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CHAPTER I
INTRODUCTION

Preparing a community master plan is one of the most important responsibilities of the Planning Board and is the basis for the ordinances, regulations and policies that guide the development of the Town. New Hampshire Revised Statutes Annotated 674:1-4 authorize the Planning Board to prepare a master plan and describe the sections, adapted to the needs of the community, that such a plan must contain. This Master Plan contains discussion and analysis of: 1) Population and Housing; 2) Existing Land Use; 3) Natural Resources; 4) Transportation; 5) Community Facilities; 6) Utilities; 7) Historic Resources; 8) Economic Development; 9) Town Center Master Plan; and 10) Future Land Use and Recommendations.

The 2002 Master Plan is an update of the 1993 Master Plan. This plan update was developed by the Planning Board over the course of a two-year period with the assistance of a broad-based citizen Master Plan Advisory Committee, Town staff, the Nashua Regional Planning Commission and other consultants, experts and professionals from various fields. The Master Plan Advisory Committee was composed of the entire membership of the Planning Board and representatives from a variety of other Town boards, committees and commissions, the School Board, Merrimack Village District, and Library, along with a number of other civic groups, organizations and citizens at large. The Committee met between once and twice a month during the period from May 2000 to November 2001. All of the information provided in the Master Plan was distributed or presented to the Committee and the text reflects its discussions, recommendations and conclusions.

Since the 1993 Master Plan was adopted, a number of issues have surfaced and changes have occurred that have prompted the Town to update its master plan. Some of these include population and housing growth; changes to the state, local and regional transportation system; demands on public water and sewer systems; surface and groundwater protection issues; town, school and library facility needs, and the availability of updated US Census information. In addition, a number of the recommendations of the 1993 plan have been implemented. These include: 1) adoption of zoning changes to permit only low-density residential development in certain western and northern sections of Town; 2) preparing and adopting an annual Capital Improvements Program; and 3) construction of the Camp Sargent Road bypass. Significant planning initiatives that occurred since 1993 include completion of the Town Center Plan in 1999, and the Buildout Study, first prepared in 1998 and updated in 2001. The Town Center Plan has been adopted as a part of the Master Plan and has been included as a chapter in this document. It should be noted, though, than a number of its key recommendations have already been implemented.

The Buildout Study is a statistical analysis and planning tool used to project the future development characteristics of the community. Essentially, it determines where the undeveloped land is located and how it could develop based on natural and man-made constraints such as soil limitations and zoning restrictions. The buildout analysis considered both residential and non-residential development and concluded that buildout would occur after an additional 2,188 housing units and 6,584,489 square feet of non-residential floor area are constructed. It is estimated that the Town will have a population of 31,895 at buildout. Using historic growth rates, buildout is estimated to occur before the year 2020. The estimates and

projections of the Buildout Study form a central component of the plan and the basis for the future facility needs recommendations, traffic projections, land use estimates, and other plan components.

To guide the Master Plan update process, provide for public participation and solicit input, a number of different strategies and information sources were relied upon. Initially, a professional facilitator was engaged to assist the Committee in defining community attitudes and opinions through a process known as a Strengths-Weaknesses-Opportunities-Threats (SWOT) analysis. The SWOT analysis was conducted by the Master Plan Advisory Committee on July 18 and August 22, 2001. During the process, the Committee was split into four groups and each developed a list of the strengths, weaknesses, opportunities and threats relating to the Town of Merrimack. The top three in each category were ranked by each group and presented to the Committee. Following this process, the groups then developed a list of critical actions to be taken by the Town to maintain a high quality of life over the next 10 years, and the top three actions were ranked by each group and compiled in an aggregate ranking. The complete results of the analysis are appended to the plan. The list of critical actions, ranked highest to lowest is as follows:

- Acquire land
- Implement Town Center Plan
- Improve quality of schools
- Finish exit 12 ramps
- Pursue State and Federal funding
- Control DW Highway traffic and development
- Control growth
- Eliminate tolls
- Prepare a long range plan for schools
- Protect water supply and find new water resources
- Preserve tax rate and find innovative financing for Town projects
- Develop a Front Street extension
- Protect Wasserman Park
- Build Elementary school facilities with a kindergarten

Along with the SWOT analysis, the Town wide survey conducted by the Board of Selectmen in 1998 was consulted to help gauge community opinion. The purpose of the survey was to help local officials make decisions on specific issues facing the Town. The survey focused on the budget, community facilities and growth control. In general, a majority of respondents were supportive of expanding emergency services facilities, constructing a new library, providing sufficient recreation land, preserving open space and historic resources, and considering growth control legislation. The survey also determined that a majority of respondents who were not lifelong residents moved to Merrimack because of proximity to place of employment and its attractive natural setting. A majority of respondents also ranked Merrimack's public services as "good" or "excellent."

In addition to the SWOT analysis and Town-wide survey, public participation and comment and was solicited through the use of media and through public meetings. All of the Master Plan Advisory Committee meetings were open to the public and participation by

nonmembers in presentations and discussions was encouraged. All meetings were also televised and agendas and minutes were posted on the Town's web site.

As discussed above, this Master Plan update considers Merrimack's needs to buildout, which is estimated to occur by the year 2020. The plan is in intended to address short-term needs while also having implications for how Merrimack will function and look when the Town is fully developed. Therefore, a significant focus of this plan is on how Merrimack's remaining developable land will be used as well as on how existing developed areas may redevelop. The impact of anticipated development on the Town's infrastructure is also a central aspect of the plan. Though this Master Plan update is intended address buildout, future updates to the Plan will still be required to address redevelopment issues, the impacts of development, shifting community preferences and priorities, and the changes built and natural environment that are certain to occur.

CHAPTER II
POPULATION AND HOUSING

A. INTRODUCTION

This chapter examines population growth and housing trends in the Town of Merrimack over the last several decades as well as population and housing projections to the year 2020. The chapter includes: (1) a summary of population trends including growth, buildout projections, race, age and household size; (2) a summary of housing trends including growth, type, tenure, location, age, assisted housing and homelessness and crisis housing; and (3) recommendations. Education and income and poverty are discussed in Chapter IX, Economic Development.

The information included in this chapter is based primarily on the decennial US Census, the Regional Housing Needs Assessment (Nashua Regional Planning Commission, 1999), and the Town of Merrimack Buildout Study, 2001, in conjunction with other local and state studies, estimates, reports and updates.[1] When available, 2000 US Census data has been utilized. However, the full range of data for the year 2000 is not yet available. The limitations of the information is presented and more recent data from other sources have been utilized whenever possible. When alternative information is available, it is often only for larger geographical units, such as for the county, aggregate statistical area or the state.

Issues related to the Town's overall rate of population growth, the rate of housing development, elderly housing and affordable housing were the principal areas of concern identified during the Master Plan process. In 1998, the Board of Selectmen conducted a town-wide survey of Merrimack's residents, soliciting opinions on a wide range of topics. When asked, "*Should the Town of Merrimack consider growth-control legislation such as stricter zoning regulations?*" over 80% of respondents replied "*Yes*" which indicates that most residents have a concern about either the rate of growth or the manner in which it is proceeding. During the Master Plan Advisory Committee's SWOT Analysis (See Chapter I) "growth" was identified as one of the top "Threats" to the community. Defining growth areas and controlling growth were also listed among the top initiatives that the Town should pursue.

B. POPULATION

1. Population Growth

Although the first permanent settlement in Merrimack occurred in 1722, the first national census and official count of the Town's population did not occur until 1790. Town boundaries have not changed since that time. For much of the 19th and 20th century, Merrimack's population hovered at around 1,000 persons. Following World War II, the Town's

[1] Two different data sources are used to describe aggregate demographic trends underway in greater Nashua. The Nashua Regional Planning Commission (NRPC) Region constitutes Merrimack and 11 other municipalities grouped around Nashua: Amherst, Brookline, Hollis, Hudson, Litchfield, Lyndeborough, Milford, Mont Vernon, Pelham and Wilton. The US Census includes most of the NRPC region within the Nashua Primary Metropolitan Statistical Area (PMSA). The exception is Pelham, which is in the Lowell MA-NH PMSA. In addition, the Nashua PMSA includes New Ipswich and Mason. When Nashua PMSA data are presented, it is slightly different than the aggregate data presented for the NRPC region.

population growth accelerated and reached 1,908 persons by 1950. Between 1960 and 1970, Merrimack was one of the fastest growing communities in the state, increasing by 188% over the decade. During the 1970s and 1980s, the Town's rate of growth declined but was still far higher than regional and state averages. Between 1990 and 2000, the Town's total population increased by 13%, with a rate similar to that of other communities in the region.

Table II-1 summarizes Merrimack's population history from 1790 to 2000, comparing the growth of the Town with that of Hillsborough County and the State. From 1940 to 1990, the Town's rate of population growth, expressed as a percentage, surpassed the rate of growth for both the County and State. The Town's rate of growth slowed significantly in the 1990s to levels approaching the county and state rates.

Table II–1: Historical Population Trends, Merrimack, Hillsborough County and State of NH, 1790-2000

Year	Merrimack	Percent Change	Hillsborough County	Percent Change	State of NH	Percent Change
1790	819	-	24,433	-	141,885	-
1800	926	13%	31,281	28%	183,858	30%
1810	1,048	13%	34,288	10%	214,460	17%
1820	1,162	11%	35,761	4%	244,161	14%
1830	1,191	2%	37,724	5%	269,328	10%
1840	1,114	-6%	42,495	13%	284,574	6%
1850	1,250	12%	57,478	35%	317,976	12%
1860	1,119	-10%	62,140	8%	326,073	3%
1870	1,066	-5%	64,238	3%	318,300	-2%
1880	1,042	-2%	75,634	18%	347,000	9%
1890	951	-9%	93,247	23%	376,500	9%
1900	1,234	30%	112,640	21%	411,600	9%
1910	1,039	-16%	126,072	12%	430,600	5%
1920	1,022	-2%	135,512	7%	443,100	3%
1930	1,084	6%	140,156	3%	465,300	5%
1940	1,253	16%	144,888	3%	491,500	6%
1950	1,908	52%	161,525	11%	533,200	8%
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%

Source: US Census, 1790-2000.

Table II-2 compares Merrimack's population growth since 1970 with 1st and 2nd tier communities. First tier communities are those directly abutting Merrimack, whereas second tier communities are those abutting the first tier communities. Together, first and second tier communities form the region within which a municipality is located for purposes of assessing a community's share of regional population growth. An analysis of growth in first and second tier communities, therefore, is often an important prerequisite to establishing growth control regulations. If the analysis shows that a community's rate of growth is significantly higher than that of its region, for example, a growth control ordinance may be warranted. In the decades following 1970 and 1980, Merrimack's percent change in population was greater than the average percentage change of both 1st and 2nd tier communities. Between 1990 and 2000, however, the Town's percent change in population slowed to less than the average percentage change for both 1st and 2nd tier communities.

