2013 MASTER PLAN UPDATE

MERRIMACK, NEW HAMPSHIRE

October 2013

Amended by the Merrimack Planning Board on January 21, 2020

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1. Vision and Goals

1.1 Community Vision

Merrimack is a community that cherishes its rural residential town character, school system, vast open spaces, and the natural resources that provide numerous cultural and recreational opportunities. This rural character is the Town's core value as expressed by the places where people gather, the open spaces, and the historical and cultural assets that residents and visitors hold dear. This Master Plan sets the course for the Town to balance the need to protect important natural, historic, and cultural areas; create new economic opportunities for business; sustain a diversity of housing options; and enhance the design of the built environment. This Plan seeks to preserve the Town's character and the great quality of life experienced by its residents. Merrimack is a great community to raise a family and live regardless of whether you are a single, younger or elder community member. Merrimack believes that its identity and sense of place is what attracts people who would like to live, work, shop and play in the community. Through its actions thus far, and through its ongoing implementation of the goals of the 2013 Master Plan, the Town will continue to thrive and build further upon these assets.

1.2 Land Use and Community Design Goals

- Provide for a sustainable and balanced land use pattern that incorporates the needs of the many stakeholders in Merrimack.
- Encourage the proper balance between residential, commercial and industrial development to ensure the Town continues to prosper while protecting the historic, environmental and rural character of the community.
- Look for opportunities to creatively revitalize underutilized and vacant sites.
- Establish guidelines for future multi-family, commercial and industrial development to enhance the design of buildings to create a quality built environment.
- Protect existing residential neighborhoods.

1.3 Housing Goals

- Encourage high-quality housing in attractive neighborhoods through development of innovative land use controls, regulations and programs, such as incentive bonuses to encourage features in site plans/New Hampshire Revised Statutes (RSA).
- Maintain the Town of Merrimack's compliance in meeting the housing affordability goals pursuant to the Workforce Housing Law.
- Ensure that housing choices are available to meet the needs of current and future generations in Merrimack.

1.4 Economic Development Goals

- Establish, maintain and expand the lines of communication and relationships between the public and private sectors.
- Retain Town businesses and attract new ones.
- Unify the Town's public sector to become more economic development-oriented.
- Develop a stronger Town "brand" that highlights economic development efforts.
- Make the Town's development review process more transparent and consistent.
- Refine the Town's zoning and land use regulations to allow for greater flexibility.
- Encourage repositioning and redevelopment through the creation of public-private development finance mechanisms such as tax increment financing (TIF).

1.5 Natural Resources Goals

- Continue to preserve significant parcels of land along the Merrimack and Souhegan Rivers, Grater Woods and Horse Hill to enhance biodiversity, recreational opportunities, and water quality.

- Integrate biodiversity protection and land use through Merrimack's land use regulations.
- Protect the quality of water in Merrimack's rivers and ground water supplies through effective stormwater management practices, subdivision regulations, and design.
- Develop community-wide environmental awareness of open space and forest conservation and practices that protect water.

1.6 Historic Resources

- Protect Merrimack's historic and archaeological resource by careful identification and documentation of historical resources.
- Continue to promote interest and pride in Merrimack's heritage through local exhibits, attractively designed markers, historical tours, and school curriculum.
- Preserve Merrimack's unique historical assets including its scenic roads, historic barns and graveyards, as well as the historic sites located along the Merrimack River.
- Integrate the protection of unique historic resources into land use regulations.

1.7 Utilities and Energy Goals

- Continue water conservation efforts and enhance public awareness of water conservation techniques through appropriate plant selection and watering.
- Continue to explore potential new water supplies to meet projected and future needs.
- Promote energy efficiency in municipal and public operations, starting with an Energy Committee that can advise and support energy efficiency efforts by Town departments.
- Encourage energy efficiency, conservation, and sustainability in Merrimack to reduce energy consumption and cost.
- Ensure that Merrimack stays competitive within the global economy by supporting telecommunications infrastructure and broadband.

1.8 Communities Facilities Goals

- Develop a comprehensive planning process for short- and long-term capital improvements for all town facilities and services.
- Given the often conflicting demands, establish priorities for building and facility upgrades and replacement.
- Establish new or improved/upgraded facilities and increase staffing for public safety to meet demands resulting from anticipated growth.
- Provide and enhance recreational opportunities for residents of all ages.
- Lead by example in community facilities and operations by establishing sustainability principles and initiatives.

1.9 Transportation Goals

- Promote and implement a roadway system that encourages the appropriate use of the Town's street system to reduce traffic volumes and travel speeds on local roads and within residential neighborhoods, relieve congestion on some of the Town's major travel routes, and proactively anticipate changes in the local roadway system as a result of future development or changes in the travel demand.
- Plan, develop, and maintain a system of bicycle and pedestrian ways serving the residents, including linkages among neighborhoods and local connections across the F.E. Everett Turnpike to the US Route 3 corridor.
- Develop a town-wide plan to prioritize the needs for additional sidewalk and pedestrian way construction throughout the Town and to plan for funding of the plan implementation.
- Establish a separate Capital Reserve Fund for sidewalk and pedestrian way construction.
- Coordinate land use planning with transportation planning to ensure that land use does not overburden the capacity of the Town's transportation system, so that land development and related transportation improvements are coordinated as to timing, individual components of the transportation system are appropriately utilized, and the ability to expand the transportation system is preserved where necessary.
- Promote and provide for mixed-use, higher density development, where appropriate, that will enable less use of the automobile.
- Provide for the enhancement of aesthetics associated with any planned transportation infrastructure improvements.
- Provide for the safety of all motorists, pedestrians, bicyclists, and travelers on and within the Town's transportation system through the implementation of appropriate design standards for improvements; improve and/or upgrade traffic control devices (such as signage, pavement markings, and lighting) in specific areas where deficiencies currently contribute toward public safety concerns and/or as opportunities arise.
- Promote the management of traffic operations on the roadway system by maintaining acceptable levels of service on the arterial and collector streets, by improving the efficiency of the existing system, and by the timely implementation of traffic operational improvements.
- Continue to seek the cooperation of the New Hampshire Department of Transportation and the Nashua Regional Planning Commission in monitoring and evaluating traffic flow and safety problems on State highways, and in coordinating transportation planning within the Town.
- Establish a multi-modal approach to the Town's transportation system, including pedestrian and bicycle travel as well as future consideration for bus and rail service, in order to assist in reducing the dependency on automobiles for travel, and thereby reducing the need to increase capacity on the roadway system.
- Seek adequate funding from public and private sources including through grants, fees, and exactions to support the expansion, improvement, operation, and maintenance of the transportation system.

2. Land Use and Community Design

2.1 Introduction

An understanding of the Merrimack's historic and existing land use patterns, regulations, growth trends, natural resources, and infrastructure is useful in identifying opportunities and constraints to future development potential of the Town. Land use within a community is represented by the historic pattern of residential, commercial, industrial, municipal and institutional development, interspersed with what is generally considered as open space, such as forests and natural features, undeveloped land, agriculture and parks and recreational areas. The evolution of land use within a community is the product of local economic conditions and community preferences; growth and development is based on such factors as access to jobs, employment, and the availability of affordable land for new housing or commercial development. Community preferences, expressed as land use plans and regulations, dictate the use, form, location, and sometimes the pace, of new development. Land use forms the basis for master planning and determines, to a large extent, a Town's need to provide public

facilities and infrastructure, transportation networks and services, and protection of environmental resources. As communities plan for their future, determining how and where growth and development should occur will provide the basis for planning where investments for municipal services will be needed, as well as determining what controls will be necessary to protect areas of the Town from unwanted development. Communities have the ability to control land use and development patterns through a variety of mechanisms, including zoning and subdivision regulations, provision of public utilities and infrastructure, and protection of open space lands through direct purchase and the acquisition or acceptance of conservation restrictions/easements.

Although land use issues are addressed in this chapter, it is important to refer to other elements of the Plan to see how these issues are interconnected.

2.2 Land Use and Community Design Goals

- Provide for a sustainable and balanced land use pattern that incorporates the needs of the many stakeholders in Merrimack.
- Encourage the proper balance between residential, commercial and industrial development to ensure the Town continues to prosper while protecting the historic, environmental and rural character of the community.
- Look for opportunities to creatively revitalize underutilized and vacant sites.
- Establish guidelines for future multi-family, commercial and industrial development to enhance the design of buildings to create a quality built environment.
- Protect existing residential neighborhoods.

2.3 Historic and Current Land Use Patterns

Merrimack comprises 33.55 square miles (21,475 acres), which is second only to Amherst of the communities in the Nashua region. The Nashua Regional Planning Commission (NRPC) maintains a Geographic Information System (GIS) database for generalized land use in Merrimack. This information categorizes the Town into thirteen different land use classifications, including separate categories for vacant land, water resources, and roads found within the boundaries of the Town.

Table 2-1: General Land Use Types in Merrimack (2001)

Land Use (parcel-based)	Total Acres	Percent Total Land Area
Commercial	532	2.5%
Industrial	1,020	4.7%
Mixed Use	20	0.1%
Multi-family Residential (includes Condominium Units)	314	1.5%
Park/Recreation/Open Space (public)	2,751	12.8%

Land Use (parcel-based)	Total Acres	Percent Total Land Area
Park/Recreation/Open Space (private)	889	4.1%
Public Facilities	557	2.6%
Public Lands (vacant)	694	3.2%
Single-family Residential	6,631	30.9%
Road	1,695	7.9%
Vacant	5,554	25.9%
Semi-public Facilities	216	1.0%
Water	601	2.8%
Total	**21,475**	**100.0%**

Source: NRPC GIS Database for land use, 2001; Merrimack Master Plan Update 2002, p. III-1.

The 2011 data, shown in **Table 2-2** below, shows land use categories based on data from the Merrimack Assessor's Office. The Town uses somewhat different classifications for the various land use categories. This is a more detailed breakdown, which includes the number of lots that fall into those land use categories. Note that the difference in total acreage for the Town is due mostly to the fact that the Town's tax parcels, on which the 2011 data is based, do not include the boundaries that extend into the Merrimack River and other water bodies, whereas the NRPC data included more water acreage. **Figure 2-1** illustrates the 2011 land use breakdown.

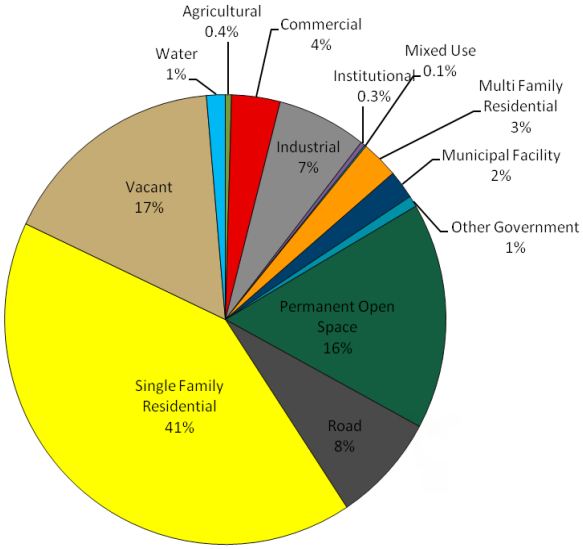
Table 2-2: General Land Use Types in Merrimack (2011)

Existing Land use	Number of Lots	Total Acres	Percent Total Land Area
Agricultural	3	94	0.4%
Commercial	221	748	3.6%
Industrial	60	1,381	6.6%
Institutional	16	69	0.3%
Manufactured Housing	14	33	0.2%
Mixed Use	2	23	0.1%
Multi-family Residential	163	576	2.7%
Municipal Facility	34	314	1.5%
Other Government	3	168	0.8%
Permanent Open Space	116	3,271	15.5%
Recreation	10	162	0.8%
Road	33	1,651	7.9%
School	10	120	0.6%
Single-family Residential	6,852	8,662	41.1%
Vacant	556	3,502	16.6%
Water	21	290	1.4%
Total	**8,398**	**21,066**	**100.0%**

Source: Town of Merrimack tax parcels; VHB

Clearly, there was an increase in single-family housing over the last ten years, with developed land in that category increasing 31 percent to 8,662 acres. Most of this land is west of the F.E. Everett Turnpike. Multi-family residential development occupies 576 acres, an increase of 262 acres over the last ten years. Overall, residential development represents 44 percent of the Town's land area. Permanently protected open space occupies approximately 16 percent. New commercial development occupies 216 more acres than in 2001 and industrial uses also saw an increase of 261 acres during that time frame.

Figure 2-1: Land Use Breakdown in Merrimack (2011)



There are other changes that will affect land use into the future, which are discussed later in this chapter. These include:

- The Circumferential Highway proposal has been abandoned by NHDOT, so land potentially impacted by the project can be planned accordingly.
- The Manchester Airport Access Road construction has been completed, which is likely to create new development opportunities along the Bedford/Merrimack line. The project, which created a new, two-mile highway, will improve transportation to and from Manchester/Boston Regional Airport, but will also provide access to industrial and commercial land for economic development in Londonderry.
- The Merrimack Premium Outlets project may create pressure for development in the southerly portion of Continental Boulevard.
- Vacant land is in relatively short supply – this may create an impetus for redevelopment of existing uses.

What is zoning?
Modern zoning began in the early 1900's in response to the location of potentially incompatible and noxious land uses next to commercial and residential areas. The zoning ordinance has evolved over the years as a means to limit the types of land uses that could locate in a particular area of the municipality, resulting in a separation of uses. Ideally, the Master Plan is the blueprint for the Town and the zoning ordinance is the regulation that implements the plan. Typically, a zoning ordinance regulates land use by:

Specifying and distinguishing different land use types;
Creating development standards for the size and shape of lots and the buildings erected on those lots;

Addressing lots, buildings and uses that predate the adoption of the zoning ordinance (non-conformities);

Establishing criteria for the evaluation of permit applications for new buildings;
Establishing procedures for permitting uses not specifically allowed by right;

Defining terms that have specific meanings under the ordinance; and,

Creating a map that displays the geographic extent of each zoning district.

2.4 Merrimack's Zoning Districts

For the most part, zoning districts in Merrimack correspond with existing land use patterns. Zoning district boundaries as of June 2011 are illustrated on the Zoning Map – **Figure 2-2**. In addition to the zoning districts described in this chapter, the Aquifer, Flood Hazard, Shoreline Protection, Wetlands Conservation, overlay districts are discussed in Chapter 5, Natural Resources and Open Space.

2.4.1 Industrial Zoning Districts

The Industrial Zoning District in Merrimack is divided into three sub-districts, I-1, I-2 and I-3, based upon the intensity of use and location. The I-1 District is intended for the establishment of general manufacturing, wholesale, and distribution facilities, large office complexes and other similar uses. Uses such as churches, gas stations and parking garages are allowed in this district. Restaurants, banks, offices, day cares, and hotels or motels are considered support uses to the Industrial District, and "big box" retail establishments are only allowed by Conditional Use Permit. The I-1 District is the largest industrial district, including almost all the land between the F.E. Everett Turnpike and the Merrimack River south of Greeley Street, much of the land between NH Route 3 and the Merrimack River north of Greeley Street and land on both sides of Continental Boulevard.

Within the I-1 District, a conditional use permit can be granted for mixed uses "which allow the creative integration of industrial, commercial, and residential housing developments based on a master site development plan". These are limited to single consolidated parcels that are at least 50 acres in size, are serviced by public water and sewer, and have a minimum of 500 feet of frontage along the state maintained portions of the Daniel Webster Highway.

The I-2 District is intended for the establishment of lighter manufacturing facilities and large office developments. Support uses similar to those permitted in the I-1 District are also allowed. The I-2 District includes a large area of land west of the Turnpike in the vicinity of Exit 10 including the approximately 550 acre Fidelity Investments property and the site of the Merrimack Premium Outlets project, opened in June 2012.

The I-3 Industrial District is similar to the I-2 District but is intended to "take into consideration the proximity of Town water supply wells and established residential uses adjacent to the district". Permitted uses include light manufacturing, offices, and research and development. The I-3 District is limited to a single 50 acre parcel located on Continental Boulevard, north-east of Greens Pond, which was recently approved by the Planning Board as the future location of Atrium Medical Corporation.

2.4.2 Commercial Zoning Districts

Commercial zoning in Merrimack is divided into two sub-districts, C-1 and C-2, based upon location and intensity of use. The C-1 District is intended to permit limited commercial use on portions of Route 3 that have a mixture of residential and non-residential uses. The District is generally applied to small lots in areas abutting residential uses and where there is a trend to convert residential structures to commercial uses. Uses allowed by right include retail establishments, personal services, and offices. Banks, automotive related uses, single user "big box" retail greater than 75,000 square feet, hotels and motels are prohibited. The Zoning Board of Adjustment may grant special exceptions for restaurants, cafes, residential uses, new telecommunication towers and accessory uses. The C-1 District includes several strips of land approximately 250 feet deep fronting on Route 3. The largest C-1 District area is on either side of Route 3 in the Reed's Ferry area.

The General Commercial (C-2) District is intended to serve local and regional shopping and service needs. Uses allowed by right include retail establishments, offices, banks, restaurants, hotels and motels. Special exceptions may be granted by the Zoning Board of Adjustment for

certain residential, automotive and other uses. "Big box" retail establishments are prohibited. District C-2 includes an area in southwest Merrimack on both sides of Route 101A, and area around F.E. Everett Turnpike Exit 11, and several stretches along Route 3 from the Exit 11 area, north toward the Bedford town line.

2.4.3 Residential Zoning Districts

Residentially zoned land in Merrimack is divided into four sub-districts, R-1, R-2, R-3 and R-4, depending upon soil limitations, the provision of public sewer and water or (in the case of R-1) the rural character of the sub-district. Except in the defined R-1 District, minimum residential lot sizes are based on soil characteristics or the provision of public water and sewer. If a septic system is to be used to accommodate residential wastewater disposal, then the minimum required lot size varies from 100,000 square feet to 80,000 square feet to 40,000 square feet of contiguous non-wetland soil depending on whether the soils are classified as severe, moderate or slight, respectively. Lots with public water and sewer must meet a 40,000 square foot minimum lot size requirement and contain not less than 20,000 square feet of contiguous non-wetland soils.

Single-family residential uses and certain home occupations are allowed by right in all the residential sub-districts. The R-3 and R-4 districts permit two-family residential uses and the R-4 district permits also multi-family residential uses east of the F.E. Everett Turnpike. Churches and camouflaged telecommunication towers are allowed by special exception granted by the Zoning Board of Adjustment in all of the residential districts. Each residential sub-district is further described below.

Residential (R-1) District

The R-1 District is designed to accommodate single-family residential development in areas with severe soils limitations for septic systems or areas defined by the zoning map as R-1. The area of R-1 defined by the zoning map is that relatively undeveloped rural land in the west-central and northwest areas of the Town (see **Figure 2-2**). The minimum contiguous non-wetland area for a single-family residence is 100,000 square feet (2.3 acres).

Residential (R-2) District

The R-2 District is designed to accommodate single-family residential development in areas with moderate soils limitations for septic systems. The minimum contiguous non-wetland area for a single-family residence is 80,000 square feet (1.83 acres).

Residential (R-3) District

The R-3 District is designed to accommodate single and two-family residential development in areas with slight soils limitations for septic systems. The minimum contiguous non-wetland area is 40,000 square feet for a single-family residence and 80,000 square feet for a two-family residence.

Residential (R-4) District

The R-4 District is designed to accommodate single, two-family and multi-family residential development (east of the Turnpike) in areas where public water and sewer is provided. The minimum contiguous non-wetland area is 40,000 square feet for a single-family residence, 80,000 square feet for a two-family residence, and 40,000 square feet per family dwelling unit for a multi-family residential development.

2.4.4 Planned Residential District (Overlay)

The Planned Residential District is designed to promote efficient use of land and utilities by providing an optional pattern of site development different from one in which there is a division of the land into separate lots for each structure. Planned unit developments (PUDs) are permitted within the PRD District. The PUD allows for higher density residential and compatible non-residential development in areas served by public water and sewer and with good highway access. PUDs are intended to promote site designs that make efficient use of land and utilities, and provide varied land uses, housing types and forms of ownership. PUDs must have a minimum gross tract area of 12 acres and may not exceed 400 units. Maximum density varies from 7-8 units per gross tract acre for one-bedroom units to 3 units per acre for dwellings with three or more bedrooms. Setback, landscaping and buffer requirements also apply. Several PRD Districts, most located along NH Route 3, have been established.

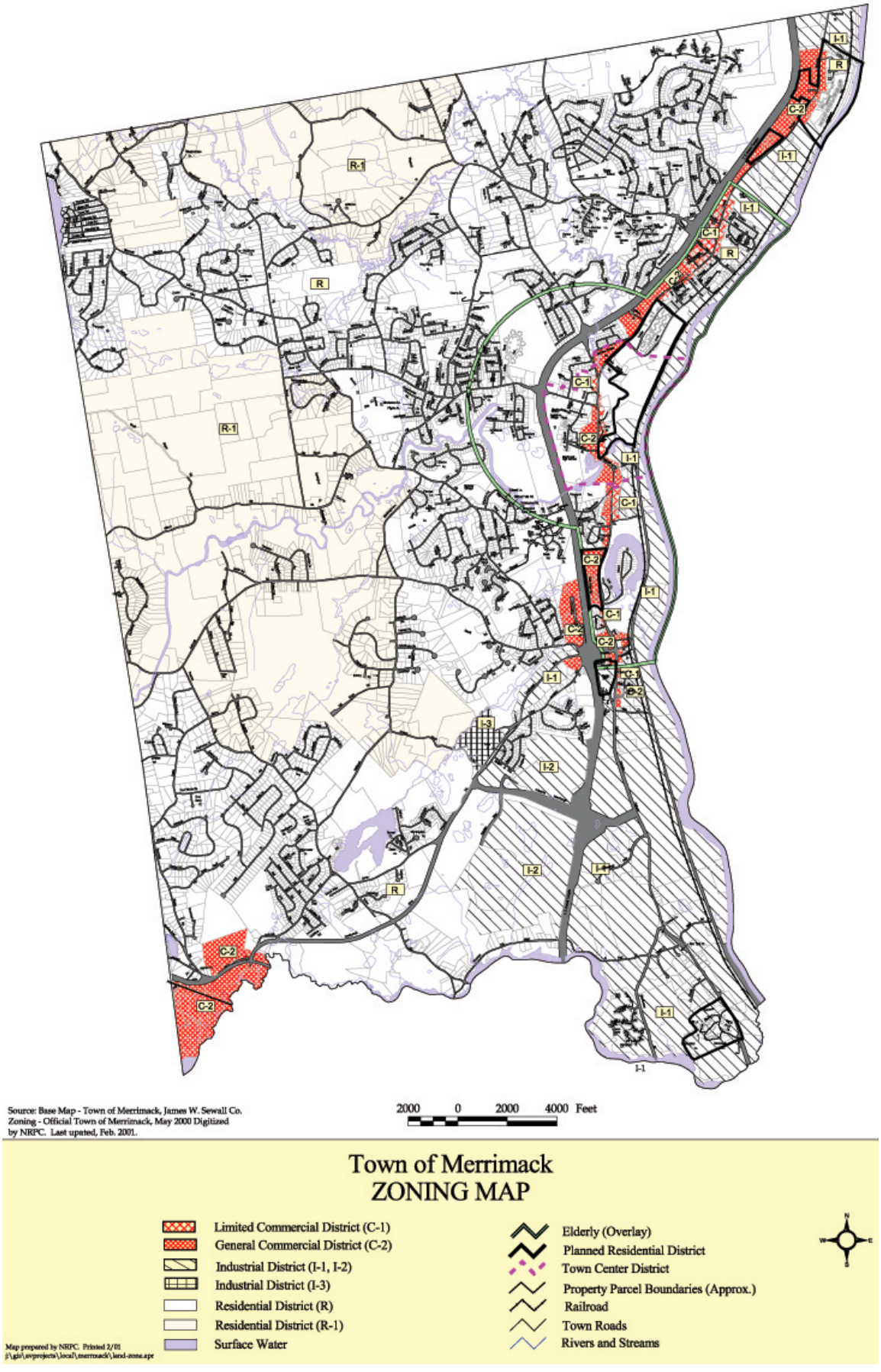
2.4.5 Elderly Zoning District (Overlay)

The Elderly Zoning District is designed to allow for the provision of higher density housing exclusively for elderly persons. The district is defined by distance from the intersection of Route 3 and Baboosic Lake Road. The district encompasses the area within a one-mile radius of the intersection west of the F.E. Everett Turnpike and within a two-mile radius east of the Turnpike. Within the district, a maximum density of eight dwelling units per acre is allowed for dwellings specifically designed and designated for occupancy by the elderly and having two or fewer bedrooms. A minimum tract area of three acres is required, and heads of households occupying the units must be at least 55 years old.

2.4.6 Town Center District (Overlay)

The Town Center District is designed to implement the recommendations of the Town Center Plan (see Appendix A, Town Center Master Plan) by encouraging an appropriate mix of land uses, transportation options and forms of development suitable to typical New England town center. Uses allowed by right include residential and any uses permitted by the underlying zoning district. In order to ensure that the intent of the Town Center Plan is being met, special exceptions may be granted by the Zoning Board of Adjustment for education facilities, day care centers, offices, churches and meeting halls in any underlying zoning district. Special exceptions are also required for automotive sales and service, gas stations, drive through food service, freight and trucking terminals, contractor's yards and fuel storage if such uses are permitted in the underlying zoning district. In order to encourage rehabilitation of existing structures, special exceptions may be granted under certain circumstances to allow improvements to buildings or sites that do not conform to the minimum dimensional requirements.

Figure 2-2: Merrimack Zoning Map



2.5 Merrimack's Physical Form and Land Use Character

Bounded by the towns of Bedford and Manchester to the north, Amherst to the west, Litchfield and Nashua to the south, Hollis to the southwest, and the Merrimack River and floodplain along its eastern side, the Town of Merrimack is located within the area known as the Eastern New England Upland which begins at the Massachusetts border extending north to the White Mountains. This region is typified by two land forms; the rolling, somewhat hilly and wooded landscape of the land outside the floodplain with fertile soils, panoramic views from high points, numerous small lakes, wetland areas and well drained valleys. Much of the land in Merrimack, from the F.E. Everett Turnpike west to the Amherst line, falls within this category. Consequently, from a land use perspective, development patterns here are typical of other towns situated within this landform, which has been highly sought as a location for farming and ultimately, for single family residential development. Where served by individual septic systems, this development is large lot and mature in age. Much of the Town's preserved open space lies within this area which further adds to its value for residential development. Almost all of the Merrimack land that falls within this upland region is residential.

Merrimack's other land form, the river valley and floodplain, provides the location of major regional transportation systems – the F.E. Everett Turnpike connecting the Town to Massachusetts on the south and to the City of Manchester and Interstate 93 to the north, a second north/south connector- Daniel Webster Highway – which serves as a local and regional arterial, and the Boston & Maine RR which serves adjacent industrial uses but also acts as a barrier to the river. Development patterns within this valley take advantage of the flat topography and connectivity regionally with larger footprint retail, office and industrial parks and large single use buildings. There is a small amount of older, smaller lot residential development and a few higher density residential developments (smaller lot sizes, apartments and condominiums) located in pockets along the corridor. Town zoning policies over the years have supported this development pattern.

It is important to note that much of the Merrimack's prime developable land has already been developed leaving floodplain, which is not as feasible to develop.

The majority of the town's arterial roads that provide connections to the surrounding towns (refer to **Table 9-1** for roadways and roadway types) are non-commercial corridors where residential and open space networks provide the predominant character reflecting the town's rural residential base. Continental Boulevard, located in the southern portion of the town, links the commercial and transportation corridors (Daniel Webster Highway and the F.E. Everett Turnpike) with Route 101A, a highly commercialized corridor located within a small portion of the southwest corner of the town.

2.5.1 Development Character: Uplands

As mentioned, the rolling "hill and dale" topography of the upland portion of the Town has provided an ideal setting for low density residential use. These areas are served by roads which have maintained a more rural character in keeping with the low density land use. In many areas, wetlands have prohibited development from lining these roads and the result

reinforces the rural character and provides a driving experience that is diverse and more interesting. For most residents, this combination of land form and built residential form is highly valued and defines the Town's character.

Large blocks of open space provide passive recreation but also support residential land values by preserving the more rural character of a large portion of the community.

The major connecting roads in this region are defined by the adjacent low density residential and large blocks of open space/wetlands and as a result there is little long term threat to this character. A few large, undeveloped parcels still exist. Continental Boulevard, which links the Route 101A commercial corridor to F.E. Everett Turnpike and the Daniel Webster Highway corridor to the northeast, is emerging as a more mixed use corridor with a retail pocket at the Turnpike, light industrial and some office spaces mixed with residential. The completion of the Merrimack Premium Outlets and its future related hotel and commercial uses will further impact the character of the corridor, although future development may be limited by access restrictions.

2.5.2 Development Character: River Valley

The overall development character of the river valley is a mixed bag of patterns dominated by the Daniel Webster Highway corridor. Large footprint retail, office and industrial development mix with pockets of older single family homes and multi-family developments. The presence of older homes converted to commercial use has helped to rein in the scale of the corridor in certain places. There are no unifying elements, such as signage, lighting or street tree planting which could serve to tie various areas of the corridor together. Any visual relief within the corridor is provided by the residential pockets which are more effectively landscaped and afford a contrast to the commercial development which also suffers to some degree from a lack of continuity.

In certain areas the developments patterns have also been a function of lot depth between Daniel Webster Highway and the F.E. Everett Turnpike where shallow lots result in smaller footprints and strip development. Where the roadways diverge, development patterns and uses are more diverse. Larger scale development is located at the southern portion of the corridor, south of Industrial Drive where further divergence of the two roadways has

provided for large parcels of land and much larger footprint development types. Although the Merrimack River defines the valley's eastern border, its presence is effectively obscured throughout most of the Daniel Webster Highway corridor and the Boston & Maine Railroad creates an effective barrier to both physical and visual access to the river.

While the F.E. Everett Turnpike effectively serves as a separator, major arterial roads (see **Table 9-1** for roadways and roadway types) cross the highway and intersect with the Daniel Webster Highway creating key nodes in the corridor. These may provide opportunities for restructuring future development patterns and corridor character. In a related way, the character, scale and mix of development types within areas of the long, linear corridor may also provide opportunities to divide it into smaller zones or pockets, reinforced over time by new standards and common features such as signage and landscaping.

2.6 Relevant Trends

It is important to consider trends, both regionally as well as nationally, that may impact the nature and character of future development patterns in Merrimack when considering future land use policy.

2.6.1 Changing Demographics

Changes in demographics which first emerged in the 2000 census and that have been reinforced by the findings of the 2010 census suggest impacts on certain land use development patterns and more importantly, land use relationships, densities and the desire for transportation options. Among the most compelling findings impacting land development are:

- The aging of the "baby boomers" and their preferences for walkable living, in proximity to services, shopping, recreation and transportation options;
- Fluctuating gas prices and energy costs place an emphasis on development patterns that reduce dependence on the automobile which has caused renewed interest in mixed use development from municipalities as well as from the development community;
- The preferences of generation X, Y and the "creative class" (young professionals whose work is idea focused) for environments that provide live/work/play synergy;
- Changes in national transportation policies that place new emphasis on funding for TOD (Transit Oriented Development) and compact design, and reduced funding for highway development;
- The rising concerns of the public regarding energy use, sustainability and environmental consciousness;
- Technological advances that impact the home, how we work and the marketplace (how we shop);
- A growing trend toward globalization where manufacturing is moving overseas leading to a decrease in local manufacturing. This is reflected within Merrimack and has been a national trend over the past decade, and is not anticipated to reverse itself in the foreseeable future;

- Some of Merrimack's largest businesses are owned by overseas companies, such as Atrium Medical Corporation and Anheuser-Busch.

2.6.2 Land Use Policy

The impacts of these trends have slowly begun to have an effect on land use policy and have gained momentum during the last half decade as towns look to balance growth while preserving their values for quality of life:

- In rural locations, towns have looked to techniques such as cluster development and smaller lots to provide for growth while preserving rural character;
- The emergence of Smart Growth and New Urbanism which have served to establish a national dialog about the importance of neighborhoods; placed new focus on the metrics we use to create residential areas and which have provided new consideration regarding the mix of uses, walkability and scale;
- In many communities, accommodating new growth has placed an emphasis on infill sites as opposed to using undeveloped land at the periphery. For example, the City of Concord, NH, established an Opportunity Corridor Performance District for the economic development of underutilized urban properties located between the downtown business district and Interstate 93, as well as former brownfield locations within the City. Offices and a hotel and conference center have been built since the district's creation. In response to the rising demands for live/work/play relationships the development community is also looking at compact, mixed use development;
- Changing retail habits combined with rapid changes in technology have led to new retail models…in suburban areas which has resulted in the creation of "main street" and "town center" development to provide centers in "centerless" suburbs…in more urban areas this has led to new uses for older retail boxes and strips.

Regionally, Merrimack lies within the Boston sphere of influence and growth pressures and accommodation will continue to pressure towns near the NH/Massachusetts border. One of Merrimack's great strengths as articulated by its citizens- its location- will also pose a threat to its "way of life" as new development looks to capitalize on this location.

2.7 Guiding Merrimack's Land Use Development

As Merrimack looks to its future it must meet the challenges presented by its favorable location recognizing the need to balance growth with community desires for maintaining a certain kind of community, continuing needs for revenue generation so that a high level of services can be sustained and adapting it's limited land resources to meet emerging desires for new living options of a balanced demographic base. Not doing so may lessen the town's ability to attract new, high quality development as well as maintaining a healthy demographic cross section.

Given the community's expressed desire to maintain the more rural character of much of its residential area coupled with demographic desires for live/work/play synergies, to accommodate future growth Merrimack should look to the valley and the Daniel Webster corridor and

develop short, mid and long term policies and strategies for growth accommodation. Aside from the rural/residential issue, there are a number of factors that support this:

- In terms of residential product, this is where the multi-family and attached residential projects are located today…i.e. there is clear precedent for this type of development.
- This is where the bulk of support services and jobs are located.
- The corridor is well served by existing infrastructure.
- Some of the larger vacant land parcels are located here and there is a higher likelihood for change as retail trends and shopping habits impact the existing retail pattern. More importantly, taking a long term view, this is where potential changes to large, existing business operations would offer the greatest potential impacts/change to the community.
- Access to the region from the F.E. Everett Turnpike is ideal and there are now further impacts/opportunities from the completion of the Airport Access Road in late 2011.
- Future transition of former industrial uses along the river may create opportunities for using the riverfront as a positive amenity in attracting new development and providing the community with improved access to the river as an open space resource.
- The possibility of commuter rail service at some time in the future points to the need for a long term strategy for maximizing development opportunities that balance growth and meet other community objectives.

Daniel Webster Highway corridor is linear and lends itself to be divided into smaller series of "villages" to enhance the corridor.

While the Daniel Webster Highway corridor is linear and in places very narrow, existing development patterns and uses in combination with land forms and fingers of open space present opportunities to divide the corridor into smaller pieces creating a series of "villages" in the corridor mitigating the linearity. This can be further reinforced by accentuating existing nodal points defined by intersections with arterial roads that cross the F.E. Everett Turnpike (Bedford Road, Baboosic Lake Road, Continental Boulevard and Industrial Drive).

Reeds Ferry

[LEFT] Corridor along ~~Baboosic Lake Road~~ can be enhanced to feel like a Center Village.

[RIGHT] The southern end of the corridor (~~Thorntons Ferry Village~~) provides another opportunity for mixed-use villages.

Town Center Area

At the north end, the area known as Reed's Ferry Village provides a number of elements that present an opportunity to create a true pedestrian scaled place. The completion of the Airport Access Road will eventually change the land use dynamics of this area and whether the commuter rail project is realized or not this area will be well suited to future mixed use development with higher density housing and retail. Reed's Ferry Village could provide a northerly anchor to the corridor as well as a gateway entry to Merrimack from the north.

At the center of the corridor the concentration of public facilities, schools and open space along Baboosic Lake Road and the node at its intersection with the Daniel Webster Highway present an opportunity to create a "Center Village" (alternately "Town Center Village") reinforced by common elements such as landscaping, lighting, signage and appropriate, small scale land use. There are some natural open space features as well as existing single family residential that would complement the village center.

The southern end of the corridor, known as Thorntons Ferry Village, characterized by larger land parcels and uses, could provide another opportunity for significant mixed use development that takes advantage of existing businesses, access to the F.E. Everett Turnpike and proximity to the river to create a walkable, mixed use development to anchor this end of the corridor and provide a gateway to Merrimack from the south.

Steering new development to the corridor implies that new policies should be put in place to control the type and quality of development. Further, Merrimack must compete for new development with surrounding towns that enjoy some of the same location benefits. To be successful, not only should there be a "climate" that is favorable to new development, but there must also be a level of environmental quality to the corridor that says this is a place with a long range community vision and a public sector commitment. Workable guidelines for the size, massing and character of new buildings, public improvements such as street trees, reinforcing special areas such as the town center with uniform signage and the like will attract good development that can balance the land use of the corridor in a sustainable and more livable manner.

[LEFT]
Daniel Webster Highway near the Town Center

[RIGHT]
Signage near the Town Center on Daniel Webster Highway

2.8 Recommendations

L-1 Adopt a zoning modification that allows mixed use as an infill style development with appropriate controls and design recommendations in all appropriate areas of the corridor.

L-2 Allow higher density development in the northerly and southerly portions of the Daniel Webster Highway corridor, where connectivity to the regional transportation system is best and existing infrastructure supports this type of development.

L-3 Adopt zoning or regulation amendments to foster access management in the Daniel Webster Highway corridor, and to provide off-street pedestrian and vehicular connectivity throughout the corridor.

L-4 Develop portions of the Daniel Webster Highway corridor as village nodes, with traffic calming measures, pedestrian amenities, and streetscaping.

L-5 Improve design standards for landscaping, site design, and site amenities.

L-6 Develop access to the river corridor where possible and adopt zoning provisions in areas surrounding these access points to incentivize use of the river as an amenity.

L-7 Develop pedestrian and bicycle connectivity from the westerly portions of the Town to the Daniel Webster Highway corridor where possible.

L-8 Preserve and enhance the rural aesthetic of existing neighborhoods by maintaining existing allowable densities and generous setbacks west of the F.E. Everett Turnpike.

L-9 Create incentives for open space residential development to enhance protection of open space.

L-10 Perform a comprehensive review and update of the Subdivision Regulations, including a separation of the Site Plan Regulations as a separate set of regulations.

L-11 Examine development review process and consider development of a "pre-application design review" process as outlined in RSA 676:4.

3. Housing

3.1 Introduction

As a significant percentage of the Town's land area, housing is the most prevalent land use in Merrimack; its cost and availability are critical components in the range of elements that together define the character of the community. While the housing stock (supply) today serves the needs of many of its citizens, market changes have made it difficult for certain segments of the community to afford housing costs. The housing goal is to provide choices for people and therefore, diversity in housing type and price is a significant aspect of this Plan.

The first section of this chapter provides an overview of the population and household changes that have been occurring in Merrimack. It also looks at how the Town's demographics compare to those of the region, which includes neighboring New Hampshire cities and towns. The following section discusses the type of housing that is available in Merrimack and includes an analysis of housing affordability, as well as key housing issues that have been identified during the public outreach process.

3.2 Housing Goals

Housing in Merrimack should be available to households of all kinds and residents of all income levels. Merrimack should strive to:

- Encourage high-quality housing in attractive neighborhoods through development of innovative land use controls, regulations and programs, such as incentive bonuses to encourage features in site plans/New Hampshire Revised Statutes (RSA).
- Maintain the Town of Merrimack's compliance in meeting the housing affordability goals pursuant to the Workforce Housing Law.
- Ensure that housing choices are available to meet the needs of current and future generations in Merrimack.

3.3 Population and Demographic Profile

Merrimack's population has grown dramatically since 1970, when the population was 8,595. It grew by 79 percent to 15,406 in 1980 and another 44 percent to 22,156 in 1990. The rate of growth since then has leveled off somewhat, showing an increase of only a few hundred between the 2000 and 2010 Census. According to 2010 U.S. Census data, the population is 25,494. While the Town's growth rate was somewhat parallel to the county and the state rate of growth between 1990 and 2000, the Town only experienced a slight rate of growth as shown in the 2010 Census. **Table 3-1** shows Merrimack's population growth from 1950 through 2010 as compared with Hillsborough County and New Hampshire.

Table3-1: Population Over Time

Year	Merrimack	% Change	Hillsborough County	% Change	New Hampshire	% Change
1950	1,908	-	161,525	-	533,200	-
1960	2,989	57%	178,161	10%	606,900	14%
1970	8,595	188%	223,941	26%	737,579	22%
1980	15,406	79%	276,608	24%	920,475	25%
1990	22,156	44%	336,073	21%	1,109,252	21%
2000	25,119	13%	380,841	13%	1,235,786	11%
2010	25,494	1%	400,721	5%	1,316,470	7%

Source: US Census 1970-2010

Compared to its neighbors on average and like much of Southern New Hampshire, Merrimack grew more rapidly in the 1970's, 1980's, and 1990's, but more slowly since the 2000 Census as shown in **Table 3-2**. Merrimack's growth during that period may be attributed in part to the availability of a large number of new housing units. The Town's school system (several schools were built in the 1960's) and accessibility to major highways for commuting purposes also make the Town an attractive community. Rapid growth continued in part of the region and the highest growth rates in the last ten years (20 percent or greater) were in Amherst, Bedford, and Hollis. In contrast, the population in Nashua actually dropped by 0.1 percent in the 2010 Census.

Table 3-2: Population Comparisons for Merrimack and Abutting Communities

Municipality	1970	1980	1990	2000	2010
Merrimack	8,595	15,406	22,156	25,119	25,494
Nashua	55,820	67,865	79,662	86,605	86,494
Bedford	5,859	9,481	12,563	18,274	21,859
Amherst	4,605	8,243	9,068	10,769	13,264
Litchfield	1,420	4,150	5,516	7,360	7,932
Hollis	2,616	4,679	5,705	7,015	8,777

Source: US Census 1970-2010, CLRSearch.com

With a total land mass of 33.55 square miles, Merrimack's current population density is 760 people per square mile.[1] This is a slight 1 percent increase in density since 2000 (749 people per square mile) and 1990 (660 people per square mile).[2]

The Town's elderly population cohort – people 65 years old and up – are the fastest growing segment of the population, having increased significantly in the last ten years. There were 1,601 (or 6 percent of the population) 65 years of age or older in 2000. The 2010 Census shows 2,638 people 65 or older, which represents a 65 percent increase in the last ten years. Slightly more than 10 percent of Merrimack's residents are now over 65 years old. Among the other more populous cohorts, the 55 to 64 age group also grew rapidly since 2000 (a 50 percent increase). The median age of the Merrimack population has been steadily increasing, from 36 in 2000 to 39.5 in 2010 and it is expected to continue to rise to at least 40 years of age in 2015. This information suggests that Merrimack's population is getting older and will continue along that trend, which will affect the type of housing the Town will need. It is consistent with national and regional trends, and also reflects the aging of the Baby Boomers.

In contrast, the number of children under age 5 dropped from 1,731 to 1,368 – a reduction of 21 percent and the number of school-age children (5 – 19 years of age) decreased by 12 percent. This follows a national trend for smaller families because parents are having fewer children, an increase in single-parent households, more childless households, and the general postponement of families having children until later in life. This data is reflected in the School District's projections for future school enrollment, as discussed in Chapter 8 - Community Facilities and Services. In fact, all age groups showed a decrease in population except the elderly population. The slight reduction in the 20 – 34 year old cohort may be indicative of relocation of younger wage earners and families to other areas where jobs and/or affordable housing are available.

1 US Census 2010; density based on NH GIS land data

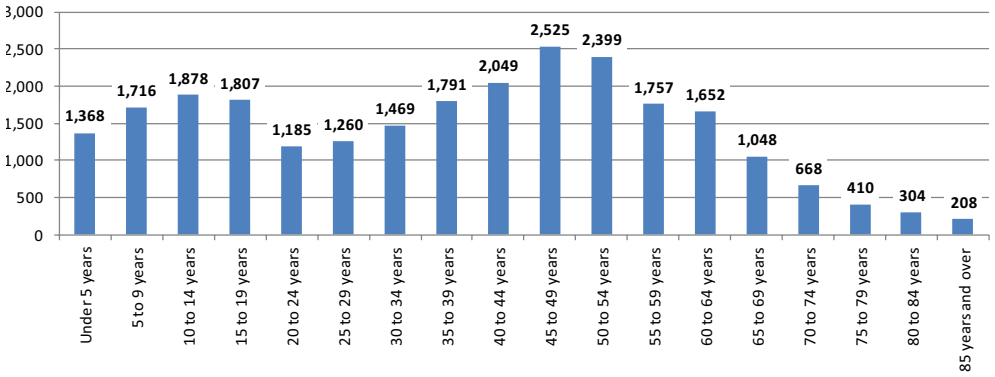
2 US Census 2000 and 2010

Table 3-3 compares the age distribution in Merrimack between 2000 and 2010, while **Figure 3-1** shows a more detailed age distribution for the Town from the 2010 Census.

Table 3-3: Age Distribution, 2000– 2010

Year	People under 5 (% of population)	People 5-19/ School Age (% of population)	People 20-34 (% of population)	People 35-54 (% of population)	People 55-64 (% of population)	People over 65 (% of population)
2000	1,731 (7%)	6,110 (24%)	4,219 (17%)	9,183 (37%)	2,275 (9%)	1,601 (6%)
2010	1,368 (5%)	5,401 (21%)	3,914 (15%)	8,764 (34%)	3,409 (13%)	2,638 (10%)

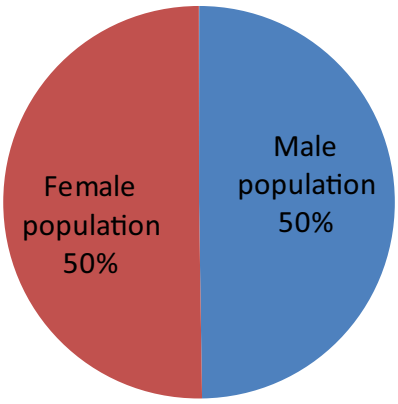
Figure 3-1: Distribution of Population by Age, 2010



Source: US Census 2010

In terms of gender, Merrimack's population is evenly distributed between men (50 percent) and women (50 percent).[3]

Figure 3-2: Distribution of Population by Gender



The Town is also largely homogeneous, with approximately 95 percent of the population identifying as White alone as shown in **Table 3-4**.[4] Approximately two percent is Asian and just under one percent of the population is African American, with the remaining 1.6 percent being two or more races.

3 US Census 2010.

4 US Census 2010.

Table 3-4: Population Comparison by Race

	Total Merrimack		18 years and over	
	Number	Percent	Number	Percent
Population				
Total population	25,494	100	19,237	100
Race				
One race	25,090	98.4	19,058	99.1
White	24,230	95	18,445	95.9
Black or African American	192	0.8	151	0.8
American Indian and Alaska Native	46	0.2	35	0.2
Asian	499	2	349	1.8
Native Hawaiian and Other Pacific Islander	4	0	4	0
Some Other Race	119	0.5	74	0.4
Two or More Races	404	1.6	179	0.9

Source: 2010 US Census

3.4 Households

Merrimack had 9,503 households in 2010 compared to 8,832 in 2000, which was an 8 percent increase, as shown in **Table 3-5**. Family households comprise 75 percent of all Merrimack households. Of the family households, 83 percent are married couples and 45 percent have children less than 18 years of age, which represents a slight decrease from the 2000 Census.[5]

Table 3-5: Household Changes by Type

	2000	2010	Percent Change 2000-2010
Total Households	8,832	9,503	8%
Family Households	6,982	7,150	2%
Married couple family	6,019	5,951	-1%
Households with children <18	3,703	3,230	-13%
Non-family households	1,850	2,353	27%

Source: US Census 2000 and 2010; CLRSearch.com

5 Please note the following definitions for households from CLRSearch: **Family Household:** A family household is a household maintained by a householder who is in a family, and includes any unrelated people (unrelated subfamily members and/or secondary individuals) who may be residing there. **Married Family Household:** A married family household consists of a married householder and one or more other persons living in the same household who are related to the householder by birth, marriage or adoption. **Other Family Household:** Another family household consists of a householder and one or more other persons living in the same household who are related to the householder by birth or adoption. These households may have a Male Householder with No Wife Present and/or Female Householder with No Husband Present. **Non-Family Household:** A non-family household consists of a householder living alone (a one-person household) or where the householder shares the home exclusively with people to whom he/she is not related.

Census data confirms that Merrimack's average household size was 2.67 persons in 2010, as compared with 2.84 in 2000. Household size was as high as 3.9 in 1970. Again, this is consistent with a trend found throughout the country and reflects that more families are having fewer or no children, and that many people are delaying the start of having children until later in life. Merrimack's average household size is higher when compared to Hillsborough County (2.53) and the state of New Hampshire (2.46).[6]

Figure 3-3 below shows the distribution of household size in Merrimack according to the 2010 Census data. More than a third of the households are two person households and more than half are households with one or two people.

Figure 3-3: 2010 Size of Households

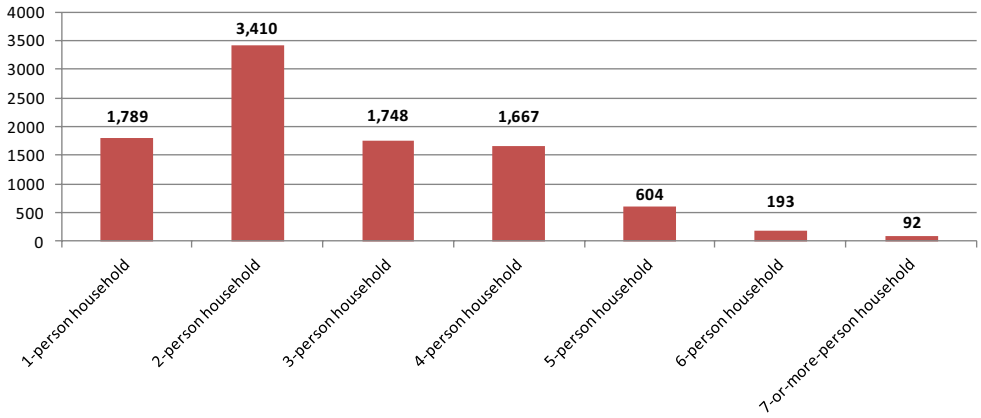
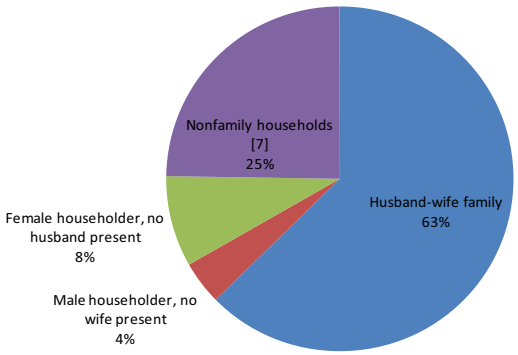


Figure 3-4 and **Table 3-6** provide additional detail about the breakdown of household types in Merrimack. Approximately three-quarters of all Merrimack households are considered to be family households, and 63 percent are husband-wife families. Single person head of household families are found in about 12 percent of all households, with two-thirds of them (8 percent) with a female head of household. Children under 18 years of age can be found in 34 percent of all households. Twenty percent of all households have people over 65 years residing in the home, and 28 percent of them (6 percent of the total households) have only one person over 65 years living in the home.

Figure 3-4: 2010 Households by Type



6 US Census 2010

Table 3-6: Detailed Breakdown of Household by Type

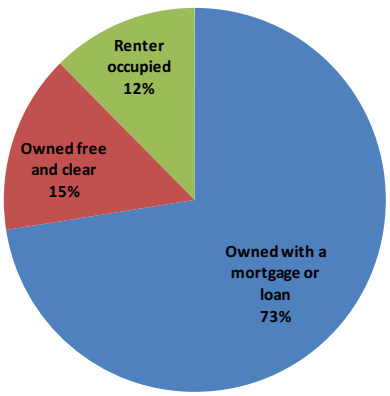
Household Type	Number	Percentage
Family Households	7,150	75.2
With own children under 18 years	3,250	34.2
Husband-wife family	5,951	62.6
With own children under 18 years	2,604	27.4
Male householder, no wife present	387	4.1
With own children under 18 years	193	2
Female householder, no husband present	812	8.5
With own children under 18 years	453	4.8
Nonfamily households	2,353	24.8
Householder living alone	1,789	18.8
Male	805	8.5
Over 65 years	130	1.4
Female	984	10.4
Over 65 years	408	4.3
Households with children under 18 years	3,489	36.7
Households with individuals over 65 years	1,901	20

Source: US Census 2010

The following tables and charts summarize household data for both owner-occupied and rental dwelling units in Merrimack. **Figure 3-5** shows that of all the occupied housing units, 73 percent are owned by someone who is paying down a mortgage or loan for the home, while 15 percent are owned free and clear. The remaining 12 percent are rental units.

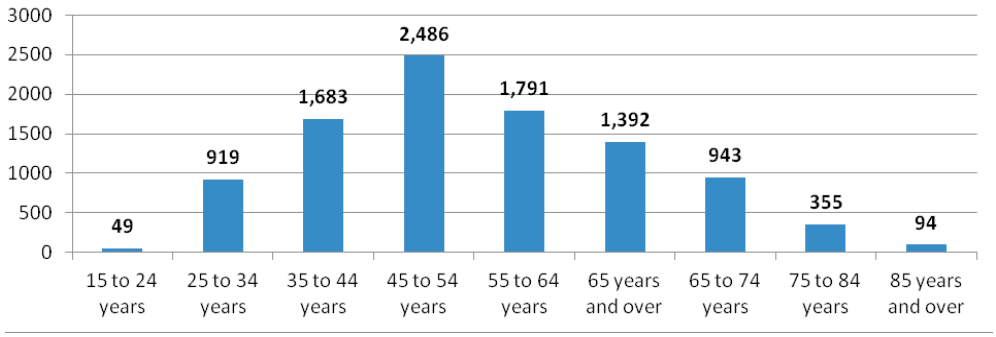
Figure 3-6 shows the distribution of householder age for owner occupied units. Thirty percent of the owners are in the 45 – 54 age bracket. Significantly, one third of all owner occupied units are owned by people 65 years old and over. Similarly, **Figure 3-7** shows the data for rental units. The majority of renters (42 percent) are between 25 and 44 years old. Almost 39 percent of all renters are over 65 years old.

Figure 3-5: Occupied Housing Units by Tenure



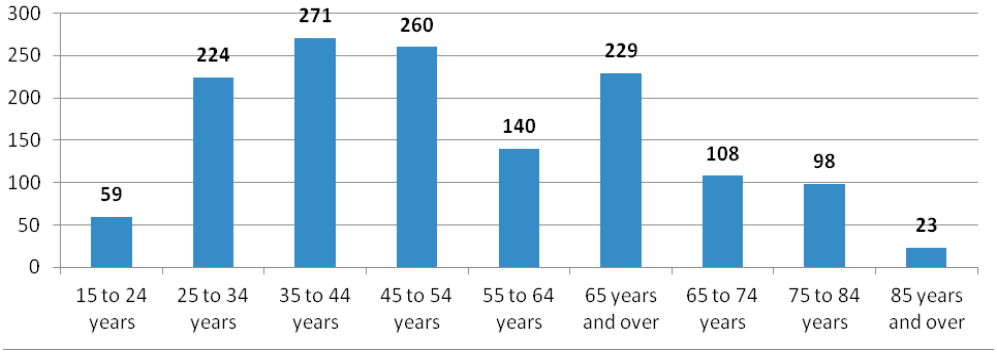
Source: US Census 2010

Figure 3-6: Age of Householder: Owner Occupied Housing Units



Source: US Census 2010

Figure 3-7: Age of Householder: Renter Occupied Housing Units



Source: US Census 2010

3.5 Housing Conditions

Household growth is a major driver of housing demand in a community. As the number of households in Merrimack increased between 2000 and 2010, so has the number of housing units. As shown in **Table 3-7**, there were 9,818 housing units in Merrimack in 2000, with 97 percent (9,503 units) being occupied. There is very little (less than 1 percent) seasonal housing in Merrimack.

Table 3-7: Change in Housing Units (2000-2010)

Housing Units	2000	2010	# Change	% Change
Occupied	8,882	9,503	641	7%
Vacant	130	315	185	142%
Total	9,013	9,818	805	9%

Source: US Census 2000 and 2010

Table 3-8 shows the vacancy rate comparison between 2000 and 2010. Although the number of vacant units is relatively small, (approximately 6 percent of all units in Hillsborough County and 16 percent in the state of New Hampshire are vacant), the increase since 2000 is fairly dramatic, possibly one result of the 2008 recession.

Table 3-8: Housing Vacancy

	2000	2010
Vacant units	130	315
Total housing units	9,013	9,818
Vacancy rate	1%	3%

Source: US Census 2000 and 2010

Of the 9,503 occupied housing units in Merrimack, approximately 88 percent were owner-occupied in 2010. This equals 8,320 units, which is a 9 percent increase from 2000, as shown in **Table 3-9**. However, the number of renter-occupied units decreased by 8 percent during the same 10-year period, from 1,281 in 2000 to 1,183 in 2010. This may reflect a trend toward conversion of rental to ownership units during this time period.

Table 3-9: Housing Tenure

Occupied Housing Units	2000	2010	% change
Owner Occupied	7,601	8,320	9%
Renter Occupied	1,281	1,183	-8%

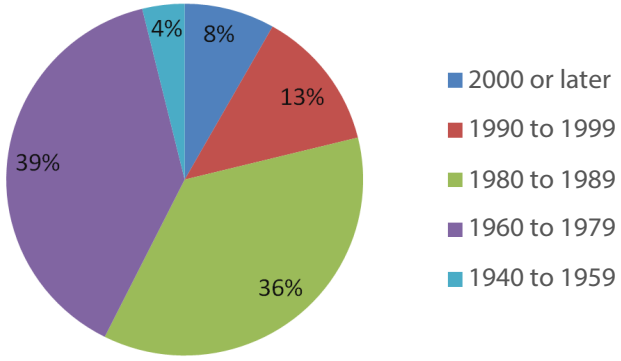
Source: US Census 2000 and 2010

In terms of housing type, Merrimack is predominantly home to single-family dwellings (72 percent), which is similar to the percentage in 2000.[7] The remainder of the units are two-family dwellings such as duplexes or multi-family housing developments.

7 Current Estimates and Trends in New Hampshire's Housing Supply Update: 2009; State of New Hampshire Office of Energy and Planning; October 2010

The housing stock in Merrimack is relatively new. A large portion of the Town's housing stock (75 percent) was built between 1960 and 1989, as shown in **Figure 3-8.** The 1990's showed another major increase in housing production, which has slowed somewhat since 2000, in part because of the recent economic downturn.

Figure 3-8: Age of Housing Stock



3.6 Housing Market

3.6.1 Home Sales Prices and Rental Costs

The sales prices of homes in Merrimack have grown considerably over the last decade, which is an indication that the values of owner occupied housing in the community have remained strong. As illustrated in **Table 3-10**, the median sale price for all homes increased by 57 percent over ten years from approximately $140,000 in 2000 to $220,000 in 2010[8]. This represents an average annual growth rate of almost 6 percent. That said, it should be noted that during the first few months of 2011, the median price dropped to $185,000 due to the continued fallout in the housing market associated with the 2008 recession (the median price before the recession was $245,000). A comparison between new and existing homes is difficult due to a small sample size for new home sales in Merrimack during this time period. This increase is similar to Hillsborough County where the median sales price grew by 50 percent overall with annual growth of 5 percent ($150,000 in 2000 to $225,000 in 2010). County-wide prices peaked at $265,000 before the recession.[9]

8 Note that the median price actually peaked at $255,000 in 2005, which represents an 82 percent increase I five years or an annual increase of 16 percent. Similarly, the median price in Hillsborough County peaked in 2007 at $265,000.

9 New Hampshire Housing Finance Authority.

Table 3-10: Median Home Prices in Merrimack and Hillsborough County – 2000-2011

Year	Merrimack Home Median Price	Hillsborough County Median Home Price	Merrimack Condominium Median Price	Hillsborough County Median Condominium Price
2000	$139,900	$149,900	$102,900	$105,000
2001	$172,000	$172,000	$130,000	$123,000
2002	$191,000	$203,700	$149,900	$150,000
2003	$206,900	$225,000	$165,000	$169,900
2004	$240,000	$249,900	$185,153	$185,000
2005	$255,000	$263,900	$193,000	$191,933
2006	$239,900	$262,000	$179,900	$189,000
2007	$244,900	$265,000	$186,200	$197,500
2008	$225,000	$244,900	$175,000	$189,900
2009	$205,000	$218,500	$156,000	$168,000
2010	$220,000	$224,900	$157,000	$175,000
2011	$214,000	$210,533	$152,000	$169,000

Source: New Hampshire Housing Finance Authority

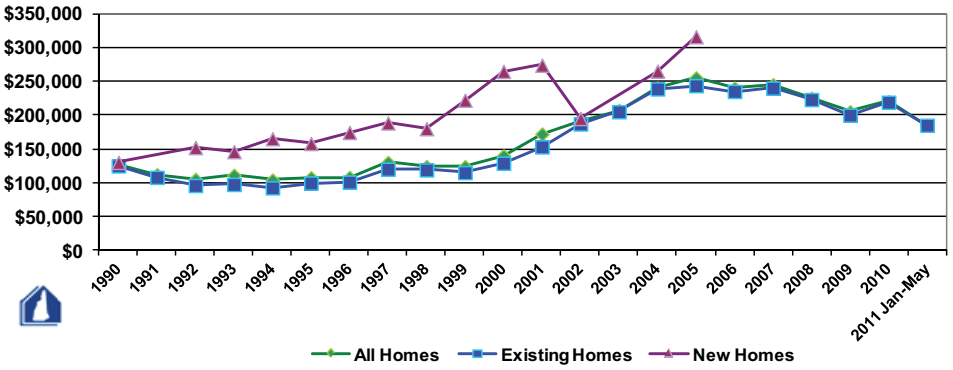
Sale prices of condominiums in Merrimack generally grew during this ten year period, although there was considerable fluctuation over the years, ranging from $103,000 in 2000 to $193,000 in 2005 (the median in 2010 was $157,000). Data for Hillsborough County shows a generally higher median price, which peaked at $197,500 before the start of the recession and is $175,000 in 2010.[10]

Median home prices in the towns surrounding Merrimack in 2010 were higher except in Nashua where the median price was comparable.

10 Ibid.

Figure 3-9 tracks the median home price trends for Merrimack from 1990 through early 2011.

Figure 3-9: Median Home Price Trends in Merrimack 1990-2011



Source: New Hampshire Housing Finance Authority
Note: Data with a small sample size of less than 50 are considered not valid, As a result, 2006 through 2011 new homes data are not displayed in the graph.

Median rental costs for apartments in Merrimack have increased steadily since 2000 from $925 per month to $1,217 in 2011. This translates into a 32 percent increase over the last 11 years, or 3 percent a year. These costs represent all rental units combined in terms of the number of bedrooms. The median rental costs for Hillsborough County were generally lower during the same time period, ranging from $779 per month in 2000 to $1,026 in 2011, which also corresponds to a 32 percent increase, or 3 percent annually. These rental costs are summarized in **Table 3-11** and **Figure 3-10**.[11]

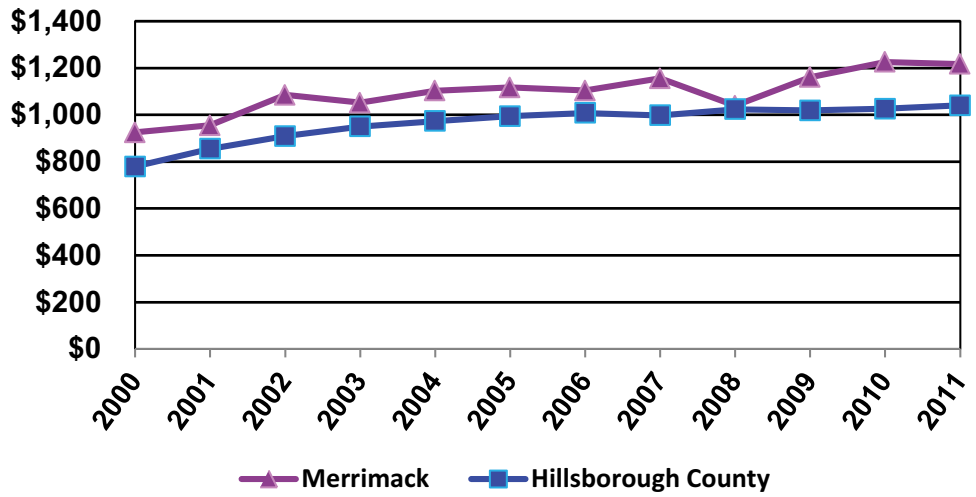
Table 3-11: Median Rental Costs in Merrimack and Hillsborough County (all units) 2000-2011

Year	Merrimack Median Rental Costs	Hillsborough County Median Rental Costs
2000	$925	$779
2001	$955	$855
2002	$1,085	$909
2003	$1,052	$950
2004	$1,103	$973
2005	$1,117	$994
2006	$1,104	$1,008
2007	$1,156	$998
2008	$1,039	$1,024
2009	$1,161	$1,019
2010	$1,226	$1,026
2011	$1,217	$1,040

Source: New Hampshire Housing Finance Authority

11 New Hampshire Housing Finance Authority.

Figure 3-10: Median Rental Costs in and Hillsborough County, 2000 – 2011



3.6.2 Housing Affordability

As the information in the preceding section illustrates, the cost to purchase a home or rent an apartment in Merrimack has risen substantially over the past decade. Renting an apartment in Merrimack remains higher than the Hillsborough County as a whole, however, buying a home is more affordable in Merrimack than the Hillsborough County. Ensuring that there is adequate affordable housing over the long-term has continued to be an issue of concern in Merrimack, as well as the region and the southern tier of New Hampshire for the better part of two decades. Housing affordability is a concern from both a social and an economic perspective. If households are required to pay a large portion of their incomes for housing it could result in a shortage of funds for other critical needs, such as food, health care, heating, etc. Furthermore, if inadequate affordable housing is available it can adversely affect the area's businesses and public agencies by reducing the supply of workers required to fill a variety of needed job skills.

The magnitude of this issue caused the New Hampshire Legislature to enact new legislation in 2008 requiring all communities to support the creation of workforce housing through their land use regulations. New Hampshire RSA 674:59, Workforce Housing Opportunities, states the following:

"…ordinances and regulations shall provide reasonable and realistic opportunities for the development of workforce housing, including multifamily housing. In order to provide such opportunities, lot size and overall density requirements for workforce housing shall be reasonable. A municipality that adopts land use ordinances and regulations shall allow workforce housing to be located in a majority, but not necessarily all, of the land area that is zoned to permit residential uses with the municipality."

As further noted in the statute, workforce housing is defined based on affordability limits that consider income levels not solely within Merrimack, but within the region as a whole. It states that for-sale workforce housing must be affordable to a household with an income of no more than 100 percent of the median income for a 4-person household for the metropolitan area or county in which the housing is located. It is also defined as rental housing that is affordable to a household with an income of no more than 60 percent of the median income for a 3-person household.[12] The income affordability guidelines require that no more than 30 percent of household income be required to support rent and utility costs, or the combined cost of mortgage, property taxes, and insurance, in the case of owner occupied housing.

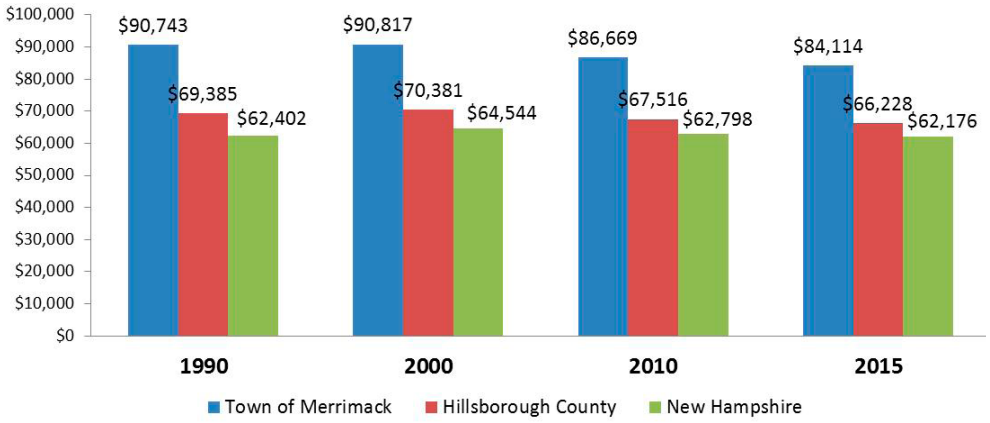
3.7 Housing Needs Assessment

A housing needs assessment examines the overall demographic profile of Merrimack, along with the household income of the population and housing costs to determine how the Town can best meet its needs for providing a diverse and affordable housing stock for its citizens. Based upon the information provided above, the needs assessment includes several major findings related to Merrimack's population and housing needs. These findings are described below:

- Merrimack median household income for 2010 was $86,669. For Hillsborough County, the 2010 median household income was $67,516 and it was $62,798 throughout New Hampshire. **Figure 3-11** presents the median household income for Merrimack, Hillsborough County, and New Hampshire adjusting to 2010 dollars to account for inflation using the Consumer Price Index (CPI-U) published by the Bureau of Labor Statistics. When accounting for standard consumer price inflation on goods such as food, housing, and transportation, real household income has been steadily dropping from $90,817 in 2000 to $86,669 in 2010. The 2015 projections show that the trend toward lower median household income is expected to continue in Merrimack, Hillsborough County, and New Hampshire. Median household income in Merrimack is projected to fall to $84,114 in 2015 as shown on **Figure 3-11**.

12 Refers to income guidelines published annually by the U.S. Department of Housing and Urban Development.

Figure 3-11: Merrimack Median Household Income in Merrimack 1990-2015

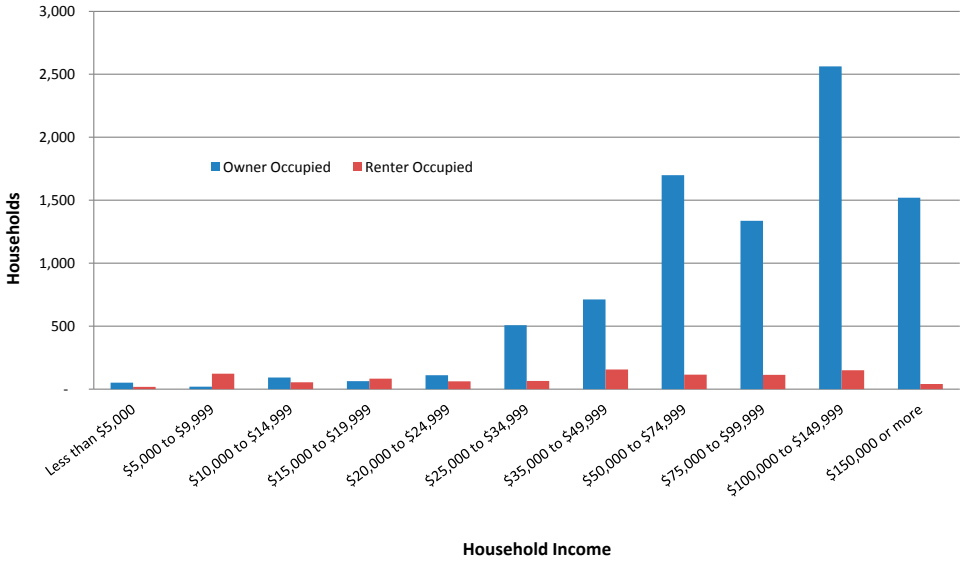


Source: US Census 1990, 2000, 2010, and 2015 projection.

Note: Income adjusted using Northeast CPI-U (Consumer Price Index for All Urban Consumers) 2010 dollars.

Figure 3-12 illustrates the distribution of median household income for renter and owner occupied housing in Merrimack.

