

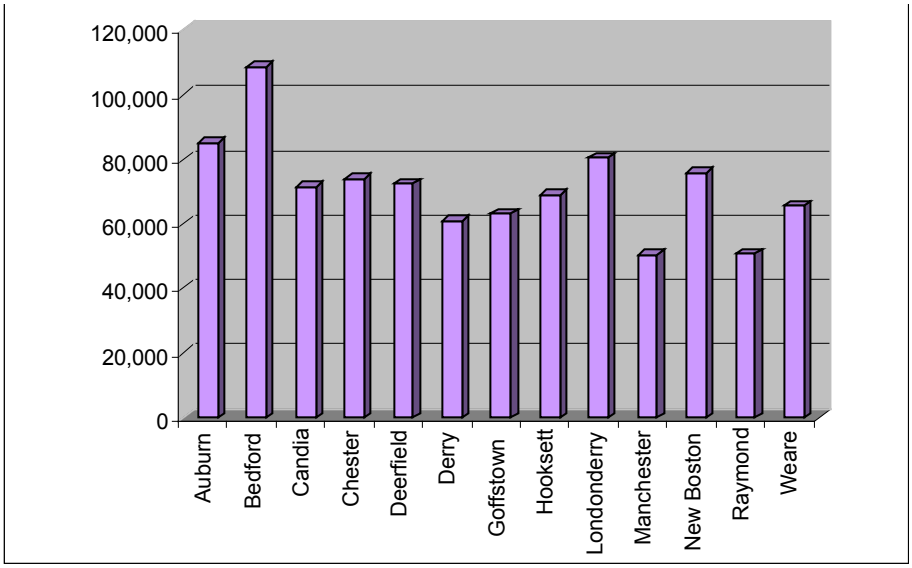
Income	Number of Households	Percentage
Total	93,914	100%
Less than $15,000	9,715	10%
$15,000 to $29,999	13,982	15%
$30,000 to $44,999	16,178	17%
$45,000 to $59,999	14,650	16%
$60,000 to $74,999	12,832	14%
$75,000 to $99,999	12,877	14%
$100,000 to $124,999	5,864	6%
$125,000 to $149,999	2,785	3%
$150,000 to $199,999	2,374	3%
$200,000 or more	1,937	2%

Source: US Census 2000 SF3-QT-P32

There is also a fairly even distribution household income throughout the region. The majority of households in the region have incomes between $15,000 to $100,000, with an even distribution of incomes throughout that range. Another 14 percent of households have annual household incomes above $100,000. While this illustrates the growing wealth of the region, it also creates challenges providing jobs that pay a living wage for the region. Figure 5.2 illustrates the distribution of wealth throughout the region and reinforces the need for affordable housing.

The wealth in the state tends to be divided along gender lines, with the median female income in New Hampshire being roughly 66 percent of the median male income in 1999. Women who are married, hold doctorate degrees, or are over the age of 55 bear the brunt of the income discrimination. Furthermore, women comprise 57 percent of the minimum wage workforce and women are significantly less likely to hold executive or decision making positions in major companies.[3]

Figure 5.2
Median Household Income by Town, 2000



Source: US Census 2000 SF3-QT-P32

Along with a high relative income, the State of New Hampshire is currently tied with Connecticut for the lowest poverty rate in the nation, with only 7.6 percent of the population living below the poverty line, compared with 13.1 percent in the United States (US Census 2004 American Community Survey, R1701). Most of the towns in the SNHPC region have only a small percentage of families living at or below the poverty level with all but Manchester and Raymond below the state average of 4.3 percent. Manchester has the highest poverty rate in the region, with 7.6 percent of residents living at or below the poverty line (US Census 2000).

Education

Table 5.4 illustrates the educational attainment levels for each town in the SNHPC region. At least 80 percent of SNHPC region residents hold a high school degrees or higher. Additionally, there is a significant percentage of residents with at least a

3. The New Hampshire Women's Policy Institute. *The Economic Status of Working Women in New Hampshire.* May 2005. Available at www.nhpi.org/report05.htm.

bachelor's degree; in many towns this number is over 30 percent. The educational attainment of the workforce gives the region great potential for higher-paying, specialized industries to relocate to the area.

Table 5.4
Educational Attainment for the SNHPC Region, 2000

	Residents with H.S. Degrees	Percent H.S. Degrees	Residents with Bachelor's Degrees or higher	Percent Bachelor's Degrees
Auburn	2785	91.70%	821	27%
Bedford	11424	92.60%	6085	49.30%
Candia	2456	92.50%	766	28.90%
Chester	2211	92%	747	31.10%
Deerfield	2189	91.70%	758	31.70%
Derry	19378	90.90%	5611	26.30%
Goffstown	9020	85%	2669	25.20%
Hooksett	6628	88.60%	2198	29.40%
Londonderry	13215	93.40%	5072	35.90%
Manchester	57770	80.70%	15940	22.30%
New Boston	2520	93.90%	967	36%
Raymond	5132	83.50%	802	13%
Weare	4267	88%	1215	25.10%

Source: U.S. Census 2000 Demographic Profile Highlights.

The region is home to many colleges, universities, and technical or vocational schools. These include University of New Hampshire Manchester (Manchester), Southern New Hampshire University (Manchester), New Hampshire Community Technical College (Manchester), Hesser College (Manchester), Saint Anselm College (Manchester), New Hampshire Institute of Art (Manchester), Massachusetts College of Pharmacy and Health (Manchester), and Chester College (Chester). Most of these schools have programs connecting students to local employers through recruitment and internships, which encourages many students to find local employment upon graduation.

While there is little data explaining the specific employment patterns of recent graduates, there is some information suggesting that New Hampshire students are not eager to find employment in state but may do so out of convenience. Potentially, 60 to 70 percent of public university graduates stay in state after graduation, while only 30-40 percent of private school graduates remain in state. The Whittemore School of Business at UNH Durham reports that 81 percent of its MBA graduates accept jobs in New Hampshire. However, there is a higher projected need for college graduates to fill a variety of jobs, including information sciences, education, health, engineering, and math, than there are projected graduates to fill them.

Accounting and information systems students were most likely to stay in state (48.4 percent and 40 percent, respectively), while international business and marketing students were most likely to want to leave (12.6 percent and 23.7 percent, respectively). A survey of 1,100 Introduction to Business undergraduate students at UNH over 4 semesters (2003-2004) reported less than 1/3 of respondents considered themselves likely to work in NH after graduation (30.8 percent). After ten years of employment, 31.8 percent expected to work in Massachusetts followed by 21.8 percent in New Hampshire.[4]

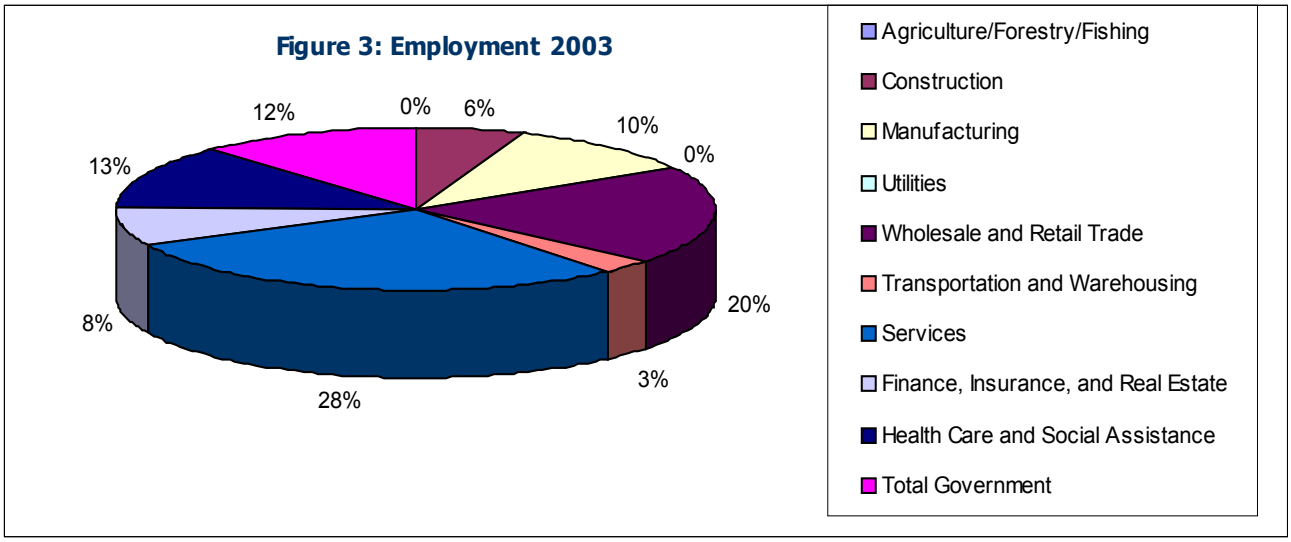
Employment

The region contains a wide range of resident income levels and employment opportunities. Additionally, the majority of residents are between 25 and 64 years (see Table 5.6). The available regional workforce ranges from unskilled, minimum wage workers to highly trained workers in specialized fields. This is an attractive mix that appeals to a variety of commercial and industrial businesses entering the region.

While the SNHPC region has experienced growth in employment over the past decade, the industry distribution has remained fairly steady among the key players. As illustrated in Table 5.5, manufacturing showed the least growth at 5.7 percent. However, healthcare, transportation, and service industries all grew by more than 33 percent between 1990 and 2003. Construction also showed large gains, as residential growth spurred considerable building activity (New Hampshire Employment and Labor Market Information Bureau 2003).

4. Gittell, Ross. 2 May 2005. Higher Education in New Hampshire and the Economy. Accessed at http://pubpages.unh.edu/~rgittell/nhheafdraft5-2-05.ppt on 20 September.

Figure 5.3
Employment 2003



Source: New Hampshire Employment and Labor Market Information Bureau 2003

Table 5.5
Employment by NAICS Industry for the SNHPC Region, 1990-2003

NAICS Code	NAICS Industry	Employment 1990	Employment 2003	Percent Change
11	Agriculture/Forestry/Fishing	88	106	20.50%
23	Construction	1914	6707	250.40%
31	Manufacturing	11340	11983	5.70%
22	Utilities	219	0	NA
42 and 44	Wholesale and Retail Trade	18634	22483	20.66%
48	Transportation and Warehousing	2442	3270	33.90%
51, 54, 55, 56, 61, 71, 72, 81	Services	24498	32844	34.07%
52-53	Finance, Insurance, and Real Estate	8000	8960	12.00%
62	Health Care and Social Assistance	9232	14635	58.50%
GOV	Total Government	10420	13527	29.80%

Source: New Hampshire Employment and Labor Market Information Bureau 2003

Table 5.6
Percent of Residents in the Workforce, 2000

Town	Residents Between the Ages 25-64	Percent of Population Age 25-64
Auburn	2752	58.78%
Bedford	10238	56.02%
Candia	2371	60.62%
Chester	2172	57.28%
Deerfield	2135	58.05%
Derry	19208	56.46%
Goffstown	8568	50.61%
Hooksett	6422	54.79%
Londonderry	12912	55.57%
Manchester	57727	53.95%
New Boston	2476	59.84%
Raymond	5479	56.64%
Weare	4484	57.66%

Source: U.S. Census 2000 Demographic Profile Highlights.

In 1983 New Hampshire began to receive refugees through the United Nations High Commissioner for Refugees (UNHCR) program from Asia, Europe, and Africa. Manchester was immediately a desirable destination due to the presence of affordable housing and a large number of unskilled manufacturing and industry jobs. Refugees come to the United States to escape persecution in their home country due to race, religion, social status, politics, or ethnicity. Refugees who settle in New Hampshire have completed intensive screening and must integrate quickly into their host community. Refugees are required to accept the first job they are offered, and because they come to the U.S. seeking a better life, they are often very motivated and hard-working. Approximately 80 percent of refugees in New Hampshire obtain and maintain full-time employment within the first six months. Refugees make up a small percentage of the region's overall immigrant population, but all contribute significantly to the economy.

Land Use

An important indicator of economic health and municipal financial sustainability are balanced ratios of residential land value to commercial and industrial land value. Table 5.7 illustrates the total assessed land values of residential, commercial/industrial, and other land types for each town in the region as well as listing ratios for residential to commercial/industrial lands. Cost of community services studies indicate that residential development costs towns more than the associated residential property tax revenues, while commercial and industrial revenues from continuously exceed costs of services (UNH Cooperative Extension, 1996). Therefore, the smaller the ratio of residential to commercial/industrial valuation, the greater the financial stability of the community.

The overall ratio for the SNHPC region is 1:3.7. This is slightly higher than the desirable ratios of 1:1 or 1:2. However, many of the small, rural towns of the region have extremely high ratios, such as Auburn with 1:28 and Chester with 1:44. Increased efforts to promote managed commercial or industrial development can result in a more desirable tax base for these towns.

Local Economic Development Initiatives

Over the years a number of municipalities have organized initiatives to manage economic development. The Town of Derry has had a private, non-profit Derry Economic Development Corporation (DEDC) in operation since 1992, which has facilitated new non-residential developments and marketing efforts. The Town of Weare established an Economic Development Commission during the 1980s that disbanded several years later, and in 2000 the Weare Economic Development Committee was formed. This committee has concentrated on the Weare Center Initiative and developing a plan to create a Town Square. The Community Economic Development Corporation of Hooksett (CEDCOH) was established several years ago as a private non profit enterprise for the purpose of attracting new economic development and to assist existing businesses but the effort was not sustained. Goffstown established an Industrial Council in 1966, which was renamed the Economic Development Council (EDC) in the 1990s to assist with and advocate for business development in the town. Finally the Town of Raymond has recently organized an Economic Development Committee composed of local town officials, business owners, and residents. The Town Manager and Town Planner are actively involved in leading this committee.

Table 5.7
Growth Barriers

Municipality	Total Local Assessed Land Valuation				Percent of Total Value		
	Other	Residential	Commercial/ Industrial	Total Value	Residential	Commercial/ Industrial%	Residential to Commercial/ Industrial Ration
Auburn	420,714	235,193,700	8288300	243,902,714	96.43%	3.40%	28 to 1
Bedford	651,729	456,338,500	68,076,200	525,066,429	86.91	12.97%	66.7 to 1
Candia	502,800	70,938,067	4,268,300	75,709,167	93.70%	5.64%	16.6 to 1
Chester	850,300	100,297,900	2,231,800	103,380,000	97.02%	2.16%	45 to 1
Deerfield	1,685,801	86,183,400	3,468,500	91,337,701	94.36%	3.80%	24.8 to 1
Derry	940,000	408,824,443	65,688,600	465,453,043	85.99%	13.82%	6.2 to 1
Goffstown	1,008,200	394,513,700	48,344,200	443,866,100	88.88%	10.89%	8.1 to 1
Hooksett	513,750	244,572,628	111,568,300	356,654,678	68,57%	31.28%	2.2 to 1
Londonderry	1,107,314	355,598,675	118,958,675	475,664,449	74.76%	25.01%	3 to 1
Manchester	176,800	858,746,875	476,466,225	1,335,389,900	64.31%	35.68%	1.8 to 1
New Boston	1,126,336	60.081,400	2,646,900	63,854,636	94.09%	4.15%	22.6 to 1
Raymond	398,228	128,136,560	27,306,340	155,841,128	82.22%	17.52%	4.7 to 1
Weare	1,246,314	83,747,000	4,477,700	89,471,014	93.60%	5.00%	18.7 to 1
SNHPC Region	10,628,286	3,483,172,633	941,790,040	4,435,590,959	78.53%	21.23%	3.7 to 1

Source: NH Department of Revenue 2000

One of the greatest physical barriers to economic development and growth is the lack of infrastructure within the region. Businesses are attracted to sites with easy access to arterial roads, water, and wastewater systems. Because many towns in the region have limited infrastructure to support more development, they must find ways to create and pay for the infrastructure if they wish to attract commercial and industrial development. Bedford, Derry, Goffstown, Hooksett, Londonderry, and Manchester all have public water and sewer systems, although most of these are limited geographically to densely developed areas. Not coincidentally, these are also the towns that are the most developed. Raymond only has a limited public water system and no municipal wastewater treatment. Businesses interested in moving into areas without existing water, sewer, and roads must work with the municipality to make arrangements for these systems.

Impact fees from developments like Applebee's support infrastructure in Hooksett.

Eventually, municipalities wishing to facilitate economic development must consider installing these systems in areas suited to industrial or commercial development.

Funding Strategies

The initial investment required to bring new business into a town can be a financial burden to the local government. The New Hampshire Department of Resources and Economic Development (DRED) recommends contacting their representatives to better navigate and successfully obtain grants and technical assistance. The following are some of the resources and strategies available to ease the costs of development.

• Community Development Block Grant (CDBG) Program funds projects that benefit low- to moderate-income populations (80 percent or less of an area's median household income). The grants are allocated to states and large cities by the U.S. Department of Housing and Urban Development. Grants of up to $500,000 are offered in the categories of housing, public facilities, and economic developments.

- Tax Increment Financing (TIF) Districts can be established by towns to use revenue gained through taxation of new development to pay for public improvements within the district (RSA 162-K: 9-10). The incremental taxes that result from new development, expansion, or renovation in the district can be earmarked specifically for infrastructure, parking, or other public needs. All previously existing taxes are distributed as standard (to schools, the county, and the town). TIF districts come with several restrictions, such as specifications on renovations, developments, and use of funds collected. Derry, Hooksett and Londonderry are currently the only towns in the region with TIF districts.

- Impact fees are a one-time fee charged to new development for the construction or improvement of public facilities necessitated by that development. The fees must go towards costs directly attributable to growth as opposed to maintenance or quality improvement of existing facilities. Municipalities most commonly use impact fees from residential development to pay for schools, but they can also be used for parks, libraries, water, sewer, and road improvements (RSA 674:21). Communities should be cautious not to impose large impact fees that may discourage companies from relocating to their town. Bedford, Deerfield, Goffstown, Hooksett, Londonderry, Manchester, and Raymond currently impose impact fees.

- RSA 79-E Community Revitalization Tax Relief Incentive encourages "investment in central business districts, downtowns, and village centers". Qualifying property owners may apply for the tax relief as long as the buildings in question fit the necessary standards of being located in the community's downtown district or other appropriate location, costs of rehabilitation is at least

15% of the assessed pre-rehab value, and the rehabilitation plans are consistent with that of the municipality's master plan. Goals of RSA 79-E include promoting strong local economies, encourage sustainable growth that is an alternative to sprawl, and encourage "the rehabilitation and active reuse of under-utilized buildings". RSA 79-E may be adopted by any town or city with the legislative body's majority vote. The property owners must submit an application for tax relief accompanied by public notice and hearing and the governing body reserves the right to grant or deny application.

Bedford's Impact Fee Ordinance (IFO) includes public safety facilities safety, public schools, sewer, solid waste, wastewater, water treatment, and disposal facilities with exceptions for projects that have demonstrated no or reduced impact to the town. In Deerfield the IFO covers capital facilities, school, highway, and solid waste, with exceptions for 62 and over communities. In Goffstown, all public facilities allowed by law are included in the IFO, but projects may make payments in the form of real property or facility improvements with equal value or utility to the public. Additionally Goffstown exempts senior housing from school impact fees. Hooksett's IFO is similar to Goffstown's, with fees assessed only for recreation, schools, roadways and public safety. Londonderry has impact fees for fire, library, police, recreation, school and roads, with exemptions for 55 and over developments as well as neighborhoods with a portion of occupancy restricted to low or moderate-income housing. Manchester charges fees for public facilities, schools, and roads, with all or part of this fee assessable through land or capital facilities improvements. Raymond, the region's most recent IFO, assesses fees on all public facilities allowed by law, with exemptions for senior housing facilities.

- Community Reinvestment and Opportunity Program (CROP) Zones, as designated by RSA 162-N:8, are "established to stimulate economic redevelopment, expand the commercial and industrial base, create new jobs, reduce sprawl, and increase tax revenues within the state by encouraging economic revitalization in designated areas" (Source: NH DRED). They can be created in an area that has experienced population loss, houses a low income population, or contains abandoned, contaminated, or under utilized commercial or industrial land and buildings. Employers who make significant investments to improve facilities in these zones can apply for tax credits equal to the compensation paid to new employees resulting from the project created. The state of New Hampshire has set aside $850,000 for tax credits in this program.

- The New Hampshire Community Development Finance Authority (CDFA) works specifically to aid in housing, community and economic development for low- to moderate-income New Hampshire residents. Projects have ranged from affordable housing to economic revitalization and downtown village development. Assistance available includes tax credits, grants, and technical

support and is available only to non-profit community or economic development organizations, housing authorities, and certain municipal entities.[5]

Derry is one example of a town that has creatively used bonds and zoning regulations to plan for the future. The Town purchased a plot of land zoned for residential development and used tax increment financing and a $2 million bond to add utilities and roads, making the property desirable for commercial and industrial operations. The bonds will be paid off with tax revenue from the properties, expected to top $200,000 annually at full occupation. After 15 years, when the bond is expected to be paid-off, the tax revenue will enter the Town's general fund.

Other Strategies

Local officials need to consider and employ creative strategies and techniques to attract businesses while managing growth and maintaining the rural character of their community. Due to the unique community characteristics and economic needs of many communities in the SNHPC region, municipalities can participate in the following:

- Greater Manchester Regional Economic Development Roundtable: Recognizing the growing population and economy of the greater Manchester area, a collaboration of economic development agencies and organizations are cultivating a cooperative project to oversee and promote regional business activities into the future. The goal is to create an Economic Development Commission allowing all towns and cities in the region to exchange ideas and market the region under one brand name "Metro Center." While the group is still in its early stages, the New Hampshire Department of Resources and Economic Development and the Greater Manchester Chamber of Commerce are enlisting local governments, planners, and businesses of all sizes. The Metro Center collaboration can be a powerful tool to make the region visible to national and international audiences as well as offer resources to all participating businesses.

- Business Incubators: A business incubator is a small office or industrial building, which start-up businesses can occupy at reasonable rates to encourage new business ventures in the area. These spaces can also offer a range of small business services including shared reception, copying, production facilities, etc. Incubators can be a good investment for towns looking to develop local commerce with minimum new development, environmental impact, or infrastructure demands. Studies show that the vast majority of firms that graduate from an incubator remain in business in the community (Business Incubation Work). There are only a few business incubators in the state of New Hampshire, including the Amoskeag Business Incubator in Manchester,

5. Contact 603-226-2170 or visit www.nhcdfa.org for more information.

Dartmouth Tech's Incubator in Hanover, and the Monadnock Region Business Incubator Network (MRBIN) in Keene.

Derry's Main Street and Town Hall.

The Amoskeag Business Incubator hosts 15 small businesses, offering affordable office space and technical assistance for start-up businesses. Over 30 local service providers provide two free hours of consultation and discounts to incubator businesses while they are in the Incubator. Many of their programs are open to the public, and they receive funding from the City of Manchester. Julie Gustafson, manager of the Amoskeag Business Incubator, believes that incubators can work outside of Manchester but only with generous support from the community. Towns that are interested in encouraging this should first do feasibility studies to assess available resources. The Monadnock Region Business Incubator Network in Keene has initiated satellite office expansion for remote areas that cater to businesses native to the region, a technique that could be duplicated in the SNHPC region.

- Village Center or Main Street Development**:** Most of the towns in the SNHPC region have expressed interest specifically in developing a village center, a main street commercial area, or mixed-use zoning districts. Several towns, such as Derry and Goffstown, have worked with NH Main Street Program to revitalize their downtowns. The NH Main Street Program alone has created over 1,500 new jobs, 130 new housing units, and 569 businesses in New Hampshire as well as putting over $100 million into public and private improvements (NH Community Development Finance Authority 2003).

The closely related idea of village or mixed-use development is consistently lauded by think-tanks across the nation as smart planning for rural areas. From a logistical and economic standpoint, a mixed-use zone that concentrates retail and other business establishments into a defined area is cost-efficient in terms of infrastructure improvements. Allowing apartments above retail or office space maximizes building usage and provides opportunities for affordable housing. From a social and community perspective, pedestrian-friendly mixed-use villages offer common social spaces for informal interaction and community events. Residents have easy access to local goods and services while businesses have a loyal client base. The businesses provide an important source of tax revenue to the town without producing the strip-mall sprawl-style development that threatens rural character.

- Eco-Industrial Parks: Eco-Industrial Parks (EIP) are collaborative business structures with the goal of optimal economic performance with minimal environmental impacts. Companies cohabitate buildings with green design, and both their facilities and production techniques are engineered for clean production, energy efficiency, and waste minimization. Participating companies often work together to achieve these goals.

Stonyfield Yogurt Eco-Industrial Park in Londonderry

The Stonyfield Londonderry Eco Park was a community collaboration that created an environmentally sound industrial park, benefiting the community with an increased tax base and significant new jobs while adhering to environmental standards dictated by a citizen committee. Stonyfield Farms Inc. and the town of Londonderry provided seed money and staff to create the park and Londonderry owns the land. The park drives on innovative collaboration between tenants, such as a plastics recycling company that purchases waste plastics from Stonyfield Farms Yogurt and an on-site power company that provides natural gas power and wastewater treatment. This is a positive model that can be successful in other towns by increasing the tax base, minimizing infrastructure improvements, and reinforcing the open spaces and rural character of the community.

- Transit-Oriented Development: Transit-Oriented Development (TOD) involves high-density, mixed-use residential, commercial, and municipal buildings concentrated around a public transit center. TOD caters towards non-vehicular transportation, and the entire development is within easy walking distance (10 minutes or less) from a transit stop. TODs greatly relieve traffic congestion and offer benefits to residents, businesses, and governments. These types of developments works best in areas with defined town and commercial centers where pedestrians can easily access a variety of services from their work or homes.

Businesses have good incentive to invest in TOD projects, as a strong client base resides proximate to their offices and the area also receives high pedestrian traffic. As the region's population continues to grow, towns that offer transit-oriented development will provide an attractive high-density housing option for residents that want to avoid stressful commutes. The housing built into TOD centers does not end up as subdivided lots on the town's open land. More information on TOD as well as potential TOD locations for the region can be found in the Transportation Chapter of the Regional Comprehensive Plan.

Business Outreach

Towns can and should work to attract specific types of businesses that will provide the necessary wages for residents to afford the local cost of living. Depending on the needs of the town, these can include light industrial, tech, and/or business services, which can provide jobs with a range of skills and pay levels. The strategy to attract businesses can work on many scales, from filling a single small business park to revitalizing a downtown village. Municipalities should begin by contacting the New Hampshire Division of Economic Development to coordinate efforts of business recruitment. The following actions can help achieve this balanced business recruiting:

1. Identify prime businesses. Using town demographic characteristics, an existing economic profile, and/or surveys of community businesses and residents, the town can determine what types of businesses it wishes to attract. Some characteristics to consider include number of employees, salary, education level of employees, and type of industry.

2. Build a business database. With the existing statistical compilation of the ideal business profile, the town can begin to compile contact information for businesses meeting specifications within the state, sub-region, region, etc. The database could be adjusted in size according to the town's commitment to preparing mailings.

3. Promotional outreach. Prepare promotional materials advertising the quality of life and area attractions in the town to send to businesses in a series of monthly mailings. Each mailing would include a personalized letter and offers of economic development information. Those businesses that request further information would be invited to town for a guided visit.

Global Market Potential

The region holds strong potential for further expansion into a global market. The Southern New Hampshire Planning Commission region is strategically located just south of the Canadian border. The Manchester Airport also allows for the transport of goods and people to destinations all over the world in a matter of hours. Additionally Manchester is only one hour from Boston, a major financial center and port city. However, according to an informal survey of business undergraduate students at the University of New Hampshire, International Business students were the least likely to seek employment in New Hampshire after graduation (Gittell 2005). While the region has the potential to be a global player, it must work to shift its image in order to retain local talent.

New Hampshire Fisher Cats' Stadium; *photo courtesy of the New Hampshire Fisher Cats.*

The Manchester Airport is in the process of adding customs services for its cargo operations to allow businesses to more efficiently send and receive goods and materials directly to and from international locations. Additionally, the Airport has established a "Foreign Trade Zone" to encourage industrial operations by allowing duty-free international imports. Approximately 61 percent of Airport users are businesses travelers, signifying the importance of the airport to area commerce and trade. "The value of the airport in terms of destination travel, commerce and corporate relocation cannot possibly be overstated," said Robin Comstock, president and CEO of the Greater Manchester Chamber of Commerce. "It's important to know a business can get their people in and out of their location or headquarters or satellite."

Improvements to the region's existing transportation infrastructure can help to facilitate new high-tech businesses and the expansion of the professional service sector. The region may witness the relocation of major global companies to the area, yet this also brings the threat of outsourcing labor to overseas locations with cheaper wages. These economic changes will require municipalities to apply effective marketing techniques and address the affordable housing and transportation issues facing the region.

Finally, the immigrant and refugee communities of the region are untapped resources in terms of economic potential. Immigrants often hold ties to their home countries and possess specialized skills. Fostering this international community can increase business opportunities as well as increase the diversity of our cities and towns.

Destination Manchester

Several local economic experts agree that promoting Manchester as a convention destination will provide a strong boost to the regional economy. Manchester already has adequate capabilities of hosting conferences with over 1,100 hotel rooms and over 170,000 square feet of meeting facilities. Convention participants would support local hotel, restaurant, and retail services and visit regional attractions, spreading the benefits to surrounding towns as well.

An estimated 25 to 30 million visitors travel to New Hampshire each year, spending $3.96 billion in 2004.[6] The majority of tourists visit New Hampshire by car, with another significant portion traveling by plane. The Manchester Airport and Interstate 93 serve as transportation hubs for these travelers as they make their way through the state. By capitalizing on opportunities to attract and provide services to these travelers, the region can gain tax revenue and new business ventures.

6. Guy C. Denechaud, 2004 "Warm Weather Brings Heaviest Tourist Traffic to Both Vermont, New Hampshire. Valley Business Journal. Accessed on 22 September 2005; Laurence E. Goss, New Hampshire Fiscal Year 2004 Tourism Satellite Account. Plymouth State University, June 2005.

Future Growth Factors

As noted earlier, a key piece of the economic development puzzle is access and infrastructure, as businesses are recruited to and retained in areas that can be easily reached. Therefore some of the major transportation projects in the SNHPC region, built in response to population growth and congestion, will have secondary impacts on the economic development of Southern New Hampshire. The expansion of I-93 and the Airport Access Road will serve to increase the accessibility and marketability of the region's economy, but they also threaten to ease the commute to Boston, thereby draining the region of its workforce. Strategic planning in concurrence with these projects can focus economic development to take advantage of these new infrastructure improvements.

A 2002 Economic Impact Study for the Manchester Airport reports an estimated $671.9 million total economic impact for the Manchester area alone. This number includes $169.9 million for on-airport impact, $111.3 million for off-airport impact, and an additional $390.7 million for expenditures of visitors arriving through the airport. The airport provided 3,900 total jobs in 2002, with 3,700 in the Manchester area. The economic impact by 2015 was projected to reach $1.457 billion with a total of 5,200 jobs in the Manchester area. The industries with the greatest airport-related impact in terms of payroll and expenditures were government agencies, airlines (passenger and cargo), rental car companies, and terminal concessionaires.[7] The airport's high noise levels make industrial endeavors the best suited developments for this area.

Londonderry has had the fastest growth rates of any community in New Hampshire since the 1980s, with jobs in non-manufacturing businesses more than tripling between 1980 and 1990. Manufacturing employment grew by 60 percent between 1980 and 1995. Londonderry is attractive to industrial employers due to its large tracts of undeveloped land, its proximity to the Airport and I-93, and its low wages (relative to Massachusetts). The town also houses several major cargo businesses, including UPS, Federal Express, and Airborne, along the Airport perimeter. Three of the most significant areas of development in Londonderry include commercial expansion along NH Rte 102 (where there was a recent expansion in sewer service), industrial development adjacent to the Airport, and industrial expansion around Exit 5 on I-93, where land was recently rezoned.

Londonderry also has many large tracts of undeveloped land south of the Airport, with several industrial developments underway or recently completed. Londonderry could potentially see the most development as a result of the planned Airport Access Road, which will increase access to these developing industrial areas.

7. Leigh Fisher Associates, *Economic Impact Study for FY 2002: Manchester Airport*, July 2003.

Manchester was developed earlier than surrounding towns, leaving little land available for future development. The area around the airport is largely residential, with no plans to rezone. There are a few industrial parks in the area as well as some hotel and restaurant commercial strip developments.

Bedford is home to a large number of regional and state corporate headquarters in the commercial district along Rte 3, such as IBM, AAA, and State Farm Insurance. The high levels of office employment also attract workers from outside the town. In addition, there is a high concentration of retail activity. However, Bedford has little remaining undeveloped land, offering less potential for future development. Instead, Bedford might see a shift in its current occupants of office parks as access to the airport and traffic through the town increases.

Economic Impacts of the Airport Access Road

The Airport Access Road construction will require the acquisition of residential and commercial properties valued at almost $5 million (Table 5.8). The NHDOT expects increased property values from new commercial and industrial development to more than compensate for tax losses.

Table 5.8
Impacts to Local Tax Base from New Airport Access Road

Town	Value (Acquisition Cost)	Total Tax Loss	Percent of Town Tax Base
Londonderry	$450,000	$16,000	0.04%
Bedford	$3,367,000	$69,000	0.3%
Manchester	$1,122,000	$39,000	0.03%

Source: Manchester Airport Access Road Final Environmental Impact Statement

The Airport Access Road is expected to encourage and support existing land use and development patterns, in terms of demand for residential, retail, and industrial development. As these areas have been developing independently over the past few years, the increased access to vacant and developing areas near the Airport will facilitate development. Access to commercial/retail areas in Bedford will also increase, but traffic along Brown Avenue will be diverted through the new access road.

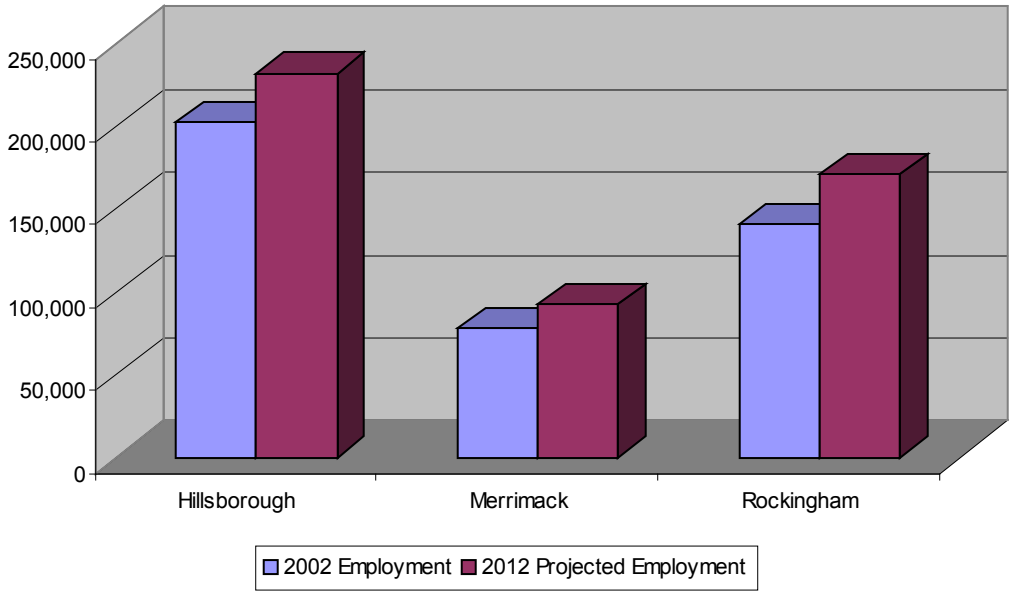
The major secondary land use impacts will be in Londonderry, where there will be an estimated 6,026,000 square feet of development for industrial use. The Town of Londonderry has created a conceptual master plan mixing industrial, office, research and development, retail, hotel, and residential uses, for a total of 5,291,400 square feet of development. These projects would increase Londonderry's property tax base and construction-related employment and wages, with build-out impacts occurring over a long period of time. Estimated value of developments is projected to be as high as $700 million with potential annual property taxes of $25 million, according to Londonderry's 1997 Conceptual Master Plan.

In Manchester, the Airport Access Road will be constructed concurrently with other airport improvement projects, resulting in significant increases in construction employment in the city. The access road alone is expected to account for 782 person years of employment, $11.9 million in primary development wages, and $67.3 million in secondary development wages (Manchester Airport Access Road Final Environmental Impact Statement 1997). In Bedford and Londonderry, the new tax revenues will exceed estimated tax losses from road construction acquisitions. Londonderry is expected to financially benefit through heavy development activity.

Future Employment Growth

Continued growth combined with the I-93 expansion will have significant changes in the economic conditions of the region by 2015. Hillsborough, Rockingham, and Merrimack Counties are expected to experience employment growth rates of approximately 15 to 20 percent by 2012 (NH Employment Projections by Industry and Occupation, 2002-2012). These changes come as a result of the region's projected population gain of nearly 30,000 people between 2005 and 2015 (SNHPC). Growth is spread throughout nearly all industries, with the greatest gains in Information, Professional and Technical Services, Arts, Entertainment, and Recreation.

Figure 5.4
Regional Employment Projection s (2002-2012)



Source: New Hampshire Employment Projections by Industry and Occupation, 2002-2012

The region shows increased employment numbers for 2015 (Table 5.9). The growth is shared by the retail and non-retail sectors, but is typically stronger in non-retail, which supports a diverse economy with higher wages and skilled labor. Bedford and Londonderry, which already have a large number of commercial and industrial businesses, still show many potential new jobs.

Table 5.9
Employment Projections by Town, 2000-2015

Municipality	2000 Employment		2015 Employment		Percent Change	
	Retail	Non-Retail	Retail	Non-Retail	Retail	Non-Retail
Auburn	60	923	122	1,635	103.3%	77.1%
Bedford	2,064	10,705	2,699	18,963	30.8%	77.1%
Candia	51	587	45	1,048	-11.8%	78.5%
Chester	11	367	40	705	263.6%	92.1%
Deerfield	18	481	80	895	344.4%	86.1%
Derry	1,997	6,693	3,037	8,509	52.1%	27.1%
Goffstown	976	3,157	1,056	4,718	8.2%	49.4%
Hooksett	1,660	5,183	2,636	8,660	58.8%	67.1%
Londonderry	2,014	9,583	2,681	18,210	33.1%	90.0%
Manchester	12,277	54,760	14,610	66,456	19.0%	21.4%
New Boston	77	344	80	666	3.9%	93.6%
Raymond	1,730	1,468	1,984	2,578	14.7%	75.6%
Weare	161	1,147	245	1,949	52.2%	69.9%
SNHPC	23,096	95,398	29,315	134,992	26.9%	41.5%

Source: SNHPC 2000

The industries expecting the largest percentages of growth between 2002 and 2012 in Hillsborough County are Health Care and Social Assistance (36 percent), Information (33 percent), Professional and Technical Services (27.5 percent), and Accommodation and Food Services (25 percent). There will be an expected 31 percent decrease in Agriculture-related jobs and an 8 percent decrease in management of companies and enterprises.

Merrimack County has a projected 61 percent increase in Arts, Entertainment, and Recreation, a 54 percent increase in Information, a 40 percent increase in Administrative and Waste Services, and a 33 percent increase in Professional and Technical Services.

The top industry growth rates in Rockingham County are Information (55 percent), Real Estate Rental and Leasing (44 percent), Administrative and Waste Services (33 percent), Professional and Technical Services (30 percent), Arts, Entertainment, and Recreation (30 percent), and Construction (27 percent). The industry of Finance and Insurance is projected to decrease by 3 percent (New Hampshire Employment Projections by Industry and Occupation, 2002-2012).

Conclusion

Given many positive economic indicators, the Southern New Hampshire Planning Commission region has the opportunity to facilitate sustainable economic development over the next decade. Using an array of smart growth strategies, collaborative planning, and calculated business recruitment, the region can balance quality of life and rural character with financial sustainability and prosperity.

In a region wary of growth, the I-93 widening and the continuation of current growth trends will undoubtedly bring tens of thousands of new residents to area municipalities. As a result, it is anticipated that employment will grow by nearly 40 percent (SNHPC). Accompanying this growth the need to direct growth responsibly. New business growth should be compatible with the resident workforce to curb the trend of long commutes and loss of potential tax revenue. Towns should continue to work to avoid the sprawling commercial and industrial businesses that threaten rural character. Finally, towns can employ innovative strategies to cost-efficiently increase the tax base of their town.

Some of the key areas of focus for the region include the following:

- The Greater Manchester Chamber of Commerce Metro Center Project: Focused business recruitment will be a key issue in the next decade as towns look to find businesses that will best employ their residents. In towns with increasingly expensive residential developments, this means skilled, high-paying jobs in the information, business, and high-tech sectors that can be active in the global economy. The Chamber of Commerce Metro Center Project can pool the resources and ideas of businesses throughout the region to market and attract the most beneficial array of commercial and industrial establishments. Municipalities are encouraged to participate in this innovative endeavor to put the Manchester area in a national and international spotlight.

- Village/Mixed-Use Development: As residential growth continues to affect small towns, residents worry about maintaining the rural quality while officials struggle to make infrastructure improvements. Though employing principles of new urbanism and village/Main Street development, rural municipalities can maintain open space and pastoral landscapes unmarred by strip developments through a concentration of business establishments in an attractive village setting. The businesses not only provide accessible services to residents, but they provide valuable tax revenue to fund schools and roads. Through public/private sector cooperation and government and non-profit funding sources, village and mixed-use developments are manageable solutions within reach to towns in the region.

- Business Development: In order to retain local college graduates and skilled labor in the region, municipalities should develop a diverse array of commerce and industry. Business incubators, such as the Amoskeag Incubator in Manchester, help to build a business base in towns of all sizes by providing resources, services, and office space to start-up businesses. Eco-parks give homes to innovative industrial firms with minimal environmental impact, providing sustainable outlets for cutting edge businesses sectors. Experts also point to increasing conventions and attracting tourists to the region to bring in tax revenue from outside sources.

- Funding: In the long run, investment in sustainable economic development is a positive financial decision for any town or city. Yet municipalities struggle to fund basic expenses, and therefore financial considerations can be the largest roadblock to economic investment. However, towns dedicate their efforts towards economic development will find several funding opportunities through government agencies and private sector investment. Among the tools available are impact fees, Tax Increment Financing, CROP zones, and the New Hampshire Community Development Authority. Municipalities should work with the NH Department of Resources and Economic Development to find their optimal strategies.

While rural character and economic development seem paradoxical, there are in fact many creative strategies for uniting the two. As growth is inevitable and consistently demanding new costly services, sustainable economic development must be a key component of regional planning throughout the next decade. By employing innovative techniques and funding tools, the Southern New Hampshire planning region can have increased quality of life characteristics for all of its municipalities. In this vein, the SNHPC has identified the region's strengths and weaknesses in terms of economic development as well as actions to address for the future, which can be found at the conclusion of this chapter.

The key to regional economic development success is to be proactive and to work together. The Southern New Hampshire Planning Commission region has many characteristics that encourage economic development as well as positive indicators of economic growth for the future. The region also faces challenges as certain characteristics limit growth potential. By identifying and addressing the region's strengths and weaknesses, municipalities can take specific actions towards ensuring a vibrant and sustainable economy.

Strength	Implication	Actions to Maintain
Quality of Life	Healthcare; recreation, social, and cultural opportunities; ecological resources; and good school systems all attract workers to the region.	• Add and maintain recreation trails and parks. • Preserve cultural and historic resources. • Balance residential growth with commercial/industrial growth to maintain healthy tax base to fund schools and other infrastructure. • Create Eco-Parks to bring in industrial and commercial development with minimal environmental impact
Strong workforce	Closely related to proximity to a strong higher education system.	• Utilize local universities, colleges, and technical and vocation schools for continuing education, workforce recruitment, and business and tech research opportunities.
Location	Close to Boston, White Mountains, and seacoast, affording more business and recreational opportunities	• Support transit and airport developments that will continue to integrate the SNHPC region into the global economy.
Communications infrastructure	Widespread high-speed Internet and wireless phone network	• Maintain existing services and improve services to underserved areas to increase business potential.
Traffic infrastructure	I-93, I-293, NH 101, and the Manchester Airport	• Address traffic congestion issues and support development and improvements to the Airport to further ease mobility.

Weaknesses	Implications	Actions to Address
Lack of affordable housing	Tied to lack of high-density development and zoning barriers	• Work with municipalities to allow for high-density zoning, transit-oriented development, and affordable housing. • Give density bonuses for affordable housing projects using funding from discretionary funds.
Long commute times for residents		• Encourage Transportation Demand Management practices. • Start a Transportation Management Association for the region to coordinate TDM benefits, such as vanpools, flexible workweeks, and bike and pedestrian options • Actively work towards commuter rail extension • Add more Park and Ride lots • Encourage Transit-Oriented Development.
Lack of jobs outside of Manchester for skilled or specialized workforce	Average house prices in many towns require much higher income than can be earned through local jobs.	• Attract non-retail commercial and industrial operations to towns. • Work with the Greater Manchester Chamber of Commerce to effectively market town and attract businesses. • Encourage towns to budget funds for economic development, possibly through a full- or part-time staff member. • Develop small-scale business incubators to encourage start-up business, or work with the Amoskeag Business Incubator to offer satellite services in other towns.
Unsustainable tax base in small towns	Need for commercial/ industrial businesses to balance tax base mixed with resistance to growth and sprawl	• Encourage high-density, mixed-use development concentrated in the downtown, village, or Main Street area. • Assist towns in preparing applications for NH Main Street Center for downtown revitalization. • Adopt zoning regulations to encourage commercial development contained to specific areas.
Threat to quality of life and "rural character" through loss of open space	Residents resist commercial and industrial growth for fear of losing rural qualities.	• Encourage cluster development to reduce sprawl. • Change zoning ordinances to allow for conservation subdivision options, which integrate open space into residential developments. • Create open space plans for each town to manage residential growth and ensure preservation of open space.

Chapter Six:

Energy

Introduction

The continued growth of the Southern New Hampshire Planning Commission region increases our demand for energy. Defined in the very technical sense, energy is "the capability to do work, expressed in units of power or capacity over time." The Southern New Hampshire Planning Commission region and the state of New Hampshire as a whole need reliable, affordable energy. These resources are needed to expand and strengthen our economy. Energy is used in every facet of our day-to-day lives. It is used in our homes, in our businesses and for our transportation needs. This important component is critical to our environmental quality and economic vitality, which are both highly regarded here in Southern New Hampshire.

Access to secure, affordable supplies of energy is required for almost every activity of private citizens, business and government. When looking at energy in the region and how it fits into the future planning of the region, we need to make an overall goal to ensure the present and future quality of life for every citizen of the region and provide them with energy at the lowest financial and environmental cost. In today's changing world we need to establish a fair degree of independence from uncertain international energy markets. In addition we need to ensure responsible contributions from our region to the global economy. The ultimate goal should be the creation of an energy program that is sustainable both locally and globally.

Based on 2000 Census data, New Hampshire ranks 41st in population in the United States, and based on 1999 U.S. Energy Information Administration (EIA) data, the State is 45th in the amount of energy consumed, indicating that New Hampshire consumes slightly less per person than the rest of the nation. However, in 1999 New Hampshire ranked 19th in dollars spent on energy. This is attributable to the high cost of transportation and heating fuels in the Northeast.

Within the Southern New Hampshire region, there is a need for increased awareness of adapting energy policy into the fabric of everyday life. New Hampshire law provides general guidance for the state's energy policies. RSA 378:37 requires that we ensure the "lowest reasonable cost while providing for the reliability and diversity of energy sources." However, no single state agency has been charged with energy planning to help policy makers ensure that energy decisions are consistent with the state's energy policy goals.

New Hampshire's electric restructuring statute, RSA 274-F:3, also sets forth several broad public policy goals. These principles call for full and fair competition, benefits for all consumers, protection of low-income consumers, environmental improvement,

increased commitment to renewable energy sources, and investments and incentives for energy efficiency.

Continuing uncertainty in the New Hampshire energy market may indicate a need for energy planning at the regional level. This type of planning can:

- Identify whether energy demand will exceed supply in the Southern New Hampshire Planning Commission region
- Clarify trade-offs among the environmental, social and economic benefits and costs of various energy policies or choices
- Identify and publicize energy efficiency opportunities
- Help local municipalities design and implement energy policies
- Enable informed regional decision making about energy policies

In the past, energy has not played a major role in regional and local planning. The SNHPC recognizes the fact that a region-wide energy planning effort needs to be created to ensure that municipalities have access to accurate energy information, as well as the tools and resources to help them with energy policy information. It is the duty of local government and regional planning organizations to facilitate with progressive citizen level actions, decisions, regulations, and land-use policies that lead to energy market shifts towards competitive, healthy and safe energy alternatives. Guidance from the SNHPC can assist communities in reducing the need for energy and the environmental impacts of electric generation and consumption and other energy resource use. Local government can also influence local energy decisions through the use of subsidies and education.

Existing Conditions

By considering energy, environmental and economic policies and programs together, we can protect the air, water, and open space in the SNHPC region. Municipalities, regional planning commissions, and the state can work together to incorporate the various existing programs and create new ones that will provide a cleaner and healthier environment for all citizens while continuing to have a strong and diverse economy.

As a result of the electric industry undergoing constant restructuring, regional organizations have the ability to play an increasingly larger role in energy planning. It is important for the SHNPC region to take action in recognizing that New Hampshire is not an energy island, and actions taken outside of New Hampshire affect our energy security, costs and environmental impacts. As privatization and deregulation have become more prevalent in our country, state, and region, it has become a regional responsibility to adopt energy policies that take into consideration the changing global energy economy. The changing global energy economy is further realized when

Currently the SNHPC region is served by Public Service of New Hampshire (PSNH) the State's largest utility. A few small areas in the towns of Auburn, Candia, Chester, Raymond and Derry are served by the Northeast Electric Cooperative. PSNH serves more than 475,000 homes and businesses throughout New Hampshire and has grown to comprise three fossil fuel-fired generating plants and nine hydroelectric facilities. These facilities are capable of generating more than 1,110 megawatts of electricity. As a wholly owned subsidiary of Northeast Utilities, PSNH is an integral part of New England's largest electric system and provides the foundation for continued prosperity and growth in New Hampshire and especially in the Southern New Hampshire Planning Commission Region. (Please refer to the Service Map in the Public Utilities Chapter). PSNH plans to utilize its statewide presence to play a major role in New Hampshire's business development efforts. There are partnerships with state and local organizations to aide in bringing new businesses to New Hampshire and enabling existing businesses to expand. A variety of services are available to companies interested in moving in to New Hampshire.

PSNH operates three fossil-fuel fired plants and nine hydroelectric facilities. Through these facilities they are capable of generating more than 1,110 megawatts of electricity. While none of the fossil-fuel fired plants are within the SNHPC region, 3 of the hydroelectric facilities are located within our region.

1) Amoskeag Hydro- Completed in 1924 by the Amoskeag Manufacturing Company and purchased by PSNH in 1936, Amoskeag Hyrdro originally powered the mills in the Manchester Millyard. The original generators and turbines are still in operation.

2) Hooksett Hydro- Completed in 1927 by PSNH, Hooksett Hydro is located on the Merrimack River. In 1988, a downstream fish passage was installed to allow native fish to move freely down river. The original generators and turbines are still in operation.
3) Garvins Fall-Originally built in 1901 by PSNH predecessor Manchester Traction and Light Company, Garvins Falls Hydro is located on the Merrimack River. The plant only had two turbine generators when built; two more were added in 1925. In 1988, the waste gate at the end of the power canal was modified to permit passage of downstream fish.

It is clear that fuel oil, kerosene, and other types of fossil fuels are the primary sources of household heating (Table 6.1). All of the communities in the region have a higher percentage of oil-based heating than the state as a whole. This dependence on oil-based heating will prove to be more costly and harder to come by in the upcoming years as oil and natural gas prices have skyrocketed and will continue to do so as China and India become more oil dependent and as oil is about to peak globally.

Table 6.1
SNHPC Household Heating Type By Percentage

Municipality	Utility Gas	Bottled, Tank or Liquid Propane	Electricity	Fuel Oil, Kerosene, Etc	Coal or Coke	Wood	Solar Energy	Other Fuel	No Fuel
Auburn	0.0	9.7	1.0	82.3	1.3	5.2	0.4	0.0	0.0
Bedford	0.1	9.0	3.8	72.0	0.0	0.9	0.0	0.0	0.0
Candia	0.0	16.0	1.9	75.9	0.4	5.7	0.0	0.0	0.0
Chester	0.3	8.9	1.5	82.2	0.0	7.1	0.0	0.0	0.0
Deerfield	0.5	11.2	1.1	78.7	0.5	7.6	0.0	0.4	0.0
Derry	6.5	14.1	14.8	59.8	0.6	2.5	0.1	1.2	0.2
Goffstown	9.6	9.7	4.6	73.4	0.1	2.4	0.0	0.1	0.0
Hooksett	28.0	6.8	4.6	57.3	0.2	1.6	0.0	0.8	0.6
Londonderry	5.0	19.1	7.9	65.3	0.5	2.1	0.0	0.1	0.0
Manchester	43.1	3.1	9.4	42.7	0.2	0.6	0.0	0.7	0.2
New Boston	1.0	17.3	1.7	73.0	0.0	7.0	0.0	0.0	0.0
Raymond	4.0	20.1	4.4	64.3	0.3	6.7	0.0	0.3	0.0
Weare	0.7	18.8	1.6	68.6	0.5	9.8	0.0	0.0	0.0
State of New Hampshire	18.4	10.7	7.6	58.1	0.2	4.3	0.0	0.5	0.2

Source: U.S. Census

Renewable Energy

Energy efficiency and energy conservation can be the most cost-effective and least polluting means of reducing our demand for energy. Homeowner and municipal education as well as other initiatives can greatly reduce the demand for energy in the Southern New Hampshire Planning Commission Region. However, energy demand cannot be eliminated completely. Thus, renewable energy can be a valuable complement to energy efficiency and conservation. Among the potential benefits of renewable energy are:

- Diversification of energy sources is important
- More secure because it can produced close to point of use and it has multiple sources such as hydro, wind, solar, biomass and geothermal
- Efficiency gains due to less energy consumed in transmission or transport
- More energy dollars are retained in local or regional economy, not exported
- Renewable energy installations can create additional local jobs
- Reduced pollution compared with fossil fuels
- Can be greenhouse-gas neutral
- Lifetime cost can be lower than for non-renewable energy sources
- "wastes" such as manure, sewer gas, landfill gas, landscape trimmings, can become energy sources
- Annual operation costs are much lower

State law, RSA 72: 61-72 (grants municipalities the option to exempt certain renewable energy installations from property taxation. As of 2003, only three communities in the SNHPC Region, Bedford, Chester and Raymond, have elected to exempt at least one type of renewable energy installation incentive. If more communities in the region participated in these programs, there would be more incentive for people to explore different options for home heating, leading to an improvement in the economic vitality of the region.

Table 6.2
SNHPC Property Taxation Exemptions

Municipality	Solar Energy Exemption	Wind Powered Exemption	Wood Heating Energy Exemption
Auburn	NO	NO	NO
Bedford	YES	YES	YES
Candia	NO	NO	NO
Chester	YES	YES	NO
Deerfield	NO	NO	NO
Derry	NO	NO	NO
Goffstown	NO	NO	NO
Hooksett	NO	NO	NO
Londonderry	NO	NO	NO
Manchester	NO	NO	NO
New Boston	NO	NO	NO
Raymond	YES	YES	YES
Weare	NO	NO	NO

Source: New Hampshire Office of Energy and Planning

If a municipality has adopted the exemption, the added value of the equipment and installation to property may be exempt from taxation.

Current Energy Programs

New Hampshire currently has a variety of programs that help homeowners, cities, towns, school districts, businesses and industries, and entire regions to cut their energy use and reduce pollution. Currently the Southern New Hampshire Planning Commission region and its member communities have done little to take advantage of these programs and, as energy consumption becomes more of a daily headline, it is time for the region to come together and take advantage of these programs.

The New Hampshire Office of Energy and Planning operate several energy programs in partnership with both private and public entities to promote a sustainable, environmentally sound future for New Hampshire as well as to encourage conservation and renewable energy source. Additionally, New Hampshire has two clean transportation programs that seek to reduce emissions by automobiles, trucks and buses and to reduce the state's reliance on foreign oil supply.

Granite State Clean Cities Coalition

Operated by the New Hampshire Department of Environmental Services and funded by the US Department of Energy, Granite State Clean Cities Coalition (GSCCC) is a partnership of local private and public fleets (including highway department, parks and recreation and emergency vehicles) throughout the state. The project seeks to expand the use of alternative, cleaner burning fuels by private and public fleets and individuals. GSCCC offers training, equipment and vehicle demonstrations, and strategic planning services. Currently within the SNHPC region, only the City of Manchester is a stakeholder of GSCCC.

The Alternative Vehicles Fuel Project

Operated by the New Hampshire Department of Environmental Services and funded by Congestion Mitigation Air Quality funding from the New Hampshire Department of Transportation and the US Department of Transportation, the project provides funding to help state and municipal fleets purchase alternative fuel vehicles and infrastructure.

PSNH

Public Service of New Hampshire offers two programs for businesses to become more energy efficient.

Large Business Retrofit Program:

PSNH can help better the efficiency of a facility through services including installation of variable frequency drives, replacement of motors, installation of energy management systems, air compressors and lighting upgrades. Technical assistance is also offered through the Retrofit Program, including project evaluation, measure identification, equipment monitoring, and energy audits. To help fund these improvements, this program offers perspective and custom rebates to customers who replace equipment at their facility with more energy efficient equipment. Not only will participants save money in the form of rebates, but they will also see long-term savings in their energy bills.

Small Business Retrofit Program

Through this program, PSNH will help better the efficiency of the facility through services including lighting upgrades, electric hot water measures, and installation of programmable thermostats and controls for walk-in coolers. Not only will you see long term savings in the electric bill, but PSNH will help fund the improvements to the facility.

Building Energy Conservation Initiative

Established in April 1997, this program analyzes state buildings for energy and resource conservation opportunities. Building Energy Conservation Initiative (BECI) utilizes a "paid from savings" procedure known as "Performance Contracting." This allows agencies to perform energy retrofits and building upgrades that would otherwise not be funded through capital appropriations, providing that energy savings can pay for the project cost, as outlined in RSA 21I. The Office of Energy and Planning (OEP) institutes the study, along with the individual state agencies whose buildings are being evaluated.

New Hampshire Industries of the Future

New Hampshire Industries of the Future (NHIOF) is a U.S. Department of Energy sponsored partnership between businesses, the Business and Industry Association's WasteCap Resource Conservation Network, and the Governor's Office of Energy and Community Services. NHIOF is designed to help energy- and waste-intensive industries use technology and process advancements to improve profitability and competitiveness by cutting energy costs. NHIOF is helping manufacturers in some of the state's largest industry sectors- metals, rubber, plastics, and forest projects- to develop strategies to resolve issues of energy efficiency, productivity, waste reduction and environmental conservation.

Rebuild New Hampshire

Rebuild New Hampshire is a one-stop, linked array of technical, educational, and financial energy assistance programs and activities administered by the New Hampshire Office of Energy and Planning (NHOEP). It is tailored for New Hampshire communities and community sub-groups, including municipal buildings, schools, businesses, non-profit organizations, and residential housing units.

Rebuild New Hampshire supports New Hampshire communities as they move to

- Reduce fossil fuel use
- Implement cost-effective energy efficiency and conservation measures
- Expand the use of renewable energy resources
- Reduce the flow of energy dollars out of state
- Conduct energy efficiency and conservation education
- Build local capacity for energy decision-making
- Raise awareness of the connection between increased energy efficiency and reduced environmental pollution

More than anything else, Rebuild New Hampshire is a network of partnerships, challenged and moved by local leadership, implementing energy efficiency, conservation, and renewable resource measures through a collaborative exchange among technical assistance providers and the energy users who benefit from their expertise.

A Rebuild New Hampshire community partnership can be a local school system or municipality, or an association of both public and private sector entities in the same local area, who agree to formulate an Action Plan for identifying and implementing cost-effective energy improvement measures to be undertaken in buildings owned and/or managed by partnership members. Any member of the community can lead a partnership, but a unit of the local or county government, or a public school system, must be among the active participants. Partnerships can include participation from:

- Building owners and operators
- Energy service companies
- Community economic development officials
- Chambers of Commerce
- Builders/Suppliers
- Banks and financial institutions
- Utility companies
- Equipment manufacturers
- Public housing authorities
- Mayors and other elected officials
- Architectural and engineering firms
- School teachers, students and administration

NHSaves

NHsaves is a collaboration of New Hampshire's electric utilities working with the NH Public Utilities Commission and other interested parties to provide NH residents with information, programs and support designed to reduce energy use, save money and protect the environment.

Residential, commercial and industrial electricity users can take advantage of this program. A product of the restructuring of New Hampshire's electric industry, the energy efficiency programs are offered to customers of PSNH, the New Hampshire Electric Cooperative, Unitil, Granite State Electric Company, and the Connecticut Valley Electric Company. The program offers coupons, rebates, free audits, and other incentives to help both homeowners and business owners achieve energy efficiency, reducing their electric costs and air pollution. Utility estimates indicate that the programs, when fully implemented have the potential to reduce electric use in NH by more than 704.7 megawatt hours, removing 522.8 tons of carbon dioxide, more than three tons of sulfur dioxide, and 1,830 pounds of nitrogen oxides from New Hampshire's air annually.

High Performance Schools

High performance schools offer superior indoor environmental conditions for health and academic performance, are cost-effective and efficient to operate and maintain, and are resource efficient in the areas of energy use, water use, and building material content and durability.

House Bill 129, effective September 9, 2005 gives the Department of Education the ability to award up to 3 percent more state funding to districts which design, build, and operate school facilities that meet new high performance standards.

Those standards, which are being developed now, will be modeled after similar criteria established by the Collaborative for High Performance Schools (CHPS) in California and modified for the New England climate and region-specific building codes. No New Hampshire school buildings currently qualify as high performance, but a number of districts, design firms, and other advocates are working toward making high performance schools a commonplace occurrence in the state.

In New Hampshire there are over 200,000 public school students and 15,000 teachers who spend time in schools with poor indoor air quality, inadequate lighting and drafty rooms. At the same time, administrators, parents and taxpayers must address parent dissatisfaction, increased energy and operation costs and the mitigation of environmental impacts. On Average $165 Million is spent annually on school construction in the

state, yet despite this investment, the buildings are still lacking in terms of quality and performance.

Over 70% of the schools in New Hampshire have been in service for 36 years or more, this gives New Hampshire a tremendous opportunity as many municipalities look to construct new schools and rehab existing spaces. High performance schools utilize proactive, cost-effective and integrated design to result in healthy and efficient school buildings. These schools serve to maximize tax dollars as well as improve the quality life for students.

The major hurdle is the perceived cost of building a new school or rehabbing an existing one. However with the incentives provided, the long-term benefits outweigh the initial costs.

Cities for Climate Protection Program

The Cities for Climate Protection Campaign (CCPC) enlists cities to adopt policies and implement measures to achieve quantifiable reductions in local greenhouse gas emissions, improve air quality, and enhance urban livability and sustainability. More than 650 local governments participate in the CCP, integrating climate change mitigation into their decision-making processes.

Communities that participate in the CCP benefit from the actions they take to reduce greenhouse gas emissions through:

- Financial savings in reduced utility and fuel costs to the local government, households, and businesses
- Improved local air quality, contributing to the general health and well being of the community
- Economic development and new local jobs as investments in locally produced energy products and services keep money circulating in the economy

The City of Keene has been participating in the CCP since 2000. Officials from that city acknowledged that local governments play a key role in climate change efforts because they can have direct influence and control of activities that produce such emissions. Decisions about development and land-use, energy efficient buildings, investment in public transit, waste reduction and recycling program all affect local air quality and living standards. They felt the Cities for Climate Protection program was an opportunity for Keene to take practical that reduce greenhouse gas emissions and generate other benefits for their communities.

The Cities for Climate Protection Campaign features a five-step process:

- Conduct an energy and emissions inventory and forecast
- Establish an emissions reduction target
- Develop and obtain approval from the Local Action Plan

- Implement policies and measures from Plan
- Monitor and verify results

Other towns in the New England region that participate include Burlington, VT, Bridgeport, CT and Springfield, MA

Bio Oil Project

New Hampshire Office of Energy and Planning and the New Hampshire Department of Resources and Economic Development led a study to determine the economic, environmental and technical feasibility of establishing a bio-oil production and utilization industry in New Hampshire. Other partners in the study team included US and Canadian federal agencies; multiple states' agencies; universities; forest industry, environmental, and biomass energy organizations; economic development organizations; and private individuals. The final report entitled *Bio-oil Opportunity which was* published in September 2004 was intended to provide New Hampshire state government, forest industries, community groups, citizens, bio-oil facility developers and others information on the opportunity that bio-oil production may provide in New Hampshire. This analysis, is part of New Hampshire's ongoing effort to secure sustainable and clean energy.

Bio-oil is a renewable, liquid resource that can be obtained from low-grade wood waste by a process known as pyrolysis. This liquid burns cleaner and produces fewer pollutants (e.g., virtually no sulfur emissions) than coal and oil fuels. Bio-oil has potential uses for the production of heat and electricity. Eventually, it may have additional, higher value as a feedstock for a "green" chemicals industry.

Bio-oil production and utilization have several potentially beneficial outcomes including: economic support of sustainable forest management practices; renewable, indigenous, carbon-neutral energy supply; creation of jobs and retention of energy dollars in the regional economy; ability to generate and market electricity at peak demand times; possible spin-off business growth through co-location; combined heat and power applications; derivative products and services.

State Heating Oil and Propane Program

The State Heating Oil and Propane Program (SHOPP) monitor's residential retail prices for heating oil and propane to determine the average prices for these fuels in New Hampshire. From October through March, SHOPP conducts weekly price surveys and monthly from April to September. Additionally, the state monitors kerosene, electricity, natural gas, gasoline, and diesel fuel prices on a monthly basis.

Weatherization Program

The State of New Hampshire's Weatherization Program is designed to reduce household energy use and costs in low-income households throughout the state by installing energy efficient improvements. The overall goal of the Weatherization Program is to serve those households that are most vulnerable to high-energy costs and may not have the means of making cost-effective energy conservation improvements to their homes.

The New Hampshire Office of Energy and Planning (NHOEP) operates the Weatherization Program with grants from the U.S. Department of Energy (DOE) and the U.S. Department of Health and Human Services. NHOEP subcontracts with New Hampshire's Community Action Agencies (CAAs), which are responsible for operating and delivering weatherization services at the local level. In the SNHPC region the following agencies are:

- Hillsborough County-Southern New Hampshire Services (603) 668-8081
- Rockingham County-Rockingham Community Action-(603) 431-2911
- Merrimack County-Community Action Program- (603) 225-3295

Industrial Assessment Centers

The Industrial Assessment Center (IAC), funded by the U.S. Department of Energy, enables eligible small and medium-sized manufacturers to have comprehensive industrial assessments performed at no cost. The IAC assessments assist manufacturers to become more economically competitive by helping them reduce energy use, minimize waste, and increase productivity.

The Center for Energy Efficiency and Renewable Energy (CEERE) at the University of Massachusetts in Amherst serves most of New Hampshire. It was established in 1984 and is nationally recognized for its work. Since being established, they have surveyed over 450 plants. More than 1,900 Assessment Recommendation (AR) measures have been identified with average cost savings of $35,000 per year and an average simple payback of 1.2 years.

Core Energy Efficiency Programs in New Hampshire

New Hampshire electric utility customers can take advantage of statewide energy efficiency products and services such as utilizing Energy Star products. These "core" energy programs are consistent with Public Utilities Commission orders that require the utilities to develop a set of innovative, statewide core programs available to all New Hampshire ratepayers. The core program will increase the availability of cost-effective energy-efficient measures and services, while providing economic and environmental benefits to the State.

Small Business Efficiency Program

This program assists small commercial and industrial customers (under 100kw) by providing 50 percent of the installed cost of electrical energy efficiency improvements, including lighting, occupancy sensors, electric hot water measures, controls for walk-in coolers, air conditioning, and programmable thermostat. This is funded by NHsaves.

Large Business Energy Advantage Program

The Large Business Energy Advantage Program assists business customers (over 100kw) with financial and technical services install new energy efficient equipment through the replacement of old, inefficient equipment in existing facilities. Rebates are available for lighting conversions and controls; energy efficient motors, energy management systems, LED traffic lights, and custom projects. This is funded by NHsaves.

New Construction/Major Renovation Program

This Program offers a variety of rebates and technical assistance to commercial or industrial customers building a new facility, undergoing a major renovation or replacing failed (end of life) equipment. NHsaves funds this program.

Pay As You Save (PAYS) Energy Efficiency Products Pilot Program

The Pay as You Save (PAYS) pilot program, offered by Public Service Company of New Hampshire (PSNH) and the New Hampshire Electric Cooperative (NHEC), allows certain customers to finance the purchase of approved efficiency devices, appliances, or services on their electric bill. This innovative pilot program provides eligible customers with a way to purchase efficiency measures while eliminating up-front costs.

The PAYS program can be used for:

- Weatherization; including air sealing, insulation and recommended through a Home Energy Analysis
- ENERGY STAR lighting, ENERGY STAR products
- Lighting and Lighting control recommended through a Business Energy Analysis

The costs of installed measures are repaid over time by participating customers from savings on their electric bill.

Energy Star Lighting Program

Residential customers who purchase Energy Star rated light bulbs and fixtures can receive rebate coupons redeemable at participating retailers. Other lighting and select energy savings products will also be made available from a mail order catalog. A typical Energy Star rated compact fluorescent lamp lasts up to 10 times longer than an equivalent incandescent bulb and uses 75 percent less energy. This program is funded by NHsaves.

Energy Star Appliance Program

Customers will receive a $50 rebate coupon from PSNH towards the purchase of an Energy Star rated washing machine and dryers when purchased at a participating retailer. Energy Star clothes washers use 35 to 50 percent less water and 50 percent less energy per load, and significantly reduce drying time. This program is funded by NHsaves.

Home Energy Solutions

Under this program, PSNH can help you with your home's energy efficiently through improvements such as insulation, air sealing, thermostat replacement, electric hot water conservation measures, and cost effective appliance and lighting upgrades. You will see long term savings in your electric bill and PSNH will help fund these improvements.

Income Qualified Energy Efficiency Program

Qualified low-income customers can receive up to $3,600 in services ($5,900 if customers also qualify for the NH Weatherization Assistance Program), including a customized report analyzing their home, improvements including insulation, thermostats, lighting upgrades, and efficient refrigerators, and recommendations on how to use energy more efficiently. This program is administered by Public Service of New Hampshire.

NH Energy Star Homes Program

The NH Energy Star Homes Program encourages customers to take advantage of the benefits of building or renovating a single or multi-family energy efficient home with rebates up to $2,500. Energy Star construction results in reduced monthly operating costs, improved homeowner comfort and a higher resale value, and environmental benefits. This program is administered by Public Service of New Hampshire.

Planning Roles

Municipalities, the SNHPC region, and the state can work together to incorporate the various programs that are available as well as create new ones that will provide a cleaner and healthier environment for all citizens while continuing to have a strong and diverse economy.

The creation and use of energy, whether for businesses, homes, transportation or other applications has a great impact on the environment both on a local and global scale. Emissions from our day to day energy use affect our health, our natural resources, and our quality of life.

The State of New Hampshire has the ability to significantly impact the electricity market through its purchasing decisions. One way the state can encourage environmentally responsible power is to purchase electricity generated from renewable sources. Additionally, the state can help create a market for renewable power by insisting that some percentage of the electricity that it uses comes from renewable sources.

New Hampshire has two statewide Energy Codes, one for residential structures and one for commercial and industrial structures. The Office of Energy and Planning (OEP) works in conjunction with the Public Utilities Commission (PUC) to raise awareness of and increase compliance with these energy codes.

The benefits of statewide energy codes:

- Save occupants money
- Make housing more affordable
- Increase resale value of buildings
- Make housing more durable
- Make indoor environments healthier
- Increase buying power of citizens by putting more money in their pocket
- Retain more money in the state's economy
- Prevent air pollution
- Reduce reliance on foreign oil
- Reduce emissions of greenhouse gases associated with global warming

Land Use Planning

The way communities are designed, planned, and built has significant influence over the amount of energy used, how energy is distributed, and the types of energy sources that will be needed in the future. As communities grow and physically spread out, vehicle miles traveled per household have increased and energy demand has increased

to support this pattern. Land use patterns can be changed in ways that reduce vehicle miles traveled. Examples include:

- Initiating impact fees, which require developers to pay for the portion of the infrastructure demands they generate.
- Adopting mixed-used zoning, which would allow greater accessibility to desired services without requiring greater mobility.
- Promoting development around transportation facilities, including transit stations, which allow communities to take advantage of existing infrastructure and offers improved accessibility.

Energy Efficient development can also be used to incorporate site-design techniques that take advantage of sun exposure, differences in microclimate, landscaping, as well as planning techniques that can be used in designing housing, deciding on density levels, integrating different land uses, and designing transportation and circulation systems. Energy-efficient planning techniques can be implemented through the use of traditional police power controls such as site plan, zoning and building code.

Comprehensive Assessment of the Impact of Increased Energy Costs

In response to increased energy costs, Governor Lynch directed state agencies to undertake a comprehensive assessment of the impact higher energy costs will have on the state budget. Additionally, he directed agencies to take additional steps to lower their energy use. This is in response to the recent and dramatic increase in energy costs that the Governor stresses will greatly impact the state's finances.

Governor Lynch asked for state agencies to submit estimates showing any administrative, service or contract costs that may be affected by increased energy prices including:

- Costs for heating buildings
- Costs for operating vehicles and mileage reimbursements
- Direct service costs
- Potential increased program costs
- Potential increased provider costs

Governor Lynch issued an executive order directing state agencies to reduce energy use by ten percent in July 2005. His declaration encouraged:

- Tele-conferencing to reduce the need for travel
- Employee carpools to meetings
- Restricting discretionary travel to the extent possible

- Reducing energy use in state facilities by turning off unused appliances and lights, and lowering the thermostat

Around the country, state and local governments have the market power to purchase renewable power. New Hampshire, and in particular the SNHPC region, should consider purchasing a fixed percentage of its power from renewable sources. Doing so will not only demonstrate the commitment of state and local government to use its market power to encourage environmentally responsible electricity generation, it will serve as an example for others.