Table II–2: Population Growth, 1st and 2nd Tier Communities, 1970-2000

Community	1970	Percent Change, 1970-1980	1980	Percent Change, 1980-1990	1990	Percent Change, 1990-2000	2000
Merrimack	**8,595**	**79%**	**15,406**	**44%**	**22,156**	**13%**	**25,119**
1st Tier Communities							
Amherst	4,605	79%	8,243	10%	9,068	19%	10,769
Bedford	5,859	62%	9,481	33%	12,563	45%	18,274
Hollis	2,616	79%	4,679	22%	5,705	23%	7,015
Hudson	10,638	32%	14,022	39%	19,530	17%	22,928
Litchfield	1,420	192%	4,150	33%	5,516	33%	7,360
Manchester	87,754	4%	90,936	9%	99,332	8%	107,006
Nashua	55,820	22%	67,865	17%	79,662	9%	86,605
1st Tier Average	**-**	***67%***	**-**	***23%***	**-**	***22%***	**-**
2nd Tier Communities							
Auburn	2,035	42%	2,883	42%	4,085	15%	4,682
Brookline	1,167	51%	1,766	36%	2,410	73%	4,181
Dunstable, MA	1,292	29%	1,671	34%	2,236	27%	2,829
Goffstown	9,284	22%	11,315	29%	14,621	16%	16,929
Hooksett	5,564	31%	7,303	23%	9,002	30%	11,721
Londonderry	5,346	154%	13,598	45%	19,781	17%	23,236
Milford	6,622	31%	8,685	36%	11,795	15%	13,535
Mont Vernon	906	59%	1,444	25%	1,812	12%	2,034
New Boston	1,390	39%	1,928	67%	3,214	29%	4,138
Pelham	5,408	50%	8,090	33%	10,793	1%	10,914
Pepperell, MA	5,887	37%	8,061	25%	10,098	10%	11,142
Tyngsboro, MA	4,204	35%	5,683	52%	8,642	28%	11,081
Windham	3,008	88%	5,664	59%	9,000	19%	10,709
2nd Tier Average	**-**	***48%***	**-**	***43%***	**-**	***16%***	**-**

Source: US Census, 1970-2000.

Although the Town's percentage change in population has slowed, Merrimack still continues to exhibit strong population growth. Between 1990 and 2000, Merrimack's numeric increase in population was the eighth largest in the state as can be seen in Table II-3. Merrimack is also New Hampshire's eighth largest municipality in total population.

Table II–3: Population Change and State Rank, Top Ten Communities, 1990-2000

Community	Population Change 1990-2000	Percentage Change 1990-2000	State Rank by Numeric Growth
Merrimack	**2,963**	**13%**	**8**
Manchester	7,439	7%	1
Nashua	6,943	9%	2
Bedford	5,711	45%	3
Concord	4,681	13%	4
Derry	4,418	15%	5
Londonderry	3,455	17%	6
Hudson	3,398	17%	7
Hooksett	2,954	34%	9
Hampton	2,659	22%	10

Source: US Census.

The New Hampshire Office of State Planning's (OSP) population projections for Merrimack, Hillsborough County and the State are presented in Table II–4. OSP's forecasting

methodology is based on a community's historical share of its respective county's growth, and assumes that a community's share of growth, according to changes in the 1970, 1980 and 1990 populations, will remain about the same into the future. Merrimack's population is projected to continue to increase by 1.6% per year over the next twenty years. If these projections hold true, then an additional 7,767 persons would be added to Merrimack's population by 2020. However, it should be noted that Merrimack's rate of growth since 1990 is lower than the 1.6% annual rate of growth projected by OSP.

Table II–4: Population Projections, NRPC Region, 2020

Community	Projected Population 2020	Population 2000	Projected Net Increase 2000-2020	Projected Percentage Increase 2000-2020	Projected Annual Percentage Increase 2000-2020
Merrimack	**32,886**	**25,119**	**7,767**	**31%**	**1.6%**
Hillsborough County	466,967	380,841	86,126	23%	1.1%
State of NH	1,527,873	1,235,786	292,087	24%	1.2%

Source: US Census 2000 and 2020 NH Office of State Planning Projection.

Based on the projected amount of new residential dwelling units to be added to the housing stock at buildout,[2] it is estimated that an additional 6,776 residents will be added to Merrimack's population based on average densities (Table II-5). Considering these projections, Merrimack could expect to have a total of an estimated 31,895 residents at buildout. Although there is no way to forecast the exact time necessary to achieve buildout, it is reasonable to assume that Merrimack will approach buildout within the next twenty years based on the NH Office of State Planning's (NH OSP) projected annual percentage increases in growth (see Table II-4). The NH OSP projected population for 2020 of 32,886 is only slightly above the buildout estimate of 31,895. It should be noted that the average density buildout population estimate of 31,895 is used throughout the Master Plan.

[2] Source: Town of Merrimack Buildout Analysis, 2001.

Table II-5: Population Estimates by TAZ

TAZ	Additional Housing Units at Buildout	Population Multiplier	Additional Population at Buildout
132	28	3.3065	93
133	41	3.3065	135
134	117	3.3065	387
135	98	3.3065	322
136	29	3.3065	94
137	147	3.3065	486
139	62	2.3214	144
143	3	3.3065	9
144	4	3.3065	13
145	26	3.3065	86
146	5	3.3065	16
147	36	3.3065	120
148	16	3.3065	54
149	22	3.3065	71
150	192	3.3065	636
151	70	3.3065	232
152	21	3.3065	70
153	14	2.3214	32
154	336	2.3214	780
155	4	2.3214	**9**
156	2	3.3065	7
157	29	3.3065	95
158	412	3.3065	1,363
159	3	3.3065	10
160	35	3.3065	117
161	96	3.3065	317
162	20	3.3065	66
163	34	3.3065	113
164	10	2.3214	23
165	45	2.3214	104
166	69	3.3065	227
167	162	3.3065	535
	2,188		**6,776**

Source: Town of Merrimack Buildout Analysis, 2001.

2. Race

The 2000 US Census indicated that 97% of Merrimack residents were classified as "white only", as compared to 94% of County residents and 96% of State residents. The largest minority group in Merrimack in 2000 was Asian, which comprised 2% of the Merrimack population. Race data between 1990 and 2000 Census is not directly comparable due to changes in the way race is categorized. Table II–6 presents the race of the residents of Merrimack and the NRPC region for 2000.

Table II–6: Population Distribution by Race and Hispanic Origin, 2000

Community	White Only		Black or African-American Only		Asian Only		American Indian Alaska Native Only		Other (Only One)		Two or More Races		Hispanic Origin	
Merrimack	**24,260**	**95.58%**	**184**	**0.72%**	**378**	**1.49%**	**48**	**0.19%**	**54**	**0.21%**	**185**	**0.73%**	**272**	**1.07%**
NRPC Communities:														
Amherst	10,446	96.05%	46	0.42%	144	1.32%	14	0.13%	23	0.21%	94	0.86%	109	1.00%
Brookline	4,092	97.04%	6	0.14%	26	0.62%	8	0.19%	9	0.21%	38	0.90%	38	0.90%
Hollis	6,776	95.72%	31	0.44%	116	1.64%	8	0.11%	12	0.17%	71	1.00%	65	0.92%
Hudson	22,091	94.93%	193	0.83%	255	1.10%	34	0.15%	125	0.54%	217	0.93%	356	1.53%
Litchfield	7,192	96.91%	39	0.53%	42	0.57%	21	0.28%	11	0.15%	55	0.74%	61	0.82%
Lyndeborough	1,556	96.59%	3	0.19%	5	0.31%	2	0.12%	6	0.37%	13	0.81%	26	1.61%
Milford	13,096	95.65%	122	0.89%	125	0.91%	19	0.14%	28	0.20%	144	1.05%	158	1.15%
Mont Vernon	2,005	98.04%	3	0.15%	5	0.24%	3	0.15%	2	0.10%	16	0.78%	11	0.54%
Pelham	10,624	96.42%	48	0.44%	114	1.03%	24	0.22%	27	0.25%	77	0.70%	105	0.95%
Wilton	3,652	96.82%	13	0.34%	19	0.50%	5	0.13%	17	0.45%	37	0.98%	29	0.77%
NRPC Region:														
Nashua	77,291	84.04%	1,740	1.89%	3,363	3.66%	275	0.30%	2,642	2.87%	1,265	1.38%	5,388	5.86%
Balance of NRPC Region	105,790	95.84%	688	0.62%	1,229	1.11%	186	0.17%	314	0.28%	947	0.86%	1,230	1.11%
Total NRPC Region	183,081	90.48%	2,428	1.20%	4,592	2.27%	461	0.23%	2,956	1.46%	2,212	1.09%	6,618	3.27%
County & State														
Hillsborough County	357,615	91.02%	4,904	1.25%	7,601	1.93%	943	0.24%	5,006	1.27%	4,660	1.19%	12,166	3.10%
State of NH	1,186,851	94.50%	9,035	0.72%	15,931	1.27%	2,964	0.24%	7,420	0.59%	13,214	1.05%	20,489	1.63%

Source: US Census, 2000.

3. Age

As shown in Table II-7, the 2000 US Census showed the Town's largest age cohort was for individuals 35 to 54 years of age, which comprised 37% of Merrimack's total population. Merrimack and other non-urbanized towns in the region generally had higher percentages of individuals 35 to 54 years of age than the county (33%) or the state (33%).

Table II–7: Age, NRPC Region, 2000

Community	Under 5 (% of Total Population)	5 to 19 (*School Age*) (% of Total Population)	20 to 34 (% of Total Population)	35 to 54 (% of Total Population)	55 to 64 (% of Total Population)	65 and Over (*Elderly*) (% of Total Population)
Merrimack	**1,731 (7%)**	**6,110 (24%)**	**4,219 (17%)**	**9,183 (37%)**	**2,275 (9%)**	**1,601 (6%)**
NRPC Communities:						
Amherst	664 (6%)	2,996 (28%)	1,057 (10%)	4,150 (39%)	1,118 (10%)	784 (7%)
Brookline	385 (9%)	1,103 (26%)	530 (13%)	1,652 (40%)	302 (7%)	209 (5%)
Hollis	459 (7%)	1,745 (25%)	653 (9%)	2,819 (40%)	760 (11%)	579 (8%)
Hudson	1,704 (7%)	5,231 (23%)	4,342 (19%)	7,948 (35%)	1,894 (8%)	1,809 (8%)
Litchfield	682 (9%)	1,925 (26%)	1,366 (19%)	2,717 (37%)	409 (6%)	261 (4%)
Lyndeborough	97 (6%)	359 (23%)	259 (16%)	596 (38%)	164 (10%)	110 (7%)
Milford	984 (7%)	3,068 (23%)	2,686 (20%)	4,445 (33%)	1,055 (8%)	1,297 (10%)
Mont Vernon	117 (6%)	530 (26%)	234 (12%)	786 (39%)	182 (9%)	185 (9%)
Pelham	804 (7%)	2,577 (24%)	1,824 (17%)	3,888 (36%)	967 (9%)	854 (8%)
Wilton	239 (6%)	848 (23%)	612 (16%)	1,324 (35%)	315 (8%)	405 (11%)
NRPC Region:						
Nashua	5,644 (7%)	17,735 (20%)	18,734 (22%)	27,055 (31%)	7,395 (9%)	10,042 (12%)
Balance of NRPC Region	7,866 (7%)	26,492 (24%)	17,782 (16%)	39,508 (36%)	9,441 (9%)	8,094 (7%)
NRPC Region	13,510 (7%)	44,227 (23%)	36,516 (19%)	66,563 (34%)	16,836 (9%)	18,136 (9%)
County & State						
Hillsborough County	25,739 (7%)	83,703 (22%)	74,508 (20%)	124,981 (33%)	31,384 (8%)	40,526 (11%)
State of NH	75,685 (6%)	268,480 (22%)	228,827 (19%)	405,165 (33%)	109,659 (9%)	147,970 (12%)

Source: US Census, 2000.