Figure 3-12: 2011 Household Income Distribution for Renter and Owner Occupied Housing



- As described above, for housing to be affordable as defined by the workforce housing statute, for-sale housing must be affordable to households earning at or below 100 percent of area median income. For rental housing, the standard is 60 percent of area median income. For the purposes of determining affordability pursuant to the workforce housing law, area median income for Merrimack is based upon the Nashua HUD Metro Fair Market Rents Area (HFMA).
- According to 2012 figures from HUD, the 100 percent of area median income for a family of four in the Nashua HMFA is $94,000, which will be the target number for determining affordability of for-sale housing units. For rental housing, 60 percent of the area median

income is $50,070 adjusted for a family of three.[13]

- New Hampshire Housing estimates that the affordable purchase price for a home in Merrimack is $295,000 and the estimated affordable rent is $1,250 per month. The estimated affordable purchase price assumes that no more than 30 percent of household income is spent for housing after a 5 percent down payment, a 30 year mortgage at a 4.81 percent interest rate, private mortgage insurance, taxes and homeowners insurance. The estimated affordable rent is based upon an expenditure of no more than 30 percent of household income that includes the monthly rental cost and utilities.
- Based upon those figures and the current median home price of $220,000 and the median monthly rent cost of $1,217, there is no housing affordability gap in Merrimack at this time.
- In 2009, 71.3 percent of the homes units sold were priced at or below, the estimated affordable purchase price. In 2011, 60.1 percent of the two-bedroom dwelling units were rented at the estimated affordable rental cost. These figures are for the Nashua HFMA, not just Merrimack.
- Given that median household income is projected to drop slightly over the next few years and the expectation that housing prices will recover, it is still important to look for ways to ensure that the housing stock remains diverse and affordable into the future in order to avoid an affordability gap. The recession resulted in a disruption of housing prices, but this has created an opportunity for the Town to foster housing affordability in the future by proactively employing the strategies described below that help to diversify the housing stock. If housing prices continued to rise at the pre-recession rate and if household income stayed steady, there would likely have been an affordability gap.
- Demographically, Merrimack is a growing community. As is true for many communities in NH and around the country, the growth is more heavily weighted towards the older population segments. Additional options for housing the growing elder population should be considered. Merrimack is also a community of predominantly family households, and Merrimack's housing stock is predominantly single-family dwellings. Merrimack has infrastructure issues that present a challenge to denser development (sewer and water), but also has areas of town where both town sewer and water are available.

3.8 Housing Recommendations

While there may not be any identifiable housing affordability gap based upon the housing needs assessment, it is important for Merrimack to create new opportunities to diversify and preserve its existing housing stock. The following recommendations are made to establish housing policies that achieve the housing goals set forth in this Plan.

13 New Hampshire Housing Finance Authority 2011 Workforce Housing Purchase and Rent Limits, RSA 674:58 – 6. [http://www.nhhfa.org/rl_docs/WrkfrcHsngPurchaseAndRentLimits_current.pdf]. Accessed August 2012.

In order to strengthen the Town's commitment to housing diversity and affordability, it should establish a Housing Commission that can advocate for the development of affordable workforce housing. A Commission can act as a resource to other Town boards and commissions on issues that arise relating to housing. It is not a regulatory body. However, a Housing Commission can also receive gifts of money or property to create an affordable housing fund. It can acquire and dispose of real property interests, subject to Town approval, in order to preserve or enhance housing affordability.

Consider establishing

H-1 ~~Establish~~ a Housing Commission that can advocate for the development of affordable workforce housing. A Commission can act as a resource to other Town boards and commissions on issues that arise relating to housing. It is not a regulatory body. However, a Housing Commission can also receive gifts of money or property to create an affordable housing fund. It can acquire and dispose of real property interests, subject to Town approval, in order to preserve or enhance housing affordability.

Goal 1: Encourage high-quality housing in attractive neighborhoods through development of innovative land use controls, regulations and programs, such as incentive bonuses to encourage features in site plans/New Hampshire Revised Statutes (RSA).

H-2 Encourage more mixed-use and infill development where appropriate along the Daniel Webster Highway corridor. This encourages the reuse of vacant or underdeveloped parcels and can allow for development at higher densities where the infrastructure can support it. Mixed-use development helps to diversify the housing stock by creating dwelling units that tend to be smaller and more affordable, either as rental or for-sale units.

H-3 Allow for smaller lot sizes in selected areas where water and sewer infrastructure is available.

H-4 Utilize substandard lots in certain areas by allowing subdivision of a lot into two lots – one with reduced area and width requirements. These new smaller lots could be developed with a goal of providing an alternative means for reducing housing costs.

H-5 Revise the zoning ordinance to encourage the development of more duplex and townhouse dwellings.

Goal 2: Maintain the Town of Merrimack's compliance in meeting the housing affordability goals pursuant to the Workforce Housing Law.

H-6 Consider adopting an Inclusionary Zoning ordinance. Many communities have enacted inclusionary zoning to designate a certain percentage of new housing units as affordable units that meet the requirements of the Workforce Housing Law. Setting aside a certain percentage of units as affordable would be done on a voluntary basis by developers if incentives are provided such as density bonuses, relief from specific dimensional regulations, or the exemption from paying certain fees, for example.

H-7 Consider revisions to the zoning regulations to allow for accessory apartments to make them more viable housing options, especially for senior citizen households. Do not

restrict accessory units to only family members and consider them as a by-right use rather than requiring a special permit. However, owner-occupancy of either the principal or the accessory unit can be one way in which to ensure greater neighborhood stability.

H-8 Inventory town-owned land and tax title property to identify potential parcels for use as affordable housing sites, which can be developed/rehabilitated by the Town or private developers.

H-9 Prepare a detailed and updated housing needs assessment that allows the Town to realistically achieve the creation of new affordable units to meet the needs of current and future Merrimack residents. This will be important given the changing demographics of the Town, especially the increasing population over 65 years of age, and the housing market that is still in a state of flux in the aftermath of the housing collapse during the recent recession. An emphasis should be placed on establishing housing for senior citizens, including assisted living facilities, and creating entry level housing opportunities for younger residents. This effort should be coordinated by the Merrimack Housing Commission, if established.

Goal 3: Ensure that housing choices are available to meet the needs of current and future generations in Merrimack.

H-10 Continue to look for ways to meet the needs of the growing elderly population. The Town currently has a couple of housing developments for senior citizens, although they are for market rate units. Others have been proposed but did not proceed because of market conditions. One option that is gaining more attraction around the country is for so-called senior cottage housing that provides for small single-family housing units clustered around a common building and other amenities.

H-11 Create incentives for open space residential development to enhance protection of open space while providing for a more diverse range of housing types. Construction costs can be reduced through lower infrastructure expenditures and lower maintenance costs by clustering dwelling units as a means to preserving larger contiguous open space resources.

4. Economic Development

4.1 Introduction

This chapter of the Master Plan is devoted to the economic conditions in the Town of Merrimack. These include:

- Demographics
- Employment & Establishments
- Income & Wages
- Land Use Trends
- Real Estate Development Trends
- Real Estate Assessed Values
- Commercial Real Estate Market Activity

These conditions define the facets of the Town's economic ecosystem, which includes people, institutions, companies, and infrastructure. Utilizing the description of these conditions, strategic recommendations are offered to maximize the Town's economic development efforts. Through the implementation of these recommendations, Merrimack will maintain its role as an attractive place to live, work, and play.

4.2 Economic Development Goals

This chapter's recommendations seek to meet the following goals for the Town's economic development efforts:

- Establish, maintain and expand the lines of communication and relationships between the public and private sectors.
- Retain Town businesses and attract new ones.
- Unify the Town's public sector to become more economic development-oriented.
- Coordinate land use policies, regulations, and permitting to facilitate economic development.
- Develop a stronger Town "brand" that highlights economic development efforts.
- Make the Town's development review process more transparent and consistent.
- Refine the Town's zoning and land use regulations to allow for greater flexibility.
- Encourage repositioning and redevelopment of under-utilized properties through the creation of public-private development finance mechanisms, such as, tax increment financing (TIF), economic revitalization zones (ERZs), and economic revitalization credits.

4.3 Summary of Major Findings

- The Town's population is stable, following two decades of growth.
- Employment conditions in Merrimack are favorable, with a 20 percent increase in the number of jobs during 2000-2009. Furthermore, these positions tend to be high-skill, high-wage positions. Meanwhile, the surrounding County had a loss of about 5 percent during that same time.
- Educational attainment in the Town is high—almost 40 percent of the Town's adults hold a four year degree, a rate that is about five percentage points higher than Hillsborough County.
- Job growth during 2008-2018 is estimated to be about 1,700 jobs.
- Merrimack's unemployment remains lower than state and national rates.
- Median household incomes are high—about $20,000 higher than the surrounding County.
- Land uses are generally segregated by F.E. Everett Turnpike, which divides residential uses to the west and commercial uses to the east.

- Almost half of the Town's land is residential in nature, followed by vacant (22 percent) and permanent open space (16 percent).
- Almost 90 percent of the Town's commercial and residential properties were built before 1990.
- The tax base is increasingly reliant on residential uses, which comprise about 80 percent of the total assessed value, up from 76 percent in 2001.
- The Town's property tax rate is towards the lower end of the range found among the surrounding communities.
- Office and industrial real estate lease rates tend to be lower than other New Hampshire real estate markets, while sale prices are somewhat high.

4.4 Demographic and Economic Conditions

The demographic and economic conditions of the Town of Merrimack and Hillsborough County (as well as New Hampshire, where applicable) provide the context upon which the Economic Development portion of the master plan is established. These conditions describe the characteristics of both residents and workers.

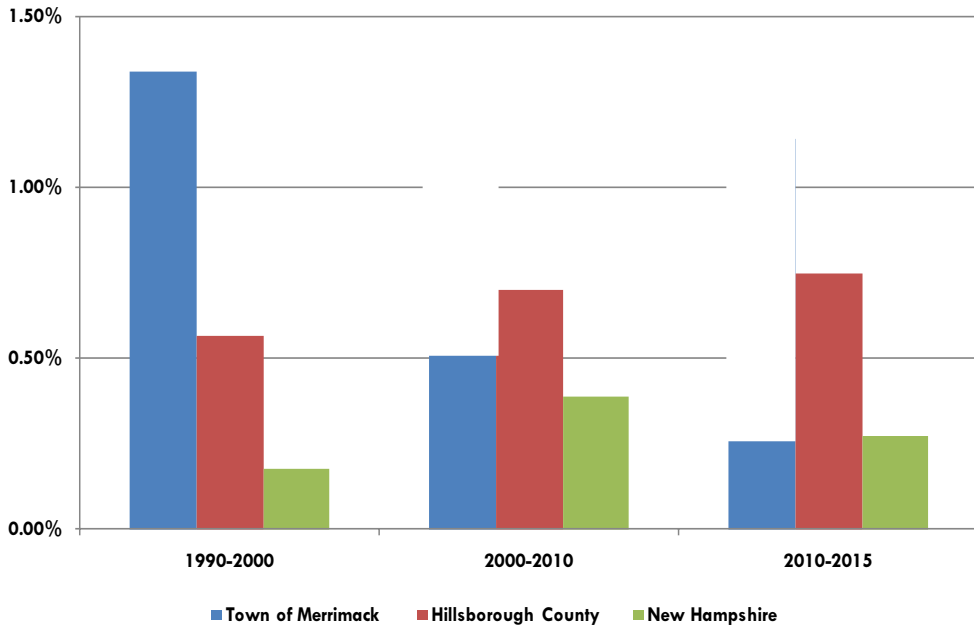
The information utilized in this section was gathered from a variety of sources:

- The Town of Merrimack's Assessing Department
- The Town of Merrimack's Community Development Department
- The Nashua Regional Planning Commission (NRPC)
- DemographicsNow (a reputable source for demographic data)
- New Hampshire's Office of Employment Security
- The US Census Bureau
- The New Hampshire Office of Energy and Planning

4.4.1 Population and Households

The annual rate of population has decreased since 1990 in the Town of Merrimack, in contrast to Hillsborough County as a whole, which has shown a steady increase. The growth rate of New Hampshire has increased since 1990 but is projected to decrease from 2000 to 2015 at a similar rate to Merrimack **(Figure 4-1).** In Merrimack, the annual rate has declined from about 1.3 percent during 1990-2000 to about 0.5 percent during 2000-2010 to a projected rate of about 0.2 percent during 2010-2015. Similar trends are occurring across all study areas.

Figure 4-1: Annual Change in Population



Source: US Census Bureau, DemographicsNow & RKG Associates, Inc., 2011

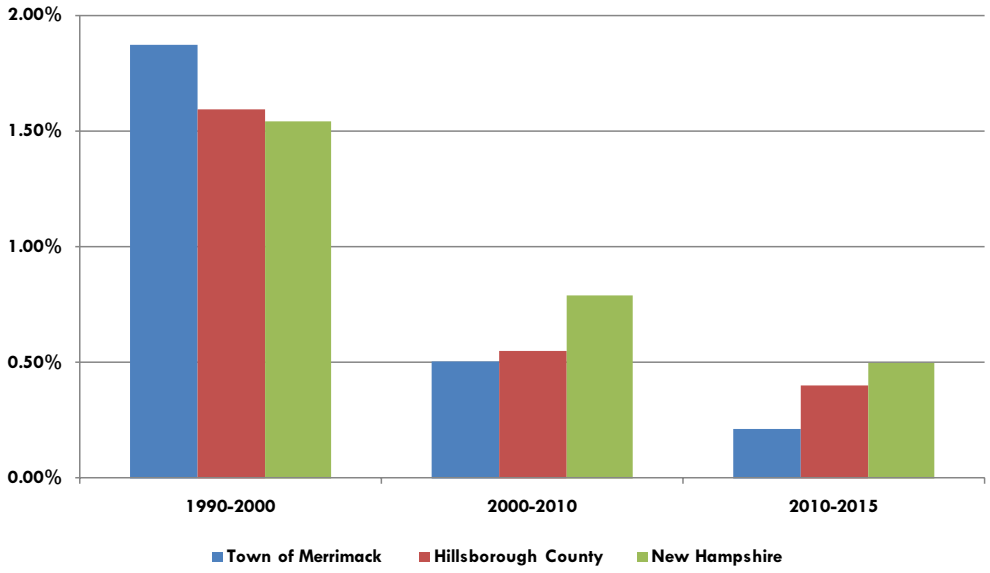
Table 4-1: Population Growth and Projections

	Trends			Projection
	1990	2000	2010	2015
Town of Merrimack	22,156	25,119	26,544	26,781
Hillsborough County	336,073	380,841	407,490	415,382
New Hampshire	1,109,253	1,235,786	1,328,192	1,346,271

Source: US Census Bureau, Demographics Now & RKG Associates, Inc., 2011

The Town's number of households increased from about 7,400 in 1990 to 8,800 in 2000 to 9,300 in 2010, with an expected increase to about 9,400 in 2015 **(Table 4-2).** While the overall number of households is increasing, the rate of increase is declining. During 1990-2000, the annual growth rate of households in the Town of Merrimack (almost 2.0 percent) was higher than its population growth rate (1.3 percent). However, that disparity disappeared during 2000-2010, at which time the growth rates were much more similar (around 0.5 percent). This shift towards a more similar rate of growth is likely attributable, at least in part, to a net decline in the Town's average household size. In 1990, the average household size in Merrimack was 2.97, but shrank to 2.84 in 2000 and then increased slightly to 2.85 in 2010. As household size declined, the number of people per household also declined, thereby reducing the difference between the rate of population and household growth.

Figure 4-2: Annual Change in Households



Source: US Census Bureau, DemographicsNow & RKG Associates, Inc., 2011

Table 4-2: Household Growth & Projections

	Trends			Projection
	1990	2000	2010	2015
Town of Merrimack	7,439	8,832	9,280	9,378
Hillsborough County	124,567	144,455	152,444	155,488
New Hampshire	411,186	474,606	512,160	524,885

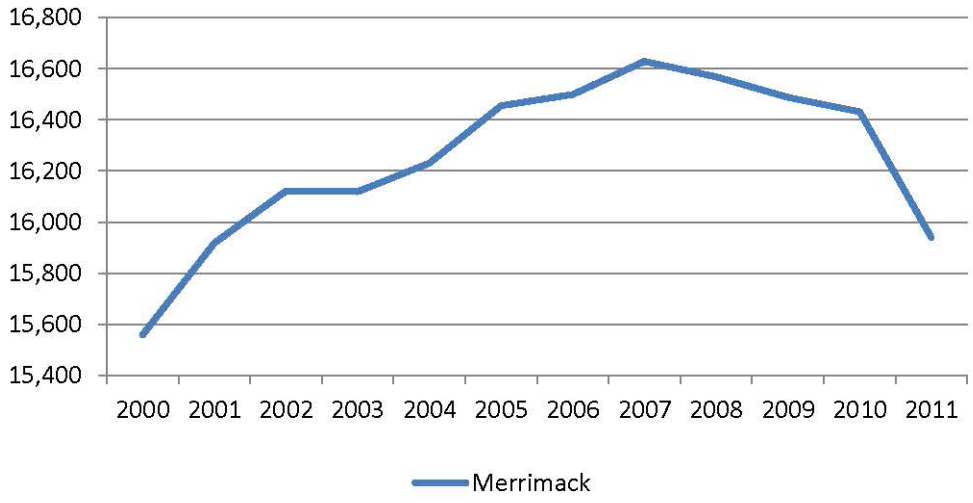
Source: US Census Bureau, Demographics Now & RKG Associates, Inc., 2011

This trend is expected to continue during 2010-2015, with an expected decline in growth rates for both population and households to an annual rate of about 0.3 percent.

4.4.2 Labor Force Characteristics

The size of Merrimack's labor force grew during the first half of the decade but slowed during the last half of the 2000s. Specifically, the Town's labor force increased from 15,559 employees in 2000 to 16,629 in 2007 at the high point, but has shown a steady decline since 2007 to 15,940 employees in 2011. Nevertheless, the Town experienced a net growth in its labor force during 2000-2011, meaning that the Town has netted about 400 labor force participants (or an increase of 2.5 percent) during the 2000s, despite persistent declines in the labor pool since 2007.

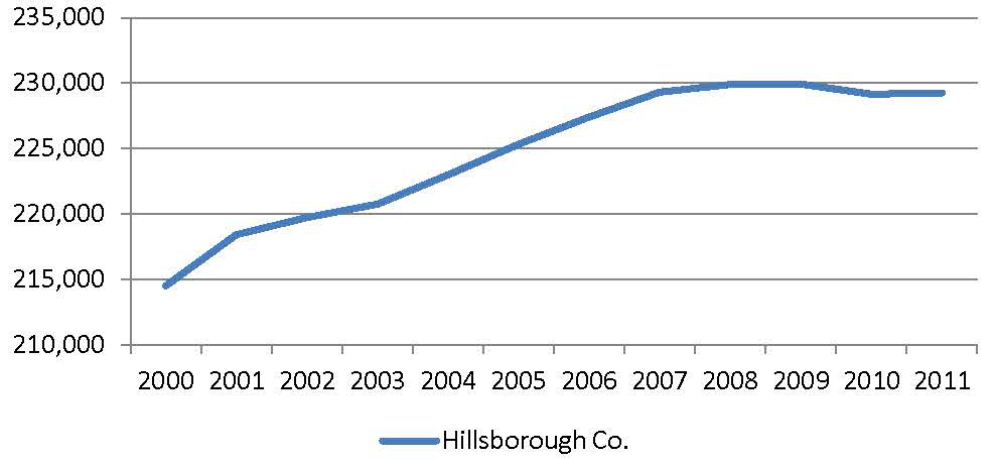
Figure 4-3: Civilian Labor Force, Town of Merrimack



Source: New Hampshire Employment Security & RKG Associates, Inc., 2011

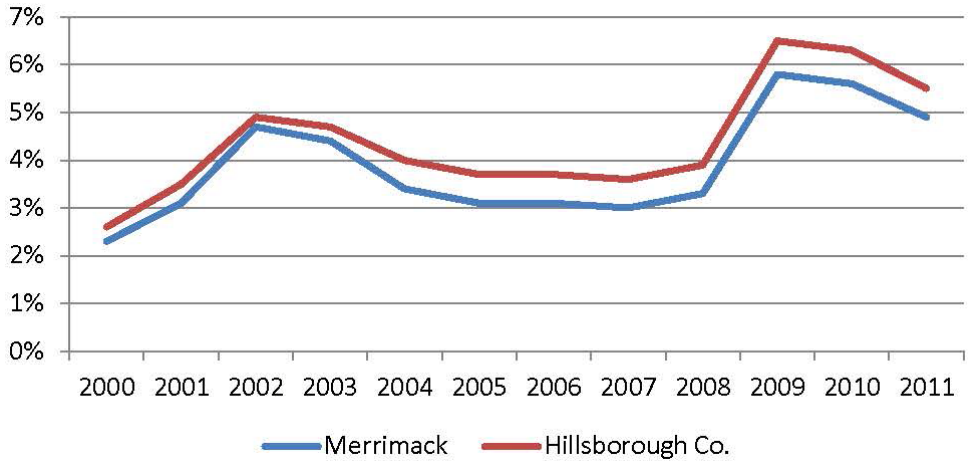
A similar trend is occurring in Hillsborough County. The workforce grew from 214,534 in 2000 to 229,927 in 2009, but then declined to 229,175 in 2010, resulting in a net gain of 14,641 persons (or 7 percent) **(Table 4-4).**

Figure 4-4: Civilian Labor Force, Hillsborough County



Merrimack's unemployment rate has remained 0.2-0.7 percent lower than the County's rate since 2000 **(Table 4-5).** Peaks in these two geography's unemployment rate have coincided with the two most recent nationwide recessions (2001 and 2007-2009). Assuming that Merrimack residents are maximizing their employment opportunities, the relatively low unemployment rate in the Town of Merrimack relative to County and nationwide trends may indicate that the Town's residents are in relatively higher demand as employees compared to the County.

Figure 4-5: Unemployment Rate, Town of Merrimack and Hillborough County



4.4.3 Employment & Establishment Trends

Employment growth in the Town of Merrimack has shown a steady increase between 2000 and 2011, growing by about 7 percent (or 843 employees). This is significant considering the two recessions that occurred during this time (2001 and 20072009) as well as a County-wide decline of 11 percent of its jobs during the same period. The majority of this growth in employment in the Town of Merrimack has occurred in white collar industries. For example, the professional and technical service, finance and insurance, and management of companies industries grew by 2,567 employees during 2000-2011, increasing from 28 percent to 42 percent of the total jobs in the Town **(Table 4-3)**. Other growing white collar industries, such as health care and social assistance, gained jobs by almost 1,000 jobs during that same time.

Table 4-3: At-place Employment: Town of Merrimack

	2000	2011	% of Total	# Change	% Change
Professional & Technical Services	443	1,659	11.2%	1,216	274.5%
Finance & Insurance	3,100	4,120	27.9%	1,020	32.9%
Management of Companies	98	429	2.9%	331	337.8%
Education Services	682	116	0.8%	-566	-83.0%
Retail Trade	1,303	1,315	8.9%	12	0.9%
Health Care & Social Assistance	410	500	3.4%	90	22.0%
Other Services	357	440	3.0%	83	23.2%
Administrative & Waste Service	354	325	2.2%	-29	-8.2%
Arts, Entertainment & Recreation	47	48	0.3%	1	2.1%
Utilities	16	0	0.0%	-16	100.0%
Real Estate, Rental & Leasing	195	168	1.1%	-27	-13.8%
Wholesale Trade	309	284	1.9%	-25	-8.1%
Transportation & Warehousing	310	159	1.1%	-151	-48.7%
Information	206	117	0.8%	-89	-43.2%
Accommodation & Food Service	1,023	886	6.0%	-137	-13.4%
Manufacturing	3,505	2,635	17.8%	-870	-24.8%
Construction	N/A	N/A	N/A	N/A	N/A
Total	**12,358**	**13,201**	**100.0%**	**843**	**6.8%**

Source: New Hampshire Employment Security & RKG Associates, Inc., 2011.

Note: Private establishments jobs only. Government-related jobs not included.

The biggest declines in employment occurred in manufacturing (almost 900 jobs lost or a 25 percent decrease), education (566 jobs or a 83 percent decrease), accommodations and food service (137 jobs or a 15 percent decrease), information (90 jobs or a 43 percent decrease), and transportation and warehousing (151 jobs or a 49 percent decrease).

Similar, but not as pronounced, trends occurred in Hillsborough County as well. However, the greatest growth occurred in less-skilled white collar jobs, such as health care and social assistance, which grew from 21,334 jobs to 26,575 jobs during 2000-2011, or an increase of 25 percent **(Table 4-4)**. Higher-skilled white collar jobs, such as professional and technical services and management of companies grew but at a slower rate, 1,744 and 590 jobs, and remained a much smaller portion of the County when compared to Merrimack's distribution of employment.

Table 4-4: At-Place Employment: Hillsborough County

	2000	2011	% of Total	# Change	% Change
Health Care & Social Assistance	21,334	26,575	16.1%	5,241	24.6%
Education Services	11,879	4,265	2.6%	-7,614	-64.1%
Professional & Tech. Services	9,855	11,599	7.0%	1,744	17.7%
Arts, Entertainment & Recreation	1,753	2,418	1.5%	665	37.9%
Management of Companies	2,407	2,997	1.8%	590	24.5%
Accommodation & Food Service	13,391	13,998	8.5%	607	4.5%
Other Services	6,231	6,523	3.9%	292	4.7%
Real Estate, Rental & Leasing	2,555	2,316	1.4%	-239	-9.4%
Finance & Insurance	9,932	9,393	5.7%	-539	-5.4%
Information	5,954	5,204	3.1%	-750	-12.6%
Utilities	614	367	0.2%	-247	-40.2%
Administrative & Waste Service	8,526	9,160	5.5%	634	7.4%
Wholesale Trade	8,104	7,187	4.3%	-917	-11.3%
Construction	7,072	6,194	3.7%	-878	-12.4%
Transportation & Warehousing	6,677	3,820	2.3%	-2,857	-42.8%
Retail Trade	28,053	26,513	16.0%	-1,540	-5.5%
Manufacturing	41,497	26,327	15.9%	-15,170	0
Total	**185,834**	**164,856**	**100.0%**	**-20,978**	**-11.3%**

Source: New Hampshire Employment Security & RKG Associates, Inc., 2011

Note: Private establishments jobs only. Government-related jobs not included.

Growth in the number of business establishments in Merrimack also exceeded that of the County, with an increase of almost 5 percent, or 26 firms. As in the case of employment growth, this is also a noteworthy achievement given the losses sustained in many other parts of the country and region. The Town's establishment growth typically occurred among its relatively high-skilled white collar firms, such as the management of companies, finance and insurance and professional and technical services **(Table 4-5)**. Conversely, wholesale trade and transportation and warehousing lost both firms and employees.

Table 4-5: Business Establishments: Town of Merrimack

	2000	2011	% of Total	# Change	% Change
Finance & Insurance	39	61	10.4%	22	56.4%
Professional & Technical Services	69	81	13.8%	12	17.4%
Administrative & Waste Service	41	52	8.9%	11	26.8%
Accommodation & Food Service	43	54	9.2%	11	25.6%
Education Services	16	16	2.7%	0	0.0%
Management of Companies	4	12	2.0%	8	200.0%
Health Care & Social Assistance	39	45	7.7%	6	15.4%
Information	12	10	1.7%	-2	-16.7%
Utilities	1	0	0.0%	-1	-100.0%
Arts, Entertainment & Recreation	5	5	0.9%	0	0.0%
Real Estate, Rental & Leasing	21	19	3.2%	-2	-9.5%
Manufacturing	40	38	6.5%	-2	-5.0%
Other Services	61	59	10.1%	-2	-3.3%
Retail Trade	74	65	11.1%	-9	-12.2%
Transportation & Warehousing	21	10	1.7%	-11	-52.4%
Wholesale Trade	75	60	10.2%	-15	-20.0%
Construction	N/A	N/A	N/A	N/A	N/A
Total	**561**	**587**	**100.0%**	**26**	**4.6%**

Source: New Hampshire Employment Security & RKG Associates, Inc., 2011

Note: Private establishments only. Government-related units not included.

Hillsborough County did not experience the same amount of growth found at the Town level, losing about 2 percent of its firms during 2000-2011. However, sectors such as retail, information, manufacturing, and wholesale trade experienced relatively large losses across both fronts **(Table 4-6)**. Meanwhile, sectors such as administrative and waste service, accommodation and food service, health care and social assistance and professional and technical services experienced growth in both employees and firms.

Table 4-6: Business Establishments: Hillsborough County

	2000	2011	% of Total	# Change	% Change
Administrative & Waste Service	572	775	7.2%	203	35.5%
Accommodation & Food Service	684	810	7.5%	126	18.4%
Health Care & Social Assistance	969	1,062	9.9%	93	9.6%
Education Services	195	188	1.7%	-7	-3.6%
Finance & Insurance	585	613	5.7%	28	4.8%
Professional & Tech. Services	1,366	1,414	13.1%	48	3.5%
Arts, Entertainment & Recreation	115	150	1.4%	35	30.4%
Management of Companies	79	103	1.0%	24	30.4%
Transportation & Warehousing	248	211	2.0%	-37	-14.9%
Utilities	26	16	0.1%	-10	-38.5%
Information	246	202	1.9%	-44	-17.9%
Construction	981	913	8.5%	-68	-6.9%
Real Estate, Rental & Leasing	419	358	3.3%	-61	-14.6%
Other Services	992	959	8.9%	-33	-3.3%
Manufacturing	773	625	5.8%	-148	-19.1%
Wholesale Trade	1,145	953	8.8%	-192	-16.8%
Retail Trade	1,621	1,429	13.3%	-192	-11.8%
Total	**11,016**	**10,781**	**100.0%**	**-235**	**-2.1%**

Source: New Hampshire Employment Security & RKG Associates, Inc., 2011

Note: Private establishments only. Government-related units not included.

4.4.4 Employment Projections

The sectors generating the most growth during 2000-2009 are generally expected to continue on their trajectory during the coming years in Hillsborough County. Some of these high-growth industries that typically require relatively high levels of skill include:

- Health care and social assistance (7,601 jobs)
- Professional, scientific, and technical services (2,787 jobs)
- Educational services (2,423 jobs)
- Finance and insurance (686 jobs)
- Information (107 jobs)

In all, the County is expected to experience a net gain of almost 20,000 jobs during 2008-2018 **(Table 4-7)**. Since Merrimack represents 8.6 percent of the County's 2008 total employment, it is reasonable to estimate that the Town may capture a similar share of the projected growth to 2018, which equates to 1,708 jobs. Based on an average quantity of 300 square feet required for each employee, the addition of these new employees to the Town's employment base could generate demand for an additional 512,500 square feet of commercial real estate, thereby increasing the Town's property tax base.

Table 4-7: Employment Projections, Hillsborough County (2008-2018)

	2008 Estimated Employment	2018 Projected Employment	# Change	% Change
Health Care and Social Assistance	25,894	33,495	7,601	29%
Professional, Scientific, and Technical Services	12,695	15,482	2,787	22%
Educational Services	15,865	18,288	2,423	15%
Accommodation and Food Services	14,354	15,770	1,416	10%
Administrative and Waste Management Services	9,093	10,412	1,319	15%
Other Services (Except Government)	7,521	8,513	992	13%
Retail Trade	27,956	28,863	907	3%
Total Self-Employed and Unpaid Family Workers	16,902	17,706	804	5%
Construction	7,107	7,882	775	11%
Finance and Insurance	11,313	11,999	686	6%
Wholesale Trade	8,240	8,782	542	7%
Arts, Entertainment, and Recreation	2,368	2,875	507	21%
Public Administration	9,180	9,584	404	4%
Real Estate and Rental and Leasing	2,684	2,967	283	11%
Transportation and Warehousing	6,008	6,183	175	3%
Information	5,630	5,737	107	2%
Management of Companies and Enterprises	2,813	2,906	93	3%
Mining	49	52	3	6%
Agriculture, Forestry, Fishing and Hunting	204	205	1	1%
Utilities	354	308	-46	-13%
Manufacturing	29,266	27,307	-1,959	-7%
TOTAL	**215,496**	**235,316**	**19,820**	**9%**

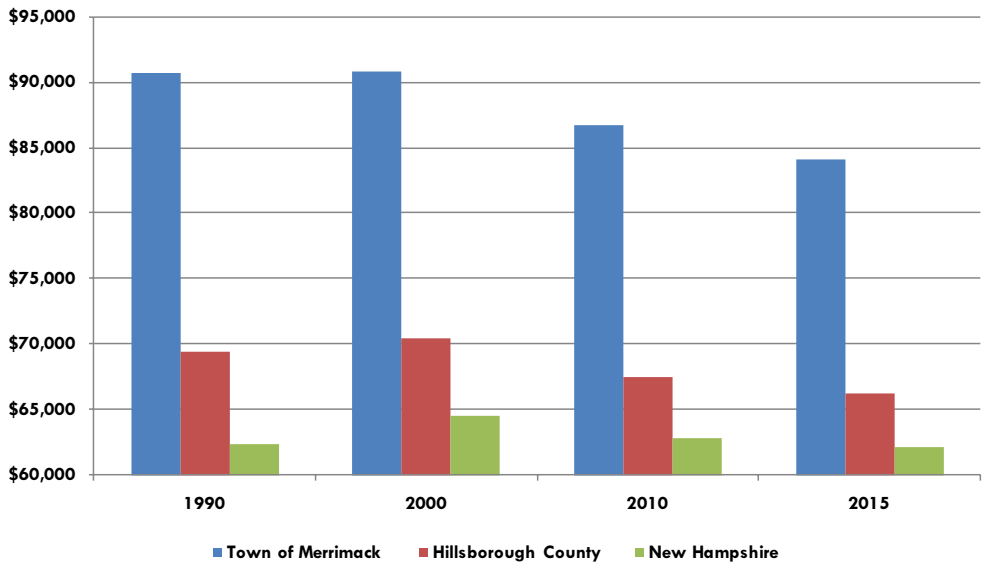
Source: New Hampshire Employment Security & RKG Associates, Inc., 2011

4.4.5 Household Incomes & Wages

For the purposes of this analysis, household incomes have been adjusted to remove the effects of inflation, the impact of which devalues the worth of money over time. By adjusting the incomes in this way, they can be measured against the worth of a dollar at a specific point in time (in this case, 2010), providing a more accurate comparison.

Median household income levels in the Town of Merrimack are consistently higher than the County and State by $20,000-$30,000 **(Figure 4-6).** When comparing the 2010 figures, the Town's median household income is about $20,000 higher than the surrounding Hillsborough County and almost $30,000 higher than the State. However, the Town's median household income has declined since 1990, remaining practically stable (about $90,800) between 1990 and 2000, but then declining to about $86,700 in 2010, followed by an additional expected decline to about $84,100 in 2015. Similar decreases since 2000 are expected in every study area. While the Town's median household income is declining, the decrease is relatively small given the high income level and the duration of the study period (25 years). However, it is worth noting that this decline is nevertheless taking place.

Figure 4-6: Median Household Income for Merrimack, Hillsborough Country, Rockingham County, and New Hampshire



The relatively large margin of Merrimack's household incomes over the County and the State can be attributed to the type of employment and high educational attainment found there, and the relatively high incomes that they provide. For example, three of the high-growth sectors in Merrimack generate relatively high incomes.

Annual wage data available for the County and the State are shown in Tables 4-8 and 4-9. Annual wage data are not available for the Town of Merrimack but providing the regional context is helpful for gaining a better understanding of salary trends for the different industries. It is also likely that residents of the Town of Merrimack have jobs within the County. Some of the wages within the County tend to be lower than statewide averages. For example, the average annual wage for the management of companies, education services, and utilities is about $20,000 to $10,000 lower in Hillsborough County than in the state.

Conversely, the average annual wage for finance and insurance is about $20,000 higher in Hillsborough County than in the state in the only wage at the 6-figure mark **(Tables 4-8 and 4-9)**. These variations are likely attributed to the varied nature of different firms within each sector, despite however similar they may be. The annual wages for each sector saw increases over the decade-long period from 2001 to 2011, with the greatest gains in wages were in real estate, finance and insurance, utilities, and manufacturing in Hillsborough County (almost 50 percent increase for these sectors). The magnitude of the wage increases were largely mirrored across the state.

Table 4-8: Annual Wages by Sector, Hillsborough County

Hillsborough County	2001	2011	% of Total	# Change	% Change
Health Care & Social Assistance	$33,910	$48,182	5.1%	$14,272	42.1%
Education Services	$25,857	$37,840	4.0%	$11,983	46.3%
Professional & Tech. Services	$62,289	$83,373	8.9%	$21,084	33.8%
Arts, Entertainment & Recreation	$18,146	$20,036	2.1%	$1,890	10.4%
Management of Companies	$49,714	$68,187	7.2%	$18,473	37.2%
Accommodation & Food Service	$14,288	$16,847	1.8%	$2,559	17.9%
Other Services	$26,016	$31,164	3.3%	$5,148	19.8%
Real Estate, Rental & Leasing	$32,783	$54,806	5.8%	$22,023	67.2%
Finance & Insurance	$60,556	$100,912	10.7%	$40,356	66.6%
Information	$62,838	$84,301	9.0%	$21,463	34.2%
Utilities	$55,877	$86,403	9.2%	$30,526	54.6%
Administrative & Waste Service	$27,636	$33,227	3.5%	$5,591	20.2%
Wholesale Trade	$58,668	$79,072	8.4%	$20,404	34.8%
Construction	$46,310	$52,229	5.6%	$5,919	12.8%
Transportation & Warehousing	$30,797	$40,657	4.3%	$9,860	32.0%
Retail Trade	$24,829	$30,463	3.2%	$5,634	22.7%
Manufacturing	$49,602	$73,346	7.8%	$23,744	47.9%
Total	$680,116	$941,045	100.0%	$260,929	38.4%

Source: U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages.

Table 4-9: Annual Wages by Sector, Statewide

Statewide	2001	2011	% of Total	# Change	% Change
Health Care & Social Assistance	$33,253	$48,032	5.2%	$14,779	44.4%
Education Services	$31,033	$47,760	5.2%	$16,727	53.9%
Professional & Tech. Services	$57,108	$77,068	8.3%	$19,960	35.0%
Arts, Entertainment & Recreation	$16,607	$19,121	2.1%	$2,514	15.1%
Management of Companies	$68,936	$88,534	9.6%	$19,598	28.4%
Accommodation & Food Service	$14,056	$17,299	1.9%	$3,243	23.1%
Other Services	$24,991	$31,645	3.4%	$6,654	26.6%
Real Estate, Rental & Leasing	$30,172	$47,032	5.1%	$16,860	55.9%
Finance & Insurance	$53,508	$81,587	8.8%	$28,079	52.5%
Information	$55,986	$74,527	8.1%	$18,541	33.1%
Utilities	$64,394	$96,334	10.4%	$31,940	49.6%
Administrative & Waste Service	$28,096	$40,259	4.4%	$12,163	43.3%
Wholesale Trade	$59,889	$77,868	8.4%	$17,979	30.0%
Construction	$42,122	$50,119	5.4%	$7,997	19.0%
Transportation & Warehousing	$30,243	$37,660	4.1%	$7,417	24.5%
Retail Trade	$23,156	$27,353	3.0%	$4,197	18.1%
Manufacturing	$44,710	$63,208	6.8%	$18,498	41.4%
Total	$678,260	$925,406	100.0%	$247,146	36.4%

Source: Bureau of Labor Statistics, Quarterly Census of Employment and Wages

4.4.6 Commuting Patterns

Besides those residing within the Town of Merrimack, workers commuting to Merrimack for employment most prominently come from Nashua and Manchester, which provide almost 30 percent of the people who are employed within the Town **(Table 4-10).** Other locations tend to include those communities which surround Merrimack within a radius of one or two municipalities away. Nashua and Manchester also receive many Merrimack residents who work outside of the Town. These workers make up almost 40 percent of Merrimack's resident workforce **(Table 4-11)**.

Table 4-10: Residence Location of Workers Employed in Merrimack

Location	# Workers	% of Total
Merrimack, New Hampshire	3,373	28%
Nashua, New Hampshire	1,856	15%
Manchester, New Hampshire	1,449	12%
Milford, New Hampshire	405	3%
Amherst, New Hampshire	362	3%
Bedford, New Hampshire	343	3%
Hudson, New Hampshire	337	3%
Goffstown, New Hampshire	276	2%

Location	# Workers	% of Total
Weare, New Hampshire	190	2%
Hooksett, New Hampshire	183	2%
Londonderry, New Hampshire	179	1%
Derry, New Hampshire	173	1%
Litchfield, New Hampshire	168	1%
Hollis, New Hampshire	146	1%
New Boston, New Hampshire	113	1%
All Other Locations	2,493	21%
TOTAL	12,046	100%

Table 4-11 : Workplace Location of Merrimack Residents

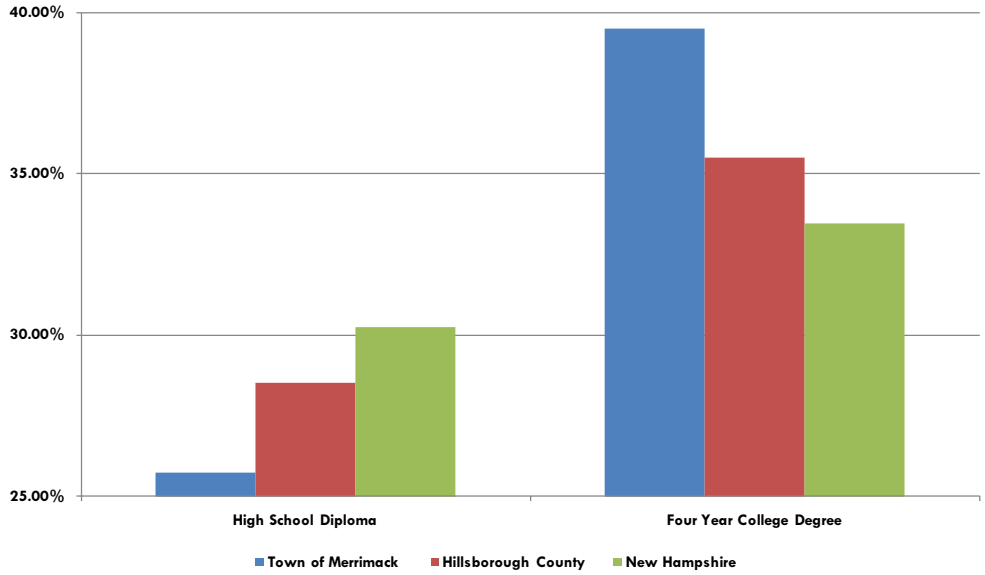
Location	# Workers	% of Total
Nashua, New Hampshire	3,628	25%
Merrimack, New Hampshire	3,373	24%
Manchester, New Hampshire	1,682	12%
Bedford, New Hampshire	802	6%
Hudson, New Hampshire	506	4%
Milford, New Hampshire	283	2%
Concord, New Hampshire	259	2%
Amherst, New Hampshire	253	2%
Billerica, Massachusetts	211	1%
Londonderry, New Hampshire	187	1%
Hollis, New Hampshire	141	1%
Hooksett, New Hampshire	141	1%
Chelmsford, Massachusetts	135	1%
Boston, Massachusetts	134	1%
Andover, Massachusetts	123	1%
All Other Locations	2,467	17%
TOTAL	14,325	100%

Source: US Census Bureau & RKG Associates, Inc., 2011

4.4.7 Educational Attainment

The educational attainment of the Town's population 25 years or older is consistent with employment and income trends discussed previously. In this case, the relatively high income and skill level required by the Town's employers is most likely correlated to the high levels of college completion among its residents. The rate of adults who completed a four year degree is almost 40 percent, which is about five percentage points higher than the County and about seven percentage points higher than the State **(Figure 47).**

Figure 4-7: Educational Attainment for Merrimack, Hillsborough Country, and New Hampshire



Source: US Census Bureau, DemographicsNow & RKG Associates, Inc., 2011

4.5 Land Use Trends

Land use trends within the Town of Merrimack are relatively segregated. Residential uses are generally concentrated west of the F.E. Everett Turnpike, while commercial, industrial, and institutional uses are typically found east of the Turnpike **(Figure 4-8).** Exceptions to this generalization occur along Continental Boulevard within one mile of Exit 10.

Given this relatively uniform separation of commercial and industrial uses from the Town's residential areas, the strategies and recommendations discussed in this plan will typically focus on the area east of F.E. Everett Turnpike as identified in Figure 4-. Note that the parcels east of the Boston & Maine (B&M) railroad line are excluded, since the railroad line limits access to these sites, thereby decreasing the likelihood of redevelopment. For the purposes of this plan, this area is referred to as the Daniel Webster Highway corridor.

As previously mentioned and further reinforced by **Table 4-12,** the Daniel Webster Highway corridor contains almost all of the Town's industrial and land. However, it also contains the majority of the Town's institutional (96 percent), school (85 percent), manufactured (90 percent) and multifamily (60 percent) housing, and mixed use (88 percent) land area, while only encompassing 29 percent of the Town's total acreage.

Table 4-12 : Land Use Trends, Town of Merrimack

	DW Highway Corridor			Town of Merrimack			
Land Use	Parcels	Acres	% of Town-Wide Supply	Land Use	Parcels	Acres	% of Total Town Acres
Vacant	171	1,431	34%	Vacant	553	4,212	22%
Industrial	55	1,297	92%	Industrial	60	1,406	7%
Single Family Residential	1,008	779	9%	Single Family Residential	6,852	8,451	43%
Commercial	221	691	99%	Commercial	224	698	4%
Permanent Open Space	27	449	14%	Permanent Open Space	116	3,126	16%
Institutional	16	201	96%	Institutional	18	210	1%
School	9	192	85%	School	10	227	1%
Multi Family Residential	97	165	60%	Multi Family Residential	163	276	1%
Government	24	150	37%	Government	35	401	2%
Recreation	4	102	50%	Recreation	10	201	1%
Manufactured Housing	7	65	90%	Manufactured Housing	14	72	0%
Mixed Use	1	20	88%	Mixed Use	2	23	0%
Right of Way	5	19	100%	ROW	9	19	0%
Agricultural	-	-	0%	Agricultural	3	131	1%
TOTAL	**1,645**	**5,561**	**29%**	**TOTAL**	**8,069**	**19,452**	**100%**

Source: Nashua Regional Planning Commission & RKG Associates, Inc., 2011

Figure 4-8 : Existing Land Use, Town of Merrimack

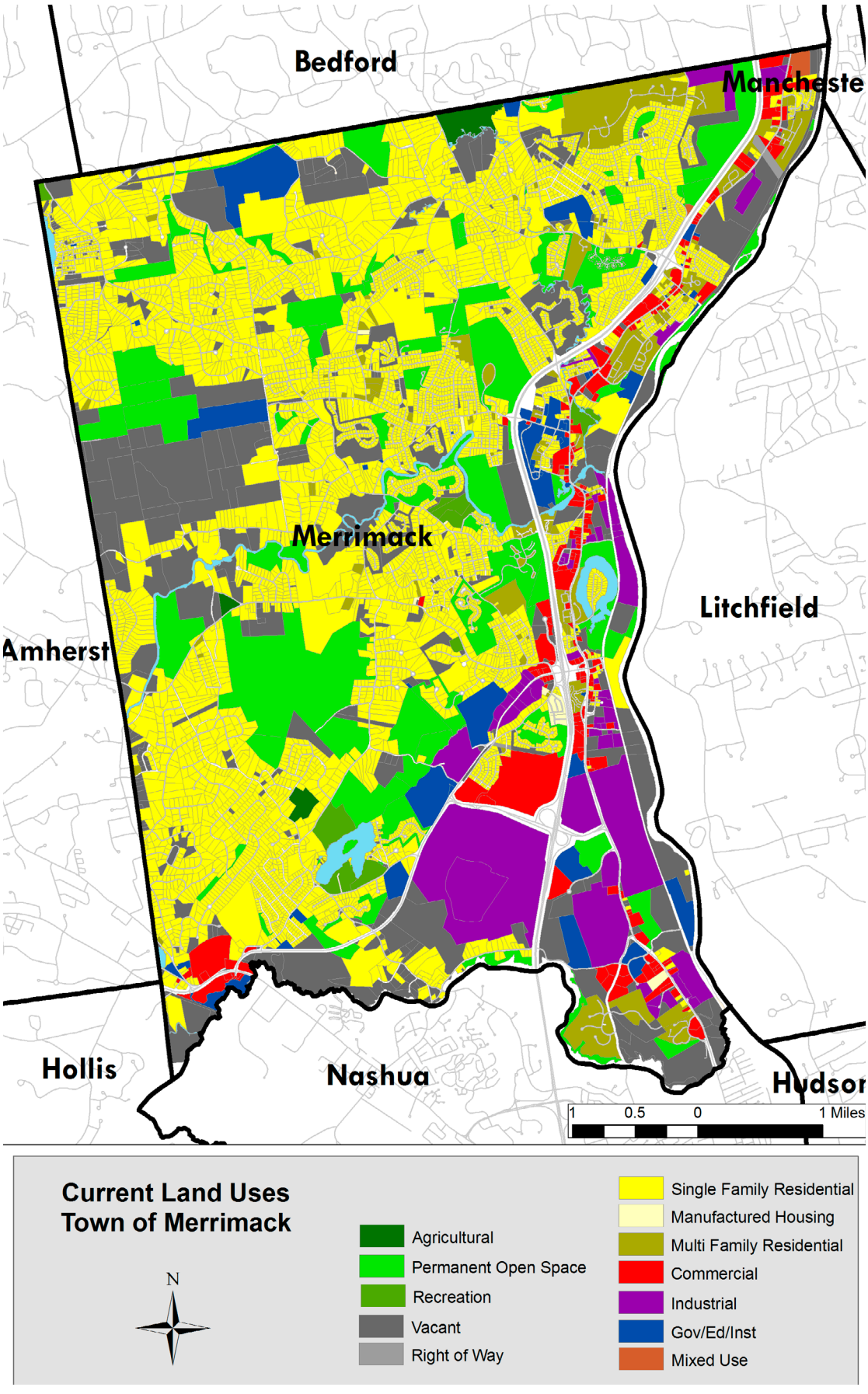
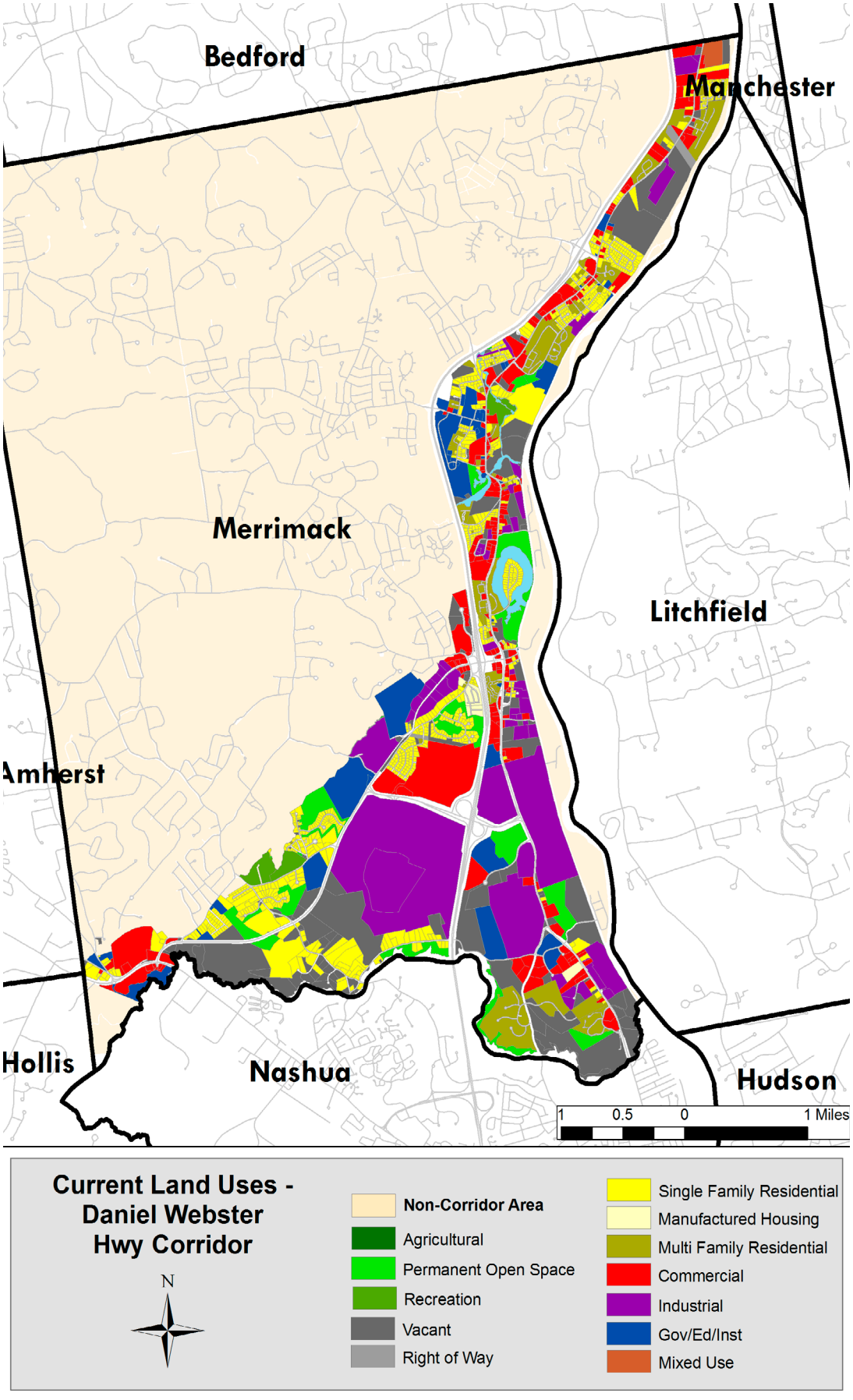


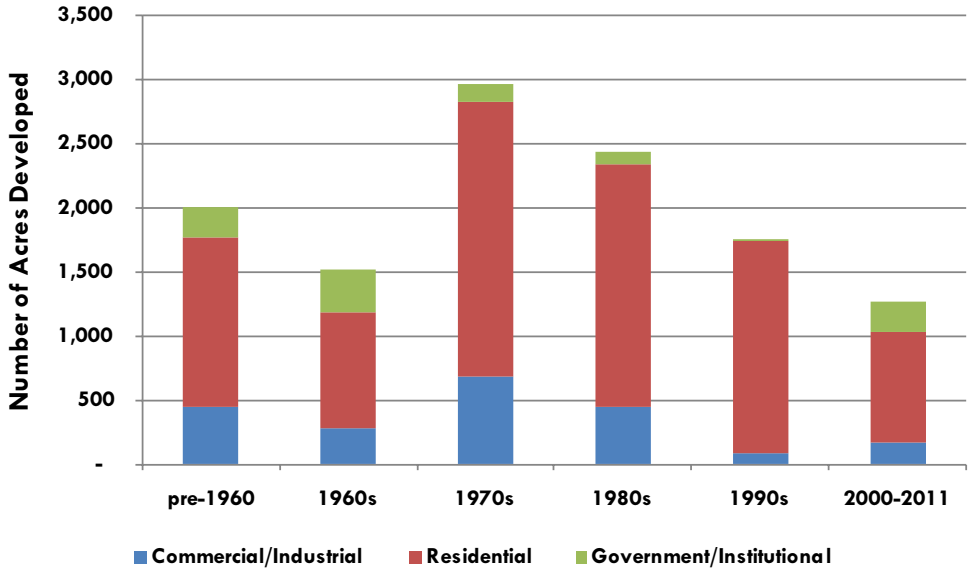
Figure 4-9: Existing Land Use, Daniel Webster Highway Corridor



4.6 Development Trends

The peak years of commercial and industrial development in Merrimack occurred during the 1970s and 1980s, during which time more than 1,100 acres were developed for these land uses **(Figure 4-10).** Since the end of that period, relatively little commercial and industrial development has occurred. In fact, almost 90 percent of the Town's developed commercial and industrial acreage includes structures more than twenty years old. This condition is most acute for industrial properties, of which less than 40 acres have been developed in the last twenty years **(Figure 4-10).** This finding indicates that there is relatively little new stock of this land use type available within the Town of Merrimack.

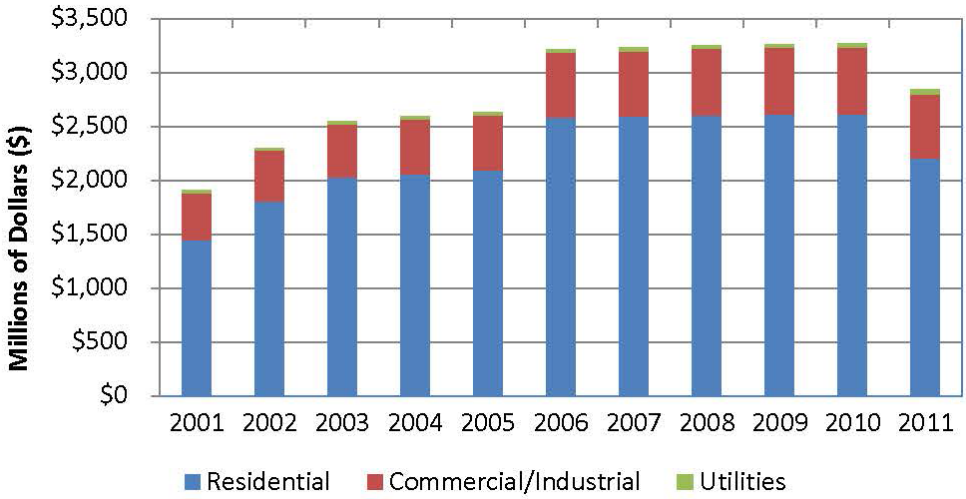
Figure 4-10: Development Trends by Land Use Type for Town of Merrimack



4.7 Tax Base Conditions

The total assessed value of properties in the Town of Merrimack has increased from $1.9 billion to $2.8 billion between 2001 and 2011 **(Figure 4-11).** However, assessed values have remained largely stable between 2006 to 2010, decreased between 2010 and 2011 by 13 percent **(Table 4-13)**.

Figure 4-11: Assessed Value in Merrimack



Source: New Hampshire Department of Revenue Administration

Notes: Assessment totals include assessment for land and buildings.

1 Includes manufactured housing.

The total value of residential properties in Merrimack increased more than 50 percent between 2001 and 2011, growing from $1.5 billion to $2.2 billion **(Table 4-13)**. Commercial and industrial properties have also increased in value from $436 million in 2001 to $589 million in 2011, an increase of 35 percent. The residential share of the Town's total assessed value has remained close to the original share in 2001 increasing only 1.6% to 77.6% of total assessed value in Merrimack. The commercial and industrial share has declined somewhat by about 2.2 percentage points to 20.7 percent of total assessed value.

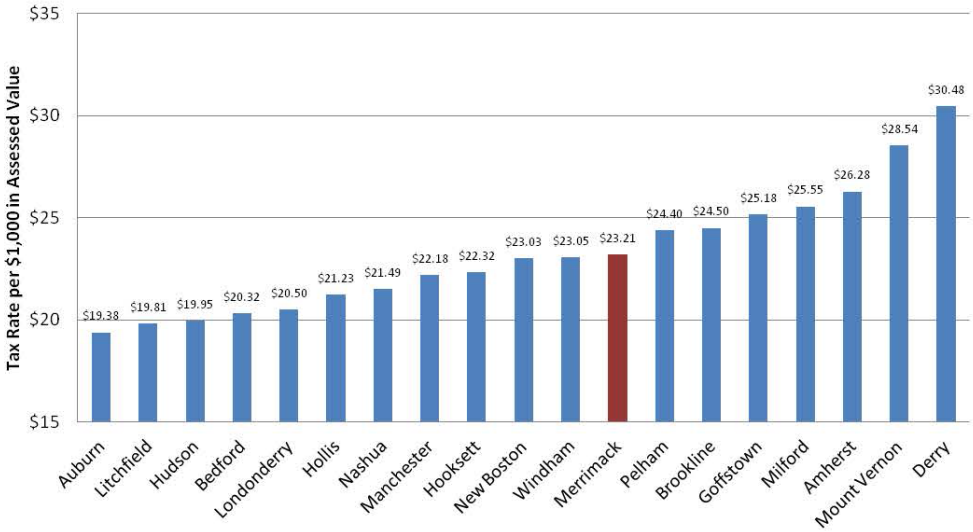
Table 4-13: Real Estate Assessment Values, Town of Merrimack, 2001 to 2011

Year	Residential[1]	Percent of Total	Commercial/ Industrial	Percent of Total	Utilities	Percent of Total	Total Assessed Value	Percent Change
2011	$2,205,523,500	77.6%	$589,316,300	20.7%	$47,801,900	1.7%	$2,842,641,700	-13.0%
2010	$2,617,713,770	80.1%	$616,501,030	18.9%	$33,161,400	1.0%	$3,267,376,200	0.2%
2009	$2,609,331,320	80.0%	$620,144,280	19.0%	$31,609,400	1.0%	$3,261,085,000	0.2%
2008	$2,606,711,040	80.1%	$615,417,660	18.9%	$31,399,300	1.0%	$3,253,528,000	0.7%
2007	$2,594,180,460	80.3%	$606,580,890	18.8%	$31,309,000	1.0%	$3,232,070,350	0.5%
2006	$2,581,867,010	80.3%	$606,946,540	18.9%	$27,753,400	0.9%	$3,216,566,950	22.4%
2005	$2,091,064,495	79.6%	$512,049,215	19.5%	$24,794,400	0.9%	$2,627,908,110	1.3%
2004	$2,059,925,497	79.4%	$508,545,913	19.6%	$24,689,400	1.0%	$2,593,160,810	1.9%
2003	$2,028,077,052	79.7%	$493,037,548	19.4%	$22,667,800	0.9%	$2,543,782,400	10.7%
2002	$1,807,370,657	78.6%	$468,345,943	20.4%	$22,397,400	1.0%	$2,298,114,000	20.6%
2001	$1,448,554,876	76.0%	$435,481,934	22.9%	$21,685,900	1.1%	$1,905,722,710	-
% change 2001-2011	**52.3%**		**35.3%**		**120.4%**		**49.2%**	

4.8 Property Tax Comparison

Merrimack's property tax rate sits approximately in the middle of the range of tax rates in eighteen surrounding communities surveyed for this section. The Town's 2012 rate of $23.21 (down from $23.43 in 2011) per $1,000 in assessed value is seventh lowest of the selected pool **(Figure 4-12)**. The lack of a relatively high property tax rate is likely an indicator of relatively high residential values in the Town which offset the shrinking share of commercial and industrial assessed values as a portion of the Town's total assessed value.[1]

Figure 4-12: Property Taxes



1 New Hampshire Department of Revenue Administration, Equalization, Property Appraisal Division. http://www.revenue.nh.gov/munc_prop/equalization/index.htm

4.9 Local Non-residential Real Estate Conditions

According to active real estate listings on the website Loopnet.com, there is about 740,000 square feet of office, industrial, and retail space available for lease in the market at the time of writing (see Appendix B for a complete list of properties). Approximately 50 percent of this supply is office, 40 percent is industrial, and 10 percent is retail. Lease rates are $5-$9 for industrial space, $7-$17 for office space, and $10-$14 for retail space. This available supply found in Merrimack represents about 40 percent of the total vacant industrial (717,000 square feet) and office (2.8 million square feet) supply in the Nashua submarket, which includes Merrimack **(Table 4-14).** This submarket is part of the larger New Hampshire commercial real estate market as defined by Grubb & Ellis, a leading property brokerage and research firm.

Table 4-14 : Commercial Market Conditions, New Hampshire Real Estate Market

Submarket	Vacant	Total	Vacancy Rate	Warehouse/ Distribution	R&D/ FlexSpace	Vacant	Total	Vacancy Rate	Class A	Class B
Concord	213,982	1,392,692	15.4%	$3.37	$9.02	351,569	3,991,939	8.8%	$18.25	$14.22
Manchester	1,092,523	5,824,348	18.8%	$5.68	$7.90	754,794	13,120,099	5.8%	$19.88	$13.13
Nashua*	717,482	2,881,942	24.9%	$5.63	$8.03	2,802,824	18,513,776	15.2%	$16.79	$12.24
Portsmouth	467,095	2,316,871	20.2%	$6.36	$10.26	1,424,322	7,906,267	18.0%	$18.22	$15.00
Rochester	227,361	810,133	28.1%	$0.00	$6.50	950,225	6,078,756	15.6%	$15.50	$19.19
Salem	88,162	576,209	15.3%	$5.48	$8.57	1,800,348	5,167,344	34.8%	$20.56	$15.27

Source: Grubb & Ellis & RKG Associates, Inc., 2011

Note: * Includes Town of Merrimack.

The Nashua submarket's vacancy rates are 0.4 and 4.6 percentage points higher than the market-wide figures for office and industrial, respectively. The submarket's industrial vacancy rate is the second highest of the submarkets (25 percent), while the submarket's office vacancy rate if the fourth highest (15.2 percent).

The Nashua submarket's industrial rent rates are about $0.30 higher than market-wide figures for warehouse and distribution properties and $0.35 lower for R&D/flex space properties. Meanwhile the submarket's office rent rates are about $1.41 lower for class A office space and $2.20 lower for class B office space. Given these findings, the submarket appears to be more competitive in the industrial sector than in the office sector. In terms of Merrimack's competitiveness within the submarket, the Town's lease rates for industrial are generally in the same range as the Nashua submarket, with both ranging between about $5-$9. However, given some of the available office space in the Town available at rates as low as $7, it is likely that the Merrimack market offers some relatively low-priced office space compared to the larger submarket.

Recent commercial/industrial land transactions include the sFale of five parcels, ranging from about one quarter to almost four acres in size **(Table 4-15).** Sale prices per acre ranged from $96,000 to $1 million. Parcels of commercial/industrial land actively on the market range in size from 0.8 to 2.48 acres and in price per acre from $111,000 to $333,000. The range of these active and recently completed sales is generally higher than comparable sales activity in the towns surrounding Merrimack, where many sales occurred at a price of less than $200,000 per acre.

Recent building sales in Merrimack ranged from $43 to $129 per square foot for retail and office buildings ranging in size from 1,800 to 79,000 square feet. Buildings actively on the market range from $37 to $225 per square foot for office, retail, and industrial structures ranging in size from 1,000 to 18,000 square feet. Recent sales activity in surrounding communities has been at the lower end of the range described by Merrimack's active and recently completed offerings. For example, the average sale price for a selection of retail, office, and industrial properties in Bedford, Manchester, and Nashua ranged in price per square foot from about $5 to $50.

Based on this comparison of both building and land sale prices between Merrimack and surrounding communities, Merrimack appears to have relatively high sale prices while at the same time having relatively low lease rates. This may be due to the relatively older nature of the supply in Merrimack, which drives the lease prices down. However, the potential for new space offered through the purchase and repositioning of a property followed by subsequently higher rents may be keeping the sale prices afloat. While these findings are anecdotal in nature due to the small sample size available, they nevertheless reflect an appropriate level of accuracy to describe current real estate market conditions for the purposes of this plan.

[LEFT]
Atrium construction sign

[RIGHT]
Atrium

Table 4-15: Commercial Property Transactions, Town of Merrimack

Active Land Listings

Address	Type	Price	Acres	Price/Acre
52 DW Hwy	Comm	$229,000	1.13	$202,655
101 Herrick St	Comm	$275,000	2.48	$110,887
6 Herrick Street	Retail	$395,000	1.51	$261,589
723-725 DW Hwy	Retail	$499,000	1.5	$332,667
Amherst & Continental	Retail	N/A	0.8	N/A

Recent Land Sales

Address	Type	Price	Acres	Price/Acre
4 Dobson Way	Comm	$500,000	1.57	$318,471
21 Star Dr	Comm	$1,000,000	1.00	$1,000,000
55 DW Hwy	Industrial	$600,000	3.75	$160,000
5 Caron St	Industrial	$206,500	0.23	$899,514
Star Dr.	Industrial	$275,000	2.86	$96,154

Active Building Listings

Address	Type	Sq Feet	Price	Price/SF
10 Twin Bridge Rd	Industrial	6,250	$465,000	$74
712-714 DW Hwy	Industrial	8,314	$950,000	$114
1 Crosswoods Path Blvd	Office	18,000	$1,800,000	$100
2 Mount Ct	Office	2,160	$189,000	$88
10 Twin Bridge Rd	Office	954	$104,900	$110
10 Twin Bridge Rd	Office	5,392	$199,900	$37
10 Twin Bridge Rd	Office	2,219	$215,000	$97
725 DW Hwy	Retail	1,310	$225,000	$172
256 DW Hwy	Retail	4,000	$900,000	$225

Recent Building Sales

Address	Type	Sq Feet	Price	Price/SF
9 Executive Park Dr	Office	27,338	$1,400,000	$51
7 Executive Park Dr	Office	20,887	$1,425,000	$68
393 DW Hwy	Retail	1,841	$237,000	$129
416 DW Hwy	Retail	31,346	$1,350,000	$43
706 Milford	Retail	9,625	$1,150,000	$119
297 DW Hwy	Retail	15,464	$660,000	$43
7 Continental Blvd	Retail	78,893	$9,760,000	$124

Source: LoopNet & RKG Associates, Inc., 2011

4.10 Commercial and Industrial Assets, Constraints, and Opportunities

The following assets, constraints, and opportunities are offered as the foundation for the creation of further recommendations. They serve as a description of the Town's current employment, demographic, and physical characteristics as they relate to economic development.

4.10.1 Assets

Demographic and Economic Conditions

- Stable Population—The Town's population is generally stable, a condition that is expected to continue into the future.
- High Incomes—Merrimack's median household income level is about $20,000 higher than the surrounding County.
- Employment and Establishments—Employment growth in the Town increased by 20 percent during 2000-2009. Much of the growth occurred in high-skill and income levels. Growth in establishments reflects similar trends. The Town is expected to capture an additional estimated 1,708 jobs during 2008-2018.
- Unemployment—Merrimack's unemployment rate has remained below the County figure since 2000.
- Educational Attainment—The Town's share of adults with a four year college degree is almost five percentage points higher than Hillsborough County and about seven percentage points higher than New Hampshire.

Infrastructure

- F.E. Everett Turnpike —The Turnpike runs in a north-south direction through the Town, connecting to the metro Boston area to the south and the Manchester area to the north.
- Turnpike Interchanges—Merrimack has three interchanges within its boundaries to connect traffic with the Turnpike. These interchanges are located in relative proximity to much of the Town's industrial and commercial properties.
- Manchester Boston Regional Airport (MHT) Access Road—The now completed airport access road just north of Merrimack on Daniel Webster Highway provides convenient connection to MHT. The construction of this roadway appears to have stimulated new commercial development along South River Road in Bedford near the intersection with the access road. Such activity may spread south into Merrimack, thereby creating a new commercial node clustered around the entrance to the access road.
- Boston & Maine (B&M) Railroad—The B&M rail line follows the eastern boundary of the Town from Nashua north to Bedford. The proximity of the line to the Town's main commercial corridor (Daniel Webster Highway) could provide an important amenity in the attraction of future businesses to the corridor.

- Water Service—Water is provided to the Town by the Merrimack Village District Water Works (MVD) and Pennichuck Water Works. Current water usage by the Town's residents and businesses has an average usage of 2.2-2.5 million gallons per day (GPD), with maximum usage rates of about 4.5-5.0 million GPD, typically during the summer. While the Town's current water supply will supply about 5.2 million GPD, the MVD typically implements water use restrictions when usage approaches these higher levels. The MVD has been actively looking at new sources as well as improvements to existing ones to meet future demand.
- Sewer Service—Sanitary sewer service is provided by the Town's Public Works Department (PWD). The Town's sewer treatment facilities have a capacity of about 5 million GPD, but have a typical usage level of about 1.8 million GPD. One of the Town's major water users, Anheuser-Busch, once contributed as much as 50 percent of the plant's daily treatment activity, but their output has declined to about 30 percent of current treatment activity.

Vacant Land

The supply of privately-owned vacant parcels in the Town of Merrimack is based on the Town's geographic information system (GIS), land use, and assessment data. Figure 4-13 illustrates the privately-owned vacant parcels by zoning designation. Parcels under one acre in size were eliminated, as were those parcels designated as permanent open space, even if they were held under private ownership. Under these parameters, almost 3,700 acres were identified, distributed among 266 parcels **(Figure 4-13).** Almost all of these acres are zoned residential (69 percent) or industrial (29 percent). The remaining 2 percent is distributed among Limited Commercial (C-1) and General Commercial (C-2). The geographic distribution of these parcels follows the general land use trends of the Town at large, with the commercial and industrial parcels concentrated east of F.E. Everett Turnpike, and the residential parcels concentrated west of F.E. Everett Turnpike. More than 80 percent of these acres are found on parcels of ten acres or more, which often makes them more attractive as development sites, since larger sites are typically more capable of capturing sufficient economies of scale.