It is expected that the purchase of renewable electricity will cost more than the purchase of fossil fuel power, and the municipalities in the SNHPC region should consider this increased cost when weighing what percentage of power to purchase from renewable generation. However, as a leader in environmental responsibility and a major consumer of electricity, the region should not miss the opportunity to use market-based, non-regulatory power to help shape the region and the state's competitive electricity market.

Currently the Southern New Hampshire Planning Commission is participating in PSNH's Small Business Efficiency Program. This will enable the Commission to conserve energy and cut energy billing costs. Programmable thermostats were installed and new Energy Star light bulbs will replace the old ones.

Issues and Concerns

The Southern New Hampshire Planning Commission has identified the following as issues that will have an impact on energy production and use in the region in the upcoming years. When addressing energy policy the following should be taken into consideration:

Volatile Fuel Prices

Develop conservation programs, identify alternative energy resources, examine infrastructure development issues, understand and monitor the impact of market design on operational efficiency and resource development, and propose solutions.

Impact of Electric Industry Restructuring

Monitor energy prices and advise the municipalities on restructuring issues.

Consolidation of Northeast Energy Markets

The federal Energy Regulatory Commission has indicated its preference to combine New England, New York, and Mid-Atlantic electricity markets into a single market, with a single system operator. There are numerous technical and logistical challenges to overcome if a successful Northeast Market is to be developed. Additionally, the financial implications for SNHPC residents, impacts on system reliability, and ability to influence market design and operations are unknown.

Energy Resource Diversity as a Means to Energy Security

Having a mix of energy supplies can reduce disruptions and mitigate the price volatility of fossil fuels. Indigenous energy resources can improve local energy security. The SNHPC region will face many decisions related to energy security and will need to assess the pros and cons of government intervention to achieve diversity goals.

The Inter-relationship of Energy and Environmental Policy

The SNHPC recognizes that environmental policy decisions can affect energy choices, prices, and reliability, and energy policy decisions can affect environmental quality and the region's ability to meet environmental goals. There is a need for close coordination between energy and environmental policy makers to more effectively achieve common goals and to ensure that their respective decisions do not inadvertently work at cross purposes.

Land Use Patterns/Sprawl

The Southern New Hampshire Planning Commission recognizes that current zoning regulations and patterns of development are not conducive to reductions in energy consumption. Working with the municipalities in the region and education citizens about best practice home building is an essential tool in reducing energy demand

Transportation Alternatives

The Southern New Hampshire Planning Commission recognizes that transportation is an activity that consumes a great deal of fossil fuel. There are numerous opportunities to create alternatives to the single-occupancy vehicle travel that we are so accustomed to today. The SNHPC can work with municipalities to upgrade fleets, incorporate the use of alternative fuels, institute non-idling policies and create incentives for efficient car-use.

New Trends

There are many sources of alternative energy that are becoming more readily available and have proven to be energy efficient and environmentally sound. The Southern New Hampshire Planning Commission must work with the municipalities in the region to explore these possibilities.

Small Wind Electric Systems

Small Wind Electric Systems can make a significant contribution to our nation's energy needs. Although wind turbines large enough to provide a significant portion of the electricity needed by the average U.S. home generally require one acre of property or more, approximately 21 million U.S. homes are built on one-acre and larger sites, and 24 percent of the U.S. population lives in rural areas.

A small wind electric system can work if:

- There is enough wind in the area
- Tall towers are allowed in the neighborhood or rural area
- There is enough space
- The resident can determine how much electricity he or she needs or wants to produce
- It works economically

Depending on the wind resource, a small wind energy system can lower an electricity bill by 50 to 90 percent, help avoid the high costs of having utility power lines extended to remote locations, prevent power interruptions, and most importantly, is non-polluting.

Using wind to generate electricity is currently being researched in the state. Alternative energy advocates are currently looking at several New Hampshire communities such as Claremont as possible locations to expand the use of wind power to generate electricity. State officials believe that wind power could someday contribute 10 percent of New Hampshire's power supply. However, there is resistance to creating such wind farms. Some people object to the large turbines and dislike their placement on visible hillsides. Additionally, wildlife organizations have expressed concern regarding bird and bat mortality related to turbines.

Biomass

Biomass materials consist of whole-tree wood chips (undried, unprocessed wood chips with bark attached), stumps, brush and smaller low-lying vegetation, low-grade woods, and other plan material unusable in timber or paper production. These materials

can result from normal forestry practices such as timber harvesting and fire control measures, or from clearing land for homes, roads and commercial developments. For wood-fired power generation and steam generation for heat (district heating), natural residue from sawmills and other clean wood by-products can be added to the mix.

For small-scale domestic applications of biomass the fuel usually takes the form of wood pellets, wood chips and wood logs.

In New Hampshire the Northern Wood Power Project at the Schiller Station in Portsmouth is the first biomass project in the state. It is the first non-hydro, commercial scale renewable project. Over 50 MW of coal-fired power generation was replaced by a biomass boiler. This project developed by PSHN will burn wood chips and other clean wood products. In addition to creating a market for woodchips from New Hampshire's many logging operations, the facility is now a major regional contributor of renewable energy.

There are two main ways of using biomass to heat a domestic property:

- Stand-alone stoves providing space heating for a room. These can be fuelled by logs or pellets but only pellets are suitable for automatic feed.
- Boilers connected to central heating and hot water systems. These are suitable for pellets, logs or chips, and are generally larger than 15 kW.

Solar Heating

Solar heating harnesses the power of the sun to provide heat for hot water, space heating and swimming pools. Solar heating can be either passive, such as simply using large windows to let in more light and warmth, or active, where specially designed mechanical systems increase the heat gained from the sunlight.

Solar Electric (Photovoltaic) Systems

Stonyfield Farms in Londonderry recently added a 5,000 square foot photovoltaic array on top of the roof of their yogurt facility. The integrated array will generate about 50,000 watts of energy on full sun days. This is enough to power 1,600 LCD computer monitors or 500 100W light bulbs. It is comparable to the amount of electricity 10 homes might use on an annual basis.

Hybrid solar lighting collects sunlight and routs it through optical fibers into buildings where it is combined with electric light in "hybrid" light fixtures. Sensors keep the room at a steady lighting level by adjusting the electric lights based on the sunlight available. This new generation of solar lighting combines both electric and solar power. Hybrid solar lighting pipes sunlight directly to the light fixture and no energy conversions are necessary, therefore the process is much more efficient.

Light Emitting Diodes

For most applications, LED's can last up to 20 years and require less maintenance than conventional incandescent bulbs, which often burn out after only a year. Traffic lights using incandescent bulbs may typically use about 150 watts per hour, 24 hours a day. LED's only require 15 watts, a 90 percent reduction in power consumption. Multiply these savings per every traffic light and it's easy to see that the energy savings are significant. LED's can be used for:

- Commercial lighting
- Traffic lighting
- Industrial lighting
- Street lighting
- Flashlights
- Light bulbs for home or office
- Fluorescent replacements

Conclusion

Region-wide energy efficiency can best be implemented when other public policies are taken into consideration. Implementation of energy measures can only work when integrated with programs dealing with other region-wide issues such as land-use, air quality, transportation, housing and economic development and other issues that are at the forefront of the SNHPC's efforts to make our region a healthier and more functional place to live.

The SNHPC recognizes that a region-wide energy planning effort needs to be created to ensure that municipalities have access to accurate energy information. Current energy challenges require that we move forward to achieve adequate, affordable, efficient, and environmentally sound energy supplies in our region and the State of New Hampshire as a whole. It will be important for the SNHPC and other Regional Planning Commissions in New Hampshire to work together with the state to create awareness on this issue. The education is dissemination of programs and alternatives is key to region-wide energy efficiency.

The Southern New Hampshire Planning Commission encourages all of the communities in the region to evaluate the effects of plans, programs, and policies on energy use, and to determine how to reduce energy impacts by making more efficient use of all energy resources.

Chapter Seven:

Existing Land Use

Introduction

The type, intensity and distribution of existing land use activity has a significant influence on future development patterns. Transportation, water and sewer services, utilities and infrastructure in general play an important role in shaping land use. Natural resources and environmental constraints also directly influence where growth and development can and cannot occur. In addition, the marketplace, economic conditions, local zoning policies, as well as the availability of developable land, are all important factors in where, and how, existing and future land use patterns emerge.

As reported in the Planning Commission's Land Use Update – 2004, there have been substantial changes in the profile of land uses within the region within the past decade (the period of 1995-2004). Overall, the total amount of developed land within the region increased 24 percent. Residential and commercial development had the greatest increase – 24.3 and 35.3 percent respectively. Public and semi-public land increased 11.9 percent and utilities and streets increased 7.3 percent. Industrial and vacant land within the region decreased by 0.9 and 15 percent respectively (Land Use Update – 2004).

Overall, these changes are not surprising considering that the Southern New Hampshire Planning Commission region is located within one of the fastest growing areas of the state. While land availability is becoming increasingly limited, there is still significant land available within the region for continued growth and development in the future. Tracking the status of the use and availability of land for development purposes allows planners to better understand how and where growth is occurring both regionally and at the community level.

This chapter examines in detail the major land use changes that have taken place within the region and describes and analyzes the existing residential, commercial, industrial and public land use patterns that have emerged. Additionally, it compares the land use and zoning patterns, which have developed in each of the region's communities.

Historical Perspective

Founded as agricultural communities, the existing land use distribution we see today in the Southern New Hampshire Planning Commission region does not illustrate a predictable pattern of development. Why did some communities shift rapidly from rural to urban and, more importantly, why did others transition from urban to suburban and rural? The patterns of existing land use seen today can be explained by the region's economic development and historic events.

In the early 19th century, the SNHPC region was poised to develop in a different direction, with communities such as Weare and Derry potential centers for urban expansion. In 1820, the communities with the greatest populations were Londonderry/Derry -- 3,127, Weare -- 2,781, Chester -- 2,262, and Deerfield -- 2,133. The town with the lowest population at this time was Manchester, with 761 residents.

The opening of the Amoskeag Mills in 1830 signaled a dramatic population shift and land use development changes. In 1830, Auburn, Bedford, Candia, Goffstown, Manchester, and Raymond all experienced population increases. The population landscape of the region was vastly different from today. In the 1820s, many of the smaller towns in the region were growing. Surprisingly, these towns had total populations and larger growth rates than Manchester, the largest city in the region today.

While the population changes were not immediately evident in 1830, by 1840, significant changes were taking place. Manchester's population grew by 269 percent from 1830 to 1840. The following decade it grew by an additional 331 percent. In fact, Manchester experienced population increases every decade from 1820 to 1920. Furthermore, towns that were population leaders in 1820, or were at least experiencing population increases between 1820 and 1830, experienced regular declines over the same 100-year period, indicating a migration to the growing urban center in Manchester.

Widespread population decreases over much of the region are evident during war years, from 1860 to 1870, and from 1910 to 1920. Bedford, Hooksett and Manchester, however, still experienced growth during the Civil War decade. Bedford, Hooksett, Derry and Manchester all experienced growth during the decade marked by World War I and the 1918 influenza pandemic. The town of Derry experienced regular population increases from 1870 to 1920, with increases between 5 and 43 percent each decade.

Auburn, Bedford, and Candia are described in the New Hampshire Municipal Abstracts of 1944 as agricultural communities whose residents commute to Manchester for work. Chester and New Boston are described as agricultural communities with up to 25 percent seasonal residences. Weare is also described as agricultural with a small summer colony. Deerfield is described as agricultural and Londonderry as 25

percent agricultural. Raymond is described as a manufacturing town, while Hooksett's residents are believed to commute to either Manchester or Suncook since Hooksett is contiguous to Manchester. Goffstown is described as suburban with an important agricultural area. Derry and Manchester are the only towns to be described as urban. These descriptions from 1944 more approximate what the region looks like today, but still are not compatible with today's existing land use.

Agriculture has declined in importance to the region's communities since 1944. There are fewer seasonal residences now also. Existing land use today is predominantly residential. Bedford, Candia, Chester, Deerfield, Derry, Goffstown, Londonderry and Raymond all have significantly more residential development than non-residential development. New Boston's residential and non-residential development is closely balanced. Auburn, Hooksett, Manchester and Weare all have slightly more non-residential development than residential development. These patterns of existing land use are evidence of the historic legacy of economic growth and decline in the region, as well as the expanding urban center of Boston and the resultant bedroom communities in the SNHPC region.

The existing land use patterns of today will shape the future land use of the region. Continued population growth will require still more acres to be devoted to residential and non-residential uses. Additional acres will be consumed for expanded utilities and streets. More and more communities are creeping ever closer to tipping the scale and having more developed acres than vacant acres. By examining the existing land use patterns in the region, we can identify potential imbalances of use ahead of time and plan for future land use issues.

Land Use Changes, 1995-2004

As a whole, the SNHPC region consists of 306,380 acres of land area and 8,260 acres of surface waters. In 1995, approximately 35.1 percent of the region's total land area acres were developed. The term "developed" means land in use for residential, public, commercial, or industrial purpose, as well as land used for utilities and streets. As of 2004, that figure increased to 43.6 percent. In the last ten years (1995-2004), all land uses including residential, commercial, industrial, public and semi-public, and utilities and streets have increased their developed area. As a result, total undeveloped acres in the region dropped by more than 26,000 acres, from 64.9 percent of the region's land area in 1995 to 56.4 percent in 2004.

Table 7.1
Summary of Land Use Change 1995 to 2004

Land Use Category	Acres		Acreage Change 1995-2004		Percent of Total Land Area		Percent of Developed Land	
	1995	2004	Acres	Percent	1995	2004	1995	2004
Residential	59,023	78,587	19,563	33.14%	19.26%	25.65%	52.88%	58.87%
Commercial	4,595	5,799	1,204	26.19%	1.50%	1.89%	4.12%	4.34%
Industrial	3,709	3,987	277	7.48%	1.21%	1.30%	3.32%	2.99%
Semi-Public and Public	28,653	29,077	424	1.48%	9.35%	9.49%	25.67%	21.78%
Utilities and Streets	15,638	16,044	406	2.60%	5.10%	5.24%	14.01%	12.02%
Total Developed	111,618	133,492	21,874	19.60%	36.43%	43.57%	100.00%	100.00%
Undeveloped	194,762	172,888	-21,874	-11.23%	63.57%	56.43%		
Total Land Area	306,380	306,380			100.00%	100.00%		

Source: SNHPC Annual Land Use Updates

Residential uses account for the largest amount of developed land in the region. In 1995, residential use accounted for 19.4 percent of the region's land, totaling 59,459 acres. These figures rose to 25.7 percent of the region's land, or approximately 78,587 acres in 2004. Approximately 58.9 percent of the developed land in the region is being used for residential purposes.

The next largest developed land use is semi-public and public uses, which consisted of 8.4 percent of all land in the region, totaling 25,621 acres in 1995. Public uses include municipal, county, state, and federal buildings used for government or public purposes. Semi-Public uses are all privately owned, often non-profit organizations, and include features such as churches, non-public schools, and colleges. Semi-public and public use increased in 2004, utilizing 9.5 percent of all land in the region, totaling

approximately 29,077 acres. Public and semi-public uses amount to approximately 21.8 percent of the region's developed lands.

Utilities and streets are the third largest developed land use, accounting for 4.8 percent of the region's land in 1995, or 14,628 acres. In 2004, utilities and streets took up 5.2 percent of the region's land, or approximately 16,044 acres. Utilities and streets accounted for approximately 12 percent of the region's developed areas.

Commercial development in 1995 accounted for 1.2 percent, or 3,753 acres of the region's land. In 2004, commercial development usage increased to make up 1.9 percent of the region's land, for a total of approximately 5,799 acres. Commercial purposes took up approximately 4.34 percent of the region's developed land.

Industrial use in 1995 consisted of 1.2 percent of the total land acreage, or 3,709 acres. In 2004, industrial development accounted for 1.3 percent of the total land acreage, or 3,987 acres. Industrial uses composed nearly three percent of the region's developed land.

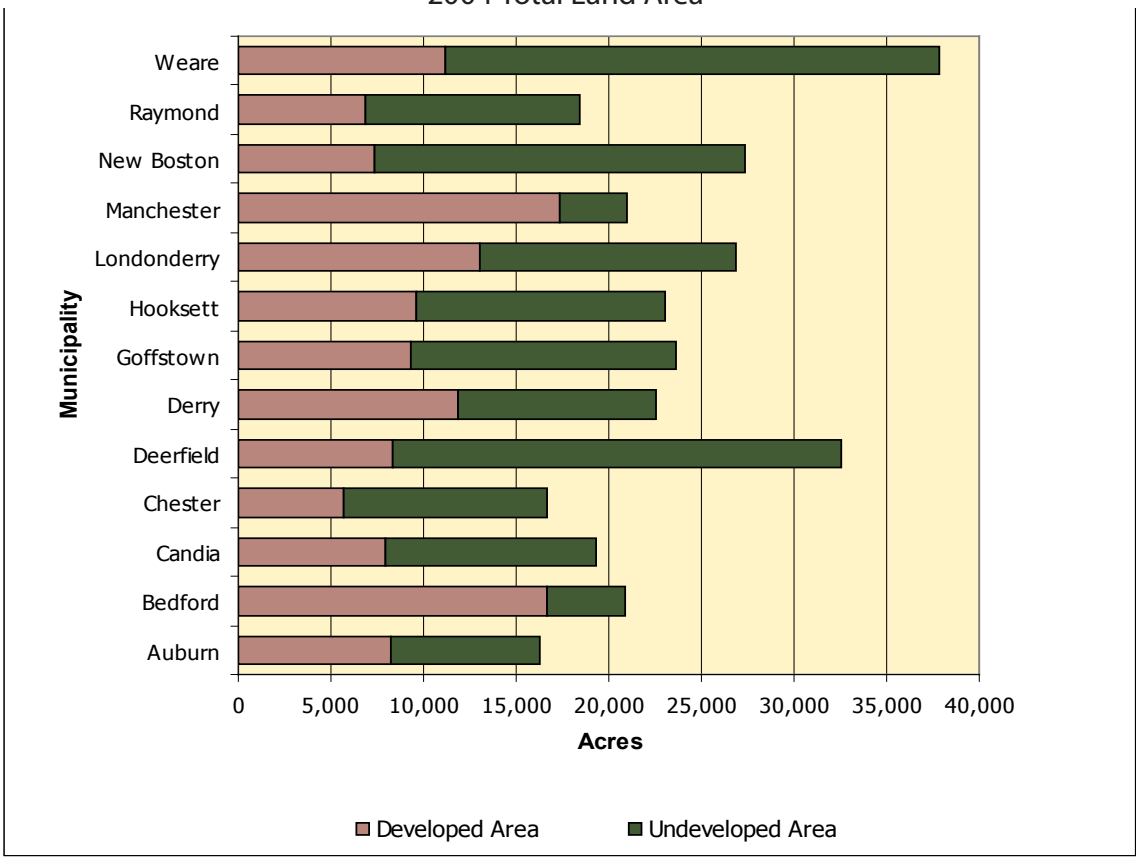
Conversely, undeveloped land exhibits a decreasing trend in acreage as a result of the increasing development described above. Active agricultural lands are areas without physical structures, but are actively used as agricultural land. While agricultural land is considered an active land use, it is not considered developed land when considering future development possibilities. Undeveloped land is all remaining land left in its natural, un-built state. Undeveloped land made up 63.57 percent of the region, totaling 194,762 acres in 1995. Since then, however, undeveloped land has dropped to 56.4 percent of the region, with a total of approximately 172,888 acres. This is a decrease of 13.1 percent. The percentage of undeveloped land (56.4 percent) is gradually becoming equal to the percentage of developed land (43.6 percent). It is a very real possibility that these numbers will cross each other in the not too distant future, meaning that developed land, not undeveloped land, would be the most common land use in the region.

Numerous negative impacts have resulted due to the continual decrease of undeveloped land. Air quality has decreased due to the amount of additional commercial and industrial development. There is additional traffic, which comes with the increasing residential development. Municipal services are being overburdened as a result of the additional population. Finally, traffic congestion has been on a steady increase, and has forced the reconstruction of many roadways due to the additional vehicles. For example, three of the larger pending projects in the region are the I-93 widening, the reconstruction of the exit 5 interchange from I-293 to Granite Street in Manchester, and the new I-93 exit 4A construction in Derry-Londonderry.

The region as a whole, however, is the sum of its parts. A better understanding of the regional land use picture can be obtained by the individual communities' land use profiles. The region's more rural communities, currently experiencing increased growth, can benefit from examining land use changes in the more developed neighboring communities. An understanding of these patterns would help the growing municipalities anticipate and plan for their own future.

The communities of Weare (37,798 acres) and Deerfield (32,585 acres) have the greatest land areas in the region (see Figure 7.1). Conversely, Auburn (16,229 acres) and Chester (16,617 acres) are the region's two smallest communities in terms of acreage. However, total land area alone is not enough to get an accurate feel for what a place is like. Even though Weare has the largest total land area in the region, 26,595 of those acres are undeveloped. However, the town of Bedford (20,907 acres) is predominantly residential, with 12,064 acres devoted to that land use.

Figure 7.1
2004 Total Land Area



Source: SNHPC

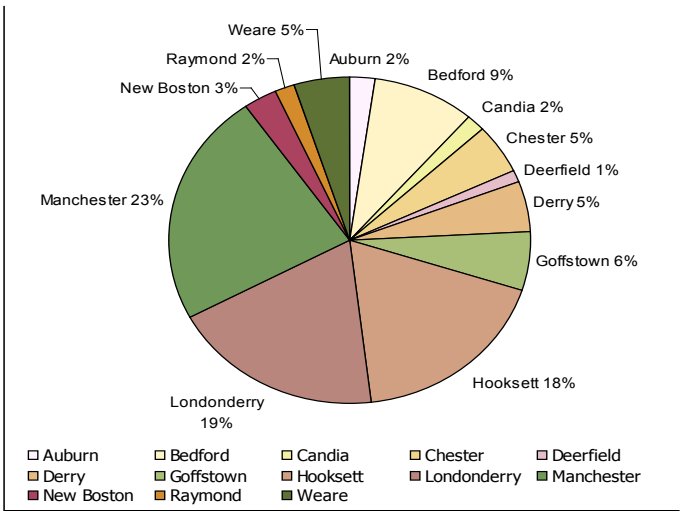
The greatest municipal concentration of commercial development is in Manchester (1,396 acres). Hooksett follows Manchester with 1,020 acres, then Londonderry with 760 acres, and Bedford with 758 acres. Londonderry has the greatest share of developed industrial land, with 1,122 acres. Manchester is next with 854 acres and is followed by Hooksett with 740 acres. The remainder of the region's communities each contains less than 350 acres developed for industrial purposes.

Manchester is also the region's leader in overall developed land area with approximately 17,362 acres. Previously, Manchester was the region's leader in developed land acres; however this is no longer the case. The Town of Bedford has grown substantially in recent years, and as a result the Town has an approximate total of 16,667 developed acres. Manchester and Bedford are the only two municipalities in the region with fewer than 4,300 undeveloped acres. Other than Auburn, which has approximately 7,959 undeveloped acres, no other municipality has fewer than 10,000 undeveloped acres.

Manchester is again the obvious leader in land used for utilities and streets, with approximately 3,555 acres. This is slightly less than half the utilities and streets area in Londonderry, whose approximately 1,846 acres ranks second in the region. Bedford is barely behind Londonderry in this category, with approximately 1,803 acres.

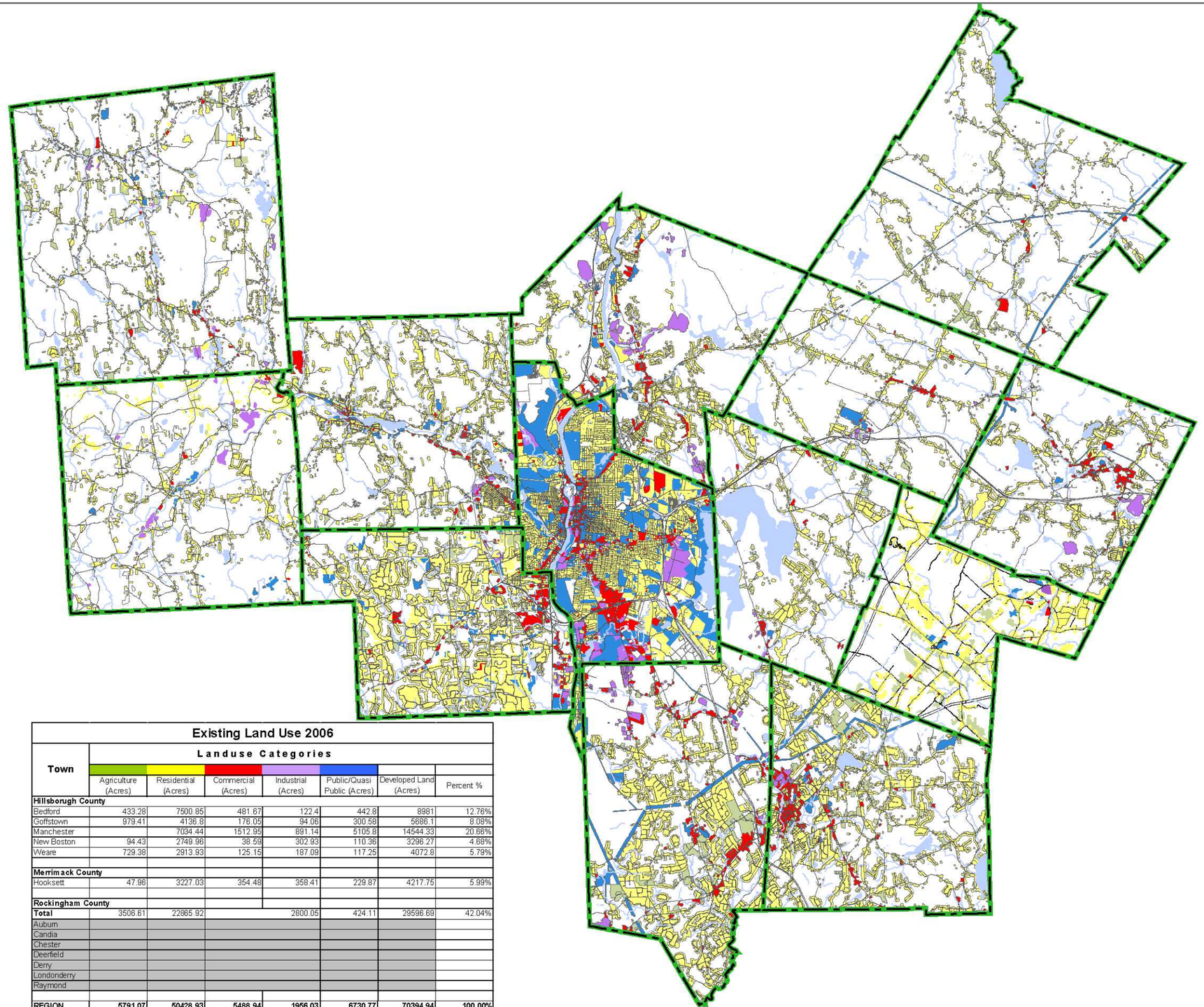
Manchester hosts 23 percent of the region's commercial and industrial lands. Londonderry (19 percent) and Hooksett (18 percent) come in second and third respectively (Figure 7.2).

Figure 7.2
Commercial & Industrial Acres



Source: SNHPC

Regional Comprehensive Plan



Map # 7.1

EXISTING LANDUSE

Legend

Political Boundaries

- Town line
- Major Roads

Hydrography

- Streams
- Rivers/ Lakes

Developed Land

Landuse Categories

- Agriculture
- Residential
- Commercial
- Industrial
- Public/Quasi Public
- Other

Data Sources:

Granit Digital Data (1:24,000)
NH Department of Transportation

Parcel based landuse code information from the following Town's Assesors Departments:
Town of Weare, New Boston, Goffstown, Bedford, Hooksett & City of Manchester

The individual municipalities represented on this map and the SNHPC make no representations or guaranties to the accuracy of the features and designations of this map.

This map is prepared for planning purposes only and is not to be used for legal boundary eterminations or for regulatory purposes.

Map Produced by GIS Service SNHPC April 2006.
For reprints or furthur questions

Contact: SNHPC, gis@snhpc.org or (603) 669-4664

SNHPC

0 7,500 15,000 30,000 Feet

0 1.5 3 6 Miles

Existing Land Use 2006

Town	Landuse Categories						
	Agriculture (Acres)	Residential (Acres)	Commercial (Acres)	Industrial (Acres)	Public/Quasi Public (Acres)	Developed Land (Acres)	Percent %
Hillsborugh County							
Bedford	433.28	7500.85	481.67	122.4	442.8	8981	12.76%
Goffstown	979.41	4136.8	176.05	94.06	300.58	5686.1	8.08%
Manchester		7034.44	1512.95	891.14	5105.8	14544.33	20.66%
New Boston	94.43	2749.96	38.59	302.93	110.36	3296.27	4.68%
Weare	729.38	2913.93	125.15	187.09	117.25	4072.8	5.79%
Merrimack County							
Hooksett	47.96	3227.03	354.48	358.41	229.87	4217.75	5.99%
Rockingham County							
Total	3506.61	22865.92		2800.05	424.11	29596.69	42.04%
Auburn							
Candia							
Chester							
Deerfield							
Derry							
Londonderry							
Raymond							
REGION	**5791.07**	**50428.93**	**5488.94**	**1956.03**	**6730.77**	**70394.94**	**100.00%**

Note: NH Granit's 1998 Exisitng Landuse data was updated using 2004 Orthophotos for the Town's in the Rockingham county.

Areas to be calculated for the towns within Rockingham County.

Regional Land Use Patterns

It is no secret that existing land use patterns have a strong influence on future development. Areas of more land-intensive activities, such as commercial, industrial, and high-density residential purposes, coincide with this statement. This is because these higher intensity activities tend to repeat themselves in similar areas as the adjacent undeveloped lands begin developing. Additionally, new land use patterns will materialize in response to new or improved infrastructure. These could be in the form of a new transportation route, or new water and sewerage service areas, all essential for higher intensity land uses.

Effective land use analysis takes into account the existing land use in order to predict future land use patterns. On August 1, 2005, SNHPC requested the assistance of its member municipalities to identify regional assets, problem areas, and major growth areas within their communities. To maintain continuity, these categories were defined as follows:

1. Regional Assets – Significant parkland, conservation areas, natural or cultural resources, farmland or other areas that are assets to the community and have regional importance;

2. Existing Problem Areas – Geographic areas that are contaminated, such as polluted water supplies or brownfields sites; areas suffering from major traffic congestion; developed areas that need water and sewer or other infrastructure support or areas suffering from other issues and problems; and

3. Major Growth Areas – Geographic areas or centers that are currently experiencing significant growth and residential, commercial, or industrial development, which is expected to continue for the next 10-15 years.

These categories provide a snapshot of the existing land use picture, as well as indicate potential future land use issues. A thorough understanding of surrounding communities' existing land use enables informed, coordinated land use decisions. Regional coordination and cooperation permits for more successful economic development initiatives and a balanced housing market.

All of the regional assets, existing problem area and major growth areas identified by the communities within the region are shown on the attached Growth Area Management Map.

Regional Assets

Auburn

- Most of town is still largely wooded, which gives the community its rural character and sense of privacy. This also offers a welcome ambiance as visitors travel through town.
- Lake Massabesic, which occupies almost ten percent of the town, and the open space associated with it.
- Recreational uses at Lake Massabesic, such as boating and fishing are also important regional assets.

Bedford

- Ten percent of the community is currently conserved or protected as open space. This open space is an important asset to the town and region.
- The Manchester Country Club.
- The Heritage Trail, a bicycle/pedestrian path to be developed along the west bank of the Merrimack River. This recreational trail and will help protect several miles of the river.

Candia

- Open space along the northern town line with Deerfield and also within the central portion of the community.
- The many streams and tributaries within Candia, which form the headwaters to the North Branch of Lamprey River.

Chester

- The Exeter River.
- The wetlands of the North Pond area.
- The South Woods.
- Historic properties found along Chester Street and within the village center.
- Wason Pond Conservation & Recreation Area.

Deerfield

- The Deerfield Fairgrounds containing buildings and sites of historic and cultural significance.
- All the conservation lands within the community including portions of Pawtuckaway State Park and Bear Brook State Park.

- Open space at the Dodge and Brown property located within the eastern part of town off of Mountain Road.
- King Estate open fields on Range Road near the center of town.
- Historic old center on Meeting House Road.
- Historic properties at the intersection of Parade and Candia Roads.

Derry

- Through the work of Derry's Main Street Program, the downtown is now an important asset for the community and serves as the economic, social and cultural heart of the community.
- Open space planning in the town including Pigley Farm through farmland protection easements, expansion of the town's existing forests, and purchase of conservation land around Ballard Pond and within the watershed of Beaver Lake. Derry is also working to purchase land around Adams Pond and to protect the remaining farms in the community.
- Derry's recreational facilities, parks and bike paths.

Goffstown

- Forested conservation and open space areas located on the North and South Uncanoonuc Mountains within the northeastern and southwestern corner of town.
- A number of ponds along Route 13 near the Dunbarton town line.
- Mystic Brook, Snook Road heron rockery, Black Brook and Purgatory Brook wetland complex, Tipping Rock area, top of Shirley Hill and its associated view, Mountain Base Lake, Glen Lane, the Marsh at Barnard Park, Kelley Bridge pond, Yacum Hill and Shirley Hill.
- The Piscataquog River, which has a federal designation as a Wild and Scenic River.
- Goffstown's revitalizing downtown and Main Street Programs are also important assets.

Hooksett

- The mostly unfragmented open space located within the northeast quadrant of town.
- The Merrimack River.
- The Pinnacle, a prominent rock outcropping located within the central Village area providing views of the river.
- Quimby Mountain, a prominent natural feature with the highest elevation in town.
- Hooksett's 21 Prime Wetlands and wetland complexes, which are largely located within the central and northeast portions of the community.

Londonderry

- Much of community is still heavily wooded and has retained a great deal of its rural qualities.
- Particularly known for its orchards which are still producing apples for local and regional customers.
- Safe and pleasant neighborhoods.
- Open areas including the Musquash Conservation Area, Scobie Pond area, and the Little Cohas Brook and surrounding wetlands.
- Prime agricultural and farm soils.

Manchester

- Cedar Swamp Preserve at Hackett Hill.
- Amoskeag Millyard.
- Currier Museum of Art.
- UNH Manchester.
- Palace Theater.
- The Verizon Civic Center.
- Fishercat Field.
- Massabesic and Cohas system and conservation lands.
- Manchester Airport.
- The Piscataquog River Trailway.
- The Riverwalk and the Portsmouth Branch – Rockingham Trail.

New Boston

- Open space located within the southeast corner of town to the south of Route 13 and within the east central part of town.
- Middle and South Branch of the Piscataquog River, which is an important natural resource that has been included under the state's Designated Rivers Program.

Raymond

- 400 acres of conservation easements along the Nottingham town line.
- Roughly 400-500 acres of town-owned conservation land.
- Large undeveloped tracts of land located between Onway Lake and Route 101.
- Large undeveloped tracts of land located within the southwest corner of town bordering Chester.
- Three large parcels of land located in south central area between Route 101 and the Chester town line.
- A large undeveloped parcel located in the southeast corner of town, east of Route 101 and south of Route 107.
- Southern portion of Route 102 to the Chester town line.

- Floodplains along the Lamprey and Pawtuckaway Rivers as well as the Pawtuckaway State Park.

Weare

- Open space located within the central and southeast corner of town and within the western portion of the town north of Route149 and east of Route 77/114, including the Mt. William property.
- Clough State Park located at the Hopkinton Everett Reservoir.
- Lake Horace and numerous great ponds and wetland complexes located throughout the town, including the North Branch of the Piscataquog River.

Existing Problem Areas

Auburn

- Auburn's Town Master Plan identifies a number of land use issues facing the community. These include encouraging cluster subdivision, limiting sprawl and strip development, establishing a village center, developing a roadway network plan considerate of abutting and nearby properties, considering the potential for additional non-residential development, and increasing the availability of affordable housing.
- In addition, establishing infrastructure support – water and sewer – surrounding the Routes 28 and 101 interchange and along By-Pass 28 near the Auburn and Derry town-line for commercial and industrial development has been a challenge.

Bedford

- Traffic congestion on Route101 and Route 114.
- Not enough water and sewer, especially in the northeastern corner of town.
- In addition, the Town's Master Plan notes that open space or conservation, growth and development, municipal and school services, and quality of life and community cohesion remain concerns for the community.
- Bedford has also held design charrettes to consider various concepts and plans for enhancing and improving the Town Center.

Candia

- No public water or sewer services.
- Pollution of a large aquifer surrounded by the North Branch of the Lamprey River from the town transfer and recycling center.
- Trucking and blasting issues associated with gravel pit on Route 27 bordering Raymond.
- Potential brownfields site at the intersection of Route 27 and old Route 101B.
- Contaminated wells on Route 27 and near the 4-corners.
- Increased traffic along the old Route 101 and at the 4-corners.

Chester

- Road intersections.
- Contaminated land at Route 102 and North Pond Road and along Fremont Road, the former town landfill site.
- The impact of future growth and development on the town as a result of the widening of I-93 and expansion of Exit 4A.

Deerfield

- Currier Road into Candia on the southern border.
- Development off Mountain Road (along the eastern border) – primarily road issues.
- Intersection of Old Center Road and Candia Road.
- Algae problems in the pond at the intersection of Routes 107 and 43.

Derry

- Limited water and sewer in East Derry and expansions into areas of new development.
- Increased traffic on Route 102.
- Traffic concerns downtown at intersection of Route 102 and Broadway.
- Need for signalization at intersections of Route 28 and Windham Depot Road.
- Need to eliminate the traffic circle at Ross Corner.
- Concerns about the amount of 55+ developments and the slow growth resulting from the adoption of low density residential development regulations.

Goffstown

- Through traffic along the town's major transportation corridors, serving Dunbarton, Weare, and New Boston, including both Goffstown Back Road and Mast Road corridors.
- The lack of land for non-residential development.
- Finding conservation open space land.

Hooksett

- The wastewater treatment facility needs to be upgraded; it has now reached 80 percent of its design capacity.
- A new Fire Substation is needed within the Exit 10 area to improve fire protection response within this rapidly growing area.
- Route 3 needs to be upgraded from two lanes to four lanes with a center left turning lane or median strips with appropriate left and right turn lanes at major intersections.
- To relieve traffic on Route 3 and to provide additional capacity as Hooksett grows an alternative north-south parkway is also needed within the community.
- Development occurring within the southwest corner of Hooksett is placing pressure on the town for additional services and facilities.
- Other areas experiencing significant development problems include the west part of town, west of I-93 at exit 10, and the area between I-93 and the Merrimack River in the northwest part of town

Londonderry

- Lack of a Town Center.
- The sewer system must be expanded and upgraded to meet future growth needs.
- Routes 102 and 28 are identified as the town's major transportation problem areas.

Manchester

- Traffic congestion along South Willow Road, Goffstown Road and the Amoskeag exit at I-93, Amoskeag Street and the Amoskeag Bridge, Route 3A down to I-293 and Route 3 (Hooksett Road and Webster Street) entering Manchester from the Hooksett town line.

New Boston

- Gravel trucks through village and vehicles backing out into road at Dodge's Store.
- Sight distances on Old Dump Road near transfer station.
- Development of the Friendly beaver campground.
- A small brownfield site near the transfer station and recreational ball fields.
- Lack of inspection of gravel pits.

Raymond

- The land area between Routes101 and 27 on the east side of town (at Exits 4 and 5 off of Route 101).
- A small area located within the northwest corner of town shared with Candia.
- A brownfields site located near the town center.

Weare

- The Route 114 at the Weare town center has traffic congestion near Middle School.
- Bigger residential subdivisions on larger parcels of land.
- No slow up in residential growth since 1999.
- Open space within cluster subdivisions not being used by the public.

Future Development Areas

Auburn

- The south central area along the Derry town line is experiencing the greatest amount of residential growth in town. A large residential subdivision is being planned consisting of 96 homes on 400 acres, 172 acres of which are proposed for conservation.
- The south central area along the Derry town line and the eastern portion of town along the Chester town line will continue to experience high residential growth pressure in the future.

Bedford

- Along the southern portion of the Route 3 corridor from the Merrimack Town line to the Manchester Country Club (about 2 million square of development has occurred within this corridor between 1990 and 2005).
- Rapid redevelopment along the Airport Access Road.
- Undeveloped land located within the northeastern corner of town.
- Areas along Route 101 from Nashua Road to Hunter's Run Road.
- Northwest corner of town including County-owned land and land along Pulpit Road.

Candia

- Currently, some of the larger residential projects impacting the town are located near the golf course in the northwestern and north central portion of Candia.
- Additional development is expected to occur at scattered locations including along the western border with Raymond, the southern border with Auburn, the south central area of town, and along Rt.27 within the east central area of town.
- Major zoning changes and new light industrial zoning has been enacted to attract new business growth along Rt. 27 and within the Exit 3 area.

Chester

- The North Woods region, which is located north of North Pond Road and west of Raymond Road in the north and central portions of town.
- Strong residential subdivision growth along Derry Road and Wells Village Road and south of the Exeter River in the eastern corner of town.

Deerfield

- Rand's Corner at the intersection of Route 107 and Old Center Road
- Mt. Delight area (due to access to Route 101 and I-93), bounded by Mt. Delight Road, Middle Road and Thurston Road.
- Leavits area along Middle Road.
- South Deerfield, including Butler's Square and Deerfield Corner, bounded by Middle Road, Old Candia Road, Candia Town Line and conservation land to the west.
- Proposed senior (62+) housing development to be built within the village area along Old Center Road.

Derry

- Exit 4A in North Derry is projected to be a high growth area in anticipation of future commercial and industrial development related to the expansion of I-93.

Goffstown

- Most of the central and northern portions of town extending from the southeastern and central border of the City of Manchester and along the Route 114 corridor through town up to the north central town line.
- Along the corridors of Route114A, Route 114 and Old Goffstown Road.

Hooksett

- The I-93 corridor including its interchanges – Exits 9, 10, and 11.
- South end of town between I-93 and the Merrimack River.
- Eastern side of Merrimack River between Routes 28 and 27
- Eastern side of Merrimack River north of Route 28 to the town line in central part of town.

Londonderry

- The area around the Airport Access Road.
- Pettingill Road Development Area is another economic development opportunity area located within northwestern section of the town.
- Kitty Hawk Development Area is located within the northwestern section of town and has the potential for commercial and industrial development.
- Northwest of Route 28 (Jack's Bridge) Development Area.
- Mill Pond Development Area includes 100+ residential dwelling units located in the northern part of town.
- The area around the proposed Exit 4A.

- Hudson Border Development Area is located on the southeastern border of town with Hudson.

Manchester

- Residential growth within the northwest corner of the city (576 +/- units over past 10 years).
- The north-western most portion of the City (Hackett Hill area) along the Hooksett and Goffstown town-lines.
- Hackett Hill Research Park.
- Former mill buildings and vacant properties located along the west side of I-293 directly north and south of Bridge Street.
- The Amoskeag Millyard between the Merrimack River and Canal Street from the Amoskeag Bridge to the north and the new Fishercat Field to the south.
- The Manchester Airport area.

New Boston

- The largest area includes several undeveloped tracts of land located within the southeast corner of town south of McCurdy Road, west of Campbell Pond Road and Bedford Road, and north of the US Military Tracking Reservation New Hampshire Tracking Station. A number of new subdivisions are being proposed within this area ranging in size from 13 to 37 lots.
- The other growth area is the continued build out and expansion of several existing residential subdivisions, including a new cluster subdivision of 55 lots located within the northwest part of town south of Route 13 and along Wilson Hill Road.

Raymond

- A major 200,000 square foot outlet mall, hotel, and other commercial buildings are being planned for Exit 4 and that this area of town will experience extensive growth in the future.
- In addition, continued growth will be occurring along Route 107 south of Route 101 at Exit 5.

Weare

- Future growth will be occurring in scattered pockets within the southeast, central, north and northeast parts of town.
- The largest growth areas will be located along Route 114 towards Goffstown and in the north bordering the Henniker town line between Routes 114 and 77.

Land Use And Zoning

Local governments employ their zoning powers as a means of accommodating various land use activities within their borders and controlling the use and development of private land for the public good. Specifically, these zoning powers are used to minimize the impact of conflicting land uses on adjacent property; to limit unplanned, premature and scattered development; and to protect sensitive natural and cultural resources. These objectives are achieved through a variety of zoning ordinances.

All thirteen communities in the SNHPC region have adopted a Zoning Ordinance of one form or another. Most communities in the region are concerned with balancing residential growth with economic development efforts. New Hampshire RSA 674:21 Innovative Land Use Controls and RSA 674:22 Growth Management; Timing of Development permit municipalities to enact ordinances to regulate and slow growth. Innovative Land Use Controls also provide municipalities with a number of tools to encourage economic development.

Zoning tools to control or slow growth include growth management ordinances, impact fees, and phased development. A growth management ordinance limits the number of building permits in any given year to a predetermined number and must be based on statistical fact that the town is growing faster than it can create municipal services to serve its population. Impact fees allow towns to charge developers for the cost of any increase in services the new development is anticipated to create. The fees must be used to fund municipal services that directly benefit the new developments. Phased development is a tool that allows new development, but in manageable stages and not all at once. The communities that have enacted a growth management ordinance, impact fees, or require phased development are shown on the following table (7.2).

Table 7.2
Growth Management Zoning

Municipality	Growth Management Ordinance	Impact Fees	Phased Development
Auburn	Yes	No	No
Bedford	No	Yes	No
Candia	Yes	Yes*	No
Chester	Yes	Yes*	Yes
Deerfield	No	Yes	Yes
Derry	Yes	Yes*	Yes
Goffstown	No	Yes	No
Hooksett	No	Yes	No
Londonderry	Yes	Yes	Yes
Manchester	No	Yes	Yes
New Boston	No	No	No
Raymond	No	Yes	No
Weare	Yes	No	Yes

* There is a provision to assess impact fees that is not implemented.
Source: Zoning Ordinances for the SNHPC communities

The goal of growth management zoning is not only to limit growth, but most often to preserve the rural character the towns have come to be identified with. There are additional non-growth control oriented tools available that can help a community preserve its rural character. These mechanisms include, but are not limited to, the village plan alternative subdivision, designating a historic district, and establishing design standards.

The village plan alternative is a unique land use control that can be used to accomplish many of the objectives of towns today. It promotes more efficient and economical development, which minimizes sprawl, preserves open space and retains village character. Any application under the village plan alternative is required to devote 80 percent of the total site area to conservation or open space purposes. Despite the advantages of the village plan alternative, no communities in the region have utilized this innovative land use tool.

Designated historic districts can help to both preserve and revitalize areas of historic significance within a community. Development and/or demolitions within a historic district may be required to be reviewed by a design committee to ensure that historic preservation interests are met. Additionally, permitted uses within a historic district could be adjusted to allow historic homes to be used for commercial or office space rather than solely as residential. Currently, Bedford, Goffstown, Londonderry, Manchester, Raymond and Weare have designated historic districts. For more information about

historic district zoning, please refer to the historic and cultural resources chapter in this document.

Design standards range from providing a general clause requiring the preservation and protection of historic features to location specific guidelines for new development. The guidelines can specify locally desired architectural styles, construction materials, building scale, window and door design, sign size and design, awnings and canopies, lighting fixtures, landscaping, fencing, and screening methods. In the SNHPC region Chester, Goffstown, Hooksett, Londonderry and Manchester have established design guidelines to ensure that future growth and development in their historic centers is compatible with its surroundings. Often times these standards or guidelines are found in the Site Plan Review or Subdivision Regulations rather than the municipal Zoning Ordinance.

Economic development is essential for prosperous communities; however, the consequences of haphazard commercial and industrial development are undesirable. Some of the zoning tools available to attract economic growth and ensure that growth is compatible with the goals of the municipality include performance zoning, tax increment financing (TIF) districts, planned unit development and mixed-use development. (Table 7.3)

Rather than listing permitted uses, performance zoning focuses on the intensity of land use allowed. Additionally, performance zoning looks at the performance of the parcel and how it impacts nearby community services and other parcels, rather than the specific land use. Since variances, appeals and re-zoning are not needed, it can be less administratively intensive. However, there can also be a larger learning curve because it is less rigid than traditional zoning.

Economic development districts – or TIF districts - are allowed under NH RSA 162. In such a district, the incremental taxes - or the difference in property tax resulting from an increase in property value on new, expanded or renovated development - are given to the municipality to use for infrastructure or other community services improvements within the district. The tax revenues associated with increased property values for existing buildings will continue to be allocated as normal for all community assets outside the TIF district.

Planned unit development is a combination of open space or conservation subdivisions and mixed-use development on a larger scale. A planned unit development is a return to the neighborhood concept, with all types of residential uses in close proximity to one another and to community services such as schools, hospitals, businesses and shopping facilities. Planned unit developments are very similar to the village plan alternative, with the exception of the required conservation land set aside. Currently Manchester is the only community that allows planned developments to be presented to the planning

board for consideration. Certainly planned unit development offers an effective means to developing pedestrian friendly neighborhood centers.

Mixed-use zoning allows for commercial and residential uses same building or lot. By allowing mixed use zones, vehicle trips are reduced because residents can access services right in their neighborhood. Design standards within the mixed-use zone can ensure the desired image of the town remains despite any new development.

Table 7.3
Economic Development Zoning

Municipality	Performance Zoning	TIF District	Planned Unit Development	Mixed-Use Development
Auburn	No	No	No	No
Bedford	Yes	No	No	Yes
Candia	No	No	No	Yes
Chester	No	No	No	No
Deerfield	No	No	No	Yes
Derry	No	Yes	No	Yes
Goffstown	No	No	No	Yes
Hooksett	Yes	Yes	No	Yes
Londonderry	Yes	Yes	No	Yes
Manchester	No	No	Yes	Yes
New Boston	No	No	No	No
Raymond	No	No	No	Yes
Weare	No	No	No	No

Source: Zoning Ordinances for the SNHPC Regional Communities

Environmental characteristics zoning focuses on protecting natural resources by limiting development within critical natural areas. Additionally, some ordinances, such as floodplain regulations, serve not only to protect natural resources, but to protect property.

Open space or cluster development is a popular choice for communities concerned about dwindling open space. In this type of development, the number of homes that would fit on a parcel of land in a traditional subdivision is built on a smaller portion of the same land, with the remaining land protected as common open space. The communities employing environmental characteristics zoning are outlined in the following table (7.4).

Wetlands protection provisions may range from an established overlay district based on a prime wetlands study the community completed to just a buffer around any wetlands established in the community's dimensional standards. These standards can be implemented through Zoning Ordinances, Site Plan Review and Subdivision

Regulations. Incorporation into all three sets of regulations ensures the greatest efficacy.

Steep slopes protections are often implemented much like wetland protections and in the SNHPC region are more often found in Subdivision and Site Plan Review Regulations rather than in Zoning. These regulations target land over a certain gradient, typically 25 percent but sometimes 15 percent. The most common and straightforward mechanism for regulating steep slopes is to remove the defined slopes from the calculation of buildable area.

Floodplain regulations must strictly follow state and national standards to ensure compliance with the National Flood Insurance Program. Floodplain regulations prohibit development in the floodway or from creating an increased risk of flooding, such as raising flood water heights, in the 100-year floodplain. The regulations not only serve to protect the floodplain, but to protect property and reduce a communities' risk to flood related disasters.

Aquifer and watershed protections work to protect groundwater supplies from adverse development and minimize the hazards related to the storage or disposal of solid and hazardous waste. They may review and inspect on site drainage systems and their associated groundwater impacts. They are designed to encourage uses that can be safely located within the direct and indirect aquifer recharge areas.

Soil based lot sizing establishes a minimum lot size based a site specific analysis of soil capacity to support development. The lot size is determined by the type of soil, its development potential as determined by drainage or erosion capabilities, or the presence of steep slopes. When combined, these factors establish the soil classification for which lot sizes are assigned to allow the least detrimental impact to the environment. Soil based lot sizing also is connected to septic design standards and ensuring adequate land area is available to provide a system that will not contaminate drinking water supplies.

Table 7.4
Environmental Characteristics Zoning

Municipality	Wetlands Protection Provisions	Steep Slope Protection Provisions	Floodplain Regulations	Aquifer or Watershed Protection District	Soil Based Lot Sizing	Open Space or Cluster Development
Auburn	Yes	No	Yes	Yes	No	Yes
Bedford	Yes	Yes*	Yes	No	Yes	Yes
Candia	Yes	No	Yes	No	No	No
Chester	Yes	Yes*	Yes	No	No	Yes
Deerfield	Yes	No	Yes	No	No	Yes
Derry	Yes	Yes*	Yes	Yes	Yes	No
Goffstown	Yes	Yes*	Yes	No	No	Yes
Hooksett	Yes	Yes*	Yes	Yes	Yes	Yes
Londonderry	Yes	Yes^	Yes	No	Yes	Yes
Manchester	Yes	Yes	Yes	No	Yes	No
New Boston	Yes	Yes	Yes	Yes	No	Yes
Raymond	Yes	Yes	Yes	Yes	No	Yes
Weare	Yes	No	Yes	Yes	Yes	Yes

*Regulations are within Subdivision or Site Plan Review Regulations and not the Zoning Ordinance.
^Only for selected zoning districts.
Source: Zoning Ordinances for the SNHPC Regional communities

There are a number of incentive based zoning techniques that communities can employ to achieve their Master Plan defined goals. Timing incentives, impact zoning, performance standards, dimensional incentives, transfer of density or development rights, flexible or discretionary zoning, inclusionary zoning and accessory dwelling unit standards can all be used by municipalities to encourage preservation of open space or historic resources and the creation of workforce housing, among many other objectives. The primary function of these tools is to induce developers and the free market to carry out a community's vision without a direct mandate. Table 7.5 below lists the communities that allow for incentive based zoning.

Timing incentives typically involve expediting the permitting process. In New Hampshire, timing incentives are unlikely because towns are bound to a 65 day clock and faster review periods are unrealistic. Impact zoning is a form of zoning that regulates the consequential impacts of development. Rather than defining a zone as commercial, industrial, residential, or some mixture, impact zoning defines standards development must meet within the zone such as noise, traffic, and visual appearance. Currently no communities in the SNHPC region utilize timing incentives or impact zoning.

Performance standards are used to control development while minimizing impacts to the natural or surrounding environment. Many uses may be allowed provided developers can meet certain standards relating to density, impervious surface coverage, open space, noise level, or other defined criteria.

Dimensional incentives are typically bonuses in the form of increased density; reduced minimum lot sizes, frontage, or setback requirements; or impervious surface coverage. Density bonuses can be given in return for a certain percentage of dwelling units being reserved as affordable or a certain percentage of land reserved as open space. Some towns allow an impervious surface bonus in return for easements in certain areas of the property.

Transfer of development rights (TDR) allows owners to separate the right to develop land from the land itself and re-allocate the development right of one parcel to another parcel of land. TDRs are similar to the provisions of a cluster development ordinance, where a developer forgoes the right to develop the entire parcel in return to higher density on a portion of the parcel with the remaining portion preserved as open space. In a TDR, however, the right to develop a parcel of land can be transferred to a different parcel, which could be non-contiguous and far apart, rather than the transaction being confined to one parcel as in cluster development. TDRs generally define "sending" and "receiving" sites in the ordinance.

Flexible or discretionary zoning is amorphous. This type of zoning can take a variety of forms including many of the things NH RSA 674:21 allows as innovative land use controls such as planned unit development and transfer of development rights. Flexible or discretionary zoning may also take shape as special permits, floating zones, conditional rezoning, and subdivision exactions, but most commonly is known as overlay zoning. With overlay zoning, communities can protect, encourage development, or discourage certain types of development within certain areas. Typically flexible zoning is applied to the entire community and not just to certain districts. It can also allow for mixed-use and densities. The discretionary portion provides for more negotiation between the developer and the community.

Inclusionary zoning provides incentives to developers that create housing for moderate, low-, and very low-income households. Incentives could be zoning exemptions and/or density bonuses if a portion of the proposed development is reserved for elderly, handicapped, or targeted lower-income households. Accessory dwelling units, while not an incentive for affordable housing, can help provide a more diverse and affordable housing stock in a community. Most communities in the SNHPC region define standards for accessory dwelling units.

Table 7.5
Incentive Based Zoning

Municipality	Performance Standards	Dimensional Incentives	Transfer of Density or Development Rights	Flexible and Discretionary Zoning	Inclusionary Zoning	Accessory Dwelling Unit Standards
Auburn	No	No	No	No	No	Yes
Bedford	Yes	Yes&	Yes	No	No	Yes
Candia	No	No	No	No	No	Yes
Chester	No	No	No	No	Yes	No
Deerfield	No	No	No	Yes	No	No
Derry	No	No	No	No	No	Yes
Goffstown	No	No	No	No	No	Yes
Hooksett	Yes	Yes	No	No	No	Yes
Londonderry	Yes	Yes	No	No	No	Yes
Manchester	No	No	No	No	No	Yes
New Boston	No	No	No	No	No	No
Raymond	No	Yes*	No	No	No	No
Weare	No	No	No	No	No	Yes

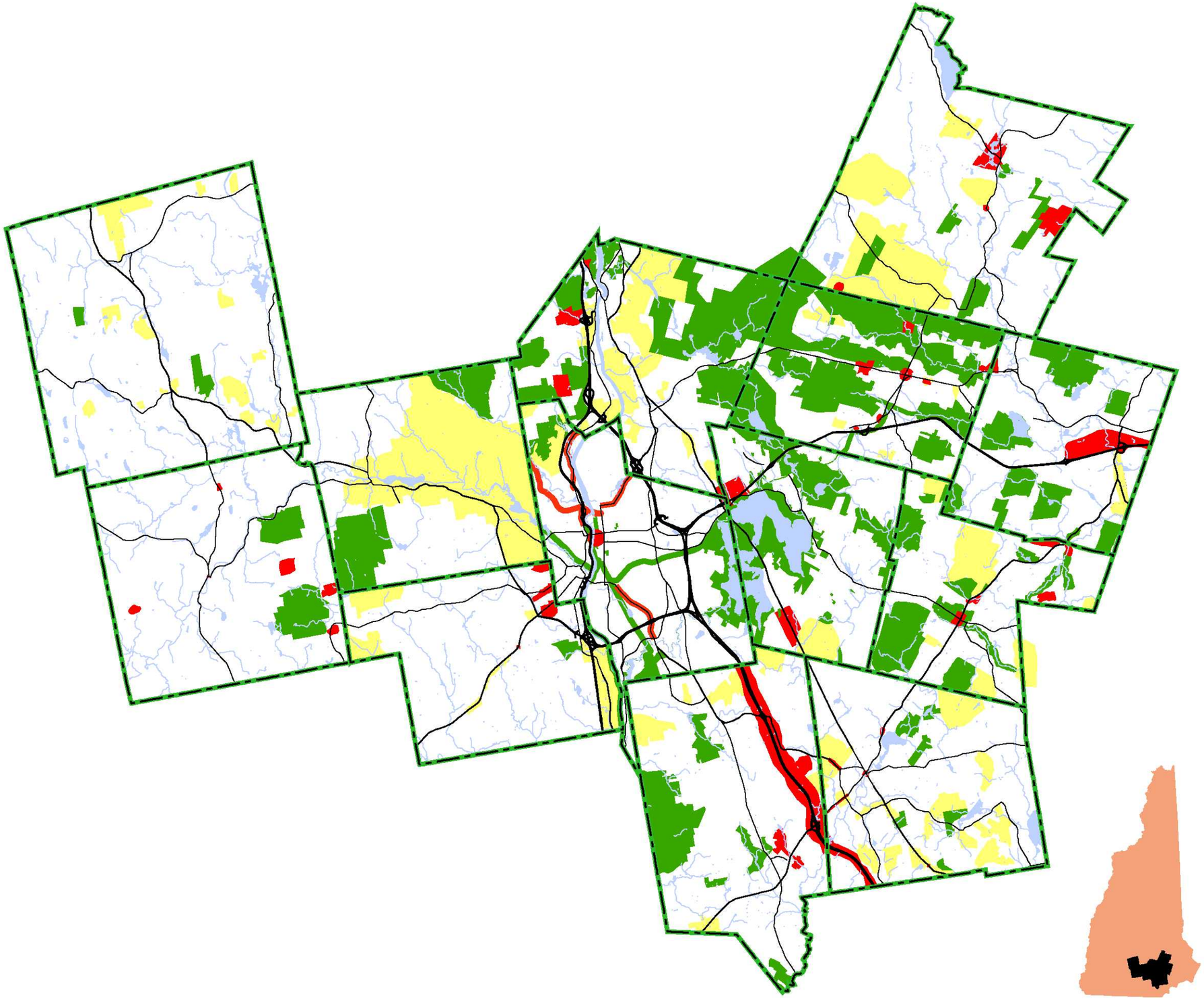
Source: Zoning ordinances for the SNHPC regional communities

While there are similarities between most ordinances, almost every community within the SNHPC region has adopted a zoning ordinance that is uniquely crafted to address the particular land use issues and concerns confronting their jurisdiction. At first glance, there is very little cross over or regional zoning consistency. However, there are pockets visible on the regional composite zoning map that illustrates instances of regional consistency. In particular, there are some industrially zoned areas that combine across municipal lines to form larger zones such as on the borders of Derry and Londonderry and the border between Auburn and Hooksett. These areas might give the impression of a large regional industrial zone, but dimension, design, permitted uses and a host of other considerations could differ between each town's ordinance resulting in developers preferring one town over another.

An additional situation that might result in uneven development patterns along municipal boundaries includes differences in residential zoning types along borders. For instance, the border between Chester and Derry and portions of Auburn reveals conflicting residential zoning provisions. The zoning in Chester is less restrictive (allows for smaller lot sizes) than that of Auburn or Derry in that area and as a result, development might be forced into Chester. Chester's desire to preserve it's outskirts as rural will be challenged by development spilling over into the town along those borders. Similar situations are evident along Weare's borders with New Boston and Goffstown, and again along Candia's border with Auburn

As the SNHPC region continues to grow and develop in the future, the need for consistency between zoning ordinances from one community to the next will increase in importance. Property owners and developers as well as the state's legal system demand predictability and consistency in building and land use practices. Additionally, the impacts of development are not limited solely within the boundaries of individual communities – they cross municipal lines just as transportation networks and natural resources do. Much of the industrial and commercial development in the region follows existing transportation routes, which often follow existing natural features such as rivers. To better protect these facilities and resources and to provide for greater predictability in building practices, there is a need for zoning consistency within the region. .

REGIONAL COMPREHENSIVE PLAN



Map #7.2

LAND USE AND GROWTH PERCEPTIONS

Legend

Political Boundaries

- Townline

Road Network

- Interstate
- State Route
- Major Roads

Hydrography

- Streams
- Rivers/ Lakes

Growth Perceptions

- Existing Problem Area
- Major Growth Area
- Regional Assets

Data Sources:

Granit Digital Data (1:24,000)
NH Department of Transportation
Growth Perceptions GIS data is created by SNHPC from digitizing the draft growth area maps of all 13 communities within the region

The individual municipalities represented on this map and the SNHPC make no representations or guaranties to the accuracy of the features and designations of this map.

This map is prepared for planning purposes only and is not to be used for legal boundary determinations or for regulatory purposes.

Map Produced by GIS Service SNHPC April 2006.
For reprints or furthur questions

Contact: SNHPC, gis@snhpc.org or (603) 669-4664

SNHPC

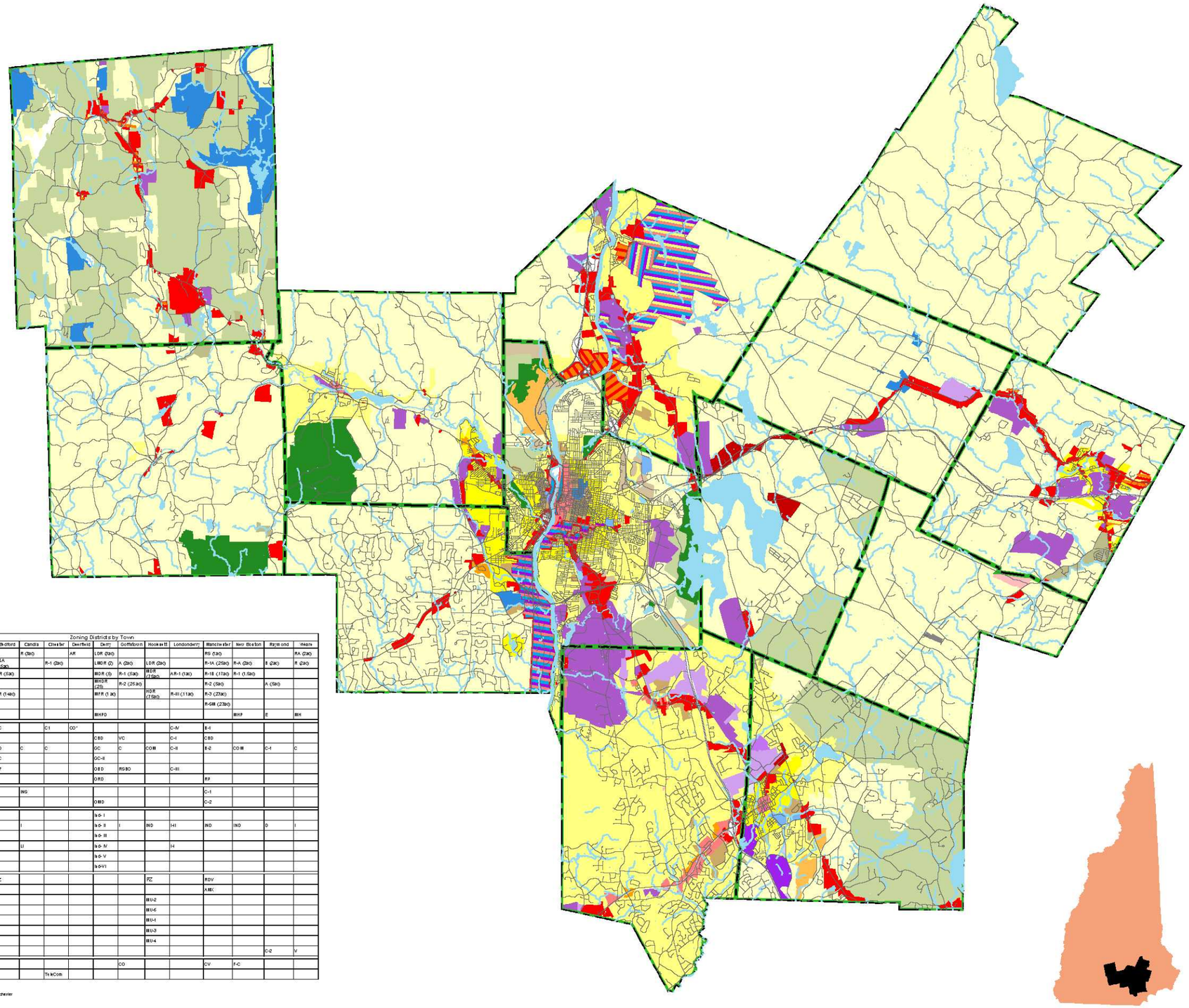
0 7,500 15,000 30,000 Feet

0 1.5 3 6 Miles

Regional Comprehensive Plan 2005

Map #7.3

Composite Generalized Zoning Map



Legend

- Major Roads
- Streams
- Rivers
- Lakes or Streams
- Town Boundaries

Zoning Districts by Town

Land Use		Auburn	Bedford	Candia	Chester	Deerfield	Derry	Goffstown	Hooksett	Londonderry	Manchester	New Boston	Raymond	Weare
Residential	Rural/Agricultural 3+	R (3ac)		R (3ac)		AR	LDR (3ac)				RS (3ac)			RA (3ac)
	Residential SF 2 ac	R-1/R-2 (2ac)	R&A (1.5ac)		R-1 (2ac)		LMDR (2)	A (2ac)	LDR (2ac)		R-1A (25ac)	R-A (2ac)	B (2ac)	R (2ac)
	Residential SF 1 ac		GR (1ac)				MDR (.5)	R-1 (1ac)	MDR (.75ac)	AR-1 (1ac)	R-1B (.17ac)	R-1 (1.5ac)		
	Residential SF < 1 ac						MHDR (.25)	R-2 (.25ac)	HDR (.5ac)		R-2 (1ac)		A (1ac)	
	Med-High Density MHS-Fam		AR (1ac)				MFR (1 ac)		HDR (.75ac)	R-III (11ac)	R-3 (.23ac)			
	Low Density MHS-Family										R-6M (.23ac)			
	Manufactured Housing						MHPD					MHP	E	MH
Commercial	Neighborhood Comm	C-2	NC		C1	CO*				C-IV	E-1			
	Central Business District						CBD	VC		C-I	CBD			
	Commercial		CO	C	C		GC	C	COM	C-II	E-2	COM	C-1	C
	Commercial Highway	C-1	HC				GC-II							
	Commercial-Office		OF				OBD	RSBD		C-III				
	Research Park						ORD				RP			
Inst	Civic/Public/Institutional		CI	INS							C-1			
	Medical						OMD				C-2			
Industrial	Industrial 1						In-0- I							
	Industrial 2	I	SI	I			In-0- II	I	IND	HI	IND	IND	D	I
	Industrial 3						In-0- III							
	Industrial 4			U			In-0- IV			H				
	Industrial 5						In-0- V							
	Industrial 6						In-0-VI							
Mixed Use	MU Comm/Ind/Res 1		FZ						FZ		RDV			
	MU Comm/Ind/Res 2										AMC			
	MU Ind/Cr/Res/Res 1								MU-2					
	MU Ind/Cr/Res/Res 2								MU-6					
	MU Res/Res/Res 1								MU-1					
	MU Res/Res/Res 2								MU-3					
	MU Res/Res/Res 3								MU-4					
	Mixed Use Com/Res												C-2	V
Other	Conservation							CO			CV	F-C		
	Tele-Communication				TeleCom									

Note:
Overlay district not included
Acres are approximated in .25 acre increments with the exception of Manchester
Lot sizes represent the smallest permitted lot

Data Sources:
Granit Digital Data (1:24,000)
NH Department of Transportation
NH Department of Environmental Services

The individual municipalities represented on this map and the SNHPC make no representations or guaranties to the accuracy of the features and designations of this map.

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SNHPC

0 7,500 15,000 30,000 Feet

0 1.5 3 6 Miles

Chapter Eight:

Housing

Introduction

The Southern New Hampshire Planning Commission Region is a desirable place to live. The current housing stock and future housing needs attest to this fact. Nearly 18 percent of the total housing units in the State are located in the SNHPC Region. Still, the need for additional housing units persists. Furthermore, as real estate costs have risen due to increased demand, home ownership has increasingly been slipping out of the reach of working families in the area. But communities can accommodate residents with affordable housing, while maintaining the rural character and charm of the New England village with which they are identified.

The demand for housing in the SNHPC Region will continue in the future. Housing production has been surpassed by population increases since the 1990s. As a result, the SNHPC Region is faced with a situation in which demand is greater than the available supply, and the high purchase prices reflect this.

The 2005 Housing Needs Assessment for the SNHPC Region provides a comprehensive overview of both the existing and future housing needs in the region and serves as the foundation for this chapter.[1] Much of the statistical data in this chapter was gleaned from this publication. The assessment analyzes the region's housing supply, demand, and affordability; presents mechanisms for promoting affordable housing creation; and allocates the region's fair share distribution of low-income housing. For this chapter, that information was consolidated to represent a regional outlook, because invariably, the success of each individual community begins with regional cooperation.

Single-family units make up the majority of the existing housing stock, both in the State of New Hampshire and in the SNHPC Region. While there has been an increase in multi-family and duplex building permits in the area, that increase has not been large enough to change the balance of the total unit make-up.

Within the SNHPC Region, there is an increased need for assisted housing due to the rising prices. Only seven of the thirteen member-communities offer rent-assisted housing, and of those, nearly 77 percent of the total rent-assisted units are in Manchester. However, the need for rental assistance is present in all communities.

Rising prices has made home ownership more difficult to attain, even for middle and upper-middle income families. From 1995 – 2003, New Hampshire home prices outpaced both New England and the nation. For the same period, the median purchase price rose 108 percent in the SNHPC Region.

1. The full document is available on the SNHPC web site at http://www.snhpc.org/Landuse.html.

Rental costs have also exhibited increases. From 1995 – 2004, the median gross rent increased nearly 75 percent, compared to an average wage increase in the region of 44% during the same period. Vacancy rates are still below the recommended five-percent rate despite small increases, which means that rental units are hard to come by. Compared to homeowners, a greater percentage of renters make less than the Median Area Income. Additionally, renters are more likely to allot more than 30 percent of their income towards housing costs than homeowners. These figures demonstrate that home ownership is a greater stretch for renters and the need for affordable rental units is high.

While there is no requirement to provide affordable housing, RSA 672:1 III-e prohibits the exclusion of such development. The law recognizes that "all citizens of the state benefit from a balanced supply of housing which is affordable to persons and families of low and moderate income." Exclusionary zoning was found to violate RSA 674:16, the zoning enabling act, because it was deemed that by not offering multi-family or affordable housing, the town was not "promoting the health, safety, or the general welfare of the community." All municipalities are also required to provide reasonable opportunities for the siting of manufactured housing per RSA 674:32. Thus, manufactured housing, including trailers or mobile homes (RSA 674:31), cannot be excluded or segregated. Communities today recognize the need for affordable housing, as well as their obligation to provide some portion of their 'fair share' of that housing in the region.

Many populations within the SNHPC Region could benefit greatly from affordable or workforce housing. Firefighters, municipal employees, police, first responders, teachers, the elderly, immigrants and refugees, and service sector personnel are good examples the region's populations that find it increasingly difficult to live in their communities. There are attempts to meet some of these needs, but communities can do more to encourage developers to provide these types of housing. New data points out that the impact multi-family and workforce housing has on local services, such as schools, is negligible. Moreover, the people that occupy these types of housing provide economic benefits for the community as well.

Inclusionary zoning, mixed-use zoning, accessory dwelling units and manufactured housing are just a few examples of how to solve the affordability problem. There are other incentives and disincentives that can also be administered. Increased density can simultaneously provide affordable housing and preserve open space. This can be accomplished through innovative land use controls, permitted by RSA 674:21. These solutions are outlined in greater depth within the chapter.