The number of school age children in Merrimack increased significantly (18%) in the 1990s after experiencing little growth (2%) in the 1980s. As shown in Table II-8, the Town's percentage of school-age children (24%) was slightly higher than the County (22%) and the State (22%). With the exception of the City of Nashua, Merrimack had the highest number of school-age children (6,110) of all the municipalities in the NRPC region in 2000.

Growth in the number of elderly residents in Merrimack moderated in the 1990s (54%) in comparison to high growth in the 1980s (119%). While the number of elderly in Merrimack grew by 54% between 1990 and 2000, the percentage of elderly (6%) was well below the level of the County (11%) and the State (12%). This lower than average percentage may be a result of Merrimack's function as an employment destination rather than that of a retirement destination. When compared to the NRPC region, Merrimack had a percentage of elderly similar to the non-urbanized portion of the region (7%), while Nashua had a considerably higher percentage (12%).

In comparison to these groups, growth in Merrimack's working age population slowed during the 1990s. Between 1990 and 2000, Merrimack's working age population only increased by 7% in comparison to growth of 64% in the 1980s and 103% in the 1970s.

Table II–8: Age Distribution by Group, Merrimack, 1970-2000

Age Group	1970	Percent Change 1970-1980	1980	Percent Change 1980-1990	1990	Percent Chang, 1990-2000	2000
School Age (5 – 19)	2,889	76%	5,088	2%	5,178	18%	6,110
Working Age (20 – 64)	4,401	103%	8,945	64%	14,696	7%	15,677
Elderly (65 and Older)	275	73%	476	119%	1,042	54%	1,601

Source: US Census 1970 – 2000.

4. Household Size/Composition

Table II-9 shows the number of persons per households in Merrimack. A household is defined by the US Census Bureau as "all the persons who occupy a housing unit." Similar to state and national trends, the number of persons per household has been steadily declining in Merrimack. According to the US Census Bureau, the number of persons per household declined from 3.9 persons per household in 1970 to 2.8 in 2000. Table II-9 further demonstrates that the number of persons per household in Merrimack mirrors the trends of other Towns within the region. However, Merrimack experienced the greatest decrease within the region in the number of persons per household from 1970 to 2000. The large number of multi-family housing units constructed during the 1980s may have contributed to this decrease.

Table II–9: Persons Per Household, NRPC Region, Hillsborough County and State, 1970-2000

Community	1970	1980	1990	2000
Merrimack	**3.9**	**3.5**	**3.0**	**2.8**
Nashua	3.3	2.7	2.6	2.5
Total NRPC Region	3.4	3.0	2.8	2.7
Hillsborough County	3.3	2.9	2.7	2.5
State of NH	3.3	2.9	2.7	2.5

Source: US Census 1970 –2000.

The decrease in household size can be partially attributed to the national tendency to have fewer children per household and the increase in the number of non-traditional families. Table II–10 examines the type of households present in Merrimack. In 2000, Merrimack had a higher percentage of family households and family households with children under 18 than Hillsborough County or the State. In addition, Merrimack had a significantly higher percentage of married couples (68%) than the County (55%) or the State (55%).

Table II–10: Households by Type, NRPC Region, Hillsborough County and State, 2000

Community	Family Households (% of Total Households)	Family Households with Children Under 18 Years (% of Total Households)	Married Couple Households (% of Total Households)	Female Headed Households (% of Total Households)	Total Households
Merrimack	**6,982 (79%)**	**3,703 (41%)**	**6,019 (68%)**	**685 (8%)**	**8,832**
NRPC Communities:					
Amherst	3,067 (85%)	1,707 (48%)	2,811 (78%)	166 (5%)	3,590
Brookline	1,147 (85%)	697 (52%)	1,030 (77%)	77 (6%)	1,343
Hollis	2,024 (83%)	1,025 (42%)	1,828 (75%)	141 (6%)	2,440
Hudson	6,261 (78%)	3,297 (41%)	5,204 (65%)	721 (9%)	8,034
Litchfield	2,031 (86%)	1,259 (53%)	1,775 (75%)	175 (7%)	2,357
Lyndeborough	420 (75%)	208 (37%)	379 (68%)	27 (5%)	560
Milford	3,549 (68%)	1,938 (37%)	2,848 (55%)	509 (10%)	5,201
Mont Vernon	576 (83%)	300 (43%)	511 (74%)	39 (6%)	693
Pelham	2,983 (83%)	1,574 (44%)	2,588 (72%)	272 (7%)	3,606
Wilton	1,023 (73%)	517 (38%)	840 (60%)	126 (9%)	1,410
NRPC Region:					
Nashua	22,083 (64%)	10,923 (32%)	17,079 (49%)	3,606 (10%)	34,614
Balance of NRPC Region	30,064 (79%)	16,225 (43%)	19,814 (52%)	2,938 (8%)	38,066
Total NRPC Region	52,147 (72%)	27,148 (37%)	36,893 (51%)	6,544 (9%)	72,680
County & State:					
Hillsborough County	98,855 (68%)	50,764 (35%)	79,432 (55%)	8,660 (6%)	144,455
State of NH	323,651 (68%)	158,410 (33%)	262,438 (55%)	42,952 (9%)	474,606

Source: US Census 2000.

C. HOUSING

1. Housing Growth

During the 1970s and 1980s, Merrimack's housing stock experienced high rates of growth. As shown in Table II-11, Merrimack had a 253% increase in the number of housing units between 1970 and 2000, which is the second largest percentage growth of any community in the region. In particular, the number of housing units increased considerably during the 1980s, where Merrimack experienced the highest rate of housing growth (73%) in the region. As of 2000, Merrimack had the second largest number of housing units in the region – second only to Nashua.

In the 1990s, growth in the housing stock slowed to levels comparable to the region. The number of housing units in the Town increased by 13% between 1990 and 2000. This percent change in housing units was lower than changes in the 1970s and 1980s, and was only slightly greater than the region (12%) and County (11%).

Table II–11: Total Housing Units, NRPC Region, 1970-2000

Community	1970	Percent Change 1970-1980	1980	Percent Change 1980-1990	1990	Percent Change 1990-2000	2000
Merrimack	**2,539**	**81%**	**4,584**	**73%**	**7,915**	**13%**	**8,959**
Nashua	18,035	41%	25,444	31%	33,383	6%	35,387
NRPC Region	31,260	53%	47,944	38%	66,375	12%	74,341
Hillsborough County	74,666	36%	101,208	34%	135,622	11%	149,961
State of NH	280,962	38%	386,381	30%	502,247	9%	547,024

Source: US Census, 1970-2000.

Table II-12 shows the residential building permit activity that occurred in Merrimack in the 1980s and 1990s. Construction of all types of residential units was greatest from 1983 to 1987. The construction of new multi-family housing noticeably decreased in the 1990s, when only 63 units were constructed. Most multi-family construction has been in the form of condominiums in Planned Unit Developments, a housing sector that had virtually disappeared with the recession of the early 1990s. In comparison, the construction of single-family homes in Merrimack was consistent throughout the 1980s and 1990s. A decrease in the construction of single-family housing units occurred in the early 1980s and early 1990s, potentially due to coinciding downturns in the national and regional economy.

Table II–12: Residential Building Permit Activity, Merrimack, 1980-2000

Year	Single-Family Building Permits	Multi-Family Building Permits	Manufactured Housing Building Permits	Total Building Permits
1980	50	20	0	70
1981	50	23	2	75
1982	124	62	0	186
1983	220	165	0	385
1984	247	247	0	494
1985	219	645	1	865
1986	163	643	0	806
1987	117	409	0	526
1988	103	50	0	153
1989	56	0	0	56
1990	62	0	0	62
1991	39	0	0	39
1992	119	0	0	119
1993	123	0	0	123
1994	89	0	0	89
1995	75	0	0	75
1996	102	0	0	102
1997	164	0	0	164
1998	168	8	0	176
1999	135	55	0	190
2000	180	0	0	180

Source: Town of Merrimack code enforcement and building reports.

2. Housing Types

Merrimack contains a diversity of housing types with a significant number of multi-family housing units. Table II–13 depicts the total housing stock in 1999 by type and

community. Despite a slowdown in creation of multi-family units during the 1990s, Merrimack had the third largest number of multi-family housing units in the NRPC region in 2000. Multi-family housing units comprise 26% of the total number of housing units in Merrimack. In addition, Merrimack has the fourth highest number of manufactured housing units in the NRPC region, although these units comprise a relatively low percentage (2%) of the total number of the Town's housing units.

As can be seen in Map II-1, most multi-family housing in Merrimack is located east of the FE Everett Turnpike or within about a half mile of the Turnpike to the west. On the east side of the Turnpike, multi-family housing has been developed primarily in Planned Unit Developments (PUDs). PUDs typically contain both townhouse and garden style units, various on-site recreational facilities and often include a commercial component. PUDs include both owner-occupied (condominium) and rental housing. On the western side of the Turnpike, multi-family housing has been primarily developed in residential "cluster" developments at densities of 40,000 square feet or less per unit.