The development of real estate in the Town of Merrimack since 1990 has occurred at an average annual rate of about 140 acres per year. Applying this annual rate to the remaining supply of privately-owned vacant land under present zoning, the Town would reach a built-out status in 26 years.

- Transitional Properties—Utilizing the assessor's database, the Town's transitional properties were identified as properties more likely to attract redevelopment activity. In this case, transitional properties included those that had an assessed value below that of the median value for the given land use type. More than 6,500 acres were identified, comprised primarily of single family residential properties, which make up 76 percent of the total supply of transitional acres (see Figure 4-14). However, industrial, institutional, and commercial uses also comprise almost 1,000 acres, or 15 percent of the total supply. These parcels also tend to be relatively small, typically less than five acres in size.

Figure 4-13: Privately-owned Vacant Parcels by Zoning Designation

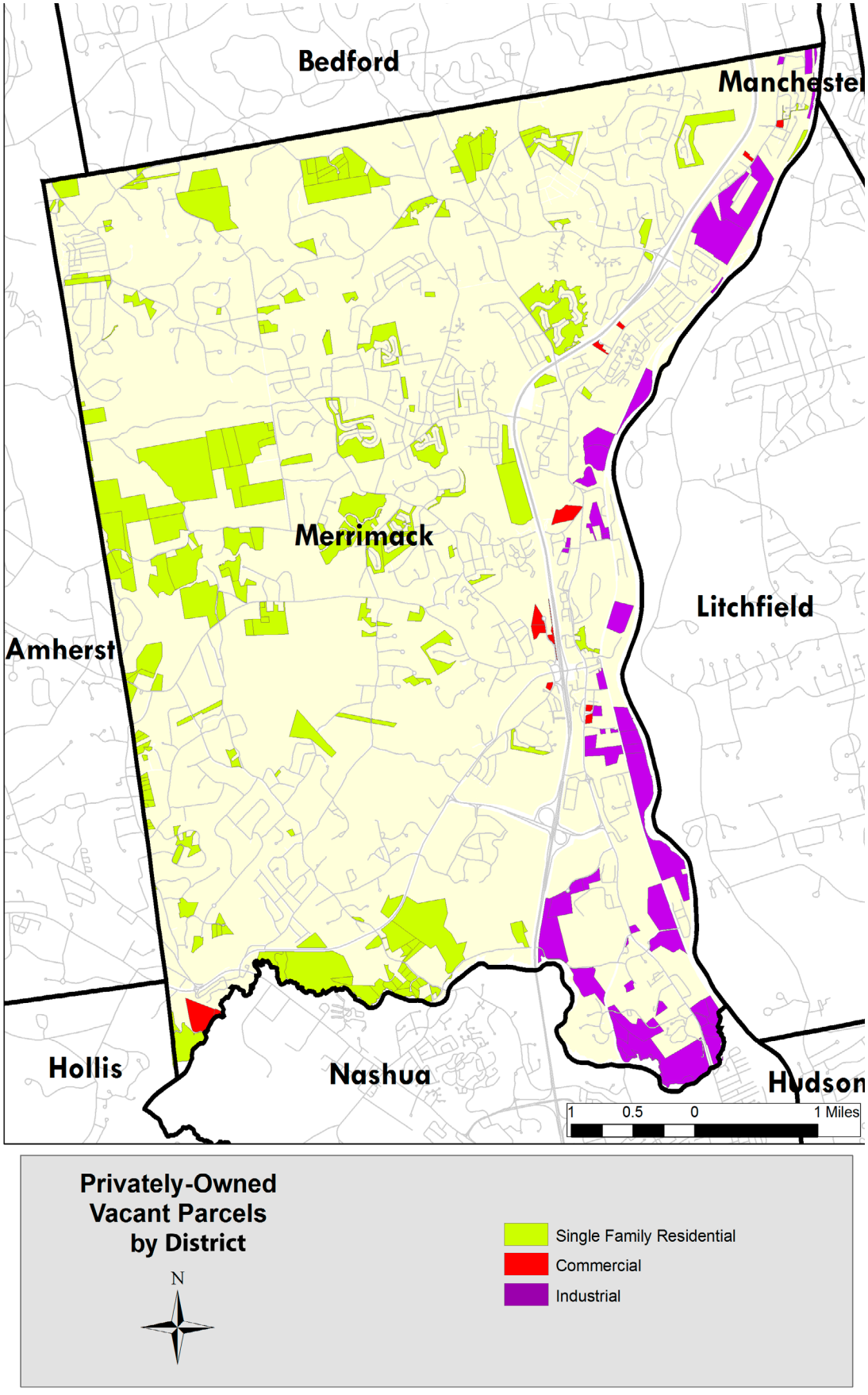
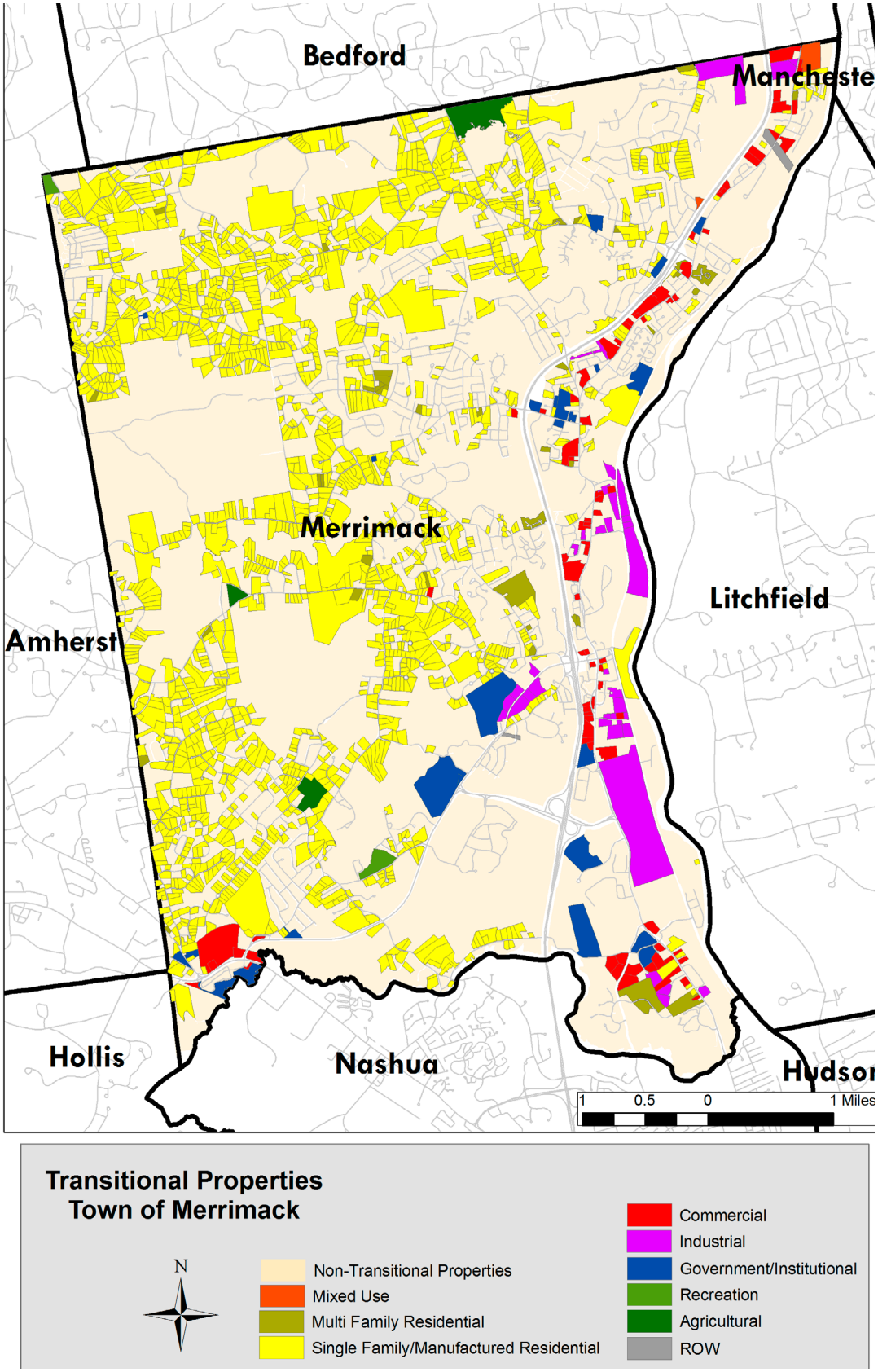


Figure 4-14: Transitional Properties



Constraints

- **Zoning**—Based on a review of the Town's land use regulations, Merrimack's zoning code represents a common style of Euclidean land use regulation. This style is common in many communities throughout the United States and focuses on segregating land uses by type, scale, and function. As the community's land use patterns have evolved over time, however, the zoning code does not appear to have evolved in tandem. In some cases, the zoning requirements of a given parcel may be inhibiting the repositioning of a property to a new "highest and best use."
- **Development Review Process**—The Town's real estate development review process is sometimes described by public officials and private businesses as opaque or inconsistent. Assuming this perception is accurate, such conditions inhibit the redevelopment of properties or the repositioning of marginal uses to adapt to changes in the current economy. Some perceive that the development review process is too challenging to allow for a feasible project, and subsequently discourages developers and property owners from creating new or redeveloped real estate.
- **Real Estate Market Conditions**—Commercial real estate market conditions in Merrimack can be characterized by relatively low rents and relatively high sale prices and replacement costs. Low rents discourage property owners from rehabilitating their existing space or creating new space, as it may be infeasible to recoup the accompanying costs. Relatively high sale prices, however, indicate that some buyers believe the property can be repositioned in order to generate higher rents or that the existing income stream is sufficient to justify the purchase price. Nevertheless, based on the minimal supply of newer commercial properties in Merrimack, such instances are relatively uncommon.

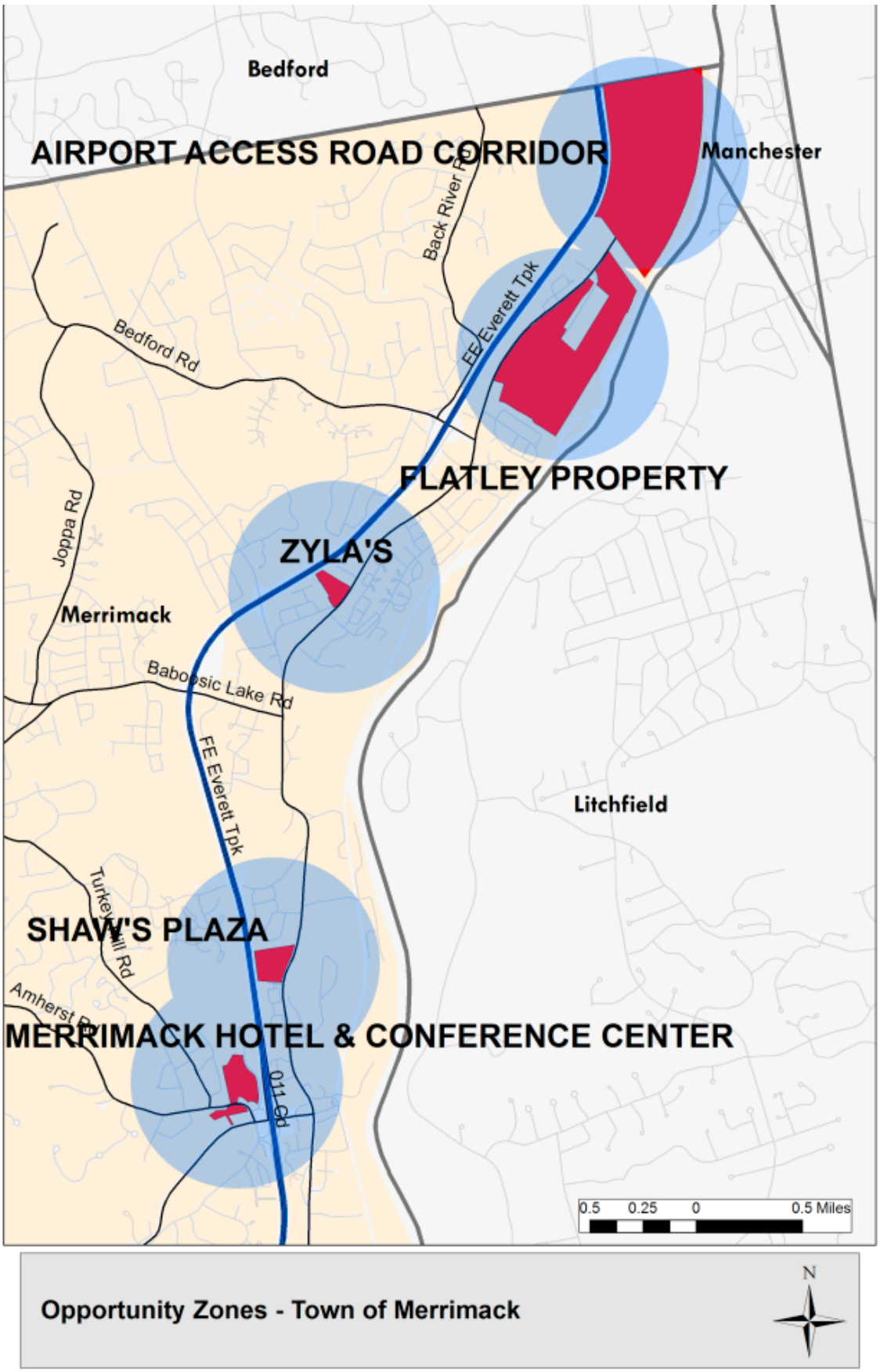
4.10.2 Opportunities

Opportunity Zones

The following are five sites which appear to have the most promising revitalization or redevelopment potential, based on their location, size, or other attributes **(Figure 4-15).** Their consideration also assumes that the existing structures, if any, will be removed and environmental contamination will either be nonexistent or mitigated prior to a new use. A feasibility study should also precede any serious consideration of redevelopment of the Opportunity Zones.

- Airport Access Road Corridor—The completion of the airport access road already appears to have generated new development activity in Bedford along Daniel Webster Highway approaching Merrimack. While many of the parcels in the Corridor have been developed, in many cases the existing uses are somewhat marginal or underdeveloped. This corridor now offers immediate access to the airport, thereby generating an opportunity to reposition the area.

Figure 4-15: Opportunity Zones, Town of Merrimack



Source: Merrimack Assessing Department, Nashua Regional Planning Commission & RKG Associates, Inc., 2011

- Flatley Property—The Flatley property is a 150 acre site just south of the Airport Access Road Corridor. It envelops the St. Gobain Performance Plastic Property, and represents a sizable development opportunity in terms of available acreage, frontage, and access. This zone is the most "shovel ready" of the five, an important characteristic given the additional cost burden required by the redevelopment of an already-improved site.
- Zyla's—A former discount retail store, this site is fronted along Daniel Webster Highway. The building has not been in use for some time and appears to be suffering from some deferred maintenance. The property may serve as a valuable redevelopment opportunity given its location along a well-traveled corridor and its ideal amount of roadside exposure. The property was designated as an Economic Revitalization Zone in 2012.
- Former Shaw's Plaza—The retail plaza at 356 Daniel Webster Highway has continued to lose tenants since the departure of the Shaw's grocery store to a new site farther north in Merrimack in 2006. CVS Pharmacy and Blockbuster Video have also vacated the Plaza since that time, leaving only three tenants in the facility at this time. These include a Bank of America branch, a new Asian restaurant, New England Credit Union, and a hair salon. Shaw's lease on their portion of the Plaza expired in April 2012, and the company chose not to renew their lease. This site offers excellent visibility from Daniel Webster Highway as well as proximity to Exit 11. And the Daniel Webster Highway/Continental Boulevard intersection. The property was designated as an Economic Revitalization Zone in 2012.

- Merrimack Hotel and Conference Center—This non-operating facility is sited relatively well, with immediate access to Route 3 via the Exit 11 interchange. There is also the recently opened Holiday Inn Express (opened November 2012) in the location of the former Fairfield Inn located nearby. The location of this site is ideal given their proximity to the Turnpike and Exit 11, Daniel Webster Highway, and other major commercial uses.

The recent opening of the Merrimack Premium Outlets on Continental Boulevard has the potential to attract additional commercial business development to this site.

The Merrimack Economic Development Citizens Advisory Committee (EDCAC) recommended that the Town adopt the Community Revitalization Tax Relief Incentive (RSA 79-E). This legislation encourages investment in downtowns and village centers with a new tax incentive through the rehabilitation and active use of under-utilized buildings. Although some specific properties are listed above, this Plan also specifically designates Reed's Ferry Village, the "Center Village" and Thorntons Ferry Village, which are described in the Land Use and Community Design element of the Plan (see Chapter 2). On November 15, 2012, the Town Council moved to support adoption of RSA 79-E.

Changes in municipal staff—the hiring of a new Community Development Director and Town Manager in 2011 can play a role in developing new economic development procedures and roles within the Town's public administration, as well as the creation of an economic development-oriented culture.

4.11 Recommendations

The Town of Merrimack has a solid economic foundation which includes high incomes, above average job growth, competitive property tax rates, and large, high-tech employers. To maintain a competitive position in the region, the following recommendations are based on three main tenets:

- Business Retention & Relationship-Building.
- Administrative & Procedural Recommendations. To encourage the redevelopment or repositioning of underutilized properties, the Town of Merrimack can streamline the development review process.
- Land Use Policy & Economic Development Finance Mechanisms.

These three tenets will leverage the Town's unique qualities and aspects to address constraints to economic development as well as existing areas of opportunity.

4.11.1 Business Retention and Relationship-Building

The Town of Merrimack has a healthy employment base that includes many large, well-paying employers and a growing number of workers. As such, retaining these employers should be the primary thrust of the Town's employment-oriented economic development strategy. This strategy should focus on the growth and expansion of existing businesses through the implementation of pro-business policies and regulations, financing infrastructure construction, and labor force training. Other specific elements of this strategy include:

ED-1 Execute outreach by the Town to develop a relationship with the Town's various employers, in order to open a line of communication between the public and private sector.

ED-2 Examine Town policies and procedures to ensure that they do not discourage local business operations and initiatives.

ED-3 Identify the key position on Town staff responsible for economic/business coordination, monitoring and outreach and ensure Merrimack's business community is aware of this person.

ED-4 Conduct periodic and regular business outreach efforts to existing businesses to identify issues and needs and how to best address these concerns.

ED-5 As the use of the internet as an information source becomes increasingly ubiquitous, the Town should create a new website (or revamp the existing Town Community Development/Economic Development webpage) to feature four core informational themes:

1. Starting a new business
2. Growing your business
3. Finding a location
4. Community information

This website should serve as the Town's "face" or "front door" for economic development by providing answers to questions in support of the four core themes including:

- "I'd like to open a business. What do I need to do?"
- "Can I get financial support from the Town or State?"
- "What space (either land or buildings) is available in Merrimack?"

The website would also serve as a platform for existing businesses to contact the Town as well as provide testimonials from existing firms in Merrimack reinforcing the community's business-friendly atmosphere, quality of life and other assets. The website for the City of Rochester, New Hampshire (www.thinkrochester.biz) is one example of a municipal economic development website. The message of this website, as well as the Town's original home page, should be that Merrimack is a great place to work, as well as live.

4.5.5 Development Review Process and Administration

In order to encourage the redevelopment or repositioning of underutilized properties and to streamline the development review process, the following recommendations are offered:

ED-6 Review and assess the Town's development review process for clarity and transparency, as well as its organizational structure. Ensure that the review process is clearly defined, guarantees flexibility, projects a business friendly attitude, and encourages high quality development. Reviews of the Town's development review process should be repeated at 3-5 year intervals.

ED-7 Create a user-friendly guide which outlines the steps and procedures necessary to expand an existing business operation or open a new business. This guide should become an integral part of the development review process in order to provide greater standardization.

4.7.1 Land Use Policy and Economic Development Finance Mechanisms

The repositioning or revitalization of properties is often more feasible when flexible land use regulations are in place. These regulations recognize the changing nature of land use compatibility and the dynamic nature of real estate demand over time. The implementation of these types of regulations, as well as public-private development finance mechanisms,

can encourage the revitalization of a property, corridor, or community. Specific methods of implementing these concepts include:

ED-8 Examine zoning regulations in existing non-residential districts to ensure that they achieve the community's land planning objectives without being overly restrictive on the establishment of new businesses or the expansion of existing ones.

ED-9 Consider implementing performance-based zoning to increase the flexibility of land development. Performance-based zoning seeks to delineate allowable land uses through their physical exterior features, such as parking, setbacks, design, and bulk, while placing less emphasis on the actual use of the property. In this way, the scope of allowable uses is broadened while still protecting the character of the community.

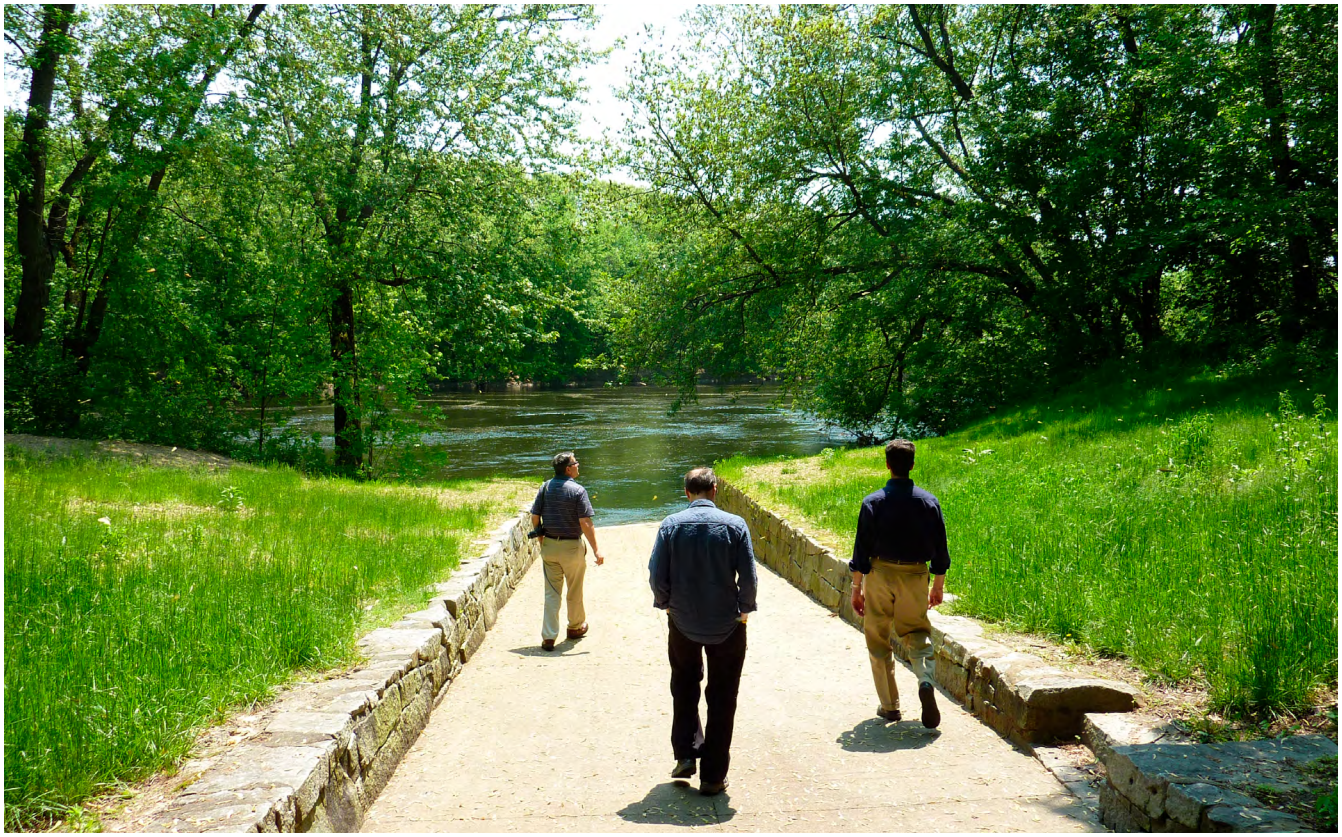
ED-10 Examine the potential for creation of Transit Oriented Development (TOD) in the vicinity of the proposed rail station and the airport access road on the Route 3 corridor. This action might include rezoning a portion of the three current districts (I-1, R, and C3), or creating an overlay district, that would allow high density mixed use development that combines residential and nonresidential uses. Residential development in this zone should include consideration for the creation of workforce housing. Any such rezoning will be dependent upon the state securing funding for upgrading of the rail corridor. Zoning changes should also be coordinated with the Town of Bedford to insure compatibility of land uses to the greatest extent possible.

ED-11 Seek grants to encourage or facilitate the repositioning of underperforming properties in the community, especially those found in the Town's opportunity zones. These include facilities that are not currently operating at their highest and best use. One example of such a property might include the former Shaw's plaza on Daniel Webster Highway.

ED-12 Consider preparation of a conceptual "master design plan" for key parcels along the northern Route 3 corridor that could illustrate the potential for a mixed use development to property owners, potential users of the site and investors. Such a plan might illustrate the possible reuse of some underutilized or transitioning retail properties for uses such as office and retail uses, or combined medical and residential uses, or other similar configurations. This plan might also include a feasibility analysis of various options to illustrate the market demand to potential users.

ED-13 Consider Tax Increment Financing District (TIF) in appropriate geographic areas to help fund infrastructure improvements. These geographies might include the Town's opportunity zones or other corridors that would benefit from such policies. Explore the possibility of linking tax base growth in commercial corridors with town center redevelopment efforts.

ED-14 The Town should work toward implementation of RSA 79-E Community Revitalization Tax Relief Incentive as well as potential locations of parcels that should be considered for inclusion in a 79-E district. On November 15, 2012, the Town Council moved to support adoption of RSA 79-E. The implementation of RSA 79-E should be pursued following completion of the 2013 Master Plan. The eventual development of the enabling ordinance should be prepared by the Community Development Director with assistance from the Town's legal counsel and the Economic Development Citizens Advisory Committee.



5. Natural Resources and Open Space

5.1 Introduction

Merrimack boasts many natural resources, and it is particularly known for its rivers, open spaces, wetlands, forests, farmland, and wildlife. From forests to ponds and the Merrimack and Souhegan Rivers, these resources add to the town's rural character, providing residents and visitors with scenic views and recreational opportunities. These resources have been long valued and seen as an integral part of the community. While Merrimack has experienced significant land use changes over the years, the town strives to maintain its character and traditions as it manages its growth going forward.

This chapter examines the current state of Merrimack's natural environment, the threats and opportunities facing that environment, and offers recommendations as to how the Town's remaining significant natural resources and open spaces can be safeguarded and managed in the years ahead. Although much of Merrimack is now suburban in character, there is still

ample opportunity for the Town to wisely plan for a future that balances environmental protection with economic development and the demands of a growing population. The preservation of natural assets is key to achieving this goal.

Merrimack still has a wealth of open spaces and natural resources worthy of protection and wise stewardship. As of 2005, approximately 60 percent of Merrimack was forested, though much of that area is comprised of relatively small forest tracts. The Merrimack and Souhegan Rivers are much cleaner today than they were 40 years ago. The Town has adopted aquifer protection zoning and a wellhead protection program to safeguard its primary sources of drinking water.

5.2 Natural Resources Goals

- Continue to preserve significant parcels of land to along the Merrimack and Souhegan Rivers, Grater Woods and Horse Hill to enhance biodiversity, recreational opportunities, and water quality.
- Integrate biodiversity protection and land use through Merrimack's land use regulations.
- Protect the quality of water in Merrimack's rivers and ground water supplies through effective stormwater management practices, subdivision regulations, and design.
- Develop community-wide environmental awareness of open space and forest conservation and practices that protect water.

5.3 Topography

Topography can be described in terms of elevation and slope. Elevations range from several hills over 450 feet above mean sea level (MSL) in western Merrimack north and south of the Souhegan River to less than 150 feet MSL along the Merrimack River. One of the highest hills, reaching 502 feet MSL, north of Greens Pond, is the location of one of the Merrimack Village District's (MVD) water tanks. Although elevation alone does not necessarily constrain development, higher elevations tend to coincide with thinner topsoil and steeper slopes.

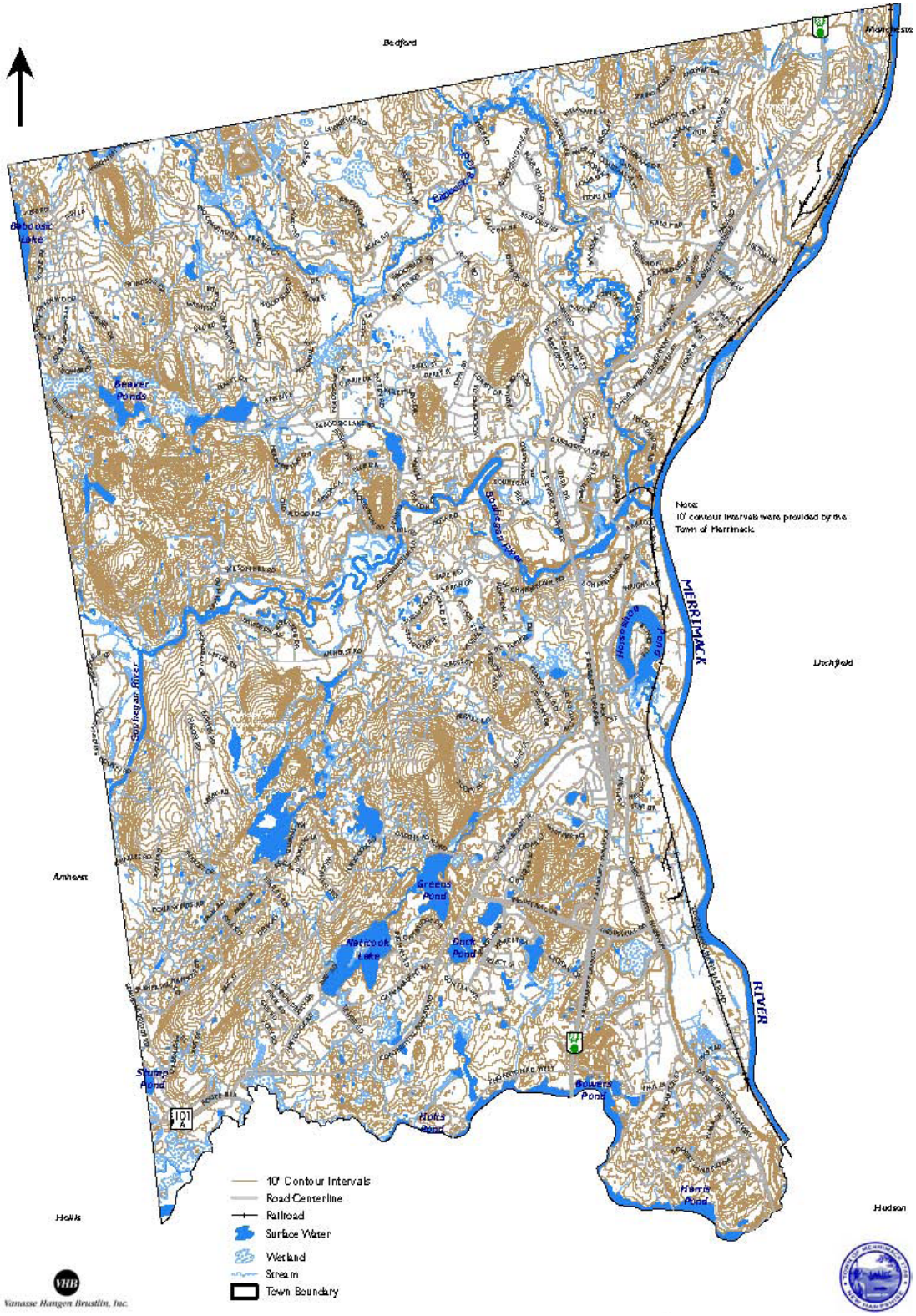
The slope of the land is an important determinant of development capability. Slopes of less than 8 percent are generally the most suitable for building. The erosion potential of such slightly sloping land is low, their ability to absorb runoff is high, and soils are usually of adequate depth and composition for septic systems. Exceptions are extremely flat areas, some of which may be classified as wetlands, where drainage is poor. Areas with slopes of less than 8 percent are also among the most suitable for non-development purposes: agricultural production, aquifer recharge and wildlife habitat.

As slopes increase, the suitability of the land for development decreases. In areas of steep slopes, the velocity of runoff and, therefore, the erosion potential, increases. The ability of the soil to filter septic system leachate is decreased. Overcoming site constraints becomes increasingly costly. Generally slopes ranging between 8 and 15 percent are considered to have moderate capacity for development. Slopes of 15 to 25 percent present significant constraints, and lands exceeding 25 percent slope are considered unbuildable. Merrimack's

rolling terrain consists primarily of moderate slopes ranging from 0 to 15 percent. Slopes are greatest in northwestern and southwestern Merrimack.

Merrimack's topography at 25-foot contour intervals is depicted on **Figure 5-1**.

Figure 5-1: Topography in Merrimack



5.4 Soils

5.4.1 Soils in General and Limitations for Septic Systems

Soils are the most important determinant of the land's development capability, especially in unsewered areas. A soil's depth to water table, susceptibility to flooding, slope, depth to bedrock, stone cover, and permeability present potential constraints to the construction of roads, buildings and septic disposal systems.

The U.S. Department of Agriculture (USDA), Natural Resource Conservation Service (NRCS), completed a soils survey of Eastern Hillsborough County in 1972. This survey classifies and maps soil types and interprets their suitability for various purposes. The mapping was based on extensive field investigation and sampling and is suitable for general planning purposes. More detailed investigation is required for site-specific planning as soil conditions may vary.

Soils with severe limitations for septic systems cover approximately 70 percent of Merrimack. Concentrations of "severe" soils are found in the northwestern, south-central, and north-eastern parts of Merrimack. Areas of moderate limitation are located primarily in central Merrimack south of Amherst Road; and in the area of southwestern Merrimack bounded by Peaslee, Naticook, Bates and Bridge Roads. Slight-limitation soils can be found in only a very few, small, scattered areas.

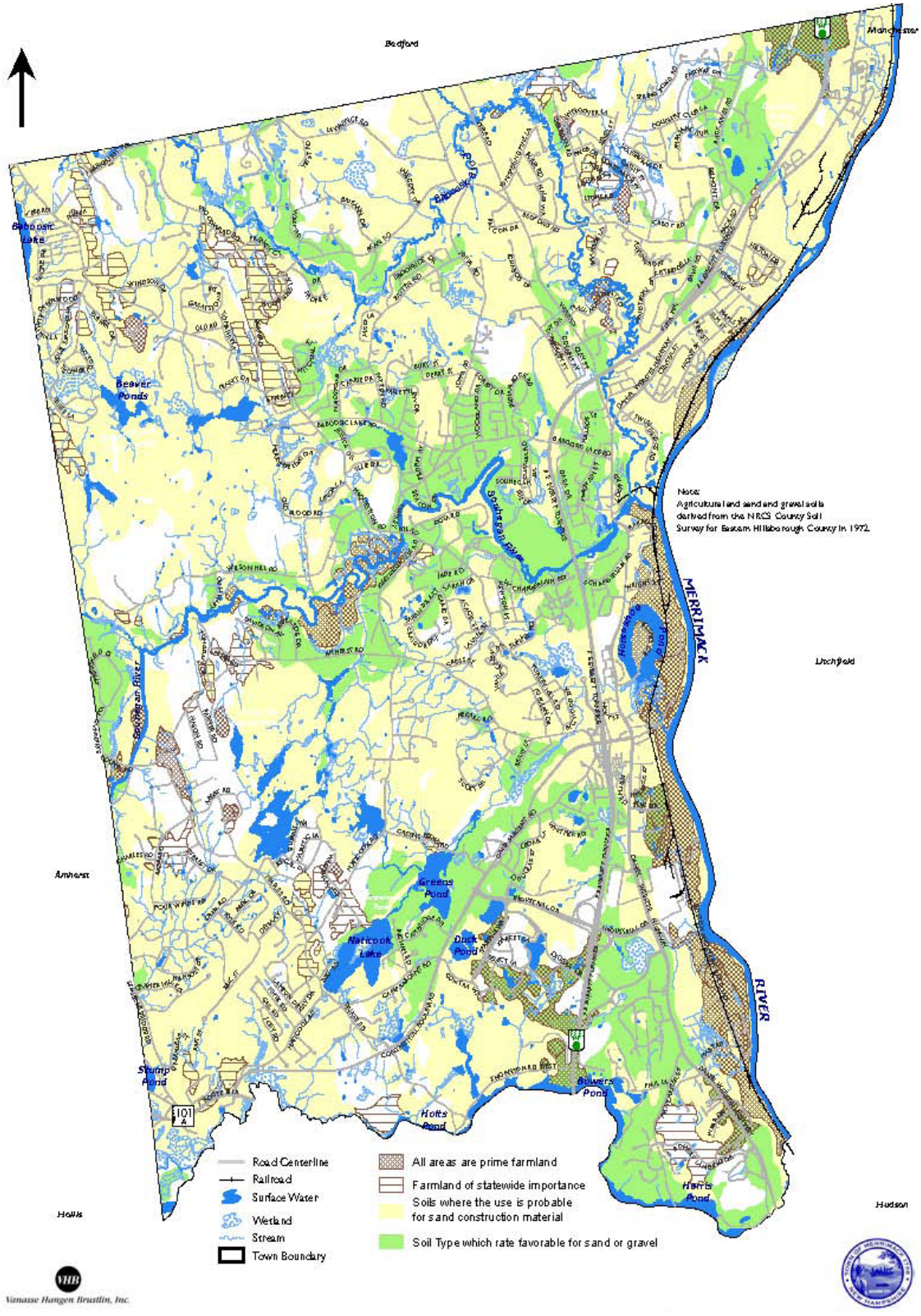
In certain parts of Town that lack public sewer, Merrimack bases minimum lot sizes for residential development on the presence of water and sewer service facilities and the soil limitations for septic systems. A single-family residence on Town water and sewer, for example, requires a minimum lot size of 40,000 square feet (0.92 acres). Without public water and sewer, the house requires 40,000 square feet, 80,000 square feet or 100,000 square feet, depending on whether soil limitations are slight, moderate or severe, respectively. In addition, Merrimack requires that septic systems be placed in the least severe soils on the lot and prohibits placement within 20 feet of lot lines.

5.4.2 Agricultural Land and Soils

The U.S. Department of Agriculture has identified soil types that are best suited to crop production based on soil quality, growing season and moisture supply. These areas, called prime farmlands, are likely to produce the highest crop yields using the least amount of economic resources and causing the least environmental impact. In addition, the State of New Hampshire has identified soils having statewide importance. The location of these soils is shown on **Figure 5-2**. Some of these soils have high water tables or are susceptible to flooding and may require drainage or flood control measures before they are suitable for agricultural use.

Figure 5-2: Farmland Soils and Sand and Gravel Soils in Merrimack

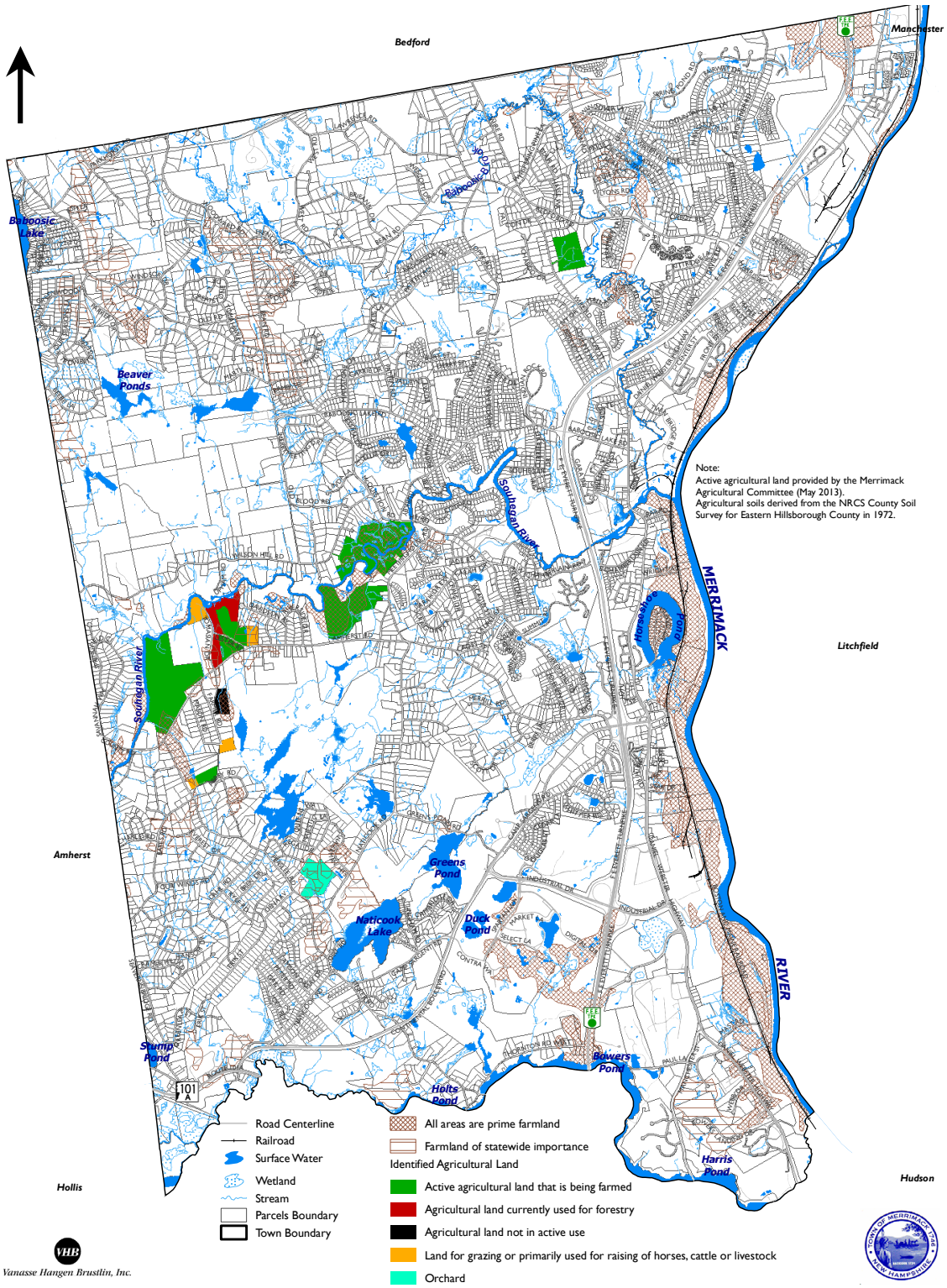
As seen on **Figure 5-2**, important agricultural soils in Merrimack, located primarily along the Merrimack and Souhegan Rivers, are fairly limited. Most of these areas however, especially east of the F.E. Everett Turnpike, have been developed for nonagricultural purposes or are not currently used for agricultural purposes.



Merrimack allows agricultural activity in any part of Town. Although agriculture is not extensive in Merrimack, the remaining agricultural areas are still an important resource that provide local seasonal produce and planting materials; provide open space; serve as an educational resource and contribute to the rural character of the Town. Preservation and enhancement of agricultural lands is important to the Town and is the primary goal of the Agricultural Commission. To that end, the Commission's purpose is to protect agricultural lands, preserve rural character, provide a voice for farmers, and encourage agriculture-based businesses. The Commission actively supports the farmer's market and community garden in Merrimack. The Commission advocates for the implementation of the New Hampshire Department of Agriculture best management practices (BMPs)[1] designed to control nonpoint pollution from agricultural sites. These BMPs provide guidance to landowners and town officials to help maintain the agricultural base and protect water quality. This includes the handling of manure, agricultural compost and chemical fertilizer as related to farm operations, natural resource conservation, water quality, and human, animal and plant health. Agricultural lands are shown in **Figure 5-3**.

1 See http://agriculture.nh.gov/divisions/markets/documents/bmp.pdf, Manual of Best Management Practices for Agriculture in New Hampshire, New Hampshire Department of Agriculture, June 2011.

Figure 5-3: Agricultural Lands



5.4.3 Construction Materials

The U.S. Department of Agriculture, Soil Conservation Service (SCS) rates the suitability of soils as sources of construction materials. Sand and gravel resources are particularly important materials for road construction; however, active excavation sites are few in Merrimack. Most of the probable sources of sand and gravel deposits shown on **Figure 5-2** are within developed areas of Town.

New Hampshire Revised Statutes Annotated, Chapter 155-E, Local Regulation Excavations, stipulates that, with some exceptions, all earth excavations in the State are subject to regulation from the local municipality in which the operation occurs.

Merrimack permits excavation of topsoil and subsoil material in any part of Town. Excavation regulations adopted by the Planning Board under the authority of RSA 155-E require a permit from the Planning Board for any clearing, grading, transporting, removal, excavation or other disturbance of land. A permit application must include a conservation plan that includes a soils map of the site and provisions for vehicular traffic and visual screening. Among the conditions of approval are adequate signage, parking, and fencing; provisions for drainage during and after completion of operations; control of siltation, noise and dust; and limitations on standing water. The Merrimack Planning Board requires grandfathered sites to provide reclamation plans when the excavation is nearing completion or when environmental problems or potential environmental problems become apparent.

5.5 Biodiversity in Merrimack

5.5.1 Biodiversity Conservation Plan

Merrimack recently completed the Biodiversity Conservation Plan in 2010. This Plan provides guidance on the identification and protection of open space for significant natural resources within the town. The Merrimack Conservation Commission uses the plan to focus the conservation efforts of wildlife habitats and to make informed decisions about land use from an ecological perspective. Merrimack is home to a variety of ecologically sensitive areas (ESA). A total of sixteen ESAs were identified in the plan based on the following criteria:

Wildlife habitats mapped by the New Hampshire Wildlife Action Plan, including marshes, peatlands, open water bodies, grasslands, floodplain forests, hemlock-hardwood-pine forests, and Appalachian oak-pine forests.[2] **Figure 5-4** illustrates the highest ranked wildlife habitats as noted by the New Hampshire Wildlife Action Plan.

Additional wildlife habitat identified by the Biodiversity Planning effort including rivers and smaller streams, riparian buffers, heron rookeries, deer wintering areas, forested swamps, vernal pools, active agricultural lands (hayfields/pastures, orchards, and row crops), shrublands, and ledge outcroppings Rare and uncommon natural communities defined by New Hampshire (NH) Natural Heritage Large unfragmented forest blocks with wetlands and other habitat in close proximity to each other Habitat known to support rare species. **Figure 5-5**

2 The 2005 New Hampshire Wildlife Action Plan (updated in 2010) is a planning and resource for making land use decisions and for land management planning.

shows the current amount of unfragmented land cover within Merrimack which helps to support wildlife habitat in Merrimack. This land is adjacent to and within residential areas showing its vulnerability to residential land development.

The Biodiversity Conservation Plan provides the most up to date information regarding important natural resources and wildlife habitat within Merrimack and is referred to throughout this chapter. It also establishes general guidelines designed to promote the integration of natural resource protection and land use planning, including:

- Protection of large unfragmented areas of land with high quality plant and wildlife habitats
- Protection of rare species populations and their habitats
- Protect wetlands and streams and promote restoration of degraded areas
- Support biodiversity protection
- Expand protected lands and connect critical habitat and conservation corridors.[3]

3 Biodiversity Conservation Plan, 2010.

Figure 5-4: Highest Ranked Wildlife Habitat in Merrimack

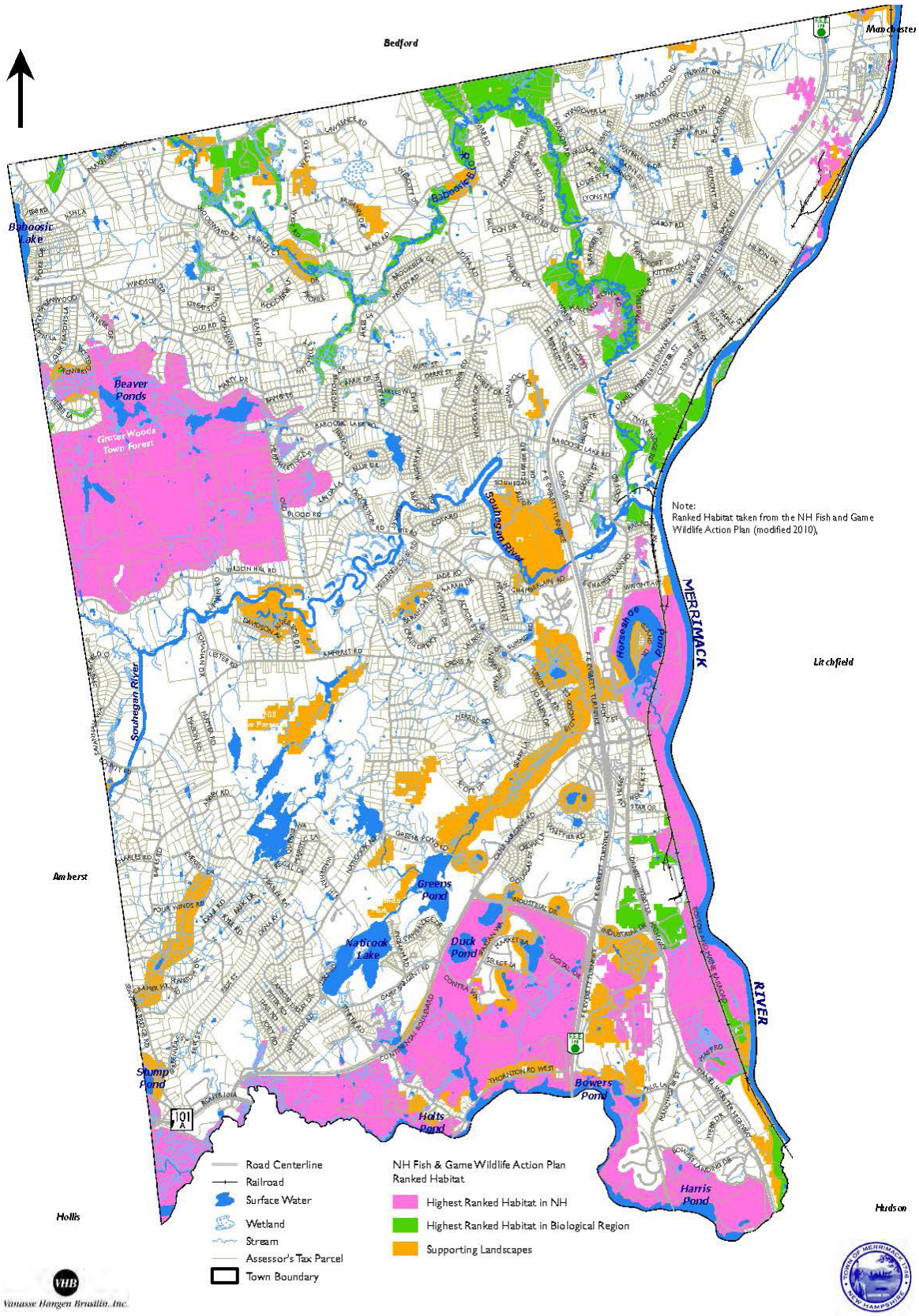
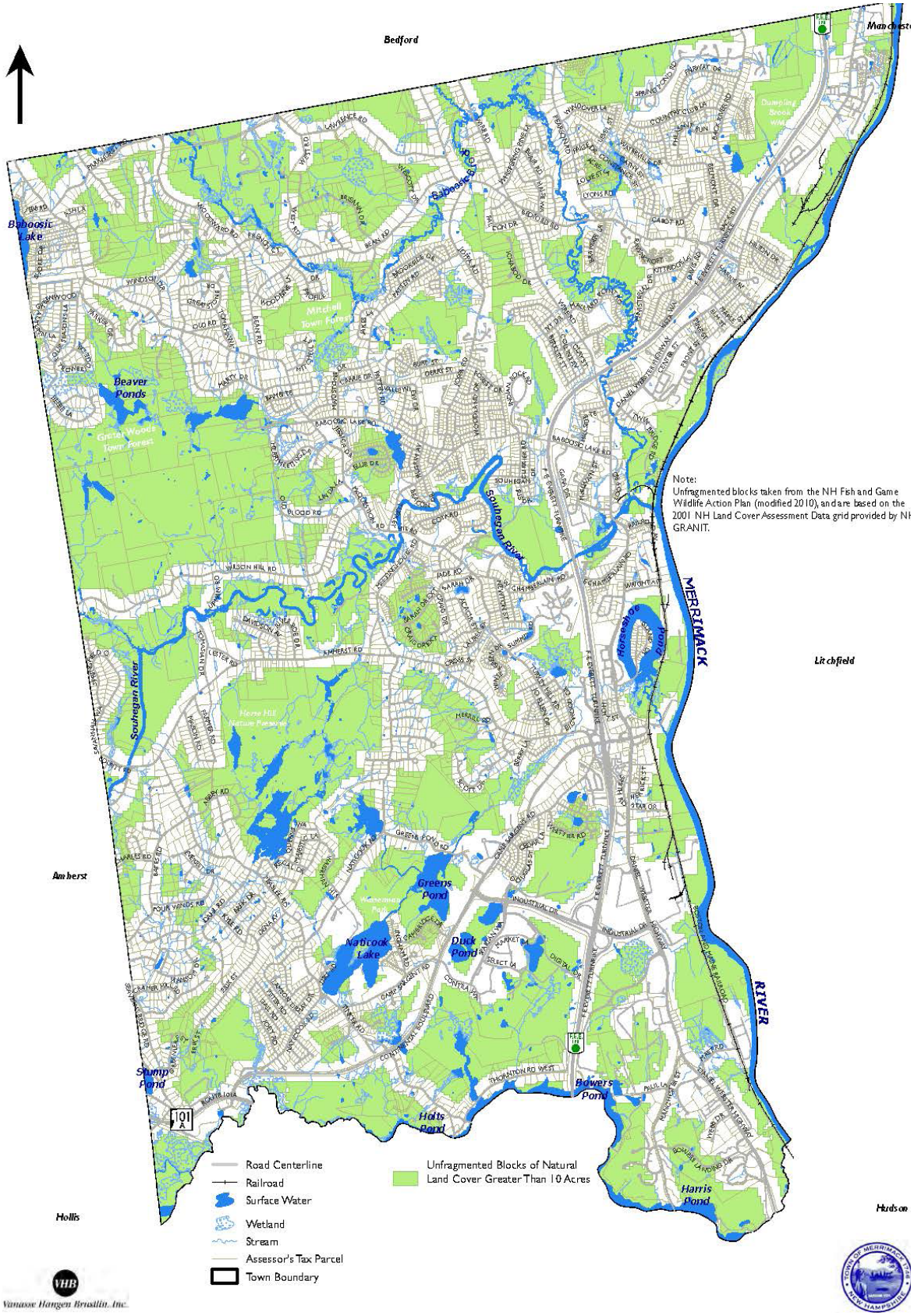


Figure 5-5: Unfragmented Natural Land Cover Over 10 Acres



5.5.2 States of Forests in Merrimack

Forests, or woodlands, are among the most prominent of the natural resources discussed in this chapter due to their prevalence in the landscape and to the wide range of benefits that can be derived from them. Perhaps the most apparent function of forests in a community such as Merrimack is their aesthetic value. Forests contribute significantly to the natural beauty and rural character of the Town while also serving as buffers between differing developed areas. Equally important, forestlands provide open space for passive recreation and for other outdoor activities. Depending on the types of trees available, forests also serve as an important source of building materials, materials for wood products, firewood, sap for maple syrup and other products. In addition, forests and woodlands provide critical habitat for a diversity of wildlife.

South-central New Hampshire receives approximately 43 inches of precipitation per year. Most of this precipitation is evenly distributed throughout the year, though there can be occasional droughts in the summer. The area's climate is ideal for the growth of forest trees. Because the natural climax vegetation is mixed-hardwood/coniferous forest, any open fields left undeveloped and untended will eventually revert to this forest type. The most common forest types within Merrimack are the hemlock-hardwood pine forest and the Appalachian pine forest. Common tree species found in these forests are eastern hemlock, white pine, white oak, red oak, American beech, white birch, black birch, sugar maple, and red maple.

5.5.3 Forest Facts

Table 5-1 provides a summary of Merrimack forest facts from the Biodiversity Conservation Plan. The most immediate threat to forestland within Merrimack is new roadways, which fragment wildlife habitat and core forest habitat for certain area sensitive species.[4] Other threats to forest habitat include residential development, the introduction of invasive plants, which can alter species composition and diversity of native trees, shrubs, and other plants, and the invasion of pests such as the hemlock wooly adelgid, a particular danger to the eastern hemlock tree species.[5]

Table 5-1: Merrimack Forest Facts

Total Area of Merrimack in Acres	**21,412**
Area and Percentage in Forest (2010)	12,933 acres/60.4% of Town
Hemlock-Hardwood-Pine Forests*	6,650
Appalachian Oak-Pine Forests*	6,283

Source: Biodiversity Conservation Plan, 2010.

* Wildlife habitats mapped as part of the NH Fish and Game Wildlife Action Plan, 2005.

Although approximately 60 percent of Merrimack was forested in 2005, the Biodiversity Conservation Plan notes that this estimate includes smaller forest blocks that are situated among areas of residential development. Eliminating the small pockets of forest abutting residential development would result in only 8,611 of contiguous forest cover, or about 40 percent of Merrimack.

4 Ibid.

5 Ibid.

5.5.4 Forest Fragmentation and the Remaining Large Forest Blocks

The term forest fragmentation refers to the progressive dissection of forested areas by new roads and development, which break up the continuity of the forested landscape. Most of the area's native plant and animal species evolved in and are adapted to a heavily forested environment. Many species require large, contiguous forest blocks to successfully reproduce and maintain their populations. The percentage of land in forest cover statewide decreased from 87 to 84 percent between 1983 and 1997, with development contributing to most of the loss.[6] The percentage of forest cover is expected to decline to 79.1 percent by 2025.[7]

According to the Forest Society's report "New Hampshire's Changing Landscape," forest blocks larger than 500 acres have a greater capacity of supporting a wider range of resource protection values such as economic forest management, wildlife habitat, outdoor recreation, and water supply protection than smaller forest tracts. It is for this reason that 500 acres is used as a threshold indicator of forest health and forest fragmentation. Several species, including squirrels, raccoons, skunks, crows, and blue jays, have been able to adapt to an environment consisting of relatively small "habitat islands." However, many species, including the pileated woodpecker, black bear, and numerous songbird species, require large areas of extensive forest or mixed habitat in order to maintain a stable population. Smaller forest tracts are also difficult to manage economically for sustainable timber harvesting and less desirable for hunting, hiking, camping and other forms of outdoor recreation.

The predicted decline in forest area and increasing forest fragmentation can be expected to adversely impact the habitat of many species of wildlife. In particular, many species of migratory songbirds ("neo-tropical migrants" such as warblers, vireos, orioles, tanagers, flycatchers, and thrushes) are thought to be particularly susceptible to forest fragmentation, and drastic population declines of many species have been noted in recent decades. In general, large forest tracts help to protect biodiversity and maintain healthy wildlife populations. As discussed later in this chapter, decreasing forest area may also adversely impact groundwater recharge and drinking water quality.

Merrimack's remaining large forest blocks were mapped as part of the Biodiversity Conservation Plan and are illustrated on **Figure 5-6**. There are four forest blocks in Merrimack that are 500 acres or larger, including a linear area associated with the Merrimack River corridor. The forestland to the southeast, while still largely undeveloped, may experience development pressure in the near future due to its proximity to major roadways and because it is primarily industrially zoned.

The Biodiversity Conservation Plan recommends five Conservation Focus Areas (CFA) as having the highest priority for protection. Two of these areas are forestland areas of more than 500 acres. The three remaining river corridor CFAs are described in the next section.

6 The Society for the Protection of NH Forests, New Hampshire's Vanishing Forests, 2001, pg. 13.

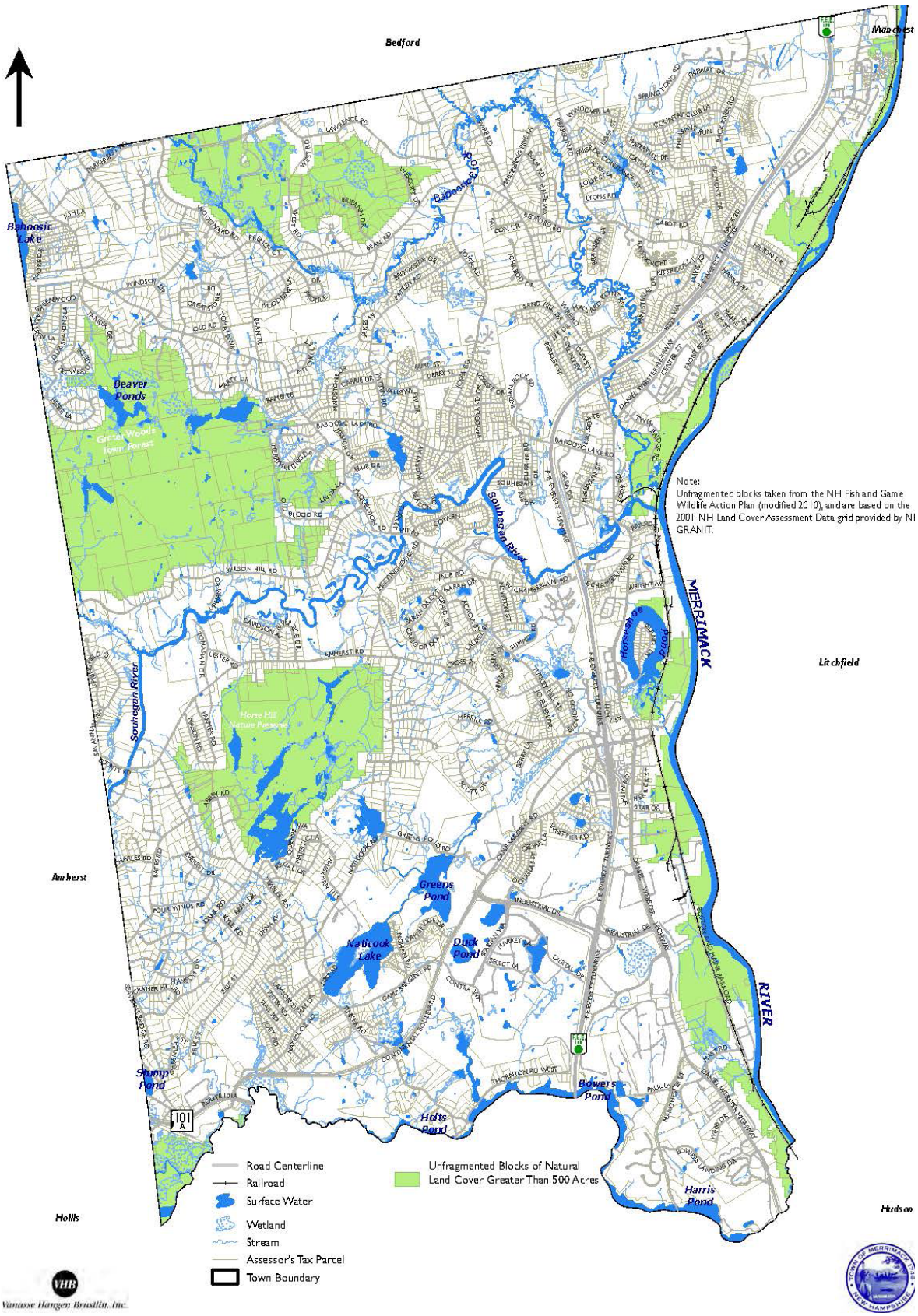
7 The Society for the Protection of NH Forests, New Hampshire's Changing Landscape, Appendix A, pg. 10, 1999.

The Grater Woods CFA, an area containing approximately 1,300 acres, represents Merrimack's largest unfragmented forested block and includes wetland and significant habitat for species of conservation concern. According to the Biodiversity Conservation Plan, as "one of Merrimack's last remaining relatively large unfragmented forests, it carries great significance for biodiversity protection. Without such large contiguous forested areas, various species would not be able to exist. These include bear, moose, bobcat, fisher, otter, mink, hawks, owls, and even small migrant songbirds such as ovenbird, veery, and scarlet tanager."[8] Of the 1,300 acres in this 1,300-acre area, 500 acres are currently protected.

The Horse Hill CFA contains 847 acres and is located just south of the Grater Woods CFA. It is similar to the Grater Woods CFA in that it contains many of the same habitats of forestland and wetland. Currently, there is no protected land within the Horse Hill CFA. One of the benefits of protecting this CFA is that there is potential to provide connectivity to other CFAs.

8 2010 Biodiversity Conservation Plan, pg. 52

Figure 5-6: Merrimack's Remaining Forest Blocks Greater than 500 Acres



Although Merrimack cannot be expected to remain as forested as more rural towns in other parts of the state, it may be possible to conserve the two remaining large forest tracts described above through targeted land acquisition, private conservation efforts and land use regulation. Since both of these forested areas are mostly located within the new R-1 zoning district adopted in 2000, lower development densities of not less than 100,000 square feet (2.3 acres) per dwelling unit are now required. Additional steps that could be accomplished include encouraging open space residential development that would place larger areas of land into public or private open space without increasing density requirements, and by concentrating land acquisition efforts within these larger forest blocks. Private land owners with larger holdings can also be encouraged to develop forest management plans that include provisions for selective timber harvesting that could enable them to gain a greater economic return from the land while maintaining it in a forested state. Through such measures, the Town could maintain large areas of contiguous open space, provide for enduring passive and outdoor recreational opportunities, conserve wildlife habitats, maintain a local source of timber and other forest products, and also help to retain much of Merrimack's remaining rural character.

5.5.5 The Status of Wildlife Habitat in Merrimack

Merrimack provides habitat for a wide diversity of plant and animal species. Many of these species, such as raccoons, skunks, grey squirrels, crows, and blue jays, have become adapted to the human environment, and, as a result, their populations have increased in developed and developing areas. Other species, however, including bobcats, fishers, and many species of forest-dwelling songbirds, require large tracts of unfragmented habitat in order to reproduce successfully. As discussed in the forest resources section, unfragmented blocks of habitat are large pieces of land with few or no roads, houses, or other human-made alterations to the landscape. Unfragmented land provides some of the most valuable wildlife habitat, especially where it provides a range of contiguous habitats of many different types (mature forests, wetlands, open fields, etc.) in close proximity. A primary characteristic of unfragmented habitat is the absence of roads. Roads are a source of mortality and a barrier to wildlife movement. The impact of roads varies with their type and intensity of use. An unmaintained dirt road does not represent the same threat to wildlife as most paved highways for several reasons. Dirt roads tend to be narrower than paved roads, necessitating lower travel speeds and lessening the chances of automobile – wildlife conflicts. Narrow dirt roads in wooded areas also permit the tree canopy to extend over the road, thereby retaining a greater degree of forest cover and habitat for many species of wildlife, especially birds. Careful consideration of road placement and configuration is therefore one of the most important steps that can be taken to safeguard significant blocks of wildlife habitat.

Merrimack is fortunate in that it retains several areas of large, relatively unbroken habitat. While the large forest blocks in the south-central and southern portions of Town are likely to be developed as the Town approaches build-out, the large block of forestland in northwestern Merrimack, by virtue of its remoteness and steep slopes, may be able to be preserved in perpetuity.

As described earlier, the Biodiversity Conservation Plan identifies a number of important ESAs that support a wide range of species. Wildlife corridors, such as the Merrimack River corridor, are important to allow wildlife to travel safely through the landscape. These corridors are not

only important to larger mammals but also to smaller wildlife such as amphibians, reptiles, and migratory birds. As part of the planning effort, the Biodiversity Conservation Plan identifies the primary mammal road crossing to prioritize areas for conservation. In addition to the forest blocks identified as important conservation focus areas above, the Plan identifies the Baboosic Brook Corridor, the Merrimack River Corridor, and the Souhegan River Corridor as important CFAs that offer pristine habitat for common species and species of concern, and allow corridors for wildlife movement by connecting to other critical habitat.

This area contains over 400 acres of contiguous public and privately owned conservation, park and recreational land around Naticook Lake, Naticook Brook and Greens Pond. Large areas of undeveloped, unprotected land are located in this vicinity as well. Other relatively unfragmented wildlife habitat areas are located in the wetlands, floodplains and woodland areas adjacent to portions of the Merrimack River, Souhegan River, Pennichuck Brook and Baboosic Brook. Although the undeveloped land adjacent to these rivers and streams is sometimes narrow, these areas can serve as important wildlife "corridors" that link various types of wildlife habitat together.

5.5.6 Invasive Species

One of the greatest threats to Merrimack's forests aside from forest fragmentation is the presence of invasive species. Conversion of forestland to residential and roadway development leads to colonization of invasive plants that can alter species composition and the natural diversity of trees, shrubs, and plants. Some non-native forest insects that are particularly detrimental to the health of Merrimack's forests include the hemlock wooly adelgid, the Asian long-horned beetle, and the emerald ash borer. The hemlock wooly adelgid is an invasive insect that destroys Eastern hemlock. According to the Biodiversity Conservation Plan, the hemlock wooly adelgid was reported at Merrimack's Twin Bridges Park in 2007 and still currently exists there today. The Asian long-horned beetle destroys native hardwood forests, including maple, box elder, birch, poplar, American elm, ash, American horse chestnut, locust, and willow. Unlike native longhorned beetles, the Asian longhorned beetle attacks live trees and has no natural enemies in the United States that would help to keep its population in check. While there have been no sightings of the Asian longhorned beetle in Merrimack or New Hampshire in general, there is evidence that the population is moving northward in New England with an extensive infestation in Worcester, Massachusetts in 2008 and Boston in 2010. There is the potential for this species to be accidently introduced via firewood from infested trees.[9] The emerald ashborer destroys ash trees and while not currently in New Hampshire, it has also spread rapidly (via infested firewood) from the Midwest and South to Massachusetts in 2012, and had destroyed tens of millions of ash trees.[10]

9 New Hampshire Audubon. Asian Long-Horned Beetle and Emerald Ash Borer. Website: http://www.nhaudubon.org/asian-long-horned-beetle-emerald-ash-borer. Accessed January 2012.

10 United States Department of Agriculture Forest Service. Emerald Ash Borer. http://www.emeraldashborer.info/index.cfm. Accessed January 2012.

5.5.7 Significant Wildlife Species and Human-Wildlife Conflicts

As human habitations encroach into large, contiguous areas of wildlife habitat, conflicts between human interests and wildlife can intensify. These human-wildlife conflicts can take several forms, including:

- Increased incidents of road kills and automobile-wildlife collisions, especially with large mammals such as deer and moose, which can be deadly for both the animals and motorists
- Rabies and other wildlife diseases
- Predatory mammals, such as bear, coyotes and coy dogs, encroach on human habitat with increasing frequency and prey on small livestock and domestic pets
- Deer destruction of shrubbery and vegetable gardens

The Merrimack Animal Control Officer reports that most calls concern loose dogs and domestic animals. She reports that in 2011, she received 645 calls, 31 of which involved dog bites, 11 concerned stray farm animals, and most calls concerned stray dogs. There were no reported cases of rabies in Merrimack in 2011. In addition to domestic animals, there have been 111 sightings of bears and other native wildlife in 2011. Although coyotes are present, she reports that they have presented no real concerns other than nuisance matters.

There are several ways in which human-wildlife conflicts can be minimized. Perhaps the most effective is to preserve as many large blocks of wildlife habitat as possible, on the premise that most species of wildlife would rather forage, breed and travel in areas removed from human activity. Though this may be true for large mammals and many other species, several species, such as raccoons and skunks, have become habituated to suburbia and may prefer an easy meal from a garbage can to a harder earned meal in the wild. In these cases, people can take steps to "wildlife proof" their garbage storage areas, not feed wild animals, and otherwise not encourage wildlife species (with the exception of seed eating birds) to forage in their backyards. With careful planning, there should be room for both wildlife and human habitat in Merrimack's future.