Existing Housing Conditions

Housing supply in the SNHPC Region is influenced by many factors, such as, housing stock, new construction, tenure and occupancy choices, condition of the existing stock, variety of housing prices, and anticipated future need. Additional elements include land use regulations, availability of suitable land for new construction, access to infrastructure, availability and cost of construction labor, and new construction technology. The availability of housing stock, in turn, affects larger issues such as housing prices and the overall economy of the region, including the ability to attract and retain businesses and employees.

The existing housing supply in the SNHPC Region comprises slightly less than 18 percent of New Hampshire's homes, or 100,379 units in 2003. The number of housing units increased by 13,145 units, or approximately 15 percent, between 1990 and 2003 in the SNHPC Region. The greatest number of housing units is found in the City of Manchester, the centrally located and largest municipality in the state. The number of housing units decreases progressively based on the distance from Manchester, as well as the accessibility to major transit routes bisecting the region.

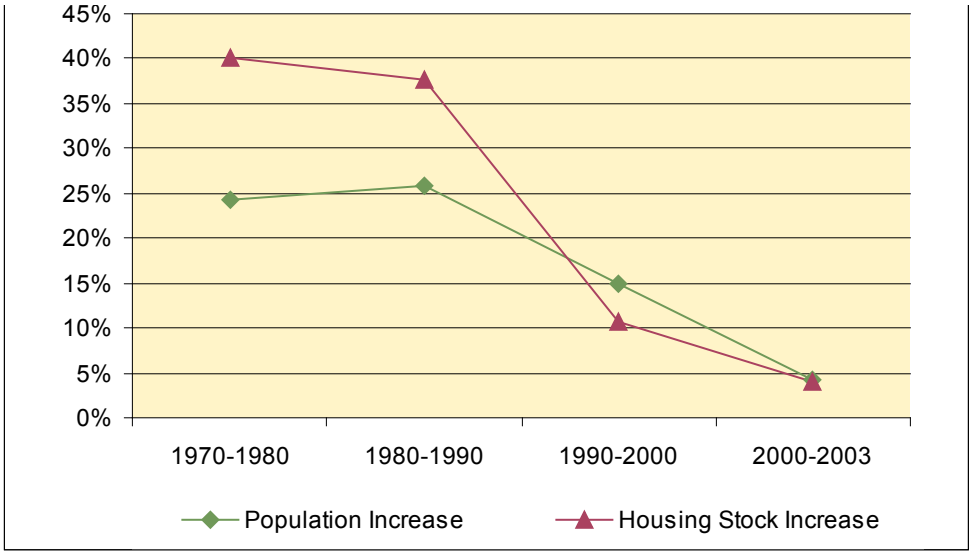
Table 8.1
Total Housing Unit Increase SNHPC Region, 1990, 2000 and 2003

Municipality	Number of Housing Units			1990-2000		2000-2003	
	1990	2000	2003	Difference	Percent Change	Difference	Percent Change
Auburn	1,355	1,622	1,734	267	19.70%	112	6.91%
Bedford	4,156	6,401	7,216	2,245	54.02%	815	12.73%
Candia	1,192	1,384	1,485	192	16.11%	101	7.30%
Chester	924	1,247	1,418	323	34.96%	171	13.71%
Deerfield	1,227	1,406	1,619	179	14.59%	213	15.15%
Derry	11,869	12,735	12,916	866	7.30%	181	1.42%
Goffstown	5,022	5,798	6,046	776	15.45%	248	4.28%
Hooksett	3,484	4,307	4,673	823	23.62%	366	8.50%
Londonderry	6,739	7,718	8,047	979	14.53%	329	4.26%
Manchester	44,361	45,892	46,568	1,531	3.45%	676	1.47%
New Boston	1,138	1,462	1,629	324	28.47%	167	11.42%
Raymond	3,350	3,710	3,952	360	10.75%	242	6.52%
Weare	2,417	2,828	3,076	411	17.00%	248	8.77%
SNHPC Region	87,234	96,510	100,379	9,276	10.63%	3,869	4.01%

Sources: 1990 U.S. Census SF1-H1
2000 U.S. Census SF1-H1
SNHPC Annual Land Use Reports, 2000-2003

With the recession in the 1980s, demand for new housing units dropped. As the economy recovered throughout the 1990s, new construction steadily increased. Population began to outpace housing production in the 1990s and has continued to do so into the 21st century. The lack of housing supply and the increased demand has caused prices to rise considerably.

Figure 8.1
Comparison of Existing Housing Stock to Population in the SNHPC Region



Housing demand is not expected to decrease in the future. On the contrary, New Hampshire's population is expected to grow by more than 357,000 from 2000 to 2025 – an increase of more than 28 percent. Furthermore, the four southeastern counties, or about one-third of the land base of the state, of which the SNHPC Region is a part, will absorb the majority of this population increase.[2]

The existing housing stock of New Hampshire and the SNHPC Region is overwhelmingly made up of single-family homes. In the SNHPC Region, the number of single-family home units increased by 26.6 percent from 1990 to 2003. The issuance of single-family home building permits has decreased since 2000, and duplex and multi-family, and manufactured housing permits have increased slightly, but this change is so small it is almost imperceptible in terms of absolute units. In fact, Manchester is the only city that has more duplex and multi-family units – 28,994 - than single-family units – 17,413. Following a close second is Derry, with 5,838 duplex and multi-family units compared to 6,512 single-family units.

2. Society for the Protection of New Hampshire's Forests, "New Hampshire's Changing Landscape 2005," http://www.forestsociety.org/research/papers/nhcl2005es.pdf accessed 26 July 2005.

As a region the amount of single-family housing units is comparable to that of the State. Duplex and multi-family units make-up a slightly higher percentage in the Region as compared to the State. This is most likely a result of the inclusion of the City of Manchester in the regional totals. Additionally, the percentage of manufactured housing in the region is less than half that of the State, again most likely due to the fact that the region encompasses a greater proportion of urban areas than other parts of the State (Table 8.2).

Table 8.2
Proportion of Housing Unit Types in the SNHPC Region, 2003

Geographic Area	Single Family		Duplex and Multi-Family		Mobile Homes and Other Housing		Total Units
	Quantity	Percent	Quantity	Percent	Quantity	Percent	Quantity
SNHPC Region	54,901	54.69%	42,712	42.55%	2,766	2.76%	100,379
State of New Hampshire	365,005	63.00%	176,528	30.50%	37,678	6.50%	579,211

Sources: SNHPC Annual Land Use Reports, 2000-2003
"Current Estimates and Trends in New Hampshire's Housing Supply 2002" NH OEP

Due to the rising prices as a result of increased demand, there is an even greater need for assisted housing supply in the SNHPC Region. Forms of assistance include rental subsidies, low-income loans, vouchers covering all or a portion of the housing allowance, and rent assisted housing development grants to encourage the development of units for low-income households.

Only seven of the thirteen member communities - Bedford, Deerfield, Derry, Goffstown, Hooksett, Manchester, and Raymond - offer rent-assisted housing facilities. Nearly 77 percent of the total rent-assisted housing units in the region are located in Manchester. The total number of units in the region is evenly split between those designated for the elderly and those for families, with 1,723 and 1,730 units respectively.

Home ownership, the American Dream, has been increasingly slipping out of the reach of many Americans – and not only low-income earners. The ability to own one's own home has progressively become more difficult even for middle and upper-middle income earners, both nationally, in New England, and more specifically, in New Hampshire. The increase in home prices, adjusted for inflation, from 1995 – 2003 was 34.7 percent nationally, and 59.6 percent in New England. New Hampshire home prices were the second fastest growing in New England for the period 1995 - 2003, with a 67.8 percent increase when adjusted for inflation (99 percent increase when not adjusted for inflation).[3] According to a survey sponsored by the National Association

3.Jeanne Morris, "When the bubble bursts," New Hampshire Sunday News, July 3, 2005.

of Realtors (NAR) in July 2002, "the high cost of housing has affected the condition and size of the home families can afford, if they can afford to buy one at all."[4]

In the SNHPC Region, the median purchase price for residential property rose 108 percent from 1995 to 2003. From 1997 to 1998 alone, the median purchase price jumped 17 percent, with an additional increase of 79 percent from 1998 to 2003. The median purchase price for all homes in the SNHPC Region escalated from $171,313 in 2001, to $203,727 in 2002, to $225,901 in 2003.[5]

While the number of low and moderate-income homeowners is less than that of renters, there is still reason for concern. Nearly 16 percent of owner-occupied households make less than half of the median area income and of those, 45 percent are paying more than 30 percent towards housing expenses. The number of owner-occupied households making less than 80 percent of the median area income is 33 percent, with 28 percent of those paying more than 30 percent of that income towards housing costs.

Rental costs in the SNHPC Region have also increased substantially. Median gross rent increased nearly 75 percent from 1995 through 2004. In 1998 the median gross rent for the SNHPC Region was $659. By 2003, that figure had climbed to $919, a 39.5 percent increase. Over the same time period, the vacancy rate rose from 1.75 percent to 2.2 percent, a 27 percent increase, but still well below the recommended five-percent rate.

The number of low and moderate-income households compounds the problem of high rental costs. In renter occupied households, 45 percent make less than 50 percent of the median area income and are considered low income. Of those, nearly 60 percent are paying more than 30 percent of that income towards housing expenses. Seventy-one percent are moderate-income earners, making less than 80 percent of the median area income, and 46 percent pay more than 30 percent of that income towards housing expenses.

According to the National Association of Realtors (NAR) survey, New Englanders were most likely to move farther out to find affordable housing, a response echoed by many New Hampshire housing and government officials and, increasingly, business managers and owners. This means commutes are longer, businesses have a harder time attracting employees, and the people who most need to live in the community – policemen, firemen, and healthcare workers – cannot afford to do so.

4.National Association of Realtors, http://www.realtor.org/SG3.nsf/Pages/highcosts?OpenDocument accessed 25 July 2005.

5.These figures have not been adjusted for inflation.

Future Housing Conditions

An understanding of future needs for housing units is invaluable to the planning process. Future housing projections are utilized both in transportation modeling, as well as growth management and future land use planning. Prior to 2003, the SNHPC's housing projections were based on the historical annual average increase in housing units. This figure was assumed to be constant, and projections were calculated at five-year intervals for both the community and traffic zone levels. Housing projections were utilized in transportation planning, and this method was the most acceptable, since for these studies projections had to be made independent of population or employment projection data.

The latest housing projections are based on a model pioneered by Bruce Mayberry on behalf of the New Hampshire Housing Finance Authority. In this model, three alternative projections are generated for 2010 and are primarily based on 1990 and 2000 census data and employment and population growth for the region. The first projection assumes the region maintains its constant share of the State's employment through 2010. The second projection assumes the region will retain its share of the State's 2000-2010 employment growth. Both the first and second projections allow housing unit growth to respond to employment growth within the region. The third method is based on municipal level population projections. The final estimation of the region's future housing needs is an average of the original historical average method and the three newer methods developed by Bruce Mayberry.

Details of SNHPC's housing unit projections are outlined in Tables 9 and 10 of the Housing Needs Assessment. A summary of the current housing needs projections is presented below.

Table 8.3
Comparative Dwelling Unit Projections, 2000-2010

Municipality	2000 Census	2010 Projection (Average of all four methods)	Percent Change from 2000 to 2010	Annualized Growth Rate
Auburn	1,595	1,940	21.61%	1.98%
Bedford	6,350	7,784	22.59%	2.06%
Candia	1,371	1,658	20.93%	1.92%
Chester	1,233	1,534	24.38%	2.21%
Deerfield	1,233	1,567	27.08%	2.43%
Derry	12,500	14,748	17.99%	1.67%
Goffstown	5,694	6,864	20.55%	1.89%
Hooksett	4,255	5,239	23.13%	2.10%
Londonderry	7,652	9,218	20.47%	1.88%
Manchester	45,101	53,239	18.04%	1.67%
New Boston	1,445	1,791	23.95%	2.17%
Raymond	3,534	4,306	21.85%	2.00%
Weare	2,667	3,304	23.88%	2.16%
SNHPC Region	94,630	113,193	19.62%	1.81%

Source: SNHPC Housing Needs Assessment, 2005

Although the Regional Comprehensive Plan provides a vision for the region to the year 2015, housing projections have not been extended to 2015 because the methodology used cannot produce a valid projection beyond 2010. In order to project to 2015, the annualized employment growth rate from 1990-2000 would have to remain constant for 15 years, rather than 10 years. Admittedly, the 2010 projections presented here may be overestimated, since two of the four projection methods assume that the 1990-2000 employment growth rate will remain constant from 2000 to 2010. In fact, the actual annualized employment growth rate from 2000 to 2003 has been only 0.5 percent in the SNHPC Region compared to an annualized growth rate of 2.9 percent from 1990-2000.

Adequate, affordable housing for families of all income levels is essential to the continued prosperity of the SNHPC Region. Such housing enables the region to attract and retain residents that contribute to its overall economic success and maintain the quality of life residents have come to appreciate. In recognition of this need, a local "fair share" distribution is determined for each municipality in the region as part of the Housing Needs Assessment.

The 2004 Housing Needs Assessment utilizes a new methodology, also developed by Bruce Mayberry for the New Hampshire Housing Finance Authority. Mayberry provided opportunity for a wide variety of income and need levels to be examined. The SNHPC analysis focuses on two: renters under 80 percent of the median area income

(MAI) and paying 30 percent or more to gross rent and renters under 50 percent MAI and paying more than 35 percent or more to gross rent. These categories are further broken down into non-elderly households and elderly (65+) households. The factors used to determine the non-elderly distribution were:

- Municipal percent share of the region's jobs
- Municipal percent share of the region's commercial-industrial valuation
- Municipal percent share of the region's workforce
- Municipal percent share of the region's existing total occupied households
- Municipal percent share of the region's aggregate household income
- Municipal percent share of the region's vacant residentially zoned land

The factors used to determine the elderly distribution were:

- Municipal percent share of the region's commercial-industrial valuation
- Municipal percent share of the region's age 65-plus households
- Municipal percent share of the region's renters age 65-plus
- Municipal percent share of the region's vacant residentially zoned land

The following table summarizes the proportionate distribution of moderate and lower income housing needs of renters earning less than 80 percent MAI and paying greater than 30 percent towards housing costs. The table is an aggregate of the 2000 and 2010 distributions for both elderly and non-elderly households. These individual calculations can be viewed in Tables 27.1, 27.2, 27.3, and 27.4 in the Housing Needs Assessment.

Table 8.4
Proportionate Distribution of Moderate and Lower Income Housing Needs
Renters Under 80% MAI and Overpay at 30%+

Municipality	2000		2010	
	Number of Households	Fair Share Distribution	Number of Households*	Fair Share Distribution
Auburn	19	291	23	336
Bedford	170	1,056	204	1,230
Candia	7	287	8	331
Chester	20	259	24	299
Deerfield	32	453	38	525
Derry	1,404	980	1,688	1,201
Goffstown	361	682	434	805
Hooksett	271	630	326	754
Londonderry	260	1,151	313	1,333
Manchester	7,923	3,561	9,527	4,501
New Boston	61	420	73	485
Raymond	241	512	290	595
Weare	131	618	158	712
SNHPC Total	10,900	10,900	13,106	13,106

Equals the 2000 number of households projected at a 1.8604% annualized growth rate
Source: SNHPC Housing Needs Assessment, 2005

The following table summarizes the proportionate distribution of low and very low income housing needs of renters earning less than 50 percent MAI and paying greater than 35 percent towards housing costs. The table is an aggregate of the 2000 and 2010 distributions for both elderly and non-elderly households. These individual calculations can be viewed in Tables 28.1, 28.2, 28.3, and 28.4 in the Housing Needs Assessment. Once again, fair share distribution projections could not be accurately extended to 2015 because they are directly linked to the overall dwelling unit projections.

Table 8.5
Proportionate Distribution of Low and Very Low Income Housing Needs
Renters Under 50% MAI and Overpay at 35%+

Municipality	2000		2010	
	Number of Households	Fair Share Distribution	Number of Households*	Fair Share Distribution
Auburn	19	222	23	253
Bedford	78	789	94	909
Candia	7	220	8	250
Chester	13	199	16	226
Deerfield	29	344	35	394
Derry	976	640	1,174	793
Goffstown	265	495	319	580
Hooksett	198	442	238	527
Londonderry	135	871	162	996
Manchester	5,533	2,137	6,653	2,789
New Boston	36	323	43	367
Raymond	164	384	197	442
Weare	85	473	102	539
SNHPC Total	7,538	7,538	9,064	9,064

Equals the 2000 number of households projected at a 1.8604% annualized growth rate
Source: SNHPC Housing Needs Assessment, 2005

Estimated fair share distributions allow communities to foresee and plan for increases in affordable housing needs. These estimates should be considered a guide for each community striving to increase the number of decent, affordable housing units it provides. By considering the distributions, communities can assess their fair share needs and contributions relative to other communities in the region. Additionally, the fair share distribution provides a framework for the establishment of a cohesive affordable housing policy at the regional level.

Current Housing Needs and Concerns in the Region

New Hampshire's population is growing. The SNHPC Region alone is projected to add nearly 30,000 more residents over the next ten years. At the same time, area incomes have not kept pace with the rising cost of home ownership. Additional housing will be needed, and it should represent a mix of types that provides housing to all income levels.

As the cost of home ownership continues to skyrocket, the reality of those who need affordable housing is very different from the perception of affordable housing. These perceptions are deeply ingrained and severely flawed. Many people think that affordable housing will not blend into their neighborhoods and are only large, ugly projects, which reduce surrounding property values and raise taxes. It is perceived that affordable housing will lead to increased crowding and social problems, as well as higher crime.

In truth, affordable housing today is none of these things. A wide range of incomes and backgrounds needs quality affordable housing. Likely the people who could most benefit from affordable housing are our neighbors, co-workers, friends, or family.

Affordable housing is housing that is affordable to all income levels when spending less than 30 percent of household income towards housing costs. However, we choose to focus on households earning 80 percent or less of the Mean Area Income (MAI), since it is assumed that households earning more have greater options and flexibility within the market-rate housing stock. For residents earning 80 percent or less of the MAI, there is currently not enough affordable housing supply to meet the demand.

Table 8.6
Median Area Family Income (MAI)

Area	Median Family Income	80% of MAI	Monthly Payment at 30% of 80% MAI
Manchester, NH PMSA	$59,710	$47,768	$1,194
Auburn, Bedford, Candia, Goffstown, Hooksett, Londonderry, Manchester, Weare			
Lawrence, MA - NH PMSA	$63,601	$50,880	$1,272
Chester, Derry, Raymond			
Hillsborough County	$62,363	$49,890	$1,247
New Boston			
Rockingham County	$66,345	$53,076	$1,327
Deerfield			

Source: NHHFA and SNHPC calculations

Table 8.7
Monthly Mortgage Payments*

Based on 2004 Average Purchase Price of $248,424			
0% down @ 5.75% for 30 years	20% down ($49,684.80) @ 5.75% for 30 years	10% down ($24,842.40) @ 5.75% for 30 years	5% down ($12,421.20) @ 5.75% for 30 years
$1,449.74	$1,159.79	$1,304.76	$1,377.25

*Monthly mortgage payments include principal and interest only
Source: SNHPC

Affordability and the need for affordable housing affect many different groups of people in various ways. Perhaps foremost in our consciousness are the rising costs of real estate. Most residents would agree that the purchase price for homes and condos in the area is quite high. Creative financing options such as reverse amortization, interest-only, and adjustable-rate (ARMs) mortgages have enabled more people to achieve the "American Dream" of home ownership despite rising prices. These types of mortgages allow people to finance more and to outbid others for the house

of their dreams, but the dangers down the road are numerous. However, these types of mortgages can offer an initial period with low payments and fixed interest rates. Once this period expires, the subsequent readjustment can mean a significant hike in the monthly payments. The result can be an inability to meet the financial obligations of the loan and eventually, foreclosure. The impacts on communities due to the rising number of foreclosures can be a significant burden. A recent report indicated that the foreclosure of one single-family home could cost the community up to $30,000 in lost tax revenues, administrative and legal fees.[6]

For those that cannot afford home ownership, the rental market presents another component of the affordable housing picture. Rental costs in the region have fluctuated, but for the most part have increased since 1995 at slightly slower percentages than purchase prices.

A greater percentage of renters opposed to homeowners in the SNHPC Region make less than half of the MAI (45.22 percent of households) or less than 80 percent MAI (70.62 percent of households). Among homeowners, on the other hand, only 15.96 percent make less than 50 percent of the MAI and 23.66 percent less than 80 percent of the MAI.

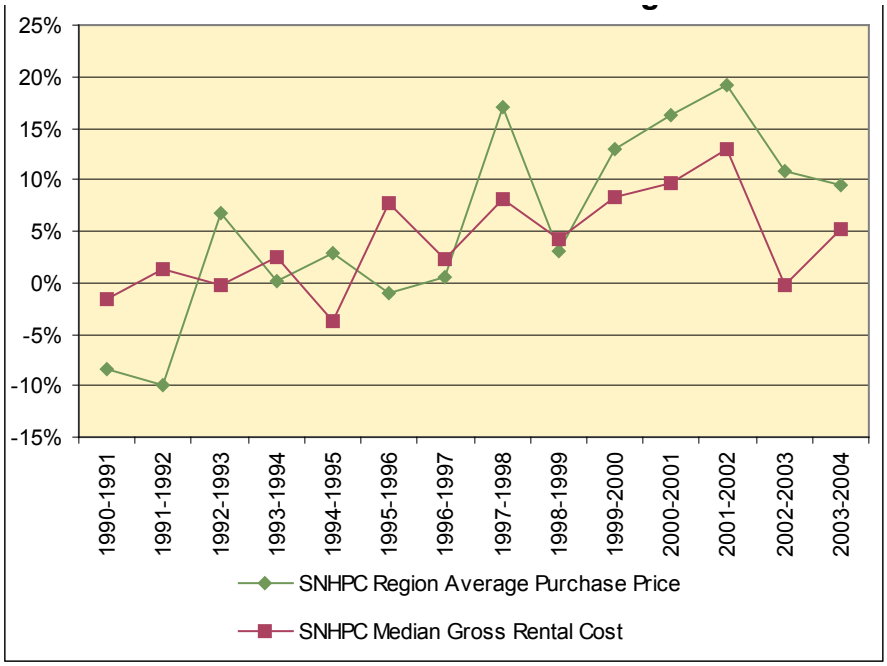
Rental properties in the SNHPC Region are extremely scarce outside Manchester and rent assisted units are subject to waiting lists hundreds of people long. The current practice of converting apartments to condominiums further exacerbates the problem, displacing people that cannot afford to own homes for the sake of supplying less expensive owner occupied homes.

With such a large percentage of renters below the median area income, communities need to provide more affordable rental units. Both the public and community planners need to be educated that apartments are positive additions, and the people who live in apartments are viable members of the community. Apartments can benefit communities by reducing sprawl, conserving open space, reducing traffic congestion and the burden to area schools, and improve economic success by providing housing for employees and customers of local businesses.

Given the recent rises in real estate prices, a growing share of residents in the 80 percent MAI to 100 percent MAI range, who previously were not considered to need affordable housing, are finding home ownership beyond their reach. Workforce housing provides opportunities to the people that fulfill jobs vital to a community's existence, such as teachers, health care workers, and police and fire personnel that may fall within this income bracket.

6 "Collateral Damage: The Municipal Impact of Today's Mortgage Foreclosure Boom," http://www.nmhc.org/Content/ServeContent.cfm?IssueID=60&ContentItemID=3489 accessed 2 August 2005.

Figure 8.2
Annual Increase of Purchase Price and Rental Costs in the SNHPC Region



Workforce housing should be a goal of communities in the SNHPC Region. Communities depend on service providers to perform at their best all the time. By not providing affordable workforce housing, these essential personnel are hampered by undue stress, long commutes, and disenfranchisement from the community.

Recent trends have been to limit housing, so as not to overburden local services, especially schools. The belief that additional housing brings additional school enrollment prevails, even while the data does not support it. The average number of school age children for all housing types is just .42, and in single-family homes the average number is still only .55. Furthermore, the numbers of parents with school age children has dropped by 16,000 since 2000 and is expected to continue to decline over the next ten years.[7] Additionally, the number of households in the SNHPC Region without children present has risen by 16.42 percent from 1990 to 2000.

7. Garry Rayno, "Housing costs, development are discussion topics," The Manchester Union Leader, May 18, 2005.

Table 8.8
Householders with no children

Municipality	Married Couple Families		Male Householder and No Wife Present		Female Householder and No Husband Present		Total		
	1990	2000	1990	2000	1990	2000	1990	2000	Percent Change
Auburn	407	554	14	26	30	41	451	621	37.7%
Bedford	1,405	2,305	42	70	81	129	1,528	2,504	63.9%
Candia	381	498	18	34	22	33	421	565	34.2%
Chester	288	420	7	16	28	29	323	465	44.0%
Deerfield	299	404	13	21	25	30	337	455	35.0%
Derry	2,680	2,954	161	197	274	388	3,115	3,539	13.6%
Goffstown	1,524	1,794	67	77	118	189	1,709	2,060	20.5%
Hooksett	1,096	1,318	54	69	109	146	1,259	1,533	21.8%
Londonderry	1,788	2,154	85	95	131	229	2,004	2,478	23.7%
Manchester	10,164	10,334	696	922	1,635	1,856	12,495	13,112	4.9%
New Boston	331	466	10	16	24	45	365	527	44.4%
Raymond	870	1,001	41	50	67	132	978	1,183	21.0%
Weare	642	767	18	42	37	47	697	856	22.8%
SNHPC Region	21,875	24,969	1,226	1,635	2,581	3,294	25,682	29,898	16.4%

Sources: 1990 U.S. Census SF1-P16 2000 U.S. Census SF1-P20

Table 8.9
Population age 55-64

Municipality	1990	2000	Percent Change
Auburn	220	383	74.1%
Bedford	1,041	1,737	66.9%
Candia	229	311	35.8%
Chester	194	300	54.6%
Deerfield	187	293	56.7%
Derry	1,448	2,204	52.2%
Goffstown	1,124	1,295	15.2%
Hooksett	740	949	28.2%
Londonderry	958	1,699	77.3%
Manchester	8,015	8,094	1.0%
New Boston	178	321	80.3%
Raymond	491	728	48.3%
Weare	286	416	45.5%
SNHPC Region	15,111	18,730	23.9%

Sources: 1990 U.S. Census SF1-P11
2000 U.S. Census SF1-P12

The over-55 demographic in the SNHPC region is growing and creating new housing needs. While aging populations do not add to school enrollment, there is the possibility that healthcare services will be impacted to a larger degree, but these services are generally not financed through property taxes and thus do not pose an undue hardship for the towns. Many communities are addressing this increase in elder population through age-restricted housing. Nine communities in the SNHPC Region permit elderly housing in community zoning – Bedford, Candia, Deerfield, Derry, Goffstown, Hooksett, Londonderry, Manchester and Raymond. In Auburn, Chester, New Boston, and Weare elderly housing is not specifically noted in zoning.

Age-restricted housing benefits communities by enabling older residents to remain in the community and providing tax income without added pressure on school enrollment. In the short-term, affordable housing for seniors makes sense economically. However, age-restricted housing should not be favored over other forms of affordable housing; a balance needs to be achieved to foster continued economic growth. Working families are more likely to attract new businesses or support existing ones than seniors are. As a result, an over-production of age-restricted units could lead to negative long-term economic impacts.[8]

The SNHPC Region, and specifically Manchester, has received an influx of immigrants and refugees over the last 15 years. As of the 2000 census, there were 10,035 foreign-born residents in Manchester. These immigrants made up 9.4 percent of Manchester's total population, more than double that of the statewide percent of immigrant population (4.4%). The immigrant population increased by 48.2 percent from 1990 to 2000 in the City; with immigrants accounting for 43.9 percent of Manchester's total population increase over the decade.[9]

8 The Rockingham News, "Affordable housing will build dynamic communities," April 2, 2004, http://www.seacoastonline.com/2004news/rock/04022004/opinion/8693.htm accessed 27 July 2005.

9. Federation for American Immigration Reform, City Factsheet: Manchester, New Hampshire, http://www.fairus.org/news/NewsPrint.cfm?ID=1070&c=9 accessed 22 July 2005.

The International Institute of New Hampshire assists refugees in many ways, including helping them to find their first job. Refugees are required to accept the first job offered to them, even if it is not in their field, forcing many to accept undesirable jobs, which native-born residents typically feel are beneath them.[10] The employers that take the time to hire and train immigrants and refugees are pleased with their performance; immigrants and refugees are reliable, possess good work ethics and a desire to constantly learn. According to Anne Sanderson, director of the International Institute, "It's rare that they are draining the community or increasing the unemployment rate because they are taking the jobs that Americans don't want."[11]
Despite the perks of attracting and settling minority populations, there are consequences too. Area healthcare and school systems are heavily impacted. Still, most experts agree that the returns are worth the extra effort. Refugees typically rent within our communities and consume local goods and services, while working in low wage jobs. There are examples of immigrants and refugees that are now homeowners. This achievement typically can take from five to eight years after arrival to attain, and communities must factor this growing population into its affordable housing initiatives.

Solutions to the affordability crisis include inclusionary zoning, adaptive re-use, development of non-conforming lots, mixed use zoning, allowing accessory dwelling units, manufactured housing and other incentives and disincentives.[12]

Inclusionary zoning encourages developers to include affordable housing units in return for a variety of incentives. An agreed upon number or percent of dwelling units must be reserved for elderly, handicapped, or targeted lower-income households; the ratio may be set through local ordinances. Incentives a community may offer include density bonuses, zoning exemptions, and expedited reviews.

Adaptive re-use converts previously unused buildings, which may have had a commercial or industrial purpose before, into housing affordable to various income levels. Many communities have found abandoned mill buildings prime for adaptive re-use. Within the SNHPC region the Chase

10. Will Stewart, "Multicultural Manchester," Hippo Press, http://www.fawi.net/ezine/vol3no4/Mmanchester.html accessed 22 July 2005.
11. Kara Steere, "Coming to NH: Refugees and immigrants continue to shape the Granite State's economy," Business NH Magazine, May 2005.
12. For a complete list of housing solutions, with examples of NH success stories, see the Housing Solutions for NH Handbook at http://www.nhhfa.org/frd_housingsolutions.htm and Section 4 of SNHPC's 2005 Housing Needs Assessment

Mill in Derry was developed into 16 age 55-plus condominiums; Families in Transition is currently developing a West Manchester mill into a mixed use facility with offices, retail and apartments; the Manchester Neighborhood Housing Services is redeveloping a former shoe factory into 57 affordable apartments and the former Brown School into one-bedroom elderly apartments.

By mixing residential and commercial uses, potential commercial revenues can serve as incentives to developers to provide below market rate units. Additionally, mixing residential units affordable to all income ranges, through the creation of affordable units, market rate, and luxury units in one development allow private developers to earn the profits they anticipate and increase the local affordable housing stock.

Another option for towns is to allow the development of non-conforming lots. Traditionally, non-conforming lots do not meet the minimum dimensional requirements of buildable lots. By classifying these lots as buildable for affordable housing units only, or dwelling units not to exceed a set gross floor area, lots that were once vacant can be put to productive use in a community and allow for lower cost single family homes.

Accessory dwelling units, such as in-law apartments, can provide affordable places to live for family members or renters. These units are permitted under Innovative Land Use Controls RSA 674:2. These units, which maintain the single-family character of neighborhoods, provide inexpensive housing for older or younger relatives.

Today's manufactured housing units can provide an aesthetically pleasing source of affordable housing. State legislation mandates that all communities provide opportunity for manufactured housing, per RSA 674:32. When manufactured home owners in parks share land costs the total housing costs remain affordable. Unfortunately, with increasing land costs, the value savings to unit owners, siting manufactured homes on individual lots or subdivisions, is decreasing.

RSA 674:21 allows timing incentives, intensity and use incentives, and transfer of density and development rights as innovative land use controls. Another incentive includes offering tax breaks for low-income homeowners. A disincentive to the individuals that buy housing stock with the intention of selling it at a quick turn-around for profit, thus further driving up the cost of real estate, is capital gains taxes of real estate profits after short-term possessions.

Affordable housing solutions today invariably focus on density. What do communities in the SNHPC Region desire? They want to provide vibrant, safe, economically healthy centers, where residents want to and can afford to live for a lifetime, and at the same time, attract new residents, who help perpetuate the continued growth and success

of the municipality. SNHPC communities are also concerned with preserving open space and the character of the New England village with which they are identified. Within the State a group of conservation, state, planning, non-profits, and real estate development agencies have formed a Growth and Development Roundtable to tackle policy and planning issues related housing development and land conservation. Yet most communities are afraid of density. For many, "density is a four-letter word."[13] By allowing increased density or offering density bonuses in return for affordable housing, communities can attain the goals listed above, without sacrificing the rural character they are striving to preserve.

There are a few options available to towns that promote increased density while preserving open space. Multi-family housing, either as condominiums or apartments is the traditional method of creating greater density development. Additional mechanisms, termed innovative land use controls, provided under RSA 674:21, include cluster zoning, the village plan alternative subdivisions, along with the previously mentioned accessory dwelling units, intensity and use incentives, and the transfer of density and development rights.

Cluster zoning allows developers to build units on smaller than average lot sizes in return for the remaining acreage to remain protected as open space. For instance, rather than building on the entire parcel, and spreading out the homes to encompass all the available land area, the homes are built on a reduced portion of the land area, and the remainder is preserved through easements.

The village plan alternative allows landowners of large parcels of open space to benefit from the economic development of the land, while still preserving its rural character. Under such a plan, the entire density permitted for the overall parcel must be on 20 percent or less of the entire parcel, with a conservation easement on the remaining land. Development must comply with existing access regulations for emergency services, but other regulations pertaining to lot size, setbacks, and density do not apply. Additionally, applications under the village plan alternative must be given expedited review of 45 days or less. Currently, no New Hampshire towns have adopted such a zoning ordinance, but the Rockingham Planning Commission has developed a model ordinance at for municipalities to use in drafting their own village plan alternative provisions.[14] The model ordinance also contains drawings of the potential development that would occur in a village plan .

Multi-family housing also offers increased density, with the potential to also offer more affordable housing as well. Designing the multi-family units to look like single-family units can mitigate concerns that multi-family housing would not fit in with existing single-family developments. This was successfully accomplished in the Echelon at

13. Mark Hayward, "NH just keeps on growing," Manchester Union Leader, June 17, 2005.
14. The model ordinance is available online at: http://www.rpc-nh.org/Village-Design.htm

Lakeside development in Plano, Texas. Higher density development is espoused, and the above example described, in the publication "Higher-Density Development: Myth and Fact."[15]

15 "Higher-Density Development: Myth and Fact," http://www.uli.org/Content/ContentGroups/PolicyPapers/MFHigher010.pdf#search='NMHC%20HigherDensity%20Development%20Myth%20and%20Fact accessed 27 July 2005.

Conclusion

Despite the fact that dwelling unit and fair share distribution projections for the SNHPC Region cannot be made to the year 2015, there are facts that are indisputable. First and foremost, the SNHPC Region is a desirable place to live, work and play. Second, the area will continue to experience population growth due to its attractiveness. An examination of the existing housing conditions has shown that housing production has begun to be outpaced by population. As a result, the existing housing stock does not meet the current demand for housing in the region. Furthermore, the costs of home ownership have risen sharply, making the "American Dream" less realistic for many.

The high cost of housing in the SNHPC Region could jeopardize future economic growth. Children who grew up in Southern New Hampshire can no longer afford to raise families here. Businesses have a difficult time attracting quality employees, which in turn makes attracting new businesses challenging for communities. In order to combat these issues, communities should provide affordable housing, both rental and owner occupied, for all income levels.

Chapter Nine:

Natural Resources

Introduction

The purpose of this chapter is to identify and describe the significant natural resources of the Southern New Hampshire region. A natural resource is significant because of the importance it has within the region, both in terms of its ecological functions and values as well as its capacity in sustaining the region's overall environment and quality of life. Examples include the region's major rivers and streams, great ponds and lakes, natural vegetative shorelines, sensitive prime wetlands, aquifers which offer or act as an important local source of drinking water, natural floodplains, steep slopes greater than twenty-five percent, forested or wooded lands in unfragmented blocks of 500 acres or more, significant wildlife habitat areas such as vernal pools, riparian corridors of 300 foot width, wetland clusters greater than five acres in size, existing agricultural lands and high quality agricultural soils. Each of these important resources has a significant role in defining the region's future growth and development.

> Natural resources can, and often do, dictate the direction development takes. Water, slope conditions, soil types, and many other factors have either encouraged development, or pushed it away through a variety of reasons.

Main Issues and Concerns

Southern New Hampshire is developing at an incredibly fast rate. The region's natural resources are deteriorating quickly, both in supply and condition, due to development pressures. These concerns are outlined in this chapter.

Water supply and water quality consistently tops the list of concerns. The Merrimack River is a hot topic of debate at this time, along with other current water supply issues within the region. Many localities are consuming more treated drinking water than what they have or plan to have available, and supply is shrinking. Additionally, water quality in the Merrimack River, although improving, is still not optimal.

Groundwater and aquifer protection are also important issues. As the region develops and the land becomes covered by pavement and buildings, the natural recharge and water quality of these important sources of drinking water become threatened. Wetlands are also a major concern as development rapidly spreads throughout the region. Wetlands are much more important than people realize as a source of both groundwater recharge and wildlife habitat. Most people are in favor of preserving their water supply and water quality, but they do not always support protecting wetlands when it comes to their own property. As a result, it becomes necessary to protect these important natural resources through local as well as state and federal regulations.

Large unfragmented blocks of forested and wooded lands are equally significant for wildlife habitat and the open space they provide. There are several rare and important species of trees located within the Southern New Hampshire region, which also need to be protected and managed. However, these large tracts of forested lands are shrinking quickly and the sustainability and ecological value of these areas need to be monitored carefully and protected for future generations.

Agricultural sustainability, and the protection of the region's high quality agricultural soils, is another equally significant issue. As the region continues to develop, the quantity and quality of the region's important farmland soils is quickly deteriorating.

Regional Goals

As a whole, the region is in danger of doing a considerable amount of harm to each of these resources. Southern New Hampshire is the fastest growing area in the state, and this region in particular is one of the hottest development locations. As a result of this development and increased human activity, the natural resources in this region are amongst the most threatened in the state.

The 2015 Land Use Plan, developed by SNHPC, outlined two specific Natural Resource protection goals that should be followed in order to help maintain and protect these precious resources before it is too late. These goals are:

1. Achieve a coordinated, planned development of the region by utilizing established land use principles and planning concepts.

2. Protect and improve the quality of the natural environment while developing a complementary man-made environment.

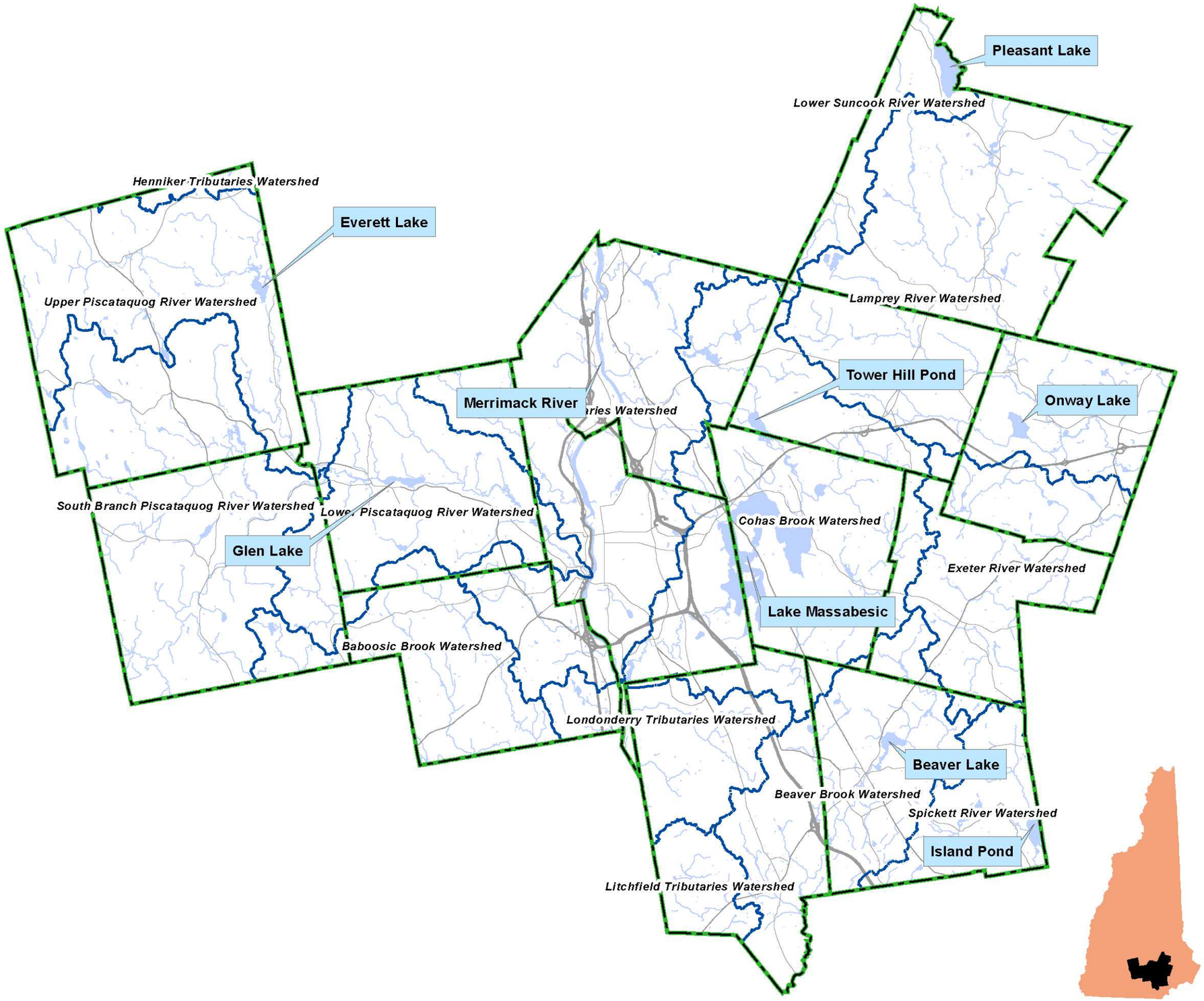
In addition to these regional goals, several towns have endorsed their own goals and objectives regarding protection of natural resources in their Master Plans. Auburn, Bedford, Derry, Goffstown, Hooksett, Londonderry, Manchester, and Weare all have outlined specific goals or objectives, or at least potential plans of action for natural resource protection. If these master plan goals can be reached, the Southern New Hampshire region can continue to develop and thrive, while maintaining these important resources for all to enjoy.

Rivers, Lakes, and Shorelines

The Southern New Hampshire region contains several major rivers, lakes, and shoreline areas. Two of the region's most important surface waters are the Merrimack River and Massabesic Lake. The Merrimack River runs south through the SNHPC communities of Hooksett, Goffstown, Bedford, and Manchester. Located mostly within Auburn, as well as in Manchester, Massabesic Lake serves as the public water supply for Manchester and many of the surrounding towns (see Surface Waters map on following page).

These resources have numerous functions, including wildlife habitat and erosion control, but also serve many other recreational and non-recreational purposes. For instance, boating and fishing are commonplace. Non-recreational activities include manufacturing purposes, transportation, hydroelectricity, and even drinking water.

REGIONAL COMPREHENSIVE PLAN



Map #9.1

SURFACE WATERS

Legend

Political Boundaries

- Townline

Road Network

- Interstate
- State Route
- Major Roads

Hydrography

- Streams
- Rivers/ Lakes
- Watershed Boundaries

Data Sources:

Granit Digital Data (1:24,000)
2006 Hydrological GIS data from NH Granit
NH Department of Transportation

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SNHPC

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0 1.5 3 6 Miles

Protection of the region's surface waters is important for a variety of reasons. One of the most important concerns is the natural vegetation growing alongside riverbanks and shorelines. These natural shorelines not only serve as wildlife habitat, but also play a significant role in holding stream and riverbanks together, as well as preventing erosion and siltation. Also, stream banks are natural conductors for runoff, and therefore replenish surface water supply.

The New Hampshire Department of Environmental Services has compiled a list of great ponds in the State of New Hampshire. A great pond is defined as a natural body of water that is at least 10 acres in size. As a whole, the region has a total of 40 great ponds. The Town of Derry leads the region with six great ponds, and several other communities have at four or five great ponds each. The complete list of all lakes and great ponds located within the region is provided below (Massabesic Lake and Tower Hill Pond are also located in adjoining towns). Regionally significant ponds are identified in bold print.

Auburn
- Calef Lake – 27.9 acres
- Little Massabesic Lake– 49.5 acres
- Clark Pond Dam – 58.1 acres
- Massabesic Lake – 2,900 acres

Bedford
- Sebbins Pond – 19.8 acres

Candia
- Tower Hill Pond – 157 acres

Deerfield
- Spruce Pond – 21.7 acres
- Beaver Pond – 58.4 acres
- Freeses Pond – 82 acres
- Pleasant Lake – 493.5 acres

Derry
- Ezekiel Pond – 10.3 acres
- Upper Shield Brook – 11.3 acres
- Beaver Brook – 40 acres
- Ballard Pond – 120.9 acres
- Beaver Lake – 133.6 acres
- Island Pond – 497.9 acres

Raymond
- Dead Pond – 10.8 acres
- Norton Pond – 11.4 acres
- Governor's Lake – 52.2 acres
- Onway Lake – 192 acres Goffstown
- Uncanoonuc Lake I – 24 acres

Hooksett
- Pinnacle Pond – 18.6 acres
- Clay Pond – 28.9 acres
- Head's Pond – 51.7 acres

Londonderry
- Kendall Pond – 11.4 acres
- Little Cohas Brook – 18.2 acres
- Scobie Pond – 26.6 acres

Manchester
- Stevens Pond – 15.5 acres
- Nutt Pond – 16.1 acres
- Dorrs Pond – 17.6 acres
- Crystal Lake – 18.6 acres
- Long Pond – 28.3 acres

New Boston
- Still Pond – 11.4 acres
- Beard Pond – 11.9 acres
- Dennison Pond – 12 acres
- Dodge Pond – 12.5 acres
- Bailey Pond – 14.2 acres

Weare
- Ferrin Pond – 14.7 acres
- Mount William Pond – 33.1 acres
- Perkins Pond Marsh – 55 acres

While all the rivers, lakes and ponds in the region are important, there are approximately 12 great ponds, which are especially significant. Several factors are taken into account when determining the regional significance of a great pond. The great pond has to first be greater than 50 acres in size. Second, the degree of urbanization and natural vegetation surrounding the lake or pond must be controlled and protected. Finally, the lake or pond itself must be of good water quality or be a public water supply source.

All of the great ponds identified on the NH DES official list of public water bodies are subject to the Shoreline Protection Act requirements of the state. This act requires a 50-

foot primary building and a 20-foot accessory structure setback. In addition, a natural wood buffer of 150 feet from the reference line is required and no septic systems are allowed within 75 feet from the surface water. The reference line for natural lakes and ponds is the natural mean high water level.

Merrimack River in Hooksett

All 4th order streams and rivers are also subject to the Shoreline Protection Act. A 250-foot wide natural woodland buffer is required on both sides of the stream or river. Within this buffer, not more than 50 percent of the basal area of trees, and 50 percent of the saplings can be removed for any purpose in a 20-year period. Structures may be built and are allowed in the buffer only within a building envelope, which extends 25 feet beyond the footprint of the building. The building envelope is excluded when computing the basal area percentage limitations.

Currently, the Town of Auburn is the only community within the region that has adopted a Watershed Protection Ordinance, which is more restrictive than the State Shoreline Protection Act requirements. More communities within the region need to look at adopting a similar ordinance in order to establish improved and comprehensive surface water regulations.

Hydric Soils and Wetlands

The U.S. Department of Agriculture National Resources Conservation Service (NRCS) defines hydric soils as those soils that are significantly wet in the upper part to develop anaerobic conditions during the growing season. Two types of hydric soils exist: Hydric A and Hydric B soils. Hydric A soils are those soils that are classified as very poorly drained. Hydric B soils are those soils that are classified as poorly drained. Water

tables lying at or near the surface for seven to nine months out of the year characterize these soils. Hydric soils typically compose wetlands, bogs, marshes and swamps.

There are several classifications of wetlands, including but not limited to emergent wetlands, vernal pools, floodplain wetlands and upland wetlands. Emergent wetlands, also called marshes, are usually dominated by perennial vegetation. Emergent wetlands are typically found in either shallow water areas, or in areas that are prone to flooding. Another type of wetland is a vernal pool. Vernal pools are areas that fill with water either when the water table rises, or with melt-water or stormwater runoff. In most cases, vernal pools become dry by late summer. Floodplain wetlands are wetlands that are situated within depressions in floodplain areas. Upland wetlands are typically found in high altitudes, and are filled via stormwater and melt-water runoff.

Wetlands are critically important to the environment. They absorb storm waters and spring snowmelt runoff. These waters are slowly released, regulating stream flows during the year. This absorption is especially significant in areas where development has rapidly sprouted, as runoff water tends to increase in these areas. Wetlands also act as a filter, trapping pollutants such as road salt, pesticides, and other chemicals, in their thick, mucky soils. This trapping prevents groundwater supplies from becoming contaminated. These thick soils also lower water acidity levels, and prevent eroded silt and sediments from infiltrating larger water bodies, such as streams, ponds, and lakes.

Wetlands are not favorable land for developmental purposes because of their poor soils. Developing these areas requires a significant amount of financial investment due to the poor quality of the ground. In the long run, dredging or filling them is not worth the necessary extra effort if alternative development opportunities exist.

Despite wetlands lacking the aesthetic appeal people tend to crave, they still have a lot to offer. Wetlands serve as a valuable habitat for spawning, nesting and feeding, and they support a wide variety of exclusive plant life. Wetlands also provide numerous human uses, such as recreation, bird watching, fishing, hiking, hunting, and other activities not requiring the construction of buildings.

In the Southern New Hampshire region, the towns of Derry, Hooksett and Weare have designated prime wetlands. The Town of Chester recently completed a study and mapping effort of wetlands that they call “prime quality,” however they still fall under the prime designation. The Town of Chester hopes to establish these wetlands as a part of their Wetlands Conservation District later in 2006. The Town of Bedford, Candia and Deerfield have also completed prime wetland studies.

Prime wetlands are simply a higher level of designation of wetlands protection. In order to designate a wetland as prime, a municipality first needs to evaluate the wetland’s functions and values by following the guidelines in the Method for Comparative

Evaluation of Nontidal Wetlands in New Hampshire (a tidal method is also available).[1] After this has been completed, a public hearing must be held on the matter, and residents will be given the chance to vote whether or not to accept the designation of the wetland as prime. If the measure is passed, the NH Department of Environmental Services (DES) will review the study completed by the town. If the study is determined to be in compliance with the law, then the wetland is designated as prime.

Once a wetland has been designated as prime, then all projects within or adjacent to the wetland, called "major projects," must be field inspected by a DES worker before work can commence. Also, a public hearing conducted by DES on the project must also take place. There are no additional special building setback requirements for designated prime wetlands. However, under RSA 155-E, no excavation shall be permitted within 75 feet of any great pond, navigable river, or any other standing body of water 10 acres or more in area or within 25 feet of any other stream, river or brook which normally flows throughout the year, or any naturally occurring standing body of water less than 10 acres, prime wetland as designated in accordance with RSA 482-A:15, I or any other wetland greater than 5 acres in area as defined by DES.

Prime Wetlands Dalton Brook, Hookestt

Presently, there are eight municipalities within the region which have adopted a Wetlands Conservation District as part of their Zoning Ordinance. These communities are Bedford, Candia, Chester, Derry, Deerfield, Goffstown, Hooksett, New Boston, and Weare. In addition, most of the municipalities within the region have adopted basic building and septic system setbacks from wetlands ranging anywhere from 25, 50, 75 and 100 feet.

1 Ammann, A.P. and Stone, A. Lindley. 1991. Method for the Comparative Evaluation of Nontidal Wetlands in New Hampshire. NHDES-WRD-1991-3. New Hampshire Department of Environmental Services, Concord, NH.

Most of the Wetlands Conservation District ordinances were adopted in the 1980s. These districts were set up as overlay zones based on the county soil survey maps delineating poorly drained and very poorly drained soils within each community. While the soil surveys remain relatively accurate, the State of New Hampshire has recently adopted a new wetlands definition (RSA 482-A, effective July 1, 2004), which now defines wetlands as "an area that is inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal conditions does support, a prevalence of vegetation typically adapted for life in saturated soil conditions." Because of this new definition and the availability of new wetland inventory maps, it is recommended that many communities go back and review their wetland conservation district ordinances and wetland maps for consistency with the new state definition.

The wetlands identified in this chapter are based on the USGS National Wetlands Inventory (NWI). These wetlands are shown on the Wildlife Habitat map in the wildlife habitat section of this chapter. Designated prime wetlands have not been mapped.

Aquifers

Most of Southern New Hampshire is served by a series of stratified drift aquifers. Stratified drift aquifers are made up of deposits of sand and gravel located above the bedrock. Although these aquifers are more effective in water transmission than are bedrock aquifers, stratified drift aquifers are much more susceptible to contamination. Leaking underground storage tanks, poorly maintained septic systems, improper disposal of hazardous chemicals, vehicular accidents and gravel pits are the leading sources of this contamination. Another large problem concerns development above aquifers. These areas are favorable largely because of the levelness of the land and ease of extracting gravel. However, this development often leads to contamination, since work is completed close to the water source.

Protection of aquifers should be among the highest of priorities in the region. Humans have relied on the use of aquifers not only for agricultural reasons, but for habitation as well. Irrigation of arid lands through the use of underground aquifers has allowed crops to be grown and life to be sustained in places where it normally would be too difficult or impossible.

However, there exists a downside to this positive situation. With growing population, aquifers are being drained much faster than they are able to recharge. As a result, they could be depleted in time, and cause a very severe crisis in areas where water is such a precious commodity. For example, in the western United States is the Ogallala Aquifer, which is located under portions of eight states – Wyoming, Colorado, New Mexico, Texas, Oklahoma, Kansas, Nebraska and South Dakota, – in the Great Plains region. Due to the excessive amounts of irrigation and municipal uses throughout the years, the

Ogallala is being drained far quicker than it can recharge. The water table's quick rate of descent has forced the deepening of wells in order to reach it, and in some places the aquifer has become dewatered.

In 1995, the U.S. Geological Survey, in cooperation with the State of New Hampshire Department of Environmental Services, Water Resources Division, published Geo-hydrology and Water Quality of Stratified-Drift Aquifers in the Middle Merrimack River Basin, South-Central New Hampshire. This study identified the more productive stratified drift aquifers within the region based upon estimated transmissivity rates ft^2/day which range from less than 2000, 2000 to 4000, 4000 to 8000 and greater than 8000. Transmissivity measures the ability of an aquifer to transmit water. Stratified drift aquifers consist mainly of layers of sand and gravel, parts of which are saturated and can supply wells and springs. Many of the region's stratified drift aquifers are shown on the attached map.

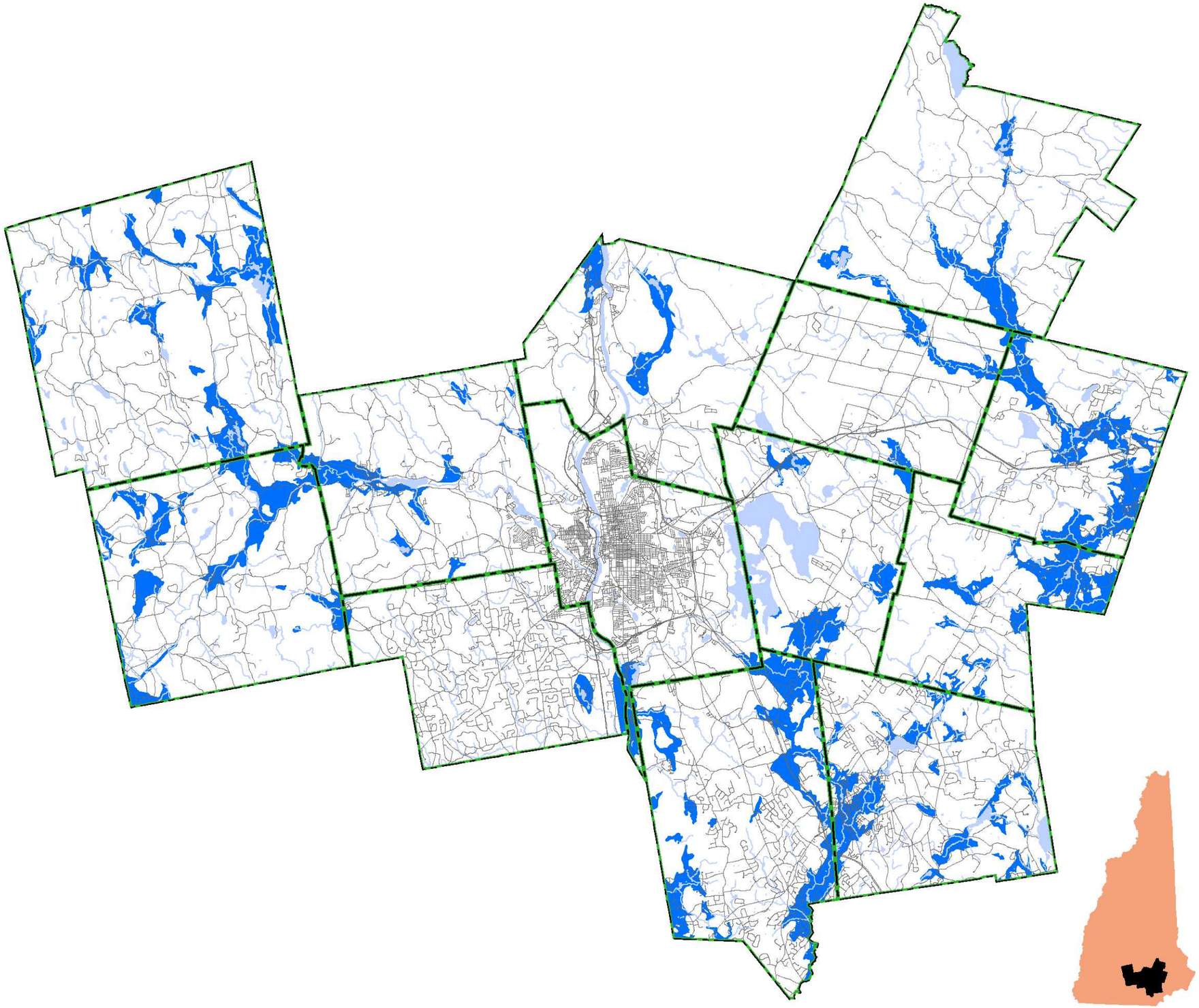
A number of municipalities within the region have utilized the 1995 study and earlier USGS studies (1977) to establish local Aquifer Protection or Groundwater Protection Districts as part of their Zoning Ordinance. These communities include the towns of Chester, Derry, Hooksett, New Boston, Raymond and Weare.

An Aquifer Protection or Groundwater Resource Protection District is similar to the Wetland Conservation District in that it is an overlay district designed to regulate certain types of land uses (such as septage lagoons, landfills, automotive service or repair shops, sand and gravel excavation, etc.) which could contribute polluted water and pollutants to aquifers that may be designated as future public and private water supply sources. Today, many of these ordinances are now out of date and need to be updated, particularly with respect to identifying and protecting critical aquifer recharge areas.

Currently, the New Hampshire Geologic Survey is digitizing and enhancing the 1995 stratified drift aquifer maps utilizing numerous well logs and well data to more accurately identify the aquifers and recharge areas. As these maps near completion, it is recommended that every community within the region amend or adopt an Aquifer Protection District based upon this new information.

In addition, each community within the region should consider establishing a Wellhead Protection Program, which provides greater controls to protect existing and future groundwater drinking supplies and well fields. Currently, only the towns of Goffstown and Raymond have adopted Wellhead Protection Programs, while the Town of Hooksett is currently studying it. Implementing Wellhead Protection Regulations is a key component to the protection of groundwater. Similarly, Aquifer Protection Ordinances are an important step to prevent groundwater contamination, prevent excess groundwater extraction and restrict hazardous land uses.

REGIONAL COMPREHENSIVE PLAN



Map #9.2

AQUIFERS

Legend

Political Boundaries

Townline

Road Network

Major Roads

Hydrography

Streams

Rivers/ Lakes

Stratified Drift Aquifers

Data Sources:

Granit Digital Data (1:24,000)
NH Department of Transportation
USGS
NH Dept. of Environmental Services

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0 1.5 3 6 Miles

Floodplains

Floodplains are land areas located adjacent to rivers and tributaries subject to periodic flooding. These areas provide not only valuable flood storage, but are some of the best wildlife habitat for numerous species, and also are without question the best land for agriculture due to the rich soils typically found there. In addition, the sustainability of plant life found within the floodplain is likely to be stronger than the plant life found outside of the flood zone, due to stronger root structures, resulting from a higher tolerance of disturbance.

Floodplains should remain in their natural condition in order to accommodate water runoff and flood storage in all its forms. Floodplains also provide important recreational sites. One of the most common activities is hiking, since these areas offer scenic views and stress-free outings.

In 1968, the United States Congress established the National Flood Insurance Program (NFIP) with the passage of the National Flood Insurance Act. In order to participate in the NFIP, a community is required to adopt and enforce a floodplain management ordinance. Once the ordinance has been adopted, the Federal Government will make flood insurance available within the community to serve as financial protection against losses caused by floods.

Presently, every community within the region participates in the National Flood Insurance Program, with the Town of Candia only recently passing Flood Insurance Regulations in March 2006. As part of the NFIP, the Federal Emergency Management Administration (FEMA) prepares a Flood Insurance Study (FIS) of every community participating in the program. The FIS includes statistical data for river flow, rainfall, topographic surveys, as well as hydrologic and hydraulic analyses. After examining the FIS data, FEMA creates a flood insurance rate map (FIRM) delineating the different areas of flood risk.

Land areas that are at high risk for flooding are called Special Flood Hazard Areas, which consist of the 100-year floodplain. The 100-year floodplain is an area that has a 1 percent chance of being flooded in any given year. The 100-year floodplains are shown on the attached Special Flood Hazard Areas map. Copies of flood insurance maps are available in community planning and zoning offices.

Steep Slopes

Steep slopes in the SNHPC region are considered to be those areas having a slope of 15 percent or greater. In areas of steep slopes, the soil layer is thinner than normal, and absorption levels are reduced, allowing for a higher concentration of surface-water runoff. As the slope of the land increases, the greater the damage from land degrading processes, such as erosion. Another common danger relates to the inadequate development of these areas. If proper care is not taken into consideration in relation to

the slope of the land, then costly environmental and also human consequences could result.

Areas with a 25 percent or greater slope should be left as open space and not developed. These areas are suitable for such uses as conservation lands or watershed protection. Slopes of 15 to 25 percent are less threatening to development, however they are still steep enough where they should be monitored carefully before pursuing any action, and if possible, should not be developed. The most ideal developmental option consists of slopes of less than 15 percent. Generally, high density commercial and industrial activities should be limited to slopes of less than eight percent. Truly ideal locations for any development are slopes of zero to three percent, however these areas are usually found near bodies of water, which presents additional problems.

In the 1980s, the Hillsborough, Merrimack and Rockingham County Conservation District offices worked with local, regional and state officials to develop soil potential ratings indicating the relative ranking of a given soil for development. The overall potential is based on the suitability rating for three uses: septic system absorption fields; dwellings with basements; and local roads and streets. The Southern New Hampshire Planning Commission uses this soil potential rating information to prepare slope maps and generalized development capability maps for communities. Many communities also use these maps to develop steep slope ordinances, to regulate the placement of septic systems, dwellings and roads on slopes generally exceeding 15 percent.

Steep slope areas should be avoided as developmental sites due to the erosion problems that follow. When erosion occurs, numerous other problems follow, such as flooding and reduction in water quality. Locating septage systems on steep slopes increases seepage and leachate runoff down gradient of the system, which could contaminate adjacent drinking water supplies. The State of New Hampshire requires a minimum 75-foot separation between wells and septic tanks, however there is limited oversight of septic installation on steep slope conditions. This concern needs to be addressed locally through the review of subdivisions and building permits in steep slope areas.

To date, the Town of New Boston is the only community within the region that has adopted a comprehensive Steep Slopes Ordinance addressing building development. All of the communities within the region have adopted site plan or subdivision regulations addressing the placement of septic systems and public and private roads on slopes of various grades.

The attached map shows the geographic location of steep slopes within the region. As a whole, there are 53,932 acres of steep slopes falling within the 15-24.99 percent range located within the SNHPC region (see Table 9.1). The Town of Weare contains most of these slopes with 11,922 acres, followed by New Boston, which has 7,630 acres, and Goffstown, which has 7,380 acres.

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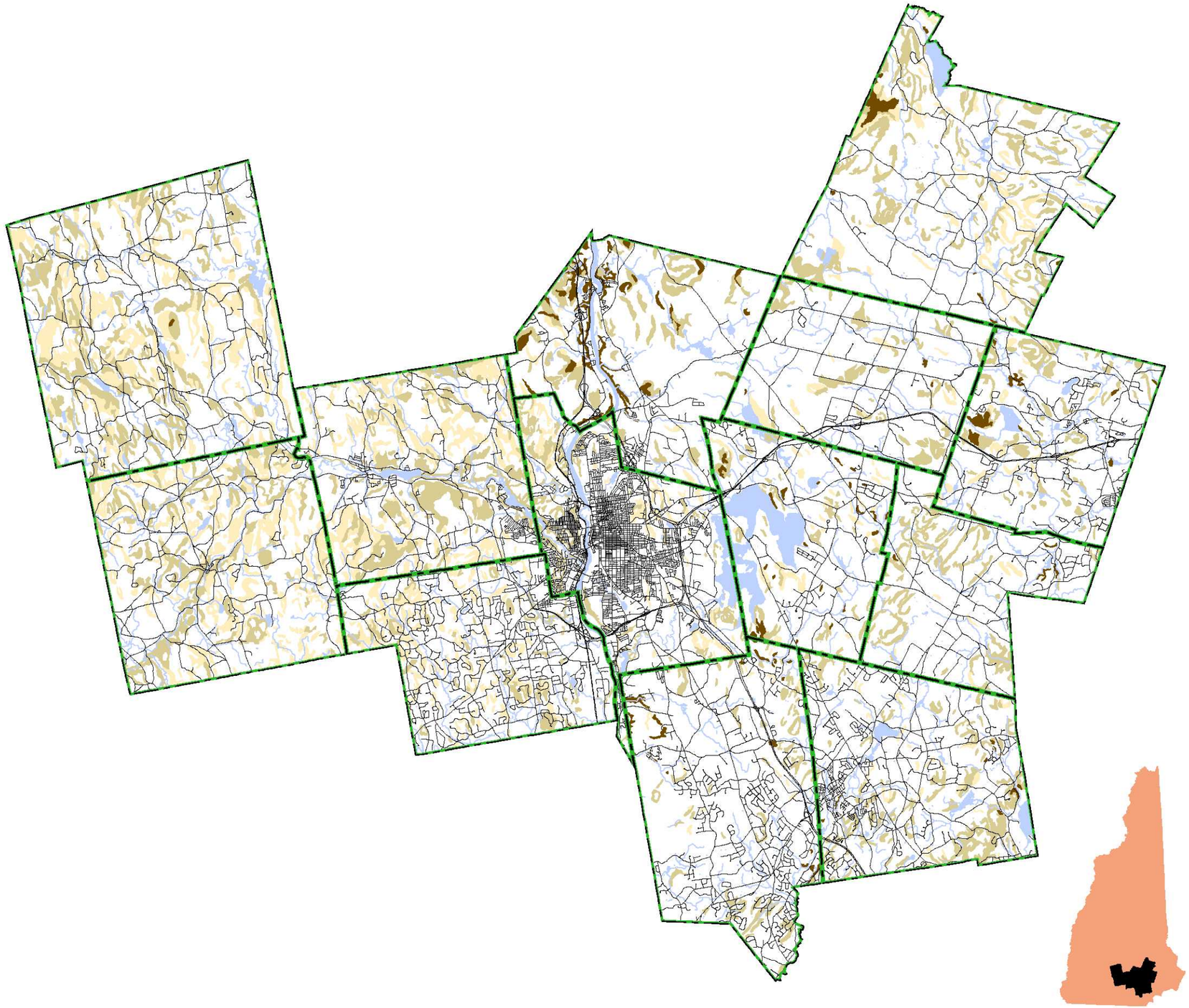

Map #9.3

STEEP SLOPES

Legend

Political Boundaries

Townline

Road Network

Major Roads

Hydrography

Streams

Rivers/ Lakes

Steep Slopes- 15% Minimum Slope

with a maximum of 25% gradient (22,373 Acres or 36.25%)

with a maximum of 35% gradient (36,297 Acres or 58.77%)

with a maximum of 60% gradient (3,081 Acres or 4.98%)

Data Sources:

Granit Digital Data (1:24,000)
NH Department of Transportation

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SNHPC

0 8,000 16,000 32,000 Feet

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The towns with the least acreage of steep slopes in the 15-24.99 percent slope range include Candia with 1,819 acres, Auburn with 1,769 acres, and Londonderry, which has 1,756 acres. The remaining communities in the region contain between 1,842 and 5,637 acres.

Overall, there are fewer acres of 25 percent or greater steep slopes within the region (see table below). The communities of Hooksett, Goffstown and New Boston lead the region with 633, 600 and 599 acres respectively. Of the remaining communities in the region, Bedford and Deerfield have the next largest amounts of slopes 25 percent or greater.

Table 9.1
Steep Slope Acreage - SNHPC Region

Municipality	Minimum Slope > 15% - 24.99%*	Minimum Slope 25% or greater**
Auburn	1,769	0
Bedford	3,144	357
Candia	1,819	0
Chester	1,842	9
Deerfield	5,637	147
Derry	2,873	34
Goffstown	7,380	600
Hooksett	3,185	633
Londonderry	1,756	0
Manchester	2,686	39
New Boston	7,630	599
Raymond	2,289	0
Weare	11,922	N/A
SNHPC Region	53,932	2,418

*Weare includes all acres with a minimum slope >15% and is not capped at 24.99%.
**Soil data for Hooksett includes a minimum slope data of 15-34.99% and greater than 35%.
Source: SNHPC

Forest Lands

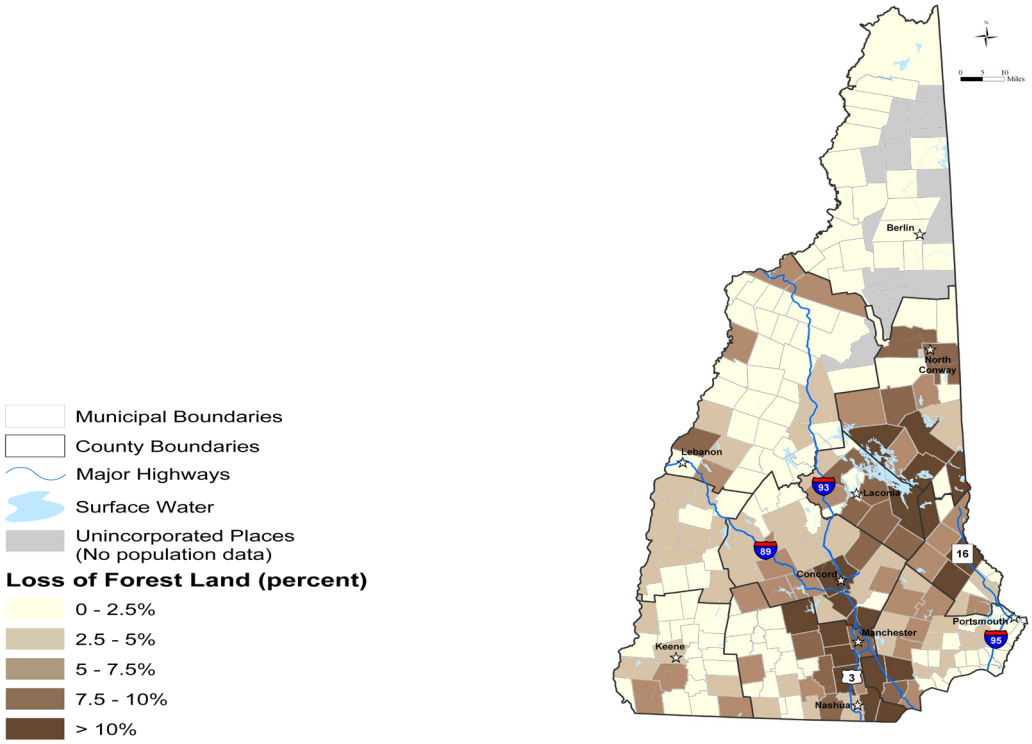
Considered one of the most important natural resources on the planet, forested lands are now disappearing quickly and without the potential for sustained replenishment. According to the Society for the Protection of New Hampshire Forests:

> "New Hampshire remains the second-most forested state in the nation following Maine, but forest cover has been steadily diminishing since

the early 1980s. This loss, which totals about 17,500 acres per year, is largely driven by land development."[2]

The Society for Protection of New Hampshire Forests (SPNHF) has been documenting and reporting the extent of forest cover in New Hampshire for many years. In *New Hampshire's Changing Landscape 2005*, SPNHF has predicted the percent loss of forest land by municipality through 2025 as shown on the following figure.9.1[3]

Figure 9.1
Percent Loss of Forest Land
by Municipality



Source: Society for Protection of New Hampshire Forests

As depicted in this figure, many of the municipalities located within the Southern New Hampshire region are projected to loose over ten percent of their forest land by 2025. According to SPNHF, the largest extent of known forest cover in the state occurred in 1983, however, by 1997, the U.S. Forest Service estimated forest cover in New Hampshire had dropped to 84 percent, a loss of 163,400 acres in 14 years.[4] Current

2. New Hampshire's Changing Landscape 2005, Society for Protection of New Hampshire Forests.
3. Ibid.
4 Ibid.

estimates according to SPNHF based on 2001 satellite data indicate New Hampshire's forest cover has since dropped to 81.1 percent."[5]

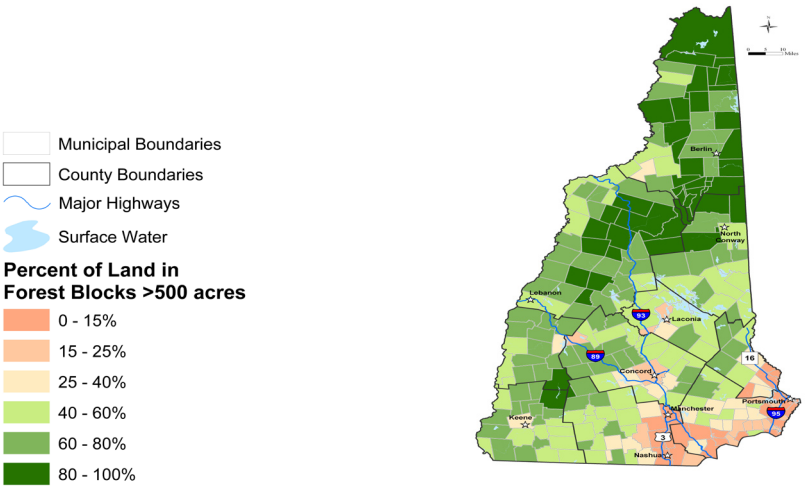
SPNHF predicts that "New Hampshire's forest cover will decline to 79.1 percent by 2025 and that a total of 85 towns will lose more than 500 acres of forestland by 2025, while 20 towns – all in the southeast and the Lakes Region – will lose more than 1,000 acres."[6] The greatest loss of forestland will occur in southeastern New Hampshire, with about 60,000 acres expected to be lost in Rockingham, Hillsborough, and Strafford Counties.[7] According to SPNHF this could accelerate the demise of critical forest-based economies in these areas, and undermine recreational opportunities.