Table II–13: Housing Stock by Type, NRPC Region, 1999

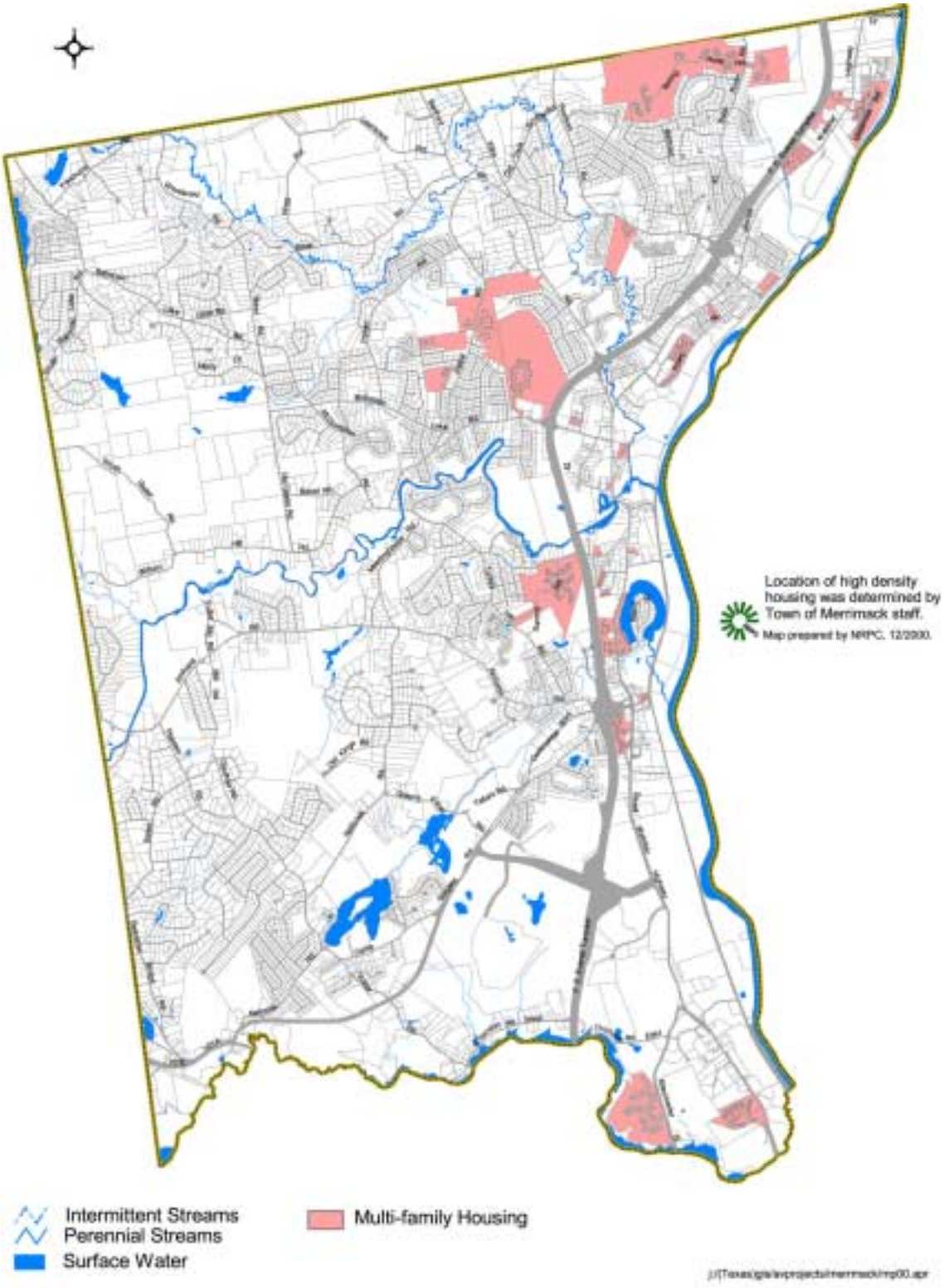
Community	Single Family Units 1999 (% of Total)	Multi-Family Units 1999 (% of Total)	Manufactured Housing, 1999 (% of Total)	Total Housing Units, 1999
Merrimack	**6,450 (71%)**	**2,377 (26%)**	**210 (2%)**	**9,037**
NRPC Communities:				
Amherst	3,487 (90%)	276 (7%)	98 (3%)	3,861
Brookline	1,266 (93%)	59 (4%)	34 (3%)	1,359
Hollis	2,281 (90%)	159 (6%)	106 (4%)	2,546
Hudson	5,363 (66%)	2,511 (31%)	240 (3%)	8,114
Litchfield	2,085 (83%)	287 (11%)	132 (5%)	2,504
Lyndeborough	518 (88%)	32 (5%)	40 (7%)	590
Milford	2,715 (51%)	2,192 (41%)	431 (8%)	5,338
Mont Vernon	616 (84%)	25 (3%)	88 (12%)	729
Pelham	3,240 (85%)	540 (14%)	31 (1%)	3,811
Wilton	970 (70%)	345 (25%)	71 (5%)	1,386
NRPC Region:				
Nashua	15,852 (45%)	17,927 (51%)	1,152 (3%)	34,931
Balance of NRPC Region	28,991 (77%)	8,803 (22%)	1,481 (4%)	39,275
Total NRPC Region	44,843 (60%)	26,730 (36%)	2,633 (4%)	74,206
County & State:				
Hillsborough County	83,498 (56%)	61,182 (41%)	5,061 (3%)	149,741
State of NH	337,727 (61%)	169,387 (31%)	46,960 (8%)	554,074

Source: NH Office of State Planning, 2000.

Merrimack's diversity in housing options is further enhanced by the presence of accessory dwelling units. Accessory dwelling units (ADUS) are commonly defined as "a secondary dwelling unit that has been added onto, or created within a single family house."[3] ADUs are typically small units that have separate kitchen, bathing and sleeping areas. Elderly individuals, who frequently have an independent lifestyle but still need to live close to relatives or friends, often occupy these units. Merrimack permits the development of accessory apartments by Special Exception, creating the highest number of new ADUs in the region (32

[3] Lindbloom, Carl and Harvey Moskowitz., "The New Illustrated Book of Development Definitions," Rutgers, 1993.

Map II-1: Location of Multi-Family Housing



units) during the 1990s. A study has shown that ADUs, when permitted, are popular and contribute towards housing diversity.[4]

3. Housing Tenure

Housing tenure refers to the terms or conditions under which housing is occupied. It can be used as a measure of the range of housing options available in a community as well as a measure of stability. Overall, Merrimack provides a relatively wide range of housing alternatives based on tenure. The high number of multi-family housing units created in Merrimack in the 1980s led to an increased presence of renters. According to the US Census Bureau, the percent of renters in Merrimack grew from 8% in 1980 to 17% in 1990 as the number of duplex and multi-family housing units available for rent in the Town grew. However, the proportion of owner-occupied housing in the Town increased during the 1990s as fewer duplex and multi-family housing units were built during this time period. As shown in Table II-14, Merrimack's increase in the percentage of owner-occupied housing units in the 1990s is in accord with similar trends within the region.

Table II–14: Owner-Occupied Housing Units, NRPC Region, 1990-2000

	1990		2000	
Community	**Number**	**Percent**	**Number**	**Percent**
Merrimack	**6,143**	**83%**	**7,601**	**86%**
NRPC Communities:				
Amherst	2,718	91%	3,317	92%
Brookline	723	89%	1,235	92%
Hollis	1,180	93%	2,261	93%
Hudson	4,967	75%	6,249	78%
Litchfield	1,482	86%	2,060	87%
Lyndeborough	400	89%	492	88%
Milford	2,718	61%	3,294	63%
Mont Vernon	535	92%	639	92%
Pelham	2,463	85%	3,088	86%
Wilton	841	73%	1,052	75%
NRPC Region:				
Nashua	17,920	58%	19,703	57%
Balance of NRPC Region	24,170	79%	31,288	82%
NRPC Region	42,090	68%	50,991	70%
Coounty & State:				
Hillsborough County	79,363	64%	93,748	65%
State of NH	280,372	68%	330,700	70%

Source: US Census 1990 and 2000.

Owner occupied housing in Merrimack usually comes in the form of detached, single-family dwellings on individual lots owned in fee or in condominiums. The condominium market expanded rapidly in Merrimack during the 1980s. Condominiums are commonly defined as a building, or group of buildings, in which dwelling units … are owned individually, and the structure, common areas, and facilities are owned by all the owners on a proportional, undivided basis. Because the grounds, parking lots, and other common areas are typically maintained collectively, condominiums can provide an attractive housing alternative for those

[4] Brown, Barbara B. and Vivian L. Cropper, "New Urban and Standard Suburban Subdivisions: Evaluating Psychological and Social Goals," Journal of the American Planning Association, Autumn 2001, Vol. 67, No. 4, p. 409.

who wish to own but do not desire certain outdoor or other property maintenance responsibilities. Condominiums are sometimes also an affordable housing resource, particularly in larger scale multi-family developments. Merrimack plays a key role in the provision of condominium units in the region. Table II-15 shows that Merrimack had the highest percentage of condominium units in its housing stock (23%) of any community in the region. Map II-1 shows the location of the major rental, multi-family, condominium and elderly housing complexes found in Merrimack as of 2001.

Table II–15: Condominium Complexes With More Than 25 Units, NRPC Region, 2000

Community	Total Condominium Units, 2000	Total Housing Units, 2000	Percent of Total Housing Units, 2000
Merrimack	**2,050**	**8,959**	**23%**
Amherst	139	3,752	4%
Brookline	0	1,384	0%
Hollis	0	2,491	0%
Hudson	941	8,165	12%
Litchfield	0	2,389	0%
Lyndeborough	0	587	0%
Milford	391	5,316	7%
Mont Vernon	0	720	0%
Nashua	5,860	35,387	17%
Pelham	89	3,740	2%
Wilton	45	1,451	3%
NRPC Region	9,515	74,341	13%

Source: NRPC Survey and US Census 2000.

Although most condominium developments in Merrimack are comprised of multi-family townhouse or garden style dwellings, the Town also includes single-family condominium units, some of which are on the higher end of the housing market. Much of the Town's stock of elderly housing is also under condominium ownership. In addition to the more common types of housing tenure discussed above, the Town does include owner-occupied and rental residential developments on leased land and one manufactured housing cooperative development.

4. Distribution of Housing Types

Merrimack provides a wide diversity of housing types and living options. This diversity is not evenly distributed throughout Town, but is distributed in a logical fashion based on the zoning ordinance. Housing types and densities vary considerably in Merrimack based on the suitability of land for development, proximity to major transportation corridors, public water, sewer and other public facilities, and on the Zoning Ordinance and other local land use regulations.. In general, there is a progression towards higher density development as one proceeds from western Merrimack eastward towards the Merrimack River.

As previously mentioned, Merrimack's multi-family housing tends to be located within a mile of the FEE Turnpike, with most of it located east of the Turnpike along Route 3. Most of the multi-family housing developed east of the Turnpike was built under the Planned Unit Development (PUD) provisions of the zoning ordinance. PUDs are developments that permit a

small amount of commercial development to take place alongside relatively high-density residential development. In Merrimack, the minimum tract size for a PUD is twelve (12) acres. PUDs must be served by both public water and sewer. The maximum number of units permissible in a PUD is four hundred (400). Dwelling unit density in PUDs can be as high as eight (8) units per acre for elderly housing, and six (6) units per acre for 2-bedroom units. Most of the Town's PUDs contain a variety of housing types including townhouse and garden apartments. Examples of PUDs include the Commons, Harris Pond, Society Hill and Webster Green developments.

Proceeding west from the Turnpike is an area of moderate density residential development. This moderate density area generally extends about one and a half miles westward from the Turnpike as well as in portions of southwest Merrimack. (See Map II-2). Much of the residential development in this area is comprised of single-family homes built in the 1960s and 1970s at densities of up to four units per acre. Most of the residential development in this area during the 1980s and 1990s was in single family and, to a lesser extent, multi-family "cluster" developments at densities of not less than 40,000 square feet per unit. Cluster development is allowed in any residentially zoned area, outside of the R-1 district described below, where public water and sewer are available. Duplexes are also permitted with a minimum lot size of 80,000 square feet.

The western and and northwestern portions of Town include Merrimack's most rural areas comprised of mostly low-density residential development and much of the Town's remaining undeveloped land. Most of this area is located in the Town's rural residential (R-1) zone adopted in 2000. Homes in this area are served by individual septic systems with many on private wells. The minimum lot sizeis 100,000 square feet of contiguous non-wetland area. In residential areas outside of the defined R-1 District that are not served by public sewer, lot size requirements are based on soil types. Lots with predominately severe soil limitations for septic systems require 100,000 square feet, lots with moderate limitations require 80,000 square feet, and lots with slight limitations require 40,000 square feet of contiguous non-wetland area. Duplexes are only permitted in these areas where slight soils exist with a minimum lot size of 80,000 square feet. Multi-family development is not permitted in non-sewered areas.