5.5.8 Rare and Endangered Species and Natural Communities

The New Hampshire Natural Heritage Bureau (NH Natural Heritage) is an agency within the Division of Forests and Lands. The NH Natural Heritage finds, tracks, and facilitates the protection of New Hampshire's rare plants, rare animal species, and exemplary natural communities. To qualify as exemplary, a natural community or system must be rare, or must be a high quality, undisturbed example of a common community.[11]

The Biodiversity Conservation Plan identifies 16 significant wildlife habitats in Merrimack including the forested uplands, wetlands, rivers and brooks, and heron rookeries, among others. These wildlife habitats are home to variety of common species as well as species of concern. For example, the upland forestland is home to birds such the Cooper's hawk and state threatened common eastern towhee, mammals such as the bobcat, a species of special concern, and reptiles such as the state-endangered Blanding's turtles.

11 NH Natural Heritage Bureau. Rare Plants, Rare Animals, and Exemplary Natural Communities in New Hampshire Towns, January 2012.

The karner blue butterfly and the shortnose sturgeon are the only federally threatened species in the region. While the bald eagle is no longer listed as federally endangered, it is still listed as threatened in the state of New Hampshire. The bald eagle makes its home along the Merrimack River corridor in the winter and the Appalachian oak-pine forests. The Audubon Society reports that the Merrimack River corridor is second only to Great Bay, located in southeastern New Hampshire, in winter eagle activity. Although human activity disturbs eagles, they are able to exist in the presence of the noise of cars and trains.

Anadromous fish species such as blue back herring, alewife, American shad and Atlantic salmon are beginning to return to the Merrimack River as a result of the anadromous fish restoration program begun in 1969. The program is a cooperative effort between the Massachusetts and New Hampshire state fisheries agencies, the US Fish and Wildlife Service and the National Marine Fisheries Service. The effort has focused primarily on Atlantic salmon and American shad, both sport fish, with the goal of establishing a self-sustaining salmon population. Fish passages at two locations downstream from Merrimack (Essex dam in Lawrence, MA, 1982 and the Pawtucket dam in Lowell, MA, 1986) have allowed shad to move upstream into New Hampshire waters for the first time in over a century. Along the scenic Souhegan River, the Merrimack Conservation Commission facilitated the removal of the Merrimack Village Dam in 2012, opening up 14-miles of fish breeding habitat in the river that had been blocked for over 100 years.

Water bodies and large wetlands in Merrimack are also known to support a variety of wildlife. Stump Pond in south Merrimack and Amherst is bordered by large swamps to the north and south. Residents have reported that it is a stopover for osprey (threatened in New Hampshire), pied-billed grebe (endangered in New Hampshire), hooded and red-breasted mergansers, ducks, geese and northern goshawks. Many other species of birds are also likely to use this habitat either for nesting or as resting and feeding areas in migration.

The NH Natural Heritage records indicate the presence of 23 plant species in Town that are critically endangered or threatened.

In addition, the NH Natural Heritage identifies seven exemplary natural communities in Merrimack: New England pitch pine heath swamp, high-gradient rocky riverbank system, kettle hole bog system, red maple floodplain forest, sand plain basin marsh system, silver maple—false nettle—sensitive fern floodplain forest, and swamp white oak basin swamp.[12] With the exception of the pitch pine heath swamp, of which there is only a historical record, these natural communities are designated by NH Natural Heritage as extremely to very high importance in terms of the rarity, size, and the health of the community. The Biodiversity Conservation Plan, which included local survey of wildlife habitat during different seasons, notes that 32 natural communities were observed in Merrimack, two of it identified as locally significant and eight as exemplary.

Most of these communities are likely to be associated with the Souhegan River, the Merrimack River, and wetlands within Town. The NH Natural Heritage regards exemplary natural communities as priorities for conservation. Natural communities are "recurring assemblages of species found in particular physical environments." represent intact examples of New Hampshire's native flora, fauna and vegetation. While there are many natural communities in

12 NH Natural Heritage Bureau. Pg. 121.

Merrimack that are common throughout New England, exemplary and those of local significance are of particular importance. The Biodiversity Conservation Plan notes that rare upland forest communities were observed in Merrimack including Appalachian oak rocky woods, which occurs on two Town owned properties, one of which has formal protection. The pitch pine-scrub oak woodland, also rare, is a historical record and may no longer be present in Merrimack.

5.6 Existing and Potential Future Conservation Lands

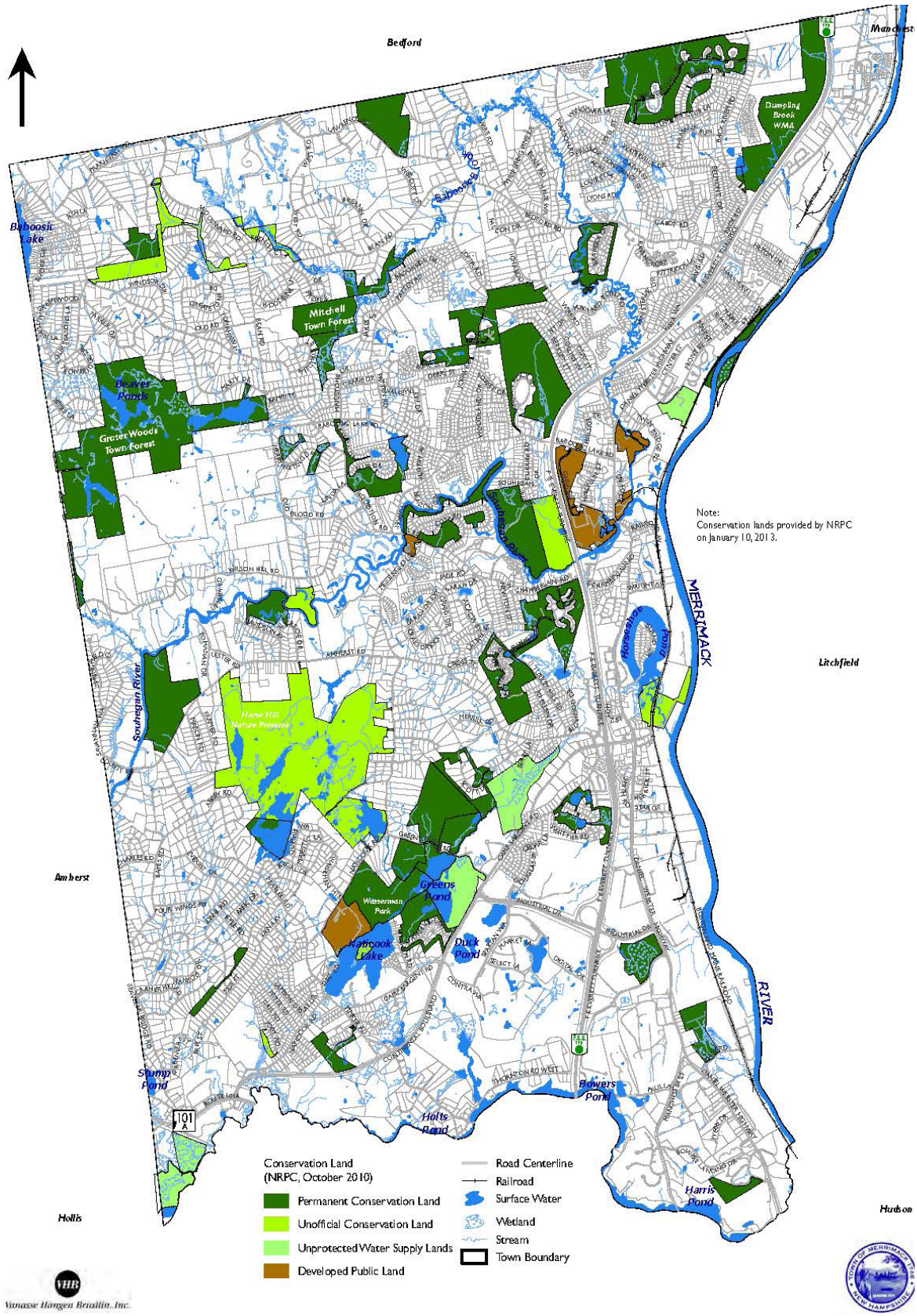
5.6.1 Existing Conservation and Publicly Owned Open Space Areas

Merrimack contains a wide variety of conservation and publicly owned open space lands. As seen on **Figure 5-7** these parcels are widely distributed throughout Town. In addition to showing land owned by the Town that is managed for conservation purposes, **Figure 5-7** also shows:

- Land owned by the Merrimack Village District (MVD) for wellhead protection purposes
- Undeveloped land owned by the Merrimack School District
- Significant easement areas managed by the Town of Merrimack or the Conservation Commission
- Town owned land with no management responsibility determined, and
- Privately owned land in current use

As indicated on **Figure 5-7**, many parcels in current use either abut or are in close proximity to conservation and open space land owned by the Town. Given the importance of large forest and habitat blocks for wildlife, groundwater recharge, and the preservation of rural character, it may be worthwhile for the Town to work with the private owners of land in current use to afford them more permanent protection. The Town should work in concert with the MVD to maintain as much open space as possible such that the land could possibly be used as future groundwater wells. The fact that many of these current use parcels are located in northwestern Merrimack, which has development limitations due to poor soils for septic systems, steep slopes, and plentiful wetlands, may provide an opportunity for the Town to work with landowners to achieve this objective. Other land of conservation value in Merrimack includes undeveloped land owned by the School Department. As the Town approaches build-out, these parcels may be needed for additional schools. However, portions of the land, especially areas abutting existing conservation land could still be left in a natural state.

Figure 5-7: Merrimack's Conservation Land



The MVD owns and manages several large parcels, most of which are in the vicinity of Greens Pond and Naticook Brook. These parcels are generally not open to the public.

Publically and privately owned conservation lands in Merrimack have been identified on a map prepared by the Merrimack Conservation Commission, along with a listing of each parcel and it size. The 2002 Master Plan listed a number of conservation priority parcels for the Town, a number of which have since been purchased or preserved. The remaining parcels from this list can be found in **Table 5-2**. **Figure 5-8** depicts the Town of Merrimack's Conservation Priorities.

Table 5-2: Conservation Priorities

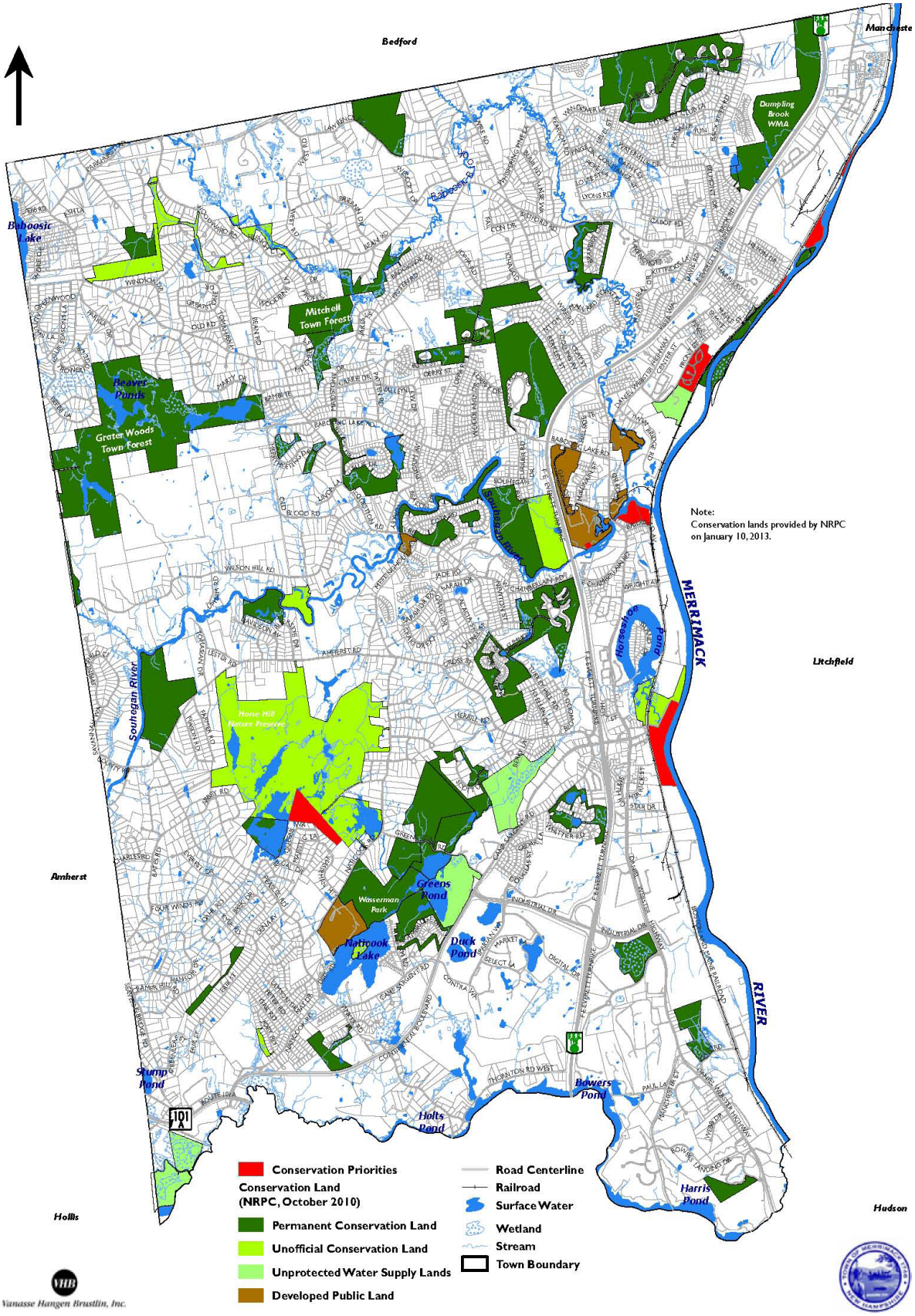
Tax Map and Lot #	Size in Acres	Description
3B/201	26.0	Abuts Horse Hill Nature Preserve, and would provide buffer from residential development for these parcels.
6E-1/64	1.8	Small thin parcel located on the bank of the Merrimack River.
3D-1/3	30.8	A key shoreline parcel along the Merrimack River. Historically the Thornton's Ferry area.
5D-1/3	4.7	Located at the confluence of the Souhegan and Merrimack Rivers. Key parcel for trail network.
5D-4/78	8.6	Located at the confluence of the Souhegan and Merrimack Rivers. Key for greenway network.
5D-4/100	1.0	Small parcel along Souhegan River. Trail potential.
5D-2/4	23.1	Located on the northern bank of the Souhegan upgradient and in the WHPA for wells # 4 and 5. Very important for groundwater recharge.
6E/6	7.9	This parcel would provide additional access to the Merrimack, with potential for trails & boat access.
6E/8	0.8	This thin parcel could be a link in a potential Merrimack R. greenway/trail system.
Total Acreage:	104.7	

5.6.2 Priorities for Future Conservation Efforts

As part of a state-wide effort with funding provided by the New Hampshire Department of Environmental Resources (DES), the Nashua Regional Planning Commission has been working with member communities, regional and state organizations to identify the natural and cultural resource protection needs and priorities for the region.

The Land and Community Heritage Commission (LCHC) was established "to determine the feasibility of a new public-private partnership to conserve New Hampshire's priority natural, cultural and historic resources." The LCHC is implemented by a program called the Land and Community Heritage Investment Program (LCHIP). The 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. The LCHIP could provide resources to Merrimack to protect important natural resources through the acquisition of development rights on these properties.

Figure 5-8: Merrimack's Conservation Priorities



In addition to the LCHIP, the Regional Environmental Planning Program (REPP) was created in response to statewide conservation efforts. The 2005 Nashua Region Open Space by Nashua Regional Planning Commission creates a region-wide inventory of New Hampshire's most significant unprotected water, land, forest, historic, cultural, ecological, geological and public resources. The Nashua Region Open Space strategy looks at open space and prioritization of key open space resources from a regional scale and places conservation importance on critical forest land blocks (over 500 acres) and vital river corridors such as the Merrimack and the Souhegan River Corridor which both pass through Merrimack. The Plan also notes that one of the objectives of the Merrimack Conservation Commission is to locate a land trust organization to assist with funding, provide technical expertise, and to hold conservation easements within Merrimack.[13]

5.6.3 Merrimack River Parcels Proposed for Protection

Parcels 6E-1/64, 6E-6 and 6E-8 are a group of long and narrow parcels located between the Merrimack River and the Boston and Maine railroad tracks. Because of the shape of these parcels, and the absence of public access due to the railroad barrier, it is unlikely that these lots are developable. Acquisition or protection of these parcels through conservation easement(s) would allow the Town to extend trails north along the Merrimack River, with the eventual goal being a greenway or trail network along the entire length of the river.

Parcel 3D-1/3 is a key shoreline parcel in Merrimack. At nearly 31 acres, it is one of the largest undeveloped parcels located on the Merrimack River. The parcel is the site of Thornton's Ferry, an historic river crossing connecting Merrimack to Litchfield. This would also be an ideal site for a boat launch.

Parcel 5D-2/4 is located between Route 3 and the Merrimack River and abuts land owned by the MVD containing wells 4 and 5. It is upgradient from the wells and development of this site could adversely affect the wells by decreasing groundwater recharge and increasing the potential of groundwater contamination. According to a study conducted by the University of New Hampshire in 1996, "This parcel has the highest recharge potential after accounting for the number of acres, the greatest potential sources of pollution, the highest buffering capacity when taking into account the highest value for protection feasibility." Protection of this parcel is thus a key component in safeguarding the Town's vulnerable groundwater supply.

5.6.4 Souhegan River Greenway Parcels

Parcels 5D-1/3, 5D-4/78, and 5D-4/100 are a group of parcels located along and near the confluence of the Souhegan and Merrimack Rivers. The purchase of parcel 5D-1/3 would be key to opening a large segment of hiking trail along the Souhegan River by enacting an existing easement that requires ownership of abutting lands. Protection of these parcels would help to bring about a greenway, connecting protected land and trails along the Souhegan River with similar land along the Merrimack River. Discussions are underway to acquire these easements.

13 Nashua Regional Planning Commission, Nashua Region Open Space Strategy, December 2005, pg. 22.

5.7 Water Resources

5.7.1 Surface Water Resources

Surface water resources include lakes, ponds, streams, rivers, and wetlands. Surface water resources serve many important functions in a community. A community's surface waters provide for water storage, aquifer (groundwater) recharge, water supply and wildlife habitat.

Surface water resources comprise 1,048 acres of land in Merrimack. The Town's most prominent surface water resource is the Merrimack River. The Merrimack River forms the entire western boundary of the Town and serves as a regional recreational resource and as a water supply source for Pennichuck Water Works. The Merrimack River also receives discharge from the Town's Wastewater Treatment Plant and much of its stormwater system. Another critical surface water resource is Pennichuck Brook and its associated ponds. The Pennichuck Brook system is the primary water supply source for Pennichuck Water Works who serves portions of Merrimack, the City of Nashua and other communities. Pennichuck Brook forms the southern boundary of the Town flowing between Merrimack and the City of Nashua. The Souhegan River, which bisects the Town in northern and southern halves, is also an important resource, particularly for recreation and wildlife habitat.

Wildcat Falls on the Souhegan River

Other critical surface water resources include Naticook Lake and Greens Pond. The lake and pond, along with portions of Naticook Brook are situated above one of the Town's most important aquifers in the vicinity of three of its most productive public water supply wells. Naticook Lake is also one of the Town's most important recreational resources. The Lakefront area includes the Town's only public beach and a major summer day camp at Wasserman Park; a YMCA summer camp and beach area; Veteran's Park; two public boat ramps; a private beach; and several private residences. Private beaches, public boat ramps and many private residences are also located on Baboosic.

This section of the natural resources chapter briefly examines Merrimack's surface water resources, with an emphasis on water quality, threats to water quality, and what can be done to safeguard and enhance water quality. In this endeavor, it has been discovered that a comprehensive watershed-based approach is the most effective in safeguarding water quality. Therefore, this discussion will start with a description of the major watersheds in Merrimack, followed by a discussion of rivers, streams and other water resources located within the major watersheds. Data and background information on Merrimack's surface and groundwater resources is found in the Merrimack Water Resources Management and Protection Plan. Although this plan was prepared in 1989, much of its data is still current.

Watersheds, Rivers and Streams

A watershed is defined as a geographic area consisting of all land that drains to a particular body of water. Watersheds vary in size, shape, and complexity. Watersheds are delineated by identifying the highest topographic points in a given area, and determining the direction in which water will flow from these high points. All water bodies have their respective watersheds. Major rivers, such as the Merrimack River, not only have their own overall watershed, but also typically contain many sub-watersheds for each of their tributaries. For example, the Souhegan River, a tributary of the Merrimack River, has its own watershed and is one of several sub-watersheds making up the entire Merrimack River watershed.

The water quality of a water body is directly related to the land use and activities that take place within its watershed. Because the drainage area of any given water body may extend beyond a town's borders, intermunicipal coordination of land use management is important in ensuring effective management and protection of the water resource. A case in point is Baboosic Lake, which is located in both Merrimack and Amherst, with about half of its watershed area in each town.

The entire Town of Merrimack is located in the greater Merrimack River watershed, which extends from the White Mountains in northern New Hampshire southward to the northeastern corner of Massachusetts. The Merrimack's 5,010 square mile watershed is the fourth largest in New England, with 76 percent of this area (3,810 square miles) in New Hampshire and the remainder in northeastern Massachusetts. As with most large rivers, the Merrimack River has numerous subwatersheds – the Merrimack has seventeen. **Figure 5-9** shows these watershed areas, as well as their associated floodplains. **Table 5-3** below provides area statistics for each watershed.

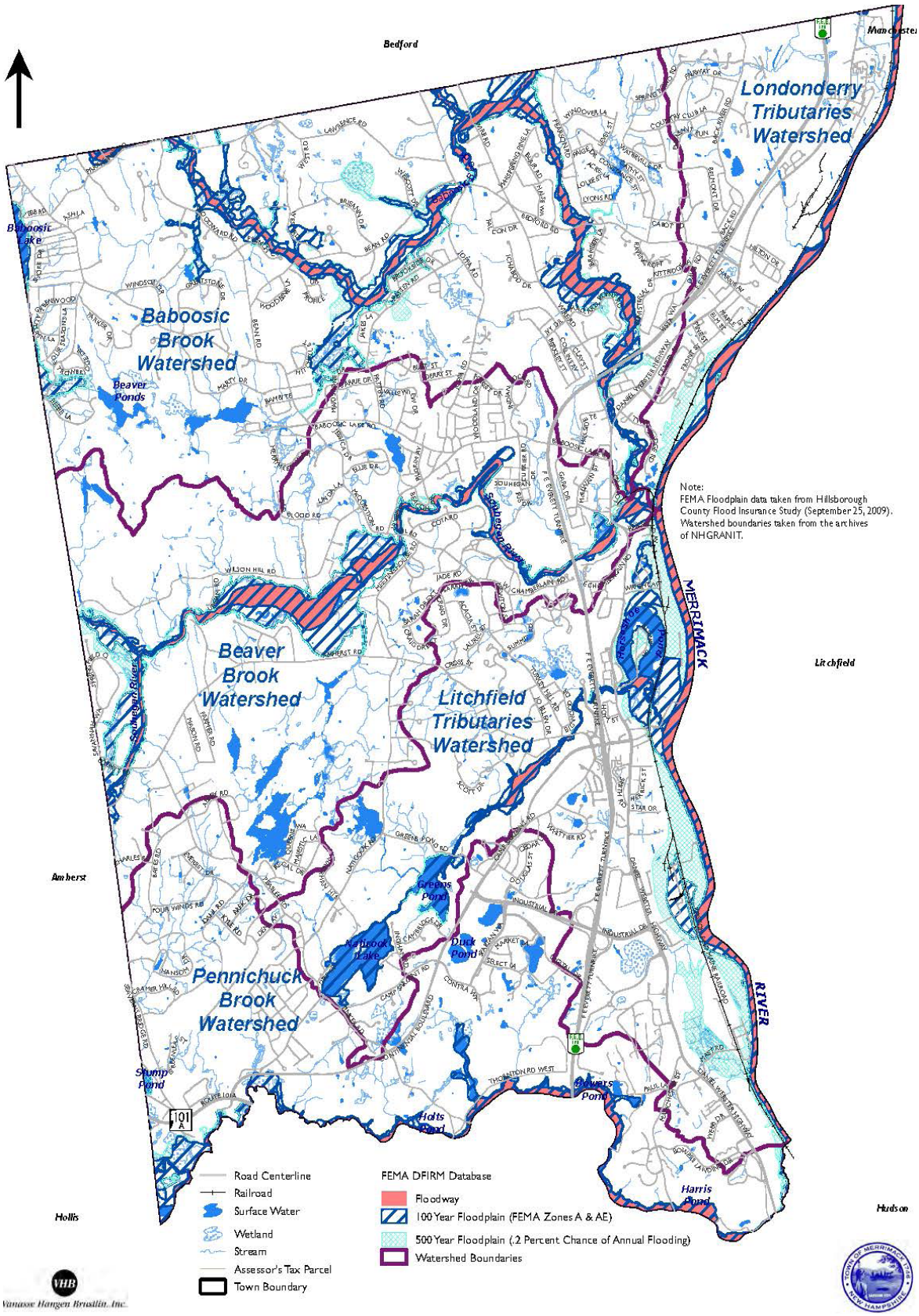
Table 5-3: Watersheds in Merrimack

Watershed	Acres in Merrimack
Baboosic Brook watershed	6,575
Londonderry tributaries watershed	1,853
Beaver Brook watershed	5,077
Litchfield tributaries watershed	4,393
Pennichuck Brook watershed	3,515
Total area:	21,413 acres

Note: The information reflects changes in watershed mapping and designations since the 2002 Master Plan.

Source: NHGRANIT data

Figure 5-9: Merrimack's Watersheds and Floodplains



The most significant local regulatory mechanism to safeguard Merrimack's surface water resources is the Town's Shoreland Conservation District Ordinance. In most ways, the ordinance parallels the State Shoreland Protection Act. The Shoreland Protection District applies to all lands within 250 feet of the shoreline of Baboosic Lake, Baboosic Brook, Bowers Pond, Greens Pond, Holts Pond, Horseshoe Pond, Harris Pond, Stump Pond, Supply Pond, Naticook Lake, Merrimack River, Pennichuck Brook, Pennichuck Pond, and the Souhegan River. The most significant features of the Ordinance are a 50 foot building setback requirement from the shoreline, a limitation on tree cutting within 150 feet of the shoreline and limitations on septic system locations and impervious surface coverage.

Additional protection is given to the Lower Merrimack River and the Souhegan River as New Hampshire protected rivers, designated in 1990 and 2000, respectively, by the NH DES Rivers Management and Protection Program. The Lower Merrimack River is designated as a community river, defined as those where the natural, scenic, recreation, and community values of the river are to be protected, while still accepting of agricultural, residential, and commercial uses that do not impact public instream uses. Most of the Souhegan River is designated as a rural river which are those adjacent to lands that are partially or predominantly used for agriculture, forest management and dispersed or clustered residential development, and where some instream structures may exist. Other parts of the Souhegan River are designated as a rural-community river or a community river.

As protected rivers, the Local Advisory Committees for each river are tasked with preparing and adopting local river corridor management plans pursuant to RSA 483. The ***Lower Merrimack River Corridor Management Plan*** was prepared in May 2008. The ***Souhegan River Watershed Management Plan*** was prepared in March 2006. In general, these two plans are intended to guide communities adjacent to these rivers in decision-making that may have the potential to affect the river itself, the river corridor, and the watershed. In addition to the preparation and adoption of river corridor management plans, the Local Advisory Committees are also tasked with considering and commenting on any local government plans to approve a license, fund, or construction facilities which may alter the resource value and characteristics of the designated river.

The Souhegan River Watershed Management Plan was instrumental in identifying the key concerns and issues facing the recreationally and ecologically important Souhegan River. In particular, the Plan noted that it would be important for Corridor communities, including Merrimack, to adopt the Plan to implement its river management strategies. These strategies range from maintaining and restoring vegetated buffers along the river to adopting site design practices that protect aquatic resources.

Characteristics of Merrimack's perennial streams are summarized in **Table 5-4**. Stream location, length and elevation were determined from United States Geological Survey (USGS) quadrangles. All streams flowing through Merrimack have been designated by the New Hampshire Legislature as Class B waters (must meet the fishable/swimmable criterion) except for Pennichuck Brook which is Class A. Class A waters must be suitable, with treatment, for use as a public drinking water supply.

A detailed discussion of water quality issues facing Merrimack's rivers and streams is found in the "Threats to Surface and Groundwater Resources" section of this chapter.

Table 5-4: Perennial Streams in Merrimack

Name	Total Length (miles)	Length In Merrimack (miles)	Generalized Begin Elevation (aMSL)	Generalized End Elevation (aMSL)	Dammed or Free-flowing	Class
Baboosic Brook	9.7	7.6	240	100	dammed	B
Pointer Club Brook	0.5	0.5	—	—	free	B
Dumpling Brook	1.8	1.8	250	100	free	B
Unnamed Stream	1.2	1.2	240	200	free	B
Merrimack River	116.0	7.9	—	—	dammed	B
Unnamed Stream	1.2	1.2	340	190	free	B
Souhegan River	34.8	6.6	940	100	dammed	B
Naticook Brook	2.0	2.0	180	100	dammed	B
Unnamed Stream	1.0	0.7	270	190	free	B
Pennichuck Brook	7.9	6.4	190	100	dammed	A

Source: USGS Quadrangles.

Table 5-5: Lakes and Ponds in Merrimack[14]

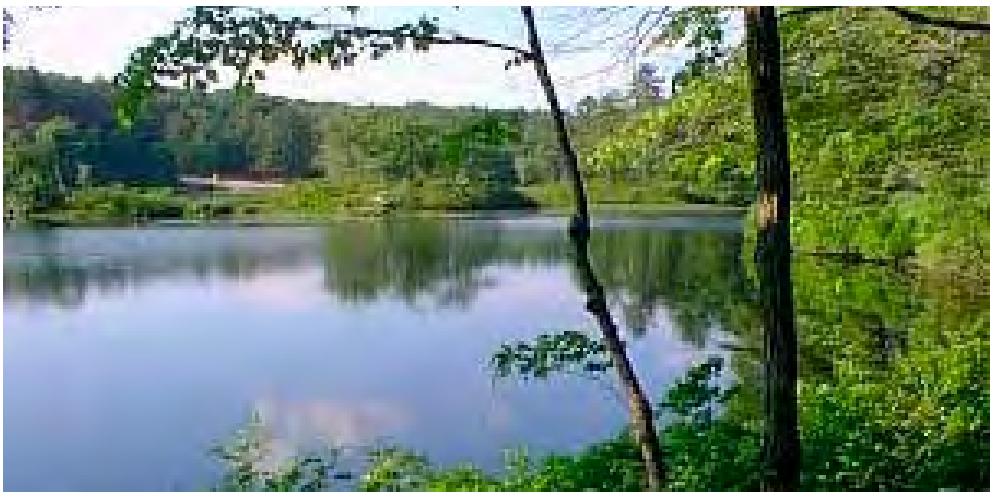
Name	Length (miles)	Area (acres)	Elevation (aMSL)	Average Depth (feet)	Maximum Depth (feet)	Trophic Class "Year"	Trophic Class "Year"	Type
Baboosic Lake	4.3	222	231	16	26	Eutrophic (1998)	Mesotrophic (2008)	Natural
Naticook Lake	2.1	72	206	N/A	20	Mesotrophic (1989)	Mesotrophic (2000)	Natural
Greens Pond	0.4	40	195	N/A	14	N/A	Eutrophic (1997)	Dammed
Horseshoe Pond	1.8	37	95	N/A	23	Eutrophic (1979)	Eutrophic (1997)	Natural
Duck Pond	0.2	8	200	N/A	N/A	N/A	N/A	N/A
Stump Pond	0.5	18	195	N/A	6	N/A	Eutrophic (1990)	Manmade

Source: NH DES, Water Division, Survey Lake Data Summary, September 2009.

14 http://des.nh.gov/organization/divisions/water/wmb/lakes/documents/summary_data.pdf

Lakes and Ponds

Merrimack contains all or part of five (5) lakes and ponds. **Table 5-5** provides some general information on Merrimack's lakes and ponds. The trophic class of a lake indicates its stage in the natural aging process, called eutrophication that all water bodies undergo. Generally, three classifications are used: oligotrophic—high transparency with low levels of nutrients and vegetation and high levels of dissolved oxygen; mesotrophic—elevated levels of nutrients and vegetation and decreased levels of dissolved oxygen; and eutrophic—low transparency, rich in nutrients, abundant aquatic vegetation and low levels of dissolved oxygen. The trophic classes also represent the manner in which most lakes age, with "young" deep lakes tending to be oligotrophic, middle-aged lakes tending to be mesotrophic, and older, shallower lakes and ponds tending to be eutrophic. The natural aging process by which lakes age and fill in with organic sediments can be accelerated by excessive nutrient loading. This encourages weed and algal growth, which in turn speeds up the deposition of decaying vegetation as organic sediments on the lake's bottom.



Perhaps the most significant finding from the above table is the reclassification of Baboosic Lake from eutrophic in 1998 to mesotrophic in 2008. This is indicative of improving water quality over the past decade. Previously Baboosic Lake was classified as mesotrophic in 1993, but experienced accelerated eutrophication through 1998 due to increased nutrient loading as a result of increasing development in the watershed. Excess phosphorus is the nutrient most likely responsible for the previous decline in the lake's water quality. The phosphorus originates from geologic materials, atmospheric deposition, waterfowl waste, fertilizer runoff, and domestic septic systems. Water clarity decreases due to algal blooms feeding on the high concentrations of phosphorus. The improved water quality may be the result of comprehensive planning and site design requirements which reduce impervious surfaces, erosion, and maximize stormwater systems. Continued implementation of best management practices such as proper septic maintenance, reduced fertilizer application, and improved buffers around the lake should be encouraged.

According to the most recent (July 2008) lake report from the New Hampshire Department of Environmental Services, the color scale (clear, transparent water has low values, darker, cloudier water has higher values) of Baboosic Lake averaged at 23, a decrease from 42 in the eight-year period, and the chlorophyll-A content, an indicator of algae growth, also decreased to a value of 2, from a high of 16. These decreases after a sharp increase prior to 2000 indicate that Baboosic Lake is improving, but remains susceptible to short-term algae blooms.

In the eleven-year period from 1989 to 2000, Naticook Lake's color scale increased from 21 to 23 and its chlorophyll-A content increased from 2 to 5, but its trophic class remained the same. While those increases are not significant, there is no data available in the twelve years since Naticook Lake was last tested. One fact brought out by the NH DES data is that many lakes and ponds in the State have not been tested in many years. While Baboosic Lake was recently tested in 2008, Greens Pond, Horseshoe Pond, and Naticook Lake were last tested well over twelve years ago. Water quality can change rapidly, and it is in the Town's interest to have up-to-date water quality data for all its water bodies. The Town's Parks and Recreation Department should ensure that Naticook Lake is tested on a regular basis, especially considering its value as a municipal recreational resource.

A recent concern for the Naticook Lake is recently discovered infestation of the lake with variable milfoil, an exotic aquatic plant first found in the lake in July 2012. It has been confirmed by the NH DES. According to the NH DES, "Freshwater exotic aquatic plants are those that are not naturally found in New Hampshire's lakes, ponds and rivers, and because they are not naturally found here, they have no predators or diseases that keep them in check, allowing them to grow quickly."[15] While the recent discovery is reported to be difficult to remove due to advanced stage of growth, the NH DES does have a number of practices to prevent its further spread including the proper boat cleaning and removal of materials on boat equipment. The Town could post signage at the boat docking areas on Naticook and Baboosic Lakes that educates boat owners of the danger of invasive species and measures to prevent their spread.

15 New Hampshire Department of Environmental Services, DES Warns of Expanding Infestations of Exotic Aquatic Plants. January 2012.

Wetlands

Wetlands have recently received much scientific and regulatory attention as recognition of their role in hydrologic and ecological processes has increased. Among the functions wetlands perform are aquifer recharge, flood control, erosion and sedimentation control, water purification, and provision of nursery grounds and habitat for numerous species of plants, animals and fish. A number of endangered and threatened species are found only in wetlands.

Wetland definitions vary according to the agency or organization delineating the wetland. The US Fish and Wildlife Service definition of wetlands is based on the location of the water table and the presence of standing water, the presence of plant species commonly found in wetland habitats, and soil type. Four federal agencies (the US Department of Agriculture, Natural Resource Conservation Service (NRCS); the Army Corps of Engineers and the Environmental Protection Agency) agreed on a definition of wetlands that considers three parameters: soils, wetland vegetation and hydrology. The NH Wetlands Board uses a three-part definition for wetlands based on hydric (saturated) soils, hydrology (water table at or near the surface), and wetland vegetation. For purposes of regulation, Merrimack, like many communities in New Hampshire, defines wetlands as areas of poorly and very poorly drained soils.

White Pine Swamp

Wetlands in Merrimack represent 509 acres of the land area of the Town.[16] Most of the wetlands are located near major water bodies, although several large isolated wetlands also exist. The two largest wetlands, encompassing 150 and 250 acres, are located in the Baboosic Brook watershed. Another significant wetland area, approximately 60 acres, is White Pine Swamp in southwestern Merrimack.

Regulatory methods of protecting wetlands from pollution and destruction include requirements for erosion and sedimentation control plans and enforcement of those plans, minimum setbacks for buildings and septic system leach fields, minimum vegetative buffer requirements and prime wetland designation. Merrimack's Wetland Conservation District zoning prohibits dredging, filling, erection of structures or any alteration of the terrain in areas of poorly or very poorly drained soils. Merrimack enforces the State's minimum setback

16 Town of Merrimack

requirement of 75 feet for septic leachfields. All buildings or structures which require building permits must be set back at least 40 feet from any wetland boundary.

New Hampshire Revised Statutes Annotated, Chapter 482-A:15, enables a municipality (acting through its Conservation Commission) to designate certain areas as prime wetlands. Prime wetland designation accomplishes the following:

- Identifies wetlands considered important locally by virtue of their size, unspoiled character, uniqueness, fragility and/or other special characteristics.
- Notifies landowners, developers, and the NH Wetlands Board that the municipality strongly believes that certain wetlands should remain in their natural state.
- Provides assurance that the Wetlands Board will give special consideration to applications for dredge and fill permits in prime wetlands (as long as the Conservation Commission notifies the Board that the permit application is for a proposed project in a prime wetland.)

Proposals for prime wetland designation must follow inventory and evaluation criteria as well as report and map formats established by the New Hampshire Wetlands Board. To date, the Town has not designated any prime wetlands. The Merrimack Conservation Commission should consider performing a functional evaluation of the Town's wetlands, which may lead to designation of prime wetlands.

5.7.2 Floodplains

Floodplains are areas adjacent to water bodies and watercourses that are susceptible to flooding during periods of excessive water runoff. Merrimack contains extensive floodplain areas, many encompassing large wetlands which facilitate flood storage. A 100-year flood is a base flood having a one percent chance of occurring in any year. As recently updated by the Federal Emergency Management Agency (FEMA) the 100-year floodplain in Merrimack includes approximately 2,204 acres of the Town. The 500-year floodplain (0.2 percent chance of annual flooding) represents 758 acres of land.[17] Significant floodplains border the Merrimack River and Horseshoe Pond, the Souhegan River, Baboosic Brook, and Naticook Brook below Greens Pond.

Merrimack's Flood Hazard Conservation District is an overlay district designed to minimize loss of life and property due to flooding. It prohibits fill or encroachments that would increase the base level of a flood as well as the removal of soil or other natural objects. The ordinance also contains 500-year floodplain provisions regarding the storage of industrial chemicals and hazardous materials, and the design and siting of septic systems. Merrimack's 100- year and 500-year floodplains are shown on **Figure 5-9**.

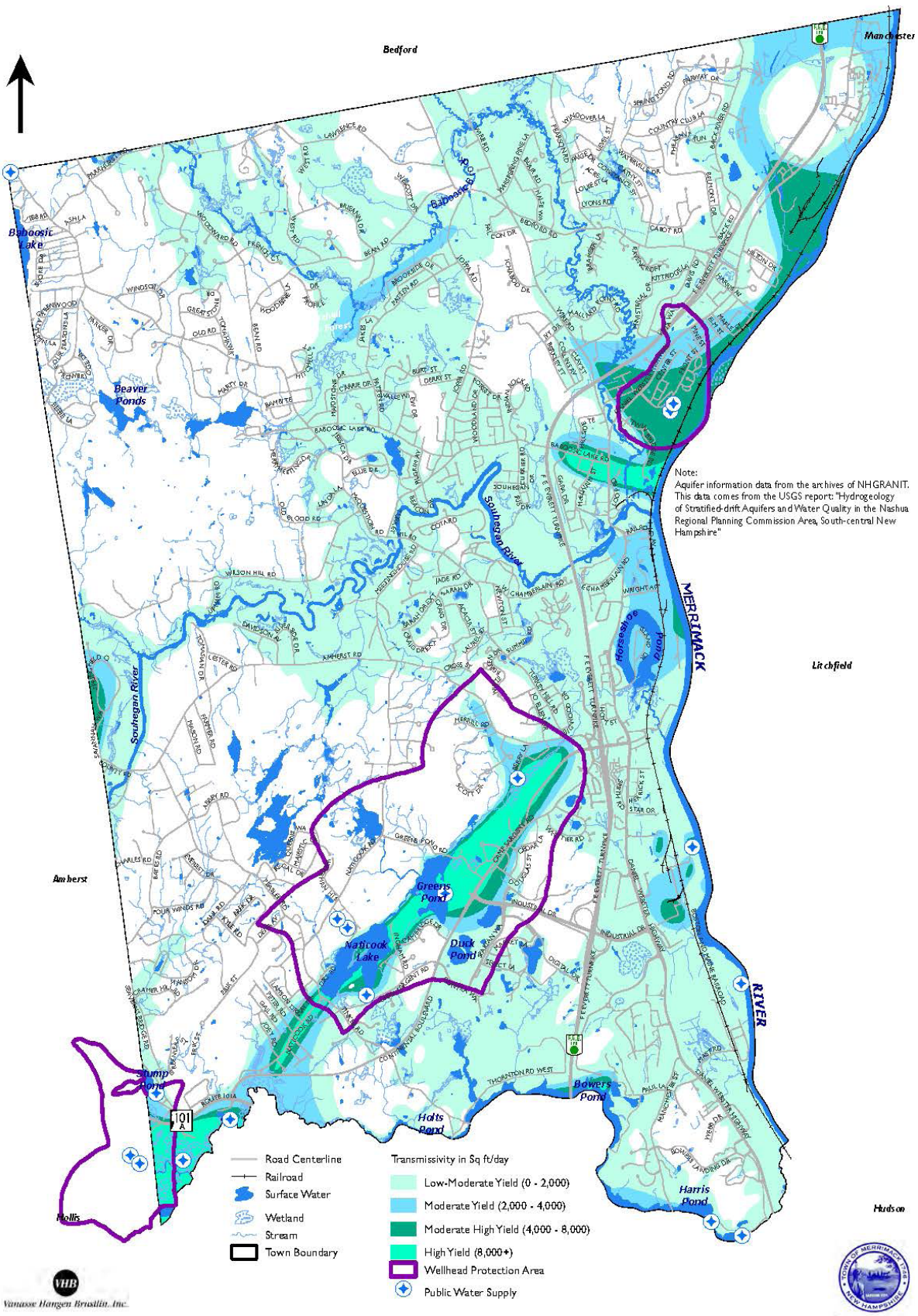
17 Federal Emergency Management Agency and GRANIT, 2012

5.7.3 Groundwater Resources

Groundwater is a very important resource in Merrimack, as 85 percent of the Town obtains its drinking water from wells operated by the MVD. These wells are located in areas called aquifers, which, in the case of MVD's wells, consist of coarse sand and gravel deposits (stratified drift) that hold and have the ability to transmit large quantities of water. Though bedrock aquifers are also found in Merrimack, they are not currently being used as a source of municipal water supply. Stratified drift aquifers, which generally have the greatest potential to yield large quantities of water, underlie approximately 19 square miles or 57 percent of the Town. The location of these aquifers is shown on **Figure 5-10.**

Merrimack has adopted an aquifer conservation (overlay) district is "created to protect, preserve and maintain the existing potential groundwater supply and recharge areas within known aquifer and wellhead areas from adverse impacts that may result from inappropriate development or land use practices." The district is divided into two sub-areas: (1) the wellhead protection areas; and (2) the balance of the aquifer district. The regulations and standards for the wellhead protection areas are stricter than those for the remainder of the district. The district allows recreation, residential development and commercial operations that do not discharge wastes on site. Discharge of wastes is limited to septic system leachate from one- or two-family residences. Use of septic systems by commercial and industrial operations is not specifically allowed but may be permitted by action of the Zoning Board of Adjustment. Several types of businesses are prohibited (e.g. junkyards, automotive service and repair shops). Storage and handling of toxic materials is also restricted (e.g. no underground storage tanks within 1,000 feet of a municipal well, no storage of toxic chemicals for sale or distribution) in addition to the provisions regarding underground storage tanks and toxic materials administered by the Merrimack Fire Department and the New Hampshire Department of Environmental Services.

Figure 5-10: Merrimack's Aquifers



Merrimack's groundwater resources are part of an extensive system of stratified drift deposits that extend beyond the Town's corporate boundaries. The use of the groundwater, and of the land overlying it, in one community may affect the quality and quantity of the ground water in other communities.

The deposits along the brook northeast of Naticook Lake and the South Merrimack deposits in the southwestern corner of town form the most important aquifers in Merrimack.[18] The Naticook Brook aquifer is located along Naticook Brook northeast of Naticook Lake in Merrimack. This coarse, thick, extensive deposit lies under the Route 101A corridor, which is extensively developed through Nashua and Merrimack and is rapidly developing westward. The Merrimack-Merrimack River aquifer is a deposit spanning the Merrimack River into the northern sections of Merrimack and Litchfield. In Merrimack, industrial and commercial land uses predominate over the aquifers, and much of the land over the aquifers is zoned for commercial uses.

The Merrimack Village District Wells and the Future of Merrimack's Water Supply

As previously mentioned, most of Merrimack obtains its drinking water from wells operated by the Merrimack Village District (MVD). The MVD's Master Plan has three major goals:

- Assure an adequate quantity of water for the long-term planning period
- Improve the quality of water delivered and protect water sources from contamination
- Plan for emergencies

The MVD supplied just over 800,000,000 gallons of water in 2011 via 169 miles of pipe to approximately 9,300 building units and 6,500 connections. The MVD operates seven high-yield wells (six active and one inactive), three of which are located in the Naticook Brook aquifer, which is roughly aligned with the Silver Lake fault zone which extends northeasterly into Merrimack from Silver Lake in Hollis. MVD owns or leases approximately 278.89 acres of land in Merrimack and Hollis for wellhead protection. The Naticook Brook aquifer portion of the Silver Lake fault zone is Merrimack's most important groundwater resource, supplying over half of Merrimack's total drinking water supply. Due to the type of sand and gravel deposits found along the fault zone, it is the only place in Merrimack where major production wells are possible.

Currently, MVD believes it has sufficient capacity to meet expected current and future annual average daily demand based on projections through 2030. However, at times, maximum day demands cannot be met. In addition, the MVD projects challenges meeting summer average day demands by the year 2020. Since there are limited additional well sites within Merrimack that can easily be used, it is critical to limit peak demand. There are also no feasible surface water sources that are not cost-prohibitive. Strategies to reduce demand are discussed below, following a discussion of Merrimack's most important aquifer, where peak demand is perhaps having the greatest adverse impact on groundwater levels.

18 U.S. Geological Survey. Hydrogeology of Stratified-Drift Aquifers and Water Quality in the Nashua Regional Planning Commission Area. South-Cental New Hampshire. 1997. http://pubs.usgs.gov/wri/1986/4358/report.pdf. Accessed January 2012.

The MVD formed the Naticook Aquifer Advisory Ad Hoc Committee in 1999 to address groundwater issues. The Committee developed a list of recommendations to prevent losses from the aquifer and to address increasing demand for water. These recommendations include:

- Address imperviousness in subdivision and site plan regulations.
- Develop a review checklist for subdivisions and site plans that incorporates recharge protection and demand management protections. The checklist would address best management practices (BMPs) for stormwater control and treatment.
- Identify opportunities to improve infiltration in existing impervious areas.
- Evaluate limitations on further sewering in the Naticook basin.
- Address existing and future large quantity withdrawals in the basin, especially by commercial and industrial users.
- Investigate the effectiveness and feasibility of raising Greens Pond for enhancing storage in the aquifer.

This Master Plan recommends that the Planning Board investigate regulations or landscape design guidelines that would require or encourage developers to leave more topsoil and vegetation in place when sites are developed. In this way, irrigation demand may be reduced, which will help to address the wider problem of declining groundwater levels. The MVD also utilizes odd/even watering restrictions for outdoor watering activities.

The other major issue facing groundwater quantity and quality is impervious surfaces and stormwater runoff. The presence of large areas of impervious surfaces on a site reduces the ability of water to percolate into the ground, and increases the chances for groundwater contamination due to contaminants in stormwater runoff. It is estimated that approximately 15-20 percent of the land area in the Naticook Brook aquifer wellhead protection area is impervious. Any further increase in impervious coverage in this area and throughout Merrimack could contribute to degradation of groundwater quality. The subdivision and site plan regulations could be amended to better address this issue by:

- Reducing the amount of impervious surfaces (such as parking lots and other paved areas) that can be placed on the land
- Requiring adequate treatment of stormwater before it reaches surface and groundwaters, and
- Ensuring that post-development total runoff does not exceed pre-development total runoff.

The MVD is constantly working to improve water quality and supply. Future projects may include treatment to improve the water quality of the wells in the south (#6, #7, and #8). In addition, the MVD is routinely investigating the possibility of bringing new cost-effective groundwater sources online.

5.7.4 Threats to Surface and Groundwater Resources

Rivers, streams, lakes, ponds and groundwater resources face a myriad of threats. The two main categories of pollution are point source and non-point source pollution. Point sources of pollution are those that can be traced back to an identifiable source, such as a pipe or sewer outfall. Non-point sources of pollution are more diffuse in origin, such as agricultural and urban stormwater runoff, septic system effluent, snow dumps, road salt, soil erosion, etc. The State of New Hampshire, Department of Environmental Services, in its publication New Hampshire Nonpoint Source Management Plan, lists the various forms of non-point source pollution in order of priority for abatement efforts. The list is based on the following factors:

- Danger to public health
- Magnitude and pervasiveness of the potential threat
- Potential impacts to receiving waters
- Professional judgment
- Ability of existing regulatory programs to control pollution
- Adequacy of existing education programs to promote pollution control
- Public perception
- Comments of Non-Point Source Management Plan Subcommittee

The list, in order of priority, is: 1) urban (stormwater) runoff; 2) hydrologic and habitat modifications; 3) subsurface systems; 4) junk, salvage, and reclamation yards; 5) construction activities; 6) marinas; 7) road maintenance; 8) unlined landfills; 9) land disposal of biosolids; 10) land disposal of septage; 11) agricultural activities; 12) timber harvesting; 13) resource extraction; 14) storage tanks (above ground and underground); and 15) golf courses and landscaping.[19]

According to the 2011 MVD Annual Report, only seven substances (out of 20 tested) were detected in its water. All were below the highest levels allowed by law. These include lead, copper, nitrate, nitrite, chloride and sodium (see road salt discussion below for more information on chloride and sodium levels).

This section briefly examines some of the issues and trends in point and non-point source pollution and actions that can be taken to address this pollution. The focus is on non- point source pollution, and urban runoff in particular, now acknowledged as being the most serious threat facing surface and groundwater resources today. The recommendations that follow this discussion mention several "best management practices" (BMPs) that address non- point source pollution and stormwater runoff in particular. BMPs are variously defined as technical guidelines for preventing pollution caused by particular activities, and recommended treatment or operational techniques to prevent or reduce pollution. Some of the major sources of surface and groundwater contamination include:

19 New Hampshire Nonpoint Source Management Plan, New Hampshire Department of Environmental Services, October 1999

Road Salt

Excessive salting of roads creates the potential for sodium, calcium and chloride contamination of the ground water, which can pose health threats to humans, endanger animals and plants, and corrode metal and concrete. Increased concern about water quality led Merrimack to adopt a reduced salt use policy in 1984. No-salt routes generally encompass areas adjacent to public water supplies, the MVD wells and Pennichuck Brook as well as areas where on-site wells are located near roadways. Other areas are treated with a mixture of salt and sand. Merrimack has been a leader in the use of liquid calcium chloride, which melts ice and snow faster than salt, to pre-wet the sand or salt applied to roadways.

Through a Local Source Water Protection Grant, MVD commissioned a study to address sodium and chloride loading within its Wellhead Protection Areas (WHPA), which was completed in May 2012. The report calculated salt loading from state, local and private roads; parking lots; residential driveways; residential septic systems; and atmospheric deposition (although that was minimal). The study concluded that sodium and chloride levels have steadily increased over the last ten years in each of the Town's wells, leading to exceedance of applicable EPA standards on numerous occasions.[20]

To that end, the report recommends a number of mitigations strategies including:

- Revising the Subdivision Regulations to remove regulatory roadblocks to reducing impervious cover, such as parking requirements
- Encourage buildings and grounds design to minimize impervious cover requiring treatment with sodium chloride, reduce drainage onto surfaces that require such treatment, and maximize winter sunlight exposure to those surfaces
- Design parking lots to separate foot and vehicular traffic areas
- Conduct outreach and educational efforts to property managers about sodium chloride issues
- Review existing plow routes to determine whether to expand areas with reduced or no salt applications
- Provide annual in-house training on deicing best practices
- Coordinate with Amherst, Hollis and Nashua, as well as NHDOT to encourage reduced salt applications within the WHPAs, particularly on Route 3, Route 101A, Industrial Drive, and Continental Drive
- Continue to monitor drinking water wells for sodium and chloride levels.[21]

20 According to the MVD 2011 Annual Report, the average levels detected for sodium and chloride were below the highest level allowed by EPA.

21 Sodium and Chloride Loading Study of the Merrimack Valley District Wellhead Protection Areas, Emery & Garrett Groundwater, Inc., May 2012

Subsurface Sanitary Waste Disposal

Septic system failures from improper design, installation, or maintenance allow nutrients, particularly nitrogen, phosphorus, and sometimes bacteria and viruses, to leach into water resources. The first receptor of these contaminants is often a nearby private well, but surface waters may also be affected. Septic system leachate, along with stormwater runoff, may contribute to excessive algae growth in surface waters which, in turn, decreases the amount of oxygen available to fish, decreases sunlight penetration and clogs waterways. In most cases, older septic systems and cesspools pose the greatest threat to groundwater and surface water quality. The EPA considers new systems that meet today's heightened standards to be passive and durable systems that can provide acceptable treatment despite a lack of attention by the owner.

Approximately 60 percent of Merrimack's land area is served by on-site sanitary waste disposal systems. Building Department records show that septic system replacements have increased from 36-37 annually in the late 1970s to over 50 per year since 1987. It can be presumed that most of these were replacements of failed systems although the precise causes of failure are not known. System failure may result from improper design, installation, or maintenance.

Stormwater Runoff

The development of land for residential, commercial or industrial purposes necessarily increases the amount of impervious surface area within any given site due to the construction of buildings, roads, driveways, parking lots and other improvements. Impervious surfaces reduce the natural infiltration of stormwater into the ground, thereby, reducing recharge of groundwater resources. This is particularly true where stormwater is discharged into a storm drainage system that exports stormwater off site and out of a watershed. Development can also reduce groundwater recharge through increased evaporation that can result from land clearing. Where increased imperviousness results in direct stormwater discharges into streams and rivers, the result is often alteration of the natural flow of the stream, causing erosion and sedimentation, loss of aquatic wildlife habitat and increased flood hazards. Stormwater runoff is also a principal nonpoint contamination source of surface and groundwaters.

Potential contaminants found in stormwater runoff include: nutrients, such as phosphorous, heavy metals, floatables and solids, pathogens such as virus and bacteria, organic compounds including oils, grease, MBTE, and pesticides and herbicides. All of these materials singly and in combination can lead to the degradation of surface and groundwaters. The MVD has had challenges with stormwater runoff at some of their wells due to drainage features nearby.

To control stormwater discharge within Merrimack, the Merrimack Town Council adopted Stormwater Management Standards as Chapter 412 of the Town Code on July 21, 2012. The purpose of the Stormwater Management Standards is to protect water quality within the town. The standards apply to any project which results in a total disturbance of 20,000 or more square feet. A project that meets or exceeds that threshold must submit a Stormwater Management Plan which describes how stormwater runoff would be managed through site

design, pollutant source controls, structural BMPs, and construction phase practices, and should be consistent with the requirements of the New Hampshire Stormwater Manual.

The United States Environmental Protection Agency (EPA), through a program called the National Pollutant Discharge Elimination System (NPDES), aims to prevent and control non-point pollutant sources.

MS4 Permit

An MS4 is a Municipal Separate Storm Sewer System, which transports polluted storm-water runoff through a municipal stormwater system where it is then discharged into local waterbodies. The majority of Merrimack is designated an MS4 community as of the 2000 Census. The Phase II rules, requires regulated small MS4s that are designated by the permitting authority to obtain a NPDES permit for their stormwater discharges. The Phase II rules went into effect in March of 2003, and the permits issued under these regulations remain in effect for authorized Operators until a new permit is issued. The U.S. Environmental Protection Agency (U.S. EPA) is currently revising its 2008 Draft New Hampshire Small MS4 Permit and will issue it as a new draft permit for public comment in the summer of 2012. The final permit will not be issued until late 2012 or early 2013 to allow for the public to comment on the draft permit and for the U.S. EPA to respond to those comments. A Notice of Availability for the new draft New Hampshire Small MS4 general permit will be published in the Federal Register as well as information about any scheduled public meetings or hearings.

Underground Storage Tanks

Leaks in improperly equipped underground storage tanks (USTs) are difficult to detect and may go unnoticed for a long time. Even a small leak of only a few gallons can contaminate millions of gallons of ground water. The State regulates USTs where the cumulative volume of all tanks at the facility is 1,100 gallons or more. Some tanks, including those containing non-petroleum based chemicals and those containing heating oil for on-site residential consumption are exempted. As of 2012, 74 active USTs and 168 closed USTs in Merrimack have been registered with the NH Department of Environmental Services, Water Supply and Pollution Control Division.

Waste Sites

Contaminants from waste disposal sites and sites contaminated by industrial activities can leach into surface and ground waters. From 1962 to 1985, the New Hampshire Plating Co. (NHPC) conducted electroplating operations on its more than 13 acre parcel in Merrimack. The property is an EPA-designated Superfund site undergoing cleanup efforts by the NHDES. The NHDES Site Remediation and Groundwater Hazard Inventory also identified 110 other waste sites in Merrimack, many of which have been remediated.[22] The Corbin Property was at one time a private dump, and sludge is known to be buried on site. In addition, the MVD's Well Number 6 is currently closed due to the presence of volatile organic compounds in the vicinity, although the remediation effort is underway. Many of the other listed sites are the result of leaking underground storage tanks, as mentioned above.

22 http://www2.des.state.nh.us/OneStop/ORCB_All_Sites_Results.aspx?Town=MERRIMACK

5.8 Conclusions and Recommendations

The management and protection of Merrimack's surface and groundwater resources is important to protect the Town's major aquifers and to increase access to and protection of the Souhegan and Merrimack Rivers. The preservation of forest and woodlands and open space is also of particular concern. By enhancing conservation and management of these resources, other objectives can be achieved as well, including wildlife conservation, retention of rural character and increased recreational opportunities. The recent Biodiversity Conservation Plan presents a new approach to resource protection in Merrimack through its establishment of five CFAs for priority protection. Additionally, it recommends coordination with surrounding communities, particularly Amherst and Bedford since there share unfragmented lands.

Because many of the threats to priority resources are directly related to land development, a key element in achieving preservation of these natural resource priorities is strategic land acquisition. State, federal and private grants and assistance should be pursued where possible. In addition to direct land acquisitions, the Town can adopt or revise land use regulations to enhance the protection of important natural resources. Where land acquisition or regulation is not practical or appropriate, the Town can encourage public education and private conservation initiatives. The recommendations provided below address each of these natural resource management and protection approaches.

5.8.1 Land Acquisition

The Town has placed a priority on land acquisition to provide for open space preservation, retention of rural character, access to and protection of surface waters (especially the Merrimack and Souhegan Rivers), preservation of wildlife habitats, protection of groundwater resources and recreation. Land acquisition can be accomplished either in fee or through the acquisition of easements. The resources of the Town are, of course, limited and with land ownership come certain duties of management, maintenance and care. Also, land acquired for conservation purposes may no longer be available for alternative public or private uses. The Town should work with the MVD, however, to preserve the ability to use these lands for public water supply whenever practicable.

The Biodiversity Conservation Plan recommends the use of a Parcel-based Ecological Assessment to prioritize parcels for protection. This approach considers and assigns points for such criteria as parcel size (especially unfragmented land), the presence of wetlands and watercourses, ecologically significant habitats, the presence of rare and endangered species, consistency with wildlife action plans, agricultural or forest resources, proximity to other conserved land or CFAs, and the amount of land in the parcel that is currently developed or in some other use. That plan recommends focusing conservation efforts within the Grater Woods and Horse Hill CFAs due to anticipated development pressures and existing biodiversity in these areas.

The 2002 Merrimack Master Plan identified almost 620 acres of priority parcels to acquire and a number of those parcels have since been preserved through purchase or easements. Just over 100 acres remain from that list and discussions have been underway to protect some of that land from future development (see **Table 5-2**). The recommendations provided below address each of these natural resource management and protection approaches.

Land Acquisition Initiatives

NR-1 Continue the Town's land acquisition strategy, placing the highest priority on the acquisition of lands that can, when managed for conservation purposes, accomplish the widest range of objectives, especially those found in the Biodiversity Conservation Plan. The Town should prioritize the following parcels for acquisition, as noted in the 2002 Plan:

Undeveloped lands along the Merrimack River

- The Town currently owns a number of parcels along the shores of the Merrimack River that include two boat ramps, and three islands within the river that contain another 25 to 30 acres of land. In addition, the Town currently has a public access easement in an area south of the confluence of the Merrimack and Souhegan Rivers. Another riverfront parcel adjacent to Town-owned land is owned by the Merrimack River Watershed Association. Merrimack riverfront lands include extensive wooded areas that provide for a variety of wildlife including bald eagle perching and roosting sites. A number of undeveloped areas are comprised of prime agricultural soils. These lands offer recreational opportunities for hiking, boating, fishing and other recreational activities. Conservation of these lands can help to protect the River from contaminants contained in stormwater runoff, protect the banks from erosion and preserve the natural beauty of the shoreland.

Undeveloped lands along the Souhegan River

- The Town and School District currently own several acres of land on the both sides of the Souhegan River including three parks, conservation land and undeveloped land behind the High School. Conservation and access easements have also been obtained from two shoreland residential developments. In addition, there are extensive areas of privately held conservation and recreational land along the river including a Boy Scout camp and land held as common open space as a part of residential cluster developments.

- The land adjacent to the Souhegan River provides a varied landscape from heavily wooded areas to wetlands to open meadows with habitat for a diversity of wildlife. The remaining undeveloped land along the Souhegan River together with existing public and privately owned conservation and recreational land, offers the opportunity for the development of a corridor of conservation and recreational land that would bisect the Town from the large forest blocks at its western border with Amherst to the Merrimack River.

- This greenway or greenbelt would also provide a wildlife corridor preventing the fragmentation of important wildlife habitats while offering numerous recreational opportunities for hiking, canoeing, fishing and other recreational activities. As with the Merrimack River, conservation of these lands would also help to protect the river from sediment and contaminants, protect the banks, and preserve the natural beauty of the shoreland and surrounding areas.

5.8.2 Regulatory Initiatives

NR-2 Assess the Town's zoning ordinance and the subdivision and site plan regulations regarding the integration between biodiversity protection and land use as recommended by the Biodiversity Conservation Plan.[23] The Plan recommends that a natural resources audit be conducted to provide an overall assessment of the Town's zoning ordinance and the subdivision and site plan regulations regarding the integration between biodiversity protection and land use. Particular attention should be paid to the areas containing Ecologically Significant Habitats. Specifically recommended sections of the ordinance include the Wetlands Overlay District, Flood Hazard Conservation District, Aquifer Protection District, Shoreland Protection District, Cluster Residential Development (see additional discussion below), and Wellhead Protection Areas. This effort can enhance the protection of natural features such as rare species, critical habitats, rare natural communities, and rare unfragmented lands.

Stormwater Management

The construction of buildings, roads, driveways, parking lots, and other land developments increases the amount of impervious surface area. The increase of impervious surfaces reduces the natural infiltration of water into the ground inhibiting the recharge of groundwater resources and increasing the amount and volume of water that is discharged into a storm drainage system that exports stormwater off of a site and out of a watershed. Development can also reduce groundwater recharge through increased evaporation that can result from land clearing. Where increased imperviousness results in direct stormwater discharges into streams and rivers. Excess stormwater alters the natural flow of streams and rivers, causing erosion and sedimentation, impacts to aquatic wildlife habitat, and flooding hazards. Stormwater runoff is also a principal nonpoint contamination source of surface and groundwater. In addition to the Stormwater Management Standards mentioned above, the Town can use its Subdivision and Site Plan Regulations and Zoning Ordinance to encourage environmentally beneficial stormwater management through road, driveway and parking lot design. The following recommendations are provided:

NR-3 Ensure that post-development runoff does not exceed pre-development runoff by requiring on-site stormwater retention. Where on-site retention is not possible or practical, efforts should be made to retain the stormwater within the same watershed.

NR-4 Reduce imperviousness in site design, where appropriate, by encouraging design features such as smaller parking lots, reduced road and driveway dimensions, the use of parking garages on larger sites, the use of pervious paving materials where practical and other measures to reduce overall imperviousness. Certainly, any changes made to existing regulations should not compromise public safety.

NR-5 Develop a review checklist for subdivisions and site plans that incorporates recharge protection and water demand management protections. The checklist would address best management practices (BMPs) for stormwater control and treatment.

NR-6 Ensure adequate treatment of stormwater before it reaches surface and groundwater.

23 See the Conservation Commission webpage (http://www.merrimacknh.gov/town/boards_and_committees/conservation_commission) to find the Biodiversity Conservation Plan.

NR-7 Establish an inspection system to ensure continued operation of required private stormwater management systems.

Open Space, Landscaping & Design

NR-8 Consider adopting an Open Space Residential Development Ordinance for low-density subdivisions using septic systems, in which a certain percentage of the tract being subdivided must be set-aside as permanently protected open space without increasing overall densities. Currently, the Town permits residential "cluster" developments that allow open space to be set aside by permitting smaller individual lot sizes and reduced frontages. Such developments, however, are not permitted for developments on septic systems. If developed carefully, low-density open space developments can result in significant open space conservation, helping to reduce fragmentation of forests and wildlife habitat while also reducing impervious surface areas by requiring less road and driveway development. Conservation or open space developments also result in less land clearing and, due to increased flexibility in design, can minimize impacts to wetlands and other natural features. The Biodiversity Conservation Plan further recommends that this type of development be encouraged within the CFAs.

NR-9 Consider amending the site plan and subdivision regulations to minimize disruption of natural vegetation. Clear cutting or the near clear cutting of vegetation should be restricted, especially within the wellhead protection areas. Excessive removal of natural vegetation, especially large trees, can reduce groundwater recharge through increased evaporation, increase erosion and sedimentation impacts to surface waters during construction and increase stormwater runoff. Further, the removal of natural vegetation frequently results in its replacement with extensive lawn areas and nonnative plant species. Large lawns and extensive landscaping with nonnative plant species often require increased watering in the summer months which increases pressure on water supply during peak demand periods. Such landscaping also often requires the increased use of fertilizers that can adversely impact surface and groundwater. The retention of existing natural vegetation also helps to protect wildlife habitat and preserve the rural character and natural beauty of much of Merrimack.

NR-10 Consider amending the subdivision and site plan regulations to limit or prohibit the removal and export of topsoil. Failure to adequately replace topsoil in areas intended for landscaping increases the difficulty of establishing new lawns and planting areas, thereby requiring more water and fertilizer to be used, especially during summer months. Increased outdoor watering places increased stress on the public water supply and increased fertilizer use can degrade surface and groundwater resources

NR-11 Consider amending the subdivision and site plan regulations to encourage increased use of native and drought resistant plant species. Native plant species and other drought resistant plant species are more capable of surviving during summer months with little or no additional watering. Such species also typically require little or no additional fertilizer. Native plant species are particularly adapted to the area's climate and also tend to be more beneficial to wildlife than foreign plant species. Lists are available from state resources and other communities such as Londonderry.

NR-12 Consider amending the subdivision and site plan regulations to limit the use of deicing compounds and to require that any pesticides or insecticides to be applied in new commercial, industrial or multi-family residential projects are applied by a licensed professional so as to protect the Town's water supply from contamination.

NR-13 Perform an analysis of existing landscaping buffer regulations and consider additional landscaping requirements for commercial properties.

5.8.3 Non-regulatory Initiatives

Open Space and Forest Conservation

NR-14 Consider implementing an educational and assistance program, most likely through the Conservation Commission, to encourage larger landowners to maintain privately held forest land and open space through the development of forest management plans and estate planning, especially for parcels in current use. Sound forest management plans can enable landowners to derive some economic return from undeveloped woodland while often improving the health of forests themselves. Tax advantages can also be realized through the imposition of voluntary easements and other development restrictions on property to provide for permanent conservation. Through such measures, the pressure to sell land for development purposes could be reduced. Educational materials and assistance are available from a variety of sources including the Society for the Protection of New Hampshire Forests and the University of New Hampshire.

Invasive Species

NR-15 Prepare an invasive species management plan as recommended by the Biodiversity Conservation Plan. This type of effort can be volunteer-based led by a professional ecologist in order to identify, contain and replace invasive species.

NR-16 Post signage at boat docking areas on Naticook and Baboosic Lakes that educates boat owners of the danger of invasive species and measures to prevent their spread.

5.8.4 Conservation and Protection Initiatives

NR-17 Identify opportunities to improve infiltration and stormwater management in existing developed areas. Amending subdivision and site plan regulations as recommended above could minimize potential adverse impacts to surface and groundwater that could result from future development. However, surface and groundwater resources have already been impacted and will continue to be impacted by existing development. Improvements to existing public and private stormwater systems can reduce existing threats to water resources. Grants available for this purpose should be pursued whenever practical.

NR-18 Evaluate limitations on further sewering in the Naticook basin. The extension of public sewer further into the Naticook Basin could impact this important water resource area primarily through the potential for the net export of water out of the basin. Existing high-density residential development on septic systems adjacent to

Naticook Lake, however, may pose a threat to both surface and groundwater. These areas may benefit from the extension public sewer. The potential threats and benefits of further sewer extensions into the Naticook Basin should be evaluated before any improvements are implemented. This can be evaluated in conjunction with the ongoing sewer master planning process.

NR-19 The Town and the Merrimack Village District (MVD) should work with the State to address existing and future large quantity groundwater withdrawals in wellhead areas, especially within the Naticook basin, by commercial and industrial users. Large quantity private withdrawals of groundwater can significantly impact the public water supply, however, such withdrawals are not currently regulated or controlled at the local level.

NR-20 The MVD should investigate the effectiveness and feasibility of raising Greens Pond for enhancing storage in the Naticook Basin aquifer.