Forested lands serve a multitude of purposes such as providing food and shelter for wildlife, shading shoreline areas, which allows for critical temperature control for aquatic species, nature trails for hiking, prevention of soil and wind erosion, and transformation of harmful gases into oxygen, needed to sustain life. Forest trees also are able to store large amounts of water and play a vital role as regulators of the hydrological process, especially those processes involving groundwater, as well as local evaporation of rainfall/snowfall patterns. Beech/Oak, Birch/Aspen, Other Deciduous, White/Red Pine, Spruce/Fir, Hemlock, and Mixed Forest areas can all be found in the SNHPC region (see following Forest Cover map).

Large blocks of forest not broken up by roads, other land uses or water are also critical. SPNHF has determined that "a 500-acre forest block is big enough to support significant wildlife habitat, protect water quality and allow some economic forest management."[8] In evaluating forest blocks in New Hampshire, SPNHF has found that 500-acre blocks are still widespread, but are already sparse in the Seacoast and lower Merrimack Valley, and becoming so in the Lakes Region."[9] This is particularly true for Southern New Hampshire as shown by the percent of land with forest blocks greater than 500 acres in size by municipality in the SPNHF figure 9.2 below. Large blocks of forested lands represent the fabric that holds together New Hampshire's natural environment and provide the basis for New Hampshire's forest, recreation and tourism industries.

5. Ibid.
6. Ibid.
7 Ibid.
8. Ibid.
9. Ibid.

Figure 9.2
Percent of Land With Forest Blocks
Greater Than 500 Acres by Municipality

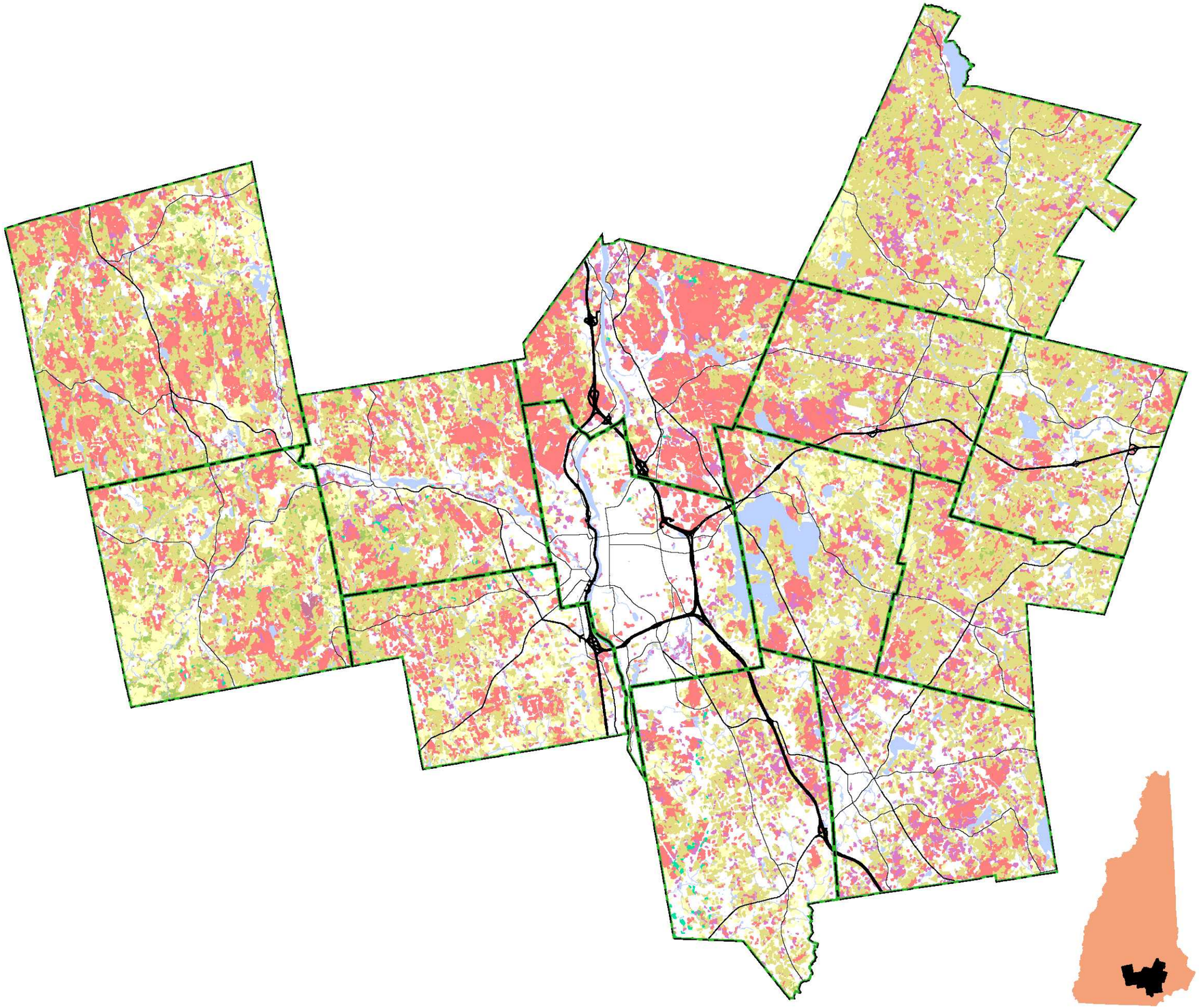


Source: Society for Protection of New Hampshire Forests

According to SPNHF, "sustainable forest management and ecological significance requires blocks of at least 5,000 acres, and these values increase with block size." Given current development patterns, there are no blocks of this size remaining within the Southern New Hampshire region.

In order to better protect these precious resources, several towns - Derry, Londonderry, New Boston and Raymond - have established and adopted Forestry and Conservation Districts. In addition to these districts, the communities of Candia, Chester, Deerfield, Hooksett, Raymond and Weare have created Open Space Plans, which are designed to inventory and assist in the protection of a community's natural resource areas.

REGIONAL COMPREHENSIVE PLAN



Map #9.4

FOREST COVER

Legend

Political Boundaries

Townline

Road Network

Interstate

State Route

Major Roads

Hydrography

Streams

Rivers/ Lakes

Forest Cover

Beech/Oak

Birch/Aspen

Other Deciduous

White/Red Pine

Spruce/Fir

Hemlock

Mixed Forest

Data Sources:

Granit Digital Data (1:24,000)
NH Department of Transportation
NH Fish and Game

The individual municipalities represented on this map and the SNHPC make no representations or guaranties to the accuracy of the features and designations of this map.

This map is prepared for planning purposes only and is not to be used for legal boundary eterminations or for regulatory purposes.

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SNHPC

0 200,000 400,000 800,000 Feet

0 40 80 160 Miles

Wildlife Habitat

Wildlife habitat can exist anywhere. Even in the extremely harsh conditions of Antarctica one can find signs of life. In the Southern New Hampshire region, a variety of wildlife habitats exist including wetlands, forests, rivers, lakes, floodplains, and many others.

Preservation of wildlife habitat is critical to the region's overall ecosystem. The loss of even one single species could have a catastrophic ecological impact. Therefore, loss of habitat is a considerable concern. Wildlife habitat loss can occur whenever land becomes developed, or when an invasive plant or a non-native species invades and overwhelms the native flora and fauna.

One of the largest destroyers of wildlife habitat is urban development. Growth and development within southern New Hampshire is rapidly expanding, and many species and habitats are at risk by this development, particularly wetlands, ponds and streams and surrounding uplands.

Removal or modification of natural vegetation reduces the quality of habitat areas. Habitats can also be fragmented and dispersed when land is subdivided into smaller lots. Other development threats to wildlife include altered hydrology, stormwater runoff, oil spills, roads and highways, and recreation.

The New Hampshire Fish and Game Department (NH F&G) has recently prepared a draft of the New Hampshire Wildlife Action Plan (WAP) (dated October 1, 2005). This plan identifies New Hampshire's wildlife and habitats at risk, and sets forth a variety of conservation strategies for habitat protection. In this plan, the types of wildlife and habitat that are most threatened within Southern New Hampshire can be identified.

According to the 2005 WAP, Southern New Hampshire harbors the greatest diversity of the state's wildlife, including many rare or endangered species, and at the current rate of protection and development, many more species will likely become rare, and several species may become extirpated.[10]

In preparing the Wildlife Action Plan (WAP), NH F&G utilized the following information sources: Endangered and Threatened Species Lists; Natural Heritage Rank: Animal Tracking List; Species of Regional Concern; Living Legacy Project; and Taxomomic Experts. As identified in the draft WAP, New Hampshire currently has 24 species listed as state endangered and 12 listed as threatened.

10. New Hampshire Wildlife Action Plan 2005, New Hampshire Fish and Game Department. WAP and mapping information on the distribution and abundance of these species has not yet been released to the public.

Table 9.2 from the plan identifies all the species of greatest conservation concern throughout the state (a copy of this table is reproduced on following page).

Table 9.2
New Hampshire Wildlife Action Plan, Species of Greatest Concern

Invertebrates	**Amphibians**	**Birds (continued)**
Freshwater Molluscs	Blue-spotted salamander (RC)	Peregrine falcon (E)
Brook floater (E, RC)	Fowler's toad (SC)	Pied-billed grebe (E, RC)
Dwarf wedgemussel (E, FE)	Jefferson salamander (SC, RC)	Piping plover (E, FT)
Eastern pondmussel (RC)	Marbled salamander (E)	Purple finch
Insects	Mink frog	Purple martin (E)
Barrens ilame	Northern leopard frog (SC, RC)	Purple sandpiper
Barrens xylotype	**Reptiles**	Red shouldered hawk (SC)
Broad-lined catopyrrha	Black racer	Roseate tern (E, FT)
Cobblestone tiger beetle (T)	Blanding's turtle (SC, RC)	Ruffed grouse
Cora moth	Eastern box turtle (RC)	Rusty blackbird (SC)
Frosted elfin butterfly (E)	Eastern hognose snake (T, RC)	Salt marsh sharp-tailed sparrow (SC, RC)
Karner Blue Butterfly (F, FE)	Ribbon snake (RC)	Seaside sparrow (SC)
Persius duskywing (E)	Spotted turtle (SC, RC)	Sedge wren (E, RC)
Phyllira tiger moth	Smooth green snake (SC)	Semipalmated sandpiper
Pine barrens zanclognatha moth (T)	Timber rattlesnake (E, RC)	Spruce grouse
Pine pinion moth (T)	Wood turtle (SC, RC)	Three-toed woodpecker (T)
Puritan tiger beetle (FT)	**Birds**	Turkey (BGP)
Ringed boghaunter (E)	American bittern (RC)	Upland sandpiper (E, RC)
Sleepy duskywing	American black duck	Veery[2]
White Mountain arctic	American pipit (SC)	Vesper Sparrow
White Mountain fritillary	American woodcock	Whip-poor-will (SC, RC)
Vertebrates	Arctic tern (T)	Willet (SC)
Fish	Bald eagle (E, FT)	Wood thrush
Alewife	Bay-breasted warbler	**Mammals**
American brook lamprey (RC)	Bicknell's thrush (SC, RC)	American marten (T)
American eel	Black guillemot (SC)	Black bear (BGP)
American shad	Canada warbler (RC)[2]	Bobcat (SC)
Atlantic salmon	Cerulean warbler (RC)	Canada lynx (E, RC, FT)
Atlantic sturgeon (RC)	Common loon (T)	Eastern pipistrelle (SC)
Banded sunfish (RC)	Common nighthawk (T)	Eastern red bat (SC, RC)
Blueback herring	Common tern (E, RC)	Eastern small-footed bat (E, RC)
Bridle shiner (RC)	Cooper's hawk (T)	Hoary bat (SC, RC)
Burbot	Common moorhen	Indiana bat (FE)
Eastern brook trout	Eastern meadowlark	Moose (BGP)
Finescale dace	Eastern Towhee	New England cottontail (SC, RC)
Lake trout	Golden eagle (E, RC)	Northern bog lemming (SC, RC)
Lake whitefish	Golden-winged warbler (SC, RC)	Northern myotis
Northern redbelly dace	Grasshopper sparrow (T)	Silver-haired bat (SC, RC)
Rainbow smelt	Great blue heron	White-tailed deer (BGP)
Redfin Pickerel	Horned lark	Wolf (FT)
Round whitefish (RC)	Least bittern (SC)	Codes:
Sea lamprey	Least tern (E, RC)	T = NH threatened
Shortnose sturgeon (E, FE)	Nelson's sharp-tailed sparrow (SC)	SC = NH species of special concern
Slimy sculpin	Northern goshawk	RC = Regional conservation concern
Sunapee trout (E)	Northern harrier (E, RC)	FE = Federally endangered
Swamp darter	Osprey (T)	FT = Federally threatened
Tessellated darter	Palm warbler	BGP = Only included in NH Big Game Plan

Source: Draft NH Wildlife Action Plan

However, a list of critical wildlife habitats was developed as part of the draft WAP based on the habitat requirements of the wildlife species of concern. A hierarchical data structure of habitats within the state was created from large scale habitats and

watershed groupings to natural community systems and natural communities forming subordinate smaller scale habitats. By utilizing this information, the critical wildlife habitats found within Southern New Hampshire are identified in the following table.

Table 9.3
New Hampshire WAP Critical Habitat List
Southern New Hampshire

Large Scale Habitats	Watershed Groupings	Medium and Small-Scale Habitats
Appalachian Oak – Pine Forest	Coastal Transitional	Grasslands
Hemlock –Hardwood – Pine Forest	Coastal Transitional Watersheds	Marsh and Wet Meadows[1]
	Non-Tidal Coastal Watersheds	Peatlands
		Floodplain Forests
		Vernal Pools

[1]Note: Marsh and Wet Meadows and Shrub Wetlands were combined for the threat ranking process and habitat profiles.
Source: NH F&G

Each of these critical habitats as identified in the WAP are described below.

Appalachian Oak-Pine Forest

The most extensive Appalachian oak-pine forest blocks are located in Rockingham County. Appalachian oak-pine forests are one of New Hampshire's most at-risk habitats. The most challenging issues facing these forests are human development and transportation infrastructure and altered natural disturbance. Some of the important wildlife found in these forests include: the American woodcock, bald eagle, black bear, black racer, Blanding's turtle, bobcat, Canada warbler, common nighthawk, Eastern box turtle, wild turkey, whip-poor-will, white tailed deer, wood thrush and migrating/wintering birds.[11]

Hemlock-Hardwood Pine Forests

Hemlock-hardwood pine forests are also one of New Hampshire's most at-risk habitats. The most extensive hemlock-hardwood pine forests are located in Belknap and Merrimack counties. The most challenging issues facing this habitat are human development, introduced species, and altered natural disturbance.[12]

11. New Hampshire Wildlife Action Plan 2005, New Hampshire Fish and Game Department

12. Ibid.

Grasslands

Grasslands are located in all New Hampshire counties. The largest proportions occur in Graffton (20 percent), Merrimack (13 percent) and Coos (12 percent) counties. Important wildlife includes American woodcock, Blanding's turtle, Eastern meadowlark, grasshopper sparrow, horned lark, purple martin, white-tailed deer, wood turtle, black racer and migrating/wintering birds.[13]

Floodplain Forests

Floodplain forests are widely distributed throughout the state and within the region in association with larger rivers and streams. Important wildlife include the American woodcock, warbler, hawk, Eastern red bat, salamander, Northern leopard frog, red shouldered hawk, spotted turtle, wood thrush, Canada warbler and migrating/wintering birds. [14]

Marsh and Shrub Wetlands

Marsh and shrub wetlands are also broadly distributed throughout the state and region. Some of the state's most extensive wetland complexes are located in southern New Hampshire, including Belknap and Rockingham counties. Some of the most challenging issues are fragmentation, transportation infrastructure, development of surrounding uplands and invasive species.[15]

Peatlands

Peatlands occur in clusters throughout the state and region. Some of the important wildlife includes mink frog, Northern bog lemming, palm warbler, ribbon snake, spotted turtle, and the spruce goose.[16]

Vernal Pools

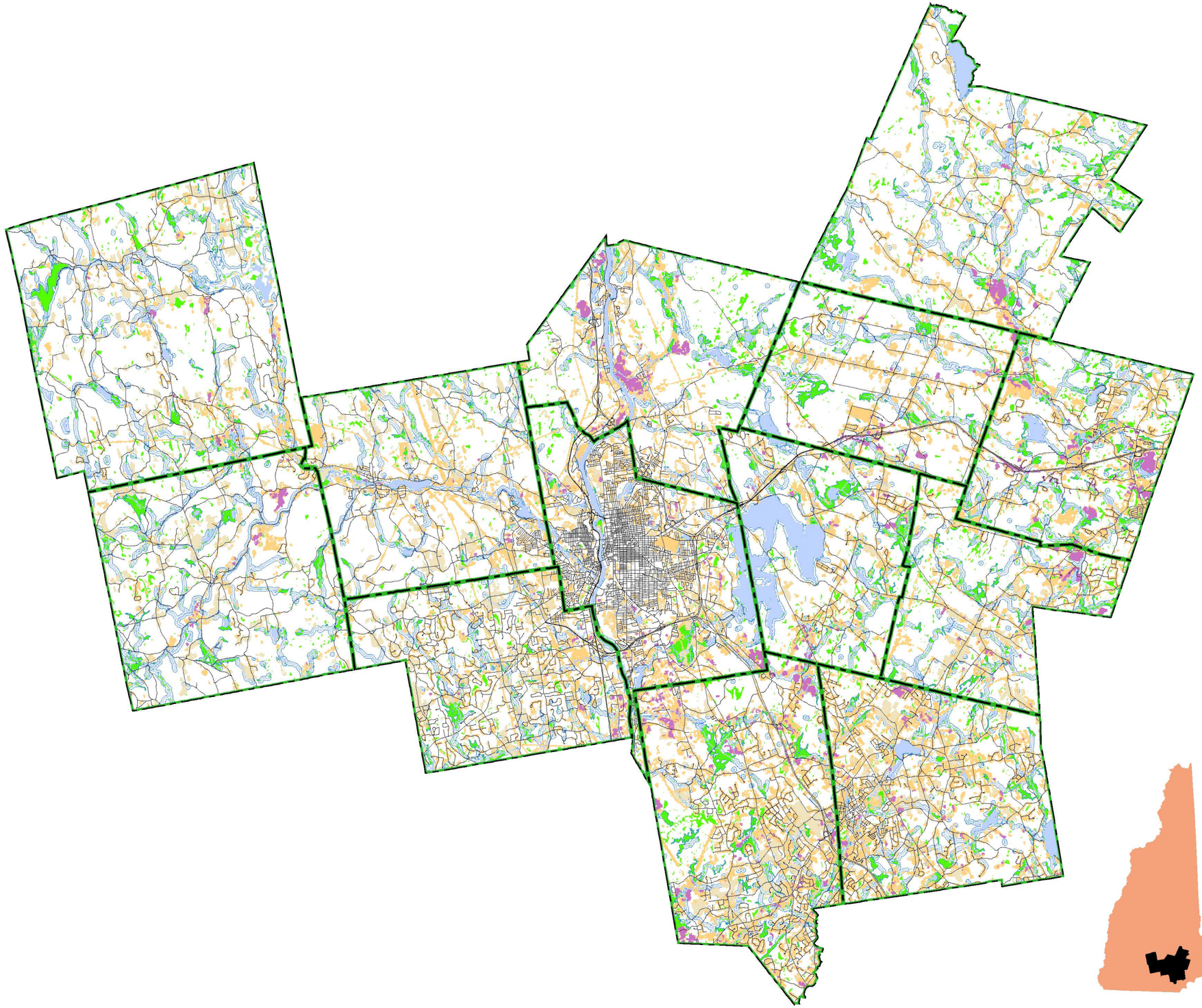
Vernal pools occur at scattered locations throughout the region. Many of the species that depend on vernal pools are restricted to southern New Hampshire. The most important wildlife values of vernal pools are critical foraging and breeding habitat for a number of reptiles, amphibians, and invertebrates.[17]

Some of the critical habitats described above are shown on the following preliminary Wildlife Habitat map. At the present time, this map is currently being updated by NH

13. Ibid.
14. Ibid.
15. Ibid.
16. Ibid.
17. Ibid.

F&G and a new map will be released shortly. When the new map is made public, it will be included in this plan. In addition, this section will be updated pending release of the final WAP.

REGIONAL COMPREHENSIVE PLAN



Map #9.5

WILDLIFE HABITAT

Legend

Political Boundaries

Townline

Road Network

Major Roads

Hydrography

Streams

Rivers/ Lakes

Habitat Areas

Agriculture

Cleared

Disturbed

Wetlands (NWI)

Riparian Areas

(300 Feet Riparian buffers from the Riparian Buffers map)

Data Sources:

Granit Digital Data (1:24,000)
NH Department of Transportation
NH Fish and Game Wildlife Action Plan GIS Data

Note: Map to be updated pending release of new fine filter GIS data by NH Fish and Game

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SNHPC

0 8,000 16,000 32,000 Feet

0 1.5 3 6 Miles

Riparian Buffers

Riparian buffers are those areas appearing along watercourses and water bodies. These areas are critically important to the protection of water resources. Buffer areas serve as filter areas for sediment and other debris in runoff waters, trapping it and preventing it from entering the main water body. The wider a buffer area is, the better the chance that any foreign substances will be caught and filtered.

In addition to trapping sediment and pollutants, buffers serve many other purposes. Buffer vegetation helps to regulate stream flow by allowing water to absorb into the soil and recharge the groundwater supply. As a result, groundwater takes longer to reach a river or stream, and thus controls flooding and maintains stream flow during dry periods of the year.

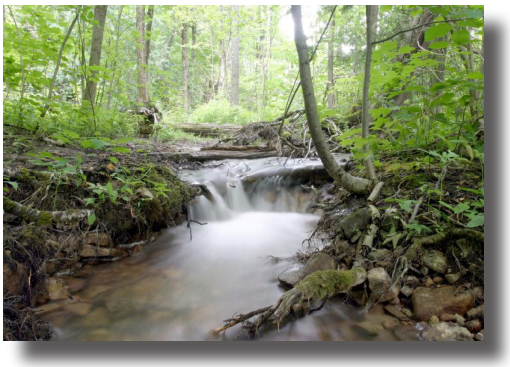
Riparian buffers also help to hold stream banks together. The root structures of the vegetation located in the buffers helps to prevent erosion of soil, and the stems assist in deflection of wave action, limiting ice damage and reducing erosion.

One of the most important functions of riparian buffers is the purpose they serve as wildlife habitats. Buffer areas are characterized by their additional water, which allows for a unique blend of plant and animal species not found as the buffer stretches away from the water body. Not only the land, but the water habitat is influenced by buffers as well. Water is shaded and cooled, as well as filtered, allowing for an increase in water quality for the aquatic species inhabiting the areas. In addition, continuous stretches of riparian buffers serve as important wildlife corridors, allowing for travel. In terms of human use, riparian areas can be used for recreational activities including hiking and camping.

There are two kinds of riparian buffers – shoreline and woodland. Shoreline buffers are areas of small grassy vegetation appearing along the water banks. Shoreline buffers are much smaller than woodland buffers and are generally less effective than their woodland counterparts at effectively removing sediment from runoff before it reaches the main water body.

The SNHPC is currently working with the towns of Candia and Deerfield in a study to establish riparian buffer regulations. At the present time, no municipality within the region has adopted specific land use regulations for riparian buffers. As noted earlier in this chapter, only 4th order streams or rivers fall under the State Shoreline Protection Act requirements. Greater awareness of the importance of riparian buffers is a critical issue that needs to be addressed within the region. A map of the region's riparian buffers is provided on the following map.

Shoreline Buffer



Woodland Buffer

Important Soils

Soils vary for a variety of reasons. Parent material, climate, topography, biology and time all play a part in shaping the character of soils. Soils are broken down into a multitude of classifications, each having their own unique qualities based upon county soil surveys.

Understanding soils is a gateway to understanding the limitations or opportunities they present for land use. Wise land use decisions can only be made through proper awareness of the types of soils existing in an area, and their specific, unique qualities. The Natural Resources Conservation Service provides extensive information about soils and offers help to landowners. Some of the most favorable soils within the region for development, septic fields and construction purposes are identified in the following table.

Table 9.4
Common Soil Types Favorable
For Building, Septic Fields and Construction
Southern New Hampshire

Soil Name	Building Site Development	Septic Tank Absorption Fields	Construction Materials
Adams	X		X
Agawam			X
Becket	X		
Belgrade	X		
Bernardston	X		
Canton	X	X	
Charlton	X	X	
Chatfield	X		
Colton	X		X
Croghan	X		
Deerfield	X		
Hinckley	X		X
Hoosic	X		X
Madawaska	X		
Marlow	X		
Monadnock	X	X	X
Montauk	X		
Newfields	X		
Ninigret	X		
Ondawa			X
Paxton	X		
Pennichuck	X		
Peru	X		
Scio	X		
Scituate	X		
Tunbridge	X		
Unadilla			X
Windsor	X		
Woodbridge	X		

Source: Rockingham and Hillsborough County Soil Survey

Conclusions and Recommendations

The Southern New Hampshire region is presently at a critical stage in natural resource protection. The steps and actions taken or ignored to protect the region's natural resources over the next decade will likely determine the overall environmental and ecological conditions of the region for many years to come. The pace of growth and development of the region will not slow down or wait for state and local government to pull together and recognize the absolute importance of the region's natural environment or the natural resource issues facing the region.

However, there are a number of key strategies and objectives for natural resource protection and conservation that can be identified here. Many of these strategies are identified in the New Hampshire Fish and Game Wildlife Action Plan and have been adapted for this plan.

Regional Conservation Plan

Similar to the effort currently underway in the seacoast, a comprehensive science-based natural resource and land conservation plan is needed for the region, which addresses all of the important focus areas: regional air and water quality, local land and water conservation, biodiversity and conservation. There is a multitude of environmental and monitoring data that is collected and maintained at both the federal and state level. None of this information, however, has ever been evaluated or addressed at a regional level.

REGIONAL COMPREHENSIVE PLAN

Map #9.6

RIPARIAN BUFFERS

Legend

Political Boundaries

Townline

Road Network

Major Roads

Hydrography

Streams

Rivers/ Lakes

Riparian Buffers

300 Feet Wide Riparian Buffers

Data Sources:

Granit Digital Data (1:24,000)
NH Department of Transportation
NHEP, SPNHF, EPA Natural Resource Inventory 06/03

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SNHPC

0 7,500 15,000 30,000 Feet

0 1.5 3 6 Miles

The Coastal Lands Conservation Plan is the first time such an effort has been addressed at the regional level in the state. This planning effort can and should be used as a model for Southern New Hampshire. The resulting plan could help to prioritize and develop regional strategies for maintaining diverse wildlife habitat, abundant wetlands, clean water, productive forests and farms, and outstanding recreational opportunities in the future.

In addition, the plan could provide a report and series of maps that delineate and describe the highest priority areas for conservation such as:

- Large, intact forest blocks
- Critical floodplains and riparian zones
- Large wetland complexes
- Significant wildlife habitats
- Rare species and exemplary natural communities
- High condition headwater stream networks
- Important connectivity zones

Local Natural Resource Inventories and Action Plans

A source of state funding needs to be developed and set aside to encourage local government, planning boards and conservation commissions to develop local land and water conservation action plans and natural resource inventories. These plans would provide the necessary science-based data and information needed to establish land use and other regulations needed to protect the natural environment. Some communities within the region have undertaken natural resource inventories at a great expense. But, once the inventory has been completed, they have not advanced to the next level of establishing an action plan or a set of guidelines for how to protect the resources that have been identified.

Inter-Agency and Regional Coordination in Resource Management

As recommended in the Wildlife Action Plan, greater emphasis needs to be placed on promoting sustainable development and wise resource use at all levels of government. This can be achieved through collaboration and improved coordination of federal, state and local conservation efforts. Working groups, technical guides and targeted educational materials will be important, but the regional planning commissions can also provide a greater role in inter-agency and regional coordination.

Request the State to Prepare Summary Maps the Region's Critical Natural Resources

Mapping the region's critical natural resources such as existing and potential wildlife corridors can target land conservation efforts and help retain ecological connectivity and sustain wildlife diversity. Summary maps will also help planners and citizens use available tools to address land protection and mitigate the impacts of development.

Advise Conservation Commissions and Planning Boards

Working together the state and regional planning commissions should develop a program to provide technical assistance to local planning boards and conservation commissions regarding key natural resource management issues in their communities. Increased awareness leads to action and encourages appropriate stewardship on private lands. A technical assistance program would help to encourage changes in regulations and policies that target wise resource management and use.

Release Wildlife Maps to the Public

The state should make wildlife-related and other natural resource information accessible to developers and the public, while also protecting sensitive information and landowner rights. If developers and the public have access to information prior to planning their projects they will know which agencies to contact for a full review or for help in project design before investing large amounts of time and money in site design and planning. This will also help to streamline the review process and reduce redundancy in the review of permits. The GRANIT or regional planning commission databases would be an appropriate venue for public access to this data.

Encourage Communities to Study and Designate Prime Wetlands

Prime wetlands designation does not result in increased land regulations. The state statutes could be revised to make this clear to the public. However, prime wetlands designation should convey the importance and the functions and values of the wetlands and more communities should embrace this concept.

Consider Fee-In-Lieu Programs for Resource Management

While not always popular, fee-in-lieu of dedication or even mitigation of a development project could be considered at both the state and local level as a means of raising funds for resource management. The New Hampshire Department of Environmental Services has proposed a wetland mitigation in-lieu-fee program to establish wetland compensation. Such a program could allow applicants that propose to harm wetlands to pay a feed rather than selecting land for protection or restoration. These fess would

than be paid into a fund which could be used to generate dollars for the protection and restoration of wetlands throughout the state. A similar program could be considered at the local level for grading permits.

Restore and Maintain Watershed Continuity and Natural Flow Regimes

The Sustainable Rivers Project is a good example of how state and federal agencies can work together to modify the way existing dams are managed to improve the ecological health of rivers. The Merrimack River should be included as a key resource in this project. In addition, stream crossings (e.g. bridges, culverts and railroads) and dams often fragment aquatic ecosystems. Constricted flow and "perched" culverts can prevent passage of fish and other aquatic organisms. Stream crossings may also alter the natural geomorphology of a river or stream, changing sediment deposition patterns above and below the crossing. The state and SNHPC could work together to establish a River and Stream Continuity Steering Committee, composed of representatives from federal, state, local and non-governmental organizations to identify problem stream crossings within the region and develop local solutions. The Nature Conservancy initiated a similar project for the Ashuelot River Watershed.

Incorporate Habitat Conservation into Local Land Use Planning

Master plans, zoning ordinances, subdivision regulations, and other innovative land use tools should be amended to include science-based data and information for addressing wildlife habitat. This will lead to greater protection of habitats and help to conserve water quality and maintain landscape connections.

Promote Riparian/Shoreland Habitat and Other Wildlife Corridors

Studies and maps of prioritized wildlife habitat in riparian zones need to be developed at both the state and regional level. These maps can than be used as guides when selecting riparian buffers and shorelines areas to protect or restore. In addition, this information would be helpful in the environmental review of development projects.

Natural Services Network

As part of the CTAP project to address the impacts of growth in the region due to the I-93 reconstruction project, a new regionally-based approach in identifying priority areas for critical natural services – water supply, flood control, forestry and agricultural soils, wildlife habitat and connections has been developed. This Natural Services Network (NSN) approach can be considered at both the local and regional level in natural resources planning. A variation of the NSN approach is currently being used in

the State of New Hampshire's seacoast coastal conservation plan. This approach can also be considered as a tool in future natural resources studies for the Southern New Hampshire region.

Chapter Ten:

Natural Hazards

Natural Hazards and Their Consequences

During the past decade, the United States has suffered a record number of natural disasters. In 1992, Hurricane Andrew caused an estimated $25 billion in damage. The 1993 Midwest floods resulted in some $12-$16 billion in damage. The 1994 Northridge earthquake caused $20 billion in damage, and the 2002 summer flooding in central Texas is expected to top $1 billion in damage. In 2005, Hurricane Katrina inflicted unprecedented financial and human costs. Flooding 80 percent of the City of New Orleans, damage is estimated to surpass $75 billion, making it the costliest hurricane in United States history. Katrina was also the deadliest U.S. hurricane since the 1928 Okeechobee Hurricane with at least 1,383 lives lost.

Photo of four homes lost in Tennessee due to a mile-wide tornado during November 2002. Portions of the Midwest and South are assessing the damage from more than 70 tornados that touched down. The death toll stands at 35 throughout five states. President George W. Bush declared a major disaster for Tennessee, opening the way for the use of federal disaster funds to help meet the recovery needs of families and businesses devastated by the tornados. Mossy Grove, Tennessee, was among the hardest hit areas as 12 people were killed and the rural town was destroyed.
(FEMA photo courtesy of Jason Pack)

In New England, more than 100 natural disasters during the past quarter century have been sufficiently catastrophic to be declared "disaster areas" by the president, making them eligible for federal disaster relief. That is about four major disasters per year. Nine out of ten of these disasters were the result of flooding.

The October 2005 floods in southwestern New Hampshire caused catastrophic damage. At lease five bridges were washed out, up to 18 families left homeless, more than 1,000 people displaced by evacuations and seven deaths. Rainfall amounts of approximately

9 inches in southwestern New Hampshire from October 7-12 made for swollen rivers, streams and brooks. While events of this magnitude are not commonplace, damage could be averted or reduced with the implementation of foresighted hazard mitigation efforts.

North of the Village of Gilsum, Southwestern New Hampshire
October, 2005

The most recent severe flooding event in New Hampshire took place over Mother's Day weekend 2006. Like the October 2005 floods, this flood was due to record breaking amounts of rainfall of 8.8 inches, as recorded in Concord, from May 13th to the 16th. Preliminary damage assessments estimate 25 homes in the State were destroyed, another 235 severely damaged, and another nearly 4,750 damaged. Over 600 roads were closed statewide. Additionally, over 200 schools closed for at least the Monday and Tuesday following the onset of flooding. Three dams were breached, another four required controlled breaches, and two other dams failed. Additional damages to businesses are estimated to be greater than four million dollars and 115 businesses were damaged. Damages to state and local infrastructure are estimated to be beyond $14 million.

Addison Road, Goffstown, NH
May, 2006

Floods, tornados, winter storms, hurricanes, earthquakes, and wildfires—natural disasters are part of the world around us. Their occurrence is inevitable. These events can wreak havoc on the natural environment by uprooting trees, eroding riverbanks and shorelines, carving new inlets, and blackening forests. Yet the natural environment is amazingly resilient, often recuperating in a matter of days or weeks.

When these events strike the man-made environment, however, the result is often more devastating. Disasters occur when a natural hazard crosses paths with elements of the man-made environment, including buildings, roads, pipelines, or crops. When hurricanes tear roofs off houses, it is a disaster. When tornados ravage a town, it is a disaster. In addition, when floods invade low-lying homes, it is a disaster. If only undeveloped wetlands and floodplains were flooded, rather than homes and businesses, we would hardly take notice. The natural environment takes care of itself. The fabricated environment, in contrast, often needs some emergency assistance.

What Is Hazard Mitigation?

Hazard mitigation is the practice of reducing risks to people and property from natural hazards. It includes both structural interventions, such as flood control devices, and non structural measures, such as avoiding construction in the most flood-prone areas. Mitigation includes not only avoiding the development of vulnerable sections of the community, but also making existing development in hazard-prone areas safer. For example, a community could identify areas that are susceptible to damage from natural disasters and take steps to make these areas less vulnerable. It could also steer growth to less risky areas. Keeping buildings and people out of harm's way is the essence of mitigation.

Regionally, communities must cooperate to identify and mitigate potential hazards. Nature knows no municipal boundaries and failure to mitigate natural hazards in one community can have severe impacts on neighboring communities. Mitigation should not be seen as an impediment to growth and development. On the contrary, incorporating mitigation into development decisions can result in a safer, more resilient region, one that is more attractive to new families and businesses.

Benefits of Hazard Mitigation

Hazard mitigation offers many benefits for a community. It can:

- Save lives and property;
- Reduce vulnerability to future hazards;
- Facilitate post-disaster funding; and
- Speed recovery.

Why Develop a Hazard Mitigation Plan?

The full cost of the damage resulting from natural hazards—personal suffering, loss of lives, disruption of the economy, loss of tax base—is difficult to measure. New Hampshire is subject to many types of natural disasters: floods, hurricanes, nor'easters, winter storms, earthquakes, tornados, and wildfires, all of which can have significant economic and social impacts. Some, such as hurricanes, are seasonal and often strike in predictable locations. Others, such as floods, can occur any time of the year and almost anywhere in the state.

Individual communities must produce hazard mitigation plans per federal regulations every three to five years.[1] Mitigation funding is contingent upon an up-to-date hazard mitigation plan. This chapter does not substitute for individual community hazard mitigation plans. It does however, attempt to point out the feasibility and need for regional cooperation in hazard mitigation planning.

Once communities have developed and adopted a FEMA approved Hazard Mitigation Plan, it may constitute a new section of the communities' master plan, in accordance with RSA 674:2. The adopted plan can also be incorporated into other planning mechanisms, such as the Capital Improvement Program (CIP). Adoption of a Hazard Mitigation Plan demonstrates the municipality's commitment to hazard mitigation. It also qualifies the municipality for federal, state and local funding and prepares the public for what the community can be expected to do both before and after a natural hazard disaster occurs.

1. FEMA Disaster Mitigation Act of 2000 44 CFR Part 201.6(d)(3) mandates "Plans must be reviewed, revised if appropriate, and resubmitted for approval within five years to continue to be eligible for HMGP project grant funding." (Federal Register Vol. 36, No. 38, Feb 26, 2002, Rules and Regulations, p8852)

Hazard Identification

The SNHPC region is located in the south-central portion of the State of New Hampshire and encompasses parts of Hillsborough, Merrimack and Rockingham Counties. The climate of Manchester and its surrounding towns is typical of the Merrimack Valley, with warm summers and cool winters. Temperatures during the month of July range from an average high of 82.1 degrees Fahrenheit to an average low of 54.6 degrees. January temperatures range from an average high of 32.3 degrees to an average low of 5.2 degrees. Prolonged periods of severe cold are rare. Annual average precipitation is 39.82 inches.[2]

All towns in the region are now participating in the National Flood Insurance Program (NFIP). According to FEMA's Biennial Reports completed by participating towns, there were approximately 938 residential structures located in the FEMA designated special flood hazard areas (100 year floodplain) and 71 non-residential structures.

The region currently has 674 NFIP policies, 430 one-to-four family residential policies, 193 other residential, and 51 non-residential structures. Seventy-seven claims have been filed with NFIP totaling $369,843. There are 23 repetitive loss properties insured under the NFIP within the region. The following table 10.1 summarizes the National Flood Insurance Program by municipality.

2 Climate information from http://ggweather.com/normals/NH.htm accessed 2 May 2006.

Table 10.1
Summary of National Flood Insurance Program For the SNHPC region

Municipality	Year of Participation Entry	Number of residential structures within the SFHA	Number of non-residential structures within the SFHA	Number of National Flood Insurance Policies			Claim Dollar Amount (Number of Claims)	Repetitive Loss Dollar Amount (Number of Claims)
				1-4 Family Residential	Other Residential	Non-Residential		
Auburn	1986	45	0	1	0	0	$0 (0)	$0 (0)
Bedford	1979	N/A	N/A	31	0	8	$33,780 (2)	$33,780 (2)
Candia	2006	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chester	2000	N/A	N/A	12	0	0	$0 (0)	$0 (0)
Deerfield	1989	75	0	24	0	0	$4,607 (2)	$0 (0)
Derry	1981	60	0	50	167	1	$41,574 (10)	$15,146 (4)
Goffstown	1979	N/A	N/A	87	0	6	$139,444 (25)	$69,889 (6)
Hooksett	1979	N/A	N/A	30	2	2	$5,752 (1)	$0 (0)
Londonderry	1980	120	0	19	0	6	$41,564 (9)	$23,402 (4)
Manchester	1981	303	49	77	21	21	$9,473 (3)	$0 (0)
New Boston	1981	32	7	20	0	3	$492 (1)	$0 (0)
Raymond	1982	303	15	64	2	3	$76,985 (21)	$45,298 (7)
Weare	1993	N/A	N/A	15	1	1	$16,172 (3)	$0 (0)
SNHPC Region	N/A	938	71	430	193	51	$369,843 (77)	$187,515 (23)

Source: FEMA Online Community Information System

Past hazard events in the SNHPC region include flooding, wind, wildfire, ice, snow, and seismic events. Other hazards include geomagnetism, drought, and extreme heat or cold. The Identified Hazard Zones Map on the following page reflects the impact areas for each hazard. For more specific information, including the probability for damage to occur from each hazard type, consult the hazard mitigation plan for the individual municipality.

Flooding

Riverine Flooding

"Typical riverine flooding involves the overflowing of the normal flood channels or rivers or streams, generally as a result of prolonged rainfall or rapid thawing of snow cover. The lateral spread of floodwater is largely a function of the terrain, becoming greater in wide, flat areas, and affecting narrower areas in steep terrain. In the latter cases, riparian hillsides in combination with seep declines in riverbed elevation often force waters downstream rapidly, sometimes resulting in flash floods." [3]

The Merrimack River flows through three communities in the region – Hooksett, Manchester, and Bedford. Tributaries of the Merrimack include the Piscataquog, which flows through Goffstown, New Boston, and Weare. The Lamprey River flows through Raymond, Candia and Deerfield. The Exeter Rivers flows through a small portion of Chester. There are numerous smaller streams and creeks within the region with a potential for riverine flooding. As in other New Hampshire communities, when "[r]esidents moved to the floodplains … [s]uch encroachment has led to problems… Flood safety is a great concern along these watercourses and can be greatly enhanced by flood hazard mitigation planning."

"The goal of flood hazard mitigation planning is to eliminate or reduce the long-term risks to human life and property from flooding by reducing the cause of the hazard or reducing the effects through preparedness, response and recovery measures. Hazard mitigation is the only phase of emergency management that can break the cycle of damage, reconstruction and repeated damage." Riverine flooding is the most common and significant hazard event in the State of New Hampshire as well as the SNHPC region.

Some of the more severe flooding in the region occurs during the spring, fall and winter seasons. The most severe riverine flooding event in the region, March 1936 along the Merrimack River, occurred due to heavy rainfall in combination with rapid snowmelt and debris impacted infrastructure. These factors occurring together created catastrophic results.[4]

From 1986 through 2005 there have been seven flood-related declared disasters by FEMA.

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3. James Schwab, Kenneth Topping, et al., Planning for Post-Disaster Recovery and Reconstruction, Planning Advisory Services, Report Number 483/484, (Chicago: American Planning Association, December, 1998), 208.
5. Manchester Flood Insurance Study, Federal Emergency Management Agency, 1981.

Table 10.2
Federally Declared Flooding Disasters
In the SNHPC region, 1986-2005

Date	Year	Title	Affected Counties in the SNHPC Region
October 26	2005	Severe Storms and Flooding	Hillsborough and Merrimack Counties
July 2	1998	Severe Storms and Flooding	Merrimack and Rockingham Counties
October 29	1996	Severe Storms and Flooding	Hillsborough, Merrimack, and Rockingham Counties
January 3	1996	Storms/Floods	Merrimack County
November 13	1991	Coastal Storm/ Flooding	Rockingham County
April 16	1987	Severe Storms and Flooding	Hillsborough, Merrimack, and Rockingham Counties
August 27	1986	Severe Storms and Flooding	Hillsborough County

Source: FEMA "Federally Declared Disasters by Calendar Year"

All special flood hazard areas (SFHAs) in the SNHPC region are potentially at risk in the event of riverine flooding. The SFHAs are located on the Identified Hazard Zones Map.

Hurricanes

"A hurricane is a heat engine that derives is energy from ocean water. Theses storms develop from tropical depressions which form off the cost of Africa in the warm Atlantic waters. When water vapor evaporates, it absorbs energy in the form of heat. As the vapor rises, it cools within the tropical depression, and then condenses, releasing heat, which sustains the system." SNHPC region communities generally are impacted by hurricanes through rain induced flooding rather than high winds.

Since 1635, twelve hurricanes have reached New Hampshire: in the years 1635, 1778, 1804, 1815, 1869, 1938, 1954 (2), 1960, 1985, 1991 and 1999. The September 1938 hurricane was the most notable event to strike southern New Hampshire. Piscataquog river flood water discharges were measured, near the Town of Goffstown, at 21,900 cubic feet per second, exceeding a 100-year storm. Additionally, during the 1938 storm the Weare Reservoir failed. The 1938 flood is estimated to have been the greatest flood since 1733.[5] Hurricanes Carol and Edna caused some damage in August and September 1954.

5 Weare Flood Insurance Study, Federal Emergency Management Agency, 1993.

Potential effects of a hurricane include flooding, runoff not handled adequately, and disrupted travel. The most recent hurricanes were: September 1985 – Gloria, August 1991 – Bob, and September 1999 – Floyd. During these events trees and power lines came down, and there was minimal structural damage.

Table 10.3
Federally Declared Hurricane Disasters
In the SNHPC Region, 1986-2005

Date	Year	Title	Affected Counties in the SNHPC region
September 9	1991	Hurricane	Statewide

Source: FEMA, "Federally Declared Disasters by Calendar Year"

All areas are potentially at risk if a hurricane reaches the SNHPC Region.

Debris-impacted infrastructure and river ice jams

"The potential effects of flooding are increased when infrastructure is obstructed either by debris or ice formations. These obstructions compromise the normal stormwater flow, creating an artificial dam or narrowing of the river channel causing a backup of water upstream and forcing water levels higher. Debris obstructions can be caused from vegetative debris, silt, soils, and other riparian structures that have been forced into the watercourse. Ice jams are caused by ice formations "in riverbeds and against structures." Bridges, culverts, and related roadways are most vulnerable to ice jams and debris-impacted infrastructure.

Historically, floods in the region have been due to snow melt and heavy rains in conjunction with ice jams or debris-impacted infrastructure. The flood of 1936, previously mentioned, was severely exacerbated by the presence of 55,000 gallon oil tanks and other debris in the river that became lodged at the Granite Street Bridge.

All special flood hazard areas in the region are potentially at risk if there is an ice jam or debris-impacted infrastructure. Particular concern should be given to bridges along the Merrimack, Piscataquog, Lamprey and Exeter Rivers.

Erosion and mudslides

The New Hampshire Department of Environmental Services (NH DES) defines erosion as "The process in which a material is worn away by a stream of liquid (water) or air, often due to the presence of abrasive particles in the stream."[6] SNHPC defines erosion as the gradual or rapid wearing away of stream banks or shores, due to prevailing winds, natural water movement and more catastrophic events. Additional causes of erosion are removal of vegetation and soil disturbance. Riparian construction sites are one non-natural contributor (NH DES Shoreland Protection). Stream bank erosion may eventually result in mudslides.

Land in the region which has at least a 15 percent slope, a vertical rise of 15 feet over a horizontal run of 100 feet, is scattered throughout the region, usually occurring

6. New Hampshire Department of Environmental Services Watershed Management Bureau.

around the hills and stream banks. Areas of steep slopes in the region are shown on the Identified Hazard Zones map at the end of this section.

All areas of steep slopes, as mapped in the region, are potentially at risk in the case of potential erosion and mudslide events

Rapid snowpack melt

Rapid snowpack melt, much as its name suggests, is the rapid melting of the snowpack in conjunction with warming temperatures and moderate to severe rains, typically during the spring. "The lower lying areas of the State may experience either flash flooding or inundation events accelerated by the rapid melting of the snowpack."

Structures and improvements located on, along, or at the base of steep slopes are most vulnerable to rapid snowpack melt. These areas can be seen on the Identified Hazard Zones map's depiction of steep slopes.

All areas of steep slopes and erosion prone soils, as mapped, are potentially at risk in the event of rapid snowpack melt.

Dam breach or failure

The NH Department of Environmental Services indicates several failure modes for dams. Most typical include hydraulic failure or the uncontrolled overflowing of water, seepage or leaking at the dam's foundation or gate, structural failure or rupture, general deterioration, and gate inoperability. These modes vary between dams depending on their construction type.[7] Additionally, failure may be triggered because of significant seismic activity, particularly earthquakes.

The State of New Hampshire uses a hazard potential classification based on the impact of dam breach or failure. All class B and C dams have the potential to cause damage if they breach or fail. The SNHPC region has 129 Class AA dams (no hazard potential), 45 Class A dams (low hazard potential), 12 Class B dams (significant hazard potential), and 6 Class C dams (high hazard potential).[8]

"The Department of Environmental Services (DES), through its Dam Bureau, is responsible for the regulation of the state's dams to ensure that they are constructed, maintained and operated in a manner to promote public safety." Per RSA 482:2 and

7. New Hampshire Department of Environmental Services Dam Bureau, Environmental Fact Sheets DB-4 through 7.
8. New Hampshire Department of Environmental Services Dam Bureau, "Dams."

RSA 482:12, all owners of Class B and C dams are required to submit an Emergency Action Plan to NHDES as well as other applicable agencies in the State.[9]

The Class C dams in the region are located in Auburn, Goffstown, Hooksett, Manchester and Weare. Class B dams are located in Derry, Goffstown, Hooksett, Manchester, and Weare. The class B and C dams are listed in Table 10.4 below. For potential damage assessments and inundation areas, consult the dam emergency action plans or hazard mitigation plan for the individual municipality.

Table 10.4
Class B and C Dams in the SNHPC Region

Hazard Class	Dam Name	River	Location
C	Tower Hill Pond	Maple Falls Brook	Auburn
C	Gregg Falls Dams	Piscataquog River	Goffstown
C	Hooksett Hydro	Merrimack River	Hooksett
C	Massabesic Lake Dam	Cohas Brook	Manchester
C	Amoskeag Dam	Merrimack River	Manchester
C	Everett Dam	Piscataquog River	Weare
B	Hoods Pond	Shields Brook	Derry
B	Sludge Treatment Lagoon	N/A	Derry
B	Waste Lagoon	N/A	Derry
B	Big Island Pond Outlet	Spickett River	Derry
B	Uncanoonuc Dam	Dan Little Brook	Goffstown
B	Hadley Falls	Piscataquog River	Goffstown
B	Dube Pond Dam	Maple Falls Brook	Hooksett
B	Dorrs Pond	Dorrs Pond	Manchester
B	Black Brook Pond	Black Brook	Manchester
B	Cohas Road Reservoir, Low Service	N/A	Manchester
B	Kelley Falls Dam	Piscataquog River	Manchester
B	Weare Reservoir - Horace Lake	Piscataquog River	Weare

Source: New Hampshire Department of Environmental Services

The SFHAs in proximity to the Region's Class B and C dams as well as their designated floodways, would be impacted by a dam breach.

9. New Hampshire Department of Environmental Services Dam Bureau, Environmental Fact Sheet, DB-

Wind

The most frequent problem and risk associated with all types of wind storms in the region is downed trees and the secondary impacts of their falling, including downed power lines. There has been one Presidentially Declared Disaster for severe wind storms in the region since 1982. The August 1990 windstorm caused approximately $2.3 million in damages across all counties in the state except Belknap.

Since 1995 there have been 75 storms with high winds recorded in the region that have not been associated with one of the specific wind event types as identified below. These 75 storms had winds of up to 134 knots and totaled $416,000 in damages across the region.[10]

Table 10.5
Federally Declared Severe Storms/Wind Disasters
In the SNHPC Region, 1986-2005

Date	Year	Title	Affected Counties in the SNHPC region
August 29	1990	Severe Storms/Wind	Hillsborough and Merrimack Counties

Source: FEMA, "Federally Declared Disasters by Calendar Year"

Hurricanes

Severe hurricanes reaching south-central New Hampshire in the late summer and early fall are the most dangerous of the coastal storms that pass through New England from the south. Tropical depressions are considered to be of hurricane force when winds reach 74 miles per hour, see table 10.6 below for hurricane categorization according to the Saffir-Simpson Scale. Substantial damage may result from winds of this force, especially considering the duration of the event, which may last for many hours. Potential effects of hurricane force winds include fallen trees, telephone poles and power lines.

Table 10.6
Saffir-Simpson Hurricane Scale

Category	Winds (mph)	Potential Damage
1	74-95	Minimal
2	96-110	Moderate
3	111-130	Extensive
4	131-155	Extreme
5	>155	Catastrophic

Source: http://www.unc.edu/~rowlett/units/scales/saffir.html

10. National Oceanic & Atmospheric Administration, National Climatic Data Center.

Winds from the Hurricane of 1938, previously mentioned, reached a high of 186 miles per hour, a category 5 on the Saffir-Simpson scale.

All areas in the SNHPC region are at risk if a hurricane reaches Southern New Hampshire.

Tornados

"A tornado is a violently rotating column of air extending from a thunderstorm to the ground. The most violent tornadoes are capable of tremendous destruction with wind speeds of 250 mph or more. Damage paths can be in excess of 1 mile wide and 50 miles long." Tornados originate from hurricanes and thunderstorms, and are created when cold air overrides warm air causing the warm air to rise rapidly.[11] Tornados are measured using the Fujita Tornado Damage Scale, as seen in the table 10.7 below.

Table 10.7
Fujita Tornado Damage Scale

Category	Winds (mph)	Potential Damage
F0	<73	Light
F1	73-112	Moderate
F2	113-157	Considerable
F3	158-206	Severe
F4	207-260	Devastating
F5	261-318	Incredible

Source: NOAA, http://www.spc.noaa.gov/faq/tornado/f-scale.html

Between 1950 and 1995 there were 30 known tornadoes in the SNHPC region. There were 18 known tornados in Hillsborough County. One of these was a F0, thirteen were F1, three were F2 (July 1961, June 1963, and July 1968), and one was a F3 (August 1968). There were three known tornadoes in Merrimack County, all were F1 (July 1967, May 1972, and August 1976). There were nine known tornadoes in Rockingham County ranging from F0 to F3. There were two F0, two F1, four F2 and one F3.[12]

All areas of the SNHPC region are potentially at risk if a tornado forms in or passes through the region.

11. Federal Emergency Management Agency, "Understanding Your Risks," 2-20.
12. Tornado data from http://www.tornadoproject.com/ accessed 2 May 2006.

Nor'easters

A Northeaster, or winter extra-tropical storm, is "[a] large weather system traveling from South to North passing along or near the seacoast. As the storm approaches New England and its intensity becomes increasingly apparent, the resulting counterclockwise cyclonic wind impacts the coast and inland areas from a northeasterly direction. The sustained winds may meet or exceed hurricane force, with larger bursts, and may exceed hurricane events by many hours in terms of duration."

"Unlike the relatively infrequent hurricane, New Hampshire generally experiences at least one or two "significant" events each year… with varying degrees of severity. These storms have the potential to inflict more damage than many hurricanes because … high winds can last from 12 hours to 3 days, while the duration of hurricanes ranges from 6 to 12 hours."

Nor'easters are measured on the Dolan- Davis scale, as is presented on the following page.

Table 10.8
Dolan-Davis Nor'easter Classification Scale

Storm Class	Percent of Nor'easters	Avg. Return Interval	Avg. Duration (hours)	Impact
1- WEAK	49.7	3 days	8	No property damage
2- MODERATE	25.2	1 month	18	Modest Property damage
3- SIGNIFICANT	22.1	9 months	34	Local-scale damage and structural loss
4- SEVERE	2.4	11 years	63	Community Scale damage and structural loss
5- EXTREME	0.1	100 years	95	Extensive regional-scale damage and structural loss

Source: State of NH Natural Hazards Mitigation Plan & NC Division of Emergency Management

All areas of the SNHPC region are potentially at risk for property damage and loss of life due to nor'easters.

Downburst

"A downburst is a severe localized wind blasting down from a thunderstorm. These 'straight line' winds are distinguishable from tornadic activity by the pattern of destruction and debris. Depending on the size and location of these events, the destruction to property may be devastating. Downbursts fall into two categories. Microbursts cover

an area less than 2.5 miles in diameter, and macrobursts cover an area at least 2.5 miles in diameter."

More recent downburst activity occurred on July 6, 1999 in the form of a macroburst within central New Hampshire; throughout Merrimack, Grafton and Hillsborough Counties. There were two fatalities as well as two lost roofs, widespread power outages, and downed trees, utility poles and wires.

All locations in the SNHPC region are at risk for property damage and loss of life due to downbursts.

Lightning

"During the development of a thunderstorm, the rapidly rising air within the cloud, combined with the movement of the precipitation within the cloud, causes electrical charges to build up within the cloud. Generally, positive charges build up near the top of the cloud, while negative charges build up near the bottom. Normally, the earth's surface has a slight negative charge. However, as the negative charges build up near the base of the cloud, the ground beneath the cloud and the area surrounding the cloud become positively charged. As the cloud moves, these induced positive charges on the ground follow the cloud like a shadow. Lightning is a giant spark of electricity that occurs between the positive and negative charges within the atmosphere or between the atmosphere and the ground. In the initial stages of development, air acts as an insulator between the positive and negative charges. However, when the potential between the positive and negative charges becomes too great, there is a discharge of electricity that is known as lightning."

In the SNHPC Region, there have been 18 reported incidents of personal and property damage resulting from lightning from 1950 to 2005. There were five injuries and one death resulting from four events. Property damage totaled $1.326 million.

All areas in the SNHPC region are potentially at risk for property damage and loss of life due to lightning.

Fires

Wild Land and Urban-Wild Land Interface Fires

"Historically, large New Hampshire wild land fires run in roughly 50-year cycles…The increased incidence of large wild land fire activity in the late 1940s and early 1950s is thought to be associated, in part, with debris from the hurricane of 1938. Significant woody 'fuel' was deposited in the forests during that event…Present concerns of the New Hampshire Department of Resources and Economic Development, Division of

Forests and Lands, are that the ice storm of 1998 has left a significant amount of woody debris in the forests of the region and may fuel future wildfires similar to the debris caused by the Hurricane of 1938."

In addition to wild land fires the areas of urban and wild land interface are particularly at risk. These fires occur along the fringes of development creating another form of fire mixing the hazards of both urban and wild land fires.

Throughout the region, the following areas are susceptible to wild land fires:

- All new developments – when trees are cut the soil dries leaving dead grass creating a new urban-wild land interface;
- Residential development adjacent to wooded areas – unattended fire pits and chimneys pose an additional risk;
- Trails and adjacent wooded areas used for hiking, biking, or snowmobiling; and
- Campgrounds – unattended fires pose an additional risk.

Isolated Homes

"New Hampshire is heavily forested and is therefore exposed to this hazard … The proximity of many populated areas to the State's forested lands exposes these areas and their populations to the potential impact of wildfire."

There are many dead end, single access roads in the region with residential development along them. Early subdivisions are of particular risk since typically they lack multiple road connections. Also the roads may be privately owned and maintained, making access by emergency vehicles difficult, especially with respect to turn arounds. Additionally, former vacation homes along the many water bodies in the region and the region's most remote areas have limited access for emergency and rescue vehicles.

Subdivisions that do not feature multiple road connections, former vacation spots along the many water bodies in the region, and the most remote areas in the region are potentially at risk for property damage and loss of life due to isolated home fires.

Ice and Snow Events

Heavy Snowstorms

"A heavy snowstorm is generally considered to be one that deposits four or more inches of snow in a twelve-hour period. A blizzard is violent snowstorm with winds blowing at a minimum speed of 35 miles per hour and visibility of less than one-quarter mile for three hours." During a blizzard temperatures drop to below 20°F. Intense wintertime

nor'easters are often referred to as blizzards. 'White outs' occur when previously fallen dry snow is blown into the air and extremely reduces visibility.

Heavy snowstorms include all storms with four or more inches of snow in a twelve-hour period, including all blizzards and nor'easters with large snow accumulation.

In the past twenty years the Federal Emergency Management Agency declared six snowstorm-related Emergency Declarations for the SNHPC region. The first was declared by FEMA in March of 1993 for statewide heavy snow. The second was for snowstorms during March of 2001 covering seven of the State's ten counties.[13]

The third declared emergency was for a snowstorm on February 17-18, 2003. This storm accumulated approximately 18 inches of snow in the Manchester area (National Weather Service, "Winter Weather Summaries"). This snow was added to an existing base of snow to create an approximate snow depth of 29 inches.[14]

The fourth declared emergency was on December 6-7, 2003. This emergency was declared for eight out of the ten counties. The storm accumulated approximately 20 inches of snow in the Manchester area and winds were measured at up to 39 miles per hour.[15]

The fifth declared emergency was for January 22-23, 2005 and was declared for all New Hampshire counties, except Coos. Snowfall accumulations of 6 to 20 inches where recorded across much of southern and central New Hampshire. Winds gusting as high as 45 mph created near blizzard conditions at times, making travel impossible during the height of the storm.[16]

The most recent declared emergency was for March 11-12, 2005 and was declared for four of New Hampshire's nine counties. Snow accumulated 4 to 15 inches across most of the state before ending during the early morning hours of March 13. State police reported numerous vehicles off roads around the region, especially on Interstate 93. A number of flights at Manchester Airport were delayed or canceled as a result of the storm.[17]

13. Federal Emergency Management Agency, "Federally Declared Disasters by Calendar Year."
14. National Weather Service, "Climate Data."
15. National Weather Service, "Winter Weather Summaries."
16. National Oceanic & Atmospheric Administration National Climatic Data Center and the National Weather Service, Gray, ME.
17. Ibid.

Table 10.9
Federally Declared Snowstorm Disasters In the SNHPC Region, 1986-2005

Date	Year	Title	Affected Counties in the SNHPC Region
March 30	2005	Snow Emergency	Hillsborough, Merrimack, and Rockingham Counties
April 28	2005	Snow Emergency	Hillsborough and Rockingham Counties
January 15	2004	Snow Emergency	Hillsborough and Merrimack Counties
March 11	2003	Snow Emergency	Hillsborough, Merrimack, and Rockingham Counties
March	2001	Snow Emergency	Hillsborough, Merrimack, and Rockingham Counties
March 16	1993	Heavy Snow	Statewide

Source: FEMA, "Federally Declared Disasters by Calendar Year"

All areas of the SNHPC region are potentially at risk for property damage and loss of life due to heavy snows.

Ice Storms

"Ice Storms occur when a mass of warm moist air collides with a mass of cold arctic air. The less dense warm air will rise and the moisture may precipitate out in the form of rain. When this rain falls through the colder more dense air and comes in contact with cold surfaces, ice will form and may continue to form until the ice is as thick as several inches."

Despite the beauty of ice events, the extreme weight of ice build-up may strain tree branches, power lines and even transmission towers to the breaking point, resulting in a loss of power, telephone service, or other services. Fallen trees, limbs, or utility poles may obstruct roads and restrict emergency vehicle passage. Additionally, ice creates treacherous conditions for highway travel and aviation.

The most recent ice storm occurred in 1998 and was a Declared Disaster by FEMA for nine of the State's 10 counties, including Hillsborough and Merrimack County. The January 1998 ice storm was very similar in both its impact area and severity to a 1929 ice storm that caused unprecedented damage to the telephone, telegraph and power system. The 1998 storm caused significant damage to the utility network. Across the State's impacted areas there were six related injuries, one fatality and 20 major road closures.

Table 10.10
Federally Declared Ice Storm Disasters In the SNHPC Region, 1986-2005

Date	Year	Title	Affected Counties in the SNHPC Region
January 15	1998	Ice Storm	Hillsborough and Merrimack Counties

Source: FEMA "Federally Declared Disasters by Calendar Year"

All areas of the SNHPC region are potentially at risk for property damage and loss of life due to ice storms.

Hailstorms

"Hailstones are balls of ice that grow as they are held up by winds, known as updrafts, that blow upwards in thunderstorms. The updrafts carry droplets of super cooled water (at a below freezing temperature) but not yet ice. The super cooled water droplets hit the balls of ice and freeze instantly, making the hailstones grow. The faster the updraft, the bigger the stone can grow."

"Most hailstones are smaller in diameter than a dime, but stones weighing more than a pound have been recorded. Details of how hailstones grow are complicated but the results are irregular balls of ice that can be as large as baseballs, sometimes even bigger. While crops are the major victims, hail is also a hazard to vehicles and windows. Hail damage events can be severe to persons, property, livestock and agriculture."

All areas of the SNHPC region are potentially at risk from this hazard.

Seismic Events

Earthquakes

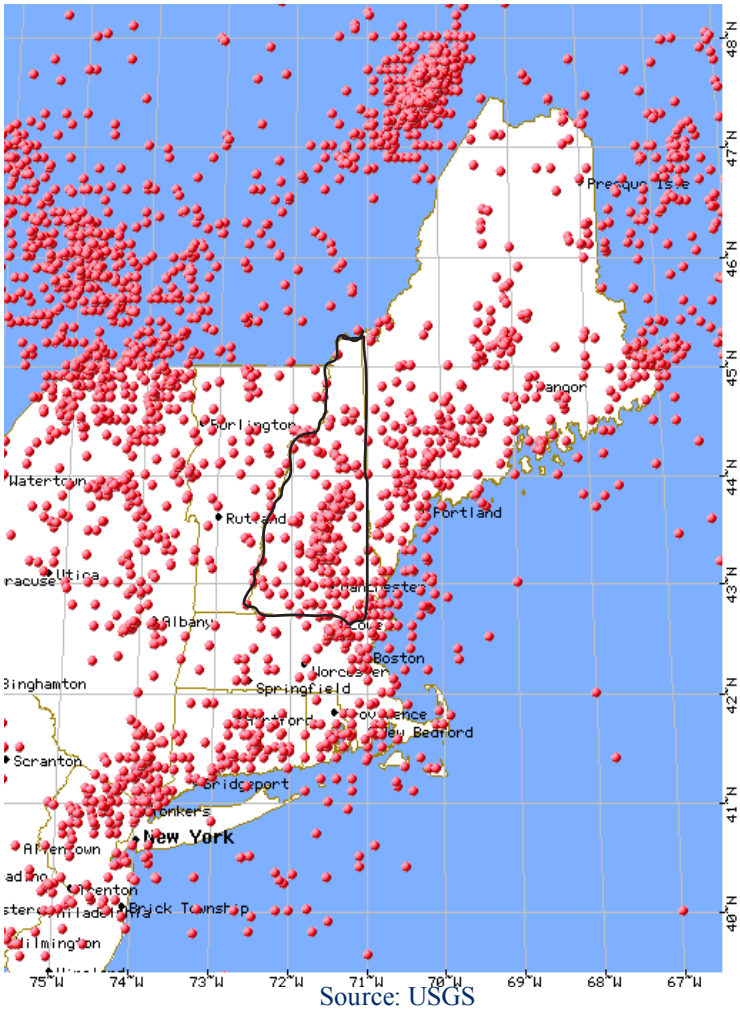
An earthquake is "a series of vibrations induced in the earth's crust by the abrupt rupture and rebound of rocks in which elastic strain has been slowly accumulating."

In the State of New Hampshire, earthquakes are due to intraplate seismic activity, opposed to interplate activity or shifting between tectonic plates as occurs in California. The causes of intraplate earthquakes have yet to be scientifically proven. One accepted explanation for the cause of intraplate "earthquakes in the Northeast is that ancient zones of weakness are being reactivated in the present-day stress field. In this model, pre-existing faults and/or other geological features formed during ancient geological episodes persist in the intraplate crust, and, by way of analogy with plate boundary

seismicity, earthquakes occur when the present-day stress is released along these zones of weakness."[18]

There are two scales that measure earthquakes, the Modified Mercalli (MM) and the Richter scales. The Richter scale is a measurement of magnitude of the quake as calculated by a seismograph and does not measure damage. The Modified Mercalli scale denotes the intensity of an earthquake as it is perceived by humans, their reactions and damage created. It is not a mathematically based scale but a ranking of perception.19

Approximate Epicenters of all Seismic Events:
Northeast US from 1638 to 1995



Source: USGS

One of New England's more notable seismic zones runs from the Ossipee Mountain area of New Hampshire, through the Manchester area, and continues south toward Boston, Massachusetts. This particular area has a mean return time of 408 years for a 6.0 Richter scale earthquake or a 39 percent probability of occurrence in 200 years. Additionally for a 6.5 Richter scale quake there is a mean return time of 1,060 years or a 17 percent probability of occurrence in 200 years.[20] When New England is generalized as a whole for earthquake probability estimation, the risk increases from the specific hazard zone noted above. For New England there is an estimated return

18. Alan L. Kafka, Ph.D., "Why Does the Earth Quake in New England?: The Science of Unexpected Earthquakes, Revised: January 3, 2004," Weston Observatory, Department of Geology and Geophysics, Boston College. 26 January 2004. http://irc.nrc-cnrc.gc.ca/fulltext/nrcc43363.pdf
19. USGS Magnitude / Intensity Comparison http://earthquake.usgs.gov/learning/topics/mag_vs_int.php accessed 2 May 2006.
20 Jay J. Pulli, "Seismiscity, Earthquakes Mechanisms, and Seismic Wave Attenuation in the Northeastern United States," PhD Dissertation Abstract. MIT, June 10, 1983. 26 January 2004. http://www-eaps.mit.edu/erl/research/theses/abstracts/Pulli.html

time of every 10 years for an earthquake with a 4.6 Richter scale magnitude and 1000 years for 7.0 magnitude.

From 1728-1989 there were 270 earthquakes in New Hampshire. This averages to approximately one quake every year. There have been six quakes over 4.0 on the Richter scale during the 1900s.[21] The most recent quake occurred on August 28, 2004, fifteen miles northwest of Manchester, New Hampshire, with a magnitude of 2.1 on the Richter scale.[22]

All areas of the SNHCP region are potentially at risk for property damage and loss of life due to earthquakes.

Landslides

"A Landslide is the downward or outward movement of slope forming materials reacting under the force of gravity including: mudflows, mudslides, debris flows, rockslides, debris avalanches, debris slides and earth flows. Landslides may be formed when a layer of soil atop a slope becomes saturated by significant precipitation and slides along a more cohesive layer of soil or rock. Seismicity may play a role in the mass movement of landforms."

All areas of steep slopes in the SNHPC region, as shown on the Identified Hazard Zones Map, are at risk for landslides.

Other Hazards

Geomagnetism

The State of New Hampshire Natural Hazards Mitigation Plan defines geomagnetism as "…of, or pertaining to, the earth's magnetic field and related phenomena. Large geomagnetic disturbances commonly known as magnetic storms, if global in scale, or as magnetic substorms, if localized in scale and limited to night time high altitude auroral regions, are of particular significance for electric power utilities, pipeline operations, radio communications, navigation, satellite operations, geophysical exploration and GPS (global positional system) use."

Geomagnetism includes both solar wind coupling and magnetic storms. Solar wind coupling is the relationship between solar events and winds with geomagnetic activity within the earth's magnetoshphere. "Magnetic storms occur when the radiation belts become filled with energetic ions and electrons. The drift of these particles produces a doughnut shaped ring of electrical current around the earth...Magnetic storms are often initiated by the sudden arrival of a high-speed stream of solar wind, carrying high particle density and high magnetic field."

21 Ibid.
22. USGS Earthquake Hazards Program http://earthquake.usgs.gov/ accessed 2 May 2006.

High-tension lines and communications towers are at risk in the SNHPC region.

Drought

"A drought is a natural hazard that evolves over months or even years and can last as long as several years to as short as a few months, fortunately droughts are rare in New Hampshire. The central theme in the definition of a drought is the concept of water deficit. The severity of the drought is gauged by the degree of moisture deficiency, its duration and the size of the area affected. The effect of droughts, or decreased precipitation, is indicated through measurements of soil moisture, groundwater levels, and streamflow. Not all of these indicators will be minimal during a particular drought. For example, frequent minor rainstorms can replenish the soil moisture without raising ground water levels or increasing streamflow."

While droughts are not as devastating as other hazards, low water levels can have negative effects on existing and future developed areas that depend on groundwater for water supply. Additionally, the dry conditions of a drought may lead to an increase wild fire risk.

All areas of the SNHPC region would be affected by a drought.

Extreme Heat

"A heat wave is defined as a period of three consecutive days during which the air temperature reaches 90 degrees Fahrenheit or higher on each day." Extreme heat is an occasional and short-lived event in southern New Hampshire. While there have been no extended periods of extreme heat in Southern New Hampshire, the State of New Hampshire Natural Hazards Mitigation Plan notes one of the hottest summers of record as 1999. There were 13 days above 90 degrees, five days over 95 degrees and two days over 97 degrees. From 1960-1994 there were 45 heat waves recorded in Concord, NH. This is an average of 1.3 heat waves per year. In 1988 there were a total of five heat waves.

All areas of the SNHPC region would be affected by extreme heat, in its event. Particular areas and populations at a greater risk are:

- Elderly populations and day care centers;
- Power system that may become overburdened; and
- Communications negatively affected by power burden.