5. Age of Housing Stock

The proportion of housing built prior to 1940 is an indicator of housing stock condition, and is directly related to the amount of development that has occurred in recent decades. Merrimack has a smaller percentage (4%) of units built prior to 1940 than does the NRPC region (16%) or the State of New Hampshire (25%). This low percentage of units built prior to 1940 reflects the recent growth and new housing development within the Town. The recent age of the Town's housing stock generally leads to very few substandard housing units.

Table II–16: Age of Housing Stock/Units Built Before 1940, NRPC Region, 2000

Community	Housing Units, Pre-1940	Total Housing Units, 2000	Percent Pre-1940
Merrimack	**337**	**8,959**	4%
Amherst	417	3,752	11%
Brookline	190	1,384	14%
Hollis	336	2,491	13%
Hudson	666	8,165	8%
Litchfield	80	2,389	3%
Lyndeborough	193	587	33%
Milford	1,189	5,316	22%
Mont Vernon	166	720	23%
Nashua	7,267	35,387	21%
Pelham	301	3,740	8%
Wilton	547	1,451	38%
NRPC Region	11,689	74,341	16%
State of NH	136,728	547,024	25%

Source: US Census 2000.

6. Housing Cost

a. Rental Housing

In the late 1990s and early 2000s, high costs and increasing demand characterized the rental housing market in the Nashua PMSA. Rent in the Nashua PMSA, including Merrimack, has historically been higher than Hillsborough County or the State. Between 1991 and 2000, median gross rental costs for two bedroom units in the Nashua PMSA increased at a faster rate (31%) than in the State (29%) and the County (27%). Since 1996, the PMSA's rental costs have been increasing at a rate of 5% per year, driving median gross rental costs for two bedroom units towards $900 per month.

Table II–17: Median Gross Rental Costs – Two Bedroom Units, Nashua PMSA, Hillsborough County and State, 1991 - 2000

Area	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	% change 1991 - 2000
Nashua PMSA	$667	$687	$717	$711	$677	$718	$765	$794	$831	$874	31%
Hillsborough County	$656	$654	$659	$665	$637	$704	$724	$759	$794	$834	27%
State of NH	$602	$608	$606	$617	$618	$663	$666	$698	$730	$774	29%

Source: NH Housing Finance Authority, 2000.

Table II-18 shows rental vacancy rates for the Town, Hillsborough County and the State in 1990 and 2000. Although Merrimack had a rental vacancy rate above the County and State in 1990, the Town's rate was below both of these levels in 2000. Merrimack had the largest drop in its rental vacancy rate in the region from 1990 (12.4%) and 2000 (1.8%). This trend is indicative of a very tight rental market, which is linked to the steady increase of rents throughout the region.

Table II–18: Rental Vacancy Rates, NRPC Region, Hillsborough County and State, 1990 and 2000

Community	Rental Vacancy Rate, 2000	Rental Vacancy Rate, 1990
Merrimack	**1.8%**	**12.4%**
Amherst	3.5%	10.0%
Brookline	3.6%	11.1%
Hollis	3.2%	7.0%
Hudson	1.3%	7.1%
Litchfield	2.0%	11.3%
Lyndeborough	*	7.3%
Milford	1.7%	10.2%
Mont Vernon	*	7.8%
Nashua	1.6%	10.6%
Pelham	0.8%	8.3%
Wilton	1.1%	5.5%
Hillsborough County	2.5%	11.1%
State of NH	3.5%	11.8%

Source: US Census, 1990 and 2000.
*Low sample size prevented accurate results.

b. Home Sales

Average home prices in Merrimack are relatively low when compared to the NRPC region. The average price of a residential home in Merrimack is projected to be $179,101 in 2001, while the average sales price in the region is projected to be $188,197. Average sales prices have crossed $200,0000 in other less urbanized communities bordering Merrimack, including Litchfield ($204,049), Hollis ($310,767) and Amherst ($259,965).The relatively low cost of housing in Merrimack is due to the large number of existing, more modest, single-family homes constructed in the 1960s and 1970s as well as to the relatively large number of multi-family condominium units in town that typically have a lower per unit value than single-family homes. The majority of new single family homes being constructed in Merrimack today, however, can be considered "high-end," often up to 5,000 square feet in size and built on larger lots than homes constructed in the 1960s and 1970s. This new construction is also more expensive, with homes often selling for upwards of $250,000.

Table II–19: Average (Mean) Residential Sales Price, NRPC Region, 2001 Projection*

Community	2001
Merrimack	**$179,101.79**
Amherst	$259,965.27
Brookline	$233,318.44
Hollis	$310,767.40
Hudson	$194,152.29
Litchfield	$204,049.08
Lyndeborough	$159,009.43
Milford	$168,855.82
Mont Vernon	$165,374.88
Nashua	$167,122.77
Pelham	$228,480.97
Wilton	$164,561.38
NRPC Region	$188,197.72

Source: NRPC Survey from Real Estate Transactions as published weekly in The Nashua Telegraph.

7. Assisted Housing

Within the context of the region, Merrimack is one the larger providers of assisted housing. The New Hampshire Housing Finance Authority defines assisted housing as "housing facilities … (that) have been or are being provided subsidies for the purpose of creating affordable (housing) units for low and very low income households." Such assisted housing units are typically subsidized by the Farmers Home Administration and Section 8 rental subsidy programs.

As shown in the Table II-20, Merrimack has the third highest number of assisted housing units (80) in the region. All of these units, located in the Wentworth Place I and Wentworth Place II developments, are elderly assisted units. These assisted units have been targeted for elderly populations. Merrimack does not have any stock of assisted housing for families or other population groups.

Table II–20: Assisted Housing, NRPC Region, 2000

Community	Elderly Assisted	Family Assisted	Other Assisted or Combined Types	Total Assisted
Merrimack	**80**	**0**	**0**	**80**
Amherst	0	0	0	0
Brookline	0	0	0	0
Hollis	24	0	0	24
Hudson	64	0	0	64
Litchfield	40	0	0	40
Lyndeborough	0	0	0	0
Milford	139	56	6	201
Mont Vernon	0	0	0	0
Nashua	646	290	836	1,774
Pelham	48	0	0	48
Wilton	33	0	0	33
NRPC Region	1,074	346	842	2,264
State of NH	8,485	3,514	4,868	16,877

Source: NHHFA, Directory of Assisted Housing, 1997; other or combined includes group homes, mentally handicapped, physically handicapped, and developments containing both elderly and family housing.

8. Elderly Housing

The Merrimack Zoning Ordinance contains special provisions for elderly or elderly assisted housing. The purpose of the Elderly Zoning (Overlay) District is to "*encourage the construction of housing units suitable for the occupancy of elderly persons, while ensuring compliance with local planning standards, land use policies, good building design and the requirements for the health, safety and general welfare of the inhabitants of the Town*."

The Elderly Housing district is currently defined by distance from the intersection of the Daniel Webster Highway (NH Route 3) and Baboosic lake Road. The district encompasses the area within a one-mile radius of the intersection west of the FEE Turnpike and within a two-mile radius east of the FEE Turnpike, as shown on the zoning map. All elderly housing developments must be served by public water and sewer. The minimum tract area for multi-family developments is three (3) acres. The density of dwelling units shall not be greater than 8 units per acre.

Since the elderly housing overlay district was adopted, 365 elderly units in six (6) housing complexes have been approved in Merrimack. 329 of these units have been built as of 2001. Complexes either exclusively or partially for the elderly include the Birches, Essex Green, Wentworth Place in The Commons, Highland Green, Merrimack Meadows and Souhegan River View Village.

9. Homelessness and Crisis Housing

While homelessness is usually not thought of as a serious problem in small or medium sized towns, there is a segment of the population in many towns that faces difficulties affording any type of housing. People and families can find themselves in a crisis situation intermittently or over a longer-term period.

In New Hampshire, state law requires towns and cities to operate a General Assistance program providing financial and housing assistance to those in need. In Merrimack, General Assistance is provided by the Town of Merrimack Welfare Department. Eligibility for General Assistance is determined by household income and expenses on basic needs such as housing, food, utilities and medical care. An applicant may be deemed eligible for assistance when household income falls below basic need expenses.

Generally, this assistance is provided to those with longer-term financial difficulties. They usually remain on general assistance until long-term assistance through the State of New Hampshire Welfare Office or Medicaid is approved. The Town of Merrimack provides rental assistance for qualifying persons and families, and in the case of homeless individuals, pays shelter costs for the duration of eligibility. The nearest homeless shelters are located in Nashua and Manchester. A great deal of the assistance provided covers the first month rent and/or security deposit often demanded by landlords. Those in need may otherwise be able to afford the rent on an ongoing basis, but have trouble coming up with the initial deposit needed to secure rental housing.

In addition to General Assistance, the Merrimack Welfare Office also provides emergency assistance to those in immediate need. Individuals and families may find themselves in a temporary housing crisis due to loss of income from losing a job, illness, unanticipated health or emergency expenses and loss of their home due to fire or other catastrophe.

In fiscal year 2000-2001, the Town of Merrimack Welfare Office provided $37,784 in housing assistance to a total of 46 clients. The average amount of assistance per person was $821.39. The Town is obligated to assist qualifying individuals and families with assistance, regardless of the amount budgeted for the Welfare Department in any given fiscal year.

10. Future Housing Development

In the Town of Merrimack Buildout Study conducted by NRPC in April 1999 and updated in 2001, it is estimated that Merrimack will approach buildout within the next twenty years. Table II-21 and Map II-2 shows the amount of additional housing units possible in each of the traffic analysis zones (TAZ) used as a basis for the analysis. The study considers two scenarios: (1) buildout at the maximum density allowed by zoning; and (2) buildout at the density determined by the average lot size identified through a representative sample of recent development in Merrimack. As noted previously, the average density estimates are considered to be the more probable, since these are based on actual development patterns that take in to account all planning and zoning requirements and development constraints in addition to lots size requirements.