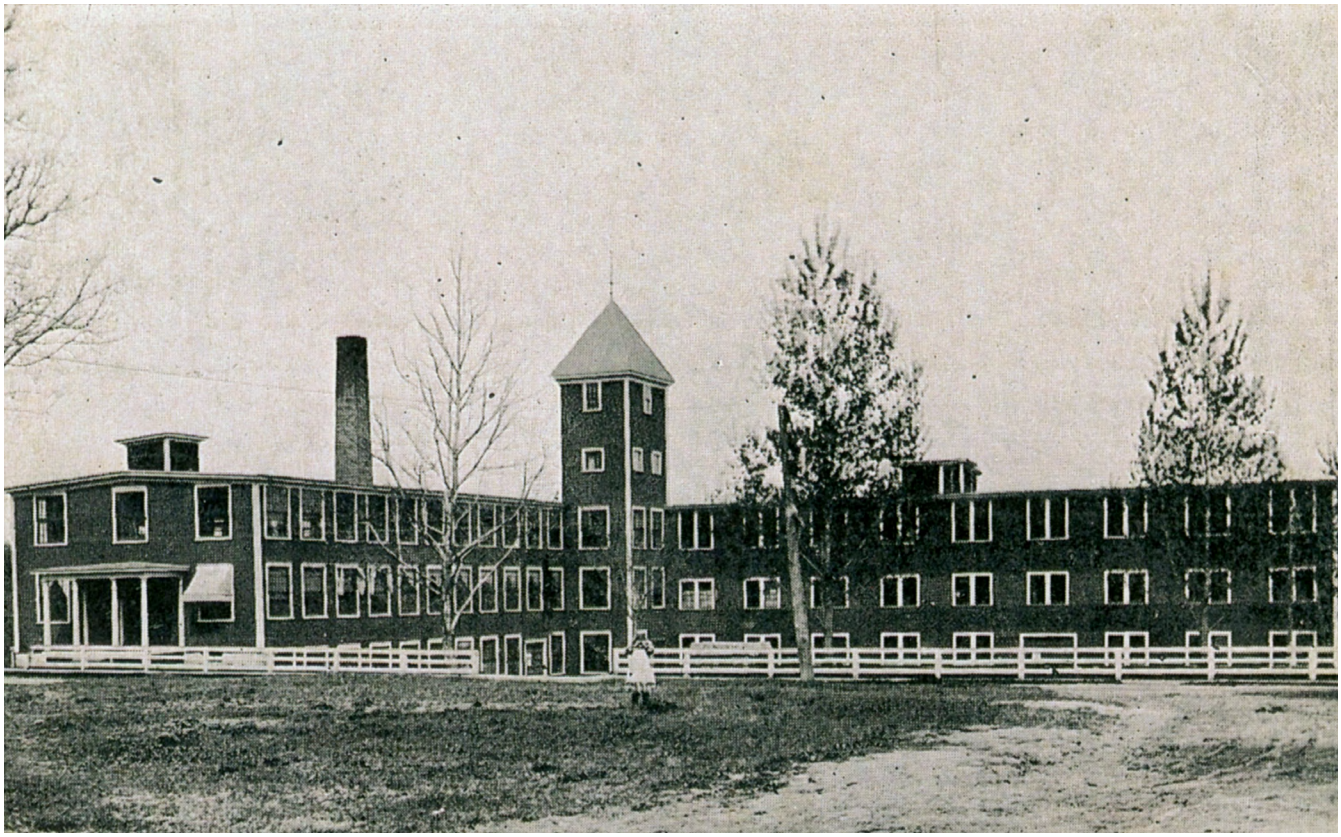
NR-21 The Town and the MVD should continue to work with residents and businesses, especially in wellhead and shoreline areas, to encourage individual water resource protection measures such as water conservation, proper septic system maintenance and proper waste disposal practices.

NR-22 Develop a set of criteria for the use of deicing materials throughout the Town.

NR-23 The Town and the MVD should implement the recommendations from the 2012 Sodium and Chloride Loading Study.

NR-24 The Town and MVD should collaborate when acquiring conservation land such that it could be used for future groundwater supply.

NR-25 The Merrimack Conservation Commission should consider performing a functional evaluation of the Town's wetlands, which may lead to designation of prime wetlands.



6. Historic Resources

6.1 Introduction

The quality of future planning can be enhanced in many ways by an appreciation of a community's past. This chapter was prepared in recognition of the fact that historic resources play a critical role in a town's character and quality of life. In terms of planning, historic structures and sites are but one part of our total environmental resources and like many others are nonrenewable, capable of being preserved or vanishing with a single action. Although Merrimack's historic resources are overshadowed by the tremendous amount of construction which has occurred in the past quarter century, the buildings and sites which survive are essential in defining the Town's unique identity. According to Census data, only 6 percent of the housing units in Town were built before 1940, as compared to 22.3 percent in the region and 22.3 percent statewide.[1]

1 2006-2010 American Community Survey 5-Year Estimates

These statistics only confirm how critical it is to identify, promote and integrate significant historic resources in Town before these important links to the past are lost forever.

This chapter briefly provides an overview of Merrimack's history and discusses those areas of the community which are of particular historic or architectural interest. A wide range of preservation techniques may be used to help ensure that future growth is compatible with local design and land use traditions. These can range from such non-regulatory options as public education (school projects on local history, establishment of markers commemorating sites of historic interest) to intermediate measures (such as suggesting compatible design themes to a developer who might otherwise be unaware of the need to integrate new structures with their surroundings or nominating structures to the National Register of Historic Places). Finally, a community may opt to use regulatory techniques such as establishing local historic districts. It is the responsibility of the community to plan a program of historical and cultural protection, based on local needs and desires.

This chapter includes a discussion of:

- the history of Merrimack including archaeological resources and architectural resources;
- tools for historic preservation; and
- recommendations

Much of this chapter has previously appeared in the 2002 Merrimack Master Plan.

6.2 Historical Overview

6.2.1 General Overview

Archaeological investigation indicates that the Merrimack River Valley supported a resident prehistoric population for thousands of years prior to the arrival of the first European settlers to the Valley in the 1600s. Recent digs in Merrimack have yielded what is thought to be evidence of a 7,000 year old Indian camp.

Over three hundred years ago a band of Penacook Indians under Chief Passaconaway settled on the banks of a wide river they named "Merrimack". There are a variety of interpretations as to the exact meaning of the name. Some believe the name of the river is related to the Indian word for sturgeon. Northern Indians may have used the name to describe a place of strong current from "merroh" (strong) and "awke" (a place). Others believe that Massachusetts Indians developed the name from the word "mena" (island) and "awke" (a place), translating to the "island place" to describe the number of beautiful islands in the River. One of these islands, the big island between Merrimack and Litchfield, is said to have served as the summer camp of Chief Passaconaway.

In 1652, a survey of the Merrimack River was conducted from Massachusetts to the outlet of Lake Winnipesaukee by Captain Simon Willard, at the request of the Massachusetts General Court. Early settlements were promoted by abundant meadow land, fertile uplands and trapping potential second to none in the state. A series of land grants were made by King Charles

l from 1656 to 1662, following the Indians' retreat from the area, with the primary white settlers coming from Massachusetts during the mid-1600s to the early 1700s.

The Town of Merrimack was one of sixteen present day communities in New Hampshire and Massachusetts included in the original grant of Dunstable, chartered in 1673. What is now southern Merrimack was included in a grant made to William Brenton in 1658 and became known as "Brenton's Farm". In 1746 Merrimack gathered together the lands south of the Souhegan River in the possession of Dunstable and Litchfield and petitioned the Provincial Government to incorporate. The northern part of the Town was granted to Joseph Blanchard of Nashua and others from the Hill and Reed family in 1729. In 1750 Merrimack was granted another charter and the northern section of the Town was added to its acreage, along with a strip of land on the western boundary.

The Town historically consisted of four villages: Reeds Ferry in the north, Souhegan Village near the mouth of the river of that name, Thornton's Ferry and South Merrimack. Reeds Ferry and Thornton's Ferry were named for the ferries that operated between Merrimack and Litchfield, beginning in 1728 and 1736, respectively. Souhegan Village was the center village and was later known as Merrimack. South Merrimack Village was sometimes called "Hard Scrabble" because of the difficulty of tilling the soil in this area. Each village was self-sufficient, with its own railroad station, post office, general store and schools.

McKeown's - Depot Street (1920)

Although the Town was first settled in 1722, as early as 1655 John Cromwell had established a trading post in Merrimack about two miles south of Thornton's Ferry on the river. One of the first permanent settlers is believed to have been Jonas Barrett, who built a house 1½ miles west of Thornton's Ferry in 1722. A meetinghouse was built in the center of Town, near Turkey Hill in 1756. As the growing population of the Town gradually settled near the river, another meetinghouse was built. The original structure burned in 1896. The current Town Hall was dedicated in 1873 and has served as the Town administrative offices for over one hundred years.

What is today Route 3 was known as the River Road, the Great Road or the road from Concord to Boston in the 1700s. It was originally a tree-shaded dirt road three rods wide, gradually becoming the main road through Town. Another of the oldest roads in Merrimack is Amherst Road also known as County Road, connecting Amherst, which was the county seat, with Exeter and the coastal towns.

Throughout the 18th and first part of the 19th century, Merrimack's industry consisted mostly of saw and grist mills which were established on every river, brook and pond. The laying of Concord and Montreal railroad track along the western bank of the Merrimack River in the 1840s shifted the industrial focus of the community to the rail corridor, with residential development in close proximity following in the late 19th century. In addition to the station at Railroad Avenue (still extant), two others at Reeds Ferry and Thornton's Ferry, a B & M railroad stop in South Merrimack spurred a second wave of settlement in this area after the arrival of the railroad in 1851. By linking Merrimack to the nearby city of Nashua, the railroad helped local farmers to bring dairy, orchard and poultry products to the city, and later transported workers who were employed in the large mills in Nashua. At the end of the 19th Century and early 20th Century, Merrimack itself also had a number of small industries including the Fessenden and Lowell barrel and bucket factory at Reeds Ferry, the Haseltine & Gordon Excelsior Factory, a shoe factory and a table manufacturer all at Souhegan Village.

Merrimack's population remained relatively stable for much of the late 19th and early 20th Centuries. For over a century, from 1810 to 1940, the Town's population hovered around 1,000 persons. After World War II, Merrimack, along with much of Southern New Hampshire, experienced suburbanization. By 1950 the Town's population had increased to 1,908 and between 1960 and 1970, Merrimack was one of the fastest growing communities in the state. In 1955, the 21 mile stretch of the F.E. Everett Turnpike between the Massachusetts line and Manchester's Queen City Bridge was opened. The section between Manchester and Concord was completed the following year. Highway access made Merrimack attractive to a number of industries beginning with Anheuser-Busch in 1968-70, followed by others including Sanders, Kollsman and Digital in the mid-1970s. As was the case historically, commercial development concentrated along Route 3.

To keep pace with the population growth, Merrimack constructed a number of new schools between 1949 and 1968 including Mastricola Elementary, Merrimack Middle School, Merrimack High School, Reeds Ferry and Thornton's Ferry Schools. Continued population growth has resulted in the construction of numerous additional expansions to each school since that time. Merrimack's population stood at 15,406 in 1980, and continued to show substantial growth during the 1980s, reaching a level of 22,156 in 1990. According to the US Census Bureau, Merrimack's 2000 population was 25,119 and the 2010 population stands at 25,494.

6.2.2 Archaeological Resources

Archaeological resources are the physical remains of the past that can be studied by archaeologists and other scholars to answer questions about history and prehistory. Most often these resources are sites and groups of sites, buried in the ground and invisible on the surface, yet they are especially important historic resources because they are often our only sources of knowledge about prehistory.

Prehistoric archaeological sites can generally be categorized as semi-permanent villages, seasonal camps for fishing, hunting and/or gathering, quarries, workshops and burial grounds. In predicting locations where archaeological sites might be expected to occur, archaeologists take into account environmental conditions including proximity to water, soil conditions, slope and exposure.

The availability of potable water from springs, lakes or streams is obviously a primary requirement of any population. Water also provided a network for travel. Residential sites were generally selected on the basis of soil conditions. Sandy or light, gravely soils were most often selected in upland regions, and silty, alluvial soils were sought in river valleys. The more permeable soils were preferred because of their rapid drying qualities, and also because pits and burials excavated with digging sticks, hoes or hands, were more easily worked in these soils. Level sites were preferred. In addition, residential sites are almost always found oriented toward the south or southwest to maximize periods of warmth and sunlight and facilitate rapid drying of soil.

Over the years, the Merrimack River corridor has been an active archaeological research area and almost two hundred archaeological sites have been recorded along the entire length of the Merrimack River in New Hampshire. While Merrimack's archaeological sites have received limited investigation, across the river, Litchfield is home to some of the most significant sites in the state. Research by archaeologist Dr. Clyde Berry during the 1930s and 40s indicated the existence of prehistoric campsites at Moores Falls on both banks of the River, in Litchfield and Merrimack. Many of the artifacts catalogued by Dr. Berry were donated to the Manchester Historic Association. It was Berry's feeling that the west bank was even richer in terms of artifact density, but his testing on the east bank was apparently not as extensive. While little new information has surfaced in recent years relative to Merrimack's prehistoric archaeological potential, the significance of historic archaeological resources has emerged, such as the lock at Cromwells Falls. Constructed in 1814 of rough granite blocks, the lock is regarded as the best preserved of the eight remaining locks which survive on the former Merrimack River navigation system. Other areas which may hold potential for historic archaeological resources include cellar holes, and the sites of schoolhouses, taverns, mills, the Town's first meetinghouse and early ferry crossings.

The preservation of areas of high potential for prehistoric and historic archaeological sites poses unique problems. In comparison to historic structures, archaeological resources are more difficult to identify and protect. Each site is unique and fragile. Once a site is disturbed, information is lost. While there is often an urgent need to keep the location of an important archaeological resource confidential, the same confidentiality will often preclude public awareness. Acquisition of the land or land development rights is often the only way to effectively preserve archaeological resources. Often, widespread awareness increases the likelihood that valuable sites will be disturbed.

Rapid growth is the greatest threat to archaeological resources. The few applicable laws that protect archaeological resources are primarily federal. As a result of these laws, large highway projects or projects which require review by a federal agency usually have a review of impacts to cultural resources. In addition, there is the possibility of review within the dredge and fill process. However, since much of the region's growth is from private rather than public sources, archaeological evaluation is not required. In some cases in the state, cooperative developers have permitted recording of archaeological data which would otherwise be

destroyed. The State Division of Historical Resources has very limited ability to review private projects for impact on archaeological resources. However, local officials should consult the Division if a proposal will impact a known archaeological resource or if a project is in a location with high archaeological potential.

6.2.3 Architectural Resources

Throughout Town a panorama of architectural styles is evident, ranging from the first period Cape Cod and gambrel roofed dwellings of the late 18th century to the bungalow and Cape Cod revivals of the early 1900s. The following section provides an overview of the styles which figured prominently in the Town's architectural development and offers local examples of each.

Early Period (Pre-1720)

The earliest structures erected by the settlers were undoubtedly log or plank houses, the evidence of which has all but disappeared or possibly been obscured under later building additions. Once the family was sheltered, erection of a barn was often the next priority for early residents, and on many homesteads today, the post and beam barn is the earliest surviving structure on the property.

The first period dwelling generally emphasized symmetry, horizontal lines and limited classical detail. With few exceptions, these early houses faced north and south to maximize solar exposure, with the rooms grouped around a central fireplace/chimney block. Decoration on the humble Cape Cod house is typically limited to simple casings or a band of rectangular transom lights over the doorway. The two-slope gable roof predominates, with the gambrel roof also evident.

Early period houses are scattered throughout Merrimack on many of the older roads. Good examples include the McClure-Hilton House at 16 Tinker Road, the Kent House at 45 Peaslee Road and the gambrel-roofed house at 26 Bates Road. The Old Conant/Holt Mill House has an estimated construction date of 1690.

Georgian Style (1700-1780)

The first real architectural style to appear in provincial America, the Georgian style is embellished by ornament inspired by Italian Renaissance and English sources. The style is characterized by classical moldings, both inside and out, symmetrical facades, window caps and more elaborate doorways. Most often the Georgian house measures 2 ½ stories with five individual windows across the front and two windows deep on the side elevations. The roof can be either a gable or a hip (four slopes meeting at the ridge). The sliding sash windows may have anywhere from six to twelve panes of glass in each sash.

Merrimack's Georgian residences include the O'Keefe House on Amherst (County) Road between the Souhegan River and the Town line and the former Spaulding House at 17 Peaslee Road. Another excellent Georgian doorway with flattened columns or pilasters supporting a cornice is seen on the house at 190 Baboosic Lake Road.

Federal Style (1780-1830)

The Federal style is in many ways a refinement of the preceding Georgian style, with somewhat lighter, more delicate ornament which often incorporates elliptical and semicircular fanlight shapes. Like the Georgian, the Federal style building almost always displays a five bay, symmetrical facade. The most common Federal house type is the two story dwelling with hip or gable roof. On brick Federal houses the decorative pieces over the windows (known as lintels) are often cut on a diagonal. The hallmark of the style is the fanlight or fan over the doorway with partial sidelights flanking the door. Inside the style may be expressed in a spiral or elliptical stairway.

The semicircular fanlight characteristic of the Federal style can be seen on various Merrimack structures including The Common Man Restaurant (304 Daniel Webster Highway at Greeley Street and the Buckley's Steak House (438 Daniel Webster Highway). Federal style detailing is also evident on the First Congregational Church on Baboosic Lake Road.

Greek Revival Style (1830-1860)

Loosely based on the look of a Greek temple front, the Greek Revival style is typified by a pedimented facade supported by colossal columns. While New Hampshire Greek Revival houses often display columned porches, the style was also expressed in other ways including flat headed windows and doors, heavy entablature moldings under the eaves and recessed doorways with corner block moldings and full sidelights. Indeed, the most important legacy of the Greek Revival style is the shift from earlier broad sided structures with central entrances to the front gabled house with an off-center, sidehall entrance. Contrary to popular belief, it was during this period that buildings were often first painted white to simulate the marble of classical antiquity.

The finest example of the Greek Revival style in Merrimack is undoubtedly the former Bowers-Blanchard House at 6 Manchester Street (now the Thomas More Institute). It was originally designed as a cape, but was renovated to its current design at a later date. Other examples of the vernacular Greek Revival style include the houses at 255 Daniel Webster Highway (corner of Star Drive) while the house at 74 Wire Road is a good example of an earlier Cape Cod structure, updated by a Greek Revival, cornerblock doorway. The South Merrimack Congregational Church, now the Merrimack Valley Baptist Church, exhibits how the style was applied for church use. Many Greek Revival houses display Federal decorative elements and therefore may be considered as transitional. The house at 465 Daniel Webster Highway, south of the Town Hall, with its columned front porch and pedimented brick ends is an excellent example of this trend.

French Second Empire (1860-1875)

In rural areas such as New Hampshire, the distinguishing feature of the Second Empire Style is the mansard roof (with sloping walls), which is often decorated by dormer windows. Additional details may also include projecting overhangs with large brackets and bay windows. There are only a few buildings in Town displaying mansard roofs, but the best local example of this style is Thornton Place at 604 Daniel Webster Highway in Reeds Ferry.

Italianate (1860-1880)

In larger metropolitan areas, the Italianate house usually displays a rectangular form with wide eaves, tall first floor windows and bay windows, all topped by a low pitch roof with cupola. In Merrimack, the last half of the nineteenth century marked a period of increased building activity especially in the village of Reeds Ferry and builders sought to apply elements of the latest styles to the simple gablefront house form. Decoration common to this period includes square or turned porch posts, bracketed cornices, and single story bay windows. This style is generally not well represented in Merrimack.

Queen Anne Style (1880-1900)

The term Queen Anne can be broadly applied to many late nineteenth century buildings. A most varied and decoratively rich style, the Queen Anne is characterized by asymmetry and a variety of forms, textures, materials and colors. Towers, turrets, tall chimneys, porches, bays and projecting pavilions are common. Stained glass, terra cotta trim and a variety of window types are also often used.

Although Merrimack's Queen Anne buildings are somewhat restrained in their decoration, there are a number of good examples in the Reeds Ferry area including 585 Daniel Webster Highway and the house across the street at 588 Daniel Webster.

Colonial Revival (1880-1930)

In contrast to the exuberance of the Queen Anne style, the Colonial Revival style marked a revival of earlier styles such as the Georgian and Federal of the late 18th and early 19th centuries. In contrast to colonial buildings however, the Colonial Revival often displays an asymmetrical profile with stylistic details often exaggerated, out of proportion and combined in a decidedly contemporary fashion. Colonial Revival buildings of the 1890s did not attempt to be accurate copies but were free interpretations of earlier styles with details inspired by Colonial prototypes. Beginning about 1910, Colonial Revival Buildings were more carefully researched and often exhibited more historically accurate proportions and details. Later Colonial Revival style houses include Cape Cod dwellings.

Classical Revival (1890-1915)

A late 19th century renewed interest in historical architecture also manifested itself in the Classical Revival style which focused on Greek and Roman architectural orders. This style is typified by symmetrical buildings with pedimented entrances, and heavy classical moldings and ornament. Across the country, the Classical Revival style was used to evoke a reverence for knowledge and learning and was commonly used for the designs of libraries, including Lowell Memorial Library in Merrimack.

6.3 Significant Local Historic Resources

Many of Merrimack's historic resources are found in the four villages of Reeds Ferry, Thornton's Ferry, Souhegan (the present Town Center) and South Merrimack. Yet, although these areas comprise the most notable concentrations of historic resources in Town, it should be noted that there is hardly an old road in Town where an historic homestead or mill site cannot be found. Merrimack's old roads still in use include Baboosic Lake, Bean, Boston Post, County, Meetinghouse, Naticook, Patten, Parkhurst, Peaslee, Seaverns Bridge, Tinker and Wire Roads. Additional historic roads, now discontinued, include the Old Kings Highway, Old Blood Road and Grater Road. In 1990, according to the U.S. Census there were 337 dwelling units in Town constructed prior to 1939.. The following is a brief summary of the historic village areas in Merrimack:

- Merrimack Center – Located where the Souhegan River meets the Merrimack, along the Great Road from Concord to Boston, and later near the railroad tracks, what is now Merrimack village was well sited for a center of local activity. Known as Souhegan Village in the nineteenth century, the village hosted industries including a carpet factory as well as a store and schoolhouse. What is known as Kiestlinger's store (471 Daniel Webster Highway opposite Baboosic Lake Road) was built as a store and has served that purpose continuously for close to 200 years. The First Congregational Church was erected in 1837. The later erection of various municipal buildings over the years attests to the growing importance of the village and include the Town Hall and Town tomb after 1870 and Lowell Memorial Library in 1924. A number of significant historic houses dating to the late 18th and early 19th centuries are found primarily on the east side of Route 3 and along Loop Road. Additional late 19th century houses (c. 1870-1890) are found along Railroad Avenue, probably in response to the construction of the railroad station during this period.

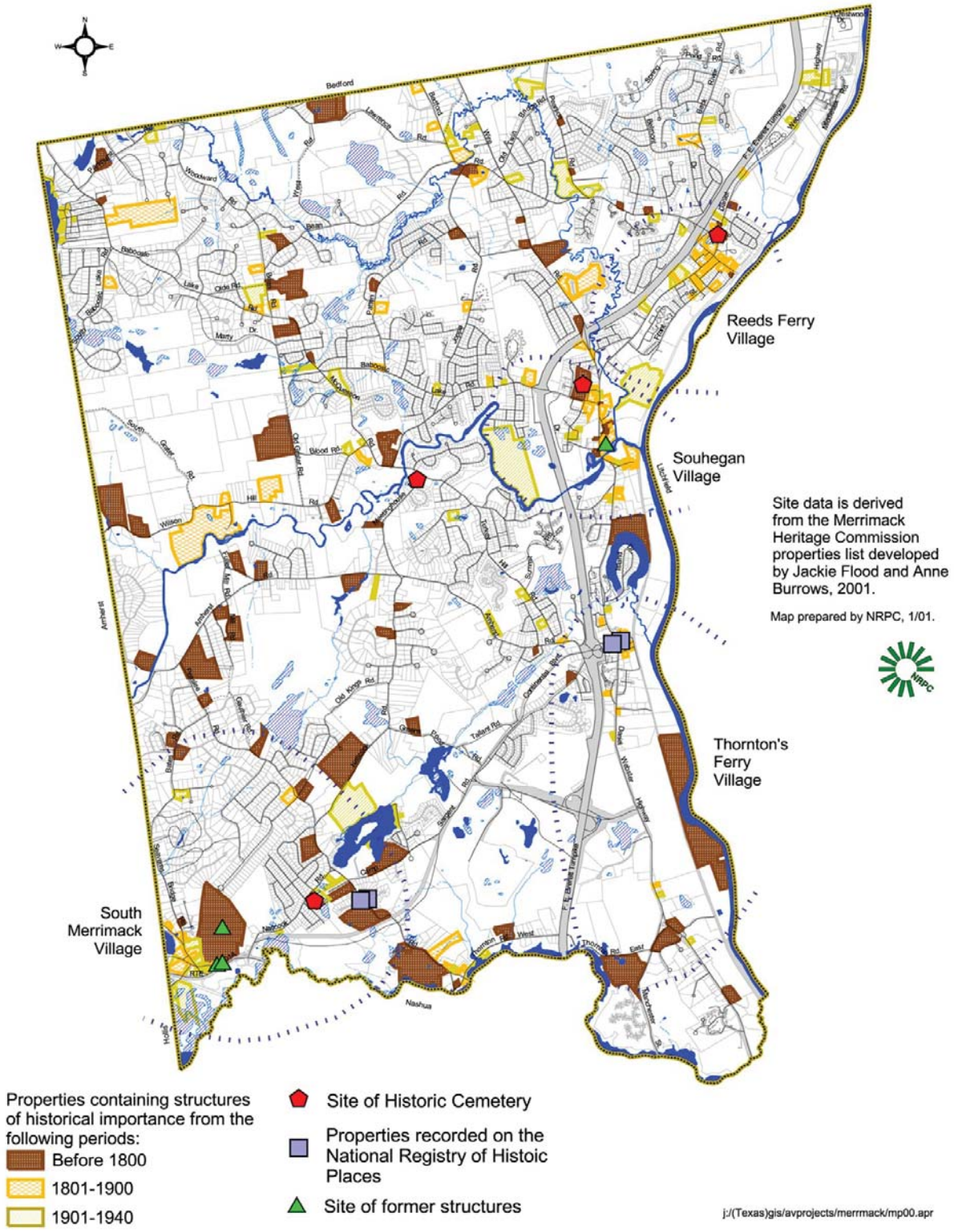
- Reeds Ferry – A ferry landing connecting this section of Merrimack with the western shore of Litchfield was in place as early as 1728. Located on Depot Street, the Merrimack Normal Institute was the first professional training school for teachers in New Hampshire. Shares were sold to raise the $6,000 for the building that opened in 1849 with William Russell from Scotland its first headmaster. It struggled until 1865 when it became the Granite Street Military and Collegiate Institute under the direction of Rev. Howell. This enterprise failed but in 1875 the building became Merrimack's first high school, the McGaw Institute. Robert McGaw, one of the original shareholders in the original Institute, died in 1872 and bequeathed $10,000 for that purpose. Although there are a number of fine early nineteenth century structures including brick houses at 4 Depot Street and on Daniel Webster Highway, many of the structures in Reeds Ferry resulted from a second period of building activity at the end of the 19th century associated with the coming of the railroad and industries such as Fessenden & Lowell's who built or owned the mill, the buildings formerly known as Levi Lowell's, the large boarding house at 7 Depot Street and housing on Elm, Maple and Front Streets. Other buildings dating to this period include the Wheeler Chapel and the simple residences on Pleasant Street. Development elsewhere in Town has left Reed's Ferry Merrimack's most intact historic area.

- Thornton's Ferry – One of Merrimack's most famous early citizens was Matthew Thornton, who moved to Town from Londonderry in 1784 after he signed the Declaration of Independence. Trained as a doctor, Thornton settled on the farm formerly owned by Edward Lutwyche and operated the ferry, which was originally known as

Cumming's Ferry. From this time on the ferry was called Thornton's Ferry, and this section of Town is still referred to as Thornton's Ferry. The tavern built for Thornton's son, the cemetery where he and his family are buried and a monument erected in his honor in 1892 are still standing on Route 3 although the house has been converted to a restaurant and the general integrity of the area is not what it once was, due to new construction, the widening of Route 3 and the interchange with the F.E. Everett Turnpike. Some of Dunstable's earliest homes exist north of the Pennichuck Pond system in the Thornton's Ferry area of Merrimack.

- South Merrimack – One of the earliest villages established in Merrimack, South Merrimack witnessed a second wave of settlement following the arrival of the railroad in 1851. As a result, the historic structures in this area fall into two general periods, the early nineteenth century evidenced in a number of buildings in the Federal and Greek Revival style followed by additional building activity in the late nineteenth and early twentieth centuries. The centerpiece of the village is the South Merrimack Baptist Church, Greek Revival in style and constructed in 1829. Across the road is the former Centerville School (Community House or 1847 Schoolhouse), a one room district schoolhouse constructed in 1847 and used as a schoolhouse until 1948. This is currently the home of the Merrimack Historical Society. The railroad depot which served the commuter line to Nashua was demolished for the Route 101A Bypass in the 1950s.

Figure 6-1: Historic Villages and Sites in Merrimack



Gordon Home - Daniel Webster Highway, built in 1896

6.4 Tools for Historic Preservation

While a variety of preservation tools are available at the local, state and federal level, obviously no sector of government has the statutory power or financial means to preserve all of the historic resources worthy of preservation. As a result, much of the most basic and yet most important responsibility for historic preservation is in the hands of the private owner, who has the power to greatly enhance or denigrate a property, through repairs and maintenance. Unfortunately, improvement work undertaken with good intentions can result in techniques or materials inconsistent or insensitive to an older building. Inappropriate improvements may compromise the integrity of a structure and may actually damage the building they were intended to preserve. For example, while the application of artificial sidings to an older home may seem to be an improvement, they may conceal and even accelerate the decay of materials under the siding. Specialized information covering topics

sensitive to the needs of older buildings is available from the New Hampshire Division of Historic Resources and the Nashua Regional Planning Commission.

Building on the actions of individual owners, historical societies, historic district commissions and other citizen groups can greatly enhance the public's awareness of the importance of preserving historic resources through exhibits, slide shows, walking tours, pamphlets and publications. In 1988 the Merrimack Historical Society acquired the 1847 Schoolhouse on Boston Post Road and has renovated the building for use as a working center, meeting place and research library.

Although this chapter is primarily dedicated to historic structures and sites, some mention should also be made of the need to preserve other materials which give us a better understanding of our history and which, in some cases, are the only surviving reminders of past people, events and sites. Early Town records, documents, manuscripts and artifacts deserve a suitable and safe repository. The collection of oral histories and the continued recording of townspeople, structures and events are excellent ways to bring history to life for future generations.

6.4.1 Historic Resources Survey

Preservation through documentation is the most basic, essential and noncontroversial of preservation strategies. There are several reasons for undertaking an historic resources survey. In addition to providing a permanent written and photographic record of a town's architecture, a good inventory is the foundation for other preservation tools. It can be of service to the historic district commission and can be used to prepare nominations for listing of historic structures in the National Register of Historic Places. Data gathered in a survey may encourage a greater appreciation of historic structures and sites by local citizens. Historic resource assessments are also necessary for accomplishing environmental reviews required in projects receiving Federal funding, such as transportation projects. As the beginning of a comprehensive historic preservation strategy, information gathered should act as a firm foundation for future decision making, by identifying buildings suitable for and worthy of preservation and/or rehabilitation. A complete historic resources survey can help a community weigh proposed actions more carefully, so that the community does not inadvertently sacrifice its long-term assets in realizing immediate objectives.

The Town history includes a section on early homesteads. Other important sources include old maps such as those included in the 1858 Atlas of Hillsborough County and the 1892 New Hampshire Atlas. Resources in the South Merrimack area were surveyed by a consultant to the New Hampshire Department of Transportation in 1989 as part of the Route 101A Bypass Study. The Merrimack Heritage Commission is continually working to update the historic resources survey for the Town.

6.4.2 National Register of Historic Places

The National Register of Historic Places is the official list of the Nation's resources worthy of preservation. Established by the National Historic Preservation Act of 1966 and administered by the National Park Service within the Department of the Interior, the Register lists properties of local, state and/or national significance in the areas of American history, architecture, archaeology, engineering and culture. Resources may be nominated individually, or in groups, as districts or as multiple resource areas and must generally be older than 50 years.

The primary benefit of National Register listing is the recognition it affords and the appreciation of local resources which is often stimulated through such recognition. The National Register also provides for review of effects which any federally funded, licensed or assisted project, most notably highway projects, might have on a property which is listed on the Register or eligible for listing. Register standing can also make a property eligible for certain federal tax benefits (investment tax credits) for the rehabilitation of income-producing buildings and the charitable deduction of donations or easements.

Contrary to many commonly held beliefs, National Register listing does not interfere with a property owner's right to alter, manage, dispose of or even demolish his property unless federal funds are involved. Nor does National Register listing require that an owner open his property to the public. For a single, privately-owned property with one owner, the property will not be listed if the owner objects. A National Register district must have the approval of a majority of property owners in the district. National Register listing can be an important catalyst to change public perception and increase historic awareness but cannot in itself prevent detrimental alterations or demolition. Yet, it remains an important first step toward historic awareness, respect and protection.

Statewide there are nearly five hundred National Register listings of which approximately fifty are districts. Twenty individual buildings or sites and four districts in the Nashua Regional Planning Commission region are listed on the Register. Within Merrimack, there are two National Register listings, the Signer's House (Hannah Jack Tavern and now The Common Man Restaurant) and Matthew Thornton Cemetery on Daniel Webster Highway and the McClure-Hilton House on Tinker Road. Because the Register lists properties of local, state and/or national significance, every community has resources which would qualify for listing, if for no other reason other than they are important to the citizens of that particular town.

6.4.3 Local Historic Districts

The term "historic district" can refer either to an historic district established by town meeting vote, or as has been previously discussed, to a National Register Historic District. Both are useful preservation tools but differ in the way in which they are established and the protection they afford. An historic area may be both a locally designated historic district and a National Register District. Several communities within the NRPC region, including Amherst, Hollis, Mont Vernon and Nashua, have enacted local historic district ordinances. In 1990, the Town of Merrimack created an Historic District Commission to accomplish an historic resources survey and evaluate whether districting might be appropriate. However, their efforts to create a district have not been accepted by the Town.

The most comprehensive preservation tool available to local governments under New Hampshire state law is the creation and administration of a local historic district (RSA 674:45). The purpose of an historic district is to protect and preserve areas of outstanding architectural and historic value from inappropriate alterations and additions which might detract from an otherwise distinctive character.

6.4.4 Certified Local Government (CLG) Program

The National Historic Preservation Act of 1966 provides for matching grants-in-aid to the states from the Historic Preservation Fund for historic preservation programs and projects. Federal law requires that at least ten percent of each state's Historic Preservation Fund grant be designated for transfer to eligible local governments which apply for the money. A local government can participate in the program once the State Preservation Office certifies that the community has established its own historic preservation commission, district and a program meeting certain federal and state standards. Matching grants are made each year to certified local governments for survey and planning projects, including preparation of National Register nominations and historic resource surveys. Currently, the CLG program represents the only source of state funds available for communities interested in preservation planning.

6.4.5 Historic Building Rehabilitation Federal Tax Credits

The rehabilitation of certain older buildings, frequently less expensive than new construction, can be a cost-effective solution benefiting the tax base while filling older structures with new life. The Economic Recovery Act of 1981, as amended, provides attractive incentives in the form of Federal investment tax credits for the substantial rehabilitation of income producing older buildings. In order to receive the credits, owners are required to furnish detailed rehabilitation plans for review and certification by the National Park Service. Municipally owned structures are not eligible for these credits.

Currently the tax incentives take two forms:

- **Credit Building Use Eligible Properties:** 10% Commercial/Industrial 40 years and older 20 percent Commercial/Industrial 50 years and older.
- **Income Residential:** To be eligible for the larger federal tax credit, a building must be a certified historic structure, either listed individually on the National Register, or contributing to a National Register or certified local district. Certified rehabilitation work must adhere to the Secretary of the Interior's Standards for Rehabilitation, a list of ten standards developed to ensure that significant features of a building will not be compromised. In order to qualify for any of the tax credits, rehabilitation expenditures must exceed $5,000 or the adjusted basis of the property (cost of the building excluding the value of the land less depreciation), whichever is greater. Although not as advantageous as they once were, the investment tax credits provide some incentive to rehabilitate older buildings, especially urban structures such as commercial or mill buildings, instead of undertaking new construction. Unfortunately because these credits do not cover residences which are not income producing which constitute many of the region's historic resources, their use is somewhat limited. Larger residential structures

with income producing potential could benefit from the use of the credits, which would also ensure the sympathetic rehabilitation of the buildings. In some cases, historic barns may also be able to qualify for these credits.

[RIGHT]
Parker Homestead, built in 1760 - Parkhurst Road

[LEFT]
Phineas Gage Homestead, built in 1783 - Bean road

[BELOW]
Mansion House

6.4.6 Historic Markers

Markers are an easy, inexpensive way to tell both residents and visitors about significant people, places and events in a community's past. The State Marker Program was originated by the New Hampshire Legislature in 1955. The aim of the program is the erection of appropriate markers designating events, people and places of historical significance to the State of New Hampshire. Communities who would like to be considered for a marker submit a request for consideration by the State Department of Transportation and Division of Historical Resources. There is generally no cost involved for a marker on a state-maintained road. There is a charge of $1,100 for a marker on a private road. Statewide there are approximately 235 historical markers. There are two markers located in the Town of Merrimack. A marker commemorating the township of Old Dunstable is located in Watson Park, while a Matthew Thornton marker is sited adjacent to the northbound lane of the Daniel Webster Highway, at Thornton's Ferry.

The sole purpose of the marker program is recognition. The program is non-restrictive; it does not protect historic sites nor does it obligate owners in any way. The criteria which apply to marker selection are also much less stringent than those for getting a property listed on the National Register. A marker may be used to point out historic sites which have changed considerably over time or even to commemorate events for which there is no standing evidence - anything which has historical significance to a community. For the simple recognition of a historic property, the historical marker program may be a better tool than the National Register, more readily visible and much easier to use. Another type of marker which has found widespread use involves the placement of wooden date markers on a variety of historic structures including houses, taverns, schools, and other public and commercial buildings, a tool that the Commission has already used. Such programs are often sponsored by a local historical society or historic district commission which works with owners to research and authenticate dates of construction for buildings in a given area. A program such as this is another simple way in which a community can draw attention to its historical resources. The Heritage Commission is currently involved in this program.

6.4.7 Easements

Across the country, preservation easements have proven to be effective tools for protecting significant historic properties. An easement is a property right that can be bought or sold through a legal agreement between a property owner and an organization eligible to hold easements. Just as a conservation easement can be used to protect open space, scenic areas, waterways, wildlife sanctuaries, etc. from incompatible use and development, an architectural easement protects the exterior appearance of a building.

Easements provide property owners with two important benefits. First, the character of a property is protected in perpetuity. In addition, the donation of an easement may make the owner eligible for certain tax advantages. If the property is listed in the National Register, in return for giving an easement, an owner is eligible under the Tax Treatment and Extension Act of 1980 to make a deduction from his taxes.

Easements also may be beneficial to a community. The costs of acquiring easements may be significantly lower than buying properties outright to protect valuable resources, particularly when easements can be acquired by donation. Significant resources can remain in private hands but are protected from inappropriate alteration as the organization holding the easement is given the right to review any proposed changes to the structure or property. If properly administered, easements can be a superior method of conserving and protecting land, water and historic resources; perhaps better and longer than zoning or locally designated historic districts.

6.4.8 Scenic Road Designations

New Hampshire State law enables a community to designate any road as scenic unless it is a Class I or II highway. A scenic road designation protects trees and stone walls located on the public right-of-way. After designation of a scenic road, any repair, maintenance, reconstruction or paving work, tree removal or stone wall removal cannot take place without prior written consent of the planning board or official municipal body.

Designation of a road as "scenic" will not affect the Town's eligibility to receive State aid for road construction. It does however give communities a way to protect an important statewide resource and may also help to preserve the scenic quality around historic structures and stimulate respect for the existing landscape. A number of communities within the region are currently taking advantage of this potential preservation tool. Merrimack currently has no scenic roads.

6.4.9 Innovative Land Use Controls

The use of clustering allows for development to be located away from sensitive areas, agricultural lands, or historic areas. In the State of New Hampshire RSA 674:21 gives communities authority to adopt a variety of innovative land use controls which may support the preservation of community character and consequently historic resources. The concept of the transfer of development rights is another strategy that may be used to help a community retain its historic character.

6.4.10 Building Code Provisions

In seeking to protect the public's health and safety, standards such as building codes may present unique complications to the use or rehabilitation of an historic building. As a result, some communities have elected to amend local building codes to exempt historic structures from certain code requirements, other than life safety provisions. This allows historic buildings to continue to be used safely while not imposing a modern set of standards that are impossible for an older building to meet without a significant loss of integrity. It should be noted that Chapter 32 of the Basic Building Code of Building Officials and Code Administrators (BOCA), used by many of the region's communities including Merrimack, specifically addresses the need for sympathetic treatment of historic structures. Under this section, buildings identified as historic buildings are not subject to the code when they are "judged by the building official to be safe and in the public's interest of health, safety and welfare regarding any proposed construction, alteration, repair, enlargement, relocation and location within fire limits."

6.5 Recommendations

HR-1 Strengthen incentives for historic preservation in the zoning ordinance and site plan and subdivision regulations.

HR-2 Consider the adoption of a Scenic Road ordinance, per RSA 231:157, in order to help preserve the scenic and historic qualities of Merrimack's rural roads.

HR-3 Investigate protection measures for Merrimack's Class VI roads, which were often the location of historic development, and which today can serve as recreational trails for Merrimack's citizens. The stone walls, cellar holes, and large trees that are often located along these Class VI roads should be safeguarded from destruction or removal.

HR-4 Investigate preservation alternatives for historic stone walls and barns through the New Hampshire Division of Historical Resources.

HR-5 Complete a comprehensive Town-wide historic resources survey. Information should be updated periodically to indicate changes to buildings, including additions, fire, demolition or changes to surroundings.

HR-6 Continue to promote interest and pride in Merrimack's heritage in a variety of ways including periodic exhibits, the installation of date and name markers at historic sites, development of brochures describing local history, tours of historic structures and sites, oral history projects and by encouraging local history courses in the school curriculum.

HR-7 Continue to identify, catalogue, and preserve Town records, documents, manuscripts and artifacts and provide a suitable and safe repository for them. Continue to make collected historical information in a protected environment accessible to Town residents and future generations. Promote the continued recording of townspeople through oral histories and photographs.

HR-8 Encourage archaeological investigation and documentation of significant historic and prehistoric sites including cellar holes, mills and school sites and ferry landings and canals along the Merrimack River.

HR-9 Preserve and maintain the Town graveyards.

HR-10 Encourage the Town Manager, Town Council, and/or Town department heads to request information from the Merrimack Heritage Commission and Historical Society before modifications are proposed to Town-owned buildings and sites of potential historical value.

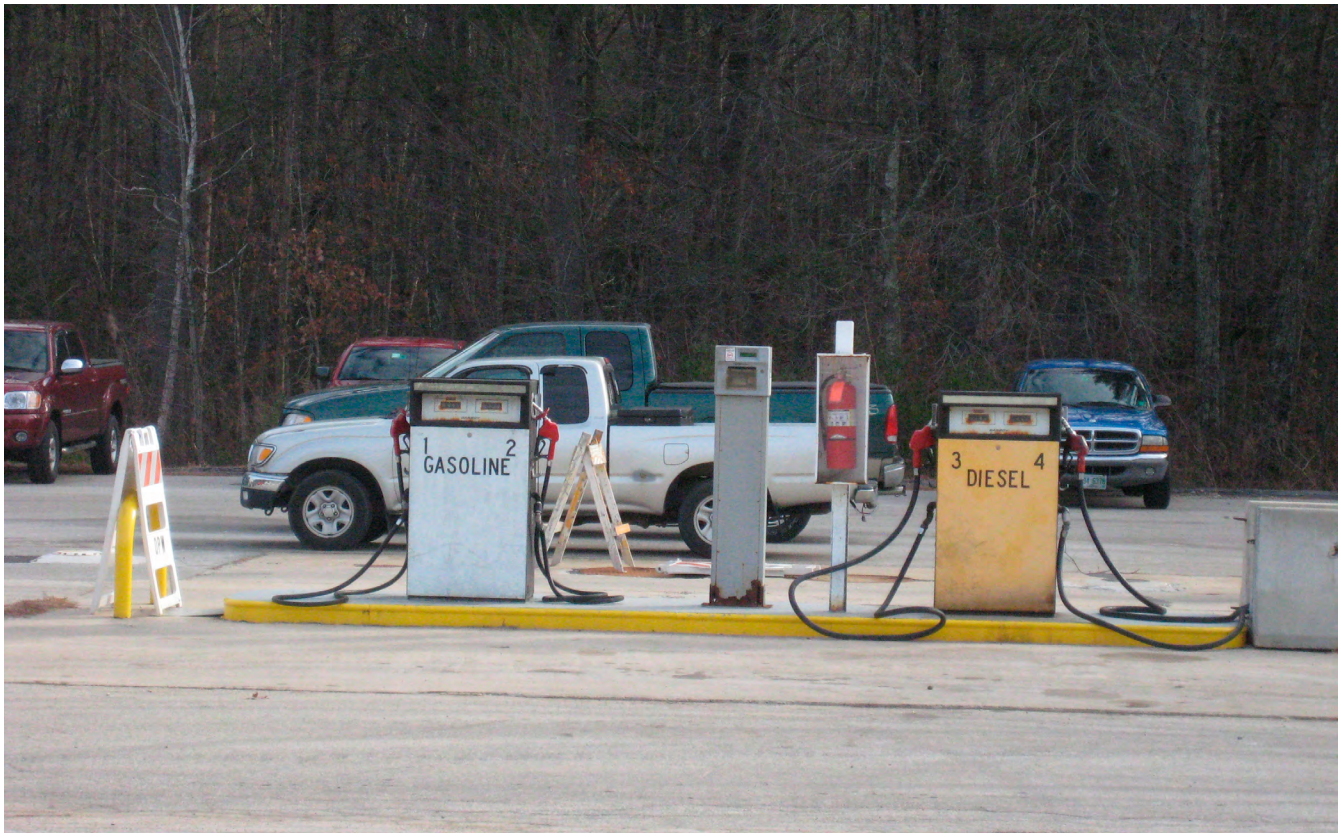
HR-11 Consider adopting architectural design standards for structures within the Town Center Overlay District (TCOD).

HR-12 Develop an "Adopt an Historic Site" program as a way of involving civic organizations and private companies in the maintenance and enhancement of local historic sites, including monuments, markers, cemeteries, etc.

HR-13 Promote the donation of easements by the owners of historic properties to a designated authority or established land trust.

HR-14 Consider the acquisition of important historical sites for conservation and preservation purposes in limited but critical cases. Funds to assist with land and building acquisition could come from the State grant programs such as the Land and Community Heritage Investment Program (LCHIP) as well as from local sources.

HR-15 Encourage National Register listing for appropriate local structures.



7. Energy and Utilities

7.1 Introduction

The status and availability of a town's utilities and public services is a necessary component to planning for the future growth of a community. In Merrimack, there are restrictions on the availability of utilities in certain areas of Town due to topography, slope, soil types and other factors. These constraints need to be identified and taken into consideration when planning any new developments. This chapter includes a description and future plans for: 1) electrical infrastructure; 2) natural gas; 3) telecommunications; and 4) water supply.

7.2 Utilities and Energy Goals

- Continue water conservation efforts and enhance public awareness of water conservation techniques through appropriate plant selection and watering.
- Continue to explore potential new water supplies to meet projected and future needs.
- Promote energy efficiency in municipal and public operations, starting with an Energy Committee that can advise and support energy efficiency efforts by Town departments.
- Encourage energy efficiency, conservation, and sustainability in Merrimack to reduce energy consumption and cost.
- Ensure that Merrimack stays competitive within the global economy by supporting telecommunications infrastructure and broadband.

7.3 State Context

The State of New Hampshire enabled communities to adopt energy chapters in their Master Plans in 2008. The State of New Hampshire established the Climate Change Policy Task Force, which in 2008, prepared the New Hampshire Climate Action Plan. The Plan identifies that some of the most significant reductions in greenhouse gases could be achieved through increased energy efficiency in all sectors of the economy and establishing land use policies that reduce the reliance on the automobile as the primary means of travel. The plan sets forth the recommendations that New Hampshire's greenhouse gas emissions be reduced by 20 percent below 1990 levels by 2025 and 80 percent below 1990 levels by 2050 consistent with the New England Governors – Eastern Canadian Premiers resolutions and the scientific community's recommendations. Building further upon these efforts, in 2009, the Legislature authorized the establishment of local energy committees at the municipal level. These committees are often comprised of local citizens and municipal staff members that are charged with assessing and improving community action on energy use and climate change. The Town of Merrimack does not yet have a designated energy committee, and it is recommended that Merrimack explore the possibility of creating an energy committee as a next step.

7.4 Electrical Infrastructure

Public Service of New Hampshire (PSNH) is the main electricity supplier for the Town of Merrimack. PSNH is a subsidiary of Northeast Utilities, an energy company based in Connecticut and Massachusetts which operates New England's largest energy delivery system. With three fossil fuel-fired generating plants, nine hydroelectric facilities, one biomass plant, and one solar array, PSNH has over 1,150 megawatts of NH-regulated generating capacity.

In Merrimack, PSNH provides service to approximately 11,335 customers, or "accounts," which include homes, commercial establishments, businesses, and outdoor lights. Distribution and transmission lines, which are placed along roadways or within "rights-of-way," carry power throughout Town to individual customers. The voltage from these lines is stepped down to a voltage that can be utilized by customers through the use of transformers and other electrical equipment.

PSNH offers customers the ability to purchase renewable energy as part of its EarthSmart Green Rate. Depending on a customer's level of membership, PSNH will buy Renewable Energy Certificates (RECs) equal to 25 percent, 50 percent, or 100 percent of a customer's monthly energy use. Those certificates provide revenue to renewable energy suppliers and are equivalent to purchasing power directly from them. In addition to the GreenRate, PSNH also provides net metering to customers with renewable energy installations that produce more electricity than what is used. Net metering allows meters to run backwards when the energy generated on site (for example, through rooftop solar panels) exceeds the energy being used on the site. Any energy generation that goes unused during a billing period converts to an energy credit toward later bills so customers receive financial benefits for the energy generation.

Electricity is delivered to Merrimack through six distribution substations, which are located in Amherst, Merrimack and Nashua. Two transmission switching substations are also located in Merrimack, to serve the Town and surrounding communities.

PSNH anticipates being fully capable of providing an adequate supply of electricity to Merrimack at full build-out. PSNH has undertaken three substation and line projects since 2005 to meet existing and future customer load. PSNH's Engineering Departments develop long-range plans, which are reviewed and analyzed annually, to ensure that PSNH has the necessary facilities and equipment in place to serve new and existing customers.

The role of PSNH's Transmission Department is to improve power quality and the reliability of electric service; this results in fewer power outages which are shorter in duration and affect fewer customers. The Transmission Department also works to enhance competition in the wholesale electricity markets, to create a more robust transmission system for homeland security, and to make New Hampshire more attractive to businesses and positioned for continued population growth and energy usage. PSNH's Distribution Department works in unison with their Transmission colleagues by building and servicing the facilities in the neighborhoods and along the streets and roads that serve customers directly.

7.4.1 Energy Usage for Merrimack

PSNH compiles aggregate figures for electricity use by all customers in Merrimack. The data are not broken down by class of customer (i.e. residential vs. commercial). Based on data from the last two years, the customer base has remained relatively steady while electricity use has decreased slightly (see **Table 7-1**).

Table 7-1: Electricity Use by Merrimack Customers

Town-wide Electric Use 2010–2011		
	2010	**2011**
Total KWh	327,899,343	317,979,276
# of Customers	11,143	11,161

Source: PSNH Northeast Utilities System

7.4.2 Energy Efficiency Programs

New Hampshire's Restructuring Act, RSA 374-F:3 X, prompted electric utilities in the State of New Hampshire to offer a variety of energy efficiency programs for both residential and commercial/industrial customers. These programs, funded by the System Benefits Charge, were initially rolled out to customers beginning in 2002. In Merrimack, the PSNH operates a number of energy efficiency programs to serve residential, commercial and industrial customers under the NHsaves program. PSNH energy efficiency programs include consultations with residents interested in new construction of Energy Star Homes, a non-income based home weatherization program that helps residents pay for energy efficiency improvements, and an income-based home energy assistance program that helps residents manage energy use and reduce electric bills. Home energy assistance helps reduce residents' electricity bills through home improvements such as insulation, air sealing, thermostat replacement, hot water conservation measures, and cost-effective appliance and lighting upgrades.

In addition to the energy efficiency programs offered through PSNH, the State of New Hampshire allows towns and cities to give property tax exemptions to property owners who install certain renewable energy systems, such as solar systems, wind turbines, and wood-fired heating systems. Merrimack has not yet offered this to its residents but it is recommended that Merrimack explore this option as a next step. To be implemented, this property tax exemption would have to be approved in a town-wide election.

7.4.3 Natural Gas

In July 2012, Liberty Utilities took over National Grid natural gas service in New Hampshire, including within the Town of Merrimack. Liberty Utilities now owns and controls the natural gas distribution lines in the Town of Merrimack.

Natural gas is currently provided to much of the Town, including many neighborhoods located along the Baboosic Lake Road, Camp Sargent Road, NH 101A, Peaslee Road/Naticook Road, Turkey Hill Road and Thorntons Ferry Road corridors. Natural gas is also provided along the Route 3 corridor south of Griffin Street.

7.5 Telecommunication Infrastructure

Telecommunications in Merrimack are provided by two primary entities. The major provider in the region is Comcast which provides cable, high speed internet, and phone service. Comcast cable plans are on average approximately $40 per month. Comcast phone rates are $25–$40 per month. High speed internet is available throughout the Town with rates at approximately $40 per month. Additionally, these services are available bundled from $100–$200.

Given the trend toward the use of cellular phone lines rather than landlines, the role of wireless communications has increased over the last few years. Although local data could not be obtained, there has been an overall shift that has resulted in a growing percentage of households that do not have a landline at all, meaning that cellular phones double as the "home"

phone number as well. This area is served by major wireless communication companies, such as Verizon, ATT, Sprint and T-mobile.

The expansion of access to broadband service is an important economic development issue as a means to provide opportunities for small businesses and home offices. The ability for employees to work out of their homes not only provides flexibility for workers to stay at home when needed, but it also can help to reduce commuter travel during peak times. Adequate broadband coverage that allows workers to work at home is one strategy to reduce the greenhouse gases associated by eliminated some of these work trips. Through its Department of Resources and Economic Development (DRED) and the Telecommunications Advisory Board (TAB), the State of New Hampshire prepared a Broadband Action Plan in 2008.[1] It contained a number of recommendations including streamlining the wireless facility siting process, remove barriers to right of way access, improve utility pole access, provide incentives for service to underserved areas, engaging local government in developing and supporting broadband initiatives, among numerous other recommendations. The Town should monitor these initiatives in order to determine how best to leverage improvements to broadband access across Merrimack as the technology continues to move toward faster and more cost-effective communication.

The New Hampshire Broadband Mapping and Planning Program (NHBMPP) is a comprehensive program that evaluates where broadband is currently available in New Hampshire and provides assistance on how to encourage increased levels of broadband adoption and usage throughout the state. As access to technology plays an ever increasing role in our daily and work lives, it is critical to plan for not only broadband coverage but also the speed with which computers are able to download and upload information. Part of the NHMPP is a broadband availability inventory and mapping effort, in addition to planning and technical assistance initiatives. The broadband mapping program shows that Merrimack is relatively well-covered by broadband technology.[2] However, Merrimack should monitor the site to ensure that Merrimack download speeds and coverage continue to keep pace with current broadband technology for both economic development and sustainability reasons.

Unfortunately, there is sometimes a divide between households that have access to broadband and those that do not, either due to cost or availability concerns. The Town should work with providers and developers to ensure that broadband access is made available in new housing developments, especially affordable housing projects.

7.6 Public Water Supply

7.6.1 Merrimack Village District

The Merrimack Village District (MVD) is a Municipal Corporation established and regulated in accordance with the provisions of RSA 52 as amended. Under this law, the District has similar powers like a town and is governed by a five-member Board of Commissioners, Clerk, Trea-

1 http://www.nheconomy.com/uploads/Final-Report-082808.pdf

2 New Hampshire Broadband Mapping and Planning Program, Broadband Service Availability Viewer v1.0. (http://broadbandnh.sr.unh.edu/NHBroadbandServiceViewer1.0/). Accessed September 2012.

surer and Moderator. The MVD provides water to over 85 percent of the town by servicing and maintaining 893,000 feet of pipe, 889 fire hydrants, 7 wells (6 active, 1 inactive), 3 water storage tanks and 2 booster stations. The MVD manages over 7,500 customer accounts, which include residents and businesses.[3] The breakdown of water use by category is approximately 81 percent residential, 14 percent commercial, and 5 percent industrial.

All of Merrimack water comes from ground water from water pumped from wells in both Merrimack and Hollis. The Merrimack Village District (MVD) is one of two primary public water suppliers for the Town of Merrimack. MVD water is often referred to as "town water," it is a separate entity and is not a part of Merrimack Town government. The existing MVD system resulted from the combination of the original MVD system and the Reeds Ferry System. The original system was formed in 1955. At that time it encompassed the area from Baboosic Brook on Route 3 to the Elbit Systems property in Thorntons Ferry. Customers of the Reeds Ferry System, which was developed in 1934 or thereabouts, held a special meeting before the 1955 formation of the MVD at which they chose not to join with the MVD. The two systems did eventually combine in 1974 with a combined service area of about 10,000 people.

The two systems were still essentially isolated although connected by gate valves in 1975 when Whitman and Howard prepared a water supply study for the MVD. The 1975 study made a number of recommendations intended to improve provision of water to two high-pressure service areas, improve fire flow capability and supplement the district's water supply. Many of the recommendations (e.g. abandonment of the Reeds Ferry tank and construction of a 4 million gallon storage tank on Turkey Hill, opening of the gate valves, addition of transmission mains and installation of MVD Well No. 6) were implemented.

7.6.2 Water Supply

All of the MVD's water comes from groundwater. The distribution system is divided into two pressure zones that are defined by elevation. The main pressure zone serves the eastern portion of Merrimack, and the high-pressure zone serves the portion of Merrimack west of Naticook Road, Meetinghouse Road and McQuestion Road. Each zone is served by one water storage tank. Water is pumped from sand and gravel packed wells, through a network of pipes into our largest storage tank for distribution to MVD customers within the main pressure zone. Water from this zone is than pumped from a booster station into the high pressure zone where two smaller tanks store water to distribute to customers within the high pressure zone.

The MVD's system is comprised of six (6) functioning sand and gravel packed wells with good water quality and sufficient yield. The MVD's newer wells, Wells 7 and 8 are located in the Town of Hollis. According to the MVD, there are no economically viable well locations remaining within the Town that will provide suitable volumes of water so water conservation is critical. Well capacity and installation dates are listed in **Table 7-2**. Capacity was determined based on 24-hour pumping of each source. However the MVD does not currently pump any of our wells on a 24 hour basis for an extended amount of time, during the summer months with the lack of rain we do see an increase in usage and longer pump cycles.

3 Merrimack Village District Annual Report 2011, p. 5

Table 7-2: Merrimack Village District Well Capacity*

Well	Installation Date	Capacity (gpm)[1]	Capacity (gpd)[2] at 24-hour pumping
1	1956	0	decommissioned
2	1960	1100	1,584,000
3	1972	800	1,152,000
4	1956		see note
5	1970	625	900,000
6	1981	not used	not used
7	1997	429	617,760
8	1997	671	966,240
Totals	-	3,625	5,220,000

Source: Underwood Engineers, Inc. Merrimack Village District Water Supply Evaluation Update 12/15/2010

* Notes: Wells #4 & #5 are pumped through a common station for treatment and are considered together. Wells #7 & #8 are pumped through a common station for treatment and are considered together.

1 gallons per minute

2 gallons per day

Water from all of the MVD wells is stored in one of three storage tanks in Merrimack. The first storage tank was constructed in 1979 and has a holding capacity of four million gallons. The other two tanks were constructed in 1988 and can hold one million gallons each. The water is treated on-site at each pumping station with Chlorine, Lime and Zinc Potassium Polyphosphate and then distributed through a network of over 169 miles of water mains to homes, businesses and schools.

Future Water Demand

The current capacity of the existing MVD system (assuming a 24-hour pumping rate for each well) is about 5.22 million gallons per day (mgd) or 3.64 mgd if the largest well is not in service. This meets the current annual average day demand of 2.2 to 2.5 mgd but falls short of the high end of the maximum daily demand of 4.3 to 5.4 mgd. The average daily demand is the average daily use over an entire year. The maximum daily demand is the highest use recorded for one day within the year. The maximum day typically occurs during the summer months after long, dry periods. Maximum daily demand is usually caused by landscape irrigation and other outdoor water uses like filling swimming pools and washing cars.

The MVD Water Supply Update, estimates that the average daily demand in year 2030 would be approximately 2.9 mgd and the maximum daily demand in year 2030 would be approximately 5.9 mgd. The average daily demand projected in year 2030 is well within the existing system capacity. The projected maximum day demand of 5.9 mgd in year 2030 exceeds the current system capacity. The MVD has been actively looking at new sources as well as improvements to existing ones. One of the recommendations of the "MVD Water Supply Evaluation Update" issued in 2010, currently under consideration by the Town, is to blend well 6 with wells 7 and 8 and treat the Fe/Mn.[4] This will not only improve water quality, but will add an additional 864,400 gallons per day (gpd) into the system putting the system capacity

4 Underwood Engineers. MVD Water Supply Evaluation Update. December 15, 2010.

over 6 mgd meeting the maximum day projection of 5.9 in year 2030. Blending these wells together (with potential Fe/Mn treatment) will bring the VOC's from well 6 to near or below detection along with improving the water quality at wells 7 and 8 prolonging or possibly avoiding the need for a treatment plant for the three wells in the future.

Another recommendation from the MVD Water Supply Evaluation Update is slated for the year 2012 - 2013 in the MVD Summary of CIP Projects to increase the pumping rate at well 2 from 1,100 gallons per minute (gpm) to 1,500 gpm at which the Town is currently permitted for. This will increase the system capacity an additional 576,000 gpd. Mitchell Woods is a source identified during the most recent water search with limited supply that could be used during high demands (summer months) with potential to add 432,000 gpd to the capacity of the system. MVD is currently in the permitting process for this source with no definite date for its construction.

Once these improvements are made, the system capacity is expected to increase by 1.87 mgd if pumped on a 24-hour basis, bringing the total system capacity to 7 mgd. If for any reason should any of the existing wells go off line, the system may not be able to meet the maximum daily demand that typically occurs during summer. The MVD continues to encourage water conservation along with infrastructure improvements.

Preparing for Future Water Demand

In order to reduce the maximum daily demand that occurs primarily during the summer months, the MVD implemented an odd-even management policy effective in 1999. This policy allows residents with odd numbered houses to use water outside on odd numbered days and residents with even numbered houses on even numbered days. The one exception to this rule is that all residents are allowed to water outside on the last day of the months of March, May, July, August and October, but only from 5AM to 8AM. These water restrictions help to manage the distribution system by lowering peak daily demand and protect against seasonal fluctuations. The policy is expected to continue indefinitely and has been successful in lowering the weekly demand. When system capacities cannot meet demands (due to a well being offline and/or increased water use during the summer months), MVD has periodically purchased water from Pennichuck Water Works (see below). However, MVD has not needed to purchase water on a regular basis since 1995.

In addition to outdoor watering limitations, the MVD has implemented a public education program to encourage water conservation as well as groundwater protection. The MVD is committed to education in conservation by providing literature at the customer service counter, sending out mailings and offering "I save water kits" to interested customers. this outreach changes regularly from "water wheels" with conservation tips to jar openers with reminders "to turn off water when brushing your teeth." Merrimack is the only community in the state to receive the distinction of becoming a Groundwater Guardian Community through the National Groundwater Foundation.

The MVD also has a number of naturalistic, educational landscaping projects for viewing by the public, which show how to use drought resistant, hardy native species and low maintenance grass blends to reduce water use. The landscape systems also have rain barrels on hand to collect rainwater for watering the plants during dry spells. In addition, the MVD will be considering conservation rate structures to help reduce the demands on the system.

The MVD is currently considering a Master Plan Update, however, based on the last update in 2000, the following recommendations are being followed:

- Continue to implement the odd/even water management plan (described above);
- Put Well #6 back online as growth requires; and
- Work with new businesses to help keep outside watering in their facilities at a minimum.

The MVD developed a strategy to address water supply demand and aquifer recharge issues in the Naticook Basin. A series of recommendations were made to address water supply and aquifer recharge issues. Specifically, it was recommended that the existing outdoor watering limitations remain in place, that separate commercial and industrial irrigation meters be used to control demand, that drought resistant alternative landscaping be encouraged and that moisture sensitive irrigation systems be employed to minimize waste. The MVD is continuing to work toward implementing the improvements needed to serve its existing customers as well as to ensure that the Town's needs can be met at build-out.

7.6.3 Pennichuck Water Works

Pennichuck Water Works was founded in 1852 and is the largest investor-owned water company in the State of New Hampshire. Pennichuck Water Works serves over 110,000 customers in the City of Nashua and the Towns of Amherst, Hollis, Merrimack and Milford. In addition, Pennichuck owns and operates 11 community water systems in Bedford, East Derry, Epping, Milford, Newmarket, Plaistow and Salem, New Hampshire.

Pennichuck Water Works currently provides water for southeastern Merrimack. The service area is bounded by the Merrimack River to the east, the FEE Turnpike to the west, the Merrimack/Nashua border to the south and extends to the area around Industrial Drive to the north. The service area includes hundreds of housing units and some of the Town's largest industries such as Anheuser-Busch, BAE Systems and Nashua Corporation.

An agreement between MVD and Pennichuck established an emergency water line at the State Barn, located directly across from the Anheuser-Busch facility, along Daniel Webster Highway that both Pennichuck and MVD can draw from. Pennichuck also ties into the MVD water line near the Home Depot along 101A in order to help with summer peak demand. Although MVD has purchased water from Pennichuck in the past, there has not been a consistent purchase since 1995. There are currently no Pennichuck Water Works storage facilities in Merrimack. However, a booster station and connection is planned for the Daniel Webster Highway area just west of Anheuser-Busch south of Exit 10.

The southern portion of Merrimack that ties into the Pennichuck system currently consumes approximately 722 million gallons per year, or 2 million gallons per day. Anheuser- Busch is the largest consumer, using nearly 1.8 mgd. According to the Town of Merrimack Build-out Study, updated 2001, the area of Merrimack served by Pennichuck Water Works can accommodate an additional 62 housing units and 2,844,351 square feet of non-residential floor area. Although the potential water demand will depend heavily upon the type of use that is developed, Pennichuck Water Works anticipates they can meet the water supply needs of its service area at build-out. The emergency connection agreement with MVD and the addition of the new booster station and connection is designed to provide the quantity of water needed to support the southeast portion of Merrimack.

7.7 Recommendations

Water Conservation

U-1 Continue to implement Town water odd/even day restrictions for outdoor water use that help to manage the distribution system by lowering peak daily demand and protect against seasonal fluctuations.

U-2 The MVD should use separate commercial and industrial irrigation meters to control demand.

U-3 The MVD should continue to expand homeowner education programs to reduce demand and encourage water conservation such as alternative drought-resistant plants for gardens on residential and commercial properties.

U-4 The MVD should create list of native and drought-resistant plants and flowers for the public that is posted on the Town's website.

U-5 The MVD should work with all businesses to help keep outside watering in their facilities to a minimum.

Energy

U-6 In order to address energy issues in a comprehensive manner throughout Merrimack, the Town should establish an Energy Committee. As an example, the Town of Bedford recently established such a committee. The following is its mission statement:

> The Bedford Energy Commission is formed to facilitate energy efficiency, conservation, sustainability, reliability and affordability within the community and will develop recommendations to advance these objectives relative to public buildings and facilities, and may develop recommendations to advance these objectives relative to residences, local businesses, civic institutions and transportation. The Bedford Energy Commission will serve in an advisory role in support of the Town Council and School District. In its advisory role in support of the Town Council and School District, the Bedford Energy Commission will review construction, renovation and maintenance projects and will provide periodic reports covering short and long range recommendations for action by the Town Council, School District and other appropriate officials of the Town or School District.[5]

U-7 The Town should consider providing for property tax exemptions to property owners who install certain renewable energy systems, such as solar systems, wind turbines, and wood-fired heating systems.

U-8 Conduct detailed energy audits to specifically identify what is needed in each building owned by the Town and the School District. Pursue available grant funding to help cover the cost of this initiative. By conducting energy audits and identifying strategies for improvements that can reduce fuel and electricity consumption, the Town can reduce costs in the long-term and serve as a "leader by example" in future efforts to encourage residents and businesses to do the same. In addition to focusing on

5 See http://www.bedfordnh.org/pages/BedfordNH_BComm/Energy/energy.pdf

town-owned buildings, the Town should address energy usage in its fleet of vehicles and street lighting (grants are frequently available to switch to LED street lighting, for example).

U-9 Once all the audits are completed, the Town should prepare a detailed energy reduction plan that should establish an energy reduction goal (a certain percentage reduction to be achieved over a period of time).[6] Included in such a plan would be the following considerations:

- Prioritized list of specific projects based on projected energy savings, as well as estimated capital and operating costs for new building construction, retrofits and renovations
- New vehicle or technology costs, projected annual energy savings, and timing of future vehicle purchase
- Cost and projected energy savings for street and traffic lighting

Among the tools that can be used by municipalities to track energy consumption is the Energy Star Portfolio Manager, which is a free energy and water consumption tracking software program available on the Energy Star website.[7] Consumption can be tracked in individual buildings as well as a combination of numerous buildings.

U-10 Contact utility companies that service Merrimack prior to undertaking major street repairs so that any planned utilities work can be done at the same time to minimize disruption to local neighborhoods and save costs

U-11 The Town should consider adopting an official policy to purchase only fuel efficient vehicles for municipal use whenever commercially available and practicable.

U-12 Review the zoning ordinance to address potential land use changes that encourage mixed-use, and compact development patterns that reduce automobile trips. Conversely, energy efficiency should be considered for future development in the undeveloped residential areas of the Town in order to minimize the impacts of sprawl.

U-13 Include street lighting as part of a comprehensive energy policy for the Town. Consider a requirement for energy-efficient light-emitting diode (LED) street lighting in any new developments.

U-14 Consider adopting regulations that recommend or incentivize the use of Leadership in Energy and Environmental Design (LEED) or similar standards for new construction, including municipal, commercial, industrial and multi-family buildings. Municipalities across the country have established such standards as a means to establish a benchmark for sustainable development.

U-15 Adopt building code regulations that enhance energy efficiency in all new and renovated residential buildings. These should be performance driven regulations designed to meet standards of efficiency based on the Home Energy Rating System (HERS). As an explanation of this code revision, the Residential Energy Services Network offers the following:

6 A typical goal advocated by agencies in New Hampshire and Massachusetts is a 20 percent reduction within five years of commencing the program.

7 See http://www.energystar.gov/index.cfm?c=evaluate_performance.bus_portfoliomanager

- "Home energy ratings provide a standard measurement of a home's energy efficiency. Ratings are used for both and new and existing homes. In new homes rating often verify energy performance for the ENERGY STAR homes program, energy efficient mortgages, and energy code compliance. Homeowners who want to upgrade the home's energy efficiency can use the energy rating to evaluate and pinpoint specific, cost-effective improvements. For existing homes, homeowners can receive a report listing cost-effective options for improving the home's energy rating. An energy rating allows a homebuyer to easily compare the energy performance of the homes being considered.
- There are two types of ratings:
    a. Projected ratings - Ratings performed prior to the construction of a home or prior to the installation of energy improvements to an existing home.
    b. Confirmed ratings - Ratings completed using data gathered from an on-site inspection, which could include performance testing of the home."[8]

Telecommunications

U-16 Work with Department of Resources and Economic Development to address issues of telecommunications access to encourage people to work from home.

U-17 Monitor efforts to ensure that Merrimack download speeds and coverage continue to keep pace with current broadband technology.

U-18 The Town should work with broadband providers and developers to ensure that access is made available in new housing developments, especially workforce housing projects.

8 See http://www.resnet.us/ratings/overview/default.htm

8. Community Facilities

8.1 Introduction

The community facilities element of a master plan should guide decisions about the public buildings, utilities and infrastructure a local government will need in order to meet future needs. Community facilities make it possible for municipal employees and volunteers to provide services for the public good. The adequacy of municipal and school facilities for the functions they serve is largely determined by three factors:

- The form, size and organization of the community's local government;
- The community's land use pattern; and
- The expectations of the community's population.

What is a Community Facility?

A community facility is any municipal property that has been improved for public purposes, such as a town hall, library, fire station or school. It also includes municipal utilities such as water or sewer service, and parks, playgrounds and cemeteries.

A town's ability to provide adequate facilities depends on effective capital planning and a commitment to implementation, asset management policies, and the amount of revenue available for local government operations. Merrimack, like many other New Hampshire municipalities, receives very little funding from non-local sources and relies almost entirely on its own residents and businesses for financial support. Although it has basic core facilities for local services, some of Merrimack's facilities are inadequate to meet current or future needs in order to accommodate the personnel, equipment, technology and records storage that government organizations need in order to run efficiently. Some departments are also under-staffed, yet it has been difficult for the Town to balance demands for excellent schools with its municipal needs.