Extreme Cold

While most New Hampshire residents are rather habituated to the extreme cold situations in the State, and this is not a section identified by the State of New Hampshire Natural Hazards Mitigation Plan, it was decided to include a statement in this *Plan*. For

the purposes of this *Plan* we will refer to extreme cold in a general manner, without a scientific definition. Periods of extreme cold pose a life-threatening situation for the SNHPC region's homeless and low-income populations. With the rising costs of heating fuel and electric heat, many low-income citizens are not able to adequately heat their homes, exposing themselves to cold related medical emergencies or death. This is an even greater concern for homeless persons who maybe unable to escape the extreme temperatures.

In Concord, New Hampshire there are on average 21 days below 32 degrees Fahrenheit in November, 29 days in December, 30 days in January, 27 days in February, and 26 days in March. The coldest temperatures recorded for each month were –5 degrees Fahrenheit in November, -22° in December, -33° in January, -37° in February, and -16° in March.[23]

All areas of the SNHPC region would be affected by extreme cold, in its event. Particular areas and populations at a greater risk are:

- Elderly populations and day care centers;
- Power system that may become overburdened; and
- Homeless and low income populations.

23 Northeast Regional Climate Center, "Comparative Climatic Data for the United States," 26 January 2004. http://www.nrcc.cornell.edu/ccd.html

Typical Existing Mitigation Strategies

There are several programs and ordinances that are commonly used in New Hampshire either as primary or secondary hazard mitigation benefits. Below are brief descriptions of these programs and how they aid in hazard mitigation. It is important to note that each individual community is different, as are the hazards it will face. This list is intended to be a resource for possible strategies a community can employ and is not a list of the strategies any one community does employ.

Emergency Operations Plan

An Emergency Operations Plan coordinates actions and responses before, during and after emergency operations. Events planned for range from flooding and snowstorms to downed aircraft and nuclear attack. Plans conform to guidelines by the Federal Emergency Management Agency, U.S. Nuclear Regulatory Commission, Federal Energy Regulatory Commission, the New Hampshire Emergency Management Agency and the NH Emergency Operations Plan. The Emergency Operations Plan addresses evacuation procedures for emergency notification and routes to be taken. Additionally, it includes a Terrorism Assessment.

Floodplain District (Zoning Ordinance & Subdivision & Site Plan Regulations)

Floodplain District regulations apply to all lands designated as special flood hazard areas by FEMA. Encroachments, including fill, new construction, substantial improvements to existing structures, and other development are prohibited unless certification by a registered professional engineer is provided by the applicant demonstrating that such encroachment will not result in any increase in flood levels during the occurrence of the 100 year base flood. All building permit applications for new construction or substantial improvements are reviewed to determine whether proposed building sites will be reasonably safe from flooding.

Elevation Certificates

An Elevation Certificate is usually required when (1) a structure is built or substantially improved within a known flood zone, or (2) if the flood map shows a part of the lot within the flood zone and the certified foundation plan shows the house is located within the flood zone. Typically the land surveyor must supply the footing elevation.

Wetlands Regulations (Zoning Ordinance)

Wetlands regulations, contained within the zoning ordinance, can require a buffer, typically ranging from 25 to 150 feet, between all wetlands falling under the State

Statutory jurisdiction of the NH Department of Environmental Services, and any building, structure or parking lot. A setback, typically between 30 and 75 feet from the high water mark, may be established between all wetlands and on-site subsurface disposal systems.

Aquifer Protection Ordinance (Zoning Ordinance)

Regulations may be established to protect, preserve and maintain the existing and potential groundwater supplies from adverse development or unwise land use practices. These ordinances are designed to encourage uses that can appropriately and safely be located within the direct and indirect recharge areas of aquifers. The Aquifer Protection Ordinance minimizes potential hazards related to the disposal of solid and hazardous waste, underground storage tanks, storage and dumping of road salt or other de-icing chemicals, including snow containing such chemicals, discharge of industrial processed waters and junk and salvage yards by prohibiting such activities in the aquifer protection zone. Further provisions can provide standards for safeguards, location of potential pollution sources, drainage and inspection for all built structures with the exception of single and two-family dwellings within the zone.

Manufactured Housing (Zoning Ordinance)

Regulations are established to provide suitable and affordable living environments in manufactured home parks and subdivisions. Minimum standards are set regulating required utilities, construction and installation methods, and foundations in order to protect the occupants and reduce the homes' vulnerability to natural disasters.

Excavation Regulations (Zoning Ordinance & Subdivision and Site Plan Regulations)

Excavation Regulations minimize safety hazards created by open excavations; safeguard the public health and welfare; preserve the natural assets of soil, water, forests, and wildlife; maintain aesthetic features of the environment; prevent land and water pollution; and promote soil stabilization.

Erosion and Sediment Control Regulations (Subdivision and Site Plan Regulations)

Erosion and sediment control regulations can be put into place to address runoff, soil erosion, and sedimentation from development sites. Efforts must be taken to minimize any impacts from stormwater runoff and erosion. Typically, the post-development peak runoff rate must not exceed pre-development rates for the 2-year 24-hour storm event.

Drainage Requirements (Subdivision and Site Plan Regulations)

Engineering design standards can be set to minimize any adverse impacts from stormwater drainage.

Steep Slopes (Zoning Ordinance, Subdivision or Site Plan Regulations)

These ordinances typically remove all steep slopes of 25 percent or greater from the calculation of buildable or open space area. Generally, steep slopes in excess of 25 percent are unsuitable for building, limit the usefulness of the land, and limit safe access to the street.

Road Design Standards (Subdivision and Site Plan Regulations)

Road design regulations are usually part of the Subdivision and Site Plan Regulations. These regulations assure "safe and convenient access" to all associated lots and set engineering standards to maintain adequate visibility and safety.

Fire Protection Cistern Specifications (Subdivision and Site Plan Regulations)

Regulations governing the use, construction, and maintenance of all cisterns can be enacted. These regulations are critical for safety and the mitigation of fire hazards.

Snow Emergency Ordinance

A Snow Emergency Ordinance allows for a declaration of snow emergencies, which trigger parking bans on all listed snow emergency routes to expedite the flow of traffic and snow removal. Additionally, these ordinances can set winter parking restrictions limiting parking to one side of the street to maintain necessary road widths, traffic flow and ease of snow removal and maintenance.

Building Codes

Building codes set minimum safety standards for occupants utilizing structural, fire and life safety provisions, wind loads and design, seismic design, flood proofing, and egress design. The State building code is the 2000 International Building Code.

Housing Code

A Housing Code Ordinance ensures that all residential rental properties meet or exceed minimum standards. One item of particular importance is the need for hard-wired smoke detectors. Additionally, the housing code delineates standards ensuring proper ventilation, fire prevention, fuel tank storage, safety and sanitation, and the provision of utilities including water, sewer, heat and electricity. The State building codes for housing is the 2000 International Building Code.

Fire Codes

Generally, a Fire Code Ordinance adopts the International Fire Code and its provisions to protect residents from fire hazards in residential and non-residential facilities. Single family residences may be required to have all gas and oil fired systems inspected by the Fire Department prior to receiving a certificate of occupancy. Commercial and industrial structures typically must have inspections reviewing sprinkler, mechanical, and fire alarm systems, structural components including firewalls. Additionally, site plans can be reviewed by the fire inspector to ensure proper hydrant placement and adequate access is provided for fire and emergency vehicles.

Hazmat/Terrorism Response

The response program covers chemical, biological, and nuclear agents and their properties, effects and identification methodology. It is typically administered through the Fire Department.

Municipal Radio Systems

Typically the Fire, Police, and Public Works Departments maintain separate, but interoperable, radio networks for day-to-day operations. The systems can also interface with regional mutual aid and State agencies.

Police

The Chief of Police is charged with preserving public peace, preventing riots and disorder. During fires the police are to prevent theft and further unwarranted destruction of property.

Water Ordinances

Regulations are established for water usage and the responsibility for maintenance of water related infrastructure designated to the property owner. These regulations aim to prevent damage to or tampering with public pipes, reservoirs or other property.

Sewer Ordinances

The purpose of a sewer ordinance is to ensure proper removal and disposal of sewage and waste water as well as the operation and maintenance of the necessary systems to do so, including sewers, drains, and treatment plant. The appropriate uses of the sanitary sewer and storm drains are established. Additional regulations are outlined for industrial pretreatment, septage disposal, and sewer construction and connection standards.

On-Site Sewage Disposal Systems

The purpose of on-site sewage disposal system regulations are to protect the public heath and well being of residents and ensure that systems are designed and constructed so they are not a public nuisance or environmentally harmful. A review of proposed plans by the Health Authority may be mandated for all new subdivisions. The ordinance usually calls for permits to be issued and sets design requirements and remediation in the event of failure.

Stormwater Management Program

The Storm Water Management Program (SWMP) is designed in conformance with the Environmental Protection Agency's mandate. Program controls include public education and outreach, public participation, illicit discharge detection and elimination, construction of site runoff controls, post-construction stormwater management in new developments, and pollution prevention for municipal operations.

Health and Sanitation

The Health and Sanitation Ordinance's primary purpose is to protect the health of residents. Several activities are typically regulated, including childcare facilities, paint removal, swimming and bathing facilities, mosquito control, and solid waste and littering.

Comprehensive Emergency Management Planning for Schools (CEMPS)

Comprehensive Emergency Management Planning for Schools is available from the NH Bureau of Emergency Management. CEMPS outlines training for school teachers, administrators, and students on actions to be taken during an emergency at school.

State Dam Program

The region maintains 192 Class AA, A, B and C dams in coordination with the State Dam Program, regulated by the Department of Environmental Services, Water Division. All class B and C plans have Emergency Action Plans that include emergency notification

procedures, staff assignments, warning procedures, inundation area evacuation procedures, and a formal list of plan holders.

New Hampshire Shoreland Protection Act

The Shoreland Protection Act, adopted during 1994, establishes minimum standards for the future subdivision, use, and development of all shore lands within 250 feet of the ordinary high water mark. When repairs, improvements or expansions are proposed to existing development, the law requires these alterations to be consistent with the intent of the Act. The N.H. Department of Environmental Services is responsible for enforcing the standards within the protected shoreland, unless a community adopts an ordinance or shoreland provisions that are equal to or more stringent than the Act.

Best Management Practices

The State has established Best Management Practices (BMPs) for erosion and sediment control. These BMPs are methods, measures or practices to prevent or reduce water pollution, including, but not limited to, structural and nonstructural controls, operation and maintenance procedures, and other requirements and scheduling and distribution of activities. Usually, BMPs are applied as a system of practices rather than a single practice. BMPs are selected because of site-specific conditions that reflect natural background conditions.

Additional Mitigation Strategies to Reduce Risk

The following actions are examples of mitigation strategies that serve to enhance existing hazard reduction efforts. These projects have been identified by many communities in the SNHPC region during their Hazard Mitigation planning process. These actions are generally over and above the normal scope of hazard mitigation and provide communities with a set of specific, targeted goals to reduce risk. Communities may choose to implement any number of these actions to provide further protection of life and property.

Table 10.11
Additional Mitigation Strategies to Reduce Risk

Preventative	
Action	Hazard
Adopt new FAA/Airport Authority noise overlay zoning codes	Aircraft
Tree maintenance program	All Hazards
Complete Comprehensive Emergency Management Protection for Schools (CEMPS)	All Hazards
Address the West Nile virus	All Hazards
Coordinate pre-construction meetings with developers and town representatives	All Hazards
Continued training for the building inspector	All Hazards
Develop and Implement a Community Warning System	All Hazards
Revise ordinances related to steep slopes to be consistent	Erosion/ Landslides
Adopt the new state-wide National Electric Code 2005 edition	Fire
Limit development on unmaintained private roads	Fire/Isolated Homes
Create or update a Watershed Protection Ordinance	Flooding
Adopt and implement the new EPA stormwater management regulations	Flooding
Map dam inundation area using GIS	Flooding
Stormwater drainage maps for GIS applications	Flooding
Update flood maps (FIRMS)	Flooding
Adopt new Digital FIRMs provided by FEMA as they become available	Flooding
Discourage construction in the floodplain	Flooding
Elevate structures in the floodplain	Flooding
Create or update wetlands regulations	Flooding
Improve Hazard Zones mapping	Flooding
Post high water level warnings along susceptible ponds	Flooding
Develop a river stewardship program	Flooding
Create maintenance program for detention/retention ponds	Flooding
Develop early warning system for floodplain residents	Flooding

Table 10.11
Continued

Preventative	
Action	Hazard
Purchase river gauges for major water courses	Flooding
Purchase flood-prone properties or development rights	Flooding
Coordinate with surrounding towns on the effects of Dams	Flooding
Create secondary water treatment facilities utilizing the Merrimack River	Flooding/ Terrorism
Establish a transportation hazard identification system	Hazardous Materials
Establish mobile truck safety inspections near highway	Hazardous Materials
Increase the frequency and enforcement of truck safety inspections	Hazardous Materials
Replace aging Highway Department equipment	Heavy Snow
Maintain the most current wind load design building codes	Wind
Structural Projects	
Action	Hazard
Relocate existing utilities underground where appropriate	All Hazards
Upgrade bridges to meet seismic design	Earthquake
Build new cisterns or improve old cisterns	Fire
Improve culverts and bridges	Flooding
Pave roads and install drainage systems	Flooding
Install bridges to raise roads above flood levels	Flooding
Elevate roads susceptible to flooding	Flooding
Continue the separation of Combined Sewer Overflows	Flooding
Emergency Services	
Action	Hazard
Establish a source of back-up power for schools	All Hazards
Upgrade radio system	All Hazards
Update the Emergency Operations Plan to most current federal standards	All Hazards

Table 10.11
Continued

Emergency Services	
Action	Hazard
Create inter-departmental Public Safety Training Facility	All Hazards
Create auxiliary Emergency Operations Center	All Hazards
Update the Police Department's operating policies	All Hazards
Implement the reverse 911 system	All Hazards
Create emergency vehicle turnarounds	All Hazards
Provide water for residents at the fire house during droughts	Drought
Emergency Services	
Action	Hazard
Form a community network to check on elderly populations	Extreme Heat / Cold
Revise and update Hazmat/Terrorism response	Hazmat/ Terrorism
Environmental Protection	
Action	Hazard
Consolidate the Excavation Regulations with excavation provisions in the Zoning Ordinance	Erosion
Coordinate forest maintenance with Manchester Water Works to reduce fuel buildup	Fire
Expand watershed security - patrol and surveillance	Hazmat/ Terrorism
Extend sewer to areas with onsite treatment	Hazmat/ Terrorism
Public Information	
Action	Hazard
Develop a public awareness program for emergency management	All Hazards
Include a report from the Hazard Mitigation Committee in the Annual Town Report	All Hazards
Create a hazard mitigation and emergency preparedness page on the town website	All Hazards
Educate the public about the Community Warning System	All Hazards
Create a disaster preparedness and response web page	All Hazards
Publish a disaster preparedness and response newspaper cutout ad	All Hazards

Table 10.11
Continued

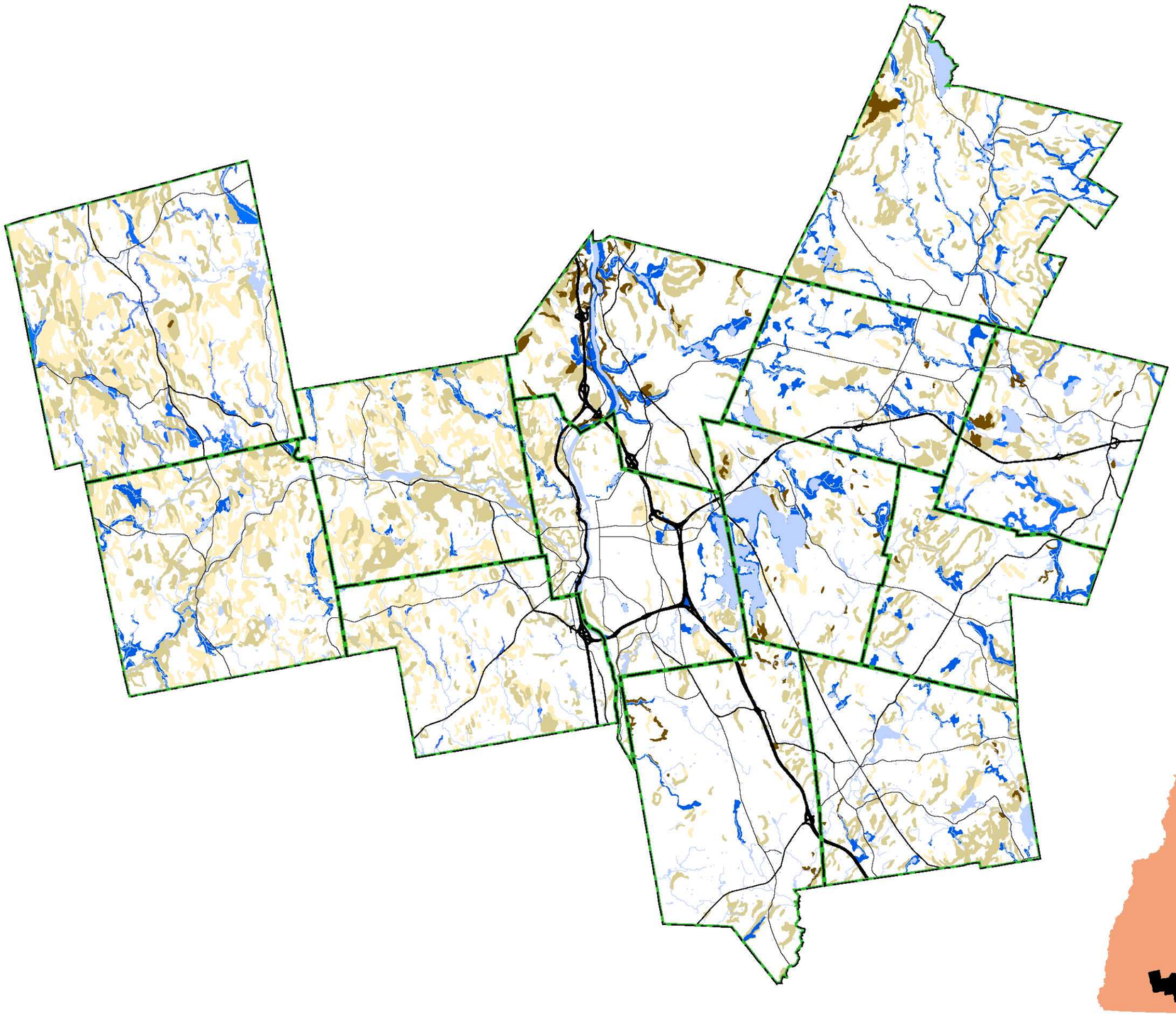
Public Information Action	Hazard
Present disaster preparedness and response on local cable access channels	All Hazards
Present disaster preparedness and response education at schools, senior centers, and the Town meeting	All Hazards
Create and distribute a disaster preparedness and response pamphlet for residents	All Hazards
Create and distribute educational materials for residents of isolated areas	All Hazards
Establish remote broadcasting locations linked to local cable access channels	All Hazards
Educate residents about flood mitigation	Flooding
Develop a web site for floodplain information	Flooding
Advertise the availability of the FIRMs and FIS at the Town Hall	Flooding
Create and distribute educational materials for residents of flood prone areas	Flooding
Include snow load design standards in the Construction Guideline Packet prepared by the building inspector	Snow
Post snow ordinance reminder notice in local publications	Snow
Post a notice in local publications alerting residents of the dangers of snow accumulation on roofs	Snow

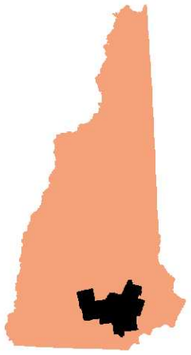
Source: Auburn, Bedford, Chester, Derry, Goffstown, Hooksett, Londonderry, Manchester, New Boston, and Weare Natural Hazard Mitigation Plans

Conclusion

The Southern New Hampshire Planning Commission region is susceptible to all forms of natural disasters with the exception of volcanic eruptions. Additionally, man-made hazards pose perhaps an even greater risk since the damage resulting from natural events is compounded by structures in the man-made environment. Furthermore, in the post-9/11 world, hazard mitigation and emergency planning has become even more critical. Communities in the region are aware of these risks and nearly all have completed individual hazard mitigation plans. However, disasters are not constrained by municipal boundaries, and regional cooperation in terms of mitigation, planning and response is beneficial in the SNHPC region.

Regional Comprehensive Plan





Map #10.1

Natural Hazards

Legend

Political Boundaries

Townline

Road Network

Interstate

State Route

Major Roads

Hydrography

Streams

Rivers/ Lakes

Special Flood Hazard Areas

100-Year Floodplains

Steep Slopes- 15% Minimum Slope

with a maximum of 25% gradient

with a maximum of 35% gradient

with a maximum of 60% gradient

Data Sources:

Granit Digital Data (1:24,000)
NH Department of Transportation
DFIRM Data for Rockingham County (FEMA/NFIP)
SNHPC Constraints GIS data for Merrimack County
FEMA's Q3 Data for Hillborough County (FEMA/NFIP)

The individual municipalities represented on this map and the SNHPC make no representations or guaranties to the accuracy of the features and designations of this map.

This map is prepared for planning purposes only and is not to be used for legal boundary determinations or for regulatory purposes.

Map Produced by GIS Service SNHPC April 2006.
For reprints or furthur questions

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SNHPC

0 187,500 375,000 750,000 Feet

0 35 70 140 Miles

Chapter Eleven:

Open Space and Recreation

Introduction

Within the past decade, a number of communities within the Southern New Hampshire Planning Region, including Auburn, Londonderry, Bedford, Chester and Derry have all passed warrant articles as well as bond issues for land protection. The primary reasons for these bonds have been to preserve key undeveloped tracts of land ("Open Space") in order to manage growth and development, protect natural resources, create recreational opportunities, and maintain community character.

In almost every community within the region, open space and recreation planning is an ongoing activity led mainly by volunteers from conservation commissions and planning boards. Some municipalities have professional planners and recreation department staff who assume these responsibilities. For the most part, however, planning for open space and recreation is a locally driven process. SNHPC is addressing open space and recreation at a regional level for the first time in this plan.

The objectives of this chapter are three-fold. First, to prepare an inventory and map of all the federal, state and municipal lands, town forests, parks and recreational areas, and other public- and privately-owned lands that are protected by public-ownership, acquisition or conservation easements. Second, to identify and map all the sites and land areas that municipalities within the region describe as desirable for protection in the future as conservation, open space or recreation. For the most part, these sites have been identified as natural areas under the 2004 Local Resource Protection Priorities (LRPP) program. Third, to describe and evaluate all the state parks, forests and other state owned lands within the region and to determine if these parks are adequate to address the region's growing population.

The Importance of Open Space and Recreation

For the purpose of this plan, "Open Space" refers to undeveloped land that has local, regional and statewide value as protected or conservation land, historic or cultural sites, or scenic vistas. Such areas may contain, but are not limited to, forests, farmlands, old fields, floodplains, wetlands, shorelands, parks and recreation areas.

Open space lands and views located in Deerfield, NH

Residents of New Hampshire have a strong connection with the outdoors as well as the natural and cultural heritage of the state. The state's landscape lends itself to a wide range of ecological and recreational pursuits that are enjoyed by residents and tourists alike. This heritage is an important reason why New Hampshire continues to be a popular place to visit and an attractive place to live.

In 1997, the University of New Hampshire (UNH) conducted a *Statewide Outdoor Recreation Needs Assessment* of New Hampshire residents.[1] According to this survey, over 81 percent of the respondents said that New Hampshire's scenic beauty and cultural heritage were important to them personally. Sixty-one percent of the respondents agreed that outdoor recreation played a central role in their lives.

New Hampshire's rapid growth has spurred interest among people in many municipalities throughout the region to conserve open space and to seek ways to raise public funds to acquire land for conservation and recreational purposes. With continued growth and development, however, there will be fewer opportunities in the future to preserve and protect the important natural and cultural lands that exemplify the open space and livability of the region.

1. New Hampshire Outdoors 2003-2007 Statewide Comprehensive Outdoor Recreation Plan, prepared by New Hampshire Office of State Planning, March 2003, page 10.

While much of the region still remains undeveloped, population growth and sprawling development are consuming open space and community character at a rapid pace.[2] Researchers estimate that within the next 25 years, southeastern New Hampshire will be virtually built-out, meaning that all the available land not conserved will be developed.[3] This will place tremendous strains on local budgets and community resources.

Planning boards and conservation commissions have an important responsibility to ensure that open space and recreational opportunities are made available to the public. This means open space and recreation must be addressed as an essential part of the community planning process.

There are many reasons why open space and recreation are important at the local, region and state level. These resources not only provide opportunities for public use and enjoyment, but they improve the environment and the overall health of the population, and promote tourism and economic development.

Some of the most important benefits that communities can derive from open space and recreation include:

- **Growth Management** -- Protecting open space and conservation lands can help guide growth and development to areas that are the most appropriate and cost-effective for municipalities to serve.

- **Land Use Compatibility** -- Incompatible land uses can be buffered and attractive and functional green space and trail opportunities can be provided within densely developed areas.

- **Historic Preservation** -- Threatened historic and cultural sites can be protected through historic and conservation easements, and possibly accessed as recreational pursuits.

- **Agricultural Preservation --** The viability of working farms and forests can be protected to sustain the community's character, economy and local employment.

- **Scenic Views** -- By preserving key parcels and large open blocks of undeveloped lands, important scenic vistas and views can be maintained and enjoyed by local residents and tourists alike.

2. The current estimate of undeveloped land is 172,888 acres, excluding all water surfaces.
3. Society for Protection of New Hampshire Forests, New Hampshire Everlasting Initiative.

- **Water Supply** -- An adequate water supply is essential for economic activity. Preservation of open space can protect and contribute to a readily accessible and sufficient supply of water.

- **Water Quality --** Sustained water quality is vitally important in supporting all ecological functions. Open and undeveloped land helps maintain water quality. The forested soil of wooded lands can filter significantly more pollutants or roadway-related runoff from entering the water system (up to 90 percent more) than can lawns or asphalt surfaces.[4]

- **Aquatic Buffers --** Vegetated buffers physically protect a stream or river by maintaining trees, shrubs, bushes, tall grasses, and groundcovers that provide shade and remove debris and polluting nutrients. Buffers usually contain three zones: the innermost *streamside zone* of forested shade to enhance stream quality; the *middle zone*, 50-100 feet, often a managed forest with some clearing for trails or open areas, and the *outer zone*, usually around 250 feet, but often expanded to protect adjacent wetlands and any floodplain.

- **Aquifer Protection/Recharge** -- By providing open space, municipalities can protect their water supply aquifers, preventing costly clean up in the case of a polluted water source. Trees, meadows, scrub areas, and agricultural lands also allow water to recharge back into underground supplies, maintaining base flow in rivers and streams, lakes and ponds, and wetlands. Without such recharge, droughts are more likely, as well as flooding during severe rainfall or snow melt.

- **Flood Control --** Many communities throughout the region are purchasing open space to increase flood storage and reduce repetitive losses due to flooding.

- **Air Quality --** Preservation of open space is integral in maintaining air quality. Trees in forested areas absorb pollutants such as ozone and sulfur dioxide, leaving the air noticeably cleaner. A single acre of trees takes in about 2.6 tons of carbon dioxide each year, removing some of the pollutants released by vehicles.[5] Older, larger trees in many of the region's forests, such as the Black Gum Tree, can remove up to 70 times more pollution from the air than trees with diameters less than thirty inches in size. Additionally, trees trap the particulate pollution that causes asthma and respiratory problems.[6]

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4. Anderson 2000, Trust for Public Land 2005.
5. Hilary Nixon and Jean-Daniel Saphores, Impacts of Motor Vehicle Operation on Water QualityA Preliminary Assessment, School of Civil & Environmental Engineering, University of California, Irvine (www.uctc.net), 2003.
6. Ibid.

- **Biodiversity --** Biodiversity, which encompasses the existence and interacting processes of plants, animals, fungi, algae, bacteria, and other microorganisms, is integral to human survival. The complex natural world provides elements that support human life, such as enriched soil to grow food, oxygen to breathe, and purified water to drink. Maintaining these processes is important for economic as well as ecological reasons. Plants are sources of food, medicine, fuel, fibers, timber, and more. Furthermore, plants and animals pollinate fruit and vegetables, control pests, and add nutrients to the soil as part of their natural functioning.

- **Habitat Protection –** Preserving open space lands enhances wildlife protection. Wildlife is an attractive draw for residents and visitors alike, who enjoy to bird-watch, hunt and fish, and hike amidst the fall foliage. As noted earlier, over 81 percent of the population in New Hampshire participates in outdoor recreation and wildlife-related activities. This brings millions of dollars to the region and local communities.

- **Greenway Planning** -- Greenways or riparian corridors offer an important means for connecting open space and recreation, particularly along the region's rivers and streams. These corridors provide many social as well as ecological benefits, including the potential for recreational trail development, wildlife viewing, and a wide expanse of connected open space. Greenways can also provide a wealth of opportunities to citizens literally in their own backyards.

- **Public Access** – Open space offers the potential for public access to a variety of active or passive recreational opportunities. Public access, however, needs to be located at appropriate places, which will not compromise the character of the area.

- **Aesthetics --** Aesthetic landscapes lend appeal to a community and provide economic benefits as well. As documented in the following section, several studies indicate that land values bordering open space and recreation are higher than those in developed neighborhoods, suggesting that people are willing to pay for the aesthetic value derived from open space protection and recreation.

- **Social Interaction --** The advancement of open space and recreational opportunities can also expand the social network of the community. Residents can meet neighbors while hiking a trail, hold town festivals in newly-established parks, and work together to construct improvements to public open spaces.

- **Tourism –** A beautiful environment makes New Hampshire and the region an attractive place to live, work and visit. This in turns helps the region's economy

and helps to attract businesses and visitors to locations where quality of life is an important factor.

In identifying and ranking important lands for open space, conservation or recreation purposes, the following criteria may be useful:

- Potential linkages to existing open space, to recreation facilities, and to similar areas in adjacent communities.

- Environmental sensitivity and importance of the parcel such as the presence of aquifers, rivers, wetlands, wildlife and scenic qualities. This includes wildlife corridors, unique habitat, and endangered, threatened and rare species.

- Areas with insufficient public open space or existing open space areas threatened by continued development. Consideration should be given to land which can encourage town-wide distribution of open space and recreation.

- Town-wide versus special group benefit. The acquisition of land should benefit the town as a whole and not a select group of residents. The importance of addressing each need will depend on the specific goals of the town.

- Outdoor recreation potential. This is related to providing additional athletic fields as well as providing areas for greenways and trails that provide opportunities for hiking, walking, running, skiing, and biking.

- Cost and availability of the parcel. This should account for the amount of residents that are willing to pay to purchase open space (in the form of increased taxes) and the availability of funding sources that would be available if a particular property were targeted for acquisition.

- The financial impact that removing the parcel from development will have on the municipality. For example, a residential parcel may cost the town in services while a commercial property may be a positive contribution to the tax base.

- Aesthetic benefits to the general public and the preservation of community character. This can include scenic values, cultural and historic preservation and/or the overall agricultural and rural character of the community.

The Economics of Open Space

While open space and recreation offers many planning, ecological, and environmental benefits, clearly the economics of open space remains a hotly debated issue. In many communities throughout New Hampshire and the region, there are major debates among planning boards about the costs and tax consequences of open space and how it should best be managed and protected. In many communities, taxpayers are concerned about the trade-offs between increasing their property tax bills versus the environmental, recreational, and quality-of-life benefits of conservation and open space.

While it is difficult to quantify these trade-offs, especially in monetary terms, it is important to address several common misconceptions about open space and growth. The issues can be boiled down to two main lines of thought. The first holds that open space and recreation programs are expensive for municipalities and thus lead to higher taxes. The second contends that growth and more development produces more taxpayers and therefore lowers taxes.

Over the past few decades, there have been a number of important studies, which have addressed these issues. The overall results show that communities who curb sprawl and implement smart growth principles, including land preservation, spend considerably less money than those municipalities with sprawl. In addition, the studies demonstrate that open space and recreation enhance property values and over time contribute to the stability of community tax rates by requiring fewer services.

Cost of Land Protection

In New Hampshire and other New England states, local governments are more reliant on the property tax than they are in other regions of the country. Local officials are often sensitive to changes in the tax base because property taxes are particularly burdensome to New Hampshire households with the least ability to pay, and many people across the state have already reached their limit. Because open space and recreation projects can involve complex land transactions, it is important that local officials and residents better understand the system of taxation in New Hampshire as well as the various costs and tax implications of preservation actions.

In 2005, the Trust for Public Land (TPL) released an important study entitled, *Managing Growth: The Impact of Conservation and Development on Property Taxes in New Hampshire*. Looking at the unique relationship between property taxes and municipal revenue in New Hampshire, the study addressed the concern that land conservation increases property taxes. In short, the results of the 2005 TPL study indicated that while there are short-term tax consequences associated with the acquisition of permanent open space and land conservation, in the long term, residents pay fewer taxes overall with more open space and protected lands than residents in other communities.

Impacts of the Cost of Land Protection to Taxpayers

According to the 2005 TPL study, the tax consequences of permanent land conservation projects vary according to the agency or organization acquiring the land. Federal, state and local governments do not pay property taxes. However, federal agencies do make payments in lieu of taxes of different amounts for fee-simple acquisitions. The State of New Hampshire also does not pay property taxes on the land it owns, however, the state does make a payment to the municipality that is based upon the amount of taxes that the land would pay if it were enrolled in the current use program, at an average value. Also municipalities do not pay taxes to themselves. Therefore, land acquired by a local government comes off the property tax rolls and there is no payment in lieu of taxes.

Most private non-profit conservation organizations enroll the land that they own in fee in the current use program and pay taxes on it. However, a local government can waive the tax requirement. Most private non-profit conservation organizations are more likely to conserve land through conservation easements than through fee-simple acquisition. If the land was already assessed at current use there would be no change to the municipality after the acquisition of the easement. If the land was previously assessed at full value, there would be a decrease in the taxable value due to the easement. As a result, acquiring conservation lands by direct purchase comes at a quantifiable cost to the purchasing body, which in the case of a municipality impacts the taxpayers.

Calculating the net revenue loss due to the purchase can give taxpayers a starting point for evaluating whether the open space purchase is a worthwhile long-term investment for their community. However, the calculation of the tax effect of a particular open space or land conservation project is not well understood, mainly because removing the property from the tax rolls is not typically an expense that shows up in the budget, but rather it is a decrease in the revenue raising ability of the municipality.

Generally, the short-term tax effect of land conservation is the removal of land value from the tax rolls. In the short term, land protection, by fully or partially removing land from taxation, reduces the tax base and results in a tax increase for a finite period. As a result, the taxes no longer paid on the open space or protected land must therefore be shifted to other taxpayers.

Since many municipalities often need to compensate for lost tax revenue, there can be a small, *short-term* tax increase for residents. To address this tax issue, municipalities purchasing conservation lands should clearly communicate to residents both the benefits of the open space to be purchased as well as the costs and benefits of the purchase itself.

In addition, there are measures in place by land conservation organizations to account for this tax base loss and avoid making residents pay the difference. Most of these

measures are described in the next section on Land Protection Techniques. However, for the purpose of this section, it is important to point out that most open space and recreation land likely acquired though municipal action or through a private conservation group is obtained by donation or conservation easement. Open space and recreation land may also be obtained through conservation subdivisions. In each situation, the cost to the taxpayer is different, as described below:

- **Private conservation groups** -- Private conservation groups generally put the land into current use and continue to pay taxes on it. These groups tend to seek open space through conservation easements, in which the owner continues to pay taxes on the land.

- **Conservation subdivision --** Open space land in conservation subdivisions is often owned by the developer, where it gets passed on to a Homeowner's Association. The taxation values are low because the land has lost its development rights, and taxes are paid through homeowner association dues by the residents of the subdivision.

- **Municipal lands --** When a municipality purchases land, they do not pay property taxes to themselves, so the property is removed from the tax roll. However, due to the Statewide Education Property Tax and Adequacy Aid (SWEPT), the total equalized value of the town would decrease with the lands removed from the tax roll. Therefore, "property rich" towns would have to send fewer property taxes to the state for education and "property poor" towns would receive greater adequacy aid from the state. While the SWEPT funds do not account for the total value lost, the resulting tax increase is slight (in the 2005 TPL study, the highest scenario of tax increase was a mere $0.88 on a $100,000 property).

State and federal government also have measures in place to account for municipal tax revenue lost through state and federal open space land acquisition. While these measures are not as likely to occur within the region, some of the basic procedures are noted below:

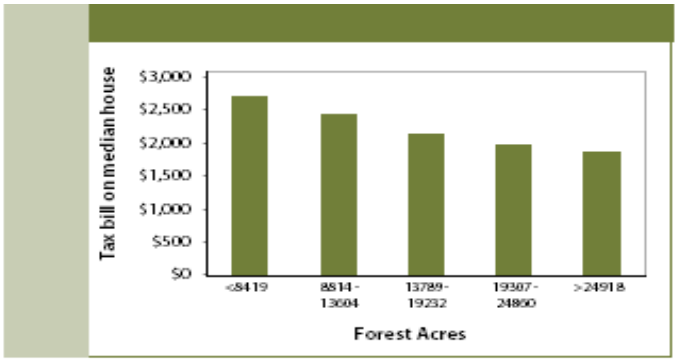
- **Federal lands** -- If the federal government purchases land in New Hampshire, they do not pay taxes but instead pay two annual fees. One fee goes directly to the town's school district and the other to the town as a Payment In Lieu of Taxes (PILT).

- **State lands --** When the state purchases land in New Hampshire, the state pays the municipality the amount of taxes they would receive under current use value of the land. If the fees do not equal the amount of taxes the town would receive on that land under current use, the state pays the difference. In many cases, these fees often exceed the current use taxation values.

Long-term Benefits of Land Protection

The results of the 2005 TPL report also demonstrate that residents in municipalities with more permanently protected land pay fewer property taxes than municipalities with fewer permanently protected lands. The strongest indication of lower taxes comes in the form of commercial development, which generally offsets the financial demands resulting from residential development. All else being equal, the 2005 TPL study emphasizes, land protection does *not* result in higher taxes and generally results in lower taxes, dispelling the myth that land protection is costly over the long run (see attached Figure 11.1 from the TPL study).

Figure 11.1
Forest Acres and Tax Bill on Median-Value House



Source: Trust for Public Lands

The report also describes that the conservation of a single parcel does not have a large effect on the amount of development that will occur within a municipality. However, the strategic placement of certain conserved parcels can influence the direction and location of development, with the possible effect of confining development to proximate areas, which would ease the construction and servicing of infrastructure to new development.[7]

Several academic studies have also examined the relationship between open space and property values, indicating that properties bordering open space increase in value due to the quality-of-life increases associated with open space. Jacqueline Geoghegan's 2002 study of Howard County, Maryland, determined that land values on land located next to "permanent" open space increased three times more than land located near "developable" open space. These studies suggest that the property value increases derived from the open space additions can be used to fund current and future open space initiatives.[8] These findings clearly indicate that there is greater land value due to proximity to permanent open space.

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7. Trust for Public Land, *Managing Growth: The Impact of Conservation and Development on Property Taxes in New Hampshire,* 2005, http://www.tpl.org/content_documents/nh_managing_growth_report.pdf.
8. Geoghegan, J., L.A. Wainger, and N.E. Bockstael. 1997. Spatial landscape indices in a hedonic framework: an ecological economics analysis using GIS. *Ecological Economics* 23(3): 251-264. Also Geoghegan, Jacqueline. 2002. The value of open spaces in residential land use. *Land Use Policy* 19: 91-98. And Hobden, David W. G.E. Laughton, and K.E. Morgan. 2004. Green space borders—a tangible benefit? Evidence from four neighborhoods in Surrey, British Columbia, 1980–2001. *Land Use Policy* 21(2): 129-138.

Payoffs of Open Space

A study conducted during the mid 1990s by Philip A. Auger, Extension Educator, Forest Resources, University of New Hampshire Cooperative Extension, looked at the cost of community service for residential, commercial, industrial and open space land uses within the communities of Stratham, Dover, Fremont, and Deerfield. In each community, the study found that expenditures exceeded residential land use revenues by an average of approximately 12 percent. Conversely, for open space, revenues exceeded expenditures.

The results of this study, published in 1996, still ring true today as evidenced by a similar study for the Town of Brentwood, NH. This small town in southern New Hampshire, not far from the town of Deerfield, had a population of 3,197 in 2000. Tax revenue generated from residential property in the town fell short of the cost of school and town services by 17 percent, while open space lands revenue exceeded town service costs by 17 percent.[9]

While each town in New Hampshire has a unique blend of land uses, revenues and expenditures, these studies point out some fiscal consistencies that are likely to apply in most circumstances. One of these findings is that residential land use very often costs communities more than they generate in revenues. Traditional residential housing brings with it a tremendous cost load in community services, roads, landfills and schools.

Open space lands are often a net asset to New Hampshire communities, and contribute to the stability of community tax rates. If land is taken out of open space and converted to housing, it will often cost far more than it generates in taxes. This has been supported by other well-documented fiscal impact studies in New Hampshire communities, including Milford and Londonderry.

The 1990 fiscal impact analysis of housing costs in Milford estimated that the community needed to raise approximately $2,073 for each new three bedroom home above and beyond taxes and fees generated by homeowners.[10] In addition, a 1989 study by Statewide Program of Action to Conserve the Environment (SPACE) compared the taxes generated and community costs of a 330-acre Londonderry apple farm enrolled in current use to those generated if the open space were converted to a 290 single family residential housing development. As a working farm enrolled in current use, it was generating $18,830 per year above the cost of services it required from the town. By

9 Brentwood Open Space Task Force. Does Open Space Pay in Brentwood? Part 1: Housing Growth and Taxes. May 2002.

10 Does Open Space Pay?, prepared by Philip A. Auger, Extension Educator, Forest Resources, University of New Hampshire Cooperative Extension, page 6.

contrast, the development would have cost the community $643,710 per year ($2,220 per home) above and beyond taxes and fees generated.[11]

Another analysis completed by the Society for the Protection of New Hampshire Forests found that open space based on economic activities contributes $8.2 billion dollars to the New Hampshire economy each year (for 1996/1997).[12] The report found that the gross direct income from agriculture related activities was $413 million; income from forest related activities was $1.2 billion, and the income from tourism and recreation spending was almost $3.2 billion.[13]

In another study, the National Association of Home Builders found that it is not uncommon for the value of building sites to be enhanced by 15 to 20 percent in the vicinity of park and recreation areas.[14] The increased value to the landowner is also shared by the municipality, because when relative property values are higher, then assessed valuations and tax revenues will also be higher. In summary, it can be concluded from these studies that in the short-term, the permanent protection of land results in a tax increase. However, there are no tax increases in the following situations:

- When the land is acquired by the federal government and the federal payments exceed the tax loss (which is only likely if the land is already assessed at is current use value).

- When a conservation easement is placed on the land and the land is already enrolled in current use.

- When the state or federal government acquires land already enrolled in current use and it is valued at or below the "average" current use value the state uses to calculate the state payment.

Thus, the short-term tax implications of land protection can be easily calculated so that the costs of "carrying" the conservation land can be made explicit to voters and taxpayers. The overall tax impact in any municipality depends not only on the type of land conservation proposed, but also on the municipality's tax rate, total assessment, and property valuations per pupil.

In the long-term, contrary to the common perception that development will bring lower taxes, property tax bills are generally higher in more developed municipalities

11 Ibid., page 6.
12 The Economic Impact of Open Space in New Hampshire, The Society for the Protection of New Hampshire Forests, January 1999, page 2.
13 Ibid.
14 National Association of Homebuilders, Business NH Magazine, October 1998.

than in rural towns. The tax bill on a typical dwelling unit is on average, higher in municipalities where there are more residents and/or more buildings.

In general, municipalities with more development have higher tax bills. However, this does not mean that every development will increase taxes. All else being equal, property taxes are likely to be somewhat lower if the community tax base has a high proportion of nonresidential property to help offset the costs of residents.

Property tax bills are not higher in municipalities that have the most permanently protected land – conservation land or easements owned by a government agency or conservation organization. In fact, tax bills are generally lower in these towns. Thus, for town residents, it can be concluded that open space land does not increase, and in many cases decreases, residents' taxes, based on infrastructure savings and improved property values.[15]

However, land protection alone does not lead to lower taxes. Open space protection and recreation often redirect rather than preclude development in town. Over the short-term at least, the amount of development a municipality is likely to experience will probably not be changed by the conservation of a single parcel of land. Instead, the conservation of certain key parcels may influence the location and pattern of development, which may make providing municipal services more efficient.

Over the long term, open space preservation will affect the ultimate "build-out" of a municipality by limiting the amount of land that can be developed. This may reduce the total amount of development and/or change the pattern of development from one of sprawl to one with denser development in designated areas with coherent patches of open space. From a planning perspective, it is only logical that it is less costly for a municipality to provide services to open space or clustered development than scattered development.

There are also many good reasons why a municipality may want both development and open space. The property tax implications and economics should only be one part of a municipality's future vision.

15 Trust for Public Land, *Managing Growth: The Impact of Conservation and Development on Property Taxes in New Hampshire,* 2005, http://www.tpl.org/content_documents/nh_managing_growth_report.pdf.

Open Space Protection Techniques

There are a variety of techniques many communities throughout the region have used for open space and land protection. Many of these techniques are described in more detail in Dorothy Tripp Taylor's handbook *"Open Space for New Hampshire, a Tool Book of Techniques for the New Millennium."* Information from this handbook as well as the Regional Open Space Plan prepared by Rockingham Planning Commission (March 2000) has been adapted for use here. For the purpose of this chapter, these techniques have been broken down into five areas:

- Public Outreach and Landowner Contact
- Voluntary Protection
- Land Acquisition
- Regulatory Measures
- Open Space and Recreation Planning

Public Outreach and Landowner Contact

Protecting open space must be approached for the public good of all citizens in mind, including the landowner(s) who own the land to be protected. Ideally, if the needs and benefits of open space and recreation were acknowledged by all the residents of the community, landowners would cooperate more with municipalities to sell their land or property rights with fair compensation. However, this is not an ideal world and municipalities and conservation groups often face the challenge of reaching out to residents to persuade them of the importance and the benefits, both social and economic, of open space.

Public education campaigns are an important first step. Many communities across the state and within the region are utilizing the facilitation services of their Regional Planning Commissions. There is also the Natural Resource Outreach Coalition (NROC), which provides an excellent forum for public education to occur. NROC is coordinated through the Community Conservation Assistance Coordinator of the UNH Cooperative Extension Office. This program allows residents to discuss growth related issues and concerns and to identify conservation lands by focusing on the need to protect lands based on natural resource values, large parcels of land, and "hot spots" within the community without identifying specific parcels or landowners.

With community outreach, education and cooperation, landowners and developers will be more eager to conserve their land through easements, conservation subdivision options, and the sale of property. Communities must recognize that not all parcels perceived to be of highest conservation value will be available for purchase. However, when landowners are contacted and approached with correct information about the benefits of land protection they may be more likely to sell or donate their land. This is

particularly true with regard to the income and estate tax benefits of land conservation, as these benefits can be some of the most influential ways to acquire and protect open space. Ultimately, the most successful protection technique will depend upon the specifications of the property and the needs of the landowner.

Voluntary Protection

There are two primary voluntary land protection methods available that can permanently protect privately held open space and conservation areas. These methods include: the donation of land and conservation easements (see Appendix A for more information related to tax benefits, funding and easements).

Donation of Land

The outright donation of open space lands is the least expensive option to protect land. The benefits to the landowner are reductions in a variety of federal, state, and local taxes. There are at least five methods of donation: fee simple, less than fee simple, donation with a reserved life estate, donation of an undivided interest in the land, and donation by bequest. The fee simple method is a gift of the entire interest in the property. Full legal title passes directly to the beneficiary (the community or conservation group), and the landowner no longer possesses any control over the land. However, the landowner may specify in the deed that the land is to be used solely for a specific purpose, such as tree farming or agriculture.

Less than fee simple is a gift of partial interest in the property. The landowner retains legal title to the property, but must give up some of the rights (for example, development rights, timber rights, mining, etc.). The donation with a reserved life estate occurs when a landowner donates property to the community or qualified conservation organization, but retains possession and use of the property for his/her lifetime and/or the lifetime of other family members. A donation of undivided interest in land is a gift of a percentage interest in the land, not any specific, physical portion. As a result, the land as a unit will be owned as tenants in common by those parties who have interest in the property. Donation by bequest occurs when a landowner donates land in his or her will to the community or conservation group. In such cases, the donated land is not subject to estate or inheritance taxes.

Conservation Easements

Conservation easements provide permanent protection from uses of land that could damage or destroy its scenic, ecological, and natural resource values. The easement operates on the premise that the right to develop a parcel is separable from the ownership of the land. Thus, it provides practical options for private landowner's who wish to protect their land while retaining ownership. Generally, easements are donated

(although they may be sold) to qualified non-profit conservation organizations or public agencies, which ensure that the conditions of the easement are fulfilled.

To be effective, the terms of the easement must run with the land and apply to all future owners. Whether purchased or received as a donation, an easement can be a much less expensive method of payment than a fee simple purchase for two reasons. First, the outright cost of acquisition will be less since not all of the land rights are being acquired. Second, the ongoing cost of ownership including maintenance, liability, and property taxes continue to be borne by the owner. The sale of a conservation easement is often referred to as the purchase of development rights. Purchasing development rights allows the landowner to receive monetary compensations for the land's development value without having to convert the land to other uses. Once the development rights are sold, the owner still retains the other rights associated with property ownership. The owner is still responsible for property taxes, which should be assessed only on the non-development potential of the land. However, if the land was already assessed at its current use value, there would be no change in assessed value.

There are also several tax incentives that make conservation easements attractive. These benefits include an increase in estate tax exclusions, a reduction in capital gains tax rates, and several other options available for estate tax planning. In donating development rights, landowners can receive a reduction in local property tax, federal income tax, capital gains tax, and estate tax. Generally, there are at least four methods by which communities and qualified conservation organizations can acquire development rights: direct purchase of the rights, purchase and resale with restrictions, purchase and lease with restrictions, and donation of rights and/or easements. With all of these methods, the restrictions on development run with land, and are binding on future landowners.

Conservation Easements

A conservation easement permanently restricts development rights on open space or agricultural land. Any landowner can donate or sell a conservation easement to the easement holder (usually a non-profit land trust or municipality). The easement holder does not hold development rights (the rights are extinguished), but rather they are responsible for stewardship and enforcement of the conditions of the easement, and the landowner's rights continue to be taxable.

The conservation easement generally removes the rights to develop the land, thereby reducing the fair market value of the property. An easement should be tailored to the specific parcel of land and the values of the landowner, meaning existing structures and activities may continue to take place according to the specific restrictions spelled out in the easement. This could include archaeological excavations, agriculture, timber management, and public events.

An easement does not signify public use; rather, the landowner can determine the best use of the land, including granting permission for public access, recreation and use.

Land Acquisition

The primary methods available for the purchase of land include: fee simple purchase, purchase and leaseback, purchase and resale or lease, the acquisition of development rights and conservation easements, options to purchase, and rights of first refusal. These methods all involve the protection of land through the direct acquisition and control of land, or some portion of the land. They are also very dependent upon the needs of the landowner, the sources of funding available to the community, and the nature and extent of the land and development rights that can be purchased by the municipality.

In the case of an outright purchase, the town buys the property at market value from the current landowner. There are no tax benefits or exceptions for either party, and the Town no longer receives taxes on the land. This is the most costly method of land protection but requires no special arrangements with the landowner.

A bargain sale is an agreement of discounted sale to the Town. The landowner agrees to sell his/her land below market value, and the difference between fair market value and the sale price becomes a tax-deductible charitable donation. Bargain sales are also useful for the landowner in minimizing the liability of a long-term capital gains tax associated with selling a large estate. After the sale, the Town retains all rights and responsibilities over the land.

Finally, the Town can purchase or acquire conservation easements over the land, which means the owner still maintains ownerships and tax responsibility but is prohibited from developing the land. The owner of the easement purchases development rights, which is usually calculated to be the fair market value of the land for development purposes minus the value of the land for open space or agricultural purposes. The Town gains the responsibility of easement stewardship, which means monitoring the land to ensure that the agreements of the easement (generally a lack of development or disturbances) are being followed. While these methods are described for use independent of other strategies, they can also be creatively combined to protect more land for less money.

Fee Simple Purchase

Fee simple acquisition is the most straightforward approach to land protection. The land, and all the property rights that go with it, are acquired. Assuming the agency acquiring the land is tax exempt, the entire value of the property is removed from the municipality's tax rolls.

Most protected lands are held in fee simple ownership where the holder of title of land possesses all rights associated with the property. This common method of protecting

open space has traditionally been through the direct purchase of property. An important consideration is that open space lands protected using fee simple acquisition are often purchased at or close to fair market value based upon development potential. Purchasing open space lands at fair market value can be prohibitively expensive, and can seriously limit the amount of land that can be protected. Fee simple purchases can also involve private organizations or state agencies that often make payments in lieu of taxes.

Though land purchased for conservation purposes will no longer generate property taxes, it will not demand much in the way of public services. In addition the sale of a property for less than its full market value, known as a bargain sale can also be useful during a fee simple purchase. There are other options that can help recover the costs associated with a simple purchase. These include purchase and leaseback, and purchase and resale with covenants, although they are rarely used in this region. The first option – purchase and leaseback – allows the purchaser (community or conservation organization) to lease the land back for a particular use compatible with open space preservation (such as farming or forestry), thus recouping a portion of the land's purchase price. Lease agreements should be written in a manner that will protect the interest of the community while being sensitive to the landowner's needs. Another option – purchase and resale with covenants – allows the land to be resold with a deed committing the buyer to maintain the parcel as open space or limit the nature and extent of development allowable.

Bargain Sale

This is the sale of property for less than its full market value. It can be considered a combination land sale and charitable contribution. One motivation for the landowner is the income tax benefit from the charitable donation. The amount deductible for income tax purposes is the difference between the land's fair market value and the actual sale price. In addition to a charitable contribution, landowners can receive the following benefits: cash from the sale, a capital gains tax reduction, the avoidance of brokerage fees, and the avoidance of a higher tax bracket which could otherwise result from a full value sale of the property.

Options to Purchase and Rights of First Refusal

If a community cannot afford to purchase a site immediately, an option to purchase, or the right of first refusal, may allow a community some time to raise the necessary funds. An option establishes a price at which the community could purchase the land during a specified period of time.

Regulatory Measures

For local government, regulatory measures are perhaps the most cost-efficient means of land preservation. If implemented according to the open space priorities of the community, these measures can be extremely effective in curbing sprawl and protecting

open space. Some of the most important regulatory measures include natural resource overlay and agricultural zoning techniques, open space development and conservation subdivisions, transfer of development rights, and growth management ordinances. Zoning is also an important tool that can be used to help protect open space within a community. NH RSA 674:21, Innovative Land Use Controls, permits environmental characteristics zoning, intensity and use incentives, cluster development, and several other innovative land uses, many of which can be incorporated in zoning approaches which promote the conservation of open space and recreation.

Environmental Characteristics Zoning

Generally, environmental characteristics zoning involves overlay districts that are superimposed on existing zoning districts. Proposed development must comply with the requirements of both the underlying district and the overlay district. A natural resource overlay district adds additional restrictions and requirements to those of the underlying district. Overlay districts can be applied to a variety of natural features including, but not limited to, floodplains, wetlands, aquifers, steep slopes, rivers, streams, ponds, and lakes. There are many examples of overlay districts in many of the communities within the region. However, as a foundation to a proposed natural resource overlay district, the master plan needs to identify and outline the importance and/or threat to the resources contained within the district.

Agriculturally Friendly Zoning

To help protect the rural qualities of the region, the ability to sustain agriculture is a vital part of the visual landscape. There are a variety of zoning tools that have been developed to help communities preserve rural character through agricultural preservation. A resource kit called Preserving Rural Character Through Agriculture (Kit 77) was made available in 1999 from the UNH Cooperative Extension. Communities should update their master plan detailing the importance and/or threat to agricultural resources within the community, as well as the region, prior to adopting agricultural friendly zoning provisions.

Open Space Development and Conservation Subdivision Ordinances

An Open Space Development or Conservation Subdivision is a residential or mixed-use development in which a large portion of the site is set aside as permanently protected open space, with the buildings clustered on the remaining portion of the land. A Conservation Subdivision Ordinance gives specific criteria that developers must meet and these criteria will vary by town. Some of the main advantages of this arrangement include its efficiency and low-cost relative to other protection methods, and its ability to maintain rural character while still allowing development. Drawbacks

include resistance from residents concerned with increased density and more complex governance of the resultant open space.

In most conventional developments, developers do not provide open space or recreation. The lots are typically drawn first, thereby eliminating many of the significant natural features. An open space development however can incorporate an incentive based approach to entice developers to set aside open space in perpetuity. An Open Space or Conservation Development Ordinance promotes the protection of open space by allowing buildings to be clustered on the area of the parcel that is best suited for development. At the same time, the remainder of the parcel is left undisturbed.

Open Space Development versus Conservation Subdivision

Conservation subdivisions, like open space developments, set aside open space land and increase the density of individual lots. However in conservation subdivisions, open space land is placed under an easement for permanent protection from development. More significantly, conservation subdivisions consider the natural features of the landscape and natural vegetation when laying out parcels for homes and for open space areas. Focus is placed upon connecting sensitive resources, unfragmented lands, and trails rather than setting aside the most convenient parcel for open space.

These ordinances can permit developers to build the same number of units allowed in a conventional subdivision while setting aside a certain percentage of the land as open space. Another incentive based method may allow a developer to build additional units, as a bonus and include less rigid dimensional requirements, in return for requiring a greater amount of open space to be preserved.

For almost all open space developments, both the development and service/utility costs are lower than for conventional developments due to shorter roads and utility lines and reduced site preparation costs. Most importantly, communities can use this technique in order to create interconnected parcels of permanent open space. To ensure that the open space is protected, typically a legal document must be recorded. There are different types of ownership of the open space. It can be deeded to the community, held in a conservation easement or included as part of a homeowner's association.

Promoting open space, conservation or clustered developments is one of the few concrete actions that can be done through land use and zoning controls to protect open space. It is also one of the most important. Unfortunately, there are several communities within the region that have attempted to make this form of development mandatory instead of optional. This has generated some mistrust and disuse of the concept. Still, where this concept remains optional, and there are incentives and cost reductions to developers, it is widely taken advantage of. A better balance among all the communities in the region is needed to place conservation or cluster development on an equal footing.

Another form of voluntary conservation subdivisions exists as the "Village Plan Alternative," as described in RSA 674:21. This stipulates that a developer must locate all development on 20 percent of the developable property to allow for maximum open space. The open space area would be protected under a recorded conservation easement. The Village Plan alternative provides for an expedited application review process and it is subject to all ordinances and regulations with the exception of density, lot size, and frontage and setbacks.

Frequently Asked Questions about Conservation Subdivisions

Do conservation subdivisions involve a taking without compensation?
No, for two reasons. The first is that no density is taken away. Developers can still build at full permitted density for the municipality's current zoning, but houses are condensed onto smaller lots such that at least half of the land is left as open space. Second, no land is taken for public use, since the neighborhood or the developer owns and manages the open space land, except in rare cases that are negotiated with the town.

What are the ownership, maintenance, and tax issues?
In the case of a conservation subdivision, the land most commonly belongs either to the original landowner, who can pass the land to heirs and keep it under conservation easement, or the Homeowner's Association, which consists of all residents in the neighborhood and minimizes facilities to keep dues low. In rare cases the municipality or a private land trust maintains the land or an easement on the land. The landowner or Homeowner's Association is responsible for taxation, generally the same as a normal subdivision, and maintenance.

How can on-site sewage work with conservation subdivisions?
Contrary to popular belief, conservation subdivisions lend themselves well to sewage disposal. One option is to situate houses on the best-drained soils to ease efficiency of septic systems. Another option is to provide central water and sewage disposal, or leach fields, which can be located under playing fields or conservation meadows. Conservation subdivisions can also utilize spray irrigation in which wastewater is heavily aerated in deep lagoons and nutrients are taken up by the forests or fields in the surrounding open space. Creative design can allow residents to enjoy the benefits of environmentally sensitive sewage treatment without unpleasant olfactory or visual side effects.

How do conservation subdivisions differ from clustering?
Clustering uses the same principle of decreased lot size in exchange for more open space. However, clustering requires less land be set aside for conservation and makes no specifications as to what land be conserved. Conservation subdivisions are planned to preserve the most strategic features and create networks of green space throughout the community.

Transfer of Development Rights (TDR)

Although this technique has never been used in this region, it is an extension to the purchase of development rights concept. It relies on the separation of development rights from other land ownership rights and adds to that the shifting of those rights from one location (the "donor" zone) or zoning district to another (the "receiver" zone). A

TDR program can protect critical resource areas by shifting the development potential from areas where it is least desirable to areas where it is most desirable.

Under a TDR program, landowners in the donor zone can sell property development rights directly to a landowner in the receiver zone or indirectly through a public agency who would then transfer the development rights to the town's receiving area. The land to be protected would then be subject to deed restrictions barring future development. Although this technique holds great promise to protect open space without great public expenditures, it is comparatively complex and has not yet gained wide acceptance in New Hampshire. The success of a TDR program depends on a strong real estate market because without strong demand for development rights, just and timely compensation for the seller cannot be assured. Under the right market conditions, TDR can be an important conservation tool for protecting land at a very low cost to the community.

Growth Management Ordinance

A Growth Management Ordinance is often employed by municipalities experiencing population growth at a rapid pace where public facilities and services cannot keep up. They function by placing short or long-term caps on new residences or population numbers. Under certain circumstances, a town may adopt regulations to control the rate of development. In New Hampshire, a town must have both a master plan and a capital improvement plan before it can adopt any ordinances controlling the timing of development. In certain rapid growth situations, slowing the rate of development can give a community time to update its master plan, develop infrastructure, and consider ways to conserve open space. Methods include limiting the number of building permits, or an interim growth moratorium allowing the planning board to halt or severely limit development for up to one year.

Open Space and Recreation Planning

Open Space and Recreation Plans

A key tool for communities to proactively protect open space is to develop open space and recreation plans. Several towns within the region have adopted open space plans including Candia, Chester, Deerfield, Derry, Hooksett, Londonderry and Weare. The communities of Auburn, Bedford, Goffstown, New Boston, Manchester and Raymond have less formal plans, but nonetheless are actively pursuing various land protection efforts. Almost every community within the region has included open space and recreation as an element of their municipal master plan.

In order to promote the protection of open space, it is important to incorporate local goals and a protection strategy in an open space plan. It is equally important to review current zoning and subdivision regulations, identify key open space and resource areas and interconnections between them, identify and contact landowners of key undeveloped land and to inform them about the community's conservation and open space objectives, prioritize areas to be protected through acquisitions of land, development rights or agreements, and establish a conservation fund through grants, the municipality's CIP, current use tax penalties or other sources.

Smart Growth Principles

The preservation of open space is closely tied to smart growth principles and the largest threat to open space may be a community's growth patterns. There are a number of smart growth principles that can help to preserve open space and rural character. Some of these are incorporated into the following actions.

- Consider mandating future subdivisions to include open space provisions, integrating practices that protect sensitive environmental features of the development parcel.

- Provide incentives to developers building open space developments, including density bonuses, reduction of minimum lot standards, and a streamlined application process.

- Create areas where increased density will be allowed in exchange for protecting specific rural features.

Conservation Commissions

Conservation Commissions play a key role in the conservation and preservation of open space, including the development of open space plans. In addition, Conservation Commissions are heavily involved in the completion of natural resource inventories, the identification of specific areas worthy of protection, and potential greenways, trail networks, and connections to existing conservation lands. The Conservation Commission is usually the entity that oversees town forest management plans, which are specifically authorized by RSA 31:112. RSA 36-A:4 also allows Conservation Commissions to receive gifts of property and/or money for conservation purposes, subject to approval of selectmen. In addition, RSA 36-A:5,I authorizes Conservation Commissions to expend monies from the conservation fund without further approval of Town Meeting. This is a tool that more communities within the region should be using in order to leverage money for conservation easements or bargain sales.

Cost of Community Service Studies (COCS)

Measuring the public costs and benefits of land use and development is an important planning function for local government. One recognized method for analyzing municipal service revenue and expense is the Cost of Community Service Study (COCS) as made popular by the American Farmland Trust. [16] A COSC study compares all the revenues a community receives by land use type to all the community's expenses associated with that land use type. The results provide valuable information on the comparative service costs and tax revenues associated with different land uses within a community.

Several communities within the region such as Deerfield and recently New Boston have participated in or prepared a COCS. These studies typically indicate that for each dollar of tax revenue generated, open space land requires less than one dollar in public services and residential development requires over a dollar in public services. Commercial development generally falls somewhere in the middle. These results can be helpful in demonstrating the economic consequences of losing open space. They also serve as another practical tool for communities to use to strengthen the need for public expenditures for open space.

Natural Resources Inventories

A Natural Resources Inventory (NRI) is a summary in map form of a municipality's protected and unprotected open space lands, water, and natural and cultural resources. The NRI is intended to clearly delineate all the natural resources within the community, which in turn, provides a foundation for the municipality's open space plan. The NRI also provides a factual basis for making natural resources decisions and formulating regulations.

16. See American Farmland Trust FIC Fact Sheets: Cost of Community Services Studies (August 2004).

Co-Occurrence Analysis

A natural resource co-occurrence analysis is an important tool in identifying and prioritizing areas for protection. A co-occurrence analysis is typically included as an important part of a NRI. It identifies high-value natural resource areas and maps them, with multiple levels of unique resource data over-layed spatially using GIS to display on one comprehensive map. The analysis applies numerical values to selected resource factors, with higher values and darker colors indicating land that should be prioritized for protection. The following are example resource factors that are typically considered:

- Stratified drift aquifers
- Potentially favorable gravel well area
- Sanitary radii
- Drinking water protection areas
- National Wetlands Inventory (NWI) identified wetlands
- Open/Agricultural/Disturbed land cover
- High elevation (>800 ft.)
- Steep south facing slopes
- Unfragmented natural land cover
- Undeveloped riparian zone
- Prime agricultural soil and soils of statewide significance
- Hydric soil (poor or very poor drainage)

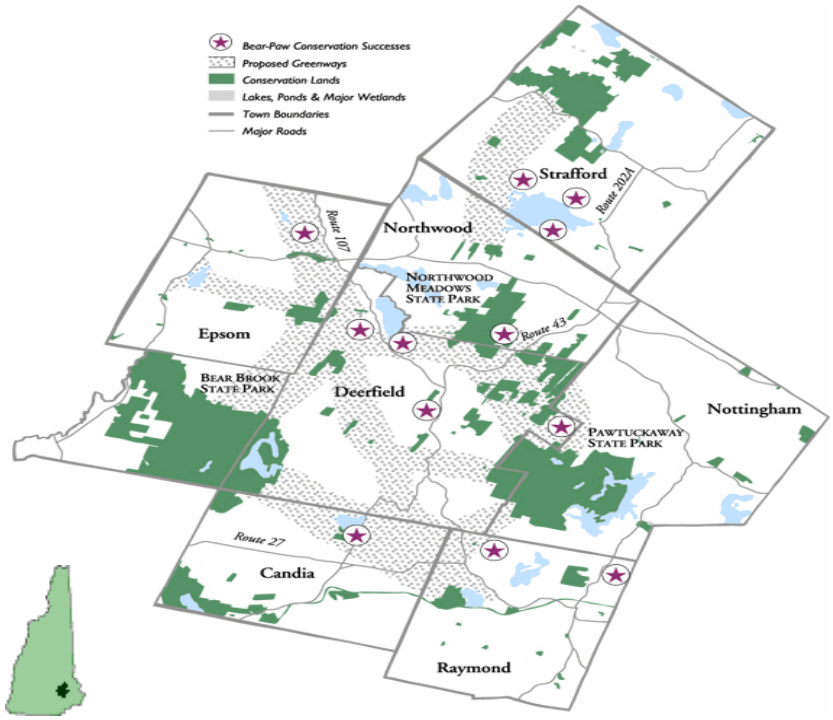
Organizations, Programs and Funding Opportunities

Many communities within the region have already taken a vital step in ensuring that some of its open lands remain permanently in their natural states. These municipalities may have adopted bond measures for open space and recreation or have allocated their land use change tax monies to their conservation commission for the purpose of acquiring conservation lands. However, these funds are not always adequate due to rising land values. In order to maximize the economic, social, and environmental benefits of open space, many municipalities must find additional funding sources and land protection strategies.

Additionally, many municipalities within the region recognize the importance of regulatory conservation strategies, including changes to zoning ordinances to encourage the use of conservation subdivisions. These regulations generally have very little implementation cost and, in fact, save money on future municipal infrastructure costs. By encouraging conservation subdivisions, the open space land is built into the new development rather than purchased afterwards, providing significant future cost savings for local government.

To help fund land acquisition, municipalities are also working cooperatively with a number of land trusts and private non-profit conservation organizations to pool financial resources and expand conservation efforts. The Bear Paw Regional Greenway Land Trust for example, works specifically with a number of surrounding communities to link Bear Brook State Park, Pawtuckaway State Park, Northwood Meadows State Park, and other conservation areas (see attached map). As a community-based organization composed of townspeople, Bear Paw can serve as an important mobilizing and organizing resource. The Rockingham Land Trust, serving all the communities of Rockingham County, can also be a good local resource, although it currently maintains very few conservation lands within the SNHPC region.

Figure 11.2
Bear Paw Conservation Land



Source: Bear Paw Regional Greenway Landtrust

The Trust for Public Land and the Nature Conservancy are both national land trust organizations active in New Hampshire, which can provide resources and assistance to preservation projects. Additional state resource organizations include the Society for the Protection of New Hampshire Forests and the Audubon Society. Many of these programs and organizations are described below. For more information see Appendix B.

Public Programs

Current Use Program – The Current Use Assessment Program allows qualifying land to be taxed according to the value of its current use rather than its potential use. One of the more distressing realities of owning large parcels of open land in New Hampshire is the exceptionally high property tax rates. The Current Use Program has been an important method of reducing this burden. Current use typically reduces property taxes assessed on undeveloped land by more than two-thirds, and is vital to the preservation of open space in the region. As of 2004, a total of 94,206 acres of land were included in the Current Use Program within the region. This represents 31 percent of the total land area of the region.

Land and Water Conservation Fund – The Planning, Development and Outreach Office through the Division of Parks and Recreation administers funds received by

the State through the Federal Land and Water Conservation Fund (LWCF). This fund provides 50 percent matching grants to municipalities for the acquisition of open space and recreation lands. The LWCF is funded through offshore oil and gas lease sales. Last year was an all time low for the program and funding was severely cut. The State received $340,147 total funding last year. In previous years, the State had received approximately $900,000. The State is currently waiting to find out how much funding will be available for the next grant round which begins in September 2006. This information will be posted to the website www.nhstateparks.org by the end of August. In previous years, the Land and Water Conservation Fund was an important source of funding for communities, particularly for leveraging monies to purchase land and develop recreational facilities.

Department of Resources and Economic Development (DRED) – The Commissioner of Resources and Economic Development may also upon request establish a program to assist those cities and towns that have adopted the provisions of Chapter 36-A, Conservation Commissions, in acquiring land and in planning of use and structures as described in RSA 36-A:2. In addition, the State Trails Bureau within NH DRED manages the recreational trails grant program in New Hampshire. The Recreational Trails Program (RTP) is a component of the Transportation Equity Act for the 21st Century (TEA-21). It funds motorized, non-motorized, and diversified trail projects through federal gas tax money paid on fuel for off-highway recreational vehicles. Projects are given up to 80 percent of funding, with at least 20 percent required from the municipality or local organization in the form of labor, supplies, or cash. Many recreational trail projects are completed by local scout groups or volunteers. New Hampshire receives approximately $500,000 annually for RTP projects.

Land Management Assistance – There are three County Conservation Districts, which serve the region – Rockingham County, Hillsborough County and Merrimack County. These agencies provide direct assistance to landowners in sustaining the productivity of their farmland. As part of their effort to protect the land, the County Conservation District will also accept and monitor conservation easements. Experienced staff from the UNH Cooperative Extension program will also assist landowners and communities with land protection efforts. In addition, the USDA Natural Resource Conservation Service (formerly the Soil Conservation Service) provides technical assistance in natural resource management serving Rockingham, Hillsborough and Merrimack counties.

NH Department of Agriculture – This federal agency is actively involved in a number of ways to protect the State's farmland resources, including providing technical assistance on land use issues, conservation programs and efforts to improve the economic return of farm enterprises. Since many farms in New Hampshire often contain a variety of open space, these programs also help to maintain the integrity of open space areas.

RSA 432:18-31A authorizes the establishment of an Agricultural Lands Preservation Committee (ALPC) within the New Hampshire Department of Agriculture. This committee administers funds for the acquisition of agricultural land development rights. However, this program has not been funded since the early 1980s. If the ALPC designates a farmland parcel as an "agricultural preservation restriction areas", the Department of Agriculture may purchase the land's development rights in order to limit the use of the land to agricultural production. Criteria used to make the designation include soil types found on the land, and the immediacy of the threat to development.

NH Land and Community Heritage Investment Program – Created in 2000, the Land and Community Heritage Program (LCHIP) is an independent state authority that makes matching grants to NH communities and non-profits to conserve and preserve New Hampshire's most important natural, cultural and historic resources. A total of $5 million dollars in funding has been appropriated to the program this year. Since 2000, the program has awarded a total of $17.2 million to 91 communities. Over 200,000 acres of land have been conserved and 83 historic structures have been preserved and/or revitalized. Within the SNHPC region the following grants have been awarded to date:

(1) The Town of Bedford received $20,000 in funding to perform a study of the Joppa Hill property, which comprises 312 acres;

(2) The Town of Derry was awarded $125,000 to acquire a 77-acre parcel known as the Corneliusen Orchard. The property has important passive recreation opportunities and agricultural land. An easement was placed on the property and the farmer donated an easement on 37 additional acres. This property abuts conservation agricultural land;

(3) The Town of Hooksett received $10,000 to rehabilitate Robie's Country Store. This building is on the National Register of Historic Places and is the first site is Hooksett to receive such a listing. Renovations to the building include replacing the roof, painting exterior clapboards, molding, and windowsills, and insulating the windows. Since 1822, a general merchandise market has operated at the site and it has a national reputation as being a "must do" political campaign stop;

(4) The Towns of Londonderry, Hudson, and Windham received $300,000 to purchase an easement on 205 acres of the Ingersoll Tri-Town Tree Farm;

(5) The City of Manchester received a total of five grants: $70,0000 to purchase and rehabilitate the Athens Building (next door and above the Palace Theatre) for use as office space and cultural programming for performing arts organizations; $75,000 to acquire 150 acres to add to a major preserve of natural resources totaling 600 acres. Unique features include rare plant communities such as an

Atlantic White Cedar, Rhododendron and Black Gum complex. The project protects endangered and rare species in a densely developed area under intense development pressure; $70,230 to convert Manchester's first High School building to a home for the Sargent Museum of Anthropology and Archeology. This phase will stabilize and secure the severely fire-damaged building, and will provide an Historic Structures Report, a National Register nomination, and Architectural and Engineering services for the building's ultimate rehabilitation; $236,250 to repair and upgrade the Historic Association Headquarters. This project will include exterior repairs (including windows) and improvements to ensure appropriate storage of the Association's extensive collection, and will make the collection more accessible to the public; and $200,000 to complete the first two phases of an extensive rehabilitation plan for a classic 1841 garden-style urban cemetery.