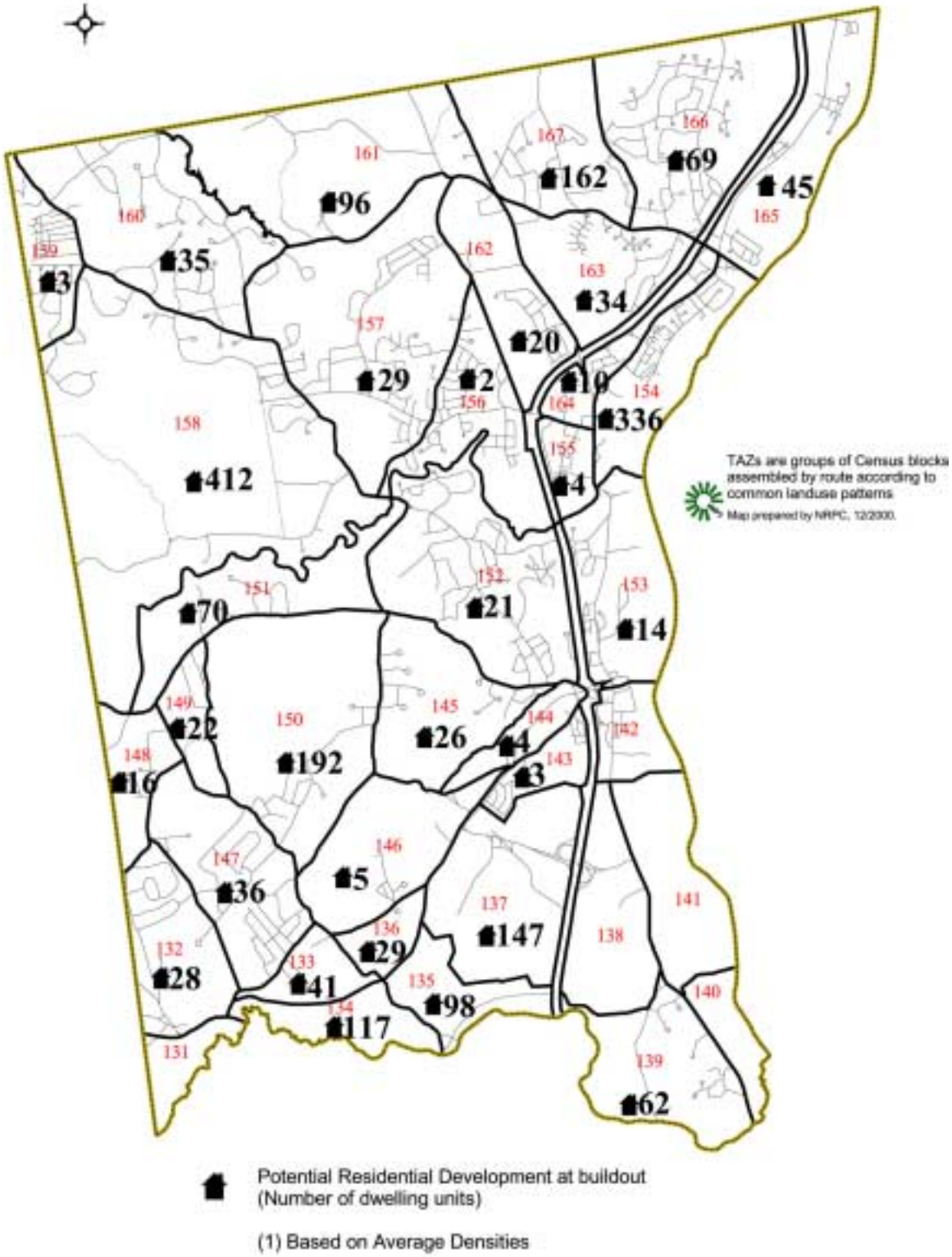
Table II–21: Buildout Projections, Residential Development

TAZ	Zoning Density	Average Density	Acres	HU 2000	Additional HU/w Zoning	Additional HU/w Average	% Increase Zoning	% Increase Average
131	100,000	166,835	0	9	0	0	0.0	0.0
132	100,000	166,835	107.8	78	47	28	60.0	36.0
133	40,000	61,855	57.6	83	63	41	76.0	49.0
134	40,000	61,855	173.4	7	189	117	2700.0	1671.0
135	40,000	61,855	138.3	39	151	98	387.0	251.0
136	40,000	61,855	40.4	31	44	29	141.0	94.0
137	40,000	61,855	208.7	0	227	147	*	*
138	NA	NA	0	1	0	0	0.0	0.0
139	40,000	61,855	88.0	200	96	62	48.0	31.0
140	NA	NA	0	11	0	0	0.0	0.0
141	NA	NA	0	0	0	0	0.0	0.0
142	NA	NA	0	168	0	0	0.0	0.0
143	40,000	61,855	4.3	178	4	3	2.0	2.0
144	40,000	61,855	5.6	44	6	4	14.0	9.0
145	100,000	166,835	100.7	147	43	26	29.25	17.7
146	100,000	166,835	20.9	79	9	5	11.4	6.3
147	100,000	166,835	139.4	513	61	36	12.0	7.0
148	100,000	166,835	62.7	58	27	16	47.0	28.0
149	100,000	166,835	82.7	33	36	22	109.0	67.0
150	100,000	166,835	737.2	178	321	192	180.0	108.0
151	100,000	166,835	269.0	101	117	70	115.0	69.0
152	40,000	61,855	30.1	770	33	21	4.0	3.0
153	NA *	NA *	21.5	442	14	14	3.2	3.2
154	NA *	NA *	56.0	568	336	336	59.0	59.0
155	NA *	NA *	4.4	36	4	4	11.0	11.0
156	40,000	61,855	1.9	737	2	2	1.0	1.0
157	100,000	166,835	113.6	825	49	29	6.0	3.5
158	100,000	166,835	1577.8	354	687	412	194.0	116.0
159	100,000	166,835	9.6	248	4	3	1.0	1.0
160	100,000	166,835	134.9	310	59	35	19.0	11.0
161	100,000	166,835	367.8	143	160	96	112.0	67.0
162	40,000	61,855	28.5	100	31	20	31.0	20.0
163	40,000	61,855	48.6	356	53	34	15.0	10.0
164	40,000	40,000	9.6	165	10	10	6.0	6.0
165	NA *	NA *	47.0	765	45	45	25.0	25.0
166	40,000	61,855	97.6	832	106	69	13.0	8.0
167	40,000	61,855	229.6	176	250	162	142.0	92.0
	TOTALS		5,015.2	8,785	3,284	2,188	37.4	25.0

Source: NRPC GIS Databases. "HU" equals housing units.
Not all TAZs will continue to residentially build out due to zoning restrictions or lack of developable land.
*The number of possible additional units for these TAZs were determined using a lot-by-lot analysis.

As can be seen in the table above, Merrimack can be expected to add an additional 2,188 new residential units upon Buildout. Of these units, 467, or just over 21%, are anticipated in the area east of the FE Everett Turnpike. Since most of the potential units would be located within a PUD overlay district, most of the units built east of the Turnpike can be expected to be multi-family condominium or rental housing units. Many of the potential units are also located within the Elderly Housing overlay district. West of the Turnpike, an additional 1,721 units are anticipated. Given the zoning and utility limitations in these areas, most of these potential units can be expected to be single-family homes. Furthermore, since 939 or approximately 54.5% of these potential units are located in unsewered areas, primarily in the R-1 District, more than half can be expected to be built at low densities (100,000+ square foot lots).

Map II-2: Potential Residential Development by TAZ (Estimated number of additional residential units)



D. CONCLUSIONS AND RECOMMENDATIONS

1. Population

Merrimack's population has grown at rates well above those of the state and region in the latter half of the 20th Century. It is not surprising; therefore, that growth has been a dominant issue of concern to the community. Overall rates of growth have declined steadily over the past three decades, however, to levels that approximate the regional average. Therefore, additional local growth control ordinances or regulations are not recommended. However, the Town should continue to monitor Merrimack's annual rate of growth relative to the region and consider the adoption of a Growth Ordinance if growth rises above these levels.

1. Housing

Merrimack's' overall pattern of residential development has provided for a wide range of housing alternatives to meet the needs of a diversity of families and individuals. When existing zoning requirements are viewed alongside current development patterns, utility availability and natural and manmade development constraints, it appears that Merrimack will continue to provide for a wide range of housing types into the foreseeable future. A number of significant regulatory changes have occurred over the years that have greatly influenced housing development in Merrimack including the adoption of soils based zoning and provisions for Cluster and Planned Unit Developments. Most recently, the creation of the R-1 District in the more rural northwest and western areas of Town is anticipated to have a significant impact on future housing development by reducing the allowable density on a large percentage of vacant developable land located within that district. Recent changes to the Elderly Housing Overlay District to permit assisted living facilities will also have an impact on housing choice. No significant changes to existing zoning district boundaries are recommended at this time.

CHAPTER III
EXISTING LAND USE

A. INTRODUCTION

The way that land in the community is currently being used lays a foundation for future development. This chapter provides a summary of existing land uses and development patterns, including discussion of "current use" land, agricultural uses and earth excavations. A summary of zoning districts is also provided. Existing land use, by parcel, is illustrated on the Map III-1, Existing Land Use. The location of Town-owned land and facilities is discussed in Chapter IV, Natural Resources, and in Chapter VI, Community Facilities. Specific types of commercial and industrial uses are also discussed in more detail in Chapter IX, Economic Development.

B. EXISTING LAND USE

1. General Land Use Pattern

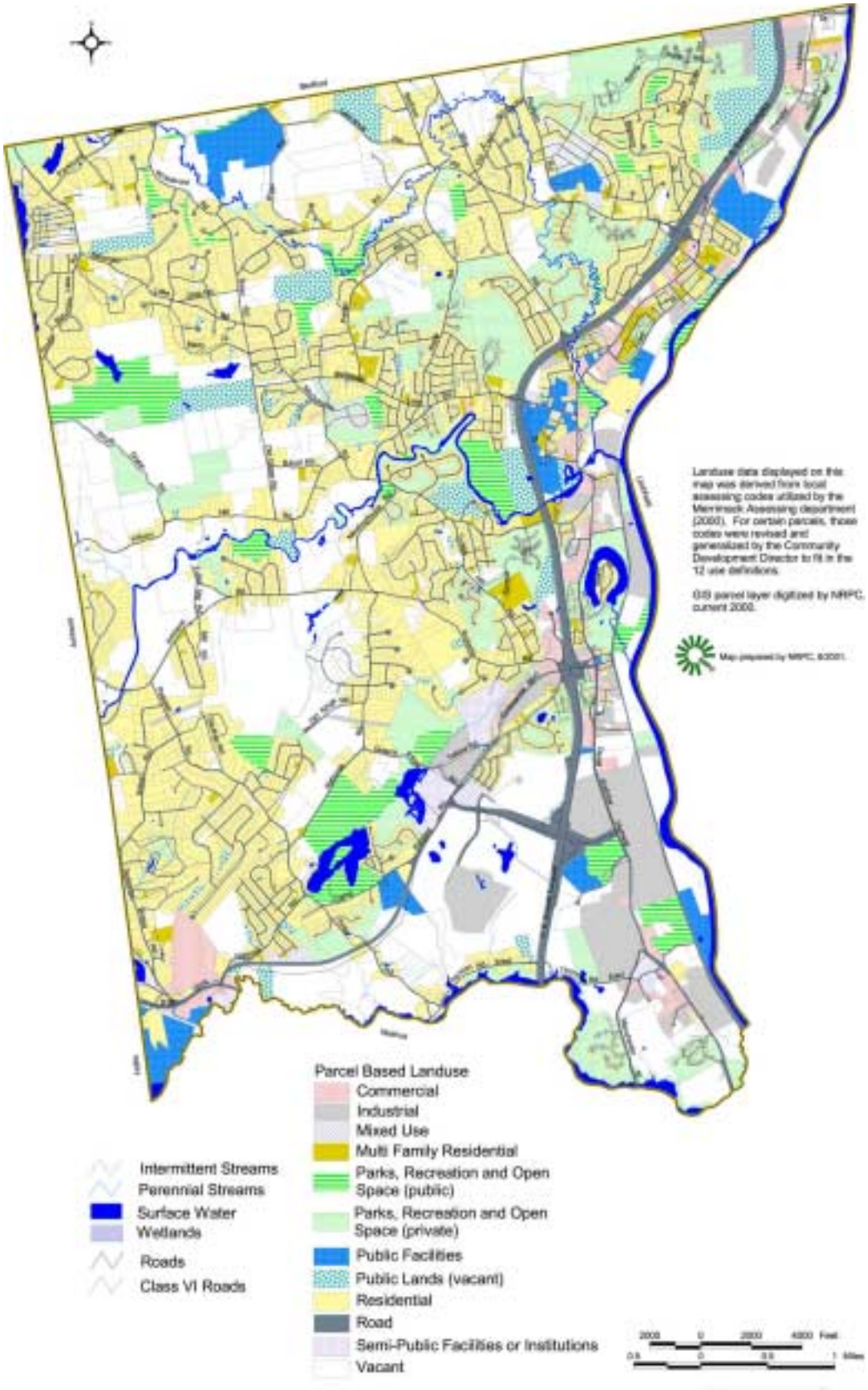
Merrimack, with an area of 33.55 square miles (21,475 acres), has the second largest land area of any community in the Nashua region, exceeded only by Amherst. The Nashua Regional Planning Commission (NRPC) maintains a Geographic Information System (GIS) database for generalized land-use in Merrimack. This GIS database is a general representation of how land is being used (e.g. residential, commercial, industrial), and does not report the specific nature of that activity (e.g. pizza shop, grocery, etc.). Thirteen (13) land use categories have been identified for use in this analysis (these categories differ from those in use by the Merrimack Assessing Department). The database is parcel specific, i.e. each property is assigned one use for the entire area of the property. Roads and water bodies are treated as distinct uses. Table III-1 identifies the thirteen generalized land-use classes as currently found in this database. Map III-1 illustrates the location of each land use.