Like residents of other towns, Merrimack voters have traditionally supported their public schools and worked hard to assure that children receive an excellent education. Good schools benefit a community's families and help to preserve high property values for everyone, so investing in public schools is very important. In addition, many people come into contact with school buildings, not only parents and children, but also any residents participating in community activities that take place inside school facilities. In contrast, few people ever venture inside a police station and for the most part, the same can be said for fire stations or the Public Works Department (PWD) facilities (aside from the transfer station). Residents may go to Town Hall to pay a tax bill, purchase a dog license, or obtain a copy of a birth certificate, but except for the most motivated citizens who routinely attend night meetings of town boards, a small percentage of a community's population spends much time in government office buildings. This fact of life for most towns makes it hard to build a constituency for high-quality municipal facilities and often causes both ordinary maintenance and capital improvements to be deferred for many years.

When communities make investment decisions on a year-to-year basis, without direction from a broadly accepted long-range plan, they are at greater risk of placing short-term needs and popular causes ahead of capital improvements. Although Merrimack has a capital budget, the process for developing it does not appear to be integrated very well with the Town's overall financial planning framework. Today, Merrimack has some municipal facility needs that should be addressed within the next few years, but needs a more comprehensive manner for prioritizing those needs in terms of projected growth.

8.2 Community Facilities Goals

- Develop a comprehensive planning process for short- and long-term capital improvements for all town facilities and services.
- Given the often conflicting demands, establish priorities for building and facility upgrades and replacement.
- Establish new or improved/upgraded facilities and increase staffing for public safety to meet demands resulting from anticipated growth.
- Provide and enhance recreational opportunities for residents of all ages.
- Lead by example in community facilities and operations by establishing sustainability principles and initiatives.

8.3 Existing Conditions

8.3.1 Municipal Services

The municipal services that Merrimack provides are fairly typical of New Hampshire towns. Like most communities, Merrimack does more for its population than it is required to do by law. To residents and businesses in just about every city or town, many local government services qualify as "essential" regardless of whether the state mandates them. For example, municipalities do not have to provide solid waste disposal services, youth services, recreation programs, a senior center or a public library, but the towns that provide these services often consider them important to the quality of life and an indispensable part of what it means to be a community.

Table 8-1: Merrimack's Municipal Services

Administration and Finance	Public Safety	Public Works
Town Manager	**Police:**	Highway
Town Clerk/Tax Collector	Animal Control	Stormwater
Assessing	**Fire and Rescue:**	Wastewater
Finance	Building Code Enforcement	Solid Waste
Human Resources	Emergency Management/ Homeland Security	Buildings and Grounds
	Health	
Land Use	**Human Services**	**Culture and Recreation**
Community Development	Welfare	Public Library
Planning and Zoning	Senior Citizens	Parks and Recreation Department
Conservation		Heritage Commission
Agriculture		Merrimack TV

Source: Merrimack Town website, http://www.merrimacknh.gov/

8.3.2 Municipal Facilities and Services

Merrimack's government operates from ten major facilities, scattered throughout the Town. Below is a description of the municipal facilities summarized in **Table 8-2**.[1] **Figure 8-1** provides a map showing the locations of all municipal facilities including municipal buildings and recreational facilities.

In 2005, the Town retained H.L. Turner Associates to conduct a comprehensive review of all Town-owned buildings and facilities. The report details the history of each building, upgrades made to each facility, and identifies needs and potential costs for further upgrades, improvements, or expansion. The following is a summary of the more significant town-owned buildings and its functions, and an assessment of any major deficiencies or needs for improvement. The information provided below is based upon Turner report, along with responses to

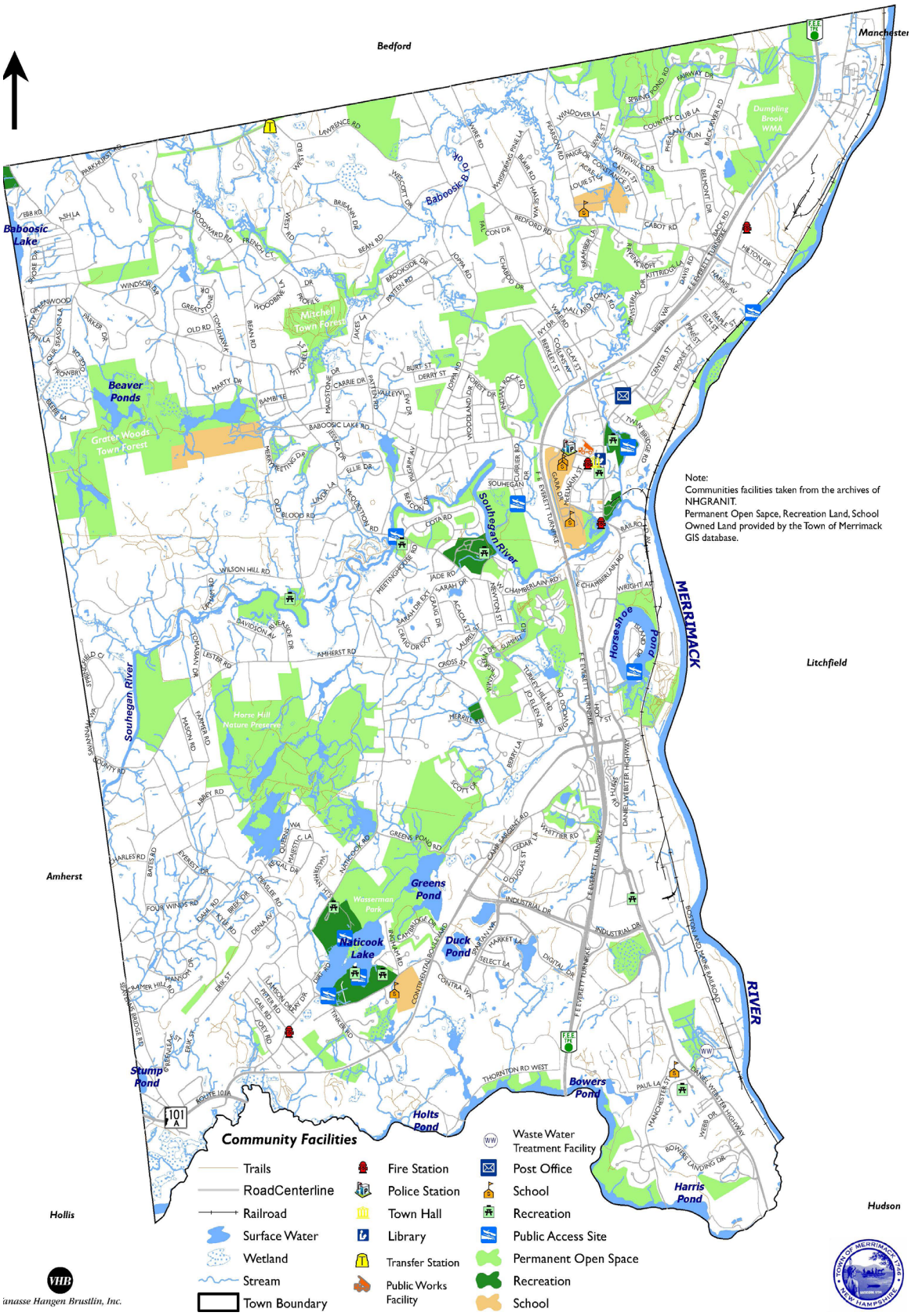
1 Community facility summaries are based on the following sources: Merrimack Planning Department, Merrimack Public Works Department, H. L. Turner Facilities Assessment, November 2005.

a questionnaire provided to each department head and a follow-up interview. For specific details on potential improvements, one should review the Turner report.

Table 8-2: Merrimack's Municipal Facilities

Facility	Location	Functions	Acres	Year Built/ Renovated	GFA	Condition
Town Hall	6 Baboosic Lake Road	Government offices	–	1872/1980/2010	15,185	Good
Library	470 Daniel Webster Highway	Library	–	1925/1979	12,644	Fair
Police Station	31 Baboosic Lake Rd.	Public Safety	–	1998	12,846	Good
Fire Station 1	432 Daniel Webster Highway	Headquarters	–	1960/1976/1997	9,216	Good
Fire Station 2	196 Naticook Road	Substation	–	1973/1987	2,480	Fair
Fire Station 3	643 Daniel Webster Highway	Substation	–	1973	3,456	Fair
Fire Station 4	6 Baboosic Lake Road	Garage bay/storage	–	1970's		Fair
PWD Garage	Turkey Hill Road	Offices, Highway, Vehicle Maintenance	10.0	1973/early 1980's	–	Fair
Transfer Station and Recycling Facility	Fearon Road	Offices, Transfer Station, Recycling, Yard Waste	11.5	1977	–	Good
Wastewater Treatment Facility and Composting Plant	36 Mast Road	Wastewater Treatment, Compost Production	27	1970	–	Good (wastewater treatment) Fair (compost)
John O'Leary Adult Community Center	Church Street	Senior Citizen Center		1981		

Figure 8-1: Community Facilities in Merrimack



Merrimack Town Hall

Town Hall

The Town Hall is located on a 3.4 acre site in what is identified as the Town Center of Merrimack. The majority of the site consists of parking, landscaping and administrative offices. The west wing of the Town Hall was originally constructed in 1872 and has been renovated over time, most recently in 2004 and 2010. It is a two and half story wood framed building. A number of municipal administrative offices and functions are housed here such as the Finance and Welfare Departments. Until 2010, it also housed the Merrimack District Court on the second floor. The Court moved into a new building in 2010 on a site adjacent to Town Hall. This allowed for the construction of a new state-of-the-art meeting room where meetings can be recorded and broadcast by Merrimack TV.

The east wing of Town Hall was built in 1980 and consists of a one story building with an occupied basement level. The main floor of East Wing contains the offices of the Town Council, Town Manager, Town Clerk and the Assessor. The basement offices, which include Community Development and Public Works, has a separate entrance at the parking lot level and cannot be accessed by the public from the first floor level offices. The two buildings comprise 15,185 square feet and are connected by an open breezeway.

Most municipal services and functions are housed within the two wings of Town Hall except for public safety (Police and Fire and Rescue), the Public Works Department (PWD), and Parks and Recreation (on a seasonal basis). At least for the foreseeable future, the Town Hall space is deemed to be adequate, although there are some issues regarding accessibility.

There are two meeting rooms in Town Hall. The east wing has the Merrimack Memorial Conference Room, which has a capacity of 40 people and has video equipment for taping and broadcasting meetings. The west wing, as mentioned above, has a new state-of-the-art larger meeting room (Matthew Thornton Meeting Room) that is equipped with new audio-visual capabilities. However, the room has fixed seating which limits the flexibility of the meeting space. Although it has a much larger seating capacity, there are times when even that room is insufficiently sized for meetings that draw large crowds. The meeting rooms are booked most weeknights for various municipal functions, including the School Board. Alternative meeting space can be found in the Library and the Police Station. The School District also has two formal conference rooms in the high school and each school has a gymnasium and auditorium that may be used for public meetings or by private organizations.

Merrimack Public Library[2]

The Merrimack Public Library, originally known as the Lowell Memorial Library, is located on a 1.5-acre parcel in the center of Merrimack on the corner of NH Route 3 and Baboosic Lake Road. The original building was constructed in 1924 as a single story structure, with approximately 2,100 square feet of space. An addition was constructed in 1979 that expanded the facility to 12,644 square feet.

In an effort to maintain the building and to prevent leaking, the windows on the roof were replaced in 2010. The Town took advantage of PSNH's Smart Start program and replaced all lighting for better efficiency in 2010. In 2009, all the pipes and heating units were replaced and a new air-conditioning unit was installed. In 2010, the 1979 boiler was replaced with a gas-fired boiler as part of an initiative by National Grid. There are ongoing issues with some leaking from the slate roof and the flat roof, as well as some drainage problems.

The Merrimack Library has provided emergency shelter, cooling, heating and Internet services for Merrimack citizens during several weather emergencies during the past decade. In 2011, the Federal Emergency Management Agency (FEMA) established new regulations qualifying libraries, along with police, fire protection/emergency services, medical care, education and utilities, as essential community services.

The Library has 28 staff members: 9 full-time and 19 part-time. Overall staff hours were cut back due to budget cuts which necessitated a reduction over the last two years in the number of hours that the Library is open.

2 Town of Merrimack 2002 Master Plan Update, p, VI-15 – VI-16; Response to questionnaire by Janet Angus, Library Director, November 2011.

The Library has a collection of 90,083 items which includes books, DVDs, VHS tapes, music CDs, audio books, video games, and CD ROMs. The Library's total circulation, which includes the items that it owns as well as items through the inter-library loan and reciprocal borrowing programs, was 277,822 in 2010-11.

A new Library building has been part of the Capital Improvements Program since 1994. The Library Building Development and Marketing Committee have been working diligently since September 2008. The options of retrofitting and expanding the library, or moving into another existing building have proven to be impractical or cost-prohibitive. The existing building is not large enough to house its current collection of materials and it cannot provide enough community meeting space. It also cannot accommodate the number of people who

come to use the wireless connection. The current CIP anticipates planning for a new Library building in FY 2014-15.

Police Department[3]

The Merrimack Police Department is a full-time department with a central station located in the Town Center on Baboosic Lake Road. This 13,500 square foot facility is the third Police Department headquarters location during the past 30 years. As a result of space constraints at the Town Hall, the Town acquired a former medical center on Baboosic Lake Road in 1996 and relocated both the Police Department and the Communications Center. The new station is centrally located, allowing for rapid response times and flow of information between the Communications Center and the department. Renovations to the new station were completed in two stages, culminating in 1998, and are intended to meet the Department's long-term needs.[4]

The building consists of one main facility, made up of two separate, but "joined" buildings (no through passage except through the exterior lobby). There are five adult jail cells and one female/juvenile cell. At this time, the department deems this to be sufficient to meet present and future needs.

Merrimack Police Department

The Police Department has a total of 61 employees, including the members of the Communications Division and administrative staff. In addition to the Chief, there are two captains, one lieutenant, 25 patrol officers and five detectives. In 2010, the Department responded to over 36,000 calls, half of which related to motor vehicle accidents or violations. Demand for services is anticipated as the Town continues to grow, especially with the upcoming opening of the Premium Outlet Mall.

3 Response to questionnaire by Chief Mark Doyle, November 2011.

4 Town of Merrimack 2002 Master Plan Update, p, VI-7 – VI-8.

The Department uses 11 marked cruisers for Patrol and Community Services; 3 unmarked cars for detectives; 3 administrative vehicles for Command Staff; 2 all-purpose SUVs (ACO and K-9 Officer use); and other miscellaneous vehicles for a variety of purposes.

Fire and Rescue Department[5]

The Fire and Rescue Department includes Fire/Rescue Operations, Fire Prevention, Office of the Fire Marshal, Emergency Medical and Ambulance Service, Building Division, Code Enforcement, Emergency Management and Health Divisions.

The Operations Division of the Merrimack Fire Department is headed by an Assistant Fire Chief who oversees four platoons of firefighters and officers. In addition there is a group of on-call firefighters and emergency medical technicians as well as a small group of part-time emergency medical technicians who supplement ambulance coverage. There are four shift captains and four lieutenants, 17 firefighter/EMTs, and seven firefighter/paramedics on a full-time basis in addition to the Chief, Assistant Chiefs, and Fire Marshall. There are also 16 volunteer firefighters on an on-call basis. The Department oversees the Building Inspector, Building Official, and Health Officer.

Merrimack Fire Department

Equipment for the Department includes 5 Engines, 1 Ladder Tower, 1 Heavy Rescue, 1 Medium Duty Rescue, 3 Wild-land Fire Trucks, 4 Ambulances, 3 Command Cars, 4 Inspection Vehicles, 1 Utility/Plow/Tow Vehicle, and 1 Command/MCI Trailer. (A CIP plan has been developed for fire apparatus and ambulance replacement).

Headquarters/Station 1 (432 Daniel Webster Highway)

The Central Fire Station houses the Emergency Services (Operations) Division, Support Services Division which includes Fire Prevention and Emergency Management, the Emergency Operations Center for the Town, as well as the Building and Health Divisions. The Operations Division includes five (5) Fire/EMS personnel who are on duty 24/7 at this station. The Fire Prevention Division, including the Fire Marshal's Office, is located at this station. In July

5 Response to questionnaire by Chief Michael Currier, November 2011.

2010, the Building and Health Divisions came under the administration of the Fire Department. The addition of four personnel and significant file storage has placed a premium on space at this station. There is virtually no more usable space available for file storage, equipment or gear storage. Parking is also very limited at numerous times during the day.

This station was originally built in 1960 and a second floor was added in 1976 to add living quarters. The station received a $598,000 expansion in 1997, adding more apparatus bays, as well as office and living space. In 2011, the station was converted from oil to natural gas at a cost of $28,000, window replacement is scheduled for 2012-2013, and air conditioning upgrades are needed. The roof was replaced in 1997 and appears to be in good shape. No major repair/replacement is anticipated to the roof over the next ten years.

Station 2 (196 Naticook Road)

This station was built in 1973, and living quarters were added in 1987. It is essentially a two-bay garage and there are three Fire/EMS personnel assigned there who are on duty 24/7. There is insufficient space for training, exercise, administrative activities, and proper storage of apparatus and equipment. Furthermore, there are no female accommodations, ADA access, or sprinkler system at this location. A new South Fire Station, to be located on Continental Boulevard was proposed to the voters in the spring of 2011, however it did not pass. An estimate of $ 50,000.00 for renovations to this station was forwarded to the Town Manager in June 2011. Due to the limited size and location of the current station, it has been recommended that the Town continue to evaluate a new station on Continental Boulevard instead.

Station 3 (643 Daniel Webster Highway)

Station 3 (Reeds Ferry Station) was built in 1973 as a garage with limited facilities. It lacks space for training, fitness, living quarters, and offices. To better meet the needs of the department, it must be transformed into a modern fire station by redesigning the interior and expanding its size to provide more usable and functional space. This expansion should include living quarters for future staffing needs. This station does offer good southbound highway access on the F.E. Everett Turnpike via Bedford Road and is relatively close to the new airport access road. There is a large tract of land to the north and east of this station that will eventually be developed. The Town may be able to attain some more land and a donation from the developer to enlarge and modernize this station.

Station 4 (Town Hall, 6 Baboosic Lake Road)

This building is currently shared with the Police Department and Building and Grounds. One bay is utilized for storage of the Rescue 2 unit along with sandbags and some hazardous materials absorption booms. This garage, built in the 1970's, has very limited facilities. It should not be considered an operational fire station.

A new fire station, to be located in the northwestern corner of Merrimack, has been in the planning stages for a number of years. This proposed new station received the highest rating from the Capital Improvements Committee in 2000 and is expected to be located on the 11.2

acre "Bishop property" at the intersection of Baboosic Lake Road and McQuestion Road. The plan is to set aside land for an approximately 8,000 square foot station along the front portion of the property, leaving the back portion potentially available for recreational fields and access to the new middle school. A northwest station will significantly reduce response times to this part of Town, which can be excessive because of traffic congestion on Baboosic Lake Road. A significantly reduced response time would be achievable from this new location.

The Operations Division of the Merrimack Fire Department responded to over 2,600 emergency calls for service in 2010 which resulted in over 3,600 emergency responses. This reflects multiple responses (fire and ambulance) during a single call.

The demand for service in the modern fire department has changed immensely over the past years. The calls for service had shifted from fires to medical as well as greater educational needs and fire prevention activities. With this being said fire departments cannot staff for the major fire that may or may not occur, but must utilize staffing to effectively handle the day to day multiple resource calls when they are received.

The demand for service is likely to increase based on the national and local trend of recent years as well as the present and anticipated growth of the community. To meet these anticipated needs, additional staffing will be required. The completion of the airport access road and the Merrimack Premium Mall and the resultant projected growth can exacerbate emergency services needs.

The other issue is the aging fleet of emergency apparatus that can also hinder response time, particularly with maintenance issues cropping up, much of it attributable to the age of the fleet which is an average of 16.6 years.

Public Works Department[6]

The Merrimack Public Works Department is responsible for town roadways, the sewer system and wastewater treatment facility, vehicle maintenance, park and recreation maintenance, and solid waste and recycling services. The Administration and Engineering functions are located in three offices in Town Hall. The department shares a conference room and entry way with staff from Community Development. In total, the department is charged with maintenance of 170 center lane miles of Town-owned roadway, 26 miles of sidewalks, and 90 miles of sewer lines.

The Highway Division is housed in one main garage, on a site that includes a fueling station for Town vehicles, a fenced storage yard, and a salt shed. The new salt shed was completed in 2010. Vehicle maintenance is also performed in the highway garage for the fleet of vehicles from PWD, Fire, Police and other Town vehicles. The garage is located on Turkey Hill Road in Central Merrimack. Although some piecemeal repairs have been made, the existing highway garage needs mechanical, structural and electrical upgrading (i.e. building siding upgrade, overhead door replacement, bathroom/locker room renovations, ADA code compliance needs, electrical panel upgrades, etc.). Indoor space for storing many of the vehicles in the garage is scarce and therefore most of the vehicles sit outside the building all months of the

6 Response to questionnaire by Richard Seymour, Director, November 2011; interviews December 2011 and January 2012.

Highway Dept. Salt Shed

Highway Garage building

Merrimack Solid Waste Transfer Station

year, which is particularly problematic during the winter months. Additionally, the gas pumps need to be replaced in order to meet safety and fire suppression standards.

A proposal to upgrade the garage and office space is listed in FY 2013-14 Capital Improvements Plan for the construction of a new 1,500–2,000 square foot administration building. This new facility is expected to be located north of the current maintenance facility and the existing office space in the maintenance facility will be converted to storage space. Although there is limited space at this site, the department would like to remain at this location because of the convenience of getting maintenance vehicles in and out of the premises.

The Town uses the "PAVER" system to assist in prioritizing needed roadway improvements as part of its pavement management plan, which is updated each year. It is estimated that the Town should spend approximately $900,000 annually to maintain the status quo in roadway condition.

The solid waste transfer station and recycling center is located on Fearon Road and off of Lawrence Road in the northeast section of Merrimack. It includes an office, separate drive-up buildings for trash and recycling, and drop-off areas for yard waste, white goods, construction debris, and other miscellaneous disposables. The facility is open five days a week – half of the estimated 4,500 resident visits to the site occur on Saturdays. There is no curbside pick-up although residents who prefer that option can arrange it through private haulers.

The Town recently adopted a single-stream recycling system (2009), which has yielded a 50% increase in the recyclable tonnage collected. The solid waste facilities are in good shape with adequate capacity, and no major upgrades needed or anticipated in the near future.

Wastewater is handled through the secondary treatment wastewater facility, located off the Daniel Webster Highway on Mast Road in the southeast section of Merrimack. The wastewater treatment system includes one compost facility on-site and six pump stations off-site. Septage and sludge from Merrimack and surrounding municipalities is accepted at the wastewater facility. This produces a revenue source that offsets some of the operating expenses associated with the treatment facility. The sludge is treated and turned into compost which is then sold as a landscaping product.

The wastewater facilities are old (40 years), but have been maintained over the years so that they are in fairly good condition. The facility, which provides secondary treatment, has a capacity of 5 million gallons per day and is only using approximately 40% of that capacity. The plant was initially designed to accommodate large industrial users such as Anheuser-Busch, although over time technological improvements led to significant reductions in water use, and subsequently wastewater discharge. Thus, the facility has more than enough capacity to accommodate new residential and commercial growth.

Sewage Treatment Plant

Currently, the facility is looking to upgrade the compost facility which is in need of new electrical control systems, new blowers and structural improvements to the building. An estimated budget for this upgrade is approximately $2.9 million. There is a proposed Phase II (FY 2012-13) and Phase III (FY2013-14) facility wide improvements program in the current Capital Improvements Plan. Phase II at $4.2 million includes replacement of main pumps, a new dechlorination system, a new plant water system, replacement of the aeration blowers, updated control systems, updated electrical systems and lighting improvements. Phase III at $4.5 million includes replacement of the primary and secondary collectors, a new raw wastewater screening facility, additional updated electrical systems, sludge storage improvements and various process instrumentation upgrades.

In April 2013, the Sewer Master Plan for the Town of Merrimack, NH was prepared by Wright-Pierce. The plan examined potential sewer improvements and extensions to the existing system, which currently includes 90 miles of pipeline. There is almost $1 million in the sewer extension fund at this time.

Additionally a drainage master plan is being prepared that will prioritize drainage improvement needs by examining areas where flooding occurs in conjunction with environmental and damage assessment criteria.

Parks and Recreation[7]

Merrimack is a family-oriented town, so it is not surprising to find that it has a number of varied parks, playgrounds and playing fields. The Merrimack Recreation Department offers recreational, leisure and cultural programs on a year-round basis, mainly but not exclusively for school-age children. Table 8-3 lists the outdoor recreation facilities owned and managed by the Town. In addition to the public parks, there are a number of privately owned park facilities that are open to the public including the Anheuser Busch Field owned by Anheuser Busch in Merrimack.

Merrimack Park and Recreation Office

7 Response to questionnaire by Sherry Kalish, Director, November 2011; interview January 2012.

Table 8-3: Town-owned Recreation Facilities Owned and Managed by the Department of Parks and Recreation

Facility Name	Use	Size
Abbie Griffin Park	Bandstand, summer concerts, weddings, library events	
Bishop Property	Soccer and lacrosse field	
Depot Street River Access	Public boat ramp to Merrimack River	
Heritage Trail	Main trail follows Souhegan River	
Kids Kove	Playground, wooden structure maze	
Lyons Road Fields	Soccer, lacrosse, baseball, softball	35 acres
O'Gara Drive Recreation Area	Skateboard park, basketball court, ice skating rink , 4 tennis courts	
Turkey Hill Park	Softball field, 2 youth baseball fields	18 acres
Twardosky Field	Softball field, 2 soccer fields	
Twin Bridges Park	Bise Field-youth baseball, hiking trails, picnic areas	25 acres
Veteran's Memorial Park	Boat ramp to Naticook Lake, 2 baseball fields, 1 Babe Ruth multi-purpose field	25.5 acres
Wasserman Park	Town Beach, 7 tennis courts, 2 baseball fields, 2 basketball courts, volleyball, playground, Function Hall, community garden	46 acres
Wasserman Park Conservation Area	Hiking trails, cross country skiing	87.7 acres
Watson Park	Passive recreation, picnic, garden	12 acre
Weston Park	Passive recreation, picnic, sledding	5.78 acres
Warriner Memorial Playground	Playground, picnic area in Veterans Park	See above

Source: Merrimack Recreation Department

The Parks and Recreation Department operates from an office at Wasserman Park except for the winter months, when it is located in Town Hall. It runs a number of recreational programs and annual special events including the Summer Concert Series, Halloween Haunted Walk, Tree Lighting Ceremony, Holiday Parade, Santa Calling, Winter Carnival, Easter Egg Hunt and two bus trips a year. Seasonal programs that are held every year include the Naticook Day Camp, as well as swimming, tennis, and golf lessons.

Staffing consists of the Director and a part-time secretary. Seventy seasonal maintenance employees are hired each year. As of July 2011, maintenance on the facilities is conducted by PWD, with the exception of a summer seasonal maintenance worker that is hired to keep up with day-to-day issues at Wasserman Park. PWD typically does the early season lawn mowing and maintenance for the playing fields.

An important component of the parks and recreation program is the contribution of the Merrimack Youth Association (MYA). The MYA is a volunteer, non-profit organization that makes recreational sports available to all youth in Merrimack. The MYA sponsors over 2,400 children in a variety of independent sporting activities, each devoted to providing the best opportunity possible for kids of all ages to play sports. These programs include baseball,

softball, football, cheerleading, basketball, lacrosse, soccer, and wrestling.[8] MYA assists in the maintenance of the fields they use, with the help of its members and sponsors.

Wasserman Park is a key recreational asset for the Town. The Park is run by the Department, and hosts the Naticook Day Camp. Wasserman Park is on a 46 acre parcel of land that borders on Naticook Lake. The park consists of a number of athletic fields, tennis courts, a playground, picnic area, beach area, a series of buildings, and a community garden. Some of the buildings include a theatre, dining hall, function hall, park office, and nine separate buildings that serve as bunkhouses or cabins for overnight stays. A Building and Health Inspection of the facility was completed in December 2011. This inspection report builds on the assessment included in the Turner Associates report on Town-owned facilities from 2005. It details existing conditions and needed maintenance and renovations, but concluded that the overall condition of the park and its components is good.

Wasserman Park

In October 2010, the Athletic Fields Needs Committee prepared the Merrimack Athletic Fields Plan. The plan identified that there are 42 public (including Merrimack School District facilities) and private playing fields and courts in Merrimack as of 2010.[9] The support the following programs:

- Baseball (from children's T-Ball to men's leagues), school sponsored, MYA sponsored, and organized adult leagues
- Softball (from school and MYA sponsored to adult leagues)
- Soccer (school and MYA related)
- Lacrosse (school and MYA related)

8 http://www.merrimackyouth.org/

9 Note that the Town also has several playgrounds and a skateboard park, although such facilities were not addressed in this report.

What is a Capital Improvements Plan?

A capital improvements plan (CIP) is a road map for planning and funding public facilities and infrastructure. It typically incorporates both the construction of new facilities and the rehabilitation or replacement of existing capital. Typically, a CIP covers a period of three to six years and serves as a declaration of intent by a locality to make capital expenditures on the schedule indicated. A CIP may or may not consider multiple forms of funding.

- Football (school and MYA related, including cheerleading)
- Field hockey (school)
- Tennis (school and recreational)
- Basketball (school and MYA related)

That plan examined the demand for field and court use by residents, the School District, and MYA, and the projected needs based upon the following major factors:

- Using school district enrollments to determine the number of children in town.
- Current usage of the fields by both children and adults.
- The possibility that certain fields may need to be replaced if some corporately-owned fields, such as the Anheuser Busch Field and the Atrium Field at 40 Continental Boulevard, are no longer available.
- The projected future population of Merrimack at full build-out.

As a result of the analysis, the Committee determined the Town and School District needs 26 new fields to meet future needs. Specifically this includes six rectangular fields[10] and three baseball/softball diamonds (one small, two large) for the School District; two baseball/softball diamonds (one small, one large) for adult league use; and nine rectangular and six baseball/softball diamonds (five small, one large) for MYA. Currently, there is a specific need for five new fields as follows:

- One softball field in support of the MYA softball program.
- Three rectangular fields in support of the MYA football, soccer, and lacrosse programs.
- One adult (90') baseball field to support several programs.

Costs, field dimensions, parking and other considerations are addressed in the report.

A number of potential locations are considered for the development of playing fields including PWD property, state-owned properties, private sites such as the Flatley property, and town-owned sites. In order to fund these efforts, the plan identifies several options including making annual $150,000 contributions to Athletic Fields Capital Reserve Fund in the CIP, establishing a $2 million bond for new field construction, applying for grants, and including some field construction in the School District CIP.

The report further concluded that any future demand for basketball or tennis courts can be met with the existing inventory of these facilities.

John O'Leary Adult Community Center

The Adult Community Center is located on the same site as the Library on Church Street in the center of Merrimack. The Center is governed by a board of directors and is primarily used as a senior center. The facilities contain a large meeting room, sitting area, kitchen, and support facilities.

10 Rectangular fields include those used for football, soccer, lacrosse, or practice.

The building, although modest in appearance, is historically significant. The Center was originally built in the early 1900s as a two-room schoolhouse (Schoolhouse #9) for eight grades. It is one of three remaining two-room schoolhouses in Merrimack. Because of this, many Merrimack residents have sentimental ties to the building. In 1970, the building was renovated to house Town's police station and was later converted to the Adult Community Center after completion of the East Wing of Town Hall in 1981.

8.3.3 Public Schools[11]

The Merrimack School District is comprised of six schools, a Superintendent's Office, a Special Services Office and a Maintenance Facility. The offices and maintenance facility are located adjacent to the high school. They are listed in Table 8-4, along with the grade levels and the current condition of each.

Table 8-4: Merrimack's School District Facilities

Facility	Grade Levels	Current Condition
James Mastricola Elementary School	Pre K-4	Good
Reeds Ferry Elementary School	Pre K-4	Good
Thorntons Ferry Elementary School	K-4	Good
James Mastricola Upper Elementary School	5-6	Good
Merrimack Middle School	7-9	Excellent
Merrimack High School	9-12	Good
Superintendent's Office	N/A	Poor
Special Services Office	N/A	Poor
Maintenance Facility	N/A	Excellent

Source: Merrimack School District

Five of the six schools were constructed in 1949, 1961, 1965 and 1968. Over time the schools were expanded to accommodate increasing enrollments. The facilities in excellent condition were built in the last ten years. The Superintendent's Office and Special Services Office were built in 1973 and 1979 respectively. Each was a private, ranch style home renovated into office space.

As of September 2011, total enrollment in the Merrimack School District is 4,205 students, including pre-kindergarten, early intervention enrollees. The student-teacher ratio is 23:1. Projections show that enrollment will continue to decline for a variety of reasons including decrease in the number of families with school-age children in Merrimack and a national trend toward a smaller household size. Enrollment peaked during the 2000-2001 academic year when it reached 4,941 students and it has been declining since then. Although there have been fluctuations, this trend has affected all schools in Merrimack. Enrollment is projected to decrease to 3,761 by 2016 and then it would start to level off in the subsequent years, although projections beyond five years are less reliable. School facilities, including the

11 Response to questionnaire by Marge Chiafery, Superintendent, Merrimack School District, January 2012; interviews with Marge Chiafery and Matt Shevenell, February 2012.

number of classrooms and size, are deemed to be adequate to meet current needs, and thus have adequate capacity for the foreseeable future and no expansion is anticipated. **Table 8-5** shows enrollment figures and projections from the 2000-2001 academic year through 2016-2017.

Table 8-5: Merrimack's School District Enrollment Figures and Projections, 2000 – 2016

Academic Year	Kindergarten – 12th Grade Enrollment
2000-2001	4,851
2001-2002	4,837
2002-2003	4,817
2003-2004	4,749
2004-2005	4,617
2005-2006	4,713
2006-2007	4,643
2007-2008	4,539
2008-2009	4,445
2009-2010	4,320
2010-2011	4,240
2011-2012	4,129
2012-2013	4,032
2013-2014	3,926
2014-2015	3,870
2015-2016	3,808
2016-2017	3,761

Source:: Merrimack School District for enrollment figures through 2011-2012; New England School Development Council for future projections

Recreation facilities at the schools are prioritized for school use before use by the public or the MYA. There are three playing fields at the Reeds Ferry Elementary School, but they are not really used by the school given the age of the students, so the MYA uses and assists in maintaining them. The Merrimack High School football/soccer field has lights, thereby allowing the fields to be used in the evening. Artificial turf is being considered to extend life and functionality of field. The high school also has another soccer field and a practice field. The middle school has a soccer/baseball field and a softball field. The Mastricola Upper Elementary School has a softball and a soccer field, and the Mastricola Elementary School has one soccer/lacrosse field. The School District takes the primary responsibility for the maintenance of the school fields. Additionally, there are two playgrounds each at the Reeds Ferry and Thorntons Ferry Elementary Schools.

The School District employs 722 employees. The composition is as follows: 28 administrators; 364 professional staff including teachers and other educators such as speech therapists and school counselors; and 330 support staff such as food service workers, maintenance workers and para-educators.

The Merrimack School District contracts with a private vendor to provide general and special education transportation. The school district owns four pickup trucks with plows and four vans.

The Merrimack School District has a Capital Improvement Plan approved on an annual basis by the School District's Planning and Building Committee, the Merrimack School Board, and the Planning Board. The most significant projects for the foreseeable future will be roof repairs/replacements (at every school except the Mastricola Upper Elementary School), paving and parking lot improvements (at every school except the Middle School), and asbestos removal (at the High School, Middle School, and Mastricola Elementary School).

The office space is inadequate because there is not enough space for the current staffing level, which is not expected to increase. The work space is considered to be less than ideal because desks and offices are located in spaces that are not suitable, such as under a stairwell. There is not enough space for records storage and there is no meeting space in those buildings. Recent flooding exacerbated this situation. Consolidation of the offices is on the CIP.

The biggest challenge the District faces in the immediate future is upgrading the network infrastructure that was installed ten years ago. This includes replacing switches, routers and miscellaneous servers throughout the system. Over the years, the on-site computer equipment has been expanded and upgraded, but its efficiency is held back due to shortcomings in the infrastructure that supports it. Improvements to the system will provide better service and communications for students, staff and parents. Replacement of the hardware to support system is on the CIP and is expected to be phased in over the next few years.

8.4 Community Facilities Recommendations

Merrimack, like many other communities in New Hampshire, is facing an uphill battle in trying to meet the needs of residents and businesses to provide cost effective services and to maintain and improve its public facilities. The Town, through its Capital Improvement Planning process, recognizes the need to plan, schedule, and budget for its capital investments.

Historically, the Town has established capital reserve funds for a variety of specific projects, building improvements, and equipment, which had as much as $7 million set aside for such purposes. Eventually, those funds were returned to residents in the form of tax relief, so the Town was in a position to try to replenish the funds over time. In FY 2013 almost $1 million has been set aside for capital improvements in addition to approximately $800,000 specifically for road work.

The funding situation is exacerbated by two primary factors that were out of the Town's control. First, the nation faced a significant economic downturn during the 2008 recession, which stressed municipal budgets across the country. Second and somewhat related, the State of New Hampshire was not in a position to honor many of its funding obligations. The Town is now committed to continue to replenish these funds on an annual basis.

Capital Improvement Planning[12]

C-1 The Town should establish a systematic process for developing, maintaining and implementing a CIP. The Town should continue its capital improvement planning process and update it on a regular basis. However, much of that planning is done by the individual departments, as well as by the MVD and the School District. These CIP's are presented to the Planning Board for review and approval. While that helps to establish priorities for each department, the plans need to be looked at in a more coordinated and comprehensive manner so that the Town can better prioritize needs on a town-wide basis across all departments.

A detailed, carefully documented CIP is just as common as an annual operating budget, especially so that it can provide solid legal ground for impact fees (see recommendation below). In addition, it is almost always carried out under the direction of a planning department (note that the CIP is reviewed by the Planning Board in Merrimack) because capital improvements should relate rationally to a community's master plan or comprehensive plan.

By way of background, a CIP is typically a six-year financing plan for a series of agreed-upon capital projects. Projects anticipated to extend beyond the plan's six-year window should be memorialized in an appendix or future projects list, and revisited as the plan is updated each year. Developing a CIP is not difficult, but developing a long-range CIP that a community can actually implement requires all of the following:

- A complete, descriptive inventory of existing assets – real estate, equipment, vehicles, infrastructure, and other items defined as a capital project under local policy;
- An assessment of the lifespan of existing assets;
- Criteria for evaluating and ranking capital project requests;
- A roster of current and anticipated near-term capital funding requests from town departments and the schools, including a description of each request, the time required to start, carry out and complete each request, and the estimated capital and operating costs associated with each request;
- An analysis of potential funding sources on a project-by-project basis, i.e., a determination of each project's eligibility for general fund, enterprise fund, recreation fees, grants, developer contributions, bonds, proceeds from sale of existing assets, and so forth, and the approximate amounts that should be contributed from each source;
- Six-year financial goals for the town;
- Debt evaluation standards;
- Local revenue projections, and a transparent methodology for preparing them;
- An analysis of the CIP's impacts on the tax rate, cash reserves, enterprise reserves, and bonding capacity; and
- A financing plan for all projects included within the CIP.

Years of deferred maintenance will aggravate the condition of facilities that need to be renovated, replaced or expanded such as Library and the Highway Division Garage. Substantial funds are needed to meet these needs and with all these pressing requirements, it is necessary to address the long-term priorities for making improvements, recognizing that continued deferral of these expenses will result in ever increasing expenses over time.

12 Terry Holzheimer, FAICP, Capital Improvement Programming, PAS QuickNotes No. 25, a publication of the American Planning Association's Planning Advisory Service (PAS), April 2010.

Essentially, the Town needs a more coordinated CIP process that takes holistic and comprehensive view of all the Town's capital needs. The process needs to allow for the integration of recommendations from various plans and studies with other capital needs. An example can be found in the Merrimack Athletic Fields Plan where the Athletic Fields Needs Committee proposes new fields at a Turkey Hill Athletic Complex, which is on land utilized by the Highway Division.13

An effort should be made to share information and resources between different departments, MVD and the School District. The Town needs to look for opportunities to break down the "silos" between municipal functions and enhance more efficient resource allocation to limited resources go further. The Town needs to develop a program for comprehensive capital planning to look at the "big picture" in setting budget priorities.

The Town should also consider developing a town-owned property inventory for the CIP to identify surplus property and conduct an assessment of a site's suitability for municipal facilities or open space. The properties should be ranked by relative importance to the Town, based upon criteria that are established for potential suitability to meet the Town's needs.

To that end, the Town should establish Capital Improvement Planning Committee and charge it with the organization and oversight of the CIP; to conduct a consensus process for ranking capital project requests, with staff support from the Community Development Director, Finance Director, and School Business Administrator; identify potential sites for municipal facilities; and monitor progress toward implementation. The Committee would start with the planning efforts that have already been undertaken by each department as referred to in this chapter. A new or updated capital plan should be prepared and updated on an annual basis.

Impact Fees

What is an Impact Fee?

An impact fee is a charge on new development to pay for the construction or expansion of off-site capital improvements that are necessitated by and benefit the new development.

C-2 The Town should consider impact fees as a means to create another source of funding to meet future capital needs. While not a panacea, impact fees can offer an opportunity to bridge the funding gap to provide improvements needed to encourage and support appropriate development. Among other things, impact fees can be used to fund school, park, road, water, sewer improvements. Before impact fees can be implemented, there is a planning process that the Town must undertake a capital improvement planning process to identify what additional capital needs are required to accommodate projected growth. This includes an assessment of the cost and timing of the improvements in order to ascertain the fee to be assessed (typically on a per home basis for residential development and a square footage basis for commercial and industrial development).

There are some important legal caveats to consider including:

- Impact fees cannot be used for staffing.
- Impact fees cannot be used to address existing deficiencies – only future projected shortfalls resulting from new development.

13 Merrimack Athletic Fields Plan, Report of the Athletic Fields Needs Committee, p. 21, October 2010.

- Funds raised through impact fees must be accounted for in a fund separate from the municipal general fund.
- Projects for which the fees are used must provide a direct benefit to the development from which the fees were received.
- Impact fees need to be encumbered within a certain period of time or they must be returned to the developer. New Hampshire law has established that the maximum amount of time is six years.[14]

Specific Department Needs

C-3 Fire and Rescue Department: A long term goal of the Fire and Rescue Department is to work toward putting forth a plan to build a fire station combined with emergency ambulance services, and house an engine company in the Northwest section of Merrimack. By doing this, response times in that section of the community will be greatly decreased allowing for quicker and more efficient service to an area of the Town that is expecting potentially significant growth.

The Town should also continue to evaluate the options for an upgrade to the existing South Fire Station or the construction of a replacement on Continental Boulevard. To accomplish this, the Town should conduct a comprehensive plan for fire and emergency services to address future town-wide needs.

C-4 **Parks and Recreation Department:** Continue maintenance of existing parks. Many cities and towns establish routine maintenance plans that describe what is to be done at each park and ball field on a revolving basis to address short-term maintenance issues and identify where repairs are needed so that they do not become long-term problems into the future. This can also help to extend the life of each field and minimize the effects of overuse. The Town needs to review and update the original 2010 plan to ensure that there are contingency plans in place in the event that the playing fields located on industrial property are no longer available. The Town should conclude an agreement with the Manchester YMCA to establish a plan of usage for their new fields being developed off Wright Avenue. In the event that the playing fields located on industrial properties are no longer available, the Town should develop a plan for the replacement of those fields.

C-5 **Library:** A modern library, as a source of knowledge, culture, literature, arts, music, and a community gathering place in good times and when emergencies arise is an essential element of Merrimack's public infrastructure. Although the library of the future may look and act much differently in the way it serves the community and uses technology, its core function to provide community access to knowledge resources is vital for the foreseeable future. To meet that core function, Merrimack's public library must develop and execute a vision for a 21st century public community library. The Library Board of Trustees has been examining a number of possibilities for replacement of the current library facility. The Library needs to stay relevant with the latest technologies so that it can provide the services to meet the needs of the Town's residents. Once a recommendation has been brought forward, the Town should incorporate it into the CIP process as described above.

14 See NH RSA 674:21.

C-6 **Public Works Department:** The Town should move forward with the designing and construction of a new Highway Garage and PWD administrative office facility as proposed in the Capital Improvements Plan.

C-7 **School District:** The School District should plan for and design new Superintendent's Office and Special Services Office to meet their future needs.

Regionalization of Services

C-8 With growing fiscal constraints, it has become more difficult for municipalities in southern New Hampshire to provide services in a cost-effective manner. As an alternative, municipalities around the country have considered ways in which supplies can be purchased and services provided across municipal boundaries. Examples include inter-municipal agreements to provide public safety, solid waste disposal, library, and public works services and shared facilities.

Although there are some challenges to implementation of a regional approach to the sharing of municipal responsibilities, such as funding disparities between small and large municipalities, control of budgets and services, and potential resistance among employees, the Town should attempt to work with the Nashua Regional Planning Commission and neighboring communities to begin a dialog on options for shared services and facilities.

Sustainability and Energy Efficiency

C-9 The Town should take a leadership role in "greening" Merrimack through its operations, governance, and management. This is particularly true with respect to municipal buildings and facilities. As an example, the Town has been upgrading energy efficiency in some municipal buildings and seeking ways to reduce energy costs across all municipal operations. These are substantial projects that can serve as models for making cost-effective, sustainable planning and building practices part of project design, planning, construction, and operations.

9. Transportation

9.1 Introduction

The Master Plan Update 2002 identified several critical areas of concern relative to existing congestion, transportation deficiencies, and the lack of connectivity within the Town. In addition, the need to create a long-term transportation plan that accommodates mobility within the community for its residents, businesses and visitors and promotes development consistent with the Town's vision was also identified. Key recommended actions from the 2002 report are summarized below with an update on the progress completed to date.

- Continue to work with the state and regional officials toward implementation of the Manchester Airport Access Road (MAAR) to improve access to the Manchester Airport for Merrimack residents and businesses while also improving access to northern Merrimack's commercial and industrial areas to the F.E. Everett Turnpike. The MAAR, now formally named Raymond Wieczorek Drive, was completed and opened for public travel

in the fall of 2011. The new interchange provides full north and south access between the F.E. Everett Turnpike and US Route 3 in Bedford, just north of the Merrimack town line. This interchange partially filled a gap in the regional transportation system for northern Merrimack residents and businesses where the existing F.E. Everett Turnpike Exit 12 configuration only provides ramps to/from the south. Previously motorists in the northern portion of the Town wishing to travel to/from the Turnpike north would have to travel via US Route 3 to the I-293/NH Route 101 interchange in Bedford to complete this trip or travel south to the Exit 11 interchange.

- Work with state and regional officials to achieve development of a full interchange at Exit 12 of F.E. Everett Turnpike to improve access for residents and businesses of northern Merrimack, improve access to undeveloped commercial and industrial land and to reduce traffic through the urban compact portion of Route 3.
  At this time, this project is not included in the State's Ten Year Plan.
- Continue to monitor the potential impact of the Circumferential Highway, the Manchester Airport Access Road and other planned improvements to the state and regional highway system on Merrimack's existing street and highway system. The remaining, unconstructed segments of the Circumferential Highway project are no longer currently being pursued by the New Hampshire Department of Transportation (NHDOT).
- Continue to encourage the removal of the ramp tolls at Exits 10, 11, and 12 consistent with a comprehensive strategy of toll removal that would avoid undue traffic impacts to Merrimack's existing street and highway system.

  In 2010, the NHDOT Bureau of Turnpikes conducted a study to evaluate the potential economic impact of removing one or more of the toll facilities located in Merrimack. At this time, there are no formal plans to remove the local toll facilities.
- Implement the improvements recommended in the 1999 Louis Berger study for the Route 3 Urban Compact area.
- The August 2000 final report for the corridor study focused on nine intersection locations along US Route 3 including: Bedford Road, Front Street, Wire Road, Baboosic Lake Road, Connell's Shopping Center, Merrimack Village Mall, Columbia, Circle, Shaw's Plaza, and Greeley Street. One notable improvement project was constructed along the corridor at the intersection of Bedford Road. This project occurred as a result of construction of the Walgreen's site and included widening US Route 3, traffic signal upgrades and modifications, and access management improvements.
- Support the extension of passenger rail service into New Hampshire including the provision of one passenger rail station in Merrimack and continue to work with state and regional officials toward implementation.
- In 2012, the NHDOT published its first NH State Rail Plan since 2001. This plan was prepared in accordance with the requirements of the Passenger Rail Investments and Improvements Act of 2008, making NH eligible to apply for federal funds on passenger rail projects in the future. The State maintains the opinion that passenger and freight rail is an important component to the NH and regional transportation network. A February 2011 Granite State Poll conducted by the University of New Hampshire Survey Center indicates that 87 percent of those surveyed strongly or generally favor extending rail into NH from Nashua to Manchester, including the Manchester-Boston Regional Airport.

Efforts to extend passenger rail into southern New Hampshire remain a priority and are on-going.

- Continue to expand the Town's sidewalk system per the Town Center Plan, the Subdivision Regulations and Capital Improvements Plan to create a sidewalk network on all arterial and collector roads that would eventually connect residential areas with commercial and industrial areas, schools, parks, and other private and public institutions and facilities. Encourage sidewalks to be included in all state and local road improvement projects.
- The Town of Merrimack has actively pursued the construction of sidewalk throughout the community through state and locally funded projects, as well as through private development projects. The November 2009 Merrimack Town Center Pedestrian and Trail Master Plan documents existing sidewalk and trails, as well as planned future needs, for US Route 3 and surrounding roadways in the Town Center area which generally extends from Front Street to the north, Railroad Avenue to the south, and Baboosic Lake Road and O'Gara Drive to the west. To better address sidewalk maintenance, the Capital Reserve Plan for sidewalks should be re-instituted by the Town.
- Expand the existing bicycle network along existing roadway corridors through widening and striping, paving unpaved shoulders, through the development of new off-the-road paths and through utilization of existing Class VI roads.
- Efforts on creating a bicycle network are on-going and partially documented by the November 2009 Merrimack Town Center Pedestrian and Trail Master Plan. A new pedestrian bridge was built in 2012 across from the Souhegan River as part of the Town Center Plan. In addition, the June 2005 Regional Bicycle and Pedestrian Plan prepared by the Nashua Regional Planning Commission (NRPC) identified US 3 (Daniel Webster Highway) and Continental Boulevard within the Town of Merrimack as two key routes for regional connectivity. While the Town Center Plan is a good start to providing a basis for non-vehicular planning in Merrimack, there is still a need for a comprehensive, town-wide bicycle and pedestrian plan.
- Consider implementing traffic calming techniques such as curb bump-outs, lane shifts, roundabouts, and roadway narrowing to improve bicycle and pedestrian safety, reduce traffic speed in new or existing residential neighborhoods.
- Efforts to improve neighborhood streets are on-going.

As noted, the community has successfully initiated and/or completed some of the recommended actions. This chapter proposes strategies to enhance the Town's plans moving forward. The following section outlines general goals that should be considered while updating the Town's transportation plans.

9.2 Transportation Goals

The overall goal is to plan and promote the development and maintenance of a comprehensive transportation system serving the community inclusive of residents of the Town of Merrimack, as well as employees who work within the Town and visitors with destinations in the Town. Transportation planning should be carried out in a manner consistent with the Town's anticipated future needs and resources, coordinated with State and regional

plans, and inclusive of plans for highways, bikeways, sidewalks and pedestrian ways. Specific transportation goals for consideration, not in any priority order, are:

- Promote and implement a roadway system that encourages the appropriate use of the Town's street system to:
  - reduce traffic volumes and travel speeds on local roads and within residential neighborhoods
  - relieve congestion on some of the Town's major travel routes, and
  - proactively anticipate changes in the local roadway system as a result of future development or changes in the travel demand.
- Plan, develop, and maintain a system of bicycle and pedestrian ways serving the residents, including linkages among neighborhoods and local connections across the F.E.E. Turnpike to the US Route 3 corridor.
- Develop a town-wide plan to prioritize the needs for additional sidewalk and pedestrian way construction throughout the Town and to plan for funding of the plan implementation.
- Establish a separate Capital Reserve Fund for sidewalk and pedestrian way construction.
- Coordinate land use planning with transportation planning to ensure that land use does not overburden the capacity of the Town's transportation system, so that:
  - land development and related transportation improvements are coordinated as to timing,
  - individual components of the transportation system are appropriately utilized, and
  - the ability to expand the transportation system is preserved where necessary.
- Promote and provide for mixed-use, higher density development, where appropriate, that will enable less use of the automobile.
- Provide for the enhancement of aesthetics associated with any planned transportation infrastructure improvements.
- Provide for the safety of all motorists, pedestrians, bicyclists, and travelers on and within the Town's transportation system through the implementation of appropriate design standards for improvements; improve and/or upgrade traffic control devices (such as signage, pavement markings, and lighting) in specific areas where deficiencies currently contribute toward public safety concerns and/or as opportunities arise.
- Promote the management of traffic operations on the roadway system by maintaining acceptable levels of service on the arterial and collector streets, by improving the efficiency of the existing system, and by the timely implementation of traffic operational improvements.
- Continue to seek the cooperation of the NHDOT and the NRPC in monitoring and evaluating traffic flow and safety problems on State highways, and in coordinating transportation planning within the Town.
- Establish a multi-modal approach to the Town's transportation system, including pedestrian and bicycle travel as well as future consideration for bus and rail service, in order to assist in reducing the dependency on automobiles for travel, and thereby reducing the need to increase capacity on the roadway system.

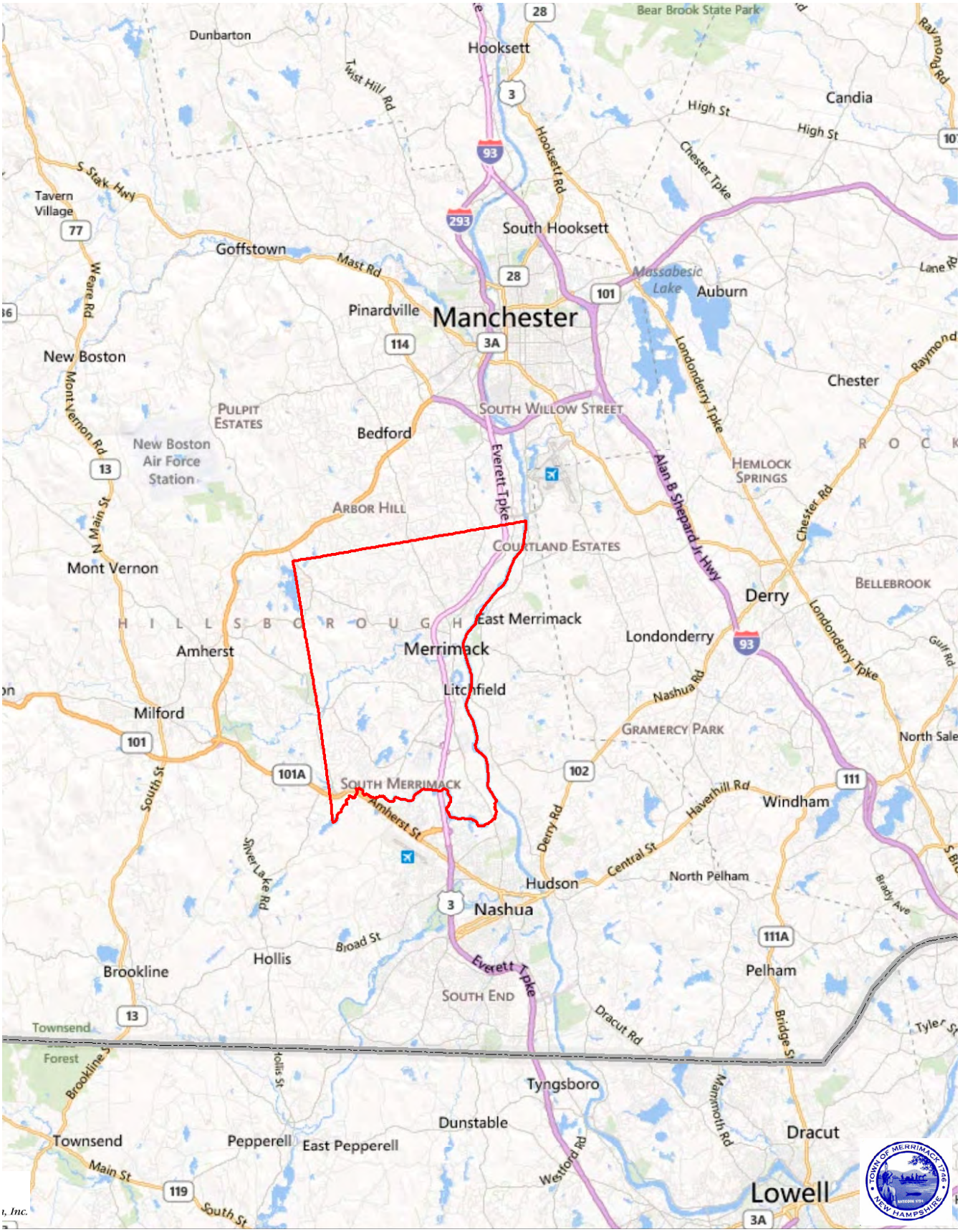
- Seek adequate funding from public and private sources including through grants, fees, and exactions to support the expansion, improvement, operation, and maintenance of the transportation system

9.3 Regional Context

Centrally located in southern NH, Merrimack is ideally situated near one of the State's three major north/south transportation routes - the F.E. Everett Turnpike. This highway borders the Town to the east, paralleling the Merrimack River, and provides convenient travel to/from Massachusetts to the south and NH points of interest to the north. Using the interstate and turnpike systems, the Town of Merrimack is within driving distance to several major cities including: Manchester, NH (11 miles north); Concord, NH (27 miles north); Nashua, NH (8 miles south); Lowell, MA (25 miles south); and Boston, MA (43 miles south). Locally, F.E. Everett Turnpike provides a direct link to I-293 in downtown Manchester and to Route 101 in Bedford, which directly abuts Merrimack to the north (see **Figure 9-1**).

Beyond the F.E. Everett Turnpike, regional and local travel in Merrimack is primarily served by US Route 3 (commonly referred to as the Daniel Webster Highway) and NH Route 101A, with a majority of the local roadways classified as Class IV Compact or Class V Rural/Local. NH Route 101A is a major east-west roadway in southern NH extending from the F.E. Everett Turnpike in Nashua, west to NH Route 101 in Milford. NH Route 101A only accounts for 0.8 miles of roadway within the town limits, but is significant due to its intersection with Continental Boulevard which serves both residential neighborhoods and commuters to/from industries and businesses within central Merrimack. US Route 3 (Daniel Webster Highway) runs north-south through Merrimack, paralleling both the Merrimack River to the east and F.E.E. Turnpike to the west. US Route 3 extends the entire length of the State of NH from Massachusetts to Canada. Locally, US Route 3 connects Merrimack to the City of Nashua to the south and the Town of Bedford and the City of Manchester to the north. Both NH Route 101A and US Route 3 provide accessibility to the turnpike system which creates a situation where a significant volume of commuter traffic relies on these roadways resulting in peak hour congestion.

Figure 9-1: Regional Context Map



9.4 Other Planning Documents and Studies

9.4.1 Capital Improvement Plan (CIP)

In 1984, the Merrimack Town Planning Board was required via a Town meeting to prepare and maintain a six-year capital improvements plan ("CIP") to aid the Budget Committee in its consideration of annual budgets. For CIP purposes, the Planning Board defines "capital expenditure" as the purchase, construction, or improvement of land, buildings, infrastructure, or equipment having an associated cost of $100,000 or more and an estimated useful life of at least seven years.

The transportation improvements planned within the most current CIP (2011-2018) include one signalized and two unsignalized intersection projects. Signal improvements are planned for the Front Street and Baboosic Lake Road intersections at US Route 3 for 2014 - 2015. Unsignalized improvements, and possibly the installation of roundabouts, are planned for the intersections of Wire Road at US Route 3 (2014 - 2015) and Turkey Hill Road at Baboosic Lake Road (2015 – 2016).

9.4.2 Town Center Pedestrian and Trails Master Plan

In 1999 and heavily pursued in 2009, Merrimack defined a Town Center Pedestrian and Trails Master Plan to promote a closer knit community and increase safety efforts along US Route 3 and expand accessibility for neighboring homes and businesses. This sector of Merrimack (historically Souhegan Village) contains all of the municipal and public buildings, as well as many businesses and parks that service the area of the Town where the Souhegan River empties onto the Merrimack River. The plan includes developing new sidewalks, as well as connecting existing sidewalk, to promote foot traffic between residents and the Town center. Other aspects of the plan include enhancing pathways and hiking trails within the Town Center neighborhood with future consideration to expand upon these trails for connectivity to the rest of the Town.

To promote non-motorized travel within the Town Center for visitors, the Town of Merrimack understands that centralized parking is crucial for the success of this program. While there is ample parking located at both public and private entities, there is a need to better communicate the location and duration of available parking to visitors.

9.4.3 State's Ten Year Transportation Improvement Plan 2013-2022

The only project in the State's Ten Year Transportation Improvement Plan that could influence the transportation system in the Town of Merrimack is the relocation/expansion of the Bedford Mainline Toll Plaza on the F.E. Everett Turnpike for open road tolling. This project is currently estimated to begin in 2015 through 2016; however, funding is dependent on a system-wide toll increase. The Town of Merrimack should work closely with the state and regional officials involved in the expansion of the mainline tolls and their effect on access to the northern portions of Merrimack, as well as potential development in this region.

Other projects that could affect the transportation system in Merrimack have been determined to be unfunded or deferred under the 2013-2022 Transportation Improvement Plan. The projects deferred or unfunded from the plan include widening NH Route 101A into Merrimack by one lane (deferred) and widening F.E. Everett Turnpike consistently from Nashua through Merrimack into Bedford (unfunded).

9.5 Transportation Network

Mobility in and around Merrimack is the central theme of the Transportation Element of the Master Plan. The following sections describe the components that comprise the transportation network in Merrimack.

9.5.1 Functional Classification and Roadway Jurisdiction

The functional classification of a roadway is an indicator of the type, volume, and speed of traffic it is intended to accommodate. The NHDOT sets the functional classification of roads throughout the State in cooperation with the Federal Highway Administration (FHWA). These functional classes were set according to the criteria defined in by the American Association of State and Highway Transportation Officials (AASHTO). The functional classifications were developed to define eligibility for funds under federal programs.

The Town of Merrimack has also developed its own functional classification system using the criteria for functional class set by AASHTO guidelines. However the Town's functional class system is different from the NHDOT's system because the State is limited in the amount of mileage it can dedicate to each class due to federal rules. The Town's functional classification system is defined in its subdivision regulations. The State and Town functional classification systems for Merrimack roads are shown in **Table 9-1**. The roadway jurisdiction is presented in **Table 9-2**.

Source: NHDOT, State-Aid Classification System

Source: Town of Merrimack Subdivision Regulations

Table 9-1: Roadway Functional Classification

NHDOT Functional Classification	Town of Merrimack Classification
Freeway / Expressway:	**Major Arterials:**
F.E. Everett Turnpike	Continental Boulevard
	US Route 3
Principal Arterial:	
NH Route 101A	**F.E. Everett Turnpike**
US Route 3 (Nashua to Industrial Dr.)	Greeley Street
	Industrial Drive
Minor Arterials:	NH Route 101A
Continental Boulevard	
Industrial Drive	**Minor Arterials:**
Tinker Road (Continental Blvd. to Nashua)	Amherst Road
US 3 (Industrial Dr. to Bedford)	Baboosic Lake Road
	Bedford Road (east of Wire Road)
Collector:	Boston Post Road
Peaslee Road	Camp Sargent Road
Boston Post Road	McQuestion Road
Bedford Road	Naticook Road
Joppa Road	
Amherst Road	**Collector:**
Baboosic Lake Road	Back River Road
South Baboosic Lake Road	Bean Road
McQuestion Road	Bedford Road (west of Wire Road)
Turkey Hill Road	Joppa Road
Stuart Road	Manchester Street
Naticook Road (Continental Blvd. to	Meetinghouse Road
Amherst Rd.)	Patten Road
	Pearson Road
All other roads are local roads.	Seaverns Bridge Road
	Tinker Road
	Turkey Hill Road
	Wilson Hill Road
	Wire Road
	All other roads are local roads.

Table 9-2: Roadway Jurisdiction

Roadway	Responsible Party
F.E. Everett Turnpike	State
NH Route 101A	State
US Route 3 from Bedford Town Line to Bedford Road & from Greeley Street to Nashua Town Line	State
US Route 3 from Bedford Road to Greeley Street	State Road/Local Maintained (Urban Compact)
Bedford Road from US Route 3 through Exit 12	Local Road/State Maintained
Greeley Street from US Route 3 to Amherst Road	Local Road/State Maintained
Continental Boulevard from Industrial Drive to NH Route 101A	Local Road/State Maintained
Industrial Drive from US Route 3 to Exit 10 NB	Local Road/State Maintained
Industrial Drive west of Exit 10 SB to Continental Boulevard	Local Road/State Maintained
All Other Roadways	Local

Source: Nashua Regional Planning Commission, May 2007

9.5.2 Commuting

According to 2011 statistics published by the Economic and Labor Market Information Bureau[1], 27.4 percent of Merrimack residents are also employed within Merrimack. The majority of Merrimack residents, 54.4 percent commute to another community within NH, while the remaining 18.2 percent of the residents commute out-of-state. The 2010 Census reported the total number of commuters in the Town to be 13,931. Commuting times for Merrimack residents vary from less than 5 minutes to more than 45 minutes, with the majority of commuters (35.4 percent) traveling an average of 15 to 24 minutes. **Table 9-3** summarizes the commute times for Merrimack residents resulting from the 2010 Census.

Table 9-3: Commuting to Work

Commuting Time	Percent of Commuters
< 5 minutes	1.2%
5 to 9 minutes	10.0%
10 to 14 minutes	11.4%
15 to 19 minutes	17.7%
20 to 24 minutes	17.7%
25 to 29 minutes	7.1%
30 to 34 minutes	11.1%
35 to 44 minutes	7.6%
45 minutes or more	16.2%

Source: 2010 Census, www.census.gov

1 Economic and Labor Market Information Bureau, NH Employment Security, 2011.

9.5.3 Mode Share

According to the American Community Survey data from the NH Employment Security, approximately 94 percent of Merrimack residents (age 16 years or older) reported they drove to work; 87 percent reported that they drove alone and almost 7 percent carpooled. Approximately 5 percent of Merrimack residents reported that they work from home. Transit, walking, bicycling, and other modes accounted for approximately 1 percent. **Table 9-4** summarizes these findings.

Table 9-4: Mode Split

Mode of Transportation	Percent of Commuters
Drove Alone	87.0%
Carpooled	6.8%
Public Transportation	0.5%
Walked	0.2%
Other Means	0.5%
Worked from Home	5.0%

Source: NH Employment Services, American Community Survey, 2011

9.5.4 Vehicular Traffic Volumes

Collector roads in Merrimack carry a considerable amount of commuter through traffic from adjacent towns such as Bedford, Amherst, etc. Mainly this is traffic seeking access to the F.E. Everett Turnpike at Exits 10, 11 and 12. Amherst Road, Wire Road, Bedford Road, Back River Road, and Continental Boulevard are especially impacted by this traffic.

Historical traffic data provides an indication to the rate of traffic growth in and through Merrimack. **Table 9-5** in Appendix C summarizes the growth on various roadways throughout Merrimack over the past 10 years (2001 – 2011) based on information available from the NHDOT. As shown in the table, volumes on US Route 3 appear to have declined slightly since 2001, while volumes on the F.E. Everett Turnpike have experienced very little growth. The local roadways have experienced low to moderate growth rates generally ranging from approximately 0.5 percent to 2 percent per year, with the exception of Tinker Road which reported a growth rate of approximately 4 percent per year. On average the overall growth throughout Merrimack was approximately 1 percent per year.

9.6 Public Transportation

Public transportation in Merrimack is very limited. There are no bus lines that service the Town of Merrimack from either the Manchester Transit Authority (MTA) or Nashua Transit-system (NTS).

9.7 Pedestrian and Bicycle Facilities

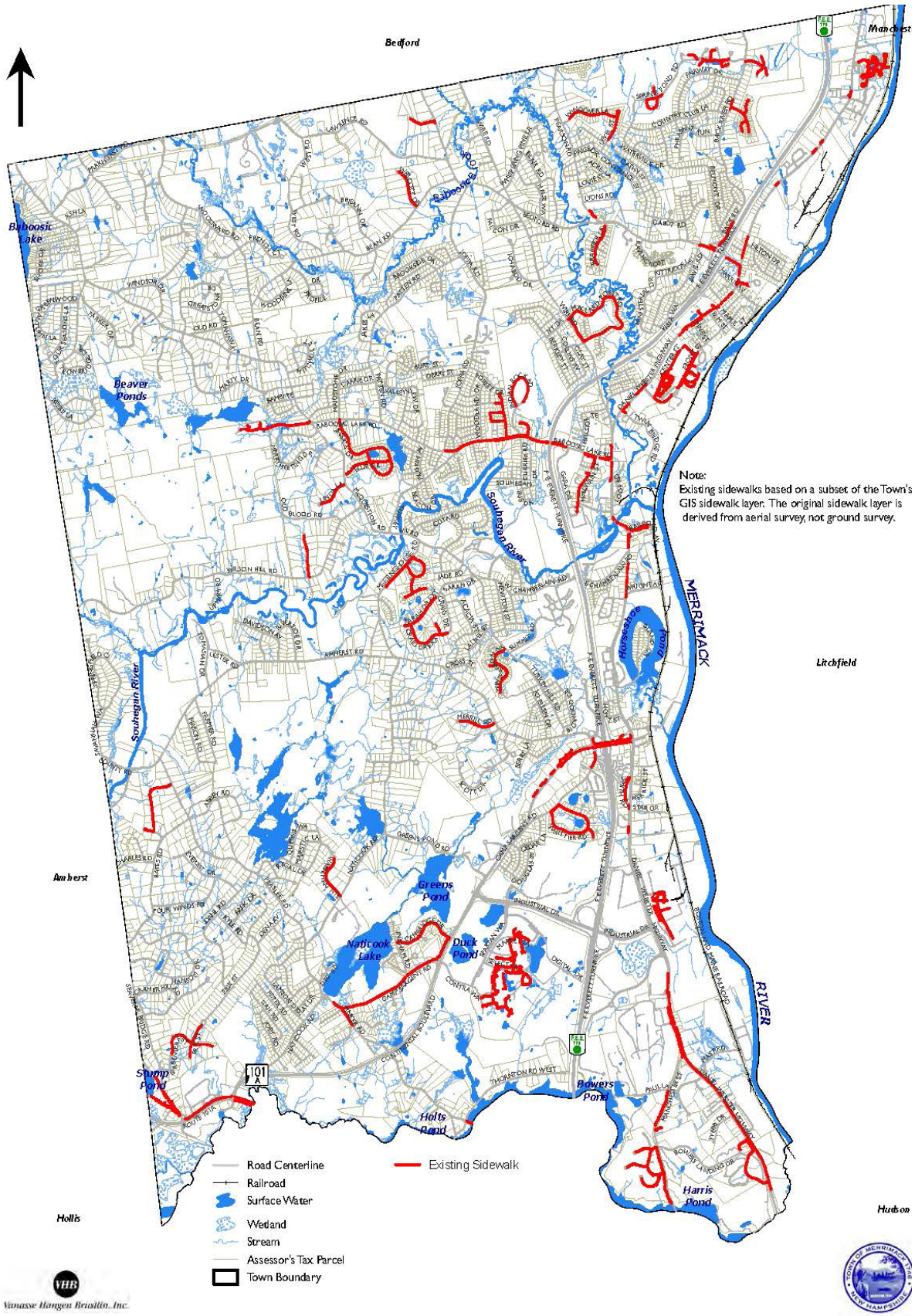
Past studies conducted by the Town have concluded that the lack of continuous, safe, and accessible pedestrian and bicycle facilities are a contributing factor in the Town's dependence upon motorized transportation. Through the Town Center Master Plan (1999, Updated November 2009) and the Nashua Regional Planning Commission's (NRPC) Merrimack iTRaC Project (2008), it became apparent that incomplete sidewalks, pathways, trails, and parks within the Merrimack Town Center (formerly Souhegan Village) creates an unfinished look and feel to the community. The following sections describe the existing non-motorized transportation facilities within the Town.