Natural Heritage Inventory - New Hampshire's Natural Heritage Inventory (NHI) is responsible for identifying and assessing sites that contain habitat of rare, endangered and threatened natural species throughout the state and region. While specific location of these sites is not released to the public, this information is helpful in evaluating lands for open space and conservation purposes. In addition, New Hampshire Fish and Game has just completed a new statewide wildlife action plan (WAP) for both game and important non-game species. This plan includes detailed wildlife habitat maps, which are important for conservation planning. Because of the importance of wildlife to rural economies, additional federal funding is expected to be provided to the state to support a wide range of activities in local communities so that wildlife populations remain healthy as the state grows.

Forest Stewardship Plan - A forest stewardship plan addresses fish and wildlife habitat, water resources, recreation, forest protection, soils, timber, wetlands, aesthetic values, cultural features and endangered species at the local level. Besides giving management direction, a forest stewardship plan is necessary for certain current use assessment categories and certified Tree Farm status. Communities should consider hiring a licensed forester to determine the best approach to managing town-owned forest lands and open space areas.

Forest Legacy Program – The Forest Legacy Program, operated by the Land Trust Alliance, is a voluntary program of the U.S.D.A. Forest Service, providing grants to states for the purchase of conservation easements and fee acquisition of environmentally sensitive or threatened forestlands. The Forest Legacy Program provides federal funding for up to 75 percent of the cost of conservation easements or fee acquisition of existing natural resources. Participation in Forest Legacy is limited to private forest landowners. To qualify, landowners are required to prepare a multiple resource management plan as part of the conservation easement acquisition. The federal government may fund up to 75 percent of program costs, with at least 25 percent coming from private, state,

or local sources. The state grants option allows states a greater role in implementing the program. The program also encourages partnerships with local governments and land trusts, recognizing the important contributions landowners, communities, and private organizations make to conservation efforts.

Other Federal Programs – There are several other federal grant programs which may be utilized for the purchase of open space land: 1) The NH Department of Fish & Game receives Pitman-Robertson Act Funds which cover 75 percent of the fair market value of lands acquired by the Department for wildlife protection, and the Dingel-Johnson Fund (1950) which cover 75 percent of acquisition costs to provide access to and provide for fishery habitat; 2) the North American Wetlands Conservation Act, enacted in 1989, to conserve North American wetland ecosystems and waterfowl and other migratory birds and fish that depend upon such habitat; and 3) the Environmental Protection Agency, through the NH DES, offers grants under the Source Water Protection State Revolving Fund for land acquisition projects, and additional funds are available (as a matching grant program) for land acquisition in designated water protection areas. See Appendix B for more information about this and other federal and state programs.

Non-Profit Organizations

Private non-profit conservation organizations and land trusts are important entities, which provide assistance in open space protection. Most of these organizations help to conserve land through land donations and conservation easements.

The Audubon Society of New Hampshir*e* encourages the preservation of wildlife habitat and natural areas through education and land acquisition.

The Society for the Protection of New Hampshire Forests (SPNHF) promotes the conservation and wise use of natural resources, and strives to protect productive forest and agricultural lands. Currently, SPNHF manages 574 conservation easements totaling 86,105 acres throughout the state. SPNHF also holds 40,976 acres of land in fee simple ownership and manages another 13,218 acres through deed restrictions.

The Nature Conservancy is an international, non-profit conservation organization. Its mission is to preserve plants, animals, and natural communities that represent the diversity of life by protecting lands and waters they need to survive. The Conservancy owns more than 1500 preserves, the largest private system of nature sanctuaries in the world. The New Hampshire Chapter has protected more than 121,000 acres of land around the state. The Manchester Cedar Swamp is the only preserve located within the region.

The Trust for Public Land (TPL), a national nonprofit organization is also actively involved in open space protection and conservation easements. As part of its Farmland

Protection Initiative in Southern New Hampshire, TPL helped the Town of Derry conserve the 86-acre Corneliusen Farm and 30 adjacent acres of active farmland in 2004. Critical funding was committed by the town, the state's Land and Community Heritage Investment Program, and private supporters. Federal grants to the state from the Land and Water Conservation Fund and USDA Natural Resource Conservation Service's Farmland and Ranchland Protection Program closed the funding gap. As a result of this collaborative project, 68 acres of prime soils have been protected from development by agricultural preservation easements and will continue to be farmed. In addition, 38 scenic acres offering views of surrounding hillsides are now owned and managed by the Town of Derry for wildlife and low-impact recreation. The remaining 10 acres were purchased by adjoining landowners and permanently protected from development by conservation easements.

The Rockingham County Conservation District (RCCD), the Merrimack County Conservation District (MCCD), and the Hillsborough County Conservation District (HCCD) are all members of the New Hampshire Association of Conservation Districts. Since 1946, the New Hampshire Association of Conservation Districts (NHACD) has provided statewide coordination, representation, and leadership for Conservation Districts to conserve, protect, and promote responsible use of New Hampshire's natural resources. At the present time, only the Rockingham County Conservation District is actively involved with federal, state, and local agencies, nonprofits, conservation groups and landowners to protect open space through conservation and agricultural preservation easements. The Merrimack County Conservation District and the Hillsborough County Conservation District offices are currently not involved or staffed to address conservation and agricultural easements.

The Rockingham Land Trust, established in 1980 and located in Exeter, is another non-profit land trust organization, which accepts gifts of land by donation or bequest, and monitors conservation easements on several properties within Rockingham County. Since 1980, the Rockingham Land Trust has worked with landowners and municipalities to voluntarily conserve more than 3,300 acres of land within Rockingham County. RLT is the primary holder of 60 easements and currently holds executory interest in 7 easements in Rockingham County. Within the region, RLT holds a total of three easements: one in Auburn and two in Derry. The conservation easement in Auburn is located on the 54-acre Preston Tree Farm.

The Bear Paw Regional Greenway is a land trust established by resident volunteers to protect open space lands around and between Pawtuckawy and Bear Brook Park. Bear Paw has proposed regional greenways as a means of connecting these parks with large

areas of conservation land in a seven-town region including: Candia, Deerfield, Epsom, Northwood, Nottingham, Raymond, and Strafford (see the following greenway plan). This network of voluntarily protected lands will provide important wildlife habitat and recreational opportunities. To date, Bear-Paw has protected over 2,028 acres and has been in contact with landowners about the protection of an additional 10,498 acres.

Bear Paw Regional Greenway Plan

Local Open Space/Land Protection Committees - There are a number of municipalities within the region that have appointed open space and land protection committees to preserve natural resources and protect open space within their communities. These municipalities include the towns of Weare, New Boston, Londonderry, Derry, Chester, Candia and Deerfield. Many of these committees are made up mostly of volunteers who work to identify and protect key parcels of land.

Summary of the Region's Protected Lands

Open space and conservation lands provide opportunities for many different recreational activities. These can range from developed, intensively used parks to somewhat remote experiences. While some parcels in this inventory may contain areas managed expressly for recreation, a majority of these lands may also be managed with a broader set of goals in mind. These broader management goals might include preserving wildlife habitat, maintaining productive forest or agricultural lands, or protecting water quality or rare or endangered species. In some cases, such as the state forests, the protected lands may only be available for dispersed low impact recreation. In other cases, public access might not be available at all. Access varies and it is important to know and respect the landowner wishes before entering public or private held conservation lands.

The conservation lands shown on the following map include the parcels of land that have been protected in one form or another principally by the primary protecting agency. This information was originally gathered from a variety of state, regional and local sources under the direction of The Society for the Protection of New Hampshire Forests, as a result of multiple efforts and projects. The digital archive of this database is managed by NH GRANIT at Complex Systems Research Center at UNH and is available to the public through the GRANIT system.

The current release of the digital conservation lands database is dated April 25, 2006. Because this data only reflects information that has been gathered from the previous two years, it is possible that parcels of land that may have been placed under conservation easement or protection prior to this date are not included.

From the many attributes available in the database, the classification scheme chosen for this chapter is the primary protecting agency or organization. As the name implies, this is a description of the agency responsible for assuring that the parcel is under protection. In some cases, however, this may or may not be the owner of the parcel and the type of protection may vary depending upon the ownership restrictions on the land. There are a variety of other attributes available for each parcel contained in the database, including the type of easement or protection in place, the level of protection, and the degree of public access available for the parcel.

The categories chosen for the display of primary protecting agency are:

1) Town government
2) State agencies
3) Federal agencies
4) Private entities/individuals
5) Other public/quasi-public entities including organizations such as school or water districts, historical societies, and in a few instances, there are parcels along the town lines, which are protected by adjacent towns

Protected Lands Analysis

Based upon GRANIT's existing conservation lands database, there are a total of 718 parcels identified as protected lands within the region. The majority (515) is classified as Town ownership; 53 are owned by the State, and 27 are owned by the Federal government. The remainder (123) is owned by private and other public or quasi-public entities.

The largest number of protected parcels (115) is located within the Town of Bedford, followed by 102 parcels located within the Town of New Boston. The fewest number of protected land parcels (17) are located in the Town of Raymond (see table 11.1 below). The Town of Deerfield, on the other hand has the largest amount of protected land (19,519 acres), followed by the Town of Weare (13,393 acres). The Town of Chester had the smallest amount of protected land (1,233 acres).

The largest single holding is Bear Brook State Park containing 9,472 acres within the Town of Deerfield. The total land area in the region under protection is approximately 63,615 acres, equivalent to about 20 percent of the region's total land area of 314,640 acres.

Table 11.1
Protected Lands by Municipality – SNHPC Region

Municipality	Number of Protected Parcels*	Acreage of Protected Parcels	Percent of Region**
Auburn	93	3,937	6%
Bedford	115	1,876	3%
Candia	42	2,965	5%
Chester	34	1,233	2%
Deerfield	58	19,519	31%
Derry	38	1,623	3%
Goffstown	80	2,510	4%
Hooksett	20	2,442	4%
Londonderry	68	2,260	4%
Manchester	58	2,918	5%
New Boston	102	7,570	12%
Raymond	17	1,389	2%
Weare	87	13,393	21%
TOTAL	812	63,635	

*Note: Some of the parcels overlap adjoining towns therefore the actual total number of parcels is 718
**Note: Percent Rounded Up
Source: NH GRANIT, April 2006

Summary of the Region's 2004 Local Resource Protection Priorities

Natural Resources

During the first and second years of the NH DES Regional Environmental Planning Program (REPP) each community within the region was given an opportunity to recommend local historical, natural, and cultural resources worthy of protection. SNHPC staff worked extensively with local conservation officials and commission members during 1997 and 1998 to assist with this identification. The land areas and sites identified for protection included ecological, historical and cultural resources, forestry and agricultural resources, and water resources.

The location of each of these resources was documented as a point location by SNHPC on a map titled Natural and Cultural Resources Identified for Protection. The associated database includes all the information offered by the communities and the information that SNHPC had available through the GIS databases, and other resource projects were also included and listed by community in a report titled Natural and Cultural Resources Inventory. However, none of the areas shown on the map or identified in the report were prioritized at the time.

In 2004, SNHPC requested that all the municipalities within the region update this information and prioritize all the resources they had previously identified for protection. As a result of this effort, the program was renamed Local Resources Protection Priorities (LRPP). A summary of the 2004 LRPP identified by municipality within the region is provided in the following table 11.2 and map 11.1. Only natural resource sites and lands identified by municipality are shown.

Table 11.2
2004 Local Resource Protection Priorities – SNHCP Region

Municipality	Natural Resources	Acreage	Percentage of Municipal Land Area	Total Municipal Land Area (Acres)
Auburn	63	2944.6	18.14%	16,229.7
Bedford	12	364	1.74%	20,907.3
Candia	11	6675	34.51%	19,340.4
Chester	29	1324.8	7.97%	16,617.8
Deerfield	N/A	N/A	N/A	32,584.9
Derry	33	2891.3	12.80%	22,587.4
Goffstown	9	1426	6.03%	23,652.0
Hooksett	27	6041	26.19%	23,063.9
Londonderry	66	2691.6	10.04%	26,814.4
Manchester	16	246	1.17%	21,015.5
New Boston	16	3607.5	13.20%	27,322.0
Raymond	11	1873	10.15%	18,446.6
Weare	22	8740.4	23.12%	37,798.1
SNHPC Region	315	38825.2	12.67%	306,380.0

Source: Municipal Planning Boards and Conservation Commissions

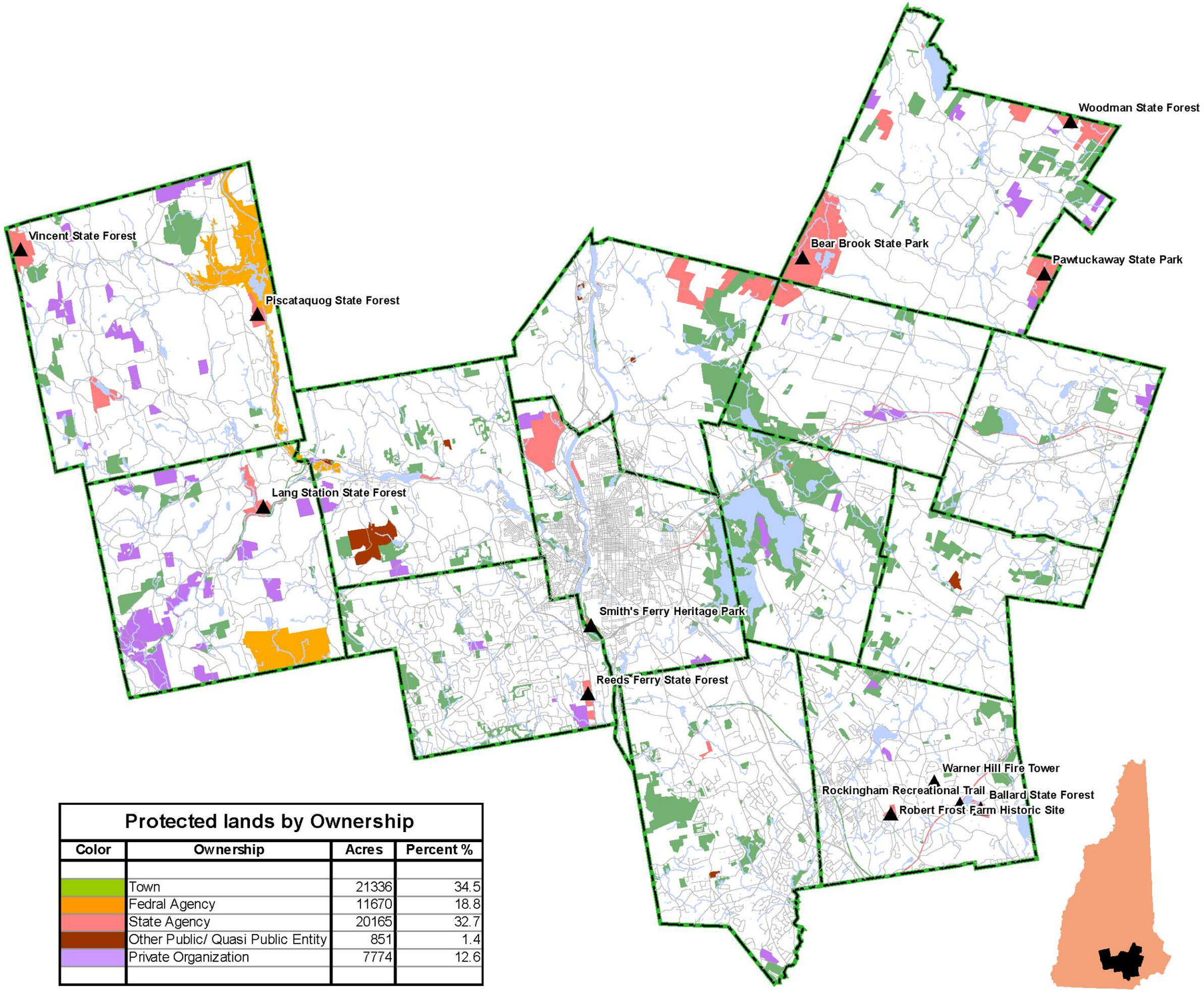
As displayed in this table, a total of 315 natural sites consisting of 338,825 acres have been identified as desirable for open space, conservation and recreation within the region. These 315 sites represent over 12 percent of the total land area of the region. The towns of Londonderry and Auburn have identified the most sites.

All of the locally defined natural resources as identified in the above table 11.2 and on the attached map are important in terms of defining a future open space framework for the region. These resources are also important given their proximity to existing protected and conservation lands and the contribution they provide in preserving large tracts of unfragmented land. When combined with the region's existing protected lands, state parks, forests and recreational areas, a regional framework for future open space and recreation can begin to be developed.

REGIONAL COMPREHENSIVE PLAN

Map #11.1

PROTECTED LANDS



Legend

Political Boundaries

- Townline
- Major Roads

Hydrography

- Streams
- Rivers/ Lakes

Protected Lands by Ownership

- Town/County
- Fedral Agency
- State Agency
- Other Public/Quasi-Public Entity
- Private Organization
- State Parks

Data Sources:

Granit Digital Data (1:24,000)
NH Department of Transportation
NH Department of Environmental Services
NH Fish and Game Habitat Features data

Protected lands by Ownership

Color	Ownership	Acres	Percent %
	Town	21336	34.5
	Fedral Agency	11670	18.8
	State Agency	20165	32.7
	Other Public/ Quasi Public Entity	851	1.4
	Private Organization	7774	12.6

The individual municipalities represented on this map and the SNHPC make no representations or guaranties to the accuracy of the features and designations of this map.

This map is prepared for planning purposes only and is not to be used for legal boundary eterminations or for regulatory purposes.

SNHPC

Map Produced by GIS Service SNHPC April 2006.
For reprints or furthur questions

Contact: SNHPC, gis@snhpc.org or (603) 669-4664

0 8,000 16,000 32,000 Feet

0 1.5 3 6 Miles

Summary of the Region's State Parks, Forests and Recreational Areas

State lands under the jurisdiction of the New Hampshire Department of Resources and Economic Development (DRED) are referred to as "reservations" by state law. RSA 227-G:2 defines "reservation" as public land under DRED including, but not limited to: state forest, state park, natural area, historic site, geologic site, recreation trail, memorial area, fire tower, wayside area, heritage park, resource center, agricultural area, state forest nursery, fish pier, administrative facility, information center, demonstration forest, certain islands, and lands under lease to the department.

Within the Southern New Hampshire Planning Region, there are currently a total of 15 reservations consisting of 4,900 acres located within 9 of the 13 municipalities. These include three state parks, five state forests and five other lands. The average overall size of each of these 15 parks, forests and other lands is 326.72 acres (see table 11.3 below).

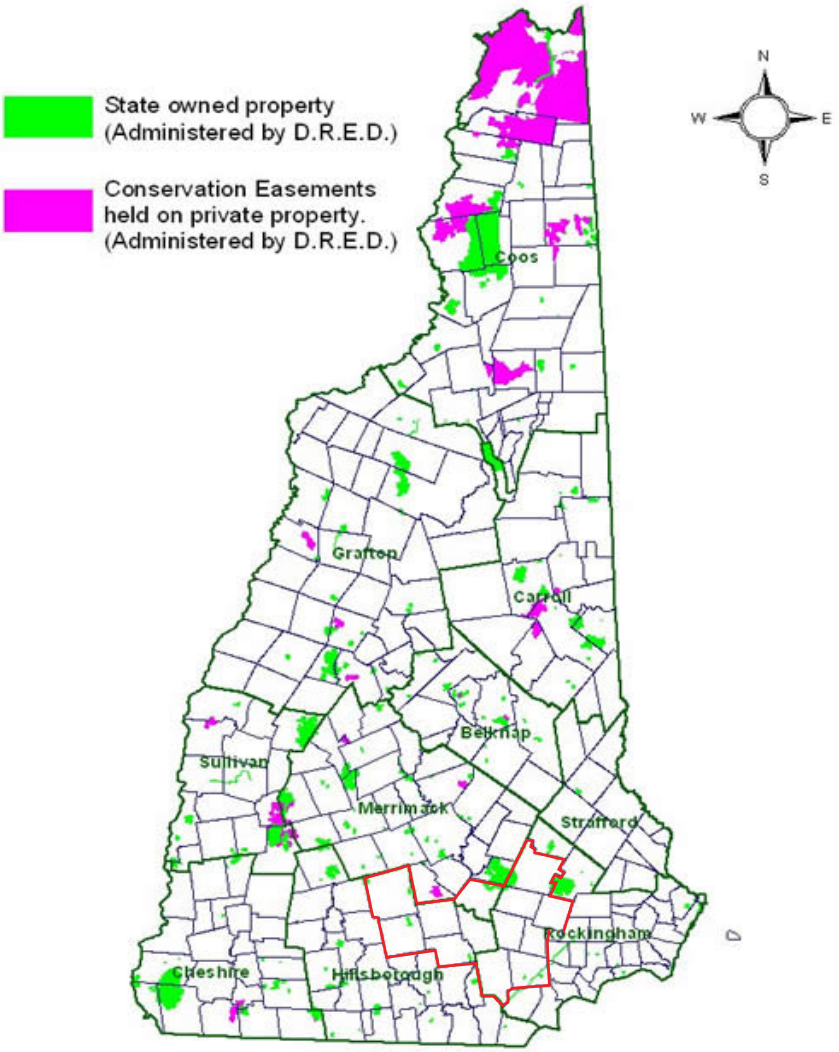
Table 11.3
State Reservations – SNHPC Region

Municipality	Reservation	Town Acreage	Property Acres
Bedford	Reed's Ferry State Park	122.5	122.5
Candia	Bear Brook State Park	263	10,083
Deerfield	Woodman State Forest	85.5	137.8
	Bear Brook State Park	1,945	10,083
	Pawtuckaway State Park	479.9	5,536.1
Derry	Frost Farm Historic Site	64	64
	Warner Hill Fire Tower	1.8	1.8
	Ballard State Forest	71	71
	Rockingham Recreation Trail	62	200
Hooksett	Bear Brook State Park	985	10,083
Manchester	Smith's Ferry Heritage Park	17.1	17.1
New Boston	Lang Station State Forest	242.7	242.7
Raymond	Pawtuckaway State Park	4.8	5,536.1
Weare	Piscataquog State Forest	160	160
	Vincent State Forest	396.5	633.8
	SNHPC Region Total	4,900.80	
	Average Size	326.72	

Source: State of New Hampshire, DRED, Division of Forest and Lands, Forest Management Bureau, May 23, 2005

Currently, the state of New Hampshire manages a total of 212 reservations consisting of 201,513 acres and 221 properties located within 145 towns throughout the state. Of these reservations, there are 212 state parks and state forests and 27 conservation easements administered by DRED (see figure 11.2 below). These reservations, parks and state forests range from 0.1 acre to 39,601 acres in size. The average size is 772 acres.

Figure 11.2
State Owned Property and Conservation Easements



Source: Dept. of Resources and Economic Development

State Parks and Forests

State Parks are properties with developed or otherwise specific recreation uses available to visitors. Most offer activities such as swimming, hiking, camping, picnicking and hunting but not necessarily to the exclusion of other uses such as timber management, water resource protection and wildlife habitat management. State Forests are properties associated with undeveloped forest land managed for many uses including demonstrations of sound forestry practices, public access for forest-based recreation, protection of threatened and endangered species, preservation of historic resources and rural culture, and conservation of biological diversity.

All state parks and forests are open for public use. Some state parks and forests have natural preserves and sites of geologic and historic interest. Bear Brook State Park,

for example, in the towns of Allenstown, Deerfield, Candia and Hooksett offers both developed and undeveloped recreation (e.g. woods roads and skid trails for hiking), wildlife and natural preserves, and timber management areas.

Other Lands

Other lands include conservation easements and reservations not associated with a state park or forest that are managed or operated for a specific purpose or program. Examples of other managed lands include Frost Farm Historical Site (64 acres) in Derry and Smith's Ferry Heritage Park (17.1 acres) in Manchester. At the present time, there are no conservation easements held on private property administered by DRED within the Southern New Hampshire Planning region.

Land Classification of State Parks and Forests

Every acre of state parks and forests is classified by the state into one of four major land use categories: (1) agricultural lands, (2) conservation easements; (3) forestry lands, and (4) recreation lands. Forestry lands are further classified into key resource areas based on identified forest resource values. Key resource area designation is based on recognized natural values or dominant features such as mountain tops, key sources of wildlife food and cover, scenic areas, cultural and natural heritage features, and water resources. In this manner, management emphasis can be placed on conserving and enhancing the highest and best forest land values for public benefit.

All of the state parks, state forests and other lands owned by the state located within the Southern New Hampshire Planning region are described below.

State Parks

Clough State Park

Route 13, Weare, NH

This state park is located about five miles east of the Town of Weare on the shoreline of Everett Lake, a 150-acre lake formed by a dam on the Piscataquog River. Activities in the park include swimming, picnicking, playing fields, fishing and boating. A boat launch is available for small boats or canoes (motorized boats are not allowed). The park is open weekends only from Memorial Day and daily from late June through Labor Day. Admission

is $3 for adults; $1 for children ages 6 and over. New Hampshire residents are admitted free.

Bear Brook State Park
Route 28, Allenstown, NH

Bear Brook State Park is the largest developed state park in New Hampshire consisting of nearly 10,000 acres.

Roughly 283 acres of the park are located within the Town of Candia, 1,945 acres are located within the Town of Deerfield and 985 acres are located with the Town of Hooksett. However, the vast majority of the park is located within the Town of Allenstown. Bear Brook State Park serves much of the southeast region of the state.

The park offers hiking, boating, swimming, fishing and camping. There are roughly 40 miles of trails through the heavily wooded forests, leading to seldom visited marshes, bogs, summits and ponds. These trails offer a variety of options for hikers, mountain bikers, and equestrians. Canoe rentals are available at both Beaver and Catamount Ponds, while rowboat rentals are also available at Beaver Pond. Fly-fishing is also available at the park. There are also two archery ranges and a 1 and ¼ mile, 20-station fitness course. Bear Hill 4-H is also located in the park. A day-use fee is collected at the toll both near Catamount Pond. Admission is $3 for adults; $1 for children ages 6-11; children 5 and under and NH residents age 65 and over are admitted free.

Pawtuckaway State Park
128 Mountain Road, Nottingham, NH

Pawtuckaway State Park contains approximately 5,536.1 acres. The majority of the park is located within the Town of Nottingham, however, roughly 479.9 acres are located within Deerfield and 4.8 acres are located within Raymond. Similar to Bear Brook, Pawtuckaway State Park serves most of Southeast New Hampshire. This large state park contains numerous exemplary natural communities and rare plant populations.

It has a little bit of everything, from rare river birch trees along the shores of the lake, to black gum and Atlantic white cedar swamps in the undulating lowlands, to rocky

ridges and rich woods on the mountains to the west. There are also marshes, boulder fields, ponds and peatlands. An extensive trail network allows for exploration of large amounts of the park area.

Pawtuckaway State Park offers a variety of landscapes for hiking with trails leading to many special points, including a mountaintop with fire tower; an extensive marsh with beavers, deer, and great blue herons; and a unique geologic field with large boulders called glacial erratics which were deposited when glacial ice melted near the end of the ice age.

The park also includes a campground and beach area along the shoreline of Pawtuckaway Lake. Other activities at the park include biking, fishing, snowmobiling, and cross-country skiing. The park is open for day use on weekends between Memorial Day weekend and June 20, and then daily until Columbus Day. Admission is $3 for adults; $1 for children ages 6-11. Children ages 5 and under and NH residents age 65 and over are admitted free.

State Forests

Reed's Ferry State Forest

The state acquired this forest in Bedford in 1977. It is roughly 220 acres in size. There are no developed recreation opportunities, but passive outdoor recreation use is allowed. Some of the land may have existing forest management roads.

Woodman State Forest

The state acquired this forest in Deerfield in 1933. It contains 137 acres. There are not developed recreation opportunities, but passive outdoor recreation use is permitted. Some of the land may have existing forest management roads.

Ballard State Forest and Taylor Sawmill Historic Site- Derry

The 200-year old "Taylor Up and Down Sawmill" is cooperatively maintained and run by the Division of Parks and Recreation and the Division of Forests and Lands Community Forestry and Stewardship Bureau. The site is located on the 71-acre Ballard State Forest in Derry. The entire property, including the sawmill, the house nearby, and 7 acres of land, were donated to the State of New Hampshire.

Lang Station State Forest

The state acquired this forest in 1993 in New Boston. It is roughly 226 acres in size. There are no developed recreational opportunities, except for passive outdoor use. Some of the forest may have existing forest management roads.

Piscataquog State Forest

The state acquired this forest in 1953 in Weare. It is 160 acre in size. There are no developed recreational opportunities, except for passive outdoor use. Some of the forest may have existing forest management roads.

Vincent State Forest

The state acquired this land in 1936 in Weare. It is roughly 638 acres in size. There are no developed recreational opportunities, except for passive outdoor use. Some of the forest may have existing forest management roads.

Other Lands

Frost Farm Historical Site- Derry

The Robert Frost Farm State Historic Site consists of 64 acres located within the Town of Derry. The site includes the home of Robert Frost and his family from 1900 to 1909, which consists of a simple 2 story white clapboard farm house typical of New England in the 1880s. There is also a nature and poetry trail at the site.

Warner Hill Fire Tower- Derry

The Warner Hill Fire Tower is 41 feet high steel tower. It was constructed in 1939 with New England Forest Emergency funds. During the Second World War the tower was altered at least twice and used for aircraft detection by the Aircraft Warning Service. After the war the extra levels were removed and new cab installed. It remains in service today.

a

Rockingham Recreation Trail - Portsmouth Branch-Manchester, Auburn, Candia, Raymond

The Rockingham Recreation Trail is a rail trail owned by the State of New Hampshire but managed by the Bureau of Trails, which is a part of DRED. The trail serves as a multiple-use recreational trail. Permitted uses include equestrian, hiking, biking, dog sledding and snowmobile use. The Portsmouth Branch is 24 miles long extending from the east side of Manchester at Lake Massabesic through the towns of Auburn, Candia and Raymond to the Rockingham Junction in Newfields. Parking is provided at either end of the trail.

Rockingham Recreational Trail - Manchester/Lawrence Branch- Manchester, Londonderry and Derry

The northern leg of the Manchester/Lawrence Branch of the Rockingham Recreational Trail is 3.3 mile long. It extends from Manchester at the former Lawrence line south through the Town of Londonderry to the Derry town line. The southern leg of the Manchester/Lawrence Branch extends north from the towns of Salem and Windham through the Town of Derry to Epping, where it connects with the Portsmouth Branch of the Rockingham Recreational Trail.

Smith's Ferry Heritage Park

The state acquired this park in 1992 in Manchester. It is roughly 17 acres in size. There are no developed recreational opportunities, except for passive outdoor recreation use such as walking and bird watching, etc.

Manchester Cedar Swamp

This preserve is located within Manchester and is open to the public for recreation and education purposes. The preserve is owned and managed by The Nature Conservancy, but it has been included in the New Hampshire Natural Heritage Bureau's Visiting NH Biodiversity project. Four different kinds of Atlantic white cedar swamps have been described in New Hampshire. The type at Manchester Cedar Swamp is the globally rare Atlantic white cedar – giant rhododendron swamp. It occurs at fewer than ten swamps in New England, and this is the only one north of Massachusetts.

Assessment of State Parks, Forests and Recreational Areas

How should the region go about assessing the adequacy of the state parks, forests and recreational areas located within the region? How much open space and recreation does the region need or desire? How can this be determined? What standards or guidelines should be used? The answers to these questions are difficult to determine. The Society for the Protection of New Hampshire Forest often suggests that a community needs 25 percent of its total land area protected as open space. Can or should this suggestion be applied to the region?

Over the years, benchmarks and standards that prescribe specific park types and acreages of recreational facilities have collected their share of critics. There are always differences from one community or region to another in terms of population age and density – not to mention climate and terrain and the availability of land – that likely influence the amount of open space and recreation considered practical or even desirable.

Perhaps the recreation standard that has received the highest profile of all is the National Recreation and Park Association (NRPA)'s recommendation "that a park system, at a minimum, be composed of a 'core' system of parklands, with a total of 6.25 to 10.5 acres of developed open space per 1,000 population – more often expressed simply as 10 acres per 1,000 population.[17]

In many communities today, however, the adequacy of open space and recreation is most commonly determined by actively monitoring the use of existing resources, including evaluating the public's demands for the additional resources. This generally requires surveys and participation forecasts to determine management priorities and to guide the acquisition and development of new resources.

Unfortunately, very few surveys and forecasts of this kind have been conducted within the State of New Hampshire let alone within the region. Presently, the only guidelines or suggestions available for assessing the need and adequacy of recreational facilities at the state or regional level is provided by the 2003-2007 Statewide Comprehensive Outdoor Recreation Plan (SCORP) for New Hampshire.
As part of the 2003-2007 SCORP, a recreation survey of 3,000 households in the state was conducted by the University of New Hampshire. This survey asked respondents to identify how important it was for the state to manage various natural resources, what priorities the state should give to outdoor recreation, and how future monies for recreation should be spent in New Hampshire.

17 "Municipal Benchmarks Assessing Local Performance and Establishing Community Standards", by David M. Ammons, Second Edition, 2001, page 261.

The results of the survey indicate the most important management objective for the state should be the preservation and protection of drinking water and groundwater recharge areas (52.1 percent), followed by setting aside special natural areas from development (37.9 percent), and protecting typical examples of New Hampshire's natural regions (37.9 percent). State programs or projects receiving the highest priorities include the preservation and/or restoration of native wildlife (58.9 percent), and wetland preservation/protection (37.4 percent).[18]

As noted in the 2003-2007 SCORP as well as the new park, recreation, open space and greenway guidelines (1996) developed for the National Recreation and Park Association and the American Academy for Park and Recreation Administration, greater emphasis is being placed on comprehensive open space and greenway planning, and the integration of recreation and open space at the regional and state level. There has also been a growing trend toward more collaboration among recreation providers, and between community parks and schools. Other trends include greater inclusion of green space as part of new development proposals, downtown and neighborhood revitalization, and a heightened recognition of the role that recreation and open space play in contributing to more livable, sustainable communities.

Unfortunately, there are limited funds and funding opportunities available in New Hampshire to purchase and expand the state park system, forests and recreational sites. In addition, funding levels in the Federal Land, Water and Conservation Fund (LWCF) and New Hampshire's Land and Community Heritage Investment Program (LCHIP) have fallen significantly and can not keep pace with increasing demands.

Given the lack of financial resources, DRED has not been actively pursuing the purchase and development of new parks and recreation facilities in the state. Instead, the state is active working with property owners, the Society for the Protection of New Hampshire Forests, and other environmental organizations in facilitating conservation easements and gifts. When and if funding is available, however, real property considered to be acquired by the State is typically evaluated based on the following criteria:

1. Seacoast property (ocean front, estuaries, salt marsh or contiguous upland)
2. In holding (totally within existing State ownership)
3. Land with frontage on a great pond or river
4. Intrusions into existing State ownership (State owns on 3 sides)
5. Land abutting existing State ownership
6. Land connecting State ownership

18. "Assessment of Outdoor Recreation in New Hampshire: A Summary Report", by Robert Alex Robinson, Ph.D., University of New Hampshire, Department of Resource Economics and Development (1997).

Generally, separate or individual parcels of land are considered by the state only if they have outstanding forestry or recreation or specialized natural or cultural values that warrant protection and/or preservation. According to DRED:

- For State Forest acquisition, the parcel must be of sufficient size, considering its species composition to make a manageable multiple use unit of public land or is an acquisition of abutting land;

- For State Parks acquisition, the parcel must be of sufficient size as a manageable recreation facility or is likely to be enlarged to such a size by acquisition;

- For protection/preservation acquisition, the parcel must be of unique or unusual or natural value or specialized tracts such as marshes, reservoir sites, floodplain, public access sites or high elevation (mountain top) land.

Most funding land acquisition by DRED is achieved through the legislative process. However, only the legislature may direct acquisition of a state forest or state park by statute as appropriate. DRED currently has management responsibility for 380,000 acres of land; of which 214,700 are easements and 165,300 are in fee simple ownership.

When the region's total population of 248,838 (2000 Census) is divided by the total number of acres of state parks, forests and other lands within the region (4,900 acres), there is only 0.02 acres (or 871 square feet) of state park, forest land available per person within the region. This equates to 4.98 acres per 1,000 population, which is significantly less than NRPA's recommendation of 10 acres per 1,000 population. However, if the total acreage of municipal parks, town forests and recreational facilities within the region are added to the state acreage, the actual number of combined state and local park land per person within the region would be much higher.

While it is important to assess the adequacy of all the state parks and forests within the region, it is also important to consider existing municipal parks and town forests as well. Generally, park adequacy is typically gauged by the residents and the visitors who use the parks. This suggests that a survey and park assessment needs to be conducted for the region and efforts to protect open space lands should continue to be encouraged.

Conclusion and Recommendations

The purpose of this chapter has been to identify and describe the protected lands, state parks and recreational facilities that exist within the region, as well as to emphasize the importance of land conservation and community open space planning in order to protect the natural resources that have been prioritized for protection in the future. Some of the major open space and recreation objectives for the region should be to continue to identify and protect the most important natural resource and large undeveloped tracts of land remaining; to foster linkages between existing protected areas and state parks and forests; and to guide communities to consider the regional importance of open space and recreation in their community planning efforts.

In addition to these objectives is the broader goal of protecting the most important open space lands in the region from future development. To foster this goal, the following recommendations are suggested to direct future open space planning activities of the SNHPC as well as assist communities in creating local land conservation strategies. Many of these recommendations are included in the Regional Open Space Plan prepared by Rockingham Planning Commission (March 2000) and have been adapted for use here.

Protect Regional Significant Natural Resources -- Areas that contain unique habitat and/or are ecologically important from a regional perspective should be a top priority for open space and land conservation planning. These areas and their associated values are described in more detail in the Natural Resources Chapter of this plan.

Promote Interconnections of Protected Open Space -- The fragmentation of forests and open spaces into increasingly small and isolated pockets is a natural outcome of a sprawling development pattern. This leads to a reduction in wildlife habitat and the loss of open space. It is apparent when reviewing the open space map prepared for this chapter that most of the existing protected lands within the region are widely dispersed, and with few exceptions, not connected. Many of the protected lands within the region were acquired based on the needs, priorities and opportunities of individual municipalities or conservation organizations that have concerns for specific natural resource areas.

From a regional perspective, open space is most effective when it is interconnected to maximize natural resource and wildlife habitat protection. Therefore, it is important to consider the proximity and character of existing protected lands as well as the feasibility of connecting areas of open space when planning for future protection. This is also true when considering the local resource protection priorities identified by each municipality.

Perhaps one of the easiest and most effective means to promote interconnections among protected open space is to establish greenways and buffers along many of the rivers and streams in the region. These natural corridors should be used to enhance connectivity between the various green spaces, parks and trails in the region.

Protect Large and Contiguous Tracts of Land -- Contiguous blocks of undisturbed and undeveloped land are disappearing rapidly within the region. Large blocks of land are illustrated on the wildlife habitat maps prepared by New Hampshire Fish and Game as part of the Natural Resources chapter. Regional and local efforts for land protection and recreation need to be aimed at the largest blocks of undisturbed land that still remain undeveloped within the region. All levels of local, state and federal government as well as appropriate land trusts and conservation organizations need to be involved in developing strategies for protecting these areas.

As noted above, greenways can be used as one method to help promote the importance of interconnecting contiguous large blocks of open space, and to garner public support for increased enjoyment of open space and recreation within the region. Greenway planning is an exceptional planning and resource management technique. It can be conducted at all levels of government.

The State of Maryland's Open Space and Green Print Program is a nationally recognized program providing dedicated funds for Maryland's state and local parks and conservation areas. This program is aimed at protecting the most valuable remaining ecological lands that are becoming fragmented within the state due to development. Most of these lands are located along the state's major rivers and streams. These areas have been identified as high priorities for protection in order to maintain biologically diverse landscapes and enable natural processes like filtering water and cleaning the air, to take place.

Promote Compact Development through "Conservation Development" -- Many of the planning boards in the region have adopted conservation development ordinances designed to promote permanent protection of open space. Often, some of the best conservation development occurs within low and moderate density zone areas and when there is a requirement that 50 percent or more of the property remain permanently protected. How and where this open space is protected within the development however remains a constant struggle.

When developing open space or conservation development ordinances, local planning boards should require that the development proposals include plans and/or easements for interconnected protected open space in neighboring developments. In addition, site design considerations pertaining to open space and natural resources should be made more integral to the development review process. This requires that greater flexibility be provided in determining actual lot sizes, lot lines, as well as road and building

locations. Subdivisions can be created to blend into the landscape if the development is designed to accommodate the site rather than to simply satisfy zoning requirements. Stonewalls, fields, agricultural structures, and tree lines should be maintained. Consideration should also be given to protecting scenic landscapes and views.

Promote Inter-municipal Cooperation in Land Protection and Recreation -- Inter-municipal cooperation in land protection efforts and recreation planning should be more strongly encouraged. River corridors, aquifers, wetlands, hills and mountain ranges cross municipal boundaries. Conservation commissions and planning boards among neighboring communities need to talk and meet with each other and share information about pending development proposals, land protection and recreation efforts.

Concentrate Public Infrastructure Investment in Developed Areas -- Often one of the causes that lead to sprawl and untimely loss of open space is the public investment in facilities that are located away from existing urban centers. Examples of this are the premature and linear extension of water and sewer facilities in rural areas and the placement of public buildings such as schools, post offices, and safety complexes away from downtown areas. Such practices not only tend to encourage dependence on the automobile, but also attract additional development to "leapfrog" away from already developed areas. This problem can be addressed, in part, by establishing public policies, which strongly favor smart growth and the development of public infrastructure, facility and transportation investment in town centers and other already developed areas.

Increase Public Awareness -- In order to garner local and regional support for open space and recreation, citizens must be made aware of the benefits of land conservation. Public education is a key factor in the sound management and protection of natural resources and recreation planning. Promoting public awareness about the work of Conservation Commissions, local land trusts, and other environmental organizations are very important in order to enlist public support and enhance public participation.

Establish Consistent Funding for Open Space and Recreation Priorities -- Communities and local conservation and recreation groups should work to establish a significant and consistent funding source for land protection. Communities need to be ready for unexpected offers, and may need a dedicated land purchase or conservation fund ready to help leverage support for purchasing or conveying an easement on an important parcel. There are a variety of mechanisms that communities should consider including: local appropriations, capital improvement program, bonding, supplying unexpected funds into the conservation fund, donations from private landowners, concerned citizens and businesses, foundation support, fees from local programs, grants, tax liens, and proceeds from timber harvest on town forests. Communities should also request 100 percent of the current use penalty proceeds be placed in their conservation fund. In addition, there are a number of private non-profit conservation organizations and state and federal protection and acquisition programs which can help

by providing monies to leverage local land conservation efforts (see a description of some of these programs in the appendix).

Increase Public Access to Surface Waters and Land Resources Where Appropriate One of the primary purposes of providing open space and recreation is for public enjoyment. Public access should be a consideration when formulating open space and recreation plans. As more land in the region is developed, public access to the region's lakes, ponds and rivers is becoming less available. Communities and local conservation organizations, however, need to be careful when deciding to increase public access, particularly if water quality or habitat values are threatened. Different situations require different types of access and making this distinction is important.

Recently, the New Hampshire House voted to keep planning boards from requiring developers to allow public access to open space as a condition of plan approval (see House Bill 1366). While this issue has not been resolved or addressed at the local level, it should be very simple that when open space is held in private or common ownership (such as a homeowner's association), public access to such open space should be determined by the landowners and not the planning board. However, if the open space is to be dedicated to the municipality or placed into a conservation easement, public access should be allowed to the land, if appropriate.

Review and Update Local Inventories and Master Plans -- Many communities within the region do not have up-to-date inventories of town-owned lands, protected lands, and natural resources. An updated master plan and an updated Natural Resource Inventory is something that all communities should have available at their fingertips. Conservation Commissions should be directed to undertake these inventories and there are a variety of grant programs available to help fund this work. Once inventories are completed, local open space, conservation and recreation plans should be developed which should also include detailed review of adjacent communities' land protection plans. Each plan should include a five and ten-year action plan with identified priorities and funding mechanisms such as the CIP incorporated.

Review and Reform Planning and Zoning Regulations -- It is of utmost importance that a community's planning and zoning regulations actually lead toward the goals of the master plan and natural resource inventory. Planning boards and conservation commissions should take time to review their master plan to make sure that the regulations as written and interpreted address the goals stated. This generally should be completed every five years or whenever the master plan is updated and anytime the community's land use regulations are amended.

Develop a Local Open Space or Recreation Plan -- Communities within the region without local open space or recreation plans should take appropriate steps to develop one. This can be accomplished as a separate plan or as a chapter in the master plan.

These plans are important in establishing local goals and protection priorities as well as for future grant funding opportunities. Additional planning tools that should be considered include completing a community wide "build out" study. The implications of population projections and development trends become much clearer when a picture of the future growth of the community is provided when the community is built out to the maximum density allowed by existing zoning regulations.

Work with Large Landowners -- While current use is an effective tool for reducing financial pressure on landowners to sell or develop their land, it does not afford any measure of permanent protection. Permanent land conservation measures are essential in order to retain significant open space for future generations. Communities should pay attention to the desires and intentions of large landowners and establish lines of communication about the benefits and tax advantages of open space and recreation. Many landowners may hope to pass the land on to the next generation, but may be unaware of the various financial and estate planning tools available to help facilitate this.

Prepare a Regional Conservation Plan -- This comprehensive plan should be viewed as a resource guide that can be presented to communities to assist local planning and conservation efforts. However, after review and discussion, it might be useful if a more detailed plan is developed which establishes a regional conservation framework and identifies region and statewide priorities for land protection and natural resource management. Such a plan could help establish partnerships between local watershed and river associations as well as a number of federal/state multi-jurisdictional natural resource projects, which are occurring within the region. In addition, it could help set up an environmental framework for greenway planning at the local, region and state level similar to the Maryland model as a means for addressing future growth predicted to result from the I-93 widening project. Lastly, it could be modeled somewhat after the Conservation Plan currently being undertaken within the Seacoast Region.

Provide Technical Assistance in Adopting Conservation Development Ordinances
The SNHPC should also be available to provide assistance to interested communities to refine their conservation development ordinances and other ordinances, which promote compact development, smart growth, and encourage the protection and interconnection of open space.

Provide Regional GIS Analysis Tools -- SNHPC should also provide GIS analysis and maps of the region's changing land use patterns, open space, protected lands and natural resources to focus conservation activities and to protect and restore important habitat throughout the region. Consideration should also be given to the idea of a regional build out analysis using digital tax map information to better understand the potential amount, density and general location of future development that would be permitted in

the region, under current zoning regulations. This could be incorporated into a regional conservation plan.

Support Local Land Trusts -- SNHPC should organize and facilitate a forum on Open Space and Recreation planning for the region and work collaboratively with local land trusts and conservation organizations to establish a support group for targeting future open space and recreation planning. This forum should also serve to ensure that all communities within the region are covered by at least one private land conservation organization that can accept conservation easements from private landowners.

Appendix A
additional Tax Benefits, Funding and Easements information

The numerous income and estate tax benefits have helped to convince many landowners to sell or donate their land or development rights. Both Congress and the New Hampshire state legislature make frequent changes to tax laws that affect the donation or sale of land, and therefore landowners should consult with an attorney or tax advisor before taking action on their property.

Any land donated for charitable purposes (i.e. without requirement, stipulation, or payment of goods or services) may qualify for an income tax deduction from the IRS. These charitable gifts may be made during the donor's lifetime or at his or her death and must be made to an IRS-qualified entity, such as a government agency or a tax-exempt land trust organization. Land donated becomes removed from estate taxes, thus releasing the burden to heirs. Conservation easements also reduce the amount of estate taxes as they reduce the assessed value of the land. If the value of the donated property or property rights exceed $5,000, the landowner must obtain a "qualified appraisal" by a "qualified appraiser," the details of which can be explained by an attorney or tax advisor.

Income Tax

Income tax deductions for gifts of appreciated property (including most gifts of land and easements) can qualify for up to 30 percent of one's adjusted gross income (AGI). If the value of the gift is more than 30 percent of one's AGI, the value can be carried for up to five additional years, with a 30 percent deduction each year until the total value

of the gift or six years have passed. If a landowner claims the property's basis—the original purchase price or value of the property at the time of inheritance—rather than fair market value, the landowner can claim up to 50 percent of his or her AGI each year for up to six years (in the same manner as with the 30 percent deduction). For a conservation easement, the easement value is adjusted in proportion to the property's basis. The 50 percent option is preferable for recently purchased or inherited property, property that has not significantly appreciated since time of acquisition, or anticipation of not living long enough to take advantage of the five-year carry forward period.

Bargain sale of property also holds tax advantages, as the amount of discount below the full value can qualify for IRS income tax deductions. With the addition of real estate broker commissions, real estate transfer tax, and capital gains tax paid through the full value sale, the bargain sale can be nearly as financially valuable to the landowner while passing significant savings to the municipality.

Other costs relevant to conservation easements can also be tax deductible. For example, cash or securities used to endow stewardship of easements are considered charitable donations. Also, legal and appraisal fees can qualify as miscellaneous deductions if they can alone or in combination with other fees make up at least two percent of one's AGI.

Estate Tax

Estate taxes are based upon the economic value of a property. Conservation easements have reduced assessed value (due to their lack of development potential), which results in significant decreases in estate taxes. This can be an important consideration for landowners wishing to conserve their land, as heirs often sell and subdivide land to pay for estate taxes. Estate tax rates are extremely high, in some cases reaching nearly 50 percent, and estate tax laws are frequently under review and revision. Landowners who anticipate their estates will be subject to estate taxes should consult a professional to determine their options.

The Taxpayers Relief Act of 1997 stipulates that up to 40 percent of the value of a conservation easement (up to $500,000) may be excluded from the gross estate, following certain qualifications. This thereby reduces the amount of the estate tax. The Act also allows the estate of the landowner to grant an easement after the death of the landowner. Under the federal estate and gift tax, an individual can give up to $11,000 tax-free annually to any number of individuals. With this arrangement, a landowner can reduce the value of his or her land with a conservation easement and then donate it to children in undivided interests over a period of years. Landowners should also be aware that any land donated to charity is exempt from federal estate taxes.

Current Use
Land under current use pays taxes at a lower rate than land not in current use. Rates for current use are set by the NH Department of Revenue Administration Current Use Board. While conservation easements can reduce the total property value and therefore reduce property taxes, most landowners already have the land under current use and are not paying property taxes on it. For land not already in the current use program or less than 10 acres in size, the landowner can apply to the municipality for a Conservation Restriction assessment. This would allow an easement on this land to be assessed at values similar to current use assessments.

Appendix B
Further Implementation Strategies, Programs, and funding Sources

The following are additional implementation tools to assist in crafting land protection:

Agricultural District Laws -- Agricultural district laws allow farmers to form special areas where commercial agriculture is encouraged and protected. Programs are authorized by state legislatures and implemented at the local level. Common benefits of enrollment in a district include automatic eligibility for differential assessment, protection from eminent domain and municipal annexation, enhanced right-to-farm protection, exemption from special local tax assessments and eligibility for state PACE programs.

Buffers -- Planning Boards are advised to consider a buffering requirement on uses adjacent to a farm when reviewing plans for subdivisions.

Circuit Breaker Tax Relief Credits -- Circuit breaker tax programs offer tax credits to offset farmers' property tax bills. Like differential assessment laws, circuit breaker tax relief credits reduce the amount farmers are required to pay in taxes.

Cooperative Purchases with Conservation Groups -- Various local, regional, and national land trusts and conservation groups can provide a tremendous amount of assistance to landowners wishing to keep their property undeveloped. Once land is accepted by a trust, stewardship of the property tends to be excellent. The Trust for Public Land (TPL), a national land trust, is able to move quickly with willing landowners, and can provide the necessary legal assistance to complete the transaction.

TPL is particularly helpful with larger more expensive pieces of property that are threatened with development.

Current Use Program -- The Current Use Program is voluntary for landowners, but it is required under state statute for municipalities. Land under the New Hampshire's Current Use Program is based upon the value of the land as it is being used now (usually farmland, forest, and wetlands) as opposed to its potential use that would result in the property being taxed at a significantly higher rate.

Density Bonuses -- Developers are allowed some reduction in regulations, such as approval for a limited number of additional units (higher densities) on a site with reduced road width or set back requirements, in exchange for providing something else that the community desires, such as open space.

Designating Forests -- A town or the state, through the Department of Resources and Economic Development (DRED), can purchase, manage and improve forestlands. The forest designation can encourage landowners to donate their forestland because the donation can be accompanied by conditions restricting its use. The town also benefits from the forest designation. It can receive money from the state in lieu of taxes it would have gotten if the land were privately owned.

Designating Scenic Roads -- The Planning Board, Conservation Commission, or Historical Commission can request that a particular road be designated as "scenic." The entire road does not have to be designated as scenic; portions of road are acceptable. Voters can decide at a town meeting whether to officially approve the road(s). Prior to acceptance of a road as "scenic" abutters must be contacted and informed of the designation. Once the road is officially designated as "scenic" any repair, maintenance, reconstruction, or paving work done to that road cannot involve the removal of trees or any portion of a stone wall except with the written permission of the town Planning Board after a public hearing is held.

Impact Fees -- Towns that have capital improvements programs are allowed to charge developers impact fees to help cover the costs of the development on specific municipal facilities and increased infrastructure to support new development areas. While the statute specifies that the fees cannot be used for public open space, fees can be used to direct new development to desired areas.

Management Agreements -- Management agreements can be made with willing landowners through verbal, written or contract agreements to help protect natural resources.

On-Farm Retail Sales -- Flexibility in site plan review regulations can be used to exempt farm stands from inappropriate commercial regulation, or allow a community to

develop a tiered approach to the regulating of farm stands. Communities are encouraged to exempt seasonal farm stands from municipal regulations other than proof of safe site access. Year-round operations warrant review by the local authorities to address the safe operation of the site. However, the review should be modified to provide for reduced standards from those applied to commercial and industrial uses.

Overlay Districts -- Overlay districts can be used by communities to apply special regulations to a number of resources with definable site-specific characterization that can be delineated on a map. There are several types of overlay districts, such as drinking water, wetlands, steep slopes, mountain, agricultural, village, historic, species of concern, and scenic overlay districts.

Performance and Design Standards -- Performance and Design Standards can include aesthetic and natural characteristics based land use regulations, and flexible zoning.

Purchase of Development Rights or Transfer of Development Rights (PDR or TDR) -- The purchase of development rights is essentially the purchase of a conservation easement. Instead of donating easements, farmers can sell them to the state, concurrently placing permanent agricultural preservation restrictions on their farms. Similarly, a community or local group may purchase development rights on farmland or other land. Instead of a tax deduction for the gift of an easement, the landowner receives cash for the value of the easement. Transfer of development rights operates under the same theory as a purchase program. This program transfers development from one area to another, and preserves open space in the sending area. Development rights are transferred from conservation land, such as farmland, to land slated for development. A developer purchases development rights from the owner of land in a conservation zone in order to accrue development "points". He or she can apply points toward development of property in a zone where development is encouraged, and develop that land at a greater density than would otherwise be permitted.

Purchase of Land -- A voluntary method that a town can use to preserve open space. Land can be acquired through donation or purchase with or without various restrictions including deed restrictions, conservation easements, or for tax benefit to the donor. Although purchasing property is an obvious method that a town can use to preserve open space, this method can often times be cost prohibitive to a community. However, there are a variety of methods that a town can use to appropriate funds to purchase land for conservation purposes. A town can appropriate money through a Conservation Fund. These funds can be utilized after a vote of the town legislative body. The town can use Capital Reserve Funds as long as they are specified for a particular purpose such as purchasing land or an easement. Dollars have been raised through managing town property in some communities, usually through timber harvesting. Surplus Funds from previous years can be used after a town meeting vote. If a proposal passes town meeting by a two-thirds vote, the town can borrow money through a municipal bond.

A property that the town acquires through a tax lien could be used for conservation purposes. If the town decides to sell the particular property, a conservation easement or deed restriction could be placed on the property. Finally, land use change tax can be used for conservation purposes when a property is withdrawn from the Current Use Program.

Right-Of-First-Refusal -- A right acquired or donated to the town, where the town would have the first option to purchase a piece of property when an owner decides to sell. The town would not be obligated to purchase the property, but would have a limited amount of time to decide if there was interest in purchasing the land.

Tax Abatement -- Tax abatement is the exemption or deferment of taxes under certain conditions, either for a specified period, or until the conditions are no longer met. Taxes can be abated in New Hampshire for providing shade trees adjacent to highways and for not cutting timber. Any person can apply to the selectmen to have their taxes abated if they plant and protect shade trees along a highway adjoining their land. A person who owns and cuts woodlands as a business has to file a notice of intent to cut with the proper assessing officials in the town where such cutting is to take place. This notice includes, among other things, the persons name, residence, and an estimate of the amount and species to be cut. This procedure enables tax officials to tax an owner for the wood that is cut.

Tax Deduction -- The federal government provides some incentives to encourage people to donate land or conservation restriction on their land to the public either during their lifetime or in their wills. A person can deduct, on their federal income tax return, the amount of the value of the property or conservation restriction donated, subject to a ceiling on the allowance for charitable gifts in any one-year period.

Urban Growth Districts -- An urban growth district allows a community to define one or more areas where growth and development will be concentrated. Typically, this includes downtown areas and perhaps existing areas with higher concentrations of development. Open space can be conserved outside the urban growth by concentrating desired growth inside the urban growth district.

State and Federal Grant Program

There are numerous State and Federal grant programs available that can be used to promote open space protection. The status of grant programs is subject to change. However, the following include some current programs that could be used by the Town to further the open space plan goal, objectives and recommendations.

STATE PROGRAMS

Community Conservation Assistance Program – is administered through the UNH Cooperative Extension. Assistance for project guidance and training for community

projects through municipalities and non-profit conservation groups. Contact Amanda Stone at (603) 364-5324.

Community Foundation Grant Program -- The Greater Piscataqua Community Foundation provides funding to non-profit and public agencies in the fields of environment, arts and humanities, education, and health and social and community services. Contact www.nhcf.org or (603)430-9182.

Conservation License Plate Grant Program -- NH State Conservation Committee. To promote natural resource related programs throughout NH. Conservation districts, Cooperative Extension, conservation commissions, schools, groups, and other non-profits can apply for funding. Contact (603) 679-2790 or www.mooseplate.com.

Fisheries Habitat Conservation Program -- NH Fish and Game Department. To conserve fisheries habitat through a watershed approach. Landowners wishing to protect/enhance fisheries habitat can apply for funding. Contact Scott Decker, (603) 271-2744 or sdecker@wildlife.state.nh.us.

Forest Legacy Program --. Provides up to 75 percent of the purchase price for development rights to forestlands from willing sellers. Streamside land is among program priorities. Rights are held by the state in perpetuity, while the landowner retains all other rights, including the right to harvest timber. Contact NH DRED at (603) 271-2411.

Land and Community Heritage Investment Program -- This is a grant program for conserving and preserving New Hampshire's most valuable natural, cultural, and historical resources. Grant applications for the purchase of land/buildings or restoration of structures are accepted from tax –exempt organizations, municipalities, or other political subdivisions of the State. Contact the SNHPC or visit www.lchip.org.

Land and Water Conservation Fund Program -- Provides grants to state and municipal agencies for outdoor recreation and conservation projects. Contact Sheri Colby at NH DRED Division of Parks and Recreation, at (603) 271-3556.

Local Water Protection Grants (Drinking Water Source Protection) -- To protect public drinking water sources. Water suppliers, municipalities, conservation districts, and non-profits can apply. For more information, call DES at (603) 271-7017.

New Hampshire Drinking Water Source Protection Program --This grant is available to public water suppliers for source water protection. The program, which began in 1997, has a total of $200,000 available to disburse every year to eligible municipalities. Grant amounts vary from $2,000 to $50,000. Past grants have been used to fund a watershed assessment and protection plan; perimeter fencing to protect

a wellhead area; and monitoring wells for groundwater evaluation. Past recipients include: Conway, Lebanon, Manchester, Rochester, Dover, Keene and Portsmouth. For further information contact: Sarah Pillsbury at (603) 271-1168 or e-mail **swap@des.state.nh.us**.

Nonpoint Source Local Initiatives Grants (Section 319 Grants) - For watershed management efforts. Grants are given to associations, organizations, and agencies. This grant program helps to fund all aspects of watershed management including organization, building, planning and assessment. Each year, a total of approximately $160,000 is made available to about 15 eligible local projects aimed at protecting water quality. Call (603) 271-2358 or www.des.state.nh.us/wmb/was/grants.htm

Transportation Enhancement Program -- New Hampshire Department of Transportation provides funding for scenic highway projects and mitigation of water pollution due to highway runoff. Contact (603) 271-3734.

Watershed Restoration Grants (Section 319 Restoration Grants) -- Grants can be given to farmers, watershed associations, conservation districts, non-profit organizations, regional planning agencies, and municipalities to implement practices that help restore impaired waters. Call ((603) 271-2358 or www.des.state.nh.us/wmb/was/grants.htm

Wildlife habitat – Small Grants Program – NH Fish and Game Department. For restoring, sustaining, or enhancing wildlife habitat on privately owned land. Owners of private, municipal, corporate or other non-governmental lands can apply for funds to implement habitat-improving practices. For more information, contact your regional F&G office at (603) 271-2461.

Chapter Twelve:

Public Facilities and Services

Introduction

This chapter provides a summary of existing public facilities and services within the Southern New Hampshire Planning Commission (SNHPC) region. These facilities include Education, Police Protection, Fire Protection, Emergency Services, Library Services and Government Offices (a map of the location of these facilities is provided at the end of this chapter). Other public facilities such as utilities, sewer, water, solid waste and stormwater are addressed in the Public Utilities and Communication chapter. Inclusion of a Public Facilities chapter serves many purposes. This information can be used to evaluate and coordinate public safety and service needs at a regional level and to aid communities in planning for necessary services and facilities to address the region's growth.

Each municipality within the State has the option to prepare and update a Capital Improvements Plan (CIP), as authorized by NH RSA 674:5. The CIP contains a list of projects that are either currently under construction, or are recommended for future construction in order to better serve the community. The CIP is used as a guide in consideration of annual budgets, and as a tool to implement the master plan.

Much of the information presented in this chapter is based upon data obtained from the most current Master Plan and CIP of each community, as well as information provided by School Administrative Offices and the New Hampshire Departments of Education and Revenue Administration. Table 12.1 identifies the status of each community's CIP. All municipalities within the region have an updated CIP, with the exception of the Town of Auburn. The Town is currently considering the development of a new CIP.

Table 12.1
Capital Improvement Plans by Municipality

Municipality	Plan Years	Adoption
Auburn	1985-1990	1985
Bedford	2006-2015	2005
Candia	2006-2011	2006
Chester	2002-2008	2002
Deerfield	2005-2010	2004
Derry	2007-2012	2006
Goffstown	2006-2011	2005
Hooksett	2006-2011	2005
Londonderry	2007-2012	2005
Manchester	2006-2011	2005
New Boston	2006-2011	2005
Raymond	2005-2010	2005
Weare	2006-2015	2005

Source: SNHPC

Education

The SNHPC region contains numerous public and private schools of various sizes and purposes. Based upon New Hampshire Department of Education data, there are currently a total of 81 schools located within the region as of the 2005-06 academic year. These include 57 public schools and 24 private schools. A complete list of schools in the region can be found at the end of this chapter in Tables 21 and 22. It should be noted however that Kellogg Elementary School, a private school in Bedford was included in the table, however the school closed and ceased operations following the conclusion of the 2005-06 academic year.

Each public school within the State belongs to a School Administrative Unit (SAU). SAUs are comprised of school districts located within either one or several communities. They are responsible for administrative and financial services, including regular meetings with school boards and preparing annual reports on the status of each school district. There are a total of 11 different SAUs covering the SNHPC region:

Auburn – SAU 15	Bedford – SAU 25
Candia – SAU 15	Chester – SAU 82
Deerfield – SAU 53	Derry Cooperative – SAU 10
Goffstown – SAU 19	Hooksett – SAU 15
Londonderry – SAU 12	Manchester – SAU 37
New Boston – SAU 19	Raymond – SAU 33
Weare – SAU 24	Pinkerton Academy – SAU 202

Only two SAUs shown above cover multiple municipalities located within the SNHPC region. SAU 15 handles the Towns of Auburn, Candia and Hooksett while SAU 19 handles the Towns of Goffstown and New Boston. All other municipalities located within the region either have their own SAU, or share an SAU with municipalities that lie outside of SNHPC's jurisdiction. Even Pinkerton Academy, which is located in the Town of Derry, has its own SAU that is separate from the Town of Derry itself. Also noteworthy is the Town of Chester, which used to belong to SAU 14. However in March 2006, each of the three municipalities comprising SAU 14 (Chester, Epping and Fremont) voted to withdraw. In July 2006, Chester officially formed and became a member of SAU 82.

As a result of increasing population growth within the region, two new schools are currently being constructed, and one existing school is being completely rebuilt and enlarged. The Town of Bedford is constructing a combined Middle and High School campus that is slated for completion by September 2007. The High School will be known as Bedford High School, while the Middle School was named in honor of Ross

Lurgio, who served the Bedford School District for 28 years (1975-2003), but passed away in 2003 after losing a battle with cancer.1
When completed, the new Bedford Middle and High School facility will have a capacity of 1,900 students. When the new facility opens, Bedford's existing McKelvie Middle School will become an intermediate level school serving grades 5 and 6. Currently, McKelvie Middle School hosts 6th, 7th and 8th grade, and is over-capacity by 226 students.[2]

The Town of Weare is also building a new Middle School, scheduled for completion by September 2007. This new school will have an ultimate student capacity of 920 students. Finally, the Town of Raymond is currently rebuilding the Iber Holmes Gore Middle School, which is scheduled for completion by December 2006. This newly rebuilt school will support a capacity of 823 pupils.

According to the New Hampshire Department of Education, there are a total of eight public high schools within the region, seven of which are regional schools (Table 12.2). Together these schools had a total enrollment of 14,346 students during the 2005-06 academic year and a combined total capacity of 16,264 pupils.

Londonderry Senior High School is the only public high school within the region not serving multiple communities. During the 2005-06 academic year, Londonderry Senior High School had a student population of 1,796, which was 204 students under the school's capacity of 2,000 students.

The City of Manchester's three high schools are experiencing capacity issues and Pinkerton Academy in Derry is also nearing capacity (Table 12.2). Capacity issues at West High School in Manchester may be improved in the future with the completion of the new high school in Bedford; however the situation at Memorial High School is growing worse. Currently, Memorial High School is over capacity by 376 students.

School capacity is based upon the State of New Hampshire's recommended minimum square footage per pupil and minimum total square footage per general-purpose classroom, including laboratories and other special purpose classroom space. These standards are specified in the NH Code of Administrative Rules Ed 321.

While school capacity is becoming a real issue within the region, the cost of providing educational services and programs is an ongoing and increasing expense for many of the region's municipalities. Total educational budgets for each community within the region for fiscal years 2000-01 through 2005-06 are shown in Table 12.3, and projected educational expenses are depicted in Table 12.4 for fiscal years 2006-07 through 2010-

1. SAU 25 webpage: http://www.sau25.net
2. Ibid.

11. As can be seen by this data, all municipalities within the region have, and are likely to continue experiencing growth in education costs.

The City of Manchester experienced the largest dollar increase in education costs from 2000 to 2005, showing a growth of approximately $41 million. Percentage-wise, the Town of Hooksett experienced the largest budget increase, rising 77 percent from 2000 to 2005. The smallest budget increase from 2000 to 2005 was in the Town of Candia, which experienced a budget increase of just under $2 million. Candia's education costs also had the smallest percentage increase in the region, rising only 34 percent.

Table 12.2
SNHPC Regional High Schools

School	Communities Served Based on Existing Tuition Agreements	2005-06 Total Enrollment	SNHPC Municipality Enrollment	School Capacity
Goffstown Area High School	Dunbarton[2], Goffstown, New Boston	1,291	1,169	2,192
John Stark Regional High School	Henniker[2], Weare	899	613	1,269
Manchester Central High School	Candia, Hooksett, Manchester	2,255	2,241	2,284
Manchester Memorial High School	Auburn, Candia, Hooksett, Manchester	2,158	2,124	1,782
Manchester West High School[1]	Bedford, Hooksett, Manchester	2,147	2,025	1,937
Pinkerton Academy	Auburn, Chester, Derry, Fremont[2], Hampstead[2]	3,266	2,654	3,400
Raymond High School	Candia, Deerfield, Fremont[2], Northwood[2], Raymond	534	524	1,400[3]

[1] - Bedford is leaving Manchester West upon completion of Bedford High School
[2] - Community located outside SNHPC region
[3] - This number reflects the total number of persons the building can hold, not just students
Sources: NH Department of Education School Administrative Units

Table 12.3
Education Budgets by Municipality*

Municipality	FY 2000-01	FY 01-02	FY 02-03	FY 03-04	FY 04-05	FY 05-06	Percent Change FY 2000 to 2005	Annualized Growth Rate
Auburn	$5,918,807	$6,561,823	$7,390,582	$7,781,659	$8,585,195	$9,471,705	60%	.0986
Bedford	$27,297,645	$29,215,636	$31,907,541	$34,190,368	$42,387,937	$42,820,682	57%	.0942
Candia	$5,118,074	$5,398,805	$5,577,803	$6,130,409	$6,509,636	$6,880,382	34%	.0610
Chester	$5,648,671	$6,745,830	$7,722,490	$8,317,046	$9,046,365	$9,521,870	69%	.1101
Deerfield	$5,955,132	$6,935,495	$8,077,810	$8,701,677	$9,185,972	$9,992,540	68%	.1091
Derry	$43,917,786	$49,102,046	$52,228,590	$59,779,236	$63,955,429	$68,336,008	56%	.0925
Goffstown	$19,795,236	$33,737,926	$23,417,791	$26,106,320	$27,187,334	$30,079,459	52%	.0873
Hooksett	$12,262,084	$13,411,952	$15,197,750	$17,999,107	$20,376,754	$21,663,139	77%	.1206
Londonderry	$39,868,279	$44,268,706	$47,259,484	$51,202,992	$53,893,340	$62,105,142	56%	.0927
Manchester	$106,372,292	$115,808,857	$125,767,867	$131,572,517	$142,661,889	$147,716,169	39%	.0679
New Boston	$5,724,795	$6,095,744	$6,678,425	$7,360,971	$7,819,365	$8,220,277	44%	.0750
Raymond	$14,388,914	$15,645,449	$16,022,127	$17,010,874	$17,809,436	$19,564,627	36%	.0634
Weare	$7,002,366	$7,637,180	$7,674,803	$8,230,951	$8,935,687	$9,835,200	41%	.0703

*Education budgets shown reflect total voted appropriations by each municipality less facilities,acquisitions and construction costs

Source: MS-22 Reports filed with the NH Department of Revenue

Table 12.4
Projected Education Budgets by Municipality

Municipality	FY 2006-07	FY 07-08	FY 08-09	FY 09-10	FY 10-11
Auburn	$10,405,596	$11,431,567	$12,558,696	$13,796,958	$15,157,311
Bedford	$46,855,358	$51,270,191	$56,101,002	$61,386,984	$67,171,025
Candia	$7,299,847	$7,744,885	$8,217,054	$8,718,010	$9,249,506
Chester	$10,570,060	$11,733,637	$13,025,303	$14,459,159	$16,050,857
Deerfield	$11,082,374	$12,291,070	$13,631,593	$15,118,319	$16,767,194
Derry	$74,653,717	$81,555,503	$89,095,364	$97,332,289	$106,330,724
Goffstown	$32,704,829	$35,559,345	$38,663,007	$42,037,559	$45,706,646
Hooksett	$24,274,640	$27,200,960	$30,480,048	$34,154,432	$38,271,765
Londonderry	$67,862,143	$74,152,806	$81,026,597	$88,537,574	$96,744,800
Manchester	$157,742,217	$168,448,770	$179,882,016	$192,091,280	$205,129,232
New Boston	$8,837,140	$9,500,294	$10,213,212	$10,979,629	$11,803,559
Raymond	$20,804,644	$22,123,253	$23,525,437	$25,016,492	$26,602,051
Weare	$10,526,667	$11,266,747	$12,058,859	$12,906,661	$13,814,068

Source: SNHPC

Budget projections were derived by figuring the annualized growth rate from the previous six years and applying that rate forward to FY 2010-2011. The projections assume that all the municipalities within the region will continue to experience an increase in education costs through FY 2010-11. Manchester will continue to have the largest education budget with an estimated figure of $205,129,232 in fiscal year 2010-2011. The Town of Candia is projected to continue to have the smallest education budget in fiscal year 2010-2011, being the only municipality wielding an education budget less than $10 million.

Also collected for the purposes of this chapter were the projected school enrollments from each SAU. Nearly every SAU was able to provide information, however in some cases, information could not be obtained.

Numerous attempts were made to contact SAU 10 in Derry to obtain enrollment projections; however no responses were received. SAU 19 reported that they do not maintain enrollment projections for the schools in the Town of New Boston. Lastly, SAU 33 in Raymond reported that they stopped updating enrollment projections several years ago.