Table III-1: General Land Use Types in Merrimack

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%
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%**

Source: NRPC GIS Database for Landuse, 2001.

Map III-1: Land Use Classes in Merrimack, 2000



In 2001, approximately 5,554 acres or 28.5% of the total land area in Merrimack remained vacant. Of the 5,554 acres of vacant land, 1,470 acres are wetlands or floodplains, leaving approximately 4,084 acres throughout Merrimack to be developed according to the development conditions currently in place. (See Table III-2).

Table III-2: Net Developable Land Area

Category	Acreage
Vacant Lands	5,554
Floodplain & Wetlands Constraints	1,470
Net Developable Land Area:	4,094

Source: NRPC GIS Databases for Landuse, Floodplains, and Soils, 2002.

A review of Map III-1 indicates that few areas of vacant land east of the FEE Turnpike are available for residential development. Most of the remaining vacant land in this area is zoned for non-residential uses, although opportunities for elderly and multi-family development continue to be available, primarily in the Town Center area. West of the FEE Turnpike, which is primarily zoned for residential use, there remain some significant tracts of vacant land in the northwestern portion of Town.

In many ways, Merrimack's existing land use has developed in a "concentric ring" growth pattern. High density residential and non-residential development is located generally east of the FE Everett Turnpike and in the southwestern corner of Town along major transportation corridors where public services are most accessible. Moderate density residential development has occurred primarily in areas within one and a half to two miles west of the Turnpike where public water and sewer are currently provided. Low-density residential development has occurred primarily in the western and northern part of Town where public services are not as readily accessible. There are some exceptions to this pattern, however, such as the higher density residential development that took place in the earlier part of the 20th century around Baboosic Lake and Lake Naticook.

The concentric ring development pattern has emerged in Merrimack primarily as a result of development of the transportation system, the distribution of public water and sewer systems and local land use regulation. The Merrimack River, running along the Town's entire eastern boundary was Merrimack's first transportation corridor and the flat, fertile lands along its banks were natural locations for early settlement. Subsequent transportation improvements including the Daniel Webster Highway (US Route 3) in the 18th Century, the B&M railroad in the 19th Century and finally the FE Everett Turnpike in the mid twentieth century ran parallel to the River and in close proximity to it. In the southwestern corner of Town, early development occurred alongside Boston Post Road, Milford Road (NH 101A) and the railroad. Commercial, industrial and residential developed in distinct clusters along these corridors. Later, public water and sewer systems were developed to serve both existing developed areas as well as nearby undeveloped land.

With the adoption of zoning in the 1950s, distinct commercial and industrial areas were created along the Town's major transportation corridors, especially east of the Turnpike. The balance of the Town was zoned residential. Until the late 1970s, however, relatively high

residential densities were allowed throughout town, despite a lack of public sewer. In some cases, such development patterns resulted in high instances of septic system failure that created a threat of surface and groundwater contamination. To address the threat of contamination from septic systems on under-sized lots, soils based zoning was introduced in the late 1970's. Soil based zoning (see Section III.C, below) limits the density of residential development based on soil characteristics where public sewer is not available. Given that the sewer service is provided primarily in the eastern and far southern part of Town, higher and moderate density development has occurred in these areas. In 2000, the Town took the further step of rezoning portions of the northern and western areas of town, including the largest remaining tracts of undeveloped land, into a newly created low-density residential district. The so-called concentric ring pattern of development was thereby codified.

2. Residential Land Use

As described more fully in Chapter VIII, early residential development in Merrimack was concentrated in the Town's four historic villages: Reed's Ferry, Thortons Ferry, Souhegan Village and South Merrimack. Scattered, individual farmsteads were also located throughout the Town. In the early 20th Century, seasonal homes were developed at relatively high densities near Baboosic Lake, Lake Naticook, and Horseshoe Pond. Most of these were later converted to year-round residences. During the 1940s and 1950s, smaller scale single-family development occurred, mostly adjacent to established neighborhoods.

In the 1960s and 1970s large-scale residential subdivisions such as Brickmill Park, Country Club Estates and Woodland Estates began to appear in north and central Merrimack, west of the Turnpike. These subdivisions were typically developed on lots of about 20,000 square feet and were served by on-site septic systems. This residential development pattern continued to occur west of the Turnpike until adoption of soils based zoning in the late 1970s. Later, public sewer was extended to many of these neighborhoods, however, some higher density subdivisions developed in the 1960s and 1970s remain without public sewer service.

The adoption of soils based zoning, which significantly increased lot size requirements, occurred at a time when public sewer was becoming more widely available for residential development. This trend would change residential development patterns significantly and broaden the range of housing alternatives available. By the late 1970s, the Town had adopted cluster and Planned Unit Development (PUD) regulations for areas served by public sewer. East of the Turnpike, several large, mixed-use PUDs have since been developed along the Route 3 corridor. These PUDs typically include a mixture of townhouse and garden style condominium units or apartments, on-site recreational facilities and a commercial component such as a shopping center. Most also include on-site recreational facilities and some include elderly housing. In non-sewered areas, especially in the northern and western areas of Town, lower density subdivisions with lot sizes ranging from 40,000 square feet (.92 acres) to 100,000 square feet (2.3 acres) predominated.

Since the late 1970s a number of modifications were made to the zoning ordinances governing residential development. Among the most significant recent changes was the adoption of the defined R-1 District in 2000. Previously, R-1 was a residential density requirement (100,000 square foot minimum lots) applicable only in non-sewered areas where soils with severe limitations for on-site septic systems were prevalent. With adoption of the R-1

zoning amendments in 2000, R-1 requirements are now applicable within a defined R-1 District located in the western and northwestern areas of Town as well as in other non-sewered areas with severe soils.

3. Commercial Land Use

Commercial activity in Merrimack takes place primarily in two corridors: along the central and northern portions of Route 3 (DW Highway) and along NH 101A in the southwestern corner of Town. The southern end of the Route 3 commercial corridor is concentrated around FE Everett Turnpike Exit 11 where Continental Boulevard, Amherst Road, Greeley Street and Route 3 converge. This area encompasses much of the original Thornton's Ferry village. The area includes a full service hotel, two motels, a long-term stay facility, a day care center and a number of restaurants, gas stations and other commercial establishments that serve nearby industries, area residents and motorists on the Turnpike. One of the more prominent commercial establishments in the area is the Hannah Jack Tavern, a popular restaurant located in a historic house that is named after the wife of Mathew Thornton.

Further north on Route 3 is Shaw's Plaza, currently Merrimack's largest shopping center. The Plaza contains Merrimack's only supermarket, a pharmacy, liquor store, and other retail establishments. A commercial strip that includes four additional shopping centers, the Skyline Mall, Merrimack Village Mall, Connell's and the Commons, along with numerous individual business establishments, stretches for about two miles further up Route 3, through the Town Center area to the area known as Reed's Ferry. Businesses in this area include several restaurants, personal service establishments, daycare centers, automobile service and repair facilities, health clubs, a bowling alley, and a number of retail establishments. Most of these businesses cater to a local clientele. Various public facilities and residences are scattered along or adjacent to the commercial strip as well. In the Reed's Ferry area, smaller scale businesses and restaurants predominate, most located in former residences with many in buildings considered to be of historic or architectural significance. A 170,000 square foot mall, however, was recently approved in the Reed's Ferry area. Once constructed, the mall would become Merrimack's largest shopping center. A handful of additional businesses, including a gas station, office building, roller skating rink and a golf driving range, are located between the Reed's Ferry area and the Bedford town line.

In Merrimack's southwestern corner is another concentration of commercial development along NH Route 101A. This area, known as South Merrimack, was one of the Town's four original villages. Commercial development in the area dates from the mid 19th century; however, the historic character of the commercially zoned potions of South Merrimack have given way to the larger scale commercial development that dominates the 101A corridor from Nashua to Milford. Commercial development in this area includes a shopping center, a car dealership, The Home Depot (Merrimack's only "big box" retail establishment) and other commercial establishments. The Headquarters for PC Connection, Inc., a computer reseller, is also located in the area. Housed in a former shopping center in 101A, PC Connection is one of Merrimack's largest employers.

4. Industrial Land Use

Merrimack's largest concentration of industrial uses is located in the southeastern portion of Town centered on Route 3 and FE Everett Turnpike Exits 10 and 11. Continental Boulevard and Industrial Drive provide important links between Route 3, the Turnpike and several business and industrial sites. This area is also one of the largest concentrations of contiguous industrially zoned land in the region as well as one of the region's largest concentrations of employment. Within the context of this chapter, it should be noted that the term "industrial" includes manufacturing uses along with research and development (R&D) facilities and large office complexes. Most of the larger manufacturing facilities are located along the Route 3 portion of the area, east of the Turnpike. Some of the more prominent of these include: BAE Systems (estimated 816 employees in 2001), Anheuser-Busch (531), Kollsman (500) and Nashua Corporation (450). A number of smaller businesses and industries are also located in this area on side streets such as Henry Clay Drive, John Tyler Street, Webb Drive and Starr Drive as well as directly on Route 3. On Manchester Street, almost 200,000 square feet of office, industrial and R&D space has been developed or approved in four buildings within the past few years. On Technology Park Drive near Exit 10, a 60,000 square foot Federal Aviation Administration facility is currently under construction. A similarly sized manufacturing facility is currently under construction on Route 3 south of Starr Drive.