9.7.1 Pedestrians

As discussed previously, the Town Center Pedestrian and Trail Master Plan has established an inventory of existing sidewalks and trails, as well as established priorities for future connectivity in the Town Center area. Town-wide mapping of existing sidewalks beyond the Town Center area is shown in **Figure 9-2**. A review of the existing sidewalks across the community clearly show the lack of connectivity between neighborhoods, municipal buildings, schools, businesses and parks, as well as an inconsistent network for major crossings along busy roadways.

As part of the Town Center Pedestrian and Trail Master Plan, a new pedestrian bridge was built in 2012 across from the Souhegan River.

Figure 9-2: Town of Merrimack Sidewalks



9.7.2 Bicyclists

There are no official bike routes through Merrimack. New Hampshire has a series of seven state-wide bicycle maps and Merrimack is covered under the Merrimack Valley Region Map. The recommended bicycle routes in Merrimack are paved roads including Joppa Road, Wire Road (North of Joppa Road), US Route 3 (from Baboosic Lake Road south to Nashua), Continental Boulevard, and Tinker Road for north-south bicycle routes within the Town. Baboosic Lake Road and Amherst Road are identified as the east-west recommended bicycle routes.

9.8 Freight Rail – New Hampshire Main Line

The New Hampshire Main Line provides freight rail service within the Town of Merrimack, running parallel to the Merrimack River. The line is owned and operated by Pan Am Railways and runs for 39 miles through Nashua, Manchester, and Concord. The line is maintained to Federal Railroad Administration (FRA) Class 3 (40 miles per hour for freight) from Nashua to Manchester, Class 2 (25 miles per hour) between Manchester and Bow, and Class 1 (10 miles per hour) between Bow and Concord. Pam Am Railways operates the line from the Massachusetts state line to Bow and delivers unit coal trains and local freight to Nashua, Merrimack, and Manchester, and Concord.

9.9 Identification of Congested Transportation Facilities

The major transportation corridors in Merrimack experience heavy traffic demands during the commuter weekday morning and evening peak hour periods. Corridors such as US Route 3, Continental Boulevard at Exit 11, and Industrial Drive at Exit 10 not only accommodate the residential travel throughout the community, but also provide direct access to most of the Town's major businesses/employers including Fidelity Investments (6,000± employees along Industrial Drive), BAE Systems (800± employees along US Route 3), Anheuser-Busch, Inc. (530± employees along US Route 3), and Kollsman/ Elbit Systems of America (500± employees along US Route 3). In addition to the major commuting routes, other local roadways and intersections also experience the routine congestion during peak hour conditions.

Congestion along US Route 3 is notable along the northern segment extending from the Bedford town line to Greeley Street (Exit 11) due to the existing cross section, which only accommodates one through travel lane in each direction. Travel speeds tend to be slow during peak hour conditions and vehicle queues resulting from signalized intersections along this segment of roadway can be extensive. In the northern portion of Town, US Route 3 carries approximately 13,500 vehicles per day with an hourly traffic flow exceeding 1,200 vehicles per hour during commuter peaks. US Route 3 widens to generally a five lane cross section south of Greeley Street to Bowers Landing Drive, carrying two through travel lanes in each direction with a center left-turn lane. South of Bowers Landing Drive, US Route 3 transitions back to a two-lane roadway. At the Nashua/Merrimack line, US Route 3 carries slightly lower volumes than the northern portion with 12,000 vehicles per day and peak hour volumes approximating 1,100 vehicles per hour. Little to no access management exists along the US Route 3 corridor with numerous unsignalized side-streets and driveways.

Traffic congestion in the vicinity of the Greeley Street and Continental Boulevard at the F.E. Everett Turnpike 11 interchange also experiences peak hour congestion. Most notably, during the weekday evening peak hour, the heavy traffic flow from the interchange area to Amherst Road (which approximates 1,000 vehicles per hour) is restricted by capacity available at the signalized intersection of Amherst Road with Executive Park Drive and Burger King and the intersection's immediate proximity to the Amherst Road signal at Continental Boulevard and Greeley Street.

Further north on Amherst Road, the local unsignalized intersection at Turkey Hill Road also experiences long delays and congestion during peak hour conditions. A traffic control officer is currently assigned and necessary to control traffic at this intersection on weekdays from 7:00 AM to 9:00 AM. Turkey Hill Road, which operates under stop control, carries higher commuter hour traffic volumes than the Amherst Road mainline. Historical data collected at the intersection shows that Turkey Hill Road accommodates more than 1,000 vehicles per hour at Amherst Road during the weekday evening peak hour. Although through volumes on Amherst Road are unlikely to satisfy the standard criteria for signal installation, the volumes indicate that installation of formal turning lanes or possibly a roundabout may improve traffic flow. However, it is anticipated that right-of-way acquisition would be necessary to improve the intersection.

Continental Boulevard intersects NH Route 101A at a major, multi-lane signalized intersection in southern Merrimack. In the vicinity of NH Route 101A, Continental Boulevard carries more than 1,000 vehicles per hour for most hours throughout a normal work day with volumes in excess of 1,500 vehicles per hour during the weekday evening peak hour. Heading north into Merrimack, the roadway quickly narrows to carry a single through travel lane in each through the unsignalized intersection of Naticook Road and the signalized intersection of Tinker Road. It is noted that this section of roadway carries traffic flow of approximately 1,000 vehicles per hour during peak conditions, which h can create congested conditions. Further north, Continental Boulevard widens to accommodate additional travel lanes, including individual turn lanes, at the signalized intersections of Contra Way and Industrial Drive. Peak hour traffic flow tends to ease and be more balanced through the northern, multi-lane section. However, similar to the US Route 3 corridor, the northern segment of Continental Boulevard has numerous curb cuts with little or no access management.

As previously discussed herein, the Department of Public Works has also identified specific intersections in need of improvement, including the two unsignalized intersections of Wire Road at US Route 3 and Turkey Hill Road at Baboosic Lake Road. Both projects are included in the Town's CIP.

9.9.1 Traffic Safety

A review of Town-wide crash data obtained from the NHDOT revealed that crash frequency has remained fairly consistent for the most recent three-year period available (January 1, 2009 through December 31, 2011). In 2009, 355 crashes occurred on roadways within the municipality, including the F.E. Everett Turnpike. The total number of crashes increased

slightly with 363 crashes reported in 2010 and 371 crashes reported in 2011. On average, approximately 26 percent of the crashes reported occurred in the F.E. Everett Turnpike or associated ramps. Local roadways that tend to experience the higher number of crashes include those most heavily traveled in the Town, such as US Route 3, Continental Boulevard, Amherst Road, Greeley Street, Bedford Road, and Baboosic Lake Road. No unusual or unexpected crash trends were observed from the data review. However, it was noted that the NHDOT database indicates that there were no reported motorist or pedestrian fatalities during the 2009 to 2011 three-year period.

9.10 Future Conditions

Once the existing condition snapshot has been described, the next step in the planning process is to identify growth trends and changes in the area. These trends are often based on previous traffic volume patterns, past and forecasted population growth, the increase in older drivers, and major development projects. The following sections discuss ongoing planned future developments within Merrimack, as well as other potential development projects associated with the completion of the MAAR in Bedford and the Merrimack Premium Outlets (MPO).

9.10.1 Planned Development

The MPO project located off Industrial Drive opened Phase 1 of the retail component in June 2012. Phase II, which brings an additional 150,000 square feet of retail space, is planned for the near future. In addition to Phase II, an outparcel property located in the northwest corner of the intersection of Industrial Drive with Premium Outlets Boulevard presents a prime development opportunity for a supporting commercial site with complimentary land uses such as hotel, restaurant, or general services. Access to the MPO site was granted via an NHDOT Driveway Permit. For transportation permitting purposes, the MPO project was permitted for both phases of retail development and an assumption of full build out for the entire property.

9.10.2 Development Potential

Development potential within the Town will be largely driven by the land use decisions made by the community, perhaps with the greatest opportunities along the US Route 3 corridor. Recommendations within this Master Plan for the US Route 3 corridor include: allowing for mixed use as an infill style of development; allowing higher density development in the northern and southern portions of the US Route 3 corridor; and developing village nodes with traffic calming measures, pedestrian amenities, and streetscaping. The completion of the MAAR creates convenient access and opens the doors for development opportunities along the northern segment of US Route 3. The MAAR, combined with potential future transit and/or rail opportunities near the airport, creates an attractive environment for mixed use projects. Long-term transportation solutions for the US Route 3 corridor should be developed in concert with future land use and development, be multi-modal in nature, and balance traffic mobility with the needs of promoting an attractive community.

9.11 Transportation Recommendations

To meet the needs of the changing Merrimack population and related transportation demand, the Town should establish strategies toward addressing existing and future issues, problems, and opportunities. Below are suggestions based upon the data collection and findings of the planning process. These strategies aim to provide guidance in planning for the transportation needs in the Town.

T-1 Consider establishing an exaction fee system[2]. Several communities in NH have developed and successfully implemented town-wide or corridor-specific exaction fee systems that assist in funding the growing transportation needs of the community. Establishing a fee system based upon a capital improvement planning process will enable the community to develop an attractive long term vision with a funding mechanism that is fair and equitable for developers.

With an exaction system in place, the Town could actively promote development opportunities along the corridor to developers and/or tenants that bring land uses to the area consistent with the Town's vision and enhance the Town's tax base. A balance must be struck between meeting the Town's fiscal obligations and creating incentives for responsible growth. Promoting a long-term vision with an established funding mechanism may help developers see potential opportunities that may not otherwise exist.

T-2 Coordinate with Town of Bedford. The completion of the MAAR and potential for future commuter rail expansion to the area opens the potential for transformation along US Route 3 in Bedford and Merrimack. Land development and transportation infrastructure doesn't necessarily have to be divided at the municipal boundaries. Working in conjunction with the Town of Bedford could be beneficial and present more opportunity for both communities in the creation of a cohesive, attractive plan for the northern segment of US Route 3.

T-3 Continue to develop a town-wide pedestrian and bicycle plan. The success of the Town Center Master Plan should be used as momentum to continue to expand the bicycle trail and pedestrian facilities to other neighborhoods with the community. Challenges to expanding pathways and trails throughout the rest of the Town come from F.E. Everett Turnpike crossings, one of which the Town has already come across with the Merrill Maurader's Bridge within the Town Center Plan. Breaking the non-motorized barrier of transportation across the F.E. Everett Turnpike is the most important aspect of developing a more accessible community for residents living outside of these population centers.

The Town-wide pedestrian and bicycle plan must consider design and location standards so that incremental sidewalk construction projects can be integrated into a uniform network. The plan should also incorporate prioritization of sidewalk construction in various areas of town to support the potential for offsite sidewalk construction by developers in lieu of construction of sidewalks on the proposed development site.

2 Authorized by RSA 674:21,V

The Town should not expect to implement an expansive pedestrian and bicycle plan all at once. Having a formal pedestrian and bicycle plan already established will act as a reminder to implement pieces of the plan as opportunities arise. Opportunities for implementation could include state and federal grants to encourage student walking and biking, and private development projects or public works projects.

Upon completion of pedestrian and bicycle plan, implement revisions to the Subdivision and Site Plan Regulations regarding sidewalk requirements.

T-4 Support on-going and future rail and bus initiatives. Expanding passenger rail service into southern NH and the costs associated with it continues to be a large political debate. However, the Town should support this initiative as a means of reducing automobile dependency in the region and promoting alternative modes of transportation. If the State is successful in obtaining funding for a future rail project, the Town should work with the State and regional planning commissions to investigate what (if any) type of bus service should be extended into Merrimack to serve the residents and support potential new development along the northern areas of the Town.

In addition, the Town should continue to support initiatives to enhance existing freight rail services within the community and seek new opportunities associated with the development and redevelopment of land in proximity to the existing rail corridor. Freight railroads offer major advantages and public benefit over other modes of freight transport. Freight rail can significantly reduce roadway truck traffic; a single train can result in the elimination of an equivalent of 300 to 500 trucks trips. In addition, rail is environmentally friendly and offers an advantage with regard to greenhouse gas emissions. On average, railroads are three times more fuel efficient and emit significantly lower levels of nitrogen oxides and particulates than trucks.

T-5 Continue to require formal traffic impact assessments for development projects. The Town currently has a formal technical review process for private development projects, which includes the submission of a traffic impact study for moderate- and large-sized projects. The Town's Planning Board should continue to seek reasonable and clear mitigation commitments from development projects on surrounding roadways.

T-6 Implement access management strategies. The Town should pursue access management strategies along the high-traffic corridors of US Route 3 and Continental Boulevard as development and redevelopment opportunities arise. Consolidating driveways and interconnecting commercial developments will assist in reducing conflict points along these busy roadways and promote safer travel.

Transportation Policies Related to Transportation Planning

In addition to the above goals, the Town can also formally adopt policies that will serve as implementation strategies in support of the goals. The following identifies potential policies for consideration.

T-7 Maintain a continuous transportation planning program consisting of: the collection, maintenance, and dissemination of traffic information; staff and/or consulting resources to collect, analyze, and report on traffic problems; and continued coordination of transportation planning with other planning disciplines, most notably land use and environmental planning.

T-8 Continue to evaluate and adjust the operations of the highway network to promote its efficient use and safe function.

T-9 Promote a user-friendly roadway network for motorists by improving and/or upgrading traffic calming and control devices (such as roundabouts, signage, pavement markings, and lighting) in specific areas where deficiencies currently contribute toward public safety concerns and/or as opportunities arise.

T-10 Endeavor to maintain acceptable levels of service (LOS D or better) for peak hour conditions, recognizing that lower levels of service may occur at certain locations.

~~T-11 Continue to consider within the Town's land use regulations factors such as the number, design and location of access points; the provision for median islands to control access; the provision for left and right-turning lanes; internal circulation patterns; and the provision of pedestrian and bicycle facilities.~~

T-11 Preserve and/or acquire right-of-way for new or expanded streets in advance of need through purchase, official mapping, and developer dedications.

T-12 Promote education of the emergency response routes development by the NRPC[3].

T-13 Explore alternative, creative and affordable transportation services to meet the needs of an aging community.

Policies Related to Fiscal Capacity to Support Transportation Infrastructure

T-14 Continue to require that new development be responsible for site-related improvements needed to provide safe and adequate access to/from the site.

Policies Related to Connectivity, Traffic Calming, and Access Management

T-15 Establish a Capital Reserve Fund for sidewalk and pedestrian way construction.

T-16 Continue to implement traffic calming measures on local streets in residential neighborhoods to direct traffic to arterial and collector streets in order to protect residential neighborhoods from adverse impacts associated with increased traffic volumes and speeds.

~~T-18 Implement access management guidelines in order to provide safe and efficient access to abutting land uses and to maintain operational characteristics of a roadway.~~

3 See p. 24 of the Merrimack Hazard Mitigation Plan prepared by the Nashua Regional Planning Commission, 2003

Policies Related to Pedestrian and Bicycle Mobility

T-17 Continue to promote the inclusion of sidewalks in appropriate highway improvement projects, ensure the proposed provision for pedestrian access within developments, and provide for the proper integration of public and private pedestrian ways.

T-18 Ensure that pedestrian ways are designed to serve the needs of the handicapped.

T-19 Give priority to the designation and improvement of walking and bicycle routes to all schools and other recreational facilities in the Town.

T-20 Continue to incorporate provisions for bicycle lanes and/or paths in road construction and resurfacing projects where appropriate, whether publicly or privately financed.

Policies Related to Aesthetics of Transportation Infrastructure

T-21 Continue to require landscaping as part of site development projects; however, care should be taken to ensure that appropriate plantings are selected that do not hinder sight lines along the roadways and intersections as a result of growth and improper maintenance.

T-22 Promote the development of effective and aesthetically pleasing signage directing the traveling public to parks, recreational areas, and other attractions in Town.

~~T-25 Provide for visual and noise buffers along arterial and collector streets within and adjacent to residential neighborhoods.~~

10. Implementation

10.1 Introduction

The implementation element is based on the goals and objectives of this Master Plan and the data that was collected and analyzed.

All planning elements will be initiated by the Planning Board. The Town Council and other Town Boards, Commissions and Committees with the assistance of the Town staff should use this Master Plan as a guidance and policy document for the period of 2013 to 2023.

It is important to note that planning is a dynamic process and priorities can shift over time. A consistent review process allows for these issues to be acknowledged while keeping each specific recommendation on the table unless a situation dictates that it be reconsidered. A regular evaluation or follow-up procedure will at least indicate how a particular action item was ultimately addressed, or it calls out those that still need attention.

In order to ensure follow-through on the recommendations of this plan and provide some "accountability" for plan implementation, the Town should consider some mechanism for reporting on progress on a regular basis. This reporting should include updates on progress and achievements as well as information on barriers to implementation that have been identified. Some communities provide this information in annual reports to the Town Council. Others have developed a follow-up evaluation form that specifically lists each action item and asks for responses. The appointment of a Master Plan Implementation Committee could assist in the oversight and coordination of the plan's implementation.

The implementation plan intends to deliver on the promise of the goals and objectives expressed throughout this process, with a program of tangible steps for the Town to take over the next ten years and beyond. There is a high level of activity on these issues, based upon the input received during the planning process.

Table 10-1 below summarizes the specific recommendations found at the end of each of the plan's elements. Levels of priority are assigned for years 1 – 2 , years 3 – 5, and years 6 – 10 implementation basis to assist in determining the time frame in which each item is to be considered. Some recommendations do not necessarily fall into a high, medium, or low designation and are noted in each column to reflect that they are ongoing in nature. The responsible parties are also listed. If more than one entity could be charged with implementing a particular strategy or recommendation, the "lead agency" is listed first in bold. **Table 10-2** sorts the recommendations by the agency that has the lead responsibility for implementation.

The following list identifies the acronyms used for responsible parties in the table:

- CC – Conservation Commission
- CD – Community Development Department
- EDC – Economic Development Citizen Advisory Committee
- FRD – Fire & Rescue Department
- Lib - Library
- MHC – Merrimack Heritage Commission
- LMRLAC – Lower Merrimack River Local Advisory Committee
- MVD – Merrimack Village District
- NHDHR – New Hampshire Division of Historical Resources
- NRPC – Nashua Regional Planning Commission
- PB – Planning Board
- P&R – Parks & Recreation
- PWD – Public Works Department
- SD – School District
- SoRLAC – Souhegan River Local Advisory Committee
- TC – Town Council
- TM – Town Manager
- TCC – Town Center Committee

Table 10-1: Plan Recommendations – Priority and Responsible Party

LAND USE AND COMMUNITY DESIGN ELEMENT

	Land Use Recommendations	Time Period for Implementation (years)				Responsible Party
		1-2	3-5	6-10	Ongoing	
LU – 1	Adopt a zoning modification that allows mixed use as an infill style development with appropriate controls and design recommendations in all appropriate areas of the corridor.	✓				**PB,** TCC, TC
LU – 2	Allow higher density development in the northerly and southerly portions of the Daniel Webster Highway corridor, where connectivity to the regional transportation system is best and existing infrastructure supports this type of development.		✓			**PB,** TC
LU – 3	Adopt zoning or regulation amendments to foster access management in the Daniel Webster Highway corridor, and to provide off-street pedestrian and vehicular connectivity throughout the corridor.		✓			**PB,** PWD, TC
LU – 4	Develop portions of the Daniel Webster Highway corridor as village nodes, with traffic calming measures, pedestrian amenities, and streetscaping. See recommendation ED-15.		✓			**PB,** PWD, TC
LU – 5	Improve design standards for landscaping, site design, and site amenities.	✓				**PB**
LU – 6	Develop access to the Merrimack River corridor where possible and adopt zoning provisions in areas surrounding these access points to incentivize use of the river as an amenity.		✓			**PB,** Con Comm.
LU – 7	Develop pedestrian and bicycle connectivity from the westerly portions of the Town to the Daniel Webster Highway corridor where possible.		✓			PWD
LU – 8	Preserve and enhance the rural aesthetic of existing neighborhoods by maintaining existing allowable densities and generous setbacks west of the F.E. Everett Turnpike.				✓	**PB**
LU – 9	Create incentives for open space residential development to enhance protection of open space.		✓			**PB**
LU – 10	Perform a comprehensive review and update of the Subdivision Regulations, including a separation of the Site Plan Regulations as a separate set of regulations.		✓			**PB**
LU – 11	Examine development review process and consider development of a "pre-application design review" process as outlined in RSA 676:4.		✓			**PB**

Table 10-1: Plan Recommendations – Priority and Responsible Party

HOUSING AND POPULATION ELEMENT

	Housing Recommendations	Time Period for Implementation				Responsible Party
		1-2	3-5	6-10	Ongoing	
H – 1	Consider establishing a Housing Commission that can advocate for the development of affordable workforce housing.			✓		**TC**
H – 2	Encourage more mixed-use and infill development where appropriate along the Daniel Webster Highway corridor.	✓				**PB,** TC
H – 3	Allow for smaller lot sizes in selected areas where water and sewer infrastructure is available.	✓				**PB,** TC
H – 4	Utilize substandard lots in certain areas by allowing subdivision of a lot into two lots – one with reduced area and width requirements.		✓			**PB,** TC
H – 5	Revise the zoning ordinance to encourage the development of more duplex and townhouse dwellings in selected areas of the Town.	✓				**PB,** TC
H – 6	Consider adopting an Inclusionary Zoning ordinance to respond to the state Workforce Housing Law.		✓			**PB,** TC
H – 7	Consider revisions to the zoning regulations to allow for accessory apartments to make them more viable housing options, especially for senior citizen households as a Workforce Housing option. Consider them as a by-right use without the need for a special permit.	✓				**PB,** TC
H – 8	Inventory town-owned land and tax title property to identify potential parcels for use as affordable housing sites.				✓	**CD**
H – 9	Prepare a detailed, updated housing needs assessment that allows the Town to realistically achieve the creation of new affordable units to meet the needs of current and future Merrimack residents.	✓				**CD**
H – 10	Continue to look for ways to meet the needs of the growing elderly population, including senior cottage housing.		✓			**CD**
H – 11	Create incentives for open space residential development to enhance protection of open space while providing for a more diverse range of housing types. See recommendation LU-9.		✓			**PB**

Table 10-1: Plan Recommendations – Priority and Responsible Party

ECONOMIC DEVELOPMENT ELEMENT

	Economic Development Recommendations	Time Period for Implementation				Responsible Party
		1-2	3-5	6-10	Ongoing	
ED – 1	Execute outreach by the Town to develop a relationship with the Town's various employers, in order to open a line of communication between the public and private sector.				✓	**CD,** TM
ED – 2	Examine Town policies and procedures to ensure that they do not discourage local business operations and initiatives.	✓				**EDC,** CD, TC
ED – 3	Identify the key position on Town staff responsible for economic/business coordination, monitoring and outreach and ensure Merrimack's business community is aware of this person.	✓				**EDC,** CD, TC
ED – 4	Conduct periodic and regular business outreach efforts to existing businesses to identify issues and needs and how to best address these concerns.				✓	**EDC,** CD
ED – 5	Create a new website (or revamp the existing Town Community Development/Economic Development web page) to feature four core informational themes: starting a business, growing your business, finding a location, and community information.	✓				**CD,** EDC
ED – 6	Review and assess the Town's development review process for clarity and transparency, as well as its organizational structure. Ensure that the review process is clearly defined, guarantees flexibility, projects a business friendly attitude, and encourages high quality development. Repeat review at 3-5 year intervals.	✓				**EDC,** CD, PB
ED – 7	Create a user-friendly guide which outlines the steps and procedures necessary to expand an existing business operation or open a new business.		✓			**CD,** EDC
ED – 8	Examine zoning regulations in existing non-residential districts to ensure that they achieve the community's land planning objectives without being overly restrictive on the establishment of new businesses or the expansion of existing ones.		✓			**EDC**
ED – 9	Consider implementing performance-based zoning to increase the flexibility of land development.		✓			**CD,** PB, EDC
ED – 10	Examine the potential for creation of Transit Oriented Development (TOD) in the vicinity of the proposed rail station and the airport access road on the Route 3 corridor.			✓		**CD,** PB, EDC

	Economic Development Recommendations	Time Period for Implementation				Responsible Party
		1-2	3-5	6-10	Ongoing	
ED – 11	Seek grants to encourage or facilitate the re-positioning of under performing properties in the community, especially those found in the Town's opportunity zones.			✓		**CD,** TC
ED – 12	Consider preparation of a conceptual "master design plan" for key parcels along the northern Route 3 corridor that could illustrate the potential for a mixed use development to property owners, potential users of the site and investors.	✓				**CD**
ED – 13	Consider a Tax Increment Financing District (TIF) in appropriate geographic areas to help fund infrastructure improvements.		✓			**EDC,** CD, PB, TC
ED – 14	The Town should work toward implementation of RSA 79-E Community Revitalization Tax Relief Incentive as well as potential locations of parcels that should be considered for inclusion in a 79-E district.		✓			**TC,** CD

Table 10-1: Plan Recommendations – Priority and Responsible Party

NATURAL RESOURCES ELEMENT

	Natural Resources Recommendations	Time Period for Implementation				Responsible Party
		1-2	3-5	6-10	Ongoing	
NR – 1	Continue the Town's land acquisition strategy, placing the highest priority on the acquisition of lands that can, when managed for conservation purposes, accomplish the widest range of objectives, especially those found in the Biodiversity Conservation Plan. Prioritize the acquisition of undeveloped lands along the Merrimack River and the Souhegan River, and parcels adjacent to existing protected land.				✓	**CC,** LMRLAC, SoRLAC
NR – 2	Assess the Town's zoning ordinance and the subdivision and site plan regulations regarding the integration between biodiversity protection and land use as recommended by the Biodiversity Conservation Plan.		✓			**PB,** CC
NR – 3	Ensure that post-development runoff does not exceed pre-development runoff by requiring on-site stormwater retention.				✓	**PB,** PWD
NR – 4	Reduce imperviousness in site design, where appropriate, by encouraging design features such as smaller parking lots, reduced road and driveway dimensions, the use of parking garages on larger sites, the use of pervious paving materials where practical and consistent with applicable codes, and other measures to reduce overall imperviousness.				✓	**PB,** PWD, MVD

	Natural Resources Recommendations	Time Period for Implementation				Responsible Party
		1-2	3-5	6-10	Ongoing	
NR – 5	Develop a review checklist for subdivisions and site plans that incorporates recharge protection and water demand management protections.	✓				**PB,** MVD
NR – 6	Ensure adequate treatment of stormwater before it reaches surface and groundwater.				✓	**PWD,** PB
NR – 7	Establish an inspection system to ensure continued operation of required private stormwater management systems.				✓	**PWD**
NR – 8	Consider adopting an Open Space Residential Development Ordinance for low-density subdivisions using septic systems, in which a certain percentage of the tract being subdivided must be set-aside as permanently protected open space without increasing overall densities. See recommendation LU-9.	✓				**PB,** CC
NR – 9	Consider amending the site plan and subdivision regulations to minimize disruption of natural vegetation.	✓				**PB,** CC
NR – 10	Consider amending the subdivision and site plan regulations to limit or prohibit the removal and export of topsoil.	✓				**PB**
NR – 11	Consider amending the subdivision and site plan regulations to encourage increased use of native and drought resistant plant species.	✓				**PB,** CC
NR – 12	Consider amending the subdivision and site plan regulations to limit the use of deicing compounds and to require that any pesticides or insecticides to be applied in new commercial, industrial or multi-family residential projects are applied by a licensed professional so as to protect the Town's water supply from contamination.	✓				**PB,** CC, MVD, PWD
NR – 13	Perform an analysis of existing landscaping buffer regulations and consider additional landscaping requirements for commercial properties.		✓			**PB**
NR – 14	Consider implementing an educational and assistance program, most likely through the Conservation Commission, to encourage larger landowners to maintain privately held forest land and open space through the development of forest management plans and estate planning, especially for parcels in current use.		✓			**CC**
NR – 15	Prepare an invasive species management plan.		✓			**CC**
NR – 16	Post signage at boat docking areas on Naticook and Baboosic Lakes that educates boat owners of the danger of invasive species and measures to prevent their spread.		✓			**CC**

	Natural Resources Recommendations	Time Period for Implementation				Responsible Party
		1-2	3-5	6-10	Ongoing	
NR – 17	Identify opportunities to improve infiltration and stormwater management in existing developed areas.		✓			**PWD**
NR – 18	Evaluate limitations on further sewering in the Naticook basin.			✓		**PWD**
NR – 19	Work with the State to address existing and future large quantity groundwater withdrawals in wellhead areas, especially within the Naticook basin, by commercial and industrial users.			✓		**MVD**
NR – 20	Investigate the effectiveness and feasibility of raising Greens Pond for enhancing storage in the Naticook Basin aquifer.			✓		**MVD**
NR – 21	Work with residents and businesses, especially in wellhead and shoreline areas, to encourage individual water resource protection measures such as water conservation, proper septic system maintenance and proper waste disposal practices.				✓	**MVD**
NR – 22	Develop a set of criteria for the use of deicing materials throughout the Town.				✓	**PB,** MVD, PWD
NR – 23	Implement the recommendations from the 2012 Sodium and Chloride Loading Study.		✓			**MVD**
NR – 24	Increase collaboration between the Town and MVD when acquiring conservation land such that it could be used for future groundwater supply.				✓	**MVD,** CC
NR – 25	Consider performing a functional evaluation of the Town's wetlands, which may lead to designation of prime wetlands.		✓			**CC**

Table 10-1: Plan Recommendations – Priority and Responsible Party

HISTORIC RESOURCES ELEMENT

	Historic Resources Recommendations	Time Period for Implementation (years)				Responsible Party
		1-2	3-5	6-10	Ongoing	
HR – 1	Strengthen incentives for historic preservation in the zoning ordinance and site plan and subdivision regulations.		✓			**MHC,** PB
HR – 2	Consider the adoption of a Scenic Road ordinance, per RSA 231:157, in order to help preserve the scenic and historic qualities of Merrimack's rural roads.		✓			**MHC,** PB
HR – 3	Investigate protection measures for Merrimack's Class VI roads, which were often the location of historic development, and which today can serve as recreational trails for Merrimack's citizens.			✓		**MHC,** PB, P&R

	Historic Resources Recommendations	Time Period for Implementation (years)				Responsible Party
		1-2	3-5	6-10	Ongoing	
HR – 4	Investigate preservation alternatives for historic stone walls and barns through the New Hampshire Division of Historical Resources.		✓			**MHC,** NHDHR
HR – 5	Complete a comprehensive Town-wide historic resources survey.		✓			**MHC**
HR – 6	Continue to promote interest and pride in Merrimack's heritage in a variety of ways including periodic exhibits, the installation of date and name markers at historic sites, development of brochures describing local history, tours of historic structures and sites, oral history projects and by encouraging local history courses in the school curriculum.				✓	**MHC**
HR – 7	Continue to identify, catalogue, and preserve Town records, documents, manuscripts and artifacts and provide a suitable and safe repository for them.				✓	**MHC**
HR – 8	Encourage archaeological investigation and documentation of significant historic and prehistoric sites including cellar holes, mills and school sites and ferry landings and canals along the Merrimack River.		✓			**MHC**
HR – 9	Preserve and maintain the Town graveyards and private burying grounds.				✓	**TM,** MHC
HR – 10	Encourage the Town Manager, Town Council, and/or Town department heads to request information from the Merrimack Heritage Commission and Historical Society before modifications are proposed to Town-owned buildings and sites of potential historical value.				✓	**MHC,** TM, TC
HR – 11	Consider adopting architectural design guidelines for structures within the Town Center Overlay District (TCOD).		✓			**PB,** MHC
HR – 12	Develop an "Adopt an Historic Site" program as a way of involving civic organizations and private companies in the maintenance and enhancement of local historic sites, including monuments, markers, cemeteries, etc.		✓			**MHC**
HR – 13	Promote the donation of easements by the owners of historic properties to a designated authority or established land trust.				✓	**MHC**
HR – 14	Consider the outright acquisition of important historical sites for conservation and preservation purposes in limited but critical cases.				✓	**MHC,** TC
HR – 15	Encourage National Register listing for appropriate local structures.				✓	**MHC**

Table 10-1: Plan Recommendations – Priority and Responsible Party

UTILITIES AND ENERGY ELEMENT

	Utilities and Energy Recommendations	Time Period for Implementation (years)				Responsible Party
		1-2	3-5	6-10	Ongoing	
U – 1	Continue to implement Town water odd/ even day restrictions for outdoor water use that help to manage the distribution system by lowering peak daily demand and protect against seasonal fluctuations.				✓	**MVD**
U – 2	Use separate commercial and industrial irrigation meters to control demand.				✓	**MVD**
U – 3	Continue to expand homeowner education programs to reduce demand and encourage water conservation such as alternative drought-resistant plants for gardens on residential and commercial properties.				✓	**MVD**
U – 4	Create list of native and drought-resistant plants and flowers for the public that is posted on the Town's website.	✓				**CC,** MVD, PB
U – 5	Work with all businesses to help keep outside watering in their facilities to a minimum.				✓	**MVD**
U – 6	Consider establishing an energy committee to review town-wide energy planning.		✓			**TC**
U – 7	Consider providing for property tax exemptions to property owners who install certain renewable energy systems, such as solar systems, wind turbines, and wood-fired heating systems (NH RSA 72:61-72).	✓				**TC**
U – 8	Conduct detailed energy audits on Town-owned buildings and pursue available grant funding. Address energy usage in the Town's fleet of vehicles and street lighting.	✓				**PWD**
U – 9	Prepare a detailed energy efficiency and reduction plan that should establish an energy reduction goal for Town-owned buildings (a certain percentage reduction to be achieved over a period of time).	✓				**PWD**
U – 10	Contact utility companies that service Merrimack prior to undertaking major street repairs so that any planned utilities work can be done at the same time to minimize disruption to local neighborhoods and save costs.				✓	**PWD**
U – 11	The Town should consider adopting an official policy to purchase only fuel efficient vehicles for municipal use whenever commercially available and practicable.				✓	**TC**
U – 12	Review the zoning ordinance to address potential land use changes that encourage mixed-use, compact development patterns that reduce automobile trips.	✓				**PB**

	Utilities and Energy Recommendations	Time Period for Implementation (years)				Responsible Party
		1-2	3-5	6-10	Ongoing	
U – 13	Include street lighting as part of a comprehensive energy policy for the Town. Consider a requirement for energy-efficient light-emitting diode (LED) street lighting in any new developments	✓				**PWD**
U – 14	Consider adopting regulations that recommend or incentivize the use of Leadership in Energy and Environmental Design (LEED) or similar standards for new construction, including municipal, commercial, industrial and multi-family buildings.		✓			**PB**
U – 15	Work with Department of Resources and Economic Development to address issues of telecommunications access to encourage people to work from home.		✓			**Technology Comm.**
U – 16	Monitor efforts to ensure that Merrimack download speeds and coverage continue to keep pace with current broadband technology.				✓	**Technology Comm.**
U – 17	Work with broadband providers and developers to ensure that access is made available in new housing developments, especially workforce housing projects.				✓	**Technology Comm.**

Table 10-1: Plan Recommendations – Priority and Responsible Party

COMMUNITIES FACILITIES ELEMENT

	Community Facilities Recommendations	Time Period for Implementation (years)				Responsible Party
		1-2	3-5	6-10	Ongoing	
C – 1	Establish a systematic process for developing, maintaining and implementing a CIP.	✓				**TM,** CD, PB, TC, SD, MVD
C – 2	Consider impact fees as a means to create another source of funding to meet future capital needs.			✓		**CD,** PB, TC
C – 3	Work toward addressing the issues of a fire station and house an engine company in the Northwest section of Merrimack and the potential South Fire Station. To accomplish this, the Town should conduct a comprehensive plan for fire and emergency services to address future town-wide needs.		✓			**TM,** FRD, TC
C – 4	Continue maintenance of existing parks and update 2010 plan for the provision of playing fields to meet the needs of the Town.				✓	**P & R**
C – 5	Examine a number of possibilities for replacement of the current library facility.		✓			**Lib**

	Community Facilities Recommendations	Time Period for Implementation (years)				Responsible Party
		1-2	3-5	6-10	Ongoing	
C – 6	The Town should move forward with the designing and construction of a new Highway Garage and PWD administrative office facility as proposed in the Capital Improvements Plan.	✓				**PWD**
C – 7	The School District should plan for and design new Superintendent's Office and Special Services Office to meet their future needs.	✓				**SD**
C – 8	Work with the Nashua Regional Planning Commission and neighboring communities to begin a dialog on options for shared services and facilities.				✓	**TM,** TC, NRPC
C – 9	Take a leadership role in "greening" Merrimack through its operations, governance, and management. This is particularly true with respect to municipal buildings and facilities.				✓	**TC,** all departments

Table 10-1: Plan Recommendations – Priority and Responsible Party

TRANSPORTATION ELEMENT

	Transportation Recommendations	Time Period for Implementation (years)				Responsible Party
		1-2	3-5	6-10	Ongoing	
T – 1	Consider establishing an Exaction Fee System to assist in funding the growing transportation needs of the community.			✓		**CD,** PB, TC
T – 2	Coordinate with the Town of Bedford to create a cohesive, attractive plan for the northern segment of US Route 3.		✓			**CD,** PB
T – 3	Continue to develop a town-wide Pedestrian and Bicycle Plan.	✓				**PB,** PWD CD
T – 4	Support on-going and future rail and bus initiatives and enhancement of existing rail service and expansion of passenger rail service into southern NH.				✓	**CD,** PB, TC
T – 5	Continue to require formal traffic impact assessments for development projects.				✓	**PB**

	Transportation Recommendations	Time Period for Implementation (years)				Responsible Party
		1-2	3-5	6-10	Ongoing	
T – 6	Implement access management guidelines in order to provide safe and efficient access to abutting land uses and to maintain operational characteristics of a roadway. Consider within the Town's land use regulations factors such as the number, design and location of access points; the provision for median islands to control access; the provision for left and right-turning lanes; internal circulation patterns; and the provision of pedestrian and bicycle facilities. Pursue access management strategies along the high-traffic corridors of US Route 3 and Continental Boulevard as development and redevelopment opportunities arise.		✓			**CD,** PB, PWD
T – 7	Maintain a continuous transportation planning program consisting of: the collection, maintenance, and dissemination of traffic information; staff and/or consulting resources to collect, analyze, and report on traffic problems; and continued coordination of transportation planning with other planning disciplines, most notably land use and environmental planning.				✓	**CD,** PB, PWD
T – 8	Continue to evaluate and adjust the operations of the highway network to promote its efficient use and safe function.				✓	**PWD**
T – 9	Promote a user-friendly roadway network for motorists by improving and/or upgrading traffic calming and control devices (such as roundabouts, signage, pavement markings, and lighting) in specific areas where deficiencies currently contribute toward public safety concerns and/or as opportunities arise.				✓	**PWD**
T – 10	Endeavor to maintain acceptable levels of service (LOS D or better) for peak hour conditions, recognizing that lower levels of service may occur at certain locations.				✓	**PWD,** PB
T – 11	Preserve and/or acquire right-of-way for new or expanded streets in advance of need through purchase, official mapping, and developer dedications.			✓		**TC**
T – 12	Promote education of the emergency response routes development by the NRPC.				✓	**PWD**
T – 13	Explore alternative, creative and affordable transportation services to meet the needs of an aging community.		✓			**CD**
T – 14	Continue to require that new development be responsible for site-related improvements needed to provide safe and adequate access to/from the site.				✓	**PB**

	Transportation Recommendations	Time Period for Implementation (years)				Responsible Party
		1-2	3-5	6-10	Ongoing	
T-16	Continue to implement traffic calming measures on local streets in residential neighborhoods to direct traffic to arterial and collector streets in order to protect residential neighborhoods from adverse impacts associated with increased traffic volumes and speeds.				✓	**PWD**
T-15	Establish a Capital Reserve Fund for sidewalk and pedestrian way construction	✓				**TM,** PB, PWD, TC, CD
T – 17	Continue to promote the inclusion of sidewalks in appropriate highway improvement projects, ensure the proposed provision for pedestrian access within developments, and provide for the proper integration of public and private pedestrian ways.				✓	**PWD,** PB
T – 18	Ensure that pedestrian ways are designed to serve the needs of the handicapped.				✓	**PWD**
T – 19	Give priority to the designation and improvement of walking and bicycle routes to all schools and other recreational facilities in the Town.	✓				**CD**
T – 20	Continue to incorporate provisions for bicycle lanes and/or paths in road construction and resurfacing projects where appropriate, whether publicly or privately financed.				✓	**PWD, CD**
T – 21	Continue to require landscaping as part of site development projects; however, care should be taken to ensure that appropriate plantings are selected that do not hinder sight lines along the roadways and intersections as a result of growth and improper maintenance.				✓	**PB**
T – 22	Promote the development of effective and aesthetically pleasing signage directing the traveling public to parks, recreational areas, and other attractions in Town.		✓			**PWD**

Table 10-2: Plan Recommendations – "Lead Agency"

Action Lead By	Time Period			
	1-2 years	3-5 years	6-10 years	Ongoing
Planning Board See Amendments, Next Page	LU-1, LU-5, H-2, H-3, H-5, H-7, NR-5, NR-8, NR-9, NR-10, NR-11, NR-12, U-12, T-3	LU-2, LU-3, LU-4, LU-6, LU-9, LU-10, LU-11, H-4, H-6, H-11, NR-2, NR-13, HR-11, U-14		LU-8, NR-3, NR-4, NR-22, T-5, T-14, T-21
Community Development Department	H-9, ED-5, ED-12, T-19	H-10, ED-7, ED-9, T-2, T-6, T-13	ED-10, ED-11, C-2, T-1	H-8, ED-1, T-4, T-7
Town Council	U-7	ED-14, U-6	H-1, T-11	U-11, C-9
Town Manager	C-1, T-16	C-3		HR-9, C-8
Public Works Department	U-8, U-9, U-13, C-6	LU-7, NR-17, T-22	NR-18	NR-6, NR-7, U-10, T-8, T-9, T-10, T-12, T-15, T-17, T-18, T-20
Merrimack Village District		NR-23	NR-19, NR-20	NR-21, NR-24, U-1, U-2, U-3, U-5
Economic Development Citizen Advisory Committee	ED-2, ED-3, ED-6	ED-8, ED-13	ED-11	ED-4
Conservation Commission	U-4	NR-14, NR-15, NR-16, NR-25		NR-1
Merrimack Heritage Commission		HR-1, HR-2, HR-4, HR-5, HR-8, HR-12	HR-3	HR-6, HR-7, HR-10, HR-13, HR-14, HR-15
Parks & Recreation				C-4
School District	C-7			
Library		C-5		
Technology Committee		U-15		U-16, U-17

The Planning Board Amends the Implementation table to re-prioritizing the Master Plan Implementation Activities for the Planning Board as follows:

Time Period 1-2 years

(1) Move the following Recommendation from Time Period 1-2 years to 6-10 years

LU-5 Improve Design Standards for Landscaping, etc.

(2) Move the Following recommendations from Time Period 1-2 years to 3-5 years

H-3. H-5, H-7 - Dealing with Residential lot sizes

(3) Move the following Recommendations from Time Period 3-5 years to 1-2 years

LU-2, LU-3, LU-4, LU-6, HR-11 – Dealing with DW Highway & high density housing

These changes facilitate combining the tasks in Time Period 1-2 years into two major tasks:
[1] Task T-3 - Develop Town-Wide Pedestrian and Bicycle Plan
[2] Tasks LU-1, LU-2, LU-3, LU-4, LU-6; H-2 ; U-12 : HR-11 – Dealing with Mixed Use and high density housing

Time Period 3-5 years

(1) Move the following Recommendations from 3-5 years to 6-10 years

NR-2, NR13, U-14, LU-10, LU-11 – biodiversity, bldg design, process

These Changes facilitate combining the tasks in Time Period 3-5 years into two major tasks
[1] H-3, H-4, H-5, H-6, H-7, H-11; LU-9 – General review of Residential Zoning
[2] NR-5, NR-8, NR-9, NR-10, NR-11, NR-12 – Considerations for open space, landscaping, etc.

Time Period 6-10 years

These changes result in the following tasks to be undertaken in the 6-10 year time period

LU-5, LU-10, LU-11, U-14; NR-2, NR-13

Appendix A

Merrimack Town Center Pedestrian and Trail Master Plan

MERRIMACK TOWN CENTER
PEDESTRIAN AND TRAIL MASTER PLAN

NOVEMBER 12, 2009

PREPARED BY:

NRPC

NASHUA REGIONAL PLANNING COMMISSION

Cover art designed at www.wordle.net/create.
This design is based upon the words in this report. Greater prominence is given to words based on their frequency in the report.

EXECUTIVE SUMMARY

The Merrimack Town Center Pedestrian and Trail Master Plan recommends that the town take specific actions to achieve a unified and well developed town center. The plan addresses sidewalks, trails, safety, design and parking; all critical elements of a successful town center. A key recommendation is the development of a Town Center Committee to implement the actions identified in this plan. This committee will be responsible for working with administration, town residents and local businesses to enhance the town center by creating a safe and inviting place for town residents and visitors to patronize local businesses and key destinations.

The following are prioritized sidewalk and trail improvements. Additional details for each proposed project can be found on pages 6 and 7. The following are recommended actions for the town center. The project completion dates are dependent upon suitable funding and may vary as opportunities present themselves.

SIDEWALK MASTER PLAN

1-a. Pedestrian Connections at Abbie Griffin Park to connect the Merrimack District Courthouse to businesses along D.W. Highway. Completion 2010

1-b. Sidewalk in front of Watson Park. Completion 2010

2. West side of D.W. Highway between Church Street and Wire Road. Completion 2011

3. East side of D.W. Highway between Wire Road and Twin Bridge Road. Completion 2013

4. West side of O'Gara Drive from Baboosic Lake Road south to existing sidewalk. Completion 2013/2014

5. East side of D.W. Highway near Railroad Avenue. Completion 2015

6. South Side of Woodbury Drive from McElwain Street east to D.W. Highway. Completion 2015

7. Sidewalks on both sides of D.W. Highway and Baboosic Lake Road. Completion 2016-2017

TRAILS ACTION PLAN

1. Connect Watson Park to the western side of the D. W. Highway near the fire station utilizing the old canal located under the bridge. Completion 2010

2. Develop a trail system along the northerly side of the Souhegan River from the fire station west to join with the trail under the Everett Turnpike at Merrill's Marauders Bridge. The trail will include a connection to the high school facility, to the new pedestrian bridge crossing over the river from West Chamberlain Road, to the system of trails extending into Wildcat Falls, will include the Heritage Trail segment and provide a trail loop along Baboosic Lake Road and D. W. Highway back to Watson Park. Completion 2011

3. Design and construct a trail leaving Watson Park on the old railroad bridge over Baboosic Brook towards the Merrimack River. The trail will turn north and west and connect to the northerly end of the Twin Bridges trail system. Completion 2014


Merrimack
Town Center Pedestrian & Trail
Master Plan
November 2009
Existing Trail/Path
Conceptual Trail
Desired Trail Connections
1-3 Trail Priority
Rail Lines
Pedestrian Accomodation Areas
Potential Ped Bridge
Buildings
Commercial
Community Resource
Residential
School & Municipal
Sidewalk Existing
Sidewalk Need
1-7 Sidewalk Priority*
Sidewalk recommended in Master Plan - Gaps
Water
N
0 200 400
Feet
*Note: Number 1-7 Indicate Project priority
Existing Signalized Crosswalk
Sidewalks recommended in Master Plan to fill gaps on DW Highway.
Twin Bridge Rd
#7
#3
Wire Rd
Potential New Crosswalk based on intersection re-design.
Twin Bridge Park & Kids Kove Playground Area
#2
Existing Pedestrian Bridge and Paved Path
Existing Crosswalk
Existing Trail
Killian Ct
Sidewalks recommended in Master Plan to fill gaps on Baboosic Lake Rd.
Hillside Ter
#7
Baboosic Lake Rd
Church St
Conceptual Trail with Development
Sidewalk Needed
#4
School St
Potential new Crosswalks
Pedestrian Access Area
Potential Future Connections - Depending on Development
Bishop St
#1a
Existing Crosswalks
Site of New Courthouse
Pedestrian Access
Abbie Griffin Park
Daniel Webster Hwy
Sidewalks recommended in Master Plan to fill gaps on DW Highway.
#7
Loop Rd
3
Highland Green
School Complex
Existing ROW Easement
Existing Pedestrian Crossing
Hadley Rd
Oldsan Dr
Potential Crosswalk in corridor depending on pedestrian safety issues.
Watson Park
Brentwood Dr
Maryland Dr
Woodbury St
#1b
Pedestrian Access Area
#6
1
Existing Passage
Existing Service Road
1
Wildcat Falls
Potential Pedestrian Bridge
Railroad Ave
#7
#5
2
Sidewalks recommended in Master Plan to fill gaps on DW Highway.
Future pedestrian access under Merrill's Marauders bridge to connect to Wildcat Falls Conservation Area and bridge to neighborhoods south of river.
2
2
Merrill's Marauders Bridge
Maps prepared by the Nashua Regional Planning Commission are for planning purposes only. NRPC uses data gathered from multiple sources at various scales of accuracy. No warranties expressed or implied, are provided for the data herein, its use, or its interpretation.

INTRODUCTION

Over the past decade the town of Merrimack has spent a considerable amount of effort planning for the future of the town center in the development of the Town Center Plan (1999), the Master Plan Update (2002) and the Merrimack Village Design Charrette (2006), developed by Plan NH. These plans, especially the Town Center Plan, provide a wealth of information about the existing features of the town center as well as a vision for the center's future. However, there are few recommendations in these documents for how to achieve this future vision.

This Merrimack Town Center Pedestrian and Trail Master Plan was developed through the Nashua Regional Planning Commission's Integrated Transportation and Community Planning Program, known as iTRaC. The iTRaC program assists communities in taking a holistic approach to integrated transportation, land use and environmental considerations through education and technical assistance. This project analyzed the existing town center documents and developed a short list of recommendations with specific items that can be implemented by the town to achieve a unified and well developed town center.

The project aims to achieve the following goals:

- Create a short action plan identifying a series of specific items for implementation in the town center during the development of the Merrimack District Courthouse and redevelopment of the municipal complex. The action items are based upon recommendations identified in the existing Town of Merrimack plans as stated above.
- Identify existing and future trail and pedestrian connections between key destinations in the town center.
- Develop a brochure for the public and identify outreach techniques to educate the town about the benefits of a well defined and developed town center.

PROJECT SUBCOMMITTEE

The formation of the iTRaC Committee was endorsed by the Merrimack Town Council and was established as a subcommittee of the town's Economic Development Citizen Advisory Committee (EDCAC). The iTRaC Committee was comprised of a diverse group of individuals and included the following members:

Peter Flood, Chair, Economic Development Citizen's Advisory Committee; Representative Chris Christensen, Parks and Recreation Committee; Tracy Bull, School District; Richard Maloon, Watson

Park; Ellen Knowlton, Library; Nelson Disco, Planning Board; Andy Powell, Conservation Commission; Debra Huffman, Resident; Bill Wilkes, Merrimack Rotary President; Dave Nichols, Heritage Commission; and Linda Bonetti, Economic Development Citizen's Advisory Committee.

PROJECT STUDY AREA

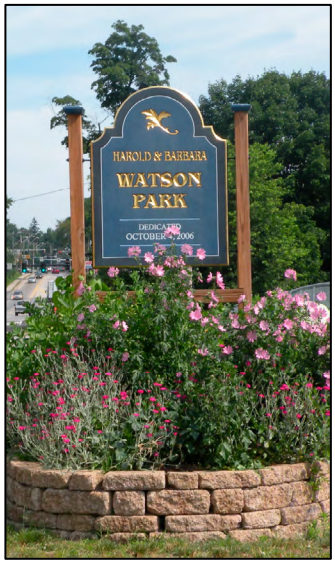
The project study area includes the town center of Merrimack generally within the boundaries of the Town Center Zoning Overlay District. This includes the Merrimack District Courthouse, municipal buildings, churches, pedestrian connections between the schools, town center amenities, businesses, Merrill's Marauders Bridge, and Wildcat Falls. Please see the Town Center Pedestrian and Trail Master Plan Map at the back of the plan.

The following quote is an overall goal listed in the Merrimack Town Center Master Plan Update (2002):

> *"Build upon the existing concentration of public facilities, semi-public institutions, historic resources, businesses and residences to create a defined Town Center for Merrimack that will provide a vital, functional and aesthetically pleasing physical expression of Merrimack's cultural, commercial, community and civic life."*

The Town Center Pedestrian and Trails Master Plan identifies key action items to implement the above goal. The town center is already home to a number of excellent resources and key destinations including public gathering places, recreation sites, municipal buildings, churches, schools, restaurants, and businesses. In particular, the committee identified two pedestrian access areas in the central and southern end of the town center. The two areas are shown with a red dashed circle on the Town Center Pedestrian and Trail Master Plan Map.

The first Pedestrian Access area is centrally located at the intersection of Baboosic Lake Road and Daniel Webster Highway (D.W. Highway). This area is home to the municipal complex, Merrimack District Courthouse, library, entrances to schools, churches, Abbie Griffin Park and the Merrimack Community Bandstand, as well as a number of businesses. The goal is to enhance pedestrian amenities such as lighting, street furniture, landscaping, special sidewalk and crosswalk treatments as well as public art in this area to attract additional pedestrian traffic and encourage additional businesses and services.



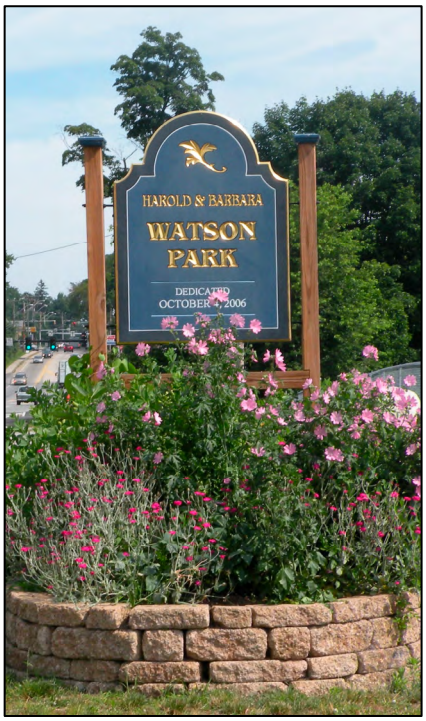
The same is the case for the second pedestrian access area centered at Watson Park along D.W. Highway. Watson Park is anticipated to attract additional pedestrian traffic and create a desirable atmosphere for additional businesses. In recent years new businesses such as Swan Chocolates and Buckley's Great Steaks have located here.

Another key destination is Kids Kove Playground. This playground is located at Twin Bridge Park and although there are no sidewalks to access the park there is a beautiful trail through the woods running behind the park. The trail exits near the Commons Shopping Plaza and adjacent multi-family housing. This provides an excellent connection for families in this area to travel along an attractive and well maintained trail to the park and adjoining ball fields. The pedestrian foot traffic has the potential to support businesses at the Commons Shopping Plaza, such as a café, ice cream and gift shop. Additional amenities such as seating, landscaping and signage will make this location more appealing to pedestrians.

These are just the beginnings of how the town center could evolve and really come to life to form a thriving and diverse center of the community.

EXISTING VERSUS DESIRED AMENITIES

Merrimack's town center is home to a number of public gathering places, recreation sites, churches, municipal buildings, schools, restaurants, businesses and existing residences. Town residents visit many of these sites on a routine basis, however additional amenities and connections should be made to enhance their pedestrian experience in the town center. Connections between sites need to be enhanced with improved trail and pedestrian connections and amenities to allow people to park at one location and walk to several destinations. The Town Center is continuing to attract new businesses, and in recent years has seen additions such as CVS, Swan Chocolates and Buckley's Great Steaks. These businesses are opportunely located across from Watson Park, all of which are within walking distance of the high school. Special attention should also be paid to current and future town center residents to encourage walking between their homes and other destinations. Additional amenities should also be added to enhance the pedestrian experience, including street furniture, landscaping, public art, attractive lighting, sidewalks, trails, signage, public parking, and bike racks.



SIDEWALK MASTER PLAN

The following is a list of connections as shown on the Town Center Pedestrian and Trail Master Plan Map, listed in priority order. The project completion dates are dependent upon suitable funding and may vary as opportunities present themselves.

1-a. Pedestrian Connections at Abbie Griffin Park to connect the Merrimack District Courthouse to businesses along D.W. Highway. *(High priority due to current development of Merrimack District Courthouse.) Completion date: 2010*

1-b. Sidewalk in front of Watson Park *(High priority due to planned development of this sidewalk and Watson Park.) Completion date: 2010*

2. West side of D.W. Highway between Church Street and Wire Road. *(Important connection to facilitate access from the north as well as Twin Bridge Park and Kids Kove Playground.) Completion date: 2011*

3. East side of D. W. Highway between Wire Road and Twin Bridge Road *(Will facilitate access to the Commons and residential areas at the north end of the town center, however this section is likely to require ROW acquisition, grading, and a needed bridge.) Completion date: 2013*

4. West side of O'Gara Drive (*Requires input from the school district and would impact current parking patterns. Sidewalk would provide an ideal walking loop for pedestrians.*) *Completion date: 2013-2014*

5. East side of D. W. Highway near Railroad Avenue (*Small section along Frasier Square at the southern end of the Town Center.*) *Completion date: 2015*

6. South side of Woodbury Drive *(Ideal connection between D.W. Highway and the High School. This would require coordination with the School District, re-evaluation of existing traffic patterns, and engineering review.) Completion date: 2015*

7. *Sidewalks on both side of D.W. Highway and Baboosic Lake Road. (Will complete any missing sidewalk segments.) Completion 2016-2017*

FUTURE FINANCING

In order to extend the network of sidewalks throughout the town center a designated on-going funding source for sidewalks and trails is needed. The following is a list of potential options for sidewalk and trail revenue sources for consideration by the Council.

- Explore grant opportunities, such at Transportation Enhancement, (NH DOT) and private foundations for fitness grants.

- Development of a designated Town Center specific fund for sidewalks, trails, and streetscaping which would implement the Town Center Pedestrian and Trail Master Plan.
- Support the funding of the Road Infrastructure Capital Reserve Fund.
- Work with the town to incorporate projects into the Capital Improvement Plan.
- Continue to work with developers to make on-site and off-site improvements, as well as obtain land grants and right-of-way easements as new development opportunities present themselves. New developers should be made aware of the Town Center Pedestrian and Trail Master Plan.
- Explore the feasibility of Development Impact Fees

TRAILS MASTER PLAN

The town center and Watson Park in particular, is designated as a central destination for sidewalks and walking and biking trails in the referenced town center documents. Currently several trail segments are being used, not as town-managed trails, but still in use by citizens as they travel on foot throughout this area. Connecting them into a trail network, expanding the system and maintaining them will enhance the accessibility and expand traffic into the town center.

The establishment of a Trail Master Plan must take into consideration the following tasks, each listed with a projected completion date. Please refer to the Town Center Pedestrian and Trail Master Plan Map at the beginning of the document for an overview of the trail system.

1. Connect Watson Park to the western side of D. W. Highway near the fire station, utilizing the old canal located underneath the bridge. Completion of this trail segment will not only provide a connection to the extended trail along the river but will also provide pedestrian traffic to and from Watson Park with a means to cross D. W. Highway safely. Completion date: 2010
2. Develop a trail system along the northerly side of the Souhegan River from the fire station west to join with the trail under the Everett Turnpike at Merrill's Marauders Bridge. The trail will include a connection to the high school facility, to the new pedestrian bridge crossing over the river from West Chamberlain Road, to the system of trails extending into Wildcat Falls, and will include the Heritage Trail segment and provide a trail loop along Baboosic Lake Road and D. W. Highway back to Watson Park. Completion date: 2011
3. Design and construct a trail leaving Watson Park on the old railroad bridge over Baboosic Brook towards the Merrimack River. The trail will turn north and west and connect to the northerly end of the Twin Bridges trail system. Completion date: 2014

Portions of the proposed trail system are being studied and will be constructed by joining forces with other organizations already working on this project including the Merrill's Marauders Bridge Committee and the Merrimack Conservation Commission. A substantial portion of the trail system can be completed using volunteer labor from scouting organizations, civic groups and interested citizens. However funds will be needed for some elements of the project. As development continues along the path of the trails, we should solicit their assistance in ensuring a route for

pedestrian traffic along the designated trail route. Grant funds should be explored at private, state and federal levels. Finally, the establishment of a Town Center fund for use on trails, sidewalks and streetscaping in support of the Town Center Master Plan should be established and funded.

As development opportunities arise on the east side of Baboosic Brook, on the Longa Property, it would present an ideal opportunity to expand the trail from Watson Park along Baboosic Brook to the back of Twin Bridge Park. This trail could provide alternative transportation between the town center and future development east of Baboosic Brook.

FUTURE FINANCING

In addition to sidewalks, a proposed trails network has also been identified to increase pedestrian access in the town center. This effort will be much more successful with a designated funding stream. The following options could be considered:

- Explore private foundation grants as well as opportunities at the state and federal level for trails development.
- Encourage Eagle Scout projects as a means of trail development.
- Establish an Adopt-A-Trail Program or projects and promote to the Boy/Girl Scouts, businesses, and civic groups.
- Development of a designated Town Center specific fund for sidewalks, trails and streetscaping which would implement the Town Center Pedestrian and Trail Master Plan.
- Continue to work with developers to make on-site and off-site improvements as well as obtain land grants and right-of-way easements as new development opportunities present themselves. New developers should be made aware of the Town Center Pedestrian and Trail Master Plan.

PARKING

In order to encourage people to park in a central location and walk to multiple destinations, there needs to be general parking for use by the public. Watson Park will provide about 30 parking spaces, and the municipal complex also has parking. However, these are heavily utilized for business at the Town Hall and the Merrimack District Courthouse. The committee feels that sufficient parking is currently available in the town center. However, it is mostly located at existing public and private entities and the general public may not feel that it is available. One way to address this is to contact these locations and negotiate the use of public parking at certain times of the day or week. For instance the schools, churches and Merrimack Youth Association (town owned) have ample parking areas which may be utilized by the general public with proper permission. The newly formed Town Center Committee would address the following actions:

- Contact public and private entities to determine if agreements could be developed to allow for public parking during off-peak hours.
- If successful, provide signage directing the public to available parking.

SAFETY

Many high school students walk along Woodbury Street, which does not currently have sidewalks. In addition, vehicle traffic leaving the high school travels east on Woodbury Street and must make a right turn on D.W. Highway as left turns are restricted. Many vehicles leaving the high school travel east on Woodbury Street, turn left behind Tire Town and exit onto D.W. Highway at CVS. This creates an unsafe travel pattern, but is used to avoid the right turn only from Woodbury Street onto D.W. Highway.

- Safety concerns should be further analyzed, and existing movement restrictions reviewed to identify potential safety improvements along Woodbury Street and at the intersection of D.W. Highway and Woodbury Street.

With the opening of Watson Park, it is anticipated that pedestrian movement will increase in the vicinity of the park with pedestrians desiring to cross D.W. Highway to travel between the park and Swan Chocolates, or to access the high school. However, locating a crosswalk in this area is extremely challenging due to the roadway speed, site distance and a significant curve in the roadway just to the south and therefore is not currently feasible.

- Research and explore the feasibility of implementing traffic calming measures, such as pedestrian refuge islands, sidewalks and landscaping, or a roundabout as a means to slow traffic, to facilitate the successful location of a crosswalk across D.W. Highway in the vicinity of Watson Park and Woodbury Street.
- Direct pedestrian crossing north of Watson Park at the CVS crosswalk.
- Explore the feasibility of closing the Church Street entrance to D.W. Highway to facilitate development of sidewalks and overall safety.

OTHER CONSIDERATIONS

- After Watson Park has opened to the public, pedestrian patterns should be reviewed to determine if any behavior changes or patterns have occurred and any changes or improvements are required.
- Explore the feasibility of locating an outdoor fitness park along O'Gara Drive. Many residents utilize a loop along Baboosic Lake Road, O'Gara Drive, and McElwain Street for walking and running. This could be enhanced by locating an outdoor exercise park in an open space along the west side of O'Gara Drive.
- Explore private foundation fitness and health grants as well as opportunities at the state and federal level to plan and build a fitness park.

DESIGN GUIDELINES

The town center is subject to design guidelines in both the Subdivision Regulations and the Town Center Overlay District of the Zoning Ordinance and Building Code.

- Develop design guidelines for lighting within the town center, in accordance with Planning Board Regulations. The Heritage Commission, Planning Board and Public Services of New Hampshire should be consulted for input on design requirements.
- Develop a Visual Guide of desired design features for the town center. This could be provided to the planning board, developers and property owners in the planning stage of new construction and redevelopment projects.
- In the Town Center Overlay District add language about methods to enhance streetscape features in the Pedestrian Access Areas as shown on the Town Center Pedestrian and Trail Master Plan. An enhanced streetscape can help create attractive and inviting locations for pedestrians to utilize in the town center. The following amenities should be considered: public art, benches, landscaping, banners, signage, bicycle racks, and sidewalk and crosswalk treatments.
- In the Town Center Overlay District add language about unified signage directing visitors, pedestrians and drivers to key destinations and amenities in the town center. Should also consider uniform standards for business signs.
- Consider the feasibility of moving the former Chamber of Commerce information booth to Watson Park.
- Coordinate with the local Garden Club about possibly enhancing the existing island at Frasier Square.

PUBLIC OUTREACH MATERIALS & METHODS

In order to successfully expand the network of sidewalks and trails within the town center, this effort needs to be spearheaded by a specific group. In addition this group will need to solicit support from the general public. It is recommended that the town designate a committee dedicated to furthering the development of a vital town center.

- Establish a permanent Town Center Committee to spearhead this effort and educate the general public about this on-going effort.
- Develop and distribute educational materials at public venues and events throughout town including Merrimack cable access, the local paper, the town website, and the Merrimack Expo.
- A brochure on the benefits and key elements of a successful town center has been developed as part of this project for general distribution and education purposes.
- Solicit participation and contributions to support and sponsor this initiative from area residents, businesses, and civic organizations.

The following are a variety of outreach methods that can be used to help effectively communicate the importance of a well developed and connected town center with board members, elected officials, and the general public. In order to connect with the greatest number of residents it is advisable to implement several different techniques.

Board/Elected Officials Outreach Materials & Methods

- Presentations at Town Council and Board Meetings
- Guidebooks
- Board training
- Fact sheets
- Brochures

General Outreach Materials & Methods

- Press releases
- Fliers
- Posters
- Informational brochures
- Display boards
- Partnerships with the Merrimack School District
- Cable access public service announcements
- Municipal websites
- Civic group presentations
- Email meeting reminders
- Police department mobile electronic signs
- Direct mail

When communicating with the general public, it is important to remember that not every resident will prefer to receive information in the same manner. Therefore, a variety of outreach methods will need to be employed. It is beneficial to meet with local officials and opinion leaders before conducting a public outreach campaign to ensure that the most effective strategy is developed.

#3066-289

Appendix B

Active Leasing Listings, Town of Merrimack

Address	Sq Ft-Low	Sq Ft-High	Type	Lease Rate-Low	Lease Rate-High
57 DW Hwy	40,000	104,360	Industrial-Distribution Warehouse	$6	$6
746 DW Hwy	9,000	18,000	Industrial-Flex	$6	$6
59 DW Hwy	20,000	76,000	Industrial-Manufacturing	$5	$5
20 Continental Blvd	12,700	12,700	Industrial-Manufacturing	$6	$6
10 Twin Bridge Rd	6,250	6,250	Industrial-Manufacturing	$9	$9
220 DW HWY	75,000	75,000	Industrial-Manufacturing	$6	$8
32 DW Hwy	1,522	7,467	Office	$12	$12
1 Crosswoods Path	1,500	6,000	Office	$8	$8
Medallion Ctr	1,064	12,341	Office	$11	$11
604 DW Hwy	433	2,025	Office	$8	$8
11 Continental Blvd	5,000	55,497	Office	$10	$10
II Heron Cove Pk	5,092	14,593	Office	$17	$17
7 Henry Clay Dr	2,000	45,620	Office	$12	$12
42 Continental Blvd	25,000	80,000	Office	$16	$16
10 Twin Bridge Rd	954	2,219	Office	$7	$8
40 Continental Blvd	10,000	114,470	Office	$13	$13
33 Depot St	3,200	3,200	Office-Medical	$7	$7
25 Depot St	3,200	3,200	Office-Medical	$7	$7
9 Executive Park Dr	6,000	6,000	Office-R&D	$12	$12
I Heron Cove Pk	10,000	10,000	Office-R&D	$17	$17
III Heron Cove Pk	6,500	6,500	Office-R&D	$17	$17
515 DW Hwy	1,050	7,300	Retail	$10	$10
380 DW Hwy (Skyline Mall)	1,300	7,000	Retail	$12	$12
560 DW Hwy (Reeds Ferry Crossing)	1,128	20,250	Retail	Negotiable	Negotiable
356 DW Hwy	37,670	37,670	Retail	Negotiable	Negotiable
7 Continental Dr	1,200	2,600	Retail	Negotiable	Negotiable
Camp Sargent Rd & Continental Blvd	1,400	1,600	Retail-Nhood Ctr	Negotiable	Negotiable
370 DW Hwy	2,400	4,800	Retail-Restaurant	$12	$14
Total	290,563	742,662		$5	$17

Source: LoopNet & RKG Associates, Inc., 2011

Appendix C

Transportation

NHDOT Count Location	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Average Annual Growth	
F.E. Everett Turnpike between Exits 10-11	55000	55000	-	-	-	61200	-	-	56900	-	-	0.4%	2001-2009
US Route 3 north of Hilton Drive	13142	13305	-	13809	13000	13519	13306	12558	13000	12455	12378	-0.6%	2001-2011
Continental Boulevard east of Naticook Road	11000	-	-	12000	-	-	13000	-	-	12000	-	1.0%	2001-2010
Industrial Drive east of Continental Boulevard	6400	-	-	7800	-	-	8900	-	-	7000	-	1.0%	2001-2010
Amherst Road west of Turkey Hill Road	4400	-	-	4700	-	-	4400	-	-	4600	-	0.5%	2001-2010
Bedford Road over Baboosic Brook	-	5400	-	-	6500	-	-	5800	-	-	5700	0.6%	2002-2011
Naticook Road south of Amherst Road	2300	-	-	2700	-	-	2300	-	-	2800	-	2.2%	2001-2010
Tinker Road south of Continental Boulevard	2700	-	-	2200	-	-	2900	-		3900	-	4.2%	2001-2010
Baboosic Lake Road at Amherst Town Line	-	1900	-	-	1600	-	-	1500	-	-	2000	0.6%	2002-2011
Boston Post Road south of Seaverns Bridge	7400	-	-	5800	-	-	6600	-	-	7800	-	0.6%	2001-2010

Source: NHDOT historical traffic count data

References

Nashua Regional Planning Commission

1. 2002 Merrimack Master Plan Update, ~~RKG Associates~~
2. 2003 Hazard Mitigation Plan, Nashua Regional Planning Commission, December 2003
3. Biodiversity Conservation Plan, Moosewood Ecological LLC, December 2010
4. DemographicsNow
5. Economic Development in Merrimack – Advantages, Opportunities and Strategy, Economic Development Citizens Advisory Committee, February 2008
6. Grater Woods Town Forest Stewardship Plan, April 2011
7. Horse Hill Nature Preserve Master Plan, Horse Hill Nature Preserve Master Plan Committee, August 2003
8. Lower Merrimack River Corridor Management Plan, Nashua Regional Planning Commission, May 2008
9. Merrimack Athletic Fields Plan, Athletic Fields Needs Committee, October 2010
10. Merrimack Town Center Pedestrian and Trail Plan, Nashua Regional Planning Commission, November 2009
11. North End Land Use Study, Community Development Department, September 2009
12. Roadway Infrastructure Master Planning Study, Nashua Regional Planning Commission and Fay, Spofford & Thorndike, July 2009
13. Sodium and Chloride Loading Study of the Merrimack Valley District Wellhead Protection Areas, Emery & Garrett Groundwater, Inc., May 2012
14. Souhegan River Watershed Management Plan, Nashua Regional Planning Commission, March 2006
15. Transportation Emergency Preparedness Plan for the Nashua Region, Nashua Regional Planning Commission, September 2010
16. U. S. Census Bureau, 2010 Census
17. Wasserman Park Updated Master Plan, September 2009

Other References: 2013 Sewer Master Plan, Wright-Pierce Associates; Watson Park Master Plan; USDA Soils Report for Hillsborough County; NH Statewide Bicycle and Pedestrian Plan, Jan 1955; Louis Berger Study, Rte 3, Town of Merrimack Zoning Ordinance; Town of Merrimack Subdivision/Site Plan Regulations; Town of Merrimack Zoning Map.