The enrollment projections received by SNHPC are provided at the end of this chapter, and are broken apart by community.

Police Protection

Police protection is a necessary element for the safety and well being of everyone. Municipalities within the region have a broad range of police departments, and each department employs various numbers of police officers and staff. Most of the police officers in the region are full-time or part-time, however the towns of Bedford and Derry also have civilian officers that perform minor duties. Police officers are trained to handle numerous situations and calls for service. Calls for assistance can range from incidents such as motor vehicle accidents and speeding violations, to family and domestic disputes, and criminal offenses.

The City of Manchester has the largest police department in the region, which is currently staffed with 277 full-time officers (see Table 12.7). The next largest departments are in the Towns of Derry and Londonderry, each of which has 73 officers. The smallest department in the region is the Town of Chester, which has only two full-time police officers on staff. Besides the number of staff, the City of Manchester also has the largest police budget in the region. For fiscal year 2005-06, the budget was $21,297,533 (Table 12.5). The next largest police department budget is the Town of Derry, which required $6,710,922 during fiscal year 2005-06. The smallest police department budget belongs to the Town of Chester, whose budget for fiscal year 2005-06 was $347,345.

Nearly every community in the region experienced a small increase in their police budget from fiscal year 2004-05 to fiscal year 2005-06 (see Table 12.5). These budget increases allow for small upgrades to be made by each department in needed areas, and help reduce the strain of unforeseen police expenditures. The only department experiencing a slight cut in their police budget from 2004-05 to 2005-06 was the Raymond Police Department. However, from 2000-01 to 2005-06, every department has experienced at least a 30 percent increase in their operating budgets.

Budget projections were derived by figuring the annualized growth rate from the previous six years and applying that rate forward to FY 2010-2011. The projections assume that all the police department budgets of the municipalities within the region will continue to increase. The City of Manchester and the Town of Derry are projected to retain the largest police departments within the region. The City of Manchester's current FY 05-06 police budget is projected to increase $6.4 million in FY 2010-11 and the Town of Derry's police budget is projected to increase $5.4 in FY 2010-11 (see Table 12.6). The Town of Chester is projected to continue to have the smallest police budget in the region, with just under $1 Million in fiscal year 2010-11.

Police departments within the region utilize a variety of methods to dispatch their officers. Seven departments use their own dispatcher, while the others use either the Goffstown dispatcher or the Rockingham County Dispatcher. Auburn uses its own

dispatcher from 8:00 A.M. until 4:00 P.M. and then converts to Rockingham County Dispatch for the evening and overnight hours.

Each department also faces an annual replacement of equipment and vehicles. Police vehicles, especially cruisers, rapidly accumulate miles due to the heavy amount of travel they endure. For example, the Town of Weare expects to place an annual request for replacement of two police cruisers each year as a direct result of high mileage. Vehicles that are replaced typically are sold at auction or donated to a department in need of a newer vehicle.

Table 12.5
Police Budgets by Municipality

Municipality	FY 2000-01	FY 01-02	FY 02-03	FY 03-04	FY 04-05	FY 05-06	Percent Change FY 2000 to 2005	Annualized Growth Rate
Auburn	$547,476	$642,214	$679,199	$697,087	$675,774	$780,053	43%	.0734
Bedford	$2,024,533	$2,117,335	$2,176,089	$2,303,979	$2,482,726	$2,714,029	34%	.0604
Candia	$425,693	$440,669	$456,716	$561,386	$592,579	$620,027	46%	.0781
Chester	$254,601	$311,195	$422,025	$328,536	$315,865	$347,345	36%	.0641
Deerfield	$325,292	$365,305	$390,752	$404,283	$451,870	$542,826	67%	.1078
Derry	$3,703,993	$4,240,002	$5,587,886	$5,868,760	$6,450,437	$6,710,922	81%	.1262
Goffstown	$2,020,644	$2,703,785	$2,913,017	$3,096,010	$3,261,767	$3,377,061	67%	.1082
Hooksett	$1,418,241	$1,644,117	$1,644,117	$1,985,906	$2,096,303	$2,382,714	68%	.1093
Londonderry	$3,887,986	$4,365,300	$4,700,948	$4,878,512	$5,076,290	$5,736,562	48%	.0809
Manchester	$16,357,345	$17,684,639	$18,301,240	$19,292,743	$20,219,898	$21,297,533	30%	.0542
New Boston	$281,237	$298,300	$310,020	$357,474	$393,120	$403,420	43%	.0748
Raymond	$853,077	$1,131,235	$1,291,242	$1,370,473	$1,525,781	$1,499,820	76%	.1195
Weare	$503,474	$571,630	$617,740	$636,827	$771,748	$859,609	71%	.1129

Source: MS-2 Reports filed with the NH Department of Revenue

Table 12.6
Projected Police Budgets by Municipality

Municipality	FY 2006-07	FY 2007-08	FY 2008-09	FY 2009-10	FY 2010-11
Auburn	$837,290	$898,727	$964,672	$1,035,455	$1,111,433
Bedford	$2,877,878	$3,051,619	$3,235,849	$3,431,201	$3,638,347
Candia	$668,457	$720,670	$776,961	$837,649	$903,077
Chester	$369,608	$393,298	$418,506	$445,330	$473,873
Deerfield	$601,365	$666,217	$738,062	$817,656	$905,833
Derry	$7,557,960	$8,511,910	$9,586,265	$10,796,222	$12,158,898
Goffstown	$3,742,387	$4,147,234	$4,595,877	$5,093,053	$5,644,013
Hooksett	$2,643,238	$2,932,248	$3,252,858	$3,608,523	$4,003,076
Londonderry	$6,200,648	$6,702,279	$7,244,491	$7,830,568	$8,464,059
Manchester	$22,451,874	$23,668,781	$24,951,645	$26,304,042	$27,729,739
New Boston	$433,605	$466,049	$500,920	$538,400	$578,685
Raymond	$1,678,995	$1,879,574	$2,104,116	$2,355,482	$2,636,878
Weare	$956,678	$1,064,708	$1,184,937	$1,318,743	$1,467,658

Source: SNHPC

In order to assist with police response, a police department may contract their services to neighboring communities. This allows for better response times in certain areas, and helps to take the strain off of a single department. The only department within the region currently practicing this is the Goffstown Police Department, which responds to dispatch calls in both New Boston and Weare. These contractual agreements are in addition to mutual aid agreements that communities may share. Mutual aid agreements allow for police from one community to lawfully enter into another community to assist in the resolution of an emergency situation.

Officer-to-population ratios can serve as good indicators of demand for law enforcement services.[3] Data from FBI reports in 1998 indicate that municipal police departments in New England had an average of 2.2 full-time sworn officers per 1,000 residents and 2.7 full-time law enforcement employees (sworn and civilian) per 1,000 population.[4] While these averages will vary depending upon local economic conditions, perceived crime problems and community values, they represent benchmarks that can be used as a general level to assess adequacy of service and police staffing within the region. As shown in Table 12.7, all the communities within the region have less than 2.2 and 2.7 full-time staff per 1,000 population, which is less than the FBI benchmarks suggest.

3. Municipal Benchmarks, David N. Ammons, 2nd Edition, 2001, page 301.
4. Ibid. Table 20.1, page 300.

Table 12.7
Police Employees by Municipality

Municipality	Police Employees						Average Number of Employees 2000-2005	2005 Population Estimate	Full-time staff/1,000 Population ratio*
	2000	2001	2002	2003	2004	2005			
Auburn	5	7	8	9	8	8	7.5	5,070	1.2:1,000
Bedford	40	40	41	42	42	41	41.0	20,760	1.4:1,000
Candia	6	6	6	6	6	7	6.2	4,180	1.4:1,000
Chester	2	2	2	2	2	2	2.0	4,570	0.4:1,000
Deerfield	8	7	8	8	8	10	8.2	4,220	1.9:1,000
Derry	70	73	74	74	74	73	73.0	35,570	1.7:1,000
Goffstown	36	35	35	37	37	37	36.2	17,910	1.6:1,000
Hooksett	34	33	30	28	32	34	31.8	13,270	1.9:1,000
Londonderry	59	53	70	70	70	73	65.8	24,880	1.8:1,000
Manchester	276	280	280	287	277	277	279.5	110,550	1.9:1,000
New Boston	4	4	4	5	5	5	4.5	4,840	0.8:1,000
Raymond	13	19	21	28	28	28	22.8	10,410	1.6:1,000
Weare	6	6	7	8	8	10	7.5	8,640	1.3:1,000

* Benchmark is 2.2:1,000
Sources: Town Offices and Local Government Center

Fire Protection

Working hand-in-hand with the region's police departments are the region's fire departments. Similar to police protection, fire protection and suppression encompasses multiple areas. Fire protection calls are handled by both full-time and part-time staff. Calls range from the obvious fire rescue and hazardous material calls to the more sporadic downed power line and animal rescue calls.

Mutual Aid agreements are a common method for handling emergency situations. As with police mutual aid agreements, one municipality can call upon another municipality during an emergency when in need of assistance. Mutual aid agreements are used nation-wide, and are a beneficial tactic for fire departments to use when handing an emergency situation.

The City of Manchester has the largest fire department within the region; employing 258 full-time firefighters (see Table 12.10). The next-largest fire department belongs to the Town of Londonderry, which has 81 full-time firefighters on staff. The smallest fire department in the region in terms of staff is located in the Town of Chester, which has only one full-time firefighter.

In terms of budgets, the largest fire department in the region is in the City of Manchester, which has a fiscal year 2005-06 budget of $21,515,501 (Table 12.8). The second-largest department is in the Town of Derry, which has a budget of $6,779,871. The smallest budget in the region for fiscal year 2005-06 is in the Town of Deerfield, whose budget is only $54,963. It should be noted, however that fire budgets in Bedford, Manchester, New Boston, and Weare appear larger than they really are. This is because these communities do not break out their ambulance and emergency budgets from their fire budgets. The same applies to the Town of Goffstown, which stopped separating their fire and emergency budgets after fiscal year 2002-03.

Table 12.8
Fire Protection Budgets by Municipality

Municipality	FY 2000-01	FY 01-02	FY 02-03	FY 03-04	FY 04-05	FY 05-06	Percent Change FY 2000 to 2005	Annualized Growth Rate
Auburn	$134,754	$161,769	$106,820	$181,511	$184,103	$143,447	7%	.0126
Bedford	$1,109,374	$1,246,736	$1,558,678	$1,676,277	$1,543,195	$1,799,670	62%	.1016
Candia	$87,500	$72,500	$78,000	$100,000	$104,000	$102,000	17%	.0311
Chester	$41,084	$358,112	$195,900	$195,895	$211,593	$202,569	393%	.3759
Deerfield	$39,160	$37,825	$49,645	$75,488	$61,067	$54,963	40%	.0702
Derry	$3,329,499	$3,858,664	$3,821,078	$4,202,003	$4,853,144	$6,779,871	104%	.1528
Goffstown	$1,320,379	$1,358,182	$1,473,933	$1,576,837	$1,819,582	$2,030,096	54%	.0898
Hooksett	$1,174,738	$1,398,350	$1,625,099	$1,770,433	$1,827,121	$1,979,051	69%	.1099
Londonderry	$2,849,815	$2,981,096	$3,600,629	$3,856,311	$4,154,373	$4,450,910	56%	.0933
Manchester	$15,446,252	$16,799,638	$17,452,848	$19,581,334	$20,086,007	$21,515,501	39%	.0685
New Boston	$91,550	$92,650	$91,717	$121,955	$114,710	$123,860	35%	.0623
Raymond	$247,894	$337,738	$343,724	$360,767	$346,277	$367,385	48%	.0819
Weare	$144,035	$167,308	$163,634	$177,592	$175,493	$250,988	74%	.1175

Source: MS-2 reports filed with NH Department of Revenue

Four of the thirteen fire budgets across the region experienced cuts from fiscal year 2004-05 to fiscal year 2005-06 (see Table 12.8). The largest decrease was in Auburn, which cut the fire budget by $40,656. None of the other budget-cutting municipalities slashed $10,000. The largest fire budget increase however was in the Town of Derry, which increased its fire budget by $1,926,727 from fiscal year 2004-05 to fiscal year 2005-06. Budget increases in general allow for necessary upgrades, in addition to being better prepared for emergency repair situations or other unforeseen expenditures.

Budget projections were derived by figuring the annualized growth rate from the previous six years and applying this rate forward. The City of Manchester and the Town of Derry are projected to maintain the largest fire budgets in the region by fiscal year 2010-11 (see Table 12.9). The towns of Deerfield, Auburn, Candia and Chester are projected to continue to have the smallest fire department budgets.

Similar to police, fire departments are also constantly in need of new equipment and vehicles. Replacement fire trucks and tankers are critical for public safety. Without updated and new equipment, the risk for breakdown and inadequate utilities could

potentially lead to a severe problem during an emergency. Many departments are using equipment and vehicles that are quite old and in need of replacement. These needs are reflected within the CIPs.

Fire departments can contract out their service to neighboring communities. This method proves effective in cutting response time, allows for more success when handling a situation, and helps to save costs for the smaller communities taking advantage of this service. Currently only the Town of Derry Fire Department follows this practice within the region, contracting their service to the SNHPC communities of Auburn and Chester, as well as to Hampstead and Windham.

Staffing statistics compiled by the National Fire Protection Association (NFPA) reveal different lengths of workweeks and ratios of career firefighters per 1,000-population for various sizes of communities. These staffing statistics or norms differ by region. Northeastern municipalities tend to employ higher ratios of career firefighters than do other regions. The average ratio for communities with populations of 25,000 to 49,999 is 1.76; a population of 50,000 to 99,999 is 2.07; and a population of 100,000 to 249,999 is 2.46. No ratios are available for municipalities smaller than 25,000 people.[5]

For the purpose of this chapter, the NFPA benchmarks can be compared to the existing ratios as shown in Table 12.10. The ratios indicate that full-time firefighting staffing levels vary significantly throughout the region, and that most of the three municipalities greater than 25,000 people in size have less than 2.46 full-time staff per 1,000-population, which the NFPA benchmarks suggest.

5. Munnicipal Benchmarks, David N. Ammons, 2nd Edition, 2001, Table 11.3, page 144.

Table 12.9
Projected Fire Protection Budgets by Municipality

Municipality	FY 2006-07	FY 07-08	FY 08-09	FY 09-10	FY 10-11
Auburn	$145,252	$147,079	$148,930	$150,803	$152,701
Bedford	$1,982,512	$2,183,931	$2,405,813	$2,650,237	$2,919,495
Candia	$105,176	$108,452	$111,829	$115,312	$118,903
Chester	$278,710	$383,471	$527,610	$725,927	$998,788
Deerfield	$58,819	$62,945	$67,361	$72,086	$77,143
Derry	$7,816,097	$9,010,698	$10,387,881	$11,975,550	$13,805,876
Goffstown	$2,212,484	$2,411,258	$2,627,891	$2,863,986	$3,121,293
Hooksett	$2,196,647	$2,438,167	$2,706,242	$3,003,791	$3,334,056
Londonderry	$4,866,035	$5,319,878	$5,816,050	$6,358,498	$6,951,539
Manchester	$22,989,903	$24,565,341	$26,248,741	$28,047,499	$29,969,522
New Boston	$131,579	$139,778	$148,489	$157,743	$167,573
Raymond	$397,459	$429,995	$465,195	$503,275	$544,474
Weare	$280,472	$313,420	$350,239	$391,382	$437,359

Source: SNHPC

Table 12.10
Fire Employees by Municipality

Municipality	Fire Employees						Average Number of Employees 2000-2005	2005 Population Estimate	Full-time staff/1,000 Population ratio	Municipal Benchmark Based on Population
	2000	2001	2002	2003	2004	2005				
Auburn[1]	0	0	0	0	0	2	0.3	5,070	0.39	n/a
Bedford	22	23	23	23	25	25	23.5	20,760	1.20	n/a
Candia[2]	0	0	0	0	0	0	0.0	4,180	0.00	n/a
Chester	0	0	0	0	1	1	0.3	4,570	0.22	n/a
Deerfield[2]	0	0	0	0	0	0	0.0	4,220	0.00	n/a
Derry	23	24	24	26	48	46	31.8	35,570	1.29	1.76
Goffstown	15	13	14	14	11	14*	13.5	17,910	0.78	n/a
Hooksett	25	34	26	27	37	29	29.7	13,270	2.19	n/a
Londonderry	50	63	77	77	78	81	71.0	24,880	3.26	1.76
Manchester	243	243	243	253	258	258	249.7	110,550	2.33	2.46
New Boston	55	55	55	53	50	47	52.5	4,840	0.00	n/a
Raymond	8	4	21	4	4	4	7.5	10,410	0.38	n/a
Weare[2]	0	0	0	0	0	0	0.0	8,640	0.00	n/a

[1] - Auburn's Fire Department added full-time staff for the first time in 2005
[2] - Fire Department consists of volunteer staff only
*The Town of Goffstown also has 53 on call volunteer fireman to supplement full-time staff
n/a – no NFPA benchmark is available for communities with less than 25,000 population
Sources: Town Offices and Local Government Center

Generally, these ratios should not be taken as absolute prescriptions or requirements for determining staffing needs. Each community needs to determine its own standards considering local factors, such as the use of volunteers, the population density of the community, and other factors that influence fire risk. There is no "one size fits all" standard for every community within the region.

Ambulance and Emergency Services

Another key public safety element is the provision of ambulance and emergency services. Emergency rescue services are often a joined unit of fire protection services, but these services can be a separate entity as well. As with some police and fire departments, emergency rescue services can be contracted out to neighboring communities, or they can be provided through a private emergency rescue company.

As discussed earlier, there are several communities that do not separate their fire and emergency service budgets, and therefore no ambulance budget information is available. Of the municipalities not separating their fire and emergency budgets, the largest emergency budget belongs to the Town of Derry, which commands just under $2 million, giving them the largest budget in the region by far (Table 12.11). The smallest emergency service budgets within the region belong to the towns of Candia and Deerfield, each of which has only $6,000 for fiscal year 2005-06. During a telephone conversation, the Town of Goffstown's Fire Chief indicated that the largest reasons for budget increases are increased fuel prices and equipment upgrades, as well as increased call volume.

Budget projections were derived by figuring the annualized growth rate from the previous six years and applying this rate forward. The Town of Derry is projected to continue to remain the only community within the region to have a budget for ambulance and emergency services of over $1 million by 2010-11. Based upon past trends, the majority of the other communities within the region are projected to have budgets at or slightly higher than current levels. Aside from Derry, the largest budget increases are expected to take place in Hooksett and Londonderry. Similar projections, however, could not be made for the towns of Bedford, Goffstown, Manchester, New Boston and Weare as separate budget information is not available

There are a total of seven communities within the region that contract their emergency rescue service out to a neighboring community or have their service provided by a private entity. These municipalities include: Auburn, Candia, Chester, Deerfield, Hooksett, Manchester and Raymond. The towns of Auburn and Chester contract with the Town of Derry's Fire Department for emergency services. Candia and Manchester contract with Rockingham Ambulance. The Town of Hooksett contracts with Tri-Town Ambulance service and the Town of Deerfield contracts service with Raymond Ambulance Service.

Recently, Hooksett has been considering setting up a municipal ambulance crew to replace the services of Tri-Town. While this is expected to save the town thousands of dollars, at the same time it could drastically alter ambulance service for two of its neighboring communities, Allenstown, where Tri-Town is headquartered, and Pembroke.

Table 12.11*
Ambulance and Emergency Service Budgets by Municipality

Municipality	FY 2000-01	FY 01-02	FY 02-03	FY 03-04	FY 04-05	FY 05-06	Percent Change FY 2000 to 2005	Annualized Growth Rate
Auburn	$45,000	$45,000	$45,000	$45,000	$45,000	$45,000	0%	0
Bedford	NBO	NBO	NBO	NBO	NBO	NBO	n/a	n/a
Candia	$16,000	$8,500	$6,000	$6,000	$6,000	$6,000	-63%	-.1781
Chester	$25,000	$25,000	$25,000	$25,000	$30,000	$32,000	28%	.0506
Deerfield	$4,500	$5,000	$5,000	$5,500	$5,500	$6,000	33%	.0592
Derry	$1,081,931	$1,258,726	$1,603,024	$1,430,880	$1,886,087	$1,956,935	81%	.1258
Goffstown	$20,350	$18,350	$237,489	NBO	NBO	NBO	n/a	n/a
Hooksett	$47,796	$52,575	$52,575	$60,461	$60,461	$66,507	39%	.0683
Londonderry	$244,249	$230,603	$243,240	$290,772	$307,961	$358,334	47%	.0797
Manchester	NBO	NBO	NBO	NBO	NBO	NBO	n/a	n/a
New Boston	NBO	NBO	NBO	NBO	NBO	NBO	n/a	n/a
Raymond	$41,905	$41,905	$42,280	$42,405	$42,655	$42,905	2%	.0047
Weare	NBO	NBO	NBO	NBO	NBO	NBO	n/a	n/a

*NBO indicates that the Emergency Budget is not broken out from the Fire Budget
n/a – information is not available
Source: MS-2 reports filed with the NH Dept. of Revenue

Table 12.12
Projected Ambulance and Emergency Service Budgets

Municipality	FY 2006-07	FY 07-08	FY 08-09	FY 09-10	FY 10-11
Auburn	$45,000	$45,000	$45,000	$45,000	$45,000
Bedford	n/a	n/a	n/a	n/a	n/a
Candia	$4,931	$4,053	$3,331	$2,738	$2,250
Chester	$33,620	$35,321	$37,109	$38,987	$40,960
Deerfield	$6,355	$6,732	$7,130	$7,553	$8,000
Derry	$2,203,189	$2,480,431	$2,792,560	$3,143,966	$3,539,592
Goffstown	n/a	n/a	n/a	n/a	n/a
Hooksett	$71,050	$75,903	$81,087	$86,626	$92,543
Londonderry	$386,882	$417,705	$450,984	$486,914	$525,706
Manchester	n/a	n/a	n/a	n/a	n/a
New Boston	n/a	n/a	n/a	n/a	n/a
Raymond	$43,108	$43,312	$43,516	$43,722	$43,929
Weare	n/a	n/a	n/a	n/a	n/a

n/a – information is not available
Source: SNHPC

Generally, measurements of adequacy and performance of a municipality's emergency management services are not based on population standards or ratios. Among the many key aspects of emergency management service (EMS) performance is speed of response. According to a 1989 study of emergency management service in Washington, D.C., the national medical community and the EMS industry have defined a two-part standard for EMS responsiveness: "90 percent of EMT responses should be within 4 minutes, and 90 percent of paramedic responses should be within 8 minutes."[6] However, as noted in Municipal Benchmarks, reported performance targets, as well as the experience of the cities examined, skews the data. An 8-minute standard might be more realistic, but a 4-minute standard would be difficult for most municipalities to reach.[7]

Determining response times is a difficult task because this data is heavily dependent upon the proximity of EMS stations to the population centers being served. Many communities within the region have old fire stations that were built when population densities were focused around the center of town. Today, with increased growth and development, the population is more spread out and EMS stations are not able to provide adequate response times to the rural areas of town.

6. Municipal Benchmarks, David N. Ammons, 2nd Edition, 2001, pg. 105.
7. Ibid. pg. 105.

As depicted in the CIPs, many of the region's communities are only now beginning to build new stations at proper locations to enable broader coverage. The Town of Raymond's new station is an example. The Town of Londonderry recently received approval to build two new substations this year. The Town of Derry has also been trying to build four new substations based on an EMS study conducted back in 2001. However, the town has yet to build a new station, although they are planning to in 2007.

Volunteer EMT staff that is not always ready or available to respond further complicates the response time issue. Response times can be greatly improved when community stations are staffed with part-time or full-time help. Some communities such as the Town of Deerfield have addressed this issue by allowing the fire department to send out an engine on every call along with the ambulance.

In addition to these issues is the overall aging of the region's population. With more senior citizens and senior housing projects, including age restricted housing, the need and demand for ambulance service has increased. Because of these issues, the State of New Hampshire has recently instituted a tracking system to begin to monitor EMS calls throughout the state. While this is an important function, response times are not requested or monitored.

Library Services

Libraries offer a valuable service to the general public. Libraries provide a wealth of information and services and are a great place to relax and enjoy a quiet working environment. Currently, there are a combined total of 15 libraries located throughout the region's 13 communities. The Town of Derry and the City of Manchester each have two libraries, while all the other municipalities each have one.

Information relating to the number of visitors, number of volumes and number of employees is summarized in Table 12.15. In addition, each library was asked if they were at space capacity at the present time. Nine of the 15 libraries reported that they were at capacity. These libraries are located in the towns of Auburn, Deerfield, Derry (both libraries), Goffstown, New Boston, Raymond, Weare, and the City of Manchester (main library). Of the six libraries that said they were not yet at capacity, four libraries, located in the towns of Bedford, Chester, Hooksett and Londonderry, said that they expected to reach capacity within two to three years. The two municipalities that reported being in the best shape in terms of space are the Town of Candia and the City of Manchester. The Candia Library was just built approximately three years ago, and the West Manchester Library recently moved into a larger facility, eliminating their space crunch.

The region's largest library system belongs to the City of Manchester. Manchester's two libraries have a combined total of 38 full-time employees (Table 12.15). The City's library budget is also the highest in the region, at approximately $2.7 million (Table 21.13). The next largest library belongs to the Town of Londonderry. Londonderry's library has a total of 24 full-time employees. The Londonderry library budget is second highest in the region as well at $1.1 million.

The smallest libraries within the region are located in the towns of Auburn, Chester and Deerfield. All three of these municipalities' library budgets are less than $100,000 each. In terms of full-time employees, there are six municipalities (Auburn, Candia, Chester, Deerfield, New Boston and Weare) that currently have only one full-time employee.

Budget projections were derived by figuring the annualized growth rate from the previous six years and applying this rate forward. It is projected that by FY 2010-11, every municipality within the region will experience growth in their library budgets (see Table 12.14). The City of Manchester is projected to continue to have the largest budget for library services, increasing from $2.7 million in FY 05-06 to approximately $3.1 million by FY 2010-11. The Town of Londonderry is projected to continue to have the second-largest budget by FY 2010-11, which will have approximately $1.7 million. The Town of Bedford is estimated to eclipse the $1 million mark in FY 2010-11, bringing the total number of municipalities having over $1 million available in their library budgets to four (Bedford, Derry, Londonderry and Manchester).

In David N. Ammons's Municipal Benchmarks, 2nd Edition, it is noted that persons wishing to judge the adequacy of local public library facilities, collection, staff, and performance can utilize the selected standards for public libraries developed by the International Federation of Library Associations and Institutions (IFLA) and statistics compiled by the U.S. Department of Education.[8] There are also numerous facility standards including the standards of accessibility prescribed by the federal Americans with Disabilities Act of 1990 (ADA, 42, U.S.C./12100), which allow persons with physical disabilities to enjoy library facilities.

For the purpose of this chapter, it is suggested that the IFLA standards be utilized. These standards suggest that in small libraries there should be at least 3 volumes per capita and in medium to large libraries 2 volumes per inhabitant. Also, in the smallest libraries there should be 1 full-time qualified librarian with clerical assistance and in medium and larger libraries 1 qualified librarian per 2,000 population.[9]

In comparing these benchmarks with the information contained in Table 12.15, the following can be observed. Generally, the overall standard of one qualified librarian per 2,000-population in all the medium and large libraries throughout the region has

8. Municipal Benchmarks, David N. Ammons, 2nd Edition, 2001, pg. 217.
9. Ibid. pg. 216.

not been met. However, many of the region's larger libraries also have part-time staff to make up for the number of qualified librarian staff. In addition, all the smallest libraries within the region have adequately addressed the standard of one full-time qualified librarian with clerical assistance.

With regard to the number of volumes at each library, only the Town of Goffstown has less than the suggested benchmark of 2 volumes per inhabitant. All of the other libraries within the region have an adequate number of volumes per the recommended benchmarks.

In terms of public use or visitation of library facilities, the U.S. Department of Education provides a breakdown of annual visits per capita based on population size. These per capita rates vary from 4.7 for populations less than 4,999, 5.0 for populations less that 24,999, 4.6 for populations less than 49,999, 4.0 for populations less than 99,999, and 3.7 for populations less than 249,999.[10] Based upon these per capita numbers, only the Towns of Bedford, Derry and Londonderry equal or exceed the suggested annual visitation benchmark numbers. Datum for the Town of Chester is unavailable as a door counter is not in place at the library.

In comparing these benchmarks with the information contained in Table 12.15, the following can be observed. Generally, the overall standard of one qualified librarian per 2,000-population in all the medium and large libraries throughout the region has not been met. However, many of the region's larger libraries also have part-time staff to make up for the number of qualified librarian staff. In addition, all the smallest libraries within the region have adequately addressed the standard of one full-time qualified librarian with clerical assistance.

10. Ibid. Table 16.15, pg. 230.

Table 12.13
Library Budgets by Municipality

Municipality	FY 2000-01	FY 01-02	FY 02-03	FY 03-04	FY 04-05	FY 05-06	Percent Change FY 2000 to 2005	Annualized Growth Rate
Auburn	$51,357	$56,885	$68,796	$73,377	$77,563	$82,896	61%	.1005
Bedford	$425,170	$462,583	$465,315	$538,572	$563,627	$659,940	55%	.0919
Candia	$76,920	$84,105	$100,100	$114,420	$115,374	$125,600	63%	.1030
Chester	$73,935	$81,900	$87,470	$91,100	$96,700	$94,500	28%	.0503
Deerfield	$42,205	$30,730	$55,959	$55,605	$62,473	$64,605	53%	.0889
Derry	$932,040	$986,003	$1,053,773	$1,075,113	$1,120,959	$1,043,754	12%	.0229
Goffstown	$358,929	$392,387	$424,412	$467,089	$518,345	$541,884	51%	.0859
Hooksett	$269,395	$299,370	$299,370	$316,717	$316,717	$346,056	29%	.0514
Londonderry	$715,804	$785,131	$860,740	$916,247	$965,354	$1,114,573	56%	.0926
Manchester	$2,302,570	$2,349,374	$2,306,852	$2,398,640	$2,560,557	$2,701,475	17%	.0325
New Boston	$94,971	$101,881	$105,040	$115,202	$131,475	$135,405	43%	.0735
Raymond	$127,880	$174,908	$169,610	$177,717	$172,304	$178,381	40%	.0688
Weare	$100,601	$112,421	$120,288	$122,157	$143,580	$157,892	57%	.0943

Source: MS-2 Reports filed with the NH Department of Revenue

With regard to the number of volumes at each library, only the Town of Goffstown has less than the suggested benchmark of 2 volumes per inhabitant. All of the other libraries within the region have an adequate number of volumes per the recommended benchmarks.

Table 12.14
Projected Library Budgets

Municipality	FY 2006-07	FY 07-08	FY 08-09	FY 09-10	FY 10-11
Auburn	$91,226	$100,394	$110,483	$121,585	$133,804
Bedford	$720,598	$786,831	$859,151	$938,119	$1,024,345
Candia	$138,541	$152,816	$168,562	$185,930	$205,088
Chester	$99,254	$104,247	$109,492	$115,000	$120,785
Deerfield	$70,347	$76,600	$83,408	$90,821	$98,894
Derry	$1,067,655	$1,092,103	$1,117,111	$1,142,692	$1,168,858
Goffstown	$588,418	$638,948	$693,817	$753,398	$818,096
Hooksett	$363,829	$382,516	$402,162	$422,816	$444,532
Londonderry	$1,217,787	$1,330,559	$1,453,775	$1,588,401	$1,735,493
Manchester	$2,789,193	$2,879,759	$2,973,266	$3,069,810	$3,169,488
New Boston	$145,360	$156,046	$167,518	$179,833	$193,054
Raymond	$190,659	$203,783	$217,809	$232,801	$248,825
Weare	$172,787	$189,088	$206,926	$226,447	$247,810

Source: SNHPC

Table 12.15
Library Employees, 2005 Volumes and 2005 Visitors

Municipality	Library Employees						Average Number of Employees 2000-2005	2005 Total Volumes	2005 Total Visitors	2010 Population Estimate
	2000	2001	2002	2003	2004	2005				
Auburn	1	1	1	1	1	1	1.0	20,000	23,000	5,420
Bedford	10	10	10	11	12	12	10.8	68,241	152,000	22,520
Candia	1	1	1	1	1	1	1.0	22,000	17,000	4,440
Chester	1	1	1	1	1	1	1.0	46,225	n/a[1]	4,910
Deerfield	0	1	1	1	1	1	0.8	20,000	9,700	4,510
Derry[2]	11	11	11	11	11	11	10.2	138,487	164,450	37,510
Goffstown	5	6	6	6	6	6	5.8	32,225	22,358	19,150
Hooksett	2	2	2	4	4	4	3.0	49,000	20,000	14,580
Londonderry	23	35	24	27	24	24	26.2	65,997	100,497	26,560
Manchester[2]	40	40	40	38	38	38	39.0	249,702	302,764	114,500
New Boston	1	1	1	1	1	1	1.0	22,000	21,268	5,200
Raymond	3	3	3	3	3	3	3.0	28,500	17,832	11,090
Weare	1	1	1	1	1	1	1.0	21,180	22,614	9,340

[1] - Chester does not have a door counter, and therefore has no visitor information
[2] - Derry and Manchester figures reflect totals for both libraries in each municipality
Sources: Town Offices; SNHPC Region Public Libraries; Local Government Center

Government Offices

Most municipalities include the following common government offices:

Town Administrator/Manager	Tax Assessor
Insurance	Tax Collector
Planning/Zoning	Public Works
Finance	Town Clerk
Legal	Town Council/Board of Selectmen
	Building Inspection/Code Enforcement

Within the region, these offices are generally housed within one municipal office building or town hall. This practice is beneficial because many of these departments can be located in one facility or area, making public access to government functions much easier for residents.

Presently, there are no comprehensive space or facility standards for government offices or municipal office buildings within New Hampshire, except for federal and state ADA requirements for public access. The size and use of most government office buildings is generally determined based upon the local needs of each municipality as well as the functions and size of each department, including public access considerations.

Improvements to government offices are typically included in the CIP and the municipality's budget requests year to year. The City of Manchester has the largest overall governmental budget within the SNHPC region, having just over $142 million during fiscal year 2005-06 (see Table 12.16). The next-largest budget for government services belongs to the Town of Derry, which has approximately $28 million at its disposal. Conversely, the smallest operating government budget belongs to the Town of Candia, which had just under $2 million; the only community in the region having under $2 million. Overall, ten municipalities within the region experienced an increase in their government budget from fiscal year 2004-05 to fiscal year 2005-06. Those experiencing a decrease in their budget were the towns of Auburn and Chester and the City of Manchester.

Budget projections were derived by figuring the annualized growth rate from the previous six years and applying this rate forward. Based upon these projections, the City of Manchester followed by the towns of Bedford, Derry and Hooksett will continue to lead the region in the total governmental budgets by the year 2010-11. On the other way, the towns of Auburn, Candia, Chester, Deerfield and Weare will continue to have general government budgets less than $5 million in size.

Table 12.16
General Government Budgets by Municipality

Municipality	FY 2000-01	FY 01-02	FY 02-03	FY 03-04	FY 04-05	FY 05-06	Percent Change FY 2000 to 2005	Annualized Growth Rate
Auburn	$1,940,744	$1,465,198	$2,191,340	$4,277,484	$2,469,354	$2,011,280	4%	.0072
Bedford	$9,059,254	$13,089,251	$12,680,038	$12,364,093	$15,404,075	$16,470,963	82%	.1270
Candia	$1,060,483	$1,560,758	$1,230,556	$1,396,475	$1,519,602	$1,850,950	75%	.1178
Chester	$1,592,388	$4,841,454	$3,677,466	$2,423,563	$4,414,589	$2,572,563	62%	.1007
Deerfield	$1,953,423	$2,168,983	$1,949,268	$2,167,600	$2,303,289	$2,971,841	52%	.0875
Derry	$16,761,933	$26,565,526	$19,080,300	$22,923,454	$22,886,946	$28,370,603	69%	.1110
Goffstown	$11,935,224	$9,605,671	$11,183,611	$10,805,307	$11,643,811	$12,272,509	3%	.0056
Hooksett	$6,454,692	$9,838,285	$10,967,364	$7,968,215	$8,514,709	$12,739,765	97%	.1457
Londonderry	$14,911,310	$11,163,559	$16,569,502	$25,527,294	$15,749,763	$16,525,772	11%	.0208
Manchester	$113,624,154	$122,067,945	$129,048,398	$130,580,943	$144,115,482	$142,298,373	25%	.0460
New Boston	$1,947,158	$2,197,387	$2,474,125	$3,156,540	$2,479,685	$3,508,553	80%	.1250
Raymond	$5,774,592	$4,162,183	$4,661,446	$5,283,864	$7,087,395	$8,460,617	47%	.0794
Weare	$2,982,831	$5,700,823	$4,123,242	$3,201,842	$2,751,756	$3,775,457	27%	.0483

Source: MS-2 Reports filed with the NH Department of Revenue

Table 12.17
General Government Employees

Municipality	Government Employees Year 2000
Auburn	1
Bedford	45
Candia	6
Chester	4
Deerfield	7
Derry	84
Goffstown	48
Hooksett	52
Londonderry	81
Manchester	700
New Boston	20
Raymond	23
Weare	25

Source: SNHPC

Table 12.18
Projected General Government Budgets

Municipality	FY 2006-07	FY 07-08	FY 08-09	FY 09-10	FY 10-11
Auburn	$2,025,692	$2,040,207	$2,054,826	$2,069,550	$2,084,380
Bedford	$18,562,835	$20,920,382	$23,577,346	$26,571,755	$29,946,464
Candia	$2,069,059	$2,312,869	$2,585,409	$2,890,064	$3,230,618
Chester	$2,831,584	$3,116,685	$3,430,491	$3,775,893	$4,156,073
Deerfield	$3,232,001	$3,514,935	$3,822,638	$4,157,277	$4,521,212
Derry	$31,519,365	$35,017,598	$38,904,089	$43,221,928	$48,018,991
Goffstown	$12,341,101	$12,410,077	$12,479,438	$12,549,187	$12,619,326
Hooksett	$14,595,487	$16,721,521	$19,157,241	$21,947,756	$25,144,749
Londonderry	$16,869,063	$17,219,484	$17,577,185	$17,942,317	$18,315,033
Manchester	$148,848,955	$155,701,087	$162,868,650	$170,366,167	$178,208,825
New Boston	$3,947,057	$4,440,366	$4,995,330	$5,619,653	$6,322,006
Raymond	$9,132,258	$9,857,217	$10,639,727	$11,484,355	$12,396,034
Weare	$3,957,653	$4,148,641	$4,348,846	$4,558,713	$4,778,707

*Office of Energy and Planning Population Projections
Sources: Town Offices and Local Government Center

Property Values and Tax Rates

Local property taxes, bonds and other state and federal aid provide the bulk of funding for most governmental services and facility improvements. The tax rate is set each year by the New Hampshire Department of Revenue. Tax rates are based upon municipal reports submitted to the state identifying the municipal budget adopted by the community, and the total assessed valuation of property within the community, including the amount of taxes levied and collected in prior years.[11]

The value of property and the tax rate plays an important factor in a municipality's ability to fund capital improvements. As a result, it is important for municipalities to maintain a high equalization ratio, which reflects how the assessed value of property equates to full market value. Generally, an equalization rate approaching 100 percent is desired. However, this is not always possible and cannot be achieved unless a community-wide property revaluation takes place on a regular basis.

There are also local tax districts, which affect how tax rates are set and levied. The Town of Derry had previously been divided into two separate tax districts: Derry and East Derry. This division was the result of there being two separate fire rates for each district. The East Derry Fire Precinct consolidated with the Derry Fire Department effective July 1, 2005, and it formally closed and ceased operations as of January 1, 2006. Therefore, in the future, Derry will only have one tax district.

In 2005, the highest equalized tax rate in the SNHPC region belonged to the Town of Derry at $19.07 per $1,000. While Derry's tax rate is currently the highest in the region, not one municipality's tax rate was higher in 2005 than in 2000. The largest decrease is in the City of Manchester, which dropped 36 percent from 2000 to 2005. The Towns of Chester and Hooksett each decreased nine percent, tying for the smallest decrease in the region.

Coinciding with property tax decreases are property revaluations. Communities undergoing a property revaluation each saw a significant decrease in their tax rates the following year. Six municipalities (Chester, Derry, Manchester, New Boston, Raymond and Weare) all indicated that they are currently going through the property revaluation process. After equalization, The Towns of Deerfield, Derry, Goffstown, Hooksett and Raymond make up the five highest totals in the region. Only two of these five communities are currently undergoing a property revaluation.

11 See http://www.nh.gov/revenue/git-rev.htm for more information.

Table 12.19
Tax Rates per $1,000 from 2000-2005 by Municipality

Municipality	2000	2001	2002	2003	2004	2005	Percent Change 2000 -2005	Date of Last Property Revaluation
Auburn	$15.05	$15.07	$13.02	$13.43	$13.05	$11.30	-25%	2003
Bedford	$16.50	$14.88	$14.10	$13.22	$14.84	$13.78	-17%	2004
Candia	$16.88	$16.36	$14.26	$15.02	$15.17	$14.62	-13%	2004
Chester	$18.08	$19.19	$19.74	$17.96	$15.50	$16.40	-9%	Underway
Deerfield	$19.98	$21.20	$19.72	$17.88	$15.56	$17.95	-10%	2005
Derry	$23.32	$24.16	$22.13	$19.12	$15.62	$19.07	-18%	Underway
Goffstown	$22.14	$19.93	$18.95	$20.11	$17.07	$18.37	-17%	2003
Hooksett	$18.76	$19.17	$16.29	$18.86	$17.86	$17.06	-9%	2003
Londonderry	$22.30	$20.39	$17.77	$17.14	$18.04	$16.82	-25%	Each Year
Manchester	$22.70	$21.11	$19.09	$17.19	$18.23	$14.55	-36%	Underway
New Boston	$20.25	$18.03	$15.83	$16.27	$18.72	$14.27	-30%	Underway
Raymond	$21.64	$20.81	$18.72	$18.59	$18.74	$18.28	-16%	Underway
Weare	$20.47	$18.62	$17.23	$16.68	$19.23	$14.29	-30%	Underway

Source: NH Department of Revenue

Future Conditions

As previously discussed, there are a number of major new schools and other capital facilities either currently under construction or proposed for construction within the region in the coming years. Many of these facilities are necessary as a result of the region's current and projected future growth, in addition to the basic need to update and replace obsolete and inadequate current facilities.

A brief description of planned projects can be found within each municipality's CIP. A list of all the major projects that are either currently under construction or planned for construction in the near future is provided in Table 12.20.

The Town of Bedford is hoping to have a needs assessment study completed for their Town Offices in order to justify the construction of a new Town Office Building. Bedford has identified the need for a larger facility due to the insufficient space that the current Town Office building provides. The Town also hopes to build a new fire station to assist service needs in the South River Road area. Construction of the new Target and Lowe's shopping centers, the proposed elderly housing facilities along Hawthorne Drive, as well as a new Hampton Inn justifies this station's construction. Currently under

construction is the Ross Lurgio Middle and Bedford High School campus. According to the Bedford School District, construction will be completed by September 2007.

The Town of Candia identified a desire to construct a Public Safety Complex, as well as a desire to restore their old library. Currently, the Library Restoration project is only in its planning stages, and no date for work has been scheduled. The Public Safety Complex has been issued a target construction date of 2010. While construction of this Safety Complex is not an urgent need, it is desirable for Candia, and would have multiple benefits.

The Town of Deerfield is in desperate need of a new Town Office building, Police Station and Fire Station. The problem, however, is that none of these projects passed at the Town Meeting in 2006, and therefore will have to be placed on hold until the community decides to vote for them.

The Town of Derry has identified a desire to construct a new fire station in order to replace their older, inadequate facility. In addition, the Town would also like to put an addition onto the Taylor Library. This addition would help to reduce the space crunch currently facing the library. The Town of Goffstown had scheduled a renovation project for their Town Offices to begin in 2006, but it was stricken.

The Town of Londonderry has identified a desire to replace two fire stations in the coming years. The South Fire Station would be replaced first, in 2007, and the North/West Fire Station would be replaced second, in 2009. Londonderry also hopes to renovate the South School building in 2008. The Town of New Boston's Whipple Free Library is in desperate need of replacement, and the Town has scheduled construction to take place in 2009.

At the 2006 Town Meeting, voters in the Town of Hooksett passed a Warrant Article to relocate the existing Town Office Building to a larger building and site, by renovating the old Village School located on Main Street. Plans are underway to begin this renovation in 2007.

In the Town of Goffstown, a new kindergarten addition was recently added to the Glen Lake elementary school opening this September 2006. This addition will enable the school to be expanded in the future. Long range plans under consideration may involve utilizing the building as a Middle School in the future.

The Town of Raymond plans to construct a new Town Office building in the near future. Once this is accomplished, the town is planning to then recycle the old Town Office building by relocating the library into it. In addition, Raymond hopes to construct a new Police Complex in the near future. Currently underway are the renovations and reconstruction of Iber Holmes Gove Middle School, which is scheduled for completion

in 2006. Also, Raymond Ambulance Service will be building a new facility to be located adjacent to the Raymond Fire Department as a result of the Granite Meadows development planned at Exit 4 on Route 101.

The City of Manchester is currently exploring options for West High School, pending the completion of Bedford's new Middle and High School. Finally, the Town of Weare has one major project currently underway, and that is the construction of the new Weare Middle School. Construction is scheduled for completion by September 2007.

Table 12.20
Current and Future Projects by Municipality

Municipality	Project Type	Project	Proposed Years of Construction	Estimated Cost
Bedford	Government	Town Office Building Needs Assessment Study	2006–2015	$100,000
	Fire	South End Fire Station	2009	$650,000
	Education	Ross Lurgio Middle School & Bedford High School	2005–2007	$49,682,000 (max)
Candia	Police, Fire, EMS	Public Safety Complex	2010	$2,500,000
	Library	Old Library Restoration	n/a	$143,000
Deerfield	Government	Town Office Building	n/a	$1,500,000
	Police	New Police Station	n/a	$1,000,000
	Fire	New Fire Station	n/a	$1,000,000
	Library	Planning for Library expansion/relocation	2008	$20,000
Derry	Fire	New Fire Station	2011	$3,500,000
	Library	Taylor Library Addition	2009	$1,554,000
Londonderry	Fire	South Fire Station Replacement	2007	$1,600,000
	Education	South School Renovations	2009	$3,600,000
	Fire	North/West Fire Station Replacement	2008	$1,600,000
New Boston	Library	New Library*	2009	$1,500,000
Raymond	Government	Town Office Building	n/a	$2,500,000
	Police	New Police Complex	n/a	$2,500,000
	Library	Move into old Town Office if new Town Office built	n/a	n/a
	Education	Iber Holmes Gove Middle School	2005-2006	n/a
Weare	Education	Weare Middle School	2006–2007	$18,000,000

*Funding is currently not being sought for this capital project
n/a – information is not available
Sources: CIPs; SNHPC

Conclusions

The extent and adequacy of community facilities and services play an important role by contributing to the general welfare of residents and the quality of life of the community. Capital facility improvements are not easy to accomplish and require much community support and advanced planning.

To plan for the community facilities that are most needed in the future, an assessment and needs evaluation of existing facilities must be accomplished and included in Town Master Plans. It is critical that this information be evaluated, prioritized and included in a municipality's CIP. The Planning Board plays an important role in this process, particularly in identifying and sorting out the facility needs and priorities of the community.

With increasing education costs and municipal budgets, finding the tax dollars and other sources of funding for necessary capital improvements has become a difficult proposition for many communities. Long range planning and a strong financial commitment to specific public projects are necessary in today's economic environment.

Impact fees can be an important tool to help communities finance capital projects. However, impact fees alone will not build the schools, governmental office buildings, police and safety complexes, and libraries that will be needed in the future. Additional funding sources such as bonds and Tax Increment Financing (TIF) Districts must be considered, including state and federal grants.

With the continuing growth and development of the region, there will be greater demands placed on local resources stretching local services and the use of local facilities to the maximum extent and capacity. Ultimately, this could have negative consequences on public health, welfare and safety. Identifying capital facility needs early on and beginning to plan for and address those needs is an important planning function and responsibility.

Table 12.21
SNHPC Region Public Schools

Municipality	School Name	2005-06 Enrollment	School Capacity	SAU
Auburn	Auburn Village School	609	634	15
Bedford	McKelvie Middle School	1,005	779	25
Bedford	Memorial School	590	485	25
Bedford	Peter Woodbury School	704	654	25
Bedford	Riddle Brook School	723	583	25
Candia	Henry W. Moore School	468	483	15
Chester	Chester Academy	693	467	82
Deerfield	Deerfield Community School	575	560	53
Derry	Derry Village School	434	714	10
Derry	East Derry Memorial Elementary School	509	827	10
Derry	Ernest P. Barka Elementary School	594	700	10
Derry	Gilbert H. Hood Middle School	899	883	10
Derry	Grinnell School	389	736	10
Derry	South Range Elementary School	373	490	10
Derry	West Running Brook Middle School	728	917	10
Derry	Pinkerton Academy	3,266	3,400	202
Goffstown	Goffstown High School	1,291	2,192	19
Goffstown	Maple Avenue School	518	445	19
Goffstown	Mountain View Middle School	948	1,240	19
Goffstown	Bartlett Elementary School	259	187	19
Hooksett	David R. Cawley Middle School	422	n/a	15
Hooksett	Fred C. Underhill School	436	543	15
Hooksett	Hooksett Memorial School	459	675	15
Londonderry	Londonderry Middle School	1,376	1,381	12
Londonderry	Londonderry Senior High School	1,796	2,000	12
Londonderry	Matthew Thornton Elementary School	755	909	12
Londonderry	Moose Hill School	420	n/a	12
Londonderry	North Londonderry Elementary School	573	691	12
Londonderry	South Londonderry Elementary School	632	650	12
Manchester	Bakersville School	304	365	37
Manchester	Beech Street School	668	596	37
Manchester	Gossler Park School	427	419	37
Manchester	Green Acres School	551	607	37
Manchester	Hallsville School	347	n/a	37
Manchester	Henry J. McLaughlin Middle School	812	689	37
Manchester	Highland-Goffs Falls School	587	618	37
Manchester	Hillside Middle School	938	1,076	37
Manchester	Jewett School	355	381	37

Table 12.21, Cont'd
SNHPC Region Public Schools

Municipality	School Name	2005-06 Enrollment	School Capacity	SAU
Manchester	Manchester Central High School	2,255	2,284	37
Manchester	Manchester Memorial High School	2,158	1,782	37
Manchester	Manchester West High School	2,147	1,937	37
Manchester	McDonough School	591	655	37
Manchester	Middle School At Parkside	779	802	37
Manchester	Northwest Elementary School	639	674	37
Manchester	Parker-Varney School	458	529	37
Manchester	Smyth Road School	361	405	37
Manchester	Southside Middle School	943	1,045	37
Manchester	Webster School	476	498	37
Manchester	Weston School	584	588	37
Manchester	Wilson School	454	509	37
New Boston	New Boston Central School	519	440	19
Raymond	Iber Holmes Gove Middle School	454	823	33
Raymond	Lamprey River Elementary School	594	457	33
Raymond	Raymond High School	534	1,400*	33
Weare	John Stark Regional High School	899	1,269	24
Weare	Center Woods School	646	604	24
Weare	Weare Middle School	590	920	24

n/a – information is not available
Sources: NH Department of Education
School Administrative Units

*This number reflects the total number of persons that the building can hold, not jus students

Table 12.22
SNHPC Private Schools

Municipality	School Name
Bedford	Kellogg Elementary School
Bedford	Mount Zion Christian School
Candia	Jesse Remington High School
Deerfield	Longview School At The Summit Center
Derry	Calvary Christian School
Derry	Derry Montessori Childrens Center
Derry	St. Thomas Aquinas
Goffstown	Villa Augustina School
Hooksett	HEAR in New Hampshire
Hooksett	Mont Blanc Academy
Londonderry	Victory Baptist School
Manchester	Derryfield School
Manchester	Holy Family Academy
Manchester	Manchester Diocesan
Manchester	Mount St. Mary Academy
Manchester	NFI Midway Shelter
Manchester	NH Youth Development Center
Manchester	Robert B. Jolicoeur School
Manchester	St. Anthony Elementary School
Manchester	St. Benedict Academy
Manchester	St. Casimir School
Manchester	St. Catherine School
Manchester	St. Joseph Junior High School
Manchester	Trinity High School

Source: NH Department of Education

Table 12.23
Auburn School Enrollment Projections

Auburn	2006-07	2007-08	2008-09	2009-10	2010-11	5-Year Average
Grades 1-8	642	633	624	606	603	621.6

Source: SAU 15

Table 12.24
Bedford School Enrollment Projections

Bedford	2006-07	2007-08	2008-09	3-Year Average
Grade 1	341	355	347	347.7
Grade 2	347	346	360	351.0
Grade 3	331	348	347	342.0
Grade 4	374	331	348	351.0
Grade 5	340	381	338	353.0
Grade 6	308	333	374	338.3
Grade 7	362	310	335	335.7
Grade 8	327	362	310	333.0
Grade 9	272	271	306	283.0
Grade 10	223	261	260	248.0
Grade 11	244	220	258	240.7
Grade 12	226	241	217	228.0

Source: SAU 25

Table 12.25
Candia School Enrollment Projections

Candia	2006-07	2007-08	2008-09	2009-10	2010-11	5-Year Average
Grades 1-8	466	479	462	471	475	470.6

Source: SAU 15

Table 12.26
Chester School Enrollment Projections

Chester	2006-07	2007-08	2008-09	2009-10	4-Year Average
Grade 1	80	80	80	80	80.0
Grade 2	74	82	82	82	80.0
Grade 3	81	76	83	83	80.8
Grade 4	86	82	77	85	82.5
Grade 5	80	87	84	79	82.5
Grade 6	92	81	89	86	87.0
Grade 7	91	94	83	91	89.8
Grade 8	86	93	96	84	89.8
Grade 9	87	87	94	97	91.3
Grade 10	70	88	89	96	85.8
Grade 11	75	72	90	91	82.0
Grade 12	105	77	73	92	86.8

Source: SAU 14 (now 82)

Table 12.27
Deerfield School Enrollment Projections

Deerfield	2006-07	2007-08	2008-09	2009-10	2010-11	5-Year Average
Grades K-8	589	585	592	592	570	585.6
Grades 9-12	256	264	288	296	325	285.8

Source: SAU 53

Table 12.28
Goffstown School Enrollment Projections

Goffstown	2006-07	2007-08	2008-09	2009-10	2010-11	5-Year Average
Grade 1	189	188	130	186	188	176.2
Grade 2	187	199	194	140	193	182.6
Grade 3	195	191	206	201	147	188.0
Grade 4	174	205	204	220	202	201.0
Grade 5	197	173	210	209	219	201.6
Grade 6	217	216	192	232	224	216.2
Grade 7	278	313	313	276	325	301.0
Grade 8	288	283	283	322	276	290.4
Grade 9	299	297	297	335	328	311.2
Grade 10	338	305	305	304	338	318.0
Grade 11	373	351	351	321	312	341.6
Grade 12	294	336	336	292	288	309.2

Source: SAU 19

Table 12.29
Hooksett School Enrollment Projections

Hooksett	2006-07	2007-08	2008-09	2009-10	2010-11	5-Year Average
Grades K-2	565	599	587	590	584	585.0
Grades 3-5	548	583	651	673	712	633.4
Grades 6-8	555	571	591	590	629	587.2
Grades 9-12	647	651	663	727	737	685.0

Source: SAU 15

Table 12.30
Londonderry School Enrollment Projections

Londonderry	2006-07	2007-08	2008-09	2009-10	2010-11	5-Year Average
Grade 1	434	390	349	392	377	388.4
Grade 2	364	438	394	352	396	388.8
Grade 3	384	364	438	394	352	386.4
Grade 4	406	385	365	439	395	398.0
Grade 5	407	408	387	367	441	402.0
Grade 6	415	408	409	388	368	397.6
Grade 7	455	415	408	409	388	415.0
Grade 8	441	456	416	409	410	426.4
Grade 9	472	437	451	412	405	435.4
Grade 10	439	463	428	442	404	435.2
Grade 11	468	421	444	411	424	433.6
Grade 12	411	468	421	444	411	431.0

Source: SAU 12

Table 12.31
Manchester School Enrollment Projections

Manchester	2006-07	2007-08	2008-09	2009-10	2010-11	5-Year Average
Grade 1	1,287	1,277	1,364	1,354	1,331	1,322.6
Grade 2	1,139	1,210	1,200	1,282	1,273	1,220.8
Grade 3	1,159	1,111	1,180	1,170	1,250	1,174.0
Grade 4	1,134	1,134	1,087	1,154	1,144	1,130.6
Grade 5	1,141	1,116	1,116	1,070	1,136	1,115.8
Grade 6	1,071	1,098	1,074	1,074	1,030	1,069.4
Grade 7	1,100	1,050	1,076	1,053	1,053	1,066.4
Grade 8	1,030	1,081	1,032	1,057	1,035	1,047.0
Grade 9	1,704	1,730	1,816	1,734	1,776	1,752.0
Grade 10	1,804	1,559	1,583	1,662	1,587	1,639.0
Grade 11	1,685	1,710	1,478	1,501	1,576	1,590.0
Grade 12	1,473	1,458	1,479	1,278	1,298	1,397.2

Source: SAU 37

Table 12.32
Weare School Enrollment Projections

Weare	2006-07	2007-08	2008-09	2009-10	2010-11	5-Year Average
Grade 1	130	135	118	92	115	118.0
Grade 2	141	134	139	122	95	126.2
Grade 3	127	142	135	140	123	133.4
Grade 4	129	131	146	139	144	137.8
Grade 5	148	132	134	149	142	141.0
Grade 6	130	152	136	138	153	141.8
Grade 7	147	131	154	137	139	141.6
Grade 8	161	151	135	159	141	149.4
Grade 9	236	238	218	183	203	215.6
Grade 10	225	238	240	220	185	221.6
Grade 11	210	214	226	228	209	217.4
Grade 12	236	193	197	208	210	208.8

Source: SAU 24

Regional Comprehensive Plan

Map #12.1

Public Facilities

Legend

- Rivers/ Lakes
- Streams
- Major Roads
- Town Line
- Municipal Offices: Fire, Police included
- Water Treatment
- Public Water System
- Solid Waste
- Waste Treatment
- Public Works
- School
- Medical Facilities
- Library
- Post Office
- Community Centers
- Athletic/Recreational Facilities
- Other Public Faclities

Data Sources:
Granit Digital Data (1:24,000)
NH Department of Transportation
NH Department of Environmental Services

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For reprints or further questions

Contact: GIS Anlayst, gis@snhpc.org (603) 669-4664

SNHPC

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0 25 50 100 Miles

Chapter Thirteen:

Public Utilities and Communication

Introduction

Public utilities are necessary for community growth and sustainability. This chapter discusses the building blocks of physical town infrastructure, including public water and sewer systems, wastewater treatment, stormwater management, and public utilities such as electricity, and natural gas. Closely related to public utilizes are communications such as cable television, the Internet, telephone systems, and wireless communications.

The theme of the Southern New Hampshire Planning Commission (SNHPC) region is sustainability, and one of the regional challenges is financing infrastructure to keep pace with growth. Public utilities and communications are essential to the region. In order for communities to grow there must be adequate water systems, wastewater treatment, solid waste and communications.

Needs and Concerns

The most important issues facing the SNHPC region are:

- Accessibility of public utilities to rural residences and new subdivisions;
- Establishing water and sewer capacity to facilitate economic development;
- Capacity Assurance and/or the rising costs of public utilities, such as sewer, water, and solid waste management; Note: Privatization is not the issue, it is one of the solutions. Capacity Assurance includes topics such as technical, managerial and financial ability to meet the needs of the organization. Privatization in some cases has proved to be the solution. Merrimach Village District and MWW are excellent examples of the efficiencies and ultimately the savings to the customers that can result from well operated public water utilities. The two largest private water utilities in the sate of New Hampshire have nearly the highest rates among the major cities in NH.
- Coordination of services; and
- Regional preparedness for emergencies, particularly in terms of communications

In many rural towns where municipal water and sewer systems are not economically feasible, larger lot sizes are necessary to accommodate private well and septic systems based on underlying soil conditions. This pattern of rural development generates additional transportation, public utility and other infrastructure costs. This chapter provides an overview of existing conditions and offers some creative perspectives for beginning to look at these issues on a regional level.

Public Water Services

Regional Overview

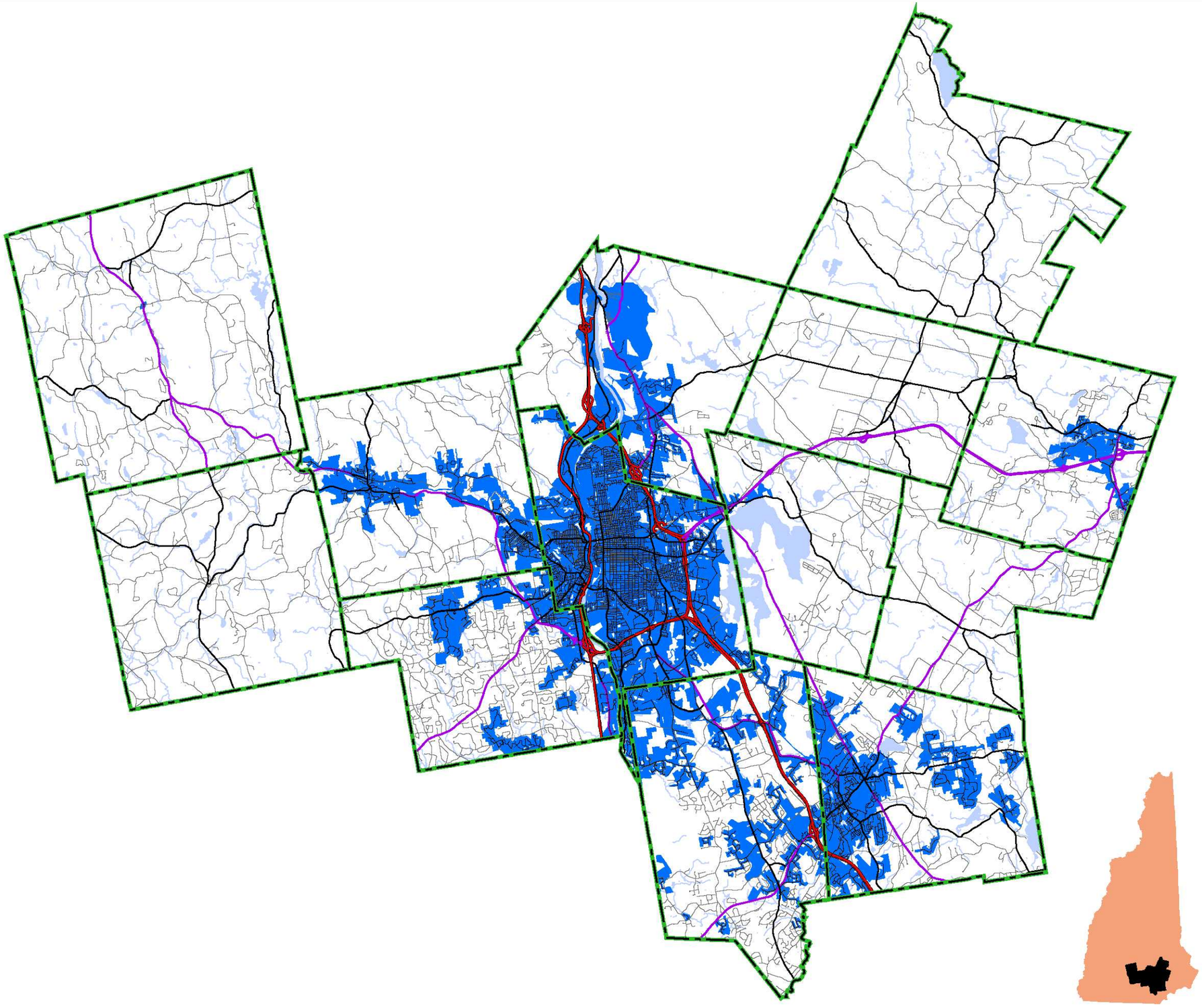
Manchester Water Works (MWW) is the largest water provider in the state, providing service to the City of Manchester and parts of six surrounding communities: Auburn, Bedford, Goffstown, Hooksett, Londonderry, and Derry. Lake Massabesic, located primarily in Auburn, serves as the primary water source, with approximately 14.7 gallons pumped per day. Water is treated at the Lake Shore Road Treatment Plant in Manchester. MWW provides service to over 30,000 domestic accounts in Manchester, which includes commercial, industrial, residential, and non-fire-fighting municipal accounts. In total, MWW serves a population of 160,000 people in the greater Manchester area. As the primary regional water provider, MWW also contracts, wholesales, or franchises water services to the aforementioned surrounding communities.

The Pennichuck Water Company is the other principle water provider for the region. As the largest investor-owned water company in the state, Pennichuck's three private water utilities and two non-regulated companies serve 120,000 people in 22 communities within New Hampshire and Massachusetts. Subsidiaries of Pennichuck service small, private water systems and/or municipal services in several SNHPC towns, including Derry, Bedford, and Raymond.

Most municipalities in the region receive water from Manchester Water Works, the Pennichuck Water Company, or smaller municipal water systems. Candia, Chester, Deerfield, and New Boston do not have municipal water systems and rely instead upon private wells or small-scale community water systems.

The following map shows the consolidated service area of all the water suppliers in the region.

REGIONAL COMPREHENSIVE PLAN



Map #13.1

WATER SERVICE

Legend

Political Boundaries

- Town line

Road Network

- Interstate
- State Route
- Major Roads
- Local Roads

Hydrography

- Streams
- Rivers/ Lakes

Water

- Waterlines
- Water Service Area

Data Sources:

Granit Digital Data (1:24,000)
NH Department of Transportation
Waterline and Service data from all 13 Towns.

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Auburn

Service Area - MWW currently provides franchised service to the northwest corner of Auburn, with extensions granted to users who pay all costs associated with the extension. The service area extends along Candia Road, Rockingham Road, and Dartmouth Drive. The rest of Auburn is served by on-site water systems from local aquifers.

Lake Massabesic in Auburn supplies most of the region's water.

Expansion and Improvements since 2000 – Portion of Dartmouth Drive.

Water Source/Plant(s) Used – Manchester Water Works. See Service Area Map.

Number of Domestic Services – 96, including 80 residential and 16 commercial/ industrial connections.

Future Plans – None reported.

Bedford

Service Area - The portions of the Town of Bedford that are served by MWW include the eastern section of town, bordered to the west by Rte 101, Rte 114, and the F.E. Everett Turnpike. Bedford's principle commercial corridor Route 3 is also served by MWW. Pennichuck Water Works holds the franchise in the remainder of Bedford and currently serves residential and municipal customers off New Boston Road and County Road. Most residents in Bedford obtain water from individual wells or small community suppliers, such as in a cluster subdivision.

Expansion and Improvements since 2000 – None.

Water Source/Plant(s) Used – Manchester Water Works. See Service Area Map.
Number of Domestic Services – 1,336 services: 1,098 residential, 231 commercial, 4 industrial, and 3 municipal.

Future Plans – None.

Derry

Service Area – Two-fifths of the Town of Derry is served with public water by Derry Water Works primarily through a wholesale agreement with Manchester Water Works., Most of the service area is concentrated west of Route 28. The following communities are also part of Derry Water Works and are served through community wells: Meadowbrook, Willow Bend, Woodlands, Randishepard Hill, and Autumn Woods. Additional developments along Hampstead Road (and other connecting roads) are served by private water systems through Pennichuck Water Company.

Expansion and Improvements since 2000 – None reported.

Water Source/Plant(s) Used – See Service Area Map

Number of Domestic Services – Derry Water Works has 3,864 domestic connections and in 2004 the average municipal usage per day was 1.52 million gallons. The largest customer is Hadco Printed Circuits, which uses 25 percent of all water consumed.

Future Plans – Service expansion to the Sunset Acres development between Windham Road and Rockingham Road and the Rainbow Lakes area.

Goffstown

Service Area - Goffstown has three different water systems: Goffstown Village, Grasmere, and Pinardville. The Pinardville section extends along Mast Road, forming a triangle with Plummer Road and St. Anslem Drive with an eastern border of the Piscataquog River. The Grasmere system extends down Mast Road from Henry Bridge Road to the Shell Station one mile to the west, and includes Center Street, Mountain View School, Juniper Drive, Condo on Locust Hill, and Goffstown Back Road to the Village of Glens Falls. The Goffstown Village Precinct encompasses the downtown area and surrounding residential developments.

Expansion and Improvements since 2000 – The Village Precinct replaces 1,000 to 2,000 feet of water pipes annually.

Water Source/Plant(s) Used – The Goffstown Village Water Precinct obtains water from two water impoundments 1.5 miles south of the Village on Whittle Brook. Goffstown also has established several wellhead protection areas in which the dumping or disposal of solid waste, chemical waste, or wastewater is prohibited. MWW supplies the Pinardville area on a franchise basis and the Grasmere area on a wholesale basis. See Service Area Map.

Number of Domestic Services – Pinardville accounts for 1,304 domestic accounts (1,213 residential, 79 commercial, 11 municipal, and 1 industrial) while the Grasmere Village Water Precinct approximates 500 connections. The Village Precinct has 1,100 connections, with six municipal connections and the majority of the rest being residential.

Future Plans – Grasmere: If a proposed development of 270 homes and a mobile home park on Carroll Hill Road is approved, the system will expand down Goffstown Back Road to serve another 400 customers; Village: MWW plans to construct a one million gallon water storage tank in the Pinardville area within the next five years.

Hooksett

Service Area – Hooksett has three independent water systems. The Hooksett Village system encompasses the area surrounding Hooksett Village and surrounding area around Route 3. The South Hooksett service area covers Hooksett Road from Manchester northerly to Zapora Drive and the 3A corridor to I-93 as well as Hackett Hill and Countryside Drive. The Central Hooksett Precinct goes from Zapora Road to Shannon Road along Route 3. See Service Area Map.

Expansion and Improvements since 2000 – The Village Precinct added the River Hill multi-family housing development with 44 units, and additional new developments along Hackett Hill were added to the South Hooksett system. MWW completed construction of a two million gallon water storage tank off Morrill Road in 2002. No new developments to Central.

Water Source/Plant(s) Used – South Hooksett is served by a MWW franchise, Central Hooksett purchases water from MWW, and the Hooksett Village obtains water from two wells by Pinnacle Pond. The Town of Hooksett is currently working with the Hooksett Village Precinct to protect these wells through a Wellhead Protection Program.,

Number of Domestic Services – South Hooksett: 550; Central Hooksett: 1,300; Hooksett Village: 841.

Future Plans – The Village Precinct plans to provide water service to several future developments along Route 3, including Manchester Sand and Gravel, Webster Common, and condominiums. Granite Heights will be a major new condominium development on Shannon Road in Central Hooksett.

Londonderry

Service Area – Londonderry is serviced by three water systems--Manchester Water Works, Pennichuck Water Words (PWW), and Derry Water Works. MWW serves the northern third of the town, encompassing the area south of the airport through Harvey

Road, Mammoth Road, Auburn Road, Old Derry Road and Rockingham Road to the Derry town line. PWW serves most of the southern developed portions of town, and Derry Water Works services a small area on the Derry-Londonderry line.

Expansion and Improvements since 2000 – West end of Litchfield Road and in central Londonderry off Pillsbury Road.

Water Source/Plant(s) Used – The northern portion franchises water from MWW, the southern portion of town franchises water from PWW, which obtains water from MWW in a wholesale agreement, and the area along the Derry- Londonderry town line is served by Derry Water Works.

Number of Domestic Services – MWW: 618 domestic services (300 residential, 310 residential, 4 municipal, and 4 industrial); SNHWC: 1480, and Derry Water Works: 12

Future Plans – Expansion of system in south Londonderry. Note: MWW has served the North School since 1996.

Manchester

Service Area – The entire city of Manchester, with the exception of the extreme northwest corner (northwest of Front Road), is in the service area of MWW.

Expansion and Improvements since 2000 – MWW has added 52,100 feet of water main, 793 new domestic services, 102 fire services, and 63 public fire hydrants between 2000 and 2004 in the City of Manchester.

Water Source/Plant(s) Used – The source of water supply for the city is Massabesic Lake in Manchester and Auburn. It is expected that water demand will exceed a safe yield from the lake by around 2010. This water is currently treated at the Lake Shore Road Treatment Plant in Manchester which completed a major upgrade and expansion in 2006.

Number of Domestic Services – Manchester Water Works provides 30,352 domestic services and 1,405 fire services to Manchester and the other communities it serves. There are a total of 26,400 domestic services provided in Manchester alone.

Future Plans – The U.S. Army Corps of Engineers is currently conducting a study on the Merrimack River, with initial findings suggesting that the Merrimack River could serve as a supplemental water source with proper treatment. Other infrastructure improvements include annual replacement and upgrades of water mains, pump stations, and storage reservoirs.

Planned expansion of the current service area will be adequate to address new developments over the next ten years. These projects may include commercial development near the new Airport Access Road, redevelopment along the Merrimack River south of Granite Street, condominiums off Hackett Hill Road, and residential development in the Crystal Lake area and off of Wellington Road.

Raymond

Service Area – Raymond Water Department is a municipal system encompassing the village center and surrounding developed areas. Other small, private systems are served by Pennichuck or individual wells in developed areas. The largest of these include Green Hills Estates on Route 107 and Leisure Village Mobile Home Park on Route 27.

Expansion and Improvements since 2000 – A third well was added in 2004 to increase capacity.

Water Source/Plant(s) Used – The Raymond water system obtains water from three wells along the Lamprey River. Raymond also has a Groundwater Protection District, which serves as an overlay district and includes the areas around the wells as part of the Town's Wellhead Protection Program. This district exists around the well near the Lamprey School and around the well at the end of Cider Ferry Road. Pennichuck provides service to small, private systems in which developers pay the cost of an extension, but not the overall capital costs.

Number of Domestic Services – 800 domestic services, the majority of which are residential, serving 2,500 individuals.

Future Plans – The town has allocated $1.5 million for a new well, including a new 750,000 gallon storage tank. The Capital Improvements Program for the Town includes annual appropriations for land acquisition for water supply as well as a new treatment facility. The Town also may work with Pennichuck to supply the Green Hills area once the proposed system expansion takes place.