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Merrimack Daniel Webster Highway Bicycle-Pedestrian Corridor Plan

2019

Prepared by the:

Nashua Regional Planning Commission

With the assistance of:

Town of Merrimack

&

New Hampshire Department of Transportation

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TABLE OF CONTENTS

TABLES

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A. INTRODUCTION

The purpose of this project is to develop a bicycle and pedestrian corridor plan for the US Route 3 (Daniel Webster Highway) corridor in Merrimack. This Plan builds on previous efforts to incorporate pedestrian and bicycle travel as vital modes of transportation and recreation in Merrimack.

In November 2009 the Nashua Regional Planning Commission (NRPC) completed a Town Center Pedestrian and Trail Master Plan for the Town of Merrimack. This plan looked at creating a safe and pedestrian – friendly sidewalk and trail network for the so-called Town Center. The Town Center was defined as the area east of the FEET Turnpike, south of Front Street and north of the Rite-Aid plaza. The Plan established 9 priority items for sidewalk construction within the Town Center. Six of the recommendations are along Route 3 and three are elsewhere in the Town Center area. The Merrimack Town Center Committee was established by the Merrimack Town Council to implement the plan. Most of the recommendations in the Town Center plan have not been implemented due to funding constraints.

The Town of Merrimack Master Plan was last updated in 2013 and was adopted by the Merrimack Planning Board in January 2014. This plan made several recommendations regarding sidewalk and bicycle paths. Specifically, the Master Plan recommends developing a town-wide pedestrian and bicycle plan that considers design and location standards so that incremental sidewalk construction projects can be integrated into a single uniform network.

In November 2013 the New Hampshire Department of Transportation (NHDOT), which maintains jurisdiction over Route 3, met with the Merrimack Community Development Department to discuss the Town's plans for sidewalks along Route 3 (see Appendix C). While supportive of the Town's desire to create a sidewalk system along the US 3 corridor, NHDOT expressed a desire that decisions related to the installation sidewalk segments be consistent with a comprehensive corridor sidewalk plan endorsed by the Town. NHDOT suggested that the Town contact NRPC regarding the possibility of assisting with the development of such a comprehensive Plan. NRPC then worked with the Town to create a scope of work to guide the planning process and this plan and an associated map of the corridor was developed.

Roadway	Responsible Party
US Route 3 from Bedford Town Line to Bedford Road & from Greeley Street to Nashua Town Line	State
US Route 3 from Bedford Road to Greeley Street	State Road/Local Maintained (Urban Compact)

B. GOALS OF THIS CORRIDOR PLAN

The goals of this plan are as follows:

- To identify and map existing bicycle and pedestrian infrastructure in the Route 3 Corridor in Merrimack.
- To identify gaps in the infrastructure.
- To identify land use regulations that accommodate future needs of all users of this major travel corridor.
- To develop a corridor plan to meet current and future bicycle and pedestrian infrastructure needs in the Route 3 corridor in Merrimack.

C. STUDY PROCESS

A scope of work was developed by NRPC that guided the planning process through two distinct phases. In Phase 1, a map of existing bicycle and pedestrian infrastructure – and gaps in that infrastructure – was developed. In Phase 2, a corridor plan was developed that summarizes data analysis, key issues and barriers, recommendations and action steps.

- **Phase 1: Map Existing Bicycle and Pedestrian Infrastructure**
  - *Task 1: Develop Base Map*
    NRPC developed a base map of the corridor in Merrimack using orthophoto (aerial photography) information and existing geographic information system (GIS) data layers to show sidewalks, crosswalks, bicycle lanes, paths, trails, and other significant information to plan for future needs in the corridor.
  - *Task 2: Survey of Corridor*
    NRPC conducted a physical survey of the corridor in Merrimack. The purpose of the survey was to verify existing conditions that may not be evident from orthophoto information or existing GIS data layers.
  - *Task 3: Level of Traffic Stress Analysis*
    NRPC developed a Level of Traffic Stress (LTS) analysis for the corridor. LTS is intended to analyze the comfort of bicyclists with varying experience levels depending on the physical characteristics of a street. The scores range from 1 (suitable for all bicyclists, including children) to 4 (suitable for only the most fearless and experienced rider), and are determined by a formula that incorporates bike lanes, shoulders, lane width, traffic speed, on-street parking, and more. A similar analysis was developed for pedestrian travel.

    The analysis identified an LTS score for each segment of the corridor. The results are explained later in this document. Maps that show the results can be seen in Appendix A and B
  - *Task 4: Participate in a workshop with the Merrimack Planning Board*

    NRPC participated in a workshop with the Planning Board using the map and LTS analysis produced in Steps 1- 3. The purpose of the workshop was to review the map, review the gaps in bicycle and pedestrian infrastructure, and identify priority connections and areas of need. Such areas of need could include gaps in the infrastructure, safety issues, repairing existing sidewalks that are in poor condition and other needs.

    The Merrimack Planning Board organized a workshop that took place on December 5th, 2017.
  - *Task 5: Produce a Final Map*
    Using data and analysis collected in steps 1-4, NRPC produced a final map and spreadsheet that lists infrastructure needs in order of priority and details of those needs including length of sidewalk and/or bicycle path segments, existing ROW, existing drainage in that area and other pertinent information that will aid in planning for those future needs. The final map is similar to the Merrimack Town Center map that was produced by NRPC. The map can be found at this link:
    https://www.nashuarpc.org/files/6615/3132/8033/DW_Hwy_Bikeped_July2018.pdf

- **Phase 2: Develop Corridor Plan**
  - *Task 1: Review Existing Plans, Documents and Maps*
    NRPC staff reviewed and summarized local and regional plans, documents and maps to confirm bicycle and pedestrian infrastructure data (such as sidewalks, bicycle lanes, paths, trails, drainage, ROW, etc.) and goals stated in previously drafted local plans for portions of the corridor.
  - *Task 2: Develop Corridor Plan Document*
    NRPC developed a corridor plan that summarizes all data analysis, key issues and barriers. The corridor plan includes recommendations, priorities and action steps.

D. STUDY METHODOLOGY

Sidewalk Inventory

NRPC staff conducted a field survey of all sidewalks within the study area. Sidewalk conditions were noted and entered into Geographic information system (GIS) mapping software. The results are included on the Phase 1 map.

Measuring the Level of Walkability and Bikeability

To conduct the analysis that shows potential areas of improvement, the corridor was assigned a Level of Traffic Stress (LTS) for bicycling and a Level of Walkability (LoW) for pedestrian travel.

The methodology for Level of Traffic Stress has been used in a handful of larger metropolitan areas across the U.S and recently, several communities in New Hampshire, including Nashua, have developed a network of LTS scores through a NHDOT pilot project. LTS is intended to analyze the comfort of bicyclists with varying experience levels depending on the physical characteristics of a street. The scores range from 1 (suitable for all bicyclists, including children) to 4 (suitable for only the most fearless and experienced rider), and are determined by a formula that incorporates bike lanes, shoulders, lane width, traffic speed, on-street parking, and other attributes.

For pedestrians, a separate formula is used that has some similarities to LTS, using attributes such as the presence of sidewalks, any buffer area between a sidewalk and the street, shoulder width, and traffic speed. Walkability scores also range from 1 to 4 but are meant to be more of a relative index than representative of specific levels of ability like the bicycle LTS system.

Appendix's A and B provide maps that show Level of Traffic Stress for walking and biking, respectively.

E. PUBLIC INPUT

Planning Board Meetings

A project workshop was held as a part of the regular Planning Board Meeting on December 5th, 2017. The purpose of the workshop was for NRPC to present the results of Phase 1 of the project and for the Planning Board to provide guidance to the NRPC regarding overall long-range goals for bicycle and pedestrian accommodations along the corridor.

NRPC staff presented and explained the corridor map that had been developed during Phase 1 of the project. This map shows the existing conditions for bicycle and pedestrian infrastructure along the corridor in Merrimack between the Nashua and Bedford borders. The process for developing the map was explained including how an analysis of walkability and bikeability had been completed for the entire corridor. Gaps in bicycle and pedestrian conditions were discussed.

Various issues were discussed during the workshop including location of crosswalks, sidewalk connections and bike lanes along the paved shoulders. There was discussion about holding a public forum to gather public input. The Board decided to poll voters at Town Meeting Election Day (April 10, 2018) to get a sense of the public perception of priorities.

The Board also discussed the importance of consulting NHDOT during Phase 2 of the planning process. It was decided that NHDOT would be given the opportunity to review and provide feeding of the draft corridor plan before it is finalized.

A progress report and discussion about Phase 2 of the corridor planning process was presented to the Board by NRPC staff on July 17th, 2018.

Voter Surveys

An election day polling-place questionnaire was developed, and a copy of the corridor map was presented to the voters at each of the three Merrimack polling places on April 10, 2018. Participation by the voters was optional and many voters did not participate. A total of 3,010 citizens of Merrimack voted in the April 10th election. 239 questionnaires were completed among the three polling stations.

- 195 voters said they believe sidewalks and/or bike lanes should be constructed along D W Highway.
- 23 voters said sidewalks and bike lanes are not important and should not be considered along D W Highway.
- 21 voters did not answer the question.

To help the Town prioritize sidewalk construction voters were asked to indicate the three (3) segments of Route 3 sidewalk that they feel should be constructed first. The following table lists a description of the segments, the number of votes each segment received and the resultant ranking.

Results of Voter Survey - April 10, 2018		
Rank	**# of Votes**	**Corridor Segment**
1	132	Town Hall to the Post Office
2	117	Town Hall to Merrimack Commons (Tractor Supply)
3	109	Watson Park to Twin Bridge Park
4	69	Reeds Ferry Village to the Post Office
5	54	Watson Park to Rite Aid Plaza
6	39	Both sides of Route 3 in Reeds Ferry Village
7	32	Merrimack Hotels (Residence Inn/ Comfort Inn) to Greeley Street

Review of Public Documents

The following town documents have been reviewed during the planning process to incorporate poilicies and recommendations from those older plans into the corridor plan:

- Merrimack Master Plan,
- Town Center Pedestrian and Trail Master Plan
- James Mastricola Elementary & Upper Elementary Schools Safe Routes to School Travel Plan

NHDOT Feedback

It was noted earlier in this document the New Hampshire Department of Transportation (NHDOT) met with Merrimack Community Development Department to discuss the Town's plans for sidewalks along Route 3 several years ago (Appendix C). While supportive of the Town's desire to create a sidewalk system along the US 3 corridor, NHDOT expressed a desire that decisions related to the installation of sidewalk segments be consistent with a comprehensive corridor sidewalk plan endorsed by the Town.

NRPC staff had conversations with NHDOT District 5 Engineer on two separate occasions at the beginning of this planning process. The purpose of those conversations was to develop a clear understanding of the level of detail NHDOT expected of this document. This document reflects those expectations.

Town of Merrimack Feedback

The Department of Public Works, Office of Community Development and the Planning Board provided feedback that was incorporated into this document.

F. KEY ISSUES

Discontinuous sidewalks and lack of crosswalks along the corridor leave potentially meaningful destinations marooned from safe and convenient pedestrian access. There are 5 miles of highway between the Nashua line and the Lobster Boat restaurant, for example, with only a single crosswalk. Much of this section of the highway is a "modern" expansive 5-lane section with no way to safely cross the street. The entire DW Highway corridor in Merrimack is urbanized and developed to the level and context where comprehensive pedestrian facilities along and across the highway are appropriate. Based on this study and interpretation of various sets of design guidelines and best practices, sidewalks or side paths on both sides of the street are ideally needed for a majority of the length of the corridor with new crosswalk locations, pedestrian signalization and geometric changes at many locations. Additionally, minimal shoulder widths, high vehicle operating speeds and generally nonexistent bicycle accommodations results in intimidating conditions for all but the more experienced bicyclists.

With potential destinations on both sides and along its entire length in Merrimack, the corridor is no longer rural so there's no objective or engineering justification to consider mixed or merely visually separated traffic facilities (shoulders serving as the sidewalk space for example) in lieu of pedestrian facilities. Even if you consider the highway in a "rural context," the traffic volumes and speeds are

beyond what FHWA's Rural Multimodal Networks Guide would tolerate for the shared pedestrian/motor vehicle use since the shoulders don't meet the recommended minimum paved shoulder widths.

Level of Pedestrian Traffic Stress

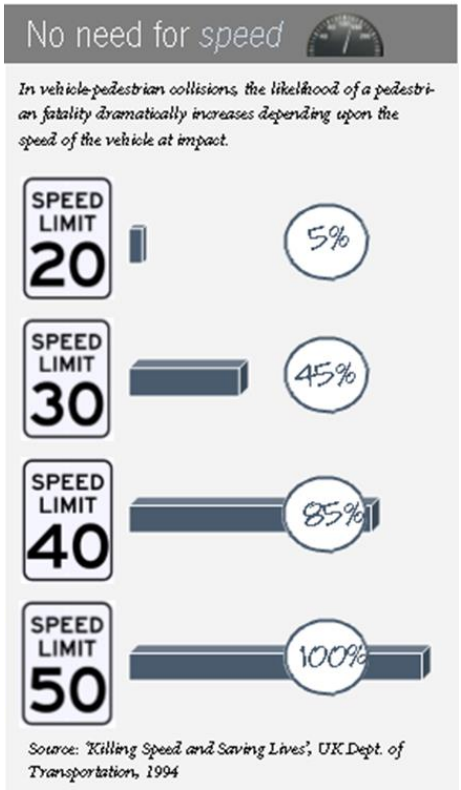
Level of pedestrian traffic stress analysis that was done for this study has shown the most walkable segments along the corridor to be where sidewalks and crosswalks exist (Appendix A). Creating a more continuous network of sidewalks along the corridor and to streets within the surrounding neighborhoods will strengthen the overall walkability of the corridor. In addition to sidewalks or side paths along the corridor this would include sidewalks on Woodbury Street, Baboosic Lake Road Wire Road and Bedford Road. These would connect the corridor to James Mastricola Elementary & Upper Elementary Schools and the Merrimack Middle School and surrounding neighborhoods.

Level of Bicycle Traffic Stress

Level of bicycle traffic stress analysis shows that conditions along the corridor support only the more experienced riders (Appendix B). This is due to narrow shoulder width, number of travel lanes, posted speed limit and lack of bicycle lanes. Speeding traffic most likely discourages bicyclists, but speed studies would need to be done to verify this.

Operating Speed of Traffic

There is a maximum safe speed for every type of conflict on a roadway. For vulnerable road users (i.e. bicyclists and pedestrians) various data show a similar pattern in fatality risk. The risk increases slowly until impact speeds of around 30 mph. Above this speed, risk increases rapidly – the increase is between 3.5 and 5.5 times from 30 mph to 40 mph.



Where vulnerable road users are more commonly found and may cross the street anywhere or act in an unpredictable manner, the target speed achieved by the road design should be 20 mph (or at least below 30 mph) as at higher speeds, the chance of surviving a collision falls rapidly.

The posted speed limit along the DW Highway corridor varies from 30-45mph. The actual operating speed is most likely in excess of the posted speed limit, although speed studies would be needed to verify this assertion. Regardless of the actual motor vehicle operating speed the posted speed limit assures that vulnerable users will be seriously or fatally injured in a collision with a motor vehicle.

This means that bicycle and pedestrian accommodations along the DW Highway corridor should be designed either to separate users so that conflicts do not occur, or else to limit traffic speed based on the conflicts that will occur. Lack of additional right-of-way along the corridor limits the likelihood that separated bicycle facilities could be incorporated in any significant way. Instead, travel lanes could be narrowed using pavement markings to allow for wider paved shoulders between the outside fog line and curbing (or the road edge). Sidewalks should continue to be used to separate pedestrians from motor vehicles. Side paths should be incorporated in the future when segments of the roadway are rehabbed or rebuilt.

Crash Data

NRPC reviewed motor vehicle crash data within the one-quarter-mile buffer of the corridor. The table to the right provides information about each reported crash. The map in Appendix D shows where these crashes are located along the corridor.

The table indicates 22 crashes involving bicycles or pedestrians were reported over the 15-year period (approx. 1.5 per year). There were 20 injuries and no fatalities. Crashes were evenly split between bikers and walkers.

Five (25%) of the crashes occurred at intersections where one might expect a greater number of conflicting movements between motor vehicles, pedestrians and bicycles conflicts. Eleven (50%) of the crashes occurred along the roadway, suggesting the need for greater separation between motor vehicles and vulnerable users.

Motor Vehicle - Bicycle - Pedestrian Crashes (2002-2017)

Accident Street	Near	Accident Type	Location	# Fatal	# Injuries
D W HWY	Childrens World Driveway	Pedestrian	Off Roadway	0	1
D W HWY	Baboosic Lake Rd	Pedestrian	Along the road	0	0
D W HWY	Crosswoods Path BLlvd	Bicyclist	Along the road	0	1
D W HWY	Bowers Landing	Bicyclist	Intersection	0	1
D W HWY	Williams St	Pedestrian	Along the road	0	1
D W HWY	Church St	Bicyclist	Along the road	0	1
D W HWY	Railroad Ave	Pedestrian	Along the road	0	1
D W HWY	Robert Milligen Way	Pedestrian	Along the road	0	1
D W HWY	Railroad Ave	Pedestrian	Off Roadway	0	1
D W HWY	Manchester St	Bicyclist	Intersection	0	1
D W HWY	Depot St	Pedestrian	In parking lot	0	1
D W HWY	Aroma Joes	Bicyclist	Off Roadway	0	1
D W HWY	Church st	Pedestrian	Intersection	0	1
D W HWY	North of Greeley St	Pedestrian	in parking lot	0	1
D W HWY	Herrick St	Moped	Along the road	0	1
D W HWY	Church St	Bicyclist	Along the road	0	1
GREELEY ST	F.E.E. TRPKE off ramp	Pedestrian	Intersection	0	1
HENRY CLAY DR	Al Paul Ln	Bicyclist	Along the road	0	1
MCGAW BRIDGE RD	Belair Ave	Pedestrian	Along the road	0	0
WHITNEY ST	Greeley St	Bicyclist	Intersection	0	1
WHITNEY ST	Greeley St	Bicyclist	In parking lot	0	1
WOODBURY ST	D W HWY	Bicyclist	Along the road	0	1

Crash data courtesy of NH DOT and represents reported crashes from 2002-17

Total Crashes:	**22**
Total Pedestrian:	**11**
Total Bicycle:	**11**
Total Injuries:	**20**
Total Fatal Injuries:	**0**

G. PLANNING AND POLICY TOOLS

Many communities around the United States have established pedestrian and bicycle programs. The most successful programs have developed plans and policies that support improved mobility, health and safety for pedestrians and bicyclists.

The principal tools for community planning in New Hampshire are master plans, subdivision regulations, zoning laws and site plan review. Master plans outline a community's qualities and express a community vision, goals and action steps. The master plan, in turn, supports the use of zoning laws and the site plan review process.

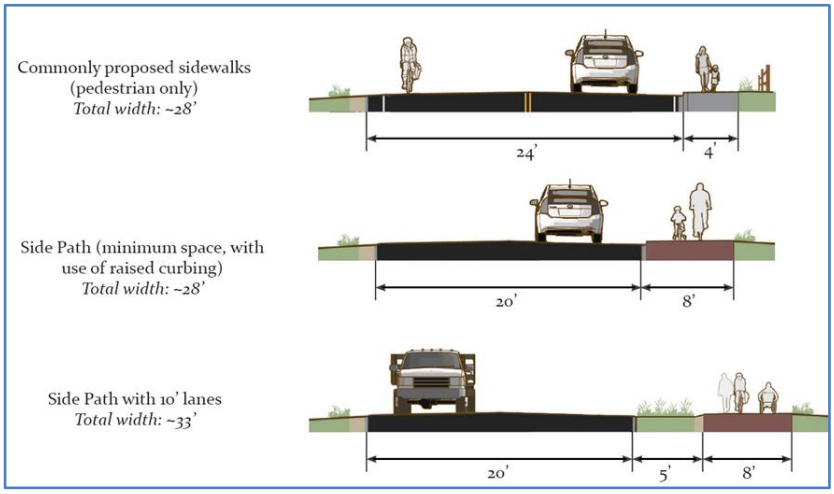
In Merrimack, the planning and policy tools that support bicycle, pedestrian and intermodal transportation are the 2013 Master Plan as well as subdivision and site plan regulations. The Master Plan addresses Land Use and Community Design, Economic Development, Natural Resources, Community Facilities, Transportation and other characteristics of the community. The plan expresses a Community Vision that seeks to preserve the Town's character and the great quality of life experienced by its residents. Walking, bicycling and physical activity are central to achieving this purpose which is why these activities are addressed in the Master Plan.

Bicycle and pedestrian amenities are referenced in the Towns subdivision and site plan regulations. One of the issues that Town officials hope to address is the blanket requirement for sidewalks in every site plan regardless of location and existing pedestrian facilities. Officials would like to tie the regulatory requirements to bicycle-pedestrian plans, so that sidewalks, paved ways and other amenities are not required everywhere, particularly in areas that are not priority or close to making reasonable connections.

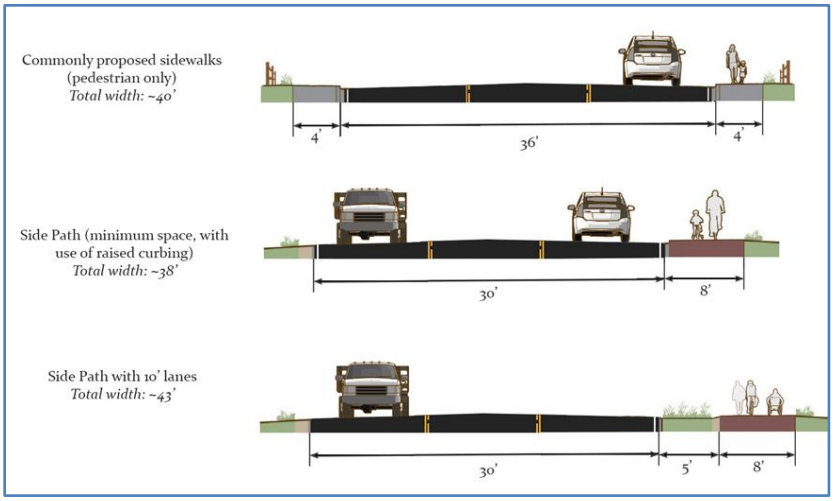
H. DESIGN GUIDELINES

Most of the DW Highway corridor in Merrimack is urbanized and developed to the level and context where comprehensive pedestrian and bicycle facilities along and across the highway are appropriate. The corridor is generally characterized by traffic speeds above 30 mph which as noted earlier presents a high risk of death or serious injury in a collision between a vehicle and a vulnerable road user. Additionally, high traffic volumes factor into a high level of bicycle and pedestrian traffic stress.

For this type of roadway, mixing of motorized traffic with vulnerable road users is not the safest solution and therefore segregation of vulnerable users away from motorized traffic is the preferred means of protection. Ideally, the recommended roadway treatment for this type of road would be a side path–a paved, eight foot-wide, bidirectional, multiuse space beside the street. A side path is simply a wider-than-normal sidewalk. The images on the right (top) show a typical cross section of 12-foot travel lanes and 4-foot sidewalk. Notice that if travel lanes are narrowed to 10-feet, an 8-foot side path can be incorporated into a narrower right of way. The image to the right (bottom) shows how a side path can be incorporated into a center turn lane cross section using less right of way than is typical of existing conditions on the DW Highway. Appendix E shows these cross sections as well as a 5-lane cross section.



A side path may still be possible in certain areas along the corridor where land use has not fully encroached into the right-of-way or where redevelopment may occur in the future. In these cases, a side path should be considered. In areas where a side path is not realistic, sidewalks should continue to be required and travel lanes should be narrowed to allow for the widest possible shoulder, thus allowing more room for bicycles.



Space occupied by non-motorized multimodal users should be defined from traditional road space in a distinctive way. It is therefore recommended that when asphalt sidewalks are installed, hot mix asphalt colorant be utilized as it tends to color the surface for the life of the asphalt, as opposed to surface-applied paints, which tend to require regular maintenance. FHWA-approved color should be used universally in these spaces. Additionally, the same color should be used on shoulders where bike lanes are defined.

The engineering of specific improvements along the corridor is beyond the scope of this corridor plan. Best practices for design guidelines and road treatments that accommodate all modes of transportation continue to evolve and this document strongly recommends that best practices always be followed. The

following resources provide clear and up-to-date guidance. Additional resources are provided in Appendix F.

- **NATCO Urban Bikeway Design Guide (2011)** HTTPS://NACTO.ORG/PUBLICATION/URBAN-BIKEWAY-DESIGN-GUIDE/
- **FHWA, SMALL TOWN & RURAL MULTIMODAL NETWORKS (2016)** HTTPS://WWW.FHWA.DOT.GOV/ENVIRONMENT/BICYCLE_PEDESTRIAN/PUBLICATIONS/SMALL_TOWNS/FHWAHEP17024_LG.PDF
- **AASHTO, Guide for the Development of Bicycle Facilities (2012)** HTTPS://NACTO.ORG/REFERENCES/AASHTO-GUIDE-FOR-THE-DEVELOPMENT-OF-BICYCLE-FACILITIES-2012/
- **FHWA, Bicycle Facilities and the Manual on Uniform Traffic Control Devices (2011)** http://www.fhwa.dot.gov/environment/bikeped/mutcd_bike.htm

I. RECOMMENDATIONS AND PRIORITIES

The following recommendations and priorities for encouraging pedestrian and bicycle travel along the corridor resulted from surveys of voters and input from Merrimack Planning Board, Department of Public Works and NHDOT*. Recommendations from various planning documents were also reviewed and incorporated as appropriate. Documents reviewed included the Merrimack Master Plan, the Merrimack Town Center Pedestrian and Trail Master Plan and the James Mastricola Elementary & Upper Elementary Schools Safe Routes to School Travel Plan.

** Meeting with NHDOT has yet to be held.*

General Recommendations

- The Town should adopt a consistent roadway cross section along the corridor like those described in the design guidelines section of this document and later in Appendix F. This cross section should be considered whenever maintenance, rehabilitation or new construction occurs within the corridor right of way. This will allow multimodal accommodations to be implemented on a gradual basis over time as part of the road maintenance and/or town capital improvement program.
- The Planning Board should review subdivision and site plan regulations and tie these regulatory requirements to the recommendations in this and other bicycle-pedestrian related planning documents. Sections 4-20 and 7-05-D-19 currently address sidewalks and paved ways.
- Sidewalks and side paths
  - Sidewalks should continue to be required in most areas of the corridor (see priorities below); where right of way allows, 8-foot wide, bidirectional side paths should be considered.
- Travel lanes and shoulders:
  - Use pavement markings to define 10-foot-wide travel lanes wherever possible.
  - Use the additional shoulder width to accommodate bicycles.
  - Use FHWA-approved color to define shoulders.
- Crosswalks
  - Existing crosswalks should be maintained or upgraded as noted in the following priorities section.
  - New crosswalks should be installed as noted in the following priorities.
- Right turn pockets:
  - Provide bicycle sharrows between the outside (right) travel lane and the turn pocket.
- Traffic Calming (for example, speed tables, raised crosswalks, sidewalk bump outs):
  - Traffic calming treatments should be considered where motor vehicle operating speeds exceed posted speed by @ least 5 MPH
  - Speed studies along the corridor should be undertaken to identify where traffic calming is needed.

PRIORITY 1: Develop key portions of the 2009 Town Center Plan, linking schools, library, Town Hall and parks. Elements include:

- Sidewalks or side paths:
  - Merrimack Public Library to Wire Road – on west side of Route 3.
  - Library to O'Gara Drive - on north side of Baboosic Lake Road.
  - McElwain Street to Route 3 – on Woodbury Street
  - D&W Auto Center & Loop Road to Twin Bridge Park – on east side of Route 3.
  - FEET to Merrimack Middle School – on Baboosic Lake Road.
  - Railroad Avenue to Rite Aid – on east side of Route 3.
- Crosswalks on Route 3
  - @ Baboosic Lake Road – continue to maintain signalized pedestrian crossing.
  - @ Connell's Shopping Center – continue to maintain signalized pedestrian crossing.
  - @ Rite Aid Plaza/Merrimack Village Mall – upgrade existing signal to pedestrian activated.
  - Install non-signalized pedestrian crosswalk on Railroad Avenue.
- Travel lanes and shoulders:
  - Use pavement markings to define 10-foot-wide travel lanes wherever possible.
  - Use the additional shoulder width to accommodate bicycles.
- Right turn pockets:
  - Provide bicycle sharrows between the outside (right) travel lane and the turn pocket.
- Traffic Calming (for example, speed tables, raised crosswalks, sidewalk bump outs):
  - Traffic calming treatments should be considered where motor vehicle operating speeds exceed posted speed by @ least 5 MPH
  - Speed studies along the corridor to support traffic calming

PRIORITY 2 Incorporate bicycle and pedestrian amenities into future improvements on Route 3 at the intersection of Wire Road and the new Baboosic Brook Bridge:

- Sidewalks or side paths:
  - Baboosic Brook Bridge – on both sides of the new bridge.
  - Wire Road to Front Street – on west side of Route 3.
  - Twin Bridge Park to Front Street on east side of Route 3 – by way of Tractor Supply Shopping Center cut through.
- Crosswalks on Route 3
  - @ Wire Road – incorporate into intersection re-design.
  - @ Front Street - maintain signalized pedestrian phase
- Crosswalk on Wire Road
  - Incorporate crosswalk onto Wire Road during intersection redesign.
- Minimum 4-foot shoulders on both sides of new bridge to accommodate bicycles.

PRIORITY 3

Integrate Town Center with Reed's Ferry Village

- Sidewalks or side paths:
  - Fill gaps between Bedford Road to the Post office – on west side of Route 3.
- Crosswalks:
  - @ Bedford Road – continue to maintain signalized pedestrian crossing.
  - @ Rainbow Avenue – upgrade existing signal to accommodate pedestrian phase.
- Travel lanes and shoulders:
  - Use pavement markings to define 10-foot-wide travel lanes wherever possible.
  - Use the additional shoulder width to accommodate bicycles.
- Right turn pockets:
  - Provide bicycle sharrows between the outside (right) travel lane and the turn pocket.

PRIORITY 4

Non-Urban Compact north of Bedford Road

- Sidewalks or side paths:

  - Bedford Road to Flatley development (Glibert Ave)– on east side of Route 3.
  - Flatley development north to Society Hill – via Flatley property on east side of Route 3.
  - Fill gaps between Bedford Road and Merrimack Ten Pin Center – on west side of Route 3.
- Crosswalks:
  - @ Society Hill
  - @ Merrimack ten Pin Center/St. Gobain
- Travel lanes and shoulders:
  - Use pavement markings to define 10-foot-wide travel lanes wherever possible.
  - Use the additional shoulder width to accommodate bicycles.
- Right turn pockets:
  - Provide bicycle sharrows between the outside (right) travel lane and the turn pocket.

PRIORITY 5

Integrate South part of Urban Compact with Town Center

- Sidewalks or side paths:
  - Rite Aid to Greeley Street – on west side of Route 3
  - Rite Aid to Wright Avenue – on east side of Route 3
  - 360 DWH to Greeley Street – on east side of Route 3
- Crosswalks:
  - @ Greeley Street – upgrade existing signal to accommodate pedestrian phase.
  - @ 360 DWH – upgrade existing signal to accommodate pedestrian phase.
- Travel lanes and shoulders:
  - Use pavement markings to define 10-foot-wide travel lanes wherever possible.
  - Use the additional shoulder width to accommodate bicycles.
- Right turn pockets:
  - Provide bicycle sharrows between the outside (right) travel lane and the turn pocket.

PRIORITY 6

Non-Urban Compact South of Greeley Street

- Sidewalks or side paths:
  - Greeley Street south to hotels – west side of Route 3
  - Gap between BAE and Bon Bon Mobil – west side of Route 3
  - Manchester Street to Harris Pond Road – west side of Route 3
  - Greeley Street to Meineke Muffler shop – east side of Route 3
- Crosswalks:
  - @ BAE Systems
  - @ Harris Pond Road
  - @ 57/59 DW Highway entrance intersection
- Travel lanes and shoulders:
  - Use pavement markings to define 10-foot-wide travel lanes wherever possible.
  - Use the additional shoulder width to accommodate bicycles.
- Right turn pockets:
  - Provide bicycle sharrows between the outside (right) travel lane and the turn pocket.

PRIORITY 7

Gaps to be addressed at a future date

- Sidewalks or side paths:
  - Route 3, East Side, Meineke Muffler Shop to BAE Crossing Light
  - Route 3, East Side Front Street to Twin Bridge Road
  - Route 3 West Side 10 Pin North to Bedford Town Line
  - Route 3, East Side Society Hill to Crosswoods Path
  - Route 3 East Side Crosswoods Path north to Bedford Line
  - Route 3, West Side South of Harris Pond to Nashua Line
  - Route 3, East Side South of Harris Pond to Nashua Line

- Route 3, East Side along Flately and Merrimack Tractor Supply Developments to be handled by sidewalks internal to the Developments
- Chamberlain Bridge, West Side

IMPLEMENTATION

It will be necessary to develop a designated and on-going financial plan if the recommended infrastructure improvements along the corridor are to be funded. The following is a list of potential options for revenue sources.

- While traditional funding methods such as state and federal grants and warrant articles should remain options for supplemental funds, it is recommended that general funding for the implementation of multimodal roadway treatments be provided through traditional road construction budgeting of all future roads in town. If this recommendation is embraced, there would be less need for special funding to implement these treatments. This will allow implementation on a gradual basis over time as part of the road maintenance and/or town capital improvement program.
- Support the funding of a Road Infrastructure Capital Reserve Fund and incorporate projects into the Capital Improvement Plan.
- Explore grant opportunities, such as the Transportation Alternatives Program, (NH DOT) and private foundations for fitness grants.
- Explore the feasibility of adopting a $5 vehicle registration fee to create a local transportation fund. (allowable under RSA 261:153 VI)
- Continue to work with developers to make on-site and off-site improvements as new development opportunities present themselves. Developers should continue to be made aware of the Daniel Webster Highway Corridor Plan, the Town Center Pedestrian and Trail Master Plan and the James Mastricola Elementary & Upper Elementary Safe Routes to School Travel Plan. These plans support additional bicycle and pedestrian facilities along or provide connections to neighborhoods and other destinations near the corridor.

Table 1: Action Plan for Priority 1 Projects

Priority 1: Develop key portions of the 2009 Town Center Plan		Lead Partners	Timeline
Sidewalks	Merrimack Public Library to Wire Road - on west side of Route 3. (1,000 LF)	**Town of Merrimack** NHDOT	1-3 years
	McElwain Street to Route 3 – on Woodbury Street. (1,300 LF)		1-3 years
	Library to O'Gara Drive - on north side of Baboosic Lake Road. (1,700 LF)		1-3 years
	Railroad Avenue to Rite Aid - on east side of Route 3 (1,000 LF)		3-5 years
	Loop Road to Twin Bridge Park - on east side of Route 3 (3,000 LF)		3-5 years
	FEET to Merrimack Middle School – on Baboosic Lake Road (9,000 LF)		3-5 years
Crosswalks	Maintain signalized pedestrian phase Baboosic Lake Road	**NHDOT** Town of Merrimack	ongoing
	Maintain signalized pedesrian phase at Connell's Shopping Center		ongoing
	Upgrade existing signal to include pedesrian phase at CVS Shopping Center		1-3 years
	on Railroad Avenue - non signalized	**Town of Merrimack** NHDOT	3-5 years
Travel Lanes & Shoulders	Use pavement markings to define 10 foot-wide travel lanes wherever possible.	**Town of Merrimack** NHDOT	1-3 years
	Use the additional shoulder width to accommodate bicycles		
Right Turn Pockets	Provide bicycle sharrows between the outside (right) travel lane and the turn pocket.	**Town of Merrimack** NHDOT	1-3 years
Traffic Calming	Traffic calming treatments should be considered where motor vehicle operating speeds exceed posted speed by @ least 5 MPH	**Town of Merrimack** NHDOT	3-5 years
	Speed studies along the corridor to support traffic calming	**Town of Merrimack**	< 1 year

Table 2: Action Plan for Priority 2 Projects

Priority 2: Incorporate bicycle and pedestrian amenities into future improvements on Route 3 at the intersection of Wire Road and the new Baboosic Brook Bridge		Lead Partners	Timeline
Sidewalks	Baboosic Brook Bridge – on both sides of the new bridge	**Town of Merrimack** NHDOT	1-3 years
	Wire Road to Front Street – on west side of Route 3.		3-5 years
	Twin Bridge Park to Front Street on east side of Route 3 – by way of Tractor Supply Shopping Center cut through		3-5 years
Crosswalks	On Route 3 @ Wire Road – incorporate into intersection re-design	**Town of Merrimack** NHDOT	1-3 years
	On Route 3 @ Front St - maintain signalized Pedestrian phase		ongoing
	On Wire Rd - incorporate crosswalk during intersection re-design		1-3 years
Travel Lanes & Shoulders	Incorporate 4-foot bike lanes on new bridge over Baboosic Brook	**Town of Merrimack** NHDOT	1-3 years
	Use pavement markings to define 10 foot-wide travel lanes wherever possible.		1-3 years
	Use the additional shoulder width to accommodate bicycles		

Table 3: Action Plan for Priority 3 Projects

Priority 3: Integrate Town Center with Reed's Ferry Village		Lead Partners	Timeline
Sidewalks or Sidepaths	Fill gaps between Bedford Road to the Post office – on west side of Route 3.	**Town of Merrimack** NHDOT	3-5 years
Crosswalks	On Route 3 @ Bedford Road – continue to maintain signalized pedestrian crossing.	**Town of Merrimack** NHDOT	ongoing
	On Route 3 @ Rainbow Avenue – upgrade existing signal to accommodate pedestrian phase.		3-5 years
Travel Lanes & Shoulders	Use pavement markings to define 10 foot-wide travel lanes wherever possible.	**Town of Merrimack** NHDOT	1-3 years
	Use the additional shoulder width to accommodate bicycles		

Table 4: Action Plan for Priority 4 Projects

Priority 4: Non-Urban Compact north of Bedford Road		Lead Partners	Timeline
Sidewalks or Sidepaths	Bedford Road to Flatley development (Glibert Ave)– on east side of Route 3	**NHDOT** **Town of Merrimack**	3-5 years
	Flatley development north to Society Hill – via Flatley property on east side of Route 3		1-3 years
	Fill gaps between Bedford Road and Merrimack Ten Pin Center – on west side of Route 3.		3-5 years
Crosswalks	On Route 3 @ Society Hill	**NHDOT** **Town of Merrimack**	3-5 years
	On Route 3 @Merrimack ten Pin Center/St. Gobain		3-5 years
Travel Lanes & Shoulders	Use pavement markings to define 10 foot-wide travel lanes wherever possible.	**NHDOT** **Town of Merrimack**	1-3 years
	Use the additional shoulder width to accommodate bicycles		

Table 5: Action Plan for Priority 5 Projects

Priority 5: Integrate South part of Urban Compact with Town Center		Lead Partners	Timeline
Sidewalks or Sidepaths	Rite Aid to Greeley Street – on west side of Route 3	**Town of Merrimack** **NHDOT**	5+ years
	Rite Aid to Wright Avenue – on east side of Route 3		5+ years
	360 DWH to Greeley Street – on east side of Route 3		5+ years
Crosswalks	On Route 3 @ Greeley Street – upgrade existing signal to accommodate pedestrian phase.	**Town of Merrimack** **NHDOT**	3-5 years
	On Route 3 @ 360 DWH – upgrade existing signal to accommodate pedestrian phase		3-5 years
Travel Lanes & Shoulders	Use pavement markings to define 10 foot-wide travel lanes wherever possible.	**Town of Merrimack** **NHDOT**	1-3 years
	Use the additional shoulder width to accommodate bicycles		

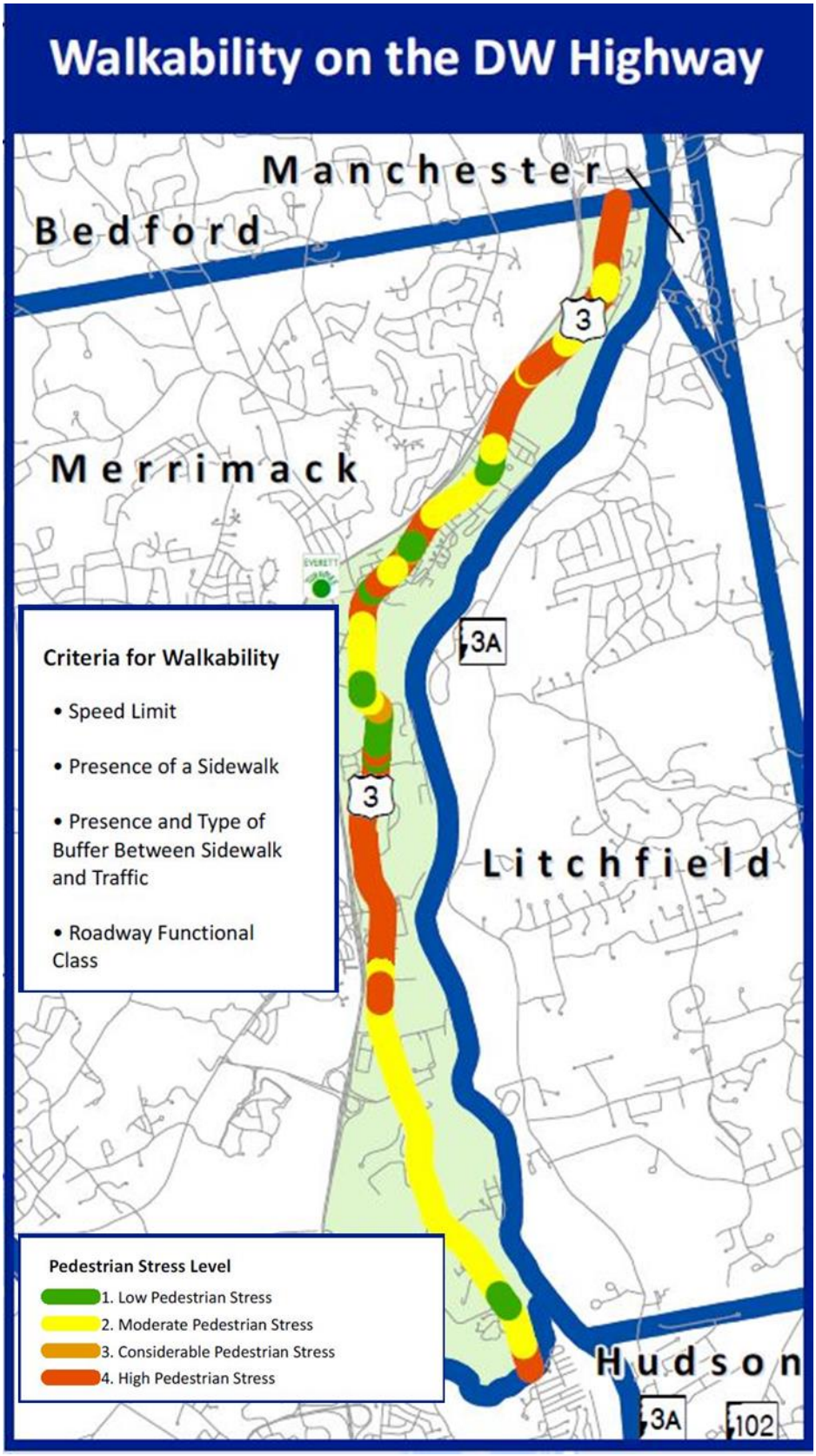
Table 6: Action Plan for Priority 6 Projects

Priority 6: Non-Urban Compact South of Greeley Street		Lead Partners	Timeline
Sidewalks or Sidepaths	Greeley Street south to hotels – west side of Route 3	**NHDOT** **Town of Merrimack**	5+ years
	Gap between BAE and Bon Bon Mobil – west side of Route 3		5+ years
	Manchester Street to Harris Pond Road – west side of Route 3		5+ years
	Greeley Street to Meineke Muffler shop – east side of Route 3		5+ years
Crosswalks	On Route 3 @ BAE Systems	**NHDOT** **Town of Merrimack**	3-5 years
	On Route 3 @ Harris Pond Road		3-5 years
	On Route 3 @ 57/59 DW Highway entrance intersection		3-5 years
Travel Lanes & Shoulders	Use pavement markings to define 10 foot-wide travel lanes wherever possible.	**NHDOT** **Town of Merrimack**	1-3 years
	Use the additional shoulder width to accommodate bicycles		

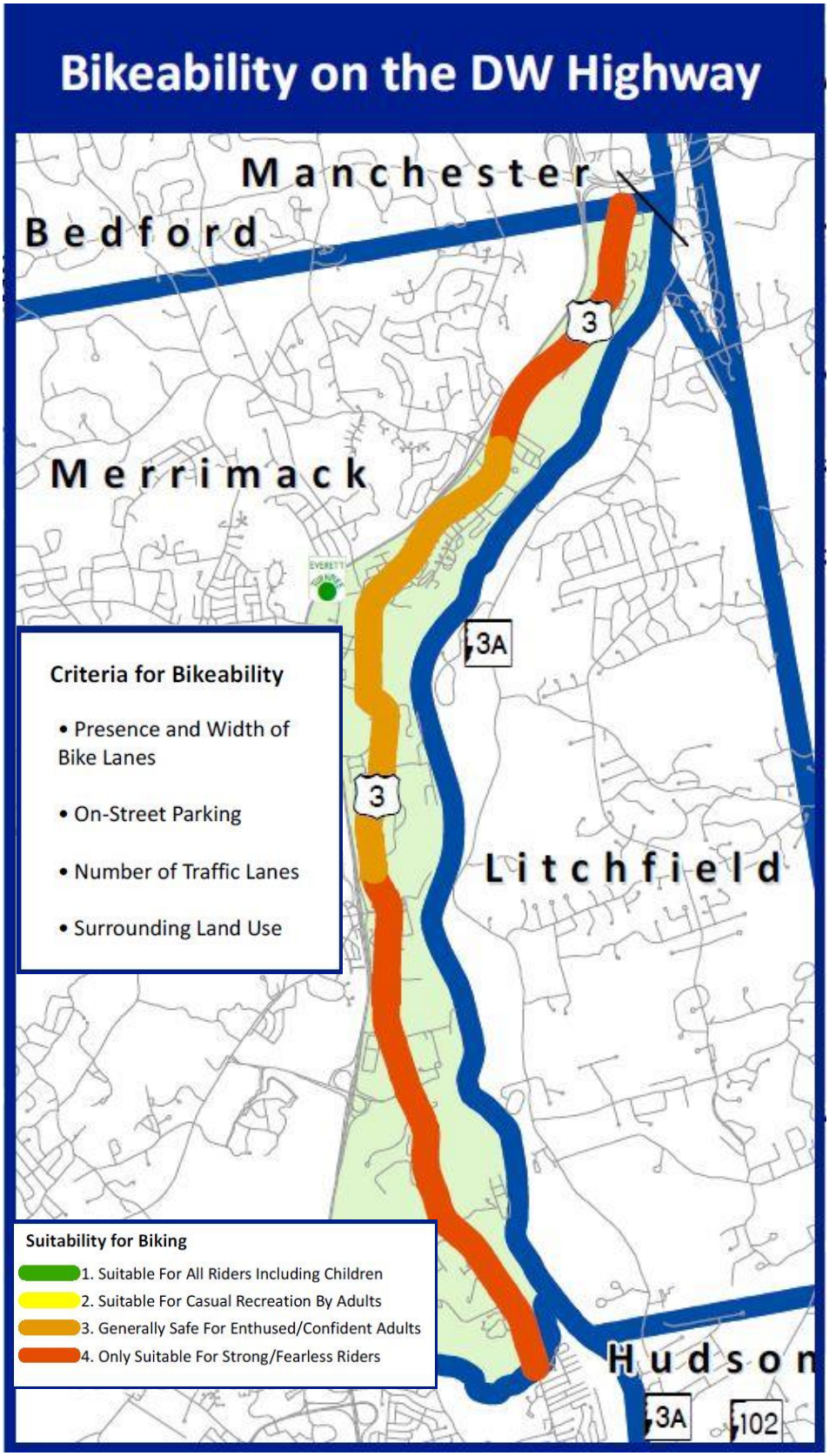
Table 7: Action Plan for Priority 7 Projects

Priority 7: Gaps to be addressed at a future date		Lead Partners	Timeline
Sidewalks or Sidepaths	Route 3, East Side, Meineke Muffler Shop to BAE Crossing Light	**NHDOT** Town of Merrimack	5+ years
	Route 3, East Side Front Street to Twin Bridge Road	**Town of Merrimack** NHDOT	
	Route 3 West Side 10 Pin North to Bedford Town Line	**NHDOT** Town of Merrimack	
	Route 3, East Side Society Hill to Crosswoods Path	**NHDOT** Town of Merrimack	
	Route 3 East Side Crosswoods Path north to Bedford Line	**NHDOT** Town of Merrimack	
	Route 3, West Side South of Harris Pond to Nashua Line	**NHDOT** Town of Merrimack	
	Route 3, East Side South of Harris Pond to Nashua Line	**NHDOT** Town of Merrimack	

APPENDIX A – LEVEL OF WALKABILITY



APPENDIX B – LEVEL OF BIKEABILITY



APPENDIX C – NHDOT CORRESPONDENCE

New Hampshire DOT Department of Transportation

THE STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION

CHRISTOPHER D. CLEMENT, SR.
COMMISSIONER

JEFF BRILLHART, P.E.
ASSISTANT COMMISSIONER

November 22, 2013

Mr. Timothy J. Thompson, AICP
Community Development Director
Town of Merrimack
6 Baboosic Lake Road
Merrimack, NH, 03054

RECEIVED
DEC 06 2013
COMMUNITY DEVELOPMENT DEPT.
TOWN OF MERRIMACK

Subj: Sidewalks along US Route 3 within Merrimack

Dear Mr. Thompson:

Thank you for taking the time to meet with Bill O"Donnell and myself yesterday to discuss the Town's plans for sidewalks along Daniel Webster Highway (US Route 3). We also appreciate you sharing your minutes from the meeting. Recent requests from the Town to construct short sidewalk segments within NHDOT's right-of-way have raised concerns about the lack of functional viability. These segments often have simply crossed along the frontage of properties that are being proposed for redevelopment, rather than connect with existing sidewalks or extend to a desired destination.

While we are supportive of the Town's desire to create a sidewalk system along US 3, we feel that the decisions related to the installation of sidewalk segments should be consistent with a comprehensive corridor sidewalk plan endorsed by the Town. With such a plan, you could hopefully combine sidewalk construction projects generated at sites proposing redevelopment with other projects funded through the Town to provide pedestrian connections over substantial lengths and having logical termini. Absent such a plan, we are not comfortable with the practice of constructing short sections of sidewalk within the NHDOT's right-of-way.

Sidewalk projects located adjacent to US 3 would require a vertical granite curb for the protection of the pedestrians and thus require that some thought be given to the treatment of runoff from the US 3 pavement flowing along the curbed gutter. These concentrated flows could not be left to enter randomly upon abutting properties, but rather should be picked up by a designed drainage system carrying them to a logical outlet.

The short unexpected sidewalk segments within the highway right-of-way can present a hazard to bypassing motorists and also complicate our efforts to remove snow during the winter season.

HIGHWAY MAINTENANCE DISTRICT 5 • 16 EAST POINT DRIVE • BEDFORD, NEW HAMPSHIRE, 03110
TELEPHONE: 603-666-3336 • FAX: 603-485-9825 • INTERNET: WWW.NHDOT.COM

We would suggest that the Town contact the Nashua Regional Planning Commission (NRPC) regarding the possibility of assisting with such a comprehensive study. While our Planning Bureau does have funds available for sidewalk studies and construction, they are limited to those that specifically serve routes to schools. Whereas, the NRPC may have more options regarding pedestrian transportation activities.

We appreciate your suggestion of a "paved pedestrian way", located outside of NHDOT right-of-way, across the Canis Property as an option acceptable to the Town. We have discussed that concept with the design consultant working on that project and suspect that they will develop a concept along their frontage and present it to you for consideration.

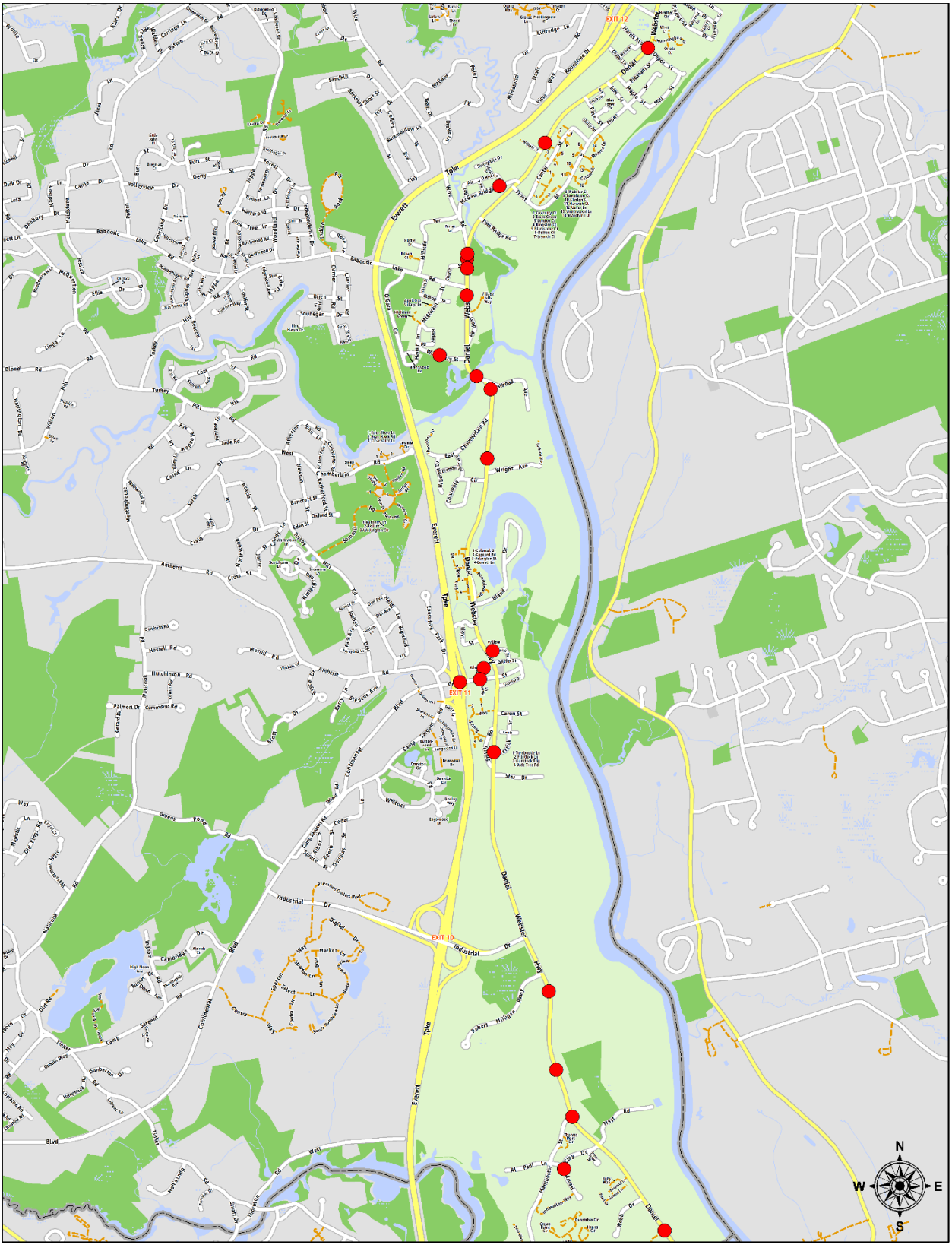
With respect to the future cross section of the US 3 corridor in this particular area, just north of Bedford Rd, we would realistically expect that a three-lane highway concept (likely 46' +/- in width between curbs), with one lane in each direction and a center turn lane, plus 5' shoulder offset to the curb, rather than a five-lane concept, would be a reasonable goal. It would be in the Town's interest to try to position future sidewalk sections at 23' where practical, to avoid the need for future relocation costs.

Sincerely,

Richard C. Radwanski, PE
District Engineer

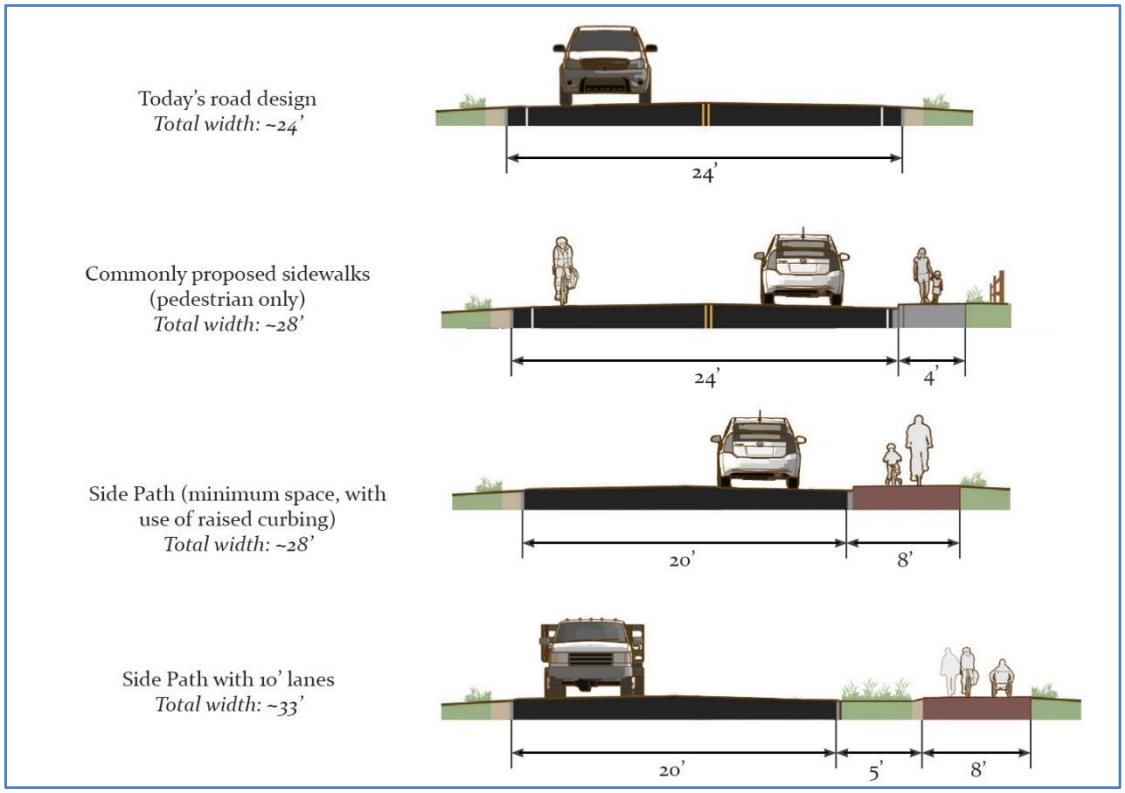
WFO'D/dlp
File in Merrimack

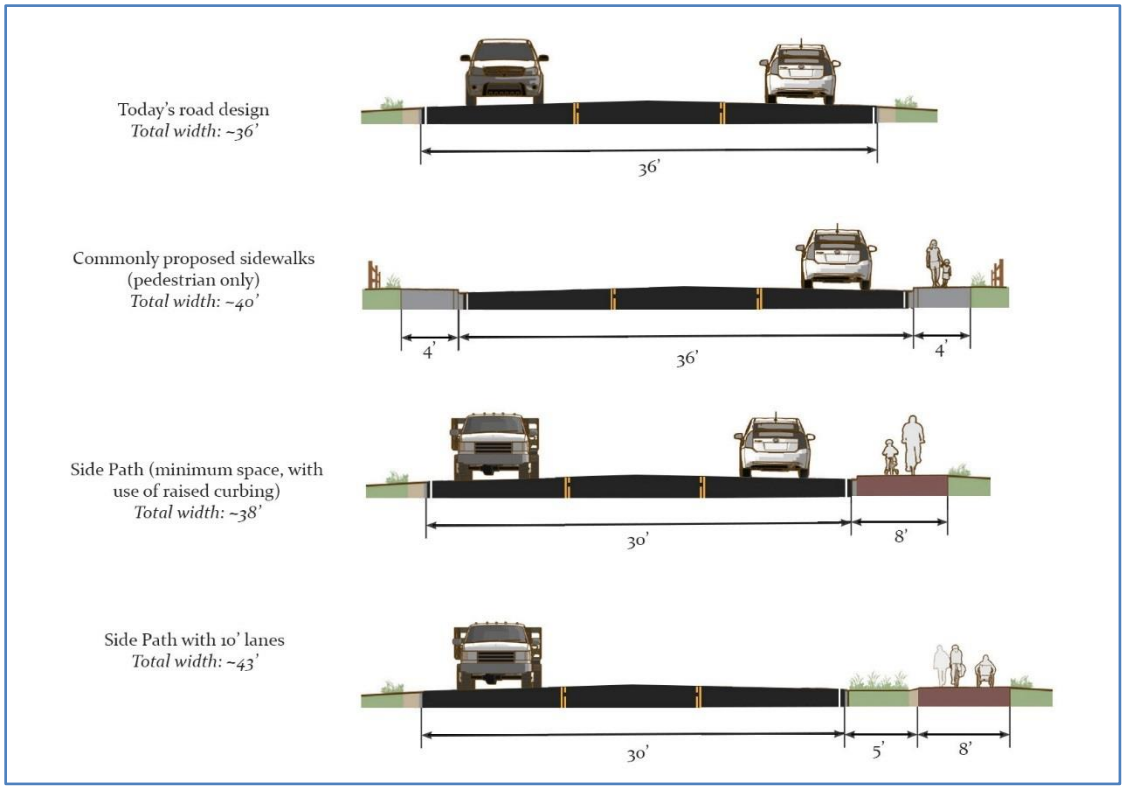
APPENDIX D – MOTOR VEHICLE/PEDESTRIAN/BICYCLE CRASH MAP

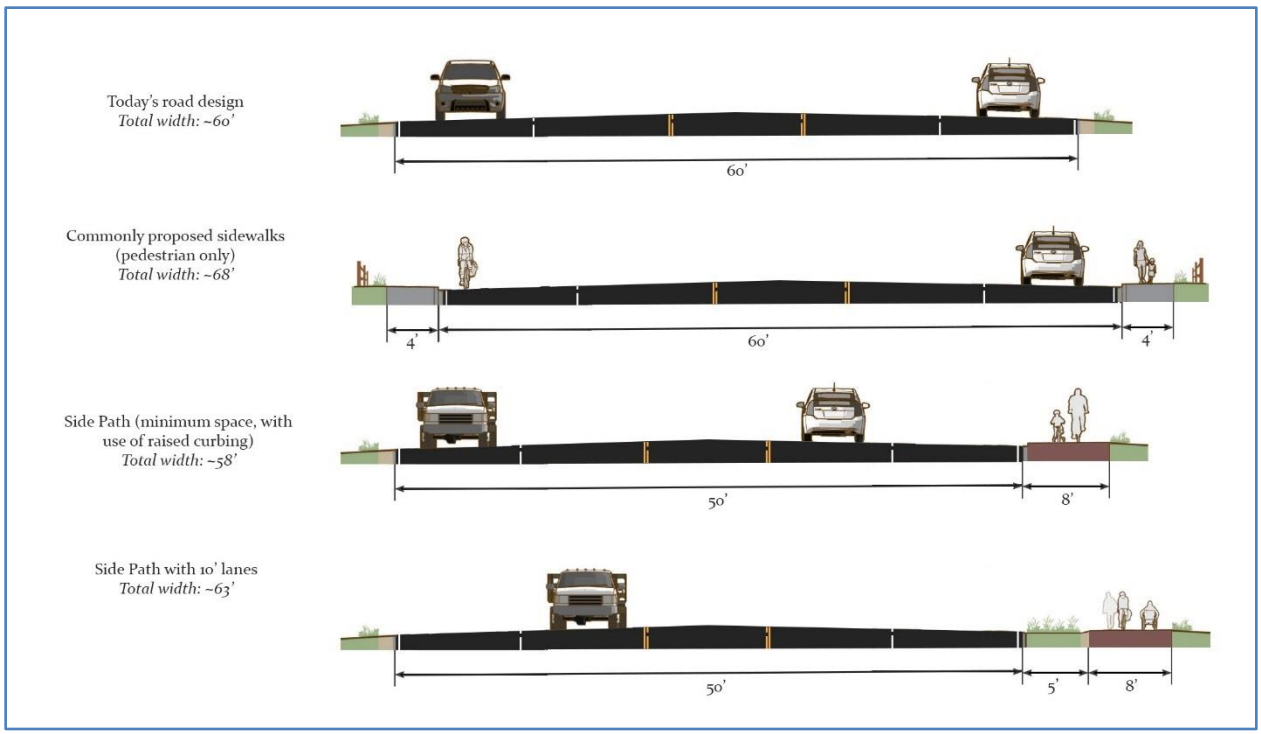


Crash data courtesy of NHDOT and represents reported crashes from 2002-2017. Some locations are estimated.

APPENDIX E – SIDEPATH CROSS SECTIONS






Today's road design
Total width: ~60'
60'
Commonly proposed sidewalks
(pedestrian only)
Total width: ~68'
4'
60'
4'
Side Path (minimum space, with
use of raised curbing)
Total width: ~58'
50'
8'
Side Path with 10' lanes
Total width: ~63'
50'
5'
8'

APPENDIX F - SOURCES OF INFORMATION

DESIGN GUIDELINES FOR BICYCLE & PEDESTRIAN FACILITIES:

PACTS Portland Area Comprehensive Transportation System
Update to Bicycle and Pedestrian Facility Design Guidelines –Region of Portland, Maine (October, 2013)
http://www.pactsplan.org/plans-studies/2013-plans-studies-completed/

Washington County Bicycle Facility Design Toolkit (2012)
http://www.co.washington.or.us/LUT/Divisions/CPM/upload/WaCo_Toolkit_Dec2012.pdf

Oregon Bicycle and Pedestrian Guide (2011)
http://www.oregon.gov/ODOT/HWY/BIKEPED/Pages/index.aspx

NATCO Urban Bikeway Design Guide (2011)
http://nacto.org/cities-for-cycling/design-guide/

Portland Bicycle Master Plan for 2030, Appendix D (2011)
http://www.portlandoregon.gov/transportation/article/289122

FHWA, Bicycle Facilities and the Manual on Uniform Traffic Control Devices (2011)
http://www.fhwa.dot.gov/environment/bikeped/mutcd_bike.htm

Urban, Rural and Suburban Complete Streets Design Manual For the City of Northampton and Communities in Hampshire County January 2017
HTTPS://WWW.NORTHAMPTONMA.GOV/DOCUMENTCENTER/VIEW/6668/HAMPSHIRE-COUNTY-COMPLETE-STREETS-DESIGN-MANUAL_1-4-2017-FINAL?BIDID=

ORGANIZATIONS, COALITIONS & PARTNERSHIPS:

The National Center for Bicycling and Walking. The NCBW mission is to create bicycle-friendly and walkable communities
http://www.bikewalk.org/

League of American Bicyclists. The League of American Bicyclists is the oldest bicycling organization in the US. It works through its members to promote better education and better facilities for bicyclists.
http://www.bikeleague.org/

Association of Pedestrian and Bicycle Professionals (APBP) is a membership organization that offers frequent webinars on bike/ped design, and hosts an active listserv.
http://www.apbp.org/

Rails to Trails Conservancy. The purpose of Rails-to-Trails Conservancy (RTC) is to enrich America's communities and countryside by creating a nationwide network of public trails from former rail lines and connecting corridors.
http://www.railstotrails.org/

National Complete Streets Coalition is a coalition of organizations that advocates that streets should be designed to serve all users, of all abilities, of all ages. The National Center for Bicycling & Walking is a long-standing member.
http://www.smartgrowthamerica.org/complete-streets/

Safe Routes to School National Partnership is an extensive resource for everything from International Walk to School Day, to research and reports on topics relating to school travel, to curricula for bicycle and pedestrian education in elementary school.
http://saferoutespartnership.org/

Context Sensitive Solutions Clearinghouse is a resource for citizens and professionals who want to ensure better outcomes from the transportation planning process.
http://contextsensitivesolutions.org/

Cities for Cycling is a project of the National Association of City Transportation Officials (NACTO). The Urban Bikeway Design Guide features innovative design treatments for accommodating cyclists in congested urban areas where competition for pavement is high.
http://nacto.org/cities-for-cycling/design-guide/

ACTIVE LIVING PROGRAMS AND PUBLIC HEALTH RESOURCES:

Active Living Resource Center (ALRC) is a major program of the National Center for Bicycling & Walking. ALRC works with community advocates, stakeholders, elected officials and professionals to remove barriers to physical activity in their communities. ALRC's work focuses on low income, low resource communities where health disparities exist and barriers to physical activity proliferate.
http://www.activelivingresources.org/

Centers for Disease Control and Prevention (CDC) is the authoritative source for data on the obesity and physical inactivity epidemic that the United States has been experiencing since 1980.
http://www.cdc.gov/obesity/index.html

Health Kids, Healthy Communities is a national program of the Robert Wood Johnson Foundation whose primary goal is to implement healthy eating and active living policy and environmental change initiatives that can support healthier communities.
http://www.healthykidshealthycommunities.org/

Active Living Research is a national program of the Robert Wood Johnson Foundation that supports research that examines how environments and policies influence active living for children and their families.
http://activelivingresearch.org/

PolicyLink is a think tank that focuses on advancing economic and social equity by promoting and propagating promising policy practices developed at the local level in areas of transportation, food access, and physical activity.
http://www.policylink.org/

USDOT & OFFICIAL CLEARINGHOUSES FOR FEDERAL TRANSPORTATION PROGRAMS:

USDOT Office of Livability coordinates the efforts of its many agencies to ensure that transportation investments help build communities and improve quality-of-life. The website includes links to grants, research, case studies, and the Partnership for Sustainable Communities (DOT, HUD, EPA).
http://www.dot.gov/livability

FHWA Bicycle and Pedestrian Program. Includes: information on the amount of Federal bike/ped funding apportioned to each state since 1992; FHWA guidance on the accommodation of bicyclists and pedestrians on Federally funded transportation projects
http://www.fhwa.dot.gov/environment/bicycle_pedestrian/

National Center for Safe Routes to School is the official information and technical assistance clearinghouse for FHWA's Safe Routes to School Program.
http://www.saferoutesinfo.org/

FHWA Recreational Trails Program. Includes: guidance on technical design; reports; a directory of state RTP administrators
http://www.fhwa.dot.gov/environment/recreational_trails/

FHWA Transportation Enhancements Program. Includes: guidance on the 12 permitted uses of Transportation Enhancement funds
http://www.fhwa.dot.gov/environment/transportation_enhancements/

NHSTA Bicycle and Pedestrian Safety Program. Includes: statistical reports on safety, and curricula for teaching bicycle and pedestrian safety.
http://www.nhtsa.gov/Pedestrians

TRANSPORTATION AND LAND USE PLANNING:

Smart Growth America is a national coalition of state and local organizations working for smart growth.
http://www.smartgrowthamerica.org/

Transportation for America is a broad coalition of housing, business, environmental, public health, transportation, and other organizations formed to influence Federal transportation legislation and policy. The National Center for Bicycling & Walking is a long-standing member. Website resources include Federal Transportation 101; developing performance measures for Federal transportation investments; case studies on livability and transit in small communities; and more.
http://t4america.org/about/

Planetizen focuses on urban planning issues relating to transportation and land use. A very good resource for planners.
http://www.planetizen.com/

Planning and Policy Models For Pedestrian and Bicycle Friendly Communities in New York State
https://www.albany.edu/ihi/files/NY_Planning_And_Policy_Models_iHi.pdf

2013 MASTER PLAN UPDATE

MERRIMACK, NEW HAMPSHIRE