Weare

Service Area – A small portion of the town center.

Expansion and Improvements since 2000 – None.

Water Source/Plant(s) Used – The town has six town-owned wells and four privately owned community systems for cluster homes or mobile homes. Most residents depend on individual wells.

Number of Domestic Services – Five municipal connections and one residential connection.

Future Plans – While the Town has no current plans for expansion, the Master Plan calls for a feasibility study in 2010 to expand the water system.

Public Sewer Systems

Currently the towns of Auburn, Candia, Chester, Deerfield, New Boston, and Raymond do not have municipal sewer systems. All buildings and dwellings within these towns have either private or shared septic tanks for wastewater. While Raymond presently has no municipal sewer system, the town is currently exploring the development of a small-scale sewage treatment plant and sewer lines to serve potential development at Exit 4 on Route 101 and eventually the downtown area. Auburn has a private subsurface septic system that may potentially connect to the City of Manchester after 2006. This system was at 75 percent capacity in 2002.

The following map shows the consolidated service area of all the public sever systems in the region.

REGIONAL COMPREHENSIVE PLAN

Map #13.2

SEWER SERVICE

Legend

Political Boundaries

- Town line

Road Network

- Interstate
- State Route
- Major Roads
- Local Roads

Hydrography

- Streams
- Rivers/ Lakes

Sewer

- Sewerlines
- Sewer Service

Data Sources:

Granit Digital Data (1:24,000)
NH Department of Transportation
Sewerline and service data from all 13 Towns

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SNHPC

0 7,500 15,000 30,000 Feet

0 1.5 3 6 Miles

Bedford

Service Area – District I of the sewer system serves the Route 3 corridor, Constitution Drive and the Bedford Village Inn. District II serves a small area south of Worthley Road and along Constance Road and Garden Party Lane.

Expansion and Improvements Since 2000 – None.

Treatment Plant(s) Used – The Manchester Wastewater Treatment facility processes wastewater.

Number of Accounts – Bedford has 120 connections served by a municipal sewer system, with 85 percent of these being commercial and light industrial.

Future Plans – Proposed expansions to the sewer system include an extension down County Road to the intersection with Nashua Road at the location of the new high school as well as a possible extension for a health club at the corner of Donald Street and Route 114. These extensions are located outside of the Town's Sewer District will require that the Town purchase additional treatment capacity from the MWW.

Derry

Service Area – The service area encompasses Derry Village and West Derry west of Route 28, including Beaver Lake as well as a segment of Route 102 and the area south of Route 102 in Londonderry

Expansion and Improvements since 2000 – Derry has continued to make small extensions to its municipal sewer system for commercial and residential development on a street-by-street basis, including services to a new elementary school on Scenic Drive.

Treatment Plant(s) Used – A secondary wastewater treatment facility near Londonderry processes wastewater, with an annual daily collection of 1.92 million gallons in 2000.

A sludge lagoon for wastewater treatment in Derry

Number of Accounts – The system has 2,595 connections, serving 15,000 individuals.

Future Plans – Construction of the Windham Road Interceptor, replacement of the liner and air system at Lagoon 2 at the wastewater treatment facility and extension of sewer

collection lines to the Bradford, Sunset, Woodland, Upstone, Durney and Edgewood Street area. (Source: Derry Capital Improvement Program).

Hooksett

Service Area – The Hooksett municipal sewer system serves South Hooksett, Hooksett Village, and the central portion of town between the two.

Expansion and Improvements since 2000 – None.

Treatment Plant(s) Used – The town owns a secondary wastewater treatment facility on the east bank of the Merrimack River near the center of town.

Number of Accounts – The system serves approximately 3,350 connections with 7 industrial, 284 commercial, and 3,059 residential hook ups.

Future Plans –Hooksett currently faces a situation in which its wastewater treatment plan is operating at full capacity, which causes a severe shortage of sewer connections in the town and no new residential connections. While Hooksett has ideas for a new treatment facility, the town is currently in limbo with the state for approval, causing development roadblocks.

Goffstown

Service Area – The service area extends from Goffstown Village to areas adjacent to Route 114 and Pinardville, the Riverview Park neighborhood, Mooseclub Park, Knoll Crest Drive, and Pine Ridge Street

Expansion and Improvements since 2000 – Across from River View Park, Mooseclub Park (behind Shaws), and the Knoll Crest Development encompassing 75 homes on Knoll Crest Drive and Pine Ridge Street.

Treatment Plant(s) Used – The municipal sewer system contains a pretreatment program, four pumping stations, and 30 miles of collection systems in town.

Number of Accounts – There are approximately 2,000 accounts, with most being residential.

Future Plans – Future plans for expansion include the developments of Lynchville, Danas Park, and Morgan Estates by Mooseclub Park.[1]

1 All information from Goffstown from Goffstown Public Works Department.

Londonderry

Service Area – Londonderry has a municipal sewer system that encompasses the industrial area south of Manchester Airport, ending approximately at Burton Drive and Aviation Park Drive. Other areas of service include Mammoth Road, Grenderfield Road, Rockingham Road (Route 28), and the Route 28 extension from 128 to I-93.

Expansion and Improvements since 2000 – A new pump station has been connected to schools and residential area and system extensions have been added off of Constitution Drive, with eventual connections to Derry.

Treatment Plant(s) Used – The system includes four pumping stations. The northern two -- the Plaza 28 pumping station and the Mammoth Road pumping station (built in 2002)—transfer water to the Manchester Wastewater Treatment Facility via the Cohas Brook Interceptor. The southern two stations—Charleston Avenue and Action Boulevard—pump waste to the Derry treatment plant.

Number of Accounts – There are approximately 1,161 connections.

Future Plans – A wastewater facility plan shows an upgrade of pumping stations and expansion on both sides of Route 102 east of Route 128 in the southern section of town in 2008 or later. The Town also plans to expand sewer lines down Pettingill Road towards the new Airport Access Road.[2]

Manchester

Service Area – The entire City of Manchester, except for the extreme northeast, southeast, and northwest corners are served by municipal wastewater

Expansion and Improvements since 2000 – Phase I of the Cohas Interceptor was recently completed to extend the city's sewer system from the treatment plant east towards the Crystal Lake area, terminating at I-93.

Treatment Plant(s) Used – The City of Manchester has over 300 miles of public sewers and a treatment plant that processes 34 million gallons per day, including the wastewater of many surrounding communities. Purified wastewater is released into the Merrimack River and sludge is burned. *Number of Accounts* – The system serves approximately 22,000 connections in Manchester, representing 46,030 units of residential, commercial, and industrial.

2 All information from Londonderry from Daniel O'Toole, Londonderry Public Works Department, and the Town of Londonderry Wastewater Facilities Plan Update, January 2005.

Future Plans – Phase II of the Cohas Interceptor project will extend the Phase I project to Industrial Park Drive and eventually Candia Road, with work expected to be completed by 2010. The City will also work towards eliminating Combined Sewer Overflow (CSO) discharges in the Piscataquog and Merrimack Rivers as well as the Crescent Road basin. In addition, the City has recently retained a consultant to begin work on developing a new wastewater treatment facility plan to determine future expansion needs over the next twenty years.

Weare

Service Area – While the majority of residents and businesses use septic tanks serviced and treated by private companies, the Town of Weare has a small municipal system located in the town's center consisting of approximately ½ mile of cement-lined ductile iron 8-inch mains.

Expansion and Improvements since 2000 – None.

Treatment Plant(s) Used – Wastewater from this system goes to a treatment system consisting of a 14,000-gallong septic tank, a 9,000 gallon tank, a leach field, and an aeration chamber located east of the village center at the base of Mt. William. There is also a 6,000-gallon storage tank connected to the wet well which is used in the event of pump failure.

Number of Accounts – With 23 connections (five public, the remainder residential), the system is under its capacity of 22,000 gallons per day (gpd), but the system is also designed so that it could be expanded to 33,930 gpd.

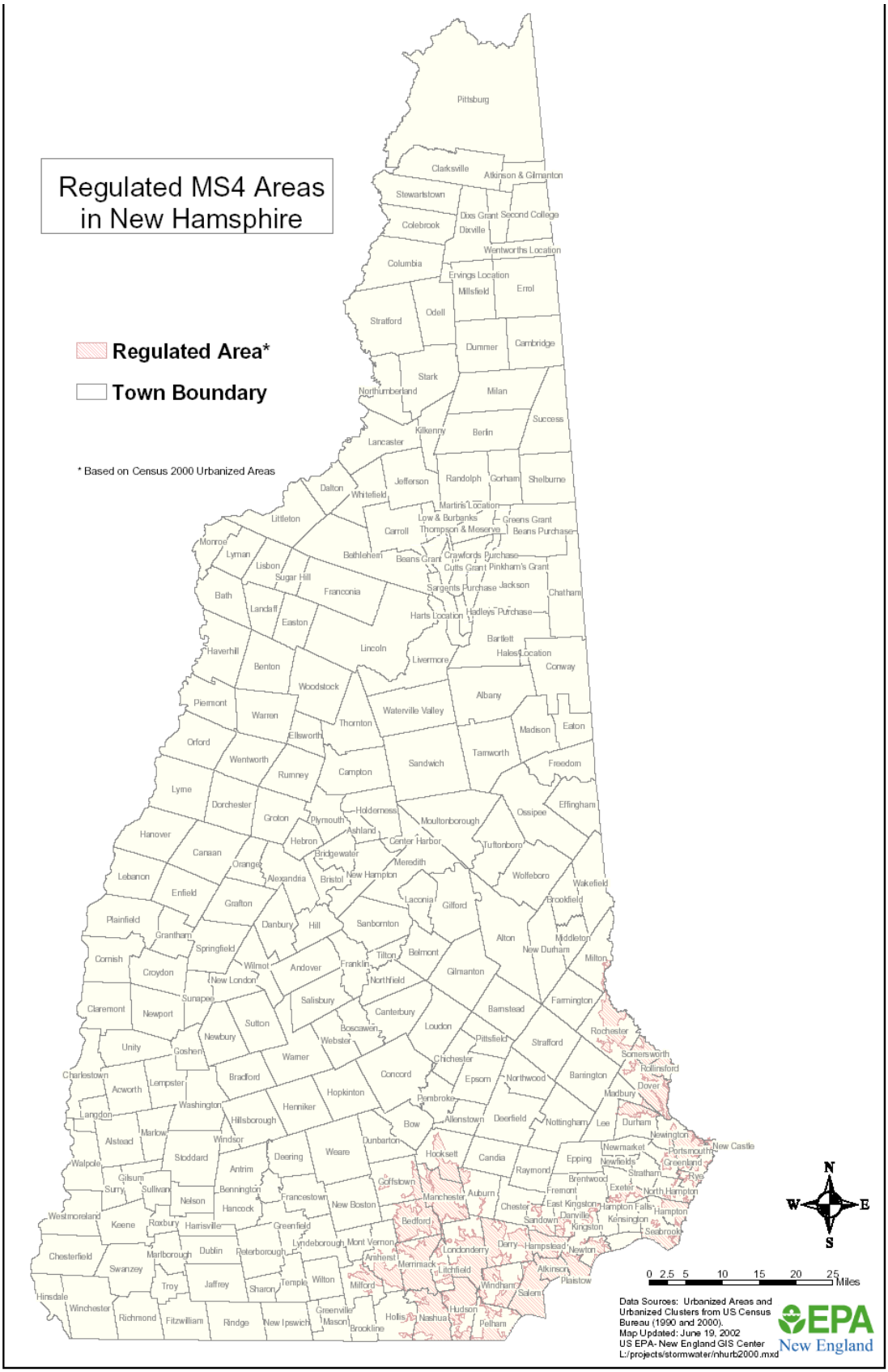
Future Plans – The Town's immediate future plans include the possible expansion of the sewer system to include the middle school. The Master Plan calls for a feasibility study in 2010 to expand the sewer system.

Septage Disposal

Despite the presence of public sewer, all the towns within the region have residences and/or businesses connected to individual or shared on-site septic systems. Individual or community septic systems in the short term are the most efficient and cost-effective solution wastewater treatment needs. Approximately once a year these tanks must be pumped to dispose of the septage. All landowners must contract private haulers to remove their septage; there are no municipalities within the region that currently offer septage disposal as a public service.

The following towns have agreements in which private haulers dump septage at the state licensed Septage Receiving Facility in Manchester: Bedford, Goffstown, Londonderry, and Manchester. Private haulers from Auburn, Candia, Chester, New Boston, and Weare arrange to dispose of septage according to company policy, with haulers in Auburn, Candia and Chester often disposing of septage in Manchester. Haulers in Weare and New Boston also often dispose at a private facility in Weare (*All Clear Solar Aquatics*) or to a facility in Concord. Deerfield's haulers dispose of septage in Concord, Hooksett haulers have an agreement to dispose in Allenstown, Derry's haulers dispose septage to the Greater Lawrence Treatment Plant under an informal agreement, and Raymond's haulers dispose in Haverhill. The costs of these services, which can be in the hundreds of dollars, rest upon home and business owners.

Figure 13.1
Regulated MS4 Areas in NH



Stormwater

Polluted stormwater runoff is the most significant source of pollution to the nearly 40 percent of surveyed U.S. water bodies that do not meet water quality standards. To address this issue, and in response to the Clean Water Act (CWA) amendments of 1987, the Environmental Protection Agency (EPA) developed the National Pollution Discharge Elimination System (NPDES) Stormwater Program in 1990. Phase I of the program addressed the most threatening sources of stormwater: large municipal separate storm sewer systems (MS4s) and industrial activities. Phase II, implemented in 1999 required permit coverage for stormwater discharge from small MS4s and construction activities of smaller scales than those covered by Phase I.

Parking lots, such as this one in Bedford, demonstrate the need for stormwater management.

Within the SNHPC region, the following towns are under MS4 regulations for medium or small municipal separate storm sewer systems: Manchester, Hooksett, Auburn, Chester, Derry, Londonderry, Bedford, and Goffstown. These towns must abide by stormwater ordinances and regulations as promulgated by the EPA. The following towns are required to develop construction and post-construction stormwater programs to control construction site runoff by 2008: Auburn, Bedford, Derry, Goffstown, Hooksett, Londonderry, and Manchester. All of these systems qualify as small or regulated small MS4s under Phase II.

Construction projects are subject to NPDES permits, with projects affecting more than five acres qualifying as Phase I and projects affecting one to five acres qualifying as Phase II. Phase II projects can claim exemption to the permits on conditions of low predicted rainfall on the site, an approved Total Maximum Daily Load, or an Equivalent Analysis that ensures that pollutants are being treated by alternate means. EPA serves as the permitting authority for all Phase I and Phase II permitting grants in New Hampshire, such that all questions and applications should be directed to the EPA.

All of the towns listed above except Auburn have site plan and subdivision regulations or zoning Overlay Districts with special performance standards or restrictions for stormwater management. Chester, Derry, and Hooksett also have Groundwater Protection Districts. Bedford also has adopted the Merrimack River Shoreland Protection Performance Standards within 250’ of the river, and Goffstown and Londonderry have Wetland Conservation Districts that include the protection of groundwater and aquifers.

The regulations for most of these districts are in accordance with the Stormwater Management and Erosion and Sediment Control Handbook for Urban and Developing Areas in New Hampshire, published in 2002, and includes prohibitions against dumping wastewater, chemicals, or solid waste in these zones. In addition many of these towns have public education campaigns to encourage the safe disposal of hazardous materials to prevent their leakage into the MS4. See figure 13.1.

Manchester has a Stormwater Ordinance accompanied by Rules and Regulations that stipulate all construction projects and industrial activities must have a Stormwater Pollution Prevention Plan registered and sealed by a professional engineer. Their ordinance prohibits dumping or storage of wastes and hazardous materials into the MS4, including the streets, curbsides, and drainage areas. The rules also prohibit pollution of buffer zones around surface waters and excavation of ground material near an MS4.

Clustered subdivisions employing techniques of low-impact development (LID) can significantly reduce stormwater runoff pollution and thereby protect the region's valuable water supply. Through minimizing impervious surfaces, decentralizing stormwater runoff, preserving open space, and incorporating natural systems, LID stormwater management practices offer an effective and money-saving solution to stormwater management. Municipalities can add regulations that require new developments to minimize impervious surfaces and employ other LID techniques.

Solid Waste

Most towns in the region provide solid waste services composed of a combination of private hauling services and solid waste transfer systems, many of which also serve as recycling centers. The towns with private trash haulers are Bedford, Candia, Chester, Deerfield, Derry, New Boston, and Weare. Hooksett, Londonderry, Manchester, and Raymond have municipal services to collect solid waste. Solid waste is carried to local transfer stations, with a station located in each municipality. Most towns send their waste to private landfills or solid waste treatment facilities located outside of the region. Recyclables, metals, woods, and other sorted waste are distributed accordingly throughout the state and region.

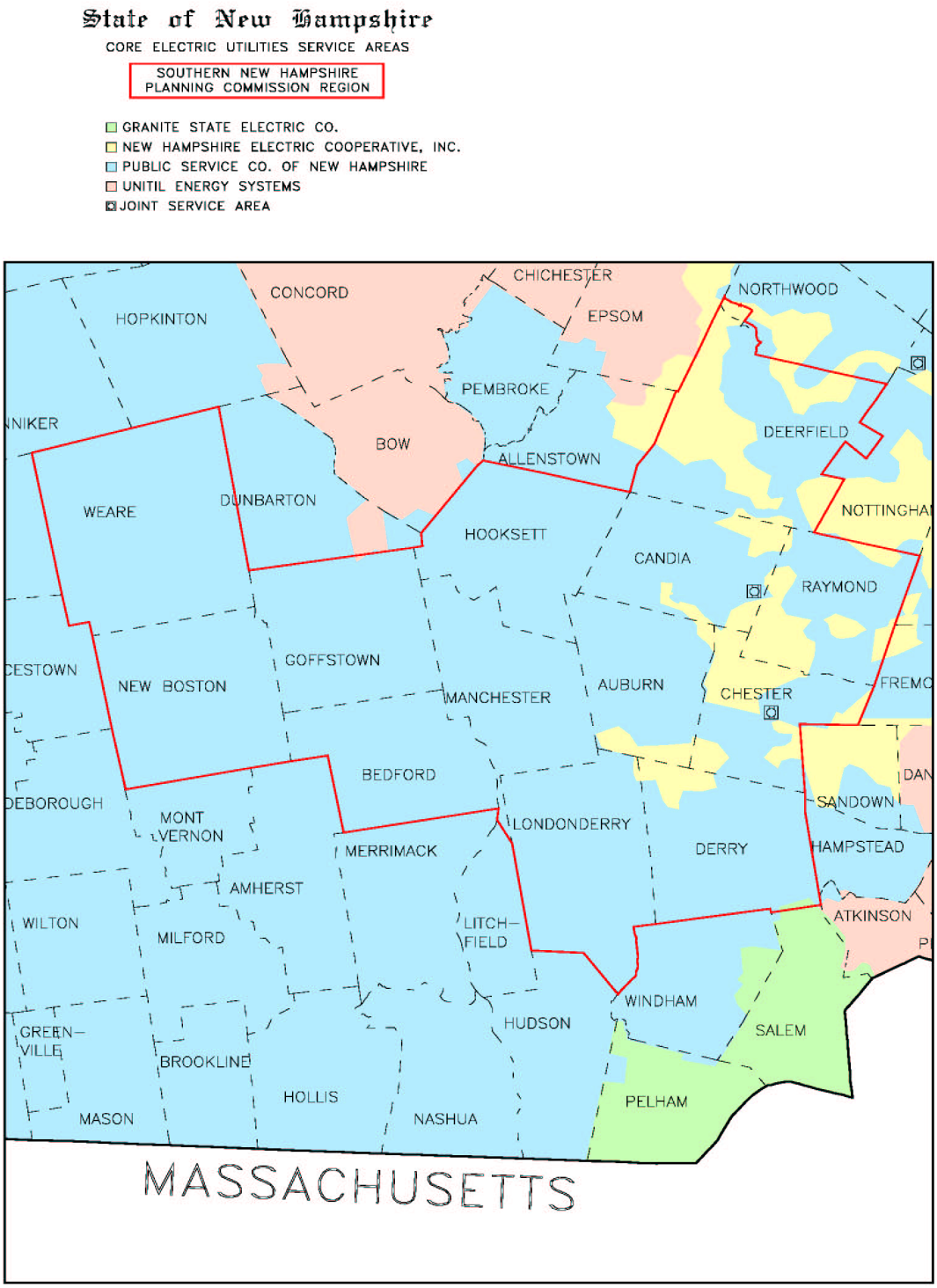
Recycling has become an important component of municipal solid waste programs to defer the transfer costs for solid waste. The following towns have mandatory recycling programs: Auburn, Candia, Chester, Derry, Goffstown, New Boston, and Weare. Due to its strengthening mandatory recycling program, Chester was able to achieve a net profit of $36 in 2004 from recyclables, with 39% of its total solid waste being recycled. The remaining towns have voluntary recycling programs (Bedford, Raymond, Deerfield, Hooksett, Manchester, and Londonderry). The towns that do not currently have mandatory programs cite the costs of regulation and enforcement as impediments, or in the case of Raymond, give monetary incentive to residents to recycle.

In 2005, the Town of Raymond instituted a "pay as you throw" solid waste program that has reduced trash volume by 61%. Under this system, residents pay $2 per bag of solid waste to a hauler contracted by the town who collects and sorts recyclables at no charge. Residents also have the option of paying private haulers, who charge for recyclables. Even at the start of this program, the town was saving thousands of dollars and bringing in enough revenue to almost match the costs of disposal, which results in tax reductions for residents. This type of program, where residents are financially rewarded for recycling solid waste, leads to economic and environmental benefits for the community.

Waste Management facility in Londonderry

All towns in the region except Deerfield also have organized hazardous waste collections on a biennial, annual, or semi-annual basis, either individually or in collaboration with neighboring towns. Typical material selected includes paint (oil based), aerosols, resins and adhesives, pesticides, asbestos/coal tars, batteries, acids, bases, florescent bulbs,

Figure 13.2
Core Electric Utilities Service Area



Source: SNHPC

antifreeze, used oil, gasoline, TVs, mercury devices, and propane tanks. As illustrated in Table 13.1, hazardous waste collection can be costly for municipalities.

The Southern New Hampshire Planning Commission, in conjunction with the Department of Environmental Services, is considering an initiative to establish a regional hazardous waste collection system. Under the proposed system, the thirteen towns of the region would be assigned to one of four geographically centered collection sites, with hazardous waste collected on an annual or semi-annual basis. The SNHPC hopes to reduce costs of hazardous waste collection through this regional approach.

Table 13.1
Household Waste Participation and Costs (2004-2005)

Town	Households served/ Participation	Total Cost	Pounds collected
Auburn/Raymond	2,263/18	$6,033.00	4,686
Bedford	7,614/152	$7,420.23	6,858
Candia	1,629/81	$7,260.75	7,443
Chester (w/ Plaistow)	16,571/400	$17,325.00	19,135
Deerfield	No collection has ever been held		
Goffstown	7,125/186	$8,400.00	7,865
Hooksett	Collect all year at transfer station		
Londonderry/Derry	25,712/221	$12,600.91	7,970
Manchester	45,032/361	$21,237.00	3,065
New Boston	1,724/46	$3,629.52	2,273
Weare	3,240/45	$4,210.50	2,500

Source: New Hampshire Department of Environmental Services 2005

The State of New Hampshire currently offers a Household Hazardous Waste (HHW) grant program twice a year. This grant offers up to half the cost of collection for the communities served. The grant deadlines are January 15 and July 15, and applications can be obtained from the New Hampshire Department of Environmental Services at www.state.nh.us/des/planning/hhw.htm. It is hoped that this source of funding can be used to establish this regional system.

Utilities

Electricity

Public Service of New Hampshire and New Hampshire Electric Cooperative are the two primary electricity providers for the region. PSNH is the largest supplier, with service in all 13 municipalities. PSNH serves 460,000 residential and commercial customers throughout the state, with headquarters in Manchester. PSNH offers three-phase power for use in commercial and industrial operations to all towns in the SNHPC region, with availability varying based on the location within the town. Parts of Deerfield, Raymond, Chester, Candia, Auburn, Derry, Londonderry, and Manchester are also supplied by New Hampshire Electric Cooperative, a member-owned electricity cooperative serving 75,000 members across New Hampshire. NHEC maintains a district office in Raymond. Figure 13.4 shows the approximate coverage of electrical service providers for the region.

At present only a very small number of residents in the region use solar panels or other alternative energy sources for electricity. Some towns, such as Raymond and Auburn, require new developments to place electric utility lines underground. This could change in the future as the cost of fossil fuels continue to increase and energy conservation becomes more economical

PSNH has made developments to improve service to customers in the SNHPC region and across the state. The following are a few of the recent improvements and expansions of the past five years:

- The Tioga Power Project, completed in 2005, added new transmission lines and a new substation to serve Bedford and Merrimack to add capacity for future growth.
- In 2004 Londonderry was outfit with new terminal additions to meet increased customer demand.
- Substation capacitor banks around the state had toxic fluid replaced with environmentally neutral mineral oil in 2001 to reduce environmental risk.
- In 2003, the Pine Hill substation added a second transformer to accommodate growth in Hooksett, Auburn, and Candia.
- In 2004, the Chester substation also added a second transformer to serve Derry, Raymond, Deerfield, and Chester.

One of PSNH's most progressive projects, currently under development, is the Northern Wood Power Project. PSNH will replace the Schiller Station coal power

plant in Portsmouth with a renewable energy wood burning power plant that will serve customers in Southern New Hampshire The project broke ground in October 2004 with plans to be operational by summer 2006.

Natural Gas

Keyspan, Inc. distributes natural gas and propane to customers in southern and central New Hampshire, including the Greater Manchester area. The company has multiple rates and services as well as a service and dispatch center. In areas without natural gas systems, Keyspan sells propane to over 10,000 customers at retail and wholesale prices and quantities. Manchester, Bedford, Londonderry, Goffstown, Hooksett, Auburn, and Derry are all within the natural gas service area and remaining towns can purchase propane from Keyspan.

Telephone

Verizon is the primary telephone service provider for the SNHPC region. The company's state headquarters, accounting operations for New Hampshire and Vermont, and the market area center are all located in Manchester. Verizon serves both residential and business needs, provides a statewide fiber optic network, and provides services in information system enhancement, disaster recovery planning, Network Management, and cellular services. Granite State also provides phone service within the towns of Weare and Auburn.

The region is served by additional private long distance, cellular telephone, and voice mail services. All major carriers maintain service stations in Manchester, with availability and coverage in most parts of the region.

Wireless communications are served by cell towers, which are located in every municipality of the region except for Auburn. Concentration is higher along major interstates and state highways, although the past few years have witnessed increasing service even in rural areas of the region.

Hoyt cell tower in Chester.

The construction of new towers is a highly regulated issue for planning and zoning boards who mitigate between the increasing need for wireless services and the aesthetic preservation of the town. Chester, Derry, and Weare already have Telecommunications Overlay Districts while the remaining towns in the region encourage or mandate companies to use existing tower facilities rather than constructing new ones. Towers have setback, design, and zoning regulations. All towns should adopt strict regulations

that force competing companies to cooperate on the use of telecommunications infrastructure and transmission structures in order to minimize impact to town and increase the efficiency of communications systems.

Cable Television and Internet

Private companies provide cable television and internet services throughout the region. In Manchester, dozens of cable and Internet providers offer residents and businesses a range of services and prices. The region is remarkably well-wired for Internet coverage, with even the small rural towns of Deerfield, Candia, and Weare having over 20 options for high-speed Internet (providers install connections for a fee).

Often, only one company will be a primary server for cable and Internet for smaller towns. AT&T Broadband serves Cable TV to most of Auburn, MetroCast Cablevision provides cable for all of Deerfield, Comcast is the primary cable provider for Manchester, and Media One provides cable TV and Internet for Raymond. The towns of Auburn, Bedford, Chester, Derry, Goffstown, Londonderry, Raymond, and Weare along with the City of Manchester all have Public Access Channels, while the Towns of Candia, Deerfield, Hooksett, and New Boston do not.

Future Conditions

Public utilities and communication are important lifelines for economic development in municipalities and the region. While to a certain extent residences can flourish with private wells and septic systems, businesses need larger-scale water, sewer, electricity, and communications systems to operate successfully. Furthermore, affordable housing often requires community or municipal water and sewer services. Frequently this is because of increased density. Currently, expanding the capacity of municipal water and sewer systems is costly. Towns and cities in the region should evaluate their public utilities needs for the future.

Expansion to large scale systems

Manchester, Derry, and Londonderry all have extensive sewer systems to meet the needs of their industrial, commercial, and dense residential areas. In Manchester, the vast majority of the city is connected to the sewer system while Derry and Londonderry have increased connections to reach newly developed areas. While these towns currently operate well, these systems are quickly approaching capacity and simultaneously face new development pressures as a result of the I-93 expansion. In conjunction with the I-93 widening, Manchester, Derry, and Londonderry need to examine the limitations of their current systems and the potential to handle future growth.

Reaching new development

Hooksett, Bedford, and Goffstown are experiencing rapid growth in the form of high-density housing developments and commercial businesses. Most of this growth can be accommodated through the expansion of current systems. However, there is a limit to this cost and the use of Tax Increment Financing can be used to help fund infrastructure improvements in these areas.

Foreseeing growing pains

Raymond is currently considering the feasibility of developing a municipal sewer system to Exit 4 and its high-density downtown area. Some of the region's small towns, experiencing increasing population or business growth in the coming decades, may be wise to encourage dense development and install public utilities in these areas. Others in the region without municipal water or sewer may never have a need for a large-scale municipal water or sewer system, and these towns can recruit small-scale development accordingly. Weare, with very small water and sewer systems, addresses the needs of its limited high-density development without exceeding the scale of the town.

Sewer and water systems

As population growth continues and goals of economic development are realized, the region will face increased construction in rural areas without water or sewer systems. Currently, the standard for rural homes and businesses is to build on large lots that can accommodate private septic systems and wells. However, changing patterns of development involving office parks and clustered subdivisions (which allow for cost-efficient infrastructure) introduces challenges of sewage disposal and water service.

Fortunately, a variety of environmentally sensitive sewage options and communal water facilities can be implemented in rural areas with denser buildings. These options can be cost efficient and require minimal maintenance, yet they do require careful planning at the time of construction.

All development sites should be mapped for environmentally sensitive features, developable land, aquifer locations and potential well sites, and soils adequate for sewage disposal. In the case of parcels with significant open space, areas buffered from the buildings can adequately serve as sewage and stormwater treatment sites.

In the case of denser development in an area without a sewer system, some of the following options for on-site sewage systems may be pursued:

- Common septic system with absorption trenches: This system involves larger, jointly owned absorption areas with either individual tanks or a large, common tank. In the case of limiting soil conditions, this system can be combined with sand filters, lagoons, or soil treatment mounts to treat discharge.
- Soil treatment mounds: A shared mound system placed in a low-impact area and treats effluent as it drains through the mound. This system can be used in areas with bedrock, high groundwater, and compact clay soils.
- Bioretention: This seasonal treatment option uses constructed wetlands, sand and grass filters, and shallow ponding to treat sewage.
- Sand filters: Similar to soil treatment mounts, sand filters treat wastewater by filtering through the sand. However, these are either open or submerged rather than built-up.
- Spray irrigation: This above-ground method pre-treats and then discharges wastewater to be absorbed by vegetation or crops. A slow rate approach uses wastewater to irrigate and fertilize crops where the overland flow method trickles wastewater down a vegetated slope of land into drainage channels. Both methods have been used successfully in New Hampshire. Spray irrigation treatment sites can include woodlands, agricultural fields, golf courses, and residential yards.

If a development is too far to be efficiently connected to a municipal water system, a community well is usually the best option for providing water to a larger population. The well should be located away from potential pollutants and roadways, and costs can be shared by residents and businesses. In the case of single family detached homes, private wells are still the most cost-effective solution. For all municipal or community wells, Wellhead Protection Programs should be in place to protect the water supply from pollution.

All businesses have the potential to improve their utility systems to save money and reduce dependence on public resources. These include underground recycling compost for sewage and drip irrigation system for gray water (water from sinks and showers). As increases in alternative wastewater systems would profit towns through decreased water and sewer usage and treatment, municipalities should consider offering site plan review or other zoning incentives to businesses that include these plans with their application.

Municipalities can take additional steps to encourage creative water and sewer systems and to reduce municipal costs for providing these services. In towns with existing municipal sewer and water, developers should pay connection fees to join existing system. Municipalities can offer incentives to clustered subdivisions with plans that include common wells and septic systems, such as decreased regulations and streamlined approval. Clustered conservation subdivisions can significantly reduce additional infrastructure costs, thereby justifying the zoning incentives.

Concerns and Recommendations

This section addresses some of the public utilities and communications challenges facing the SNHPC region. The largest concerns are the high cost of infrastructure construction to towns currently experiencing budgetary constraints. Each challenge is accompanied by recommendations for regional cooperation and action.

Municipal Solid Waste Agreements

Most of the towns in the region have transfer stations to collect, condense, and transfer the solid waste of the town. Due to an increase in trash tonnage and pay-per-ton disposal fee charged by solid waste treatment centers, solid waste disposal expenses in general have escalated. Larger transfer stations serving multiple towns are more cost-efficient, yet there is only one example of a shared facility in the region, the Waste Management Inc. facility in Auburn, which is owned and run by a private contractor.

New Hampshire RSA 53-B:7 allows for solid waste management districts (SWMD) to build and operate solid waste facilities that serve multiple cities and towns. Under this statute, solid waste management districts received power delegated from member municipalities concerning solid waste regulations, and they can charge expenses to member towns. Solid waste management districts are also permitted to make special contracts or agreements with the municipality in which the facility is located that may grant special privileges to the host community, thereby offsetting any negative consequences of hosting the site. Finally the SWMD may accept solid waste generated outside the boundaries of the district and may contract solid waste services with private companies.

Municipalities in the SNHPC who enact a SWMD can build upon successful solid waste systems in the region while cutting infrastructure costs. New transfer stations that utilize carefully planning on a regional level can avoid problems of noise and pollution. Transfer stations can be constructed in existing industrial areas or include mandatory buffer zones to reduce the impact on residents.

Mandatory recycling programs can significantly curtail the amount of waste that the town has to pay to dispose of. Towns should look into the benefits of curbside recycling pick up, which may end up saving money if the town can convert their percentage of waste recycled versus disposed through conventional means. Municipalities also might consider composting facilities on a town or regional level, which will also decrease the total weight of solid waste. At a minimum, school cafeterias and local restaurants can start small-scale composting of food waste. Local agricultural operators may use this compost to fertilize their crops.

Underground utilities

New subdivisions require extensive infrastructure. Many municipalities already mandate that new developments must install underground utilities, furthering the expense of the installation to developers. Municipalities can create regulations that require joint trenching techniques in utility corridors for all utilities, including electricity, water, sewer, natural gas, cable, and telephone. Doing so will save time and money for installation, and corridors can be easily accessible for repair. This technique requires communication between utility companies, which can add to the efficiency of the system.

Clustered conservation developments

Trends toward clustered subdivisions and multi-family developments mean a greater percentage of residents in suburban and rural areas need a shared water system. In many cases, condominium owners do not have expertise to manage a small private water system. Local and regional officials can develop a plan with Manchester Water Works and Pennichuck Water Service Co. to purchase small scale water systems in existing developments and to contract services out to new developments. Under these arrangements, the systems will still be financed privately by the residents or condominium association but will be operated by a large scale operator. The guidelines of the plan should be streamlined and user-friendly so as to encourage developers and condominium owners to take advantage of this opportunity.

Stormwater pollution

Runoff from parking lots, roadways, and other developed surfaces is the largest source of water pollution in the nation. While the water supply in the SNHPC region is currently safe, proper management of stormwater in the years ahead can prevent costly clean-up in the future. The UNH Stormwater Center studied the effects of multiple stormwater treatment options in the first comparative study of its kind in New Hampshire.

In the first year of the study, researchers determined that layering soils and plants in a gravel wetland unit is very effective in minimizing pollution to nearby waterways or aquifers. The wetland does not freeze due to compost in the soil. Other methods tested include:

- Surface sand filters
- Retention Ponds
- Bioretention units
- Aqua Swirl and Aqua Filter Systems
- Storm Drift Manhole Refit

- Vegetated Swale
- Porous Asphalt Pavement
- Tree Box Filter

Methods vary in efficacy depending on the volume, scale, location, and type of road or parking lot. All systems can be viewed in action at the UNH Durham campus. More information on these methods can be found at the UNH Stormwater Center website: http://www.unh.edu/erg/cstev/.

The new research on stormwater management can be easily integrated into new developments, regardless of whether or not the development requires a NPDES permit. Towns can adopt zoning regulations that mandate stormwater management methods for new developments or encourage these additions through incentives.

Communication hub

Verizon's major switching hub in Manchester is a weak point in the state's emergency communication's system. A water line leak shut down long distance service throughout the region for 3½ hours on September 26, 2005. By handling so much long distance traffic in one location, the region is vulnerable when unforeseen circumstances cause the location to shut down.[3] As the region is susceptible to water line shut downs, electrical failures, and severe storms, regional and state officials might consider working with communications vendors to develop guidelines for emergency shut-downs.

Multiple Internet and cable providers

While most areas of the region choose to install high speed Internet and/or cable television into their home or business, not all areas can choose the provider. Goffstown Selectmen Chairman Gossett McRae says of the potential for multiple providers, "We are always looking for some little edge to make competition with bigger cities in the area. (Multiple providers) give us a data infrastructure that is attractive to businesses, which is a plus for Goffstown."

In order to target businesses to the region and increase tax revenues, municipalities can break down barriers to private communications companies. One way of doing this is to work out franchise agreements with communications companies, in which a small fee from the company's total income is paid to the town. The small source of revenue pales, though, in comparison to the tax benefits these moves could bring by attracting businesses.

3 Kathryn Marchocki, "Hub called a weak point," The New Hampshire Union Leader, 28 September 2005.

Conclusion

The Southern New Hampshire Planning region faces a challenging mix of growth related issues, which demand unique solutions for public utilities and communications. The priority of the region should be for all residences and businesses to have safe and efficient access to water, sewer, waste disposal, electricity, and communications at a cost that is not burdensome the public. While there is no single solution, regional coordination of water and sewer systems, local collaboration for utilities and communications, recycling and conservation of resources, and creative methods for site-specific utilities offer viable alternatives.

The provision of well-planned utilities and communications systems promote economic development and the ensuing tax dollars that can support schools, roads, and other infrastructure improvements. Successful systems also have built-in measures for emergency situations, which can be as simple as coordination between systems or towns. Many towns in the SNHPC region already have innovative and effective systems in place to provide utilities and communications to their residents and businesses. Key components of the successful implementation of optimal systems will be communication between towns and between utility providers as well as a willingness to combine resources and work together.

Chapter Fourteen:

Transportation

Introduction

The Southern New Hampshire Planning Commission region is served by highway, air, and rail facilities. Due to its existing highway infrastructure, which includes Interstate 93, the F.E. Everett Turnpike, US 3, and New Hampshire Routes 101 and 28,. The Manchester area also serves as the hub of the motor freight industry in New Hampshire. More than a dozen major common carriers have terminals in the area, and the highway system provides the majority of passenger and freight movement.

Passenger transportation is provided by automobile, air, taxi, and bus. Air service primarily provides long haul, high-speed service for business executives, and high value goods delivery. The regional rail system is limited to material bulk movement and presently does not service passengers.

The Manchester Transit Authority (MTA) provides fixed route bus and paratransit service. Three existing MTA routes also extend into Bedford, Goffstown and Londonderry at Manchester-Boston Airport. Approximately 90 percent of Manchester residents live within one-quarter mile of MTA service.

The Transportation Equity Act for the 21st Century (SAFETEA-LU) requires Metropolitan Planning Organizations (MPO) to develop and implement the Transportation Improvement Program (TIP) which must be updated at least every two years. The FY 2007-2010 TIP for the SNHPC region includes all regionally significant transportation projects as well as related planning and research, along with their costs, funding sources, and operating agencies. The SHNPC is the designated MPO for the 13-community region.

The FY 2007-2010 Unified Planning Work Program (UPWP) for the SNHPC includes the description of all transportation and transportation-related planning activities during that period. The UPWP provides linkage between the federal planning requirements outlined in the RTP designed to improve transportation in the region and specified work tasks.

In compliance with SAFETEA-LU and other federal mandates, the SNHPC uses projections and data for a diverse array of regional transportation modes utilized for the movement of people and goods to develop information required for the TIP and UPWP. The plan also considers the intermodal nature of the transportation system.

Projects from the TIP and planning principles and goals expressed in the UPWP are presented in the *Regional Transportation Plan and Transportation Improvement Program FY 2007-2010* (RTP) for the SNHPC region. This chapter is based on and provides a summary of the RTP, which considers projections for transportation system

needs through 2025. The RTP addresses all forms of transportation used in the thirteen municipalities and outlines existing and future conditions. It also discusses initiatives to address needs and final prioritized recommendations for each mode of transportation. The plan is intended to establish a master guide for funding transportation projects.

Prioritization of the plan recommendations results form a screening process that uses seven factors identified and mandated in TEA-21 to assure that impacts associated with health, safety, welfare and the environment are properly weighed in the public interest. Projects included in the RTP have been prioritized based on the following four-step process:

1. Review of previous transportation studies in the region from which an extensive list of feasible projects was derived.
2. The application of traditional transportation planning techniques using data developed for the base year (2000) and the future year (2025). Travel demand forecasting, technical evaluation and analysis, and alternative assessment procedure produced a master list of projects for further consideration.
3. Project evaluation considering the seven factors specified for the UPWP, mandated by the TEA-21.
4. Public evaluation and endorsement.

Issues and Concerns

The Southern New Hampshire planning region faces a projected influx of about 30,000 residents over the next decade (SNHPC). With increased population comes increased traffic on roadways that are already at capacity, spurring roadway expansions and construction projects to ease congestion. The NHDOT's priority list of projects for the next 10 years is detailed later in this chapter.

These traffic improvements, deemed necessary to meet growing transportation demands, come at a price—one which municipalities in the region cannot necessarily afford. The state has committed nearly $200 million for projects in the SNHPC region over the next ten years, but in some cases important transportation improvements require matching or total funding from municipalities. Towns face the extreme challenge of financing projects on tight budgets as the number of vehicles on the road continues to increase.

Due to the financial challenges of maintaining roadway capacity for the growing population, the Southern New Hampshire Planning Commission, along with planning experts across the nation, are looking towards transportation alternatives to mitigate current excessive traffic demands. Among the issues explored in this chapter are Transit Oriented Development, Transportation Demand Management programs (reduction of

single-occupancy vehicle commute trips to the workplace), and commuter rail potential for Manchester.

Existing Conditions

The SNHPC region contains a diverse array of transportation options. This section details the existing conditions of each mode of transportation.

The majority of SNHPC residents make daily trips to work by car, and this percentage has increased in the past decade. In 2000, 83 percent of SNHPC residents drove alone to work, with an average commute time of 29.35 minutes, up from 26.94 minutes in 1990 (see Table 14.1).

Table 14.1
Commuting Methods and Times for the SNHPC Region (1990-2000)

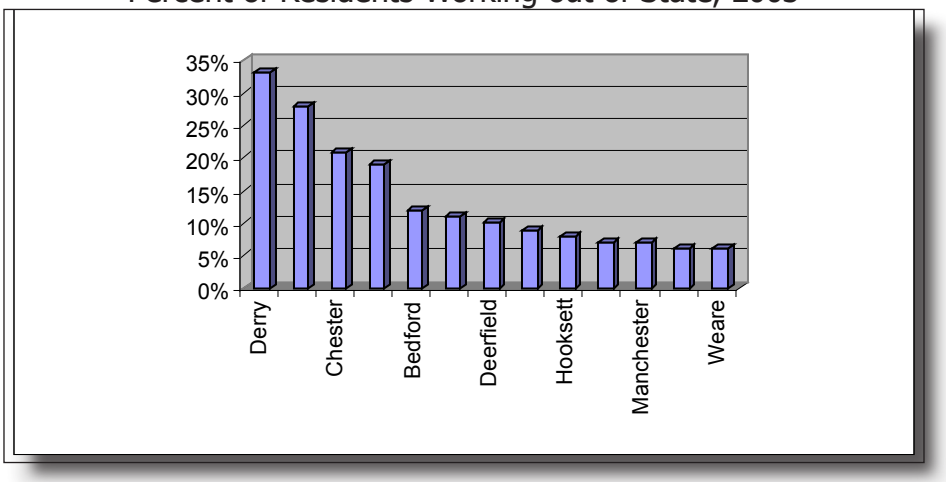
Municipality	Drove Alone		Carpooled		Public Transportation (Including Taxi)		Bicycled or Walked		Motorcycle or other means		Mean Travel Time to Work	
	1990	2000	1990	2000	1990	2000	1990	2000	1990	2000	1990	2000
Auburn	79.3	87.9	15.4	6.8	0.5	0.4	1.5	0.3	0.4	1.3	25.6	26.7
Bedford	85.5	86	7.5	5.4	0.4	0.3	1.2	0.5	0.5	1.5	21.4	27.2
Candia	79.6	86.5	12.1	9.4	1.1	0.5	2.1	0.5	0.8	0	25.8	28.3
Chester	79.9	84.2	10.4	6.8	0.6	1.2	2.4	0.6	1	0	32.3	32.2
Deerfield	82.6	86.6	9.7	7.8	0.3	0	1.4	1	1	0.3	33.6	33.9
Derry	83.3	84.9	12.1	9.7	0.6	0.8	1.3	1.4	0.5	0.6	29.6	31.1
Goffstown	78	81.7	11.5	8.5	0.1	0.1	6	5.1	0.5	1	22.6	26.1
Hooksett	87.8	82	6.9	8.8	0.5	1.6	1.6	3.6	0.2	0.4	20.7	25.7
Londonderry	82.8	86.3	12.1	7.9	0.8	1.3	1.7	0.7	0.5	0.6	28.3	29.7
Manchester	76.9	81	14.2	11.9	1.5	1.4	4.8	3.1	0.6	0.4	18.8	21.3
New Boston	79.1	82.4	14.1	10.5	0	0.5	3	1.3	0.5	0.6	29.3	32.7
Raymond	81.2	83.7	14.4	12.3	0.6	0.2	1.3	1.5	0.5	0.2	31.2	31.6
Weare	82.4	81.6	13	11.5	0	0.4	0.4	2.1	0.6	0.4	31	35.1
SNHPC Region	80.0	83.0	12.7	10.0	0.9	1.0	3.3	2.3	0.5	0.6	26.94	29.35
State of New Hampshire	78.2	81.8	12.3	9.8	0.7	0.7	4.4	3.1	0.8	0.6	21.9	25.3

Source: 2000 Census Transportation Planning Package

In addition to the strong commuter preference of single-occupancy vehicles, a large number of residents in the SNHPC region commute daily out of state (in general to Massachusetts) to their place of employment. This ranges from 33% of residents in

Derry, a town with easy access to Boston via I-93, to six percent for the towns of Weare and New Boston. Londonderry, Chester, and Raymond also have large populations of out of state commuters, making this issue an important concern for the region with economic development implications as well.

Figure 14.1
Percent of Residents Working out of State, 2003



Source: 2003 New Hampshire Employment and Labor Market Information Community Profiles

Major freeways, such as Interstate 93 and the F. E. Everett Turnpike, primarily carry through traffic while arterial roads, such as NH 101, NH 28, and US 3 access adjoining properties and local roads. Daily traffic on the major roadways in the SNHPC region is continually monitored by both the commission and the New Hampshire Department of Transportation. Exhibit 1 provides information on existing base year traffic volumes on selected roadways within the SNHPC region.

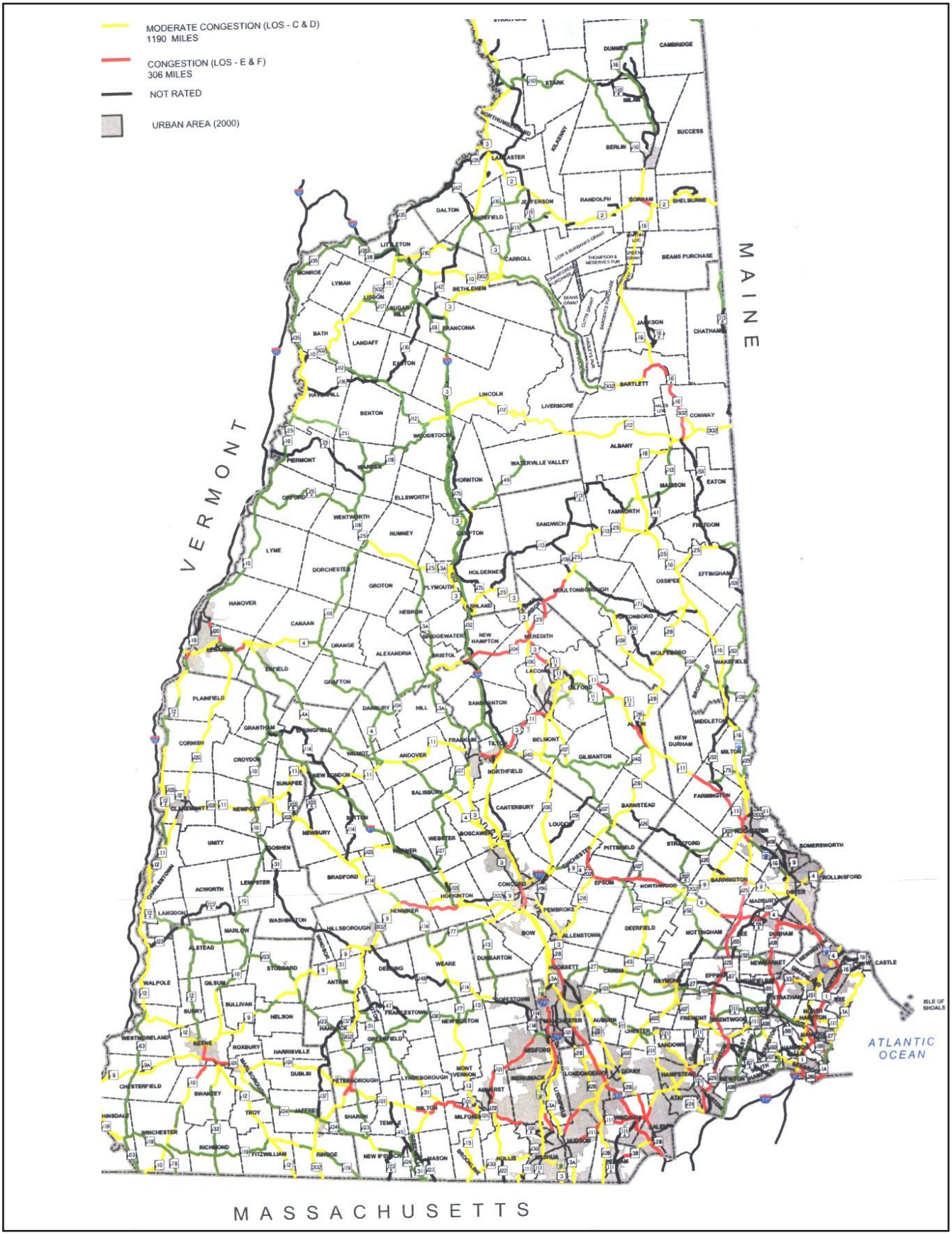
Traffic congestion in New Hampshire is measured in terms of Level of Service (LOS) A through F, with A being free flowing and F being heavily congested. Out of 2,730 miles of major state highways, including state maintained and numbered routes, 310 miles are congested at LOS E and F and 1,190 miles are moderately congested at LOS C and D. Figure 14.2 on the following page shows the LOS ratings for NH state roads in 2004. The most congested roads are visible in red. The map shows clearly that the SNHPC has among the highest concentration of congested and moderately congested roads in the state. The largest volumes of traffic flow occur in and between major traffic generator locations, including areas with concentrations of business, industry, airport-related functions and large residential developments. The SNHPC region generators are identified as follows:

1. Manchester Airport/South Willow Street area; manufacturing, wholesale distributors, retail sales and services

2. Manchester downtown central business district; offices, retail sales, entertainment, and services
3. Londonderry, Route 102; retail sales
4. Derry, Rute 28, Crystal Avenue; retail sales, manufacturing
5. Hooksett, U.S. Route 3; retail sales and service companies, manufacturing
6. Bedford, Route 3; retail sales

A school bus on Bog Road in Goffstown.

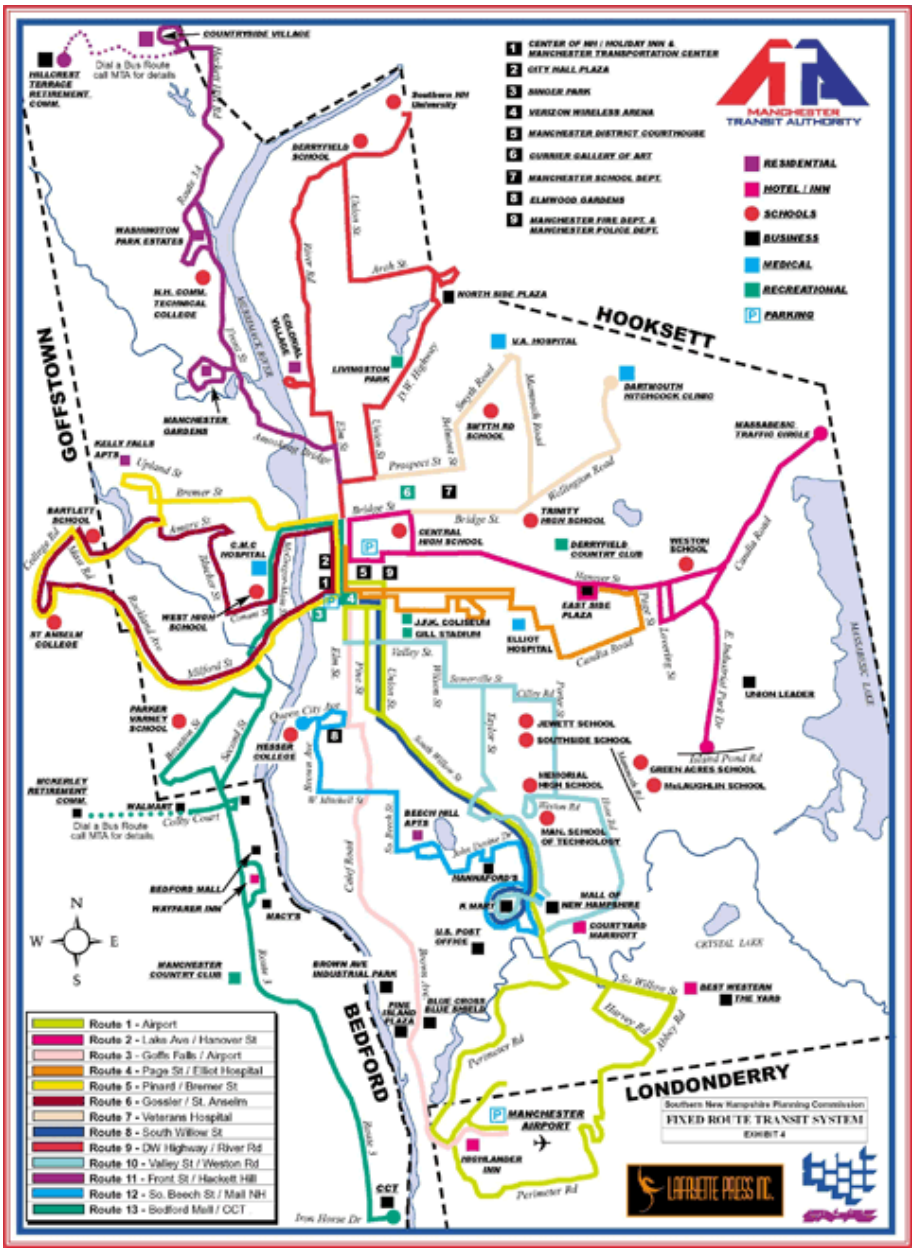
Figure 14.2
Congestion on State Roads



The Manchester Transit Authority provides fixed route bus service on fourteen routes, depicted in Figure 14.3. The MTA provides service Monday through Friday between the hours of 5:25 a.m. and 7:00 p.m., with nine routes providing additional service between the hours of 7:30 a.m. and 6:55 p.m. on Saturdays. One-way fares are $1.00, with discounts for senior citizens, handicapped passengers, students, and multiple ride passes. The MTA primarily runs within the city limits of Manchester, with three routes giving limited access to surrounding towns. The frequency of service is approximately one hour.

Ridership on the MTA has generally decreased throughout the 1980's and 1990's due to route reductions and fare increases. Multiple fare increases in the late 1980s and early 1990s likely account for declining ridership, and reductions in service continuing through the 1990s extended this decrease through the past decade. Minor changes were made to bus routes in 2000, including increases in service to local colleges and universities. Further changes occurred in September 2003 with additional round trip sand service to Manchester Airport. Statistics for 1988 through the fiscal year 2002 indicate a stabilization of ridership, yet substantial drops of ridership in 2002 interrupted this pattern.

Figure 14.3
MTA Routes



Several carriers operate inter-city bus service with stops in the SNHPC region. Concord Trailways provides service between Concord, New Hampshire and Boston, Massachusetts with 18-22 trips daily through Manchester and 9 trips a day Monday through Friday through Londonderry. Vermont Transit Lines provides service from Hanover, New Hampshire to Boston, including five southbound and five northbound

stops each day, servicing Manchester Transit Center and/or Manchester Airport. Peter Pan Trailways offers limited service between Concord and Worcester, Massachusetts, and the carrier services one trip daily through Manchester.

In 2004, 34 truck freight carriers and three liquid or dry bulk carriers operated in the Southern New Hampshire Planning Commission region and were based primarily in Manchester, Londonderry, and Hooksett. Approximately 83.7 percent of all New Hampshire communities are served exclusively by trucks, and trucks move 92.8 percent of all manufactured freight to and from New Hampshire. These carriers primarily use major streets and turnpikes in the Manchester area for efficient access for larger vehicles. Trucks can link to air transport at Manchester Airport, Logan Airport, and Pease Airport and to rail transport in Nashua, Manchester, and Boston. Limiting factors to freight flow include poor weather, speed limits, road quality, road grades, bridge capacity, truck size restrictions, private loading/unloading provisions, availability of qualified drivers, narrow streets, and illegally parked vehicles.

Manchester Airport, New Hampshire's largest commercial air traffic facility, offers 306,000 square foot passenger terminal with modern airport amenities. Seven major airlines provide domestic passenger service at the Manchester Airport and four regional airlines, the largest being Southwest with approximately 40 percent of the passengers. Additionally, Air Canada provides several daily flights to Toronto, Canada. Six all-cargo airlines also serve the Airport.

Entrance to Manchester Airport

Manchester Airport and the Manchester Transportation Center on Canal Street in Manchester serve as key links between several modes of transportation. Manchester Airport serves as a junction of trucks, passenger vehicles, buses, bicycles, and planes; Manchester Transportation Center serves as a junction of buses, passenger, vehicles, bicycles, pedestrians, and perhaps future passenger rail. In addition, several warehousing areas throughout the region connect trucks, passenger vehicles, and rail cars.

Although the percentage of bicycling and walking trips is very low, these trips have been increasing steadily despite lack of concerted government support. The SNHPC updated its bicycle and pedestrian plan in 2002 with the following objectives:

- Establish a continuous and coordinate regional bikeway and pedestrian walkway system that is well-linked to local municipalities systems and systems of adjacent towns and regions;
- Make biking and walking safer;
- Create an inviting, viable alternative to motorized travel;
- Promote public awareness and acceptance of bicycling and walking for transportation and recreation;
- Fully and meaningfully integrate bicycle and pedestrian needs into land use planning, transportation planning, highway design, and highway maintenance processes.

The plan proposes strategy changes in land use planning, engineering policy, education, public and private sector encouragement, and law enforcement. The plan also proposes changing practices at the project level including signage, supporting facilities, traffic calming, and principle guidelines for shared use path design, pedestrian planning and design, and bicycle planning and design. Finally, the plan suggests a planning process for implementing these improvements in each community.

There are approximately 464 miles of railroads in use in New Hampshire, owned and operated by thirteen different entities. All railroads are rated according to the standards of the Federal Railroad Administration.

Future Conditions

To assess the region's existing highway facilities and plan for future changes, the SNHPC maintains a regional transportation model. The model utilizes the TP+/VIPER commercial travel demand modeling software package and the Commission's socio-economic database. The region's principle street system is divided into links and nodes. Each link in the network has specified length, average speed, number of lanes, capacity, and use with one-way or two-way traffic. Within the model network of links and nodes, the region's thirteen communities are represented by 220 internal traffic zones and 67 external stations. The traffic forecasting procedure follows a standard four-step process:

1. Trip Generation - determine number of trips in each zone
2. Trip Distribution - determine origin and destination patterns of trips in each zone
3. Mode Split - determine what type of transportation each trip will use[1]
4. Trip Assignment - determine which routes the trips will take to their destination

1. No modal split analysis has been applied to the data because transit ridership is an insignificant percentage of total travel activity.

The traffic assignment portion of the model uses an algorithm that reflects the way traffic gradually diverts away from roadways as they become congested. The assignment portion also includes movement counts and timing data from all signaled intersections in the SNHPC region to account for vehicle delays at these intersections. Finally, the model factors in capacity of roadways and delay at the signals.

The regional transportation model has undergone a validation process to ensure that it reasonably estimates base year (2000) travel activity in the region. This validation process has a degree of built-in error and is considered to make reasonable travel estimations given reasonable future year input.

Traffic assignments were prepared for 2007, 2010, 2017, and 2025 to coincide with the requirements for air quality conformity determination. Each of the above years was analyzed for both "Build" and "No-Build" scenarios. If a project had a National Environmental Policy Act (NEPA) approval, it was placed in the No-Build scenario. In cases where no NEPA approvals are necessary, if the project had received other required approvals or is being implemented or was implemented, or had been in a previously approved TIP then the project was also categorized in the No-Build scenario of the respective analysis year. If a project didn't fall into any of the above categories, then it was placed in the Build scenario. Once a project was placed in the Build scenario, it continued to be in the Build scenario for all the analysis years and was not placed in the No-Build scenario until one of the above conditions was met.

The overall growth in terms of volume on roadways averages to an annual rate of 14.1 percent. Growth rates at individual spot locations vary from 0.3 percent to 3.0 percent annually, assuming uniform growth. The 2025 projections reveal that regional Vehicle Miles Traveled (VMT) which measures the overall daily use of a region's highway system will total 9,576,313, up from 6,806,272 in 2000, or an average increase of 1.4 percent per year over the 25-year planning horizon.

Based upon link capacities in the model, many roadways currently operate at or above capacity during peak hours, and an even greater number are predicted to reach capacity by 2025. Among the roadways already operating at capacity are NH 101 in Bedford, I-93 in Londonderry and Manchester, I-293 in Manchester, NH 114A in Goffstown, NH 102 in Londonderry, and US 3/NH 28 in Hooksett. Roadways expected to have exceeded capacity by 2025 include Route 101 in Auburn and Bedford, NH 3A in Hooksett, NH 28 Bypass in Auburn and Hooksett, NH 28 in Londonderry and Derry, NH 128 in Londonderry, and NH 102 in Derry.

A comparison of the existing network in 2025 with the projected Build traffic assignments shows a decrease in traffic in the Build scenario on I-293 between I-93 and the F.E.E. Turnpike, on portions of South Willow Street in Manchester, and on Crystal Avenue in Derry. Certain areas will experience increases in the Build scenario, particularly

along the F.E. E. Turnpike with the two new interchanges. While the total VMT shows an insignificant decrease between Existing and Build highway networks, the new highway facilities will shorten the trip length for some with a more direct route while lengthening the trip length for others with a longer but faster new route. The model results also indicate that the Build network will decrease congested vehicle hours by 6 percent over the existing network scenario for the year 2025. Vehicular emissions for the Build scenarios conform to the Clean Air Act of 1990.

Bridge over 293 in Hooksett

The SNHPC promotes Transportation Demand Management (TDM) to reduce the number of single-occupancy vehicle trips. Organized TDM programs can include benefits such as vanpools, bicycling and walking programs, incentive programs, and compressed workweeks. While office employers can coordinate TDM benefits for their employees, Transportation Management Associations can coordinate TDM commuter benefits on a regional scale, making TMAs a valuable transportation administration tool for the region.

Despite declining levels of ridership on the MTA system, the popularity of transit facilities is expected to increase by 2025 due to population growth and development, marketing efforts by the MTA, increased costs of personal vehicle travel, concerns for congestion and safety, and improved transit schedules and coach comfort. The SNHPC, in association with the Rockingham Planning Commission, is currently conducting a feasibility study to examine the potential for intercity bus service between Portsmouth and Manchester Airport. The RTP also includes information on the implications of system-wide growth for alternative modes of transportation and for multi-modal facilities such as Manchester Airport.

A substantial proportion of traffic in the region is created by commuters who live far distances from where they work. Transit Oriented Development, in which towns build mixed-use, pedestrian-friendly developments around transportation centers (such as transit stations or Park and Ride facilities) can be promoted as a response to this issue. These higher-density complexes allow residents to live in close proximity to retail services and have easy access to their workplaces. They serve the towns by easing infrastructure costs and reducing traffic congestion. Transit Oriented Developments reflect the regional need for more Park and Ride lots and facilities.

Table 14.3 presents a listing of regionally significant projects included in the State 10-Year Plan. Table 14.3 includes location, descriptive material, estimated total cost

and construction schedule for the listed projects. The total estimated cost for the listed projects is approximately $197.8 million.

The high cost of regional transportation projects will only be partially covered by state and federal funds. As transportation is clearly a pressing need of the region and municipal budgets cannot afford the prohibitive costs of these improvements, the region must explore creative funding methods. Table 14.4 on the following page lists a variety of innovative funding methods for transportation projects along with some benefits and drawbacks. Alternative taxation and fee methods can have complex processes and implications; therefore the listed strategies should be used as guidelines for further research into the method that is most compatible for each municipality.

The FY 2005-2007 TIP for the SNHPC region contains a list of priority projects to be carried out during this three-year period. The TIP is financially constrained by year and includes a financial plan that demonstrates which projects can be implemented using current revenue sources and which projects are the be implemented using proposed revenue sources and which projects are to be implemented using proposed revenue sources while the existing transportation system is being adequately operated and maintained.

Two of the large-scale projects listed in the State 10-Year Plan show potential for substantial region impacts in terms of population growth and economic development. The I-93 corridor has shown sizeable increases in the average daily traffic since 1980 with an annual average growth rate of 5.1 percent. The widening of I-93, combined with transit improvements, is the state's response to increased traffic volumes and congestion. The widening of I-93 will strengthen the region's ties and accessibility to Boston and, it is projected to bring tens of thousands of new residents to the region by 2020. The NHDOT has identified primary and secondary impact communities, which encompass almost all of the SNHPC region, to provide technical and financial growth assistance. Construction has been approved, budgeted in the list of NH DOT projects, and will begin in 2007.

Table 14.2
Alternative Financing Methods

Alternative	Description	Drawbacks/Benefits
Tax increment financing	Property values are assessed for the base year. Any taxes from an increase in property values or new property are dedicated to improvements in those areas, such as roads, transit, parking, pedestrian, and traffic signals.	Most districts use bonds initially and then use taxes to repay bonds. Immediate tax benefits from new developments delayed for several years until bonds are paid off.
Assessments	A fee on properties within a district to pay for specific improvements within the district Can be one-time or recurring, used to retire bonds or fund maintenance costs.	Works well only with cooperation from local businesses paying the fees. Are not considered taxes and cannot be deducted from federal taxable income.
Transit Assessment District	This is similar to assessment, but rates vary according to proximity from transportation improvements. Can be divided into graduated assessment benefit zones.	Subject to voter approval. Can be done completely at a local level.
Fees	As opposed to taxes, these are levied only on those parties causing a significant impact on transportation infrastructure May be assessed based on square ft of development, units constructed, or peak hour vehicle trips generated	Can be challenged by the private sector. Levied at the time that the building permit is issued—assuring concurrent construction of roads. Money only funds new improvements—new and old residents must equally share maintenance costs of old roads
Negotiated Investments	Private sector contributes or fully funds public sector transportation improvements, either in exchange for zoning changes and building permits or for projects that benefit the private company	Can be used on the local level as a negotiation technique for developers who need zoning changes
Private donations or initiatives	A private developer finances all or part of a transportation project that benefits him/her but is a low public priority.	Raises the question of the degree to which private interests can influence public priorities
Use of property rights	The city or state sells or leases property rights above, below, or adjacent to highways, routes, or other transportation facilities	Requires intensive negotiations and involvement and is a lengthy process
Contracted transit services	When private interests dictate a public-access transit system, private funds are invested in fully financing or contracting out services for public use	In cases with little public involvement, transit can become effective and efficient for the intended users. However, construction is totally dictated by private interests.
Tolls	Tolls are collected for use on roads	Toll roads are constructed more quickly
Tax on gasoline	Taxes are levied on gasoline and used towards transportation projects.	Can be passed at a local or county level Must receive public support Gas prices already expensive
Beer tax	Taxes collected on beer in Birmingham, AL raised $2 million for transportation	
Lottery	Portions of lottery proceeds go towards transit and transportation costs.	Currently, NH lotto revenues go towards operating expenses, prizes, and education. Requires legislative approval

Table 14.3
Freeway Segment Average Daily Traffic 2020 No Build and 2020 Build--Three-Lane and Four-Lane Alternatives

Segment	No-Build	Build Three-Lanes	Build Four-Lanes
MA State Line to Exit 1	137,000	142,200	143,600
Exit 1 to Exit 2	103,600	114,300	116,500
Exit 2 to Exit 3	98,000	107,100	108,900
Exit 3 to Exit 4	73,000	75,900	76,600
Exit 4 to Exit 5	81,200	84,400	85,200
North of Exit 5	84,300	87,900	88,900

Source: NH DOT Final Environmental Impact Statement, page 4-7, volume 1

Table 14.3 shows average daily traffic for the I-93 corridor for 2020 with No Build and Three Lane and Four Lane Build scenarios. Current figures for Annual Average Daily Traffic are not updated past 1997. However, for purposes of comparison, the highest monthly Average Daily Traffic figure for 2000 was August with 77,500 vehicles per day in Derry. The Build scenario shows growth from both current averages as well as the No Build scenario, indicating the importance of the expansion project.

The I-93 widening is considered to be necessary to manage future traffic growth in the region, yet experts believe the expansion alone will not meet transportation needs. Rather, the expansion combined with a potential rail link between Boston, Nashua, and Manchester will allow high-speed commuter transit and reduce road congestion. Currently, there is an active proposal to extend the Lowell commuter rail to Nashua. The SNHPC is currently working with the Nashua Regional Planning Commission, the Federal Transit Administration, the City of Manchester, and other stakeholders on a proposal to extend service to Manchester.

The Airport Access Road will address increased passenger and cargo activity at Manchester Airport. The Airport currently serves over 3.6 million passengers annually, a number that has doubled since 1999, and transports over 160 million pounds of air cargo. Traffic volumes on the airport's primary access road, Brown Avenue (NH Route 3A), were 24,000 vehicles daily in 1998, a figure projected to climb to over 33,000 by 2015. The proposed Airport Access Road will connect the F. E. E. Turnpike south of I-293 with the Manchester Airport by means of Londonderry. The new road will decrease traffic on Brown Avenue by 45 percent and on I-293 over the Merrimack River by 28 percent. The new road also shows a considerable decrease in travel time, with trips from the north via the F.E.E. Turnpike decreasing from 21.9 minutes to 9.7 minutes and trips from the south via the Turnpike decreasing from 22.5 minutes to 4.6

minutes. The project is included in the NHDOT Ten Year Transportation Improvement Plan and construction is currently scheduled to begin in 2006.

In addition to the highway and transit projects listed in the State 10-Year Plan and the FY 2005-2007 TIP for the region, the SNHPC develops and meets the planning priorities for the area as well as the federal requirements of TEA-21 through additional projects contained in the FY 2006-2007 Unified Planning Work Program (UPWP). The UPWP includes regularly scheduled transportation planning activities of the SNHPC such as the roadway inventory and traffic counting programs. The document is also designed to meet more specific needs of the SNHPC member communities through the development of additional planning projects. Examples of these projects in the current UPWP document include the Portsmouth to Manchester Airport Bus Feasibility Study, a Signage Inventory Study for the City of Manchester, a Feasibility Study for extending commuter rail service to the Manchester area and an evaluation of high accident and critical roadway locations in the SNHPC region.

Finally, the SNHPC Regional Transportation Plan and Transportation Improvement Program FY 2005-2007 concludes that all of the regional highway and highway related projects from the Plan that may be initiated by the municipalities can be implemented within the financial resources identified in the document. Additionally, because expenditures estimated for turnpike-funded projects in the 10-Year Plan exceed the turnpike system revenue projections, it appears that other sources of funding will be required.

Regional Comprehensive Plan

Map #14.1

Highway Capacities

Legend

Political Boundaries

- Town line

Road Network

- Interstate
- State Route
- Major Roads
- Town Maintained
- Unmaintained Roads

Hydrography

- Streams
- Rivers/ Lakes
- Congested Areas

Data Sources:

Granit Digital Data (1:24,000)
NH Department of Transportation
SNHPC's Regional Transportation Plan 2025

The individual municipalities represented on this map and the SNHPC make no representations or guaranties to the accuracy of the features and designations of this map.

This map is prepared for planning purposes only and is not to be used for legal boundary eterminations or for regulatory purposes.

Map Produced by GIS Service SNHPC April 2006.
For reprints or furthur questions

Contact: SNHPC, gis@snhpc.org or (603) 669-4664

SNHPC

0 7,500 15,000 30,000 Feet

0 1.5 3 6 Miles

REGIONAL COMPREHENSIVE PLAN

Map #14.2

ADMINISTRATIVE HIGHWAY CLASSIFICATION

Legend

Political Boundaries

- Town line

Hydrography

- Streams
- Rivers/ Lakes

Road Network

- Interstate/Turnpike/Other
- State Primary Roads
- State Secondary Roads
- Town Maintained Roads
- Unmaintained Roads

Data Sources:

Granit Digital Data (1:24,000)
NH Department of Transportation
SNHPC's GPS data and base maps

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SNHPC

0 7,500 15,000 30,000 Feet

0 1.5 3 6 Miles