West of the Turnpike, off of Continental Boulevard and Industrial Drive, is the sprawling campus style office complex of Fidelity Investments. With approximately 3,500 employees, Fidelity is the Town's largest employer and recently completed additions provide room for at least an additional 1,200 employees. The site includes approximately 1,000,000 feet of office and support facility space, three parking garages and other facilities located on approximately 530 acres. Previously, the Digital Equipment Corporation occupied the site. Also east of the Turnpike, are a number of mid and smaller sized businesses and industries located on Continental Boulevard. These include Amherst Computer, Johnson Controls, and the former Texas Instruments and Filtronic Comtec facilities.

Alongside the industrial uses in the areas described above are various non-industrial uses that have been permitted as support uses such as restaurants, childcare facilities and banks, or uses within a PUD such as the Harris Pond Shopping Center and condominiums. Various "grandfathered" uses or uses permitted by variance are also found in the vicinity. Some of the more prominent non-industrial uses located in the area include Thomas Moore College, the Nashua Fish & Game Club and the Heron Cove residential development, all located off of Manchester Street. A YMCA facility is also located in the area on Henry Clay Drive, and the Wastewater Treatment Plan is located on Mast Road. This area also includes two new and used car lots, two veterinary facilities and a mobile home park along with various other uses.

Directly south of Greeley Street, on the east side of Route 3, are a handful of industrial sites including a former wood products facility and an environmental testing laboratory. This area also includes several nonconforming residences and smaller businesses. North of Exit 11, east of Route 3, is an older concentration of industrial uses along Wright Avenue and east of Horseshoe Pond. This area includes a telephone pole facility, a construction company, and a repackaging facility for the Jones Chemical Company and other industrial uses. The New

Hampshire Plating Superfund site is also located on Wright Avenue alongside an abandoned concrete plant.

North of Wright Avenue, Merrimack's industrial districts continue along the entire eastern boundary of town to the Bedford Town line. In many areas, these northerly industrial lands are confined to a narrow strip between the railroad and the Merrimack River. Significant exceptions, however, include a relatively large industrial area north of the Reed's Ferry area that includes the St. Gobain facility, (a specialized textile manufacturer) and further to the north, a large self-storage facility and office building. Much of this northern industrial area is either undeveloped or developed for non-industrial purposes.

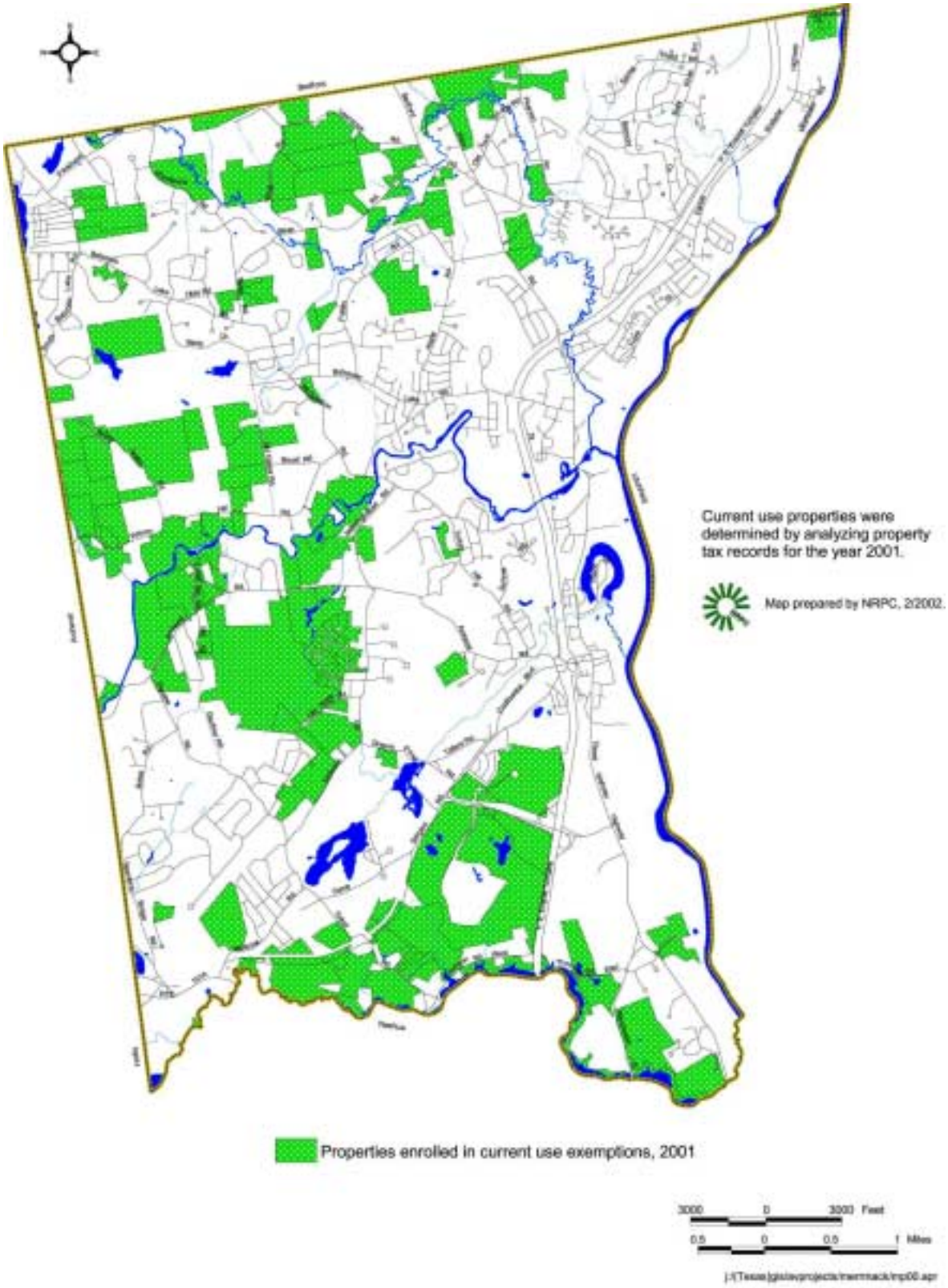
Despite a number of large business and industrial facilities, Merrimack continues to have considerable areas of vacant or partially developed industrial land remaining in the northern and southern ends of Town. In the southern portion of Town, significant tracts of vacant developable land can be found near the Nashua boundary, on Mast Road, and in vicinity of Exit 10 in the Merrimack Technology Park and Summit Business Center. In addition, a narrow strip running the length of the Town between the Boston and Maine Railroad right-of-way and the Merrimack River remains largely undeveloped because the railroad tracks inhibit access. Development in those areas also is limited by floodplains and the Comprehensive Shoreline Protection Act. In the northern area of Town near Bedford, 155 acres of industrial land remains undeveloped around the St. Gobain facility and along the Town's border with Bedford. There are also a number of under-utilized brownfield sites in or around the Town Center, including the NH Plating Co., Harcross Chemical, and Jones Chemical sites. As mentioned above, the NH Plating site is a US EPA Superfund site proposed for future recreational fields and other, as yet unknown, uses. In total, Merrimack's industrial districts can accommodate approximately 4,600,000 square feet of additional commercial/industrial floor area[1].

5. Current Use Land

NH RSA 79-A, enacted in 1973, authorized current use taxation of property. Administered by the NH Department of Revenue Administration, the current use program is designed to "prevent the conversion of open space to more intensive use by the pressure of property tax values incompatible with open space usage" (RSA 79-A: 1). Parcels of fieldland, farmland and forestland of ten acres or more; "natural preserves" or wetlands of any size; and farmland generating more than $2,500 annually are eligible for reduced property assessments under the program. Local officials must lower the assessed valuation of any property in the program to a prescribed level. When a parcel is removed from the program, the owner must pay a penalty (or "land use change tax") equal to ten percent of the land's fair market value. 3,525 acres in Merrimack were enrolled in the current use assessment program in 2001[1]. These parcels can be seen in Map III-2.

[1] Source: NRPC GIS. Acres based on area of GIS parcels coded as current use, 2000.

Map III-2: Current Use Land



6. Agriculture

According to the US Department of Agriculture, Hillsborough County Cooperative Extension, slightly less than 100 acres, or 0.5 percent of the Town's land area, was cultivated in 1992. Among the most prominent agricultural operations in Merrimack in 2001 are the Currier Orchards on Peaslee Road and the Willow Pond Nursery on Bedford Road. As Merrimack has very little remaining agricultural land, it will be important to preserve what remains as it serves as a valuable source of local produce and open space, and provides an educational and recreational function for local residents.

7. Excavations

Table III-3 identifies excavation sites in Merrimack. The Callahan and Aldrich sites have been granted permits by the Planning Board under NH RSA 155-E. The Audley site is not formally permitted (because it supplies the NH Department of Transportation) but meets all Planning Board criteria. Sand and gravel soils are discussed in more detail in Chapter IV, Natural Resources.

Table III-3: Excavations In Merrimack

Site	Location	Status
Callahan	Route 3	Closed. Reclamation complete.
Aldrich	Ingham Road	Inactive but approved for excavation
Longa	Twin Bridge Road	Active
Audley	East of FEE Turnpike just north of Nashua Line	Active

Source: Merrimack Community Development Department.

C. MERRIMACK ZONING DISTRICTS

For the most part, zoning districts in Merrimack correspond with existing land use patterns. Zoning district boundaries as of April 2001 are illustrated on Map III-3. In addition to the zoning districts described in this chapter, the Aquifer, Flood Hazard, Shoreline Protection and Wetlands Conservation overlay districts are discussed in Chapter IV, Natural Resources.

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 Industrial (I-1) District is intended for the establishment of general manufacturing, wholesale, and distribution facilities, large office complexes and other similar uses. “Big box” retail establishments and support uses such as gas stations, restaurants, banks, daycare, and hotels or motels are also allowed. The District I-1 is the largest industrial district, including almost all the land between the FE 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.

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 undeveloped 160 acre Summit Business Center.

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, northeast of Greens Pond. The District contains a single occupant, the Amherst Computer office facility.

2. Commercial Districts

The 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, “big box” retail, hotels and motels are prohibited. The Zoning Board of Adjustment may grant Special exceptions for restaurants, cafes, residential uses and new telecommunication towers. The C-1 District includes several strips of land approximately 250 feet deep fronting on Route 3. The largest District C-1 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 FE Everett Turnpike Exit 11, and several stretches along Route 3 from the Exit 11 area, north toward the Bedford town line.

3. Residential Zoning Districts

The Residential Zoning 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 FE 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. District R-1 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 Map III-3). The minimum lot size for a single-family residence is 100,000 square feet (2.3 acres).

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

Residential (R-3) District. District R-3 is designed to accommodate single and two-family residential development in areas with slight soils limitations for septic systems. The minimum lot size is 40,000 square feet for a single-family residence and 80,000 square feet for a two-family residence.

Residential (R-4) District. District R-4 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 lot size 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 residence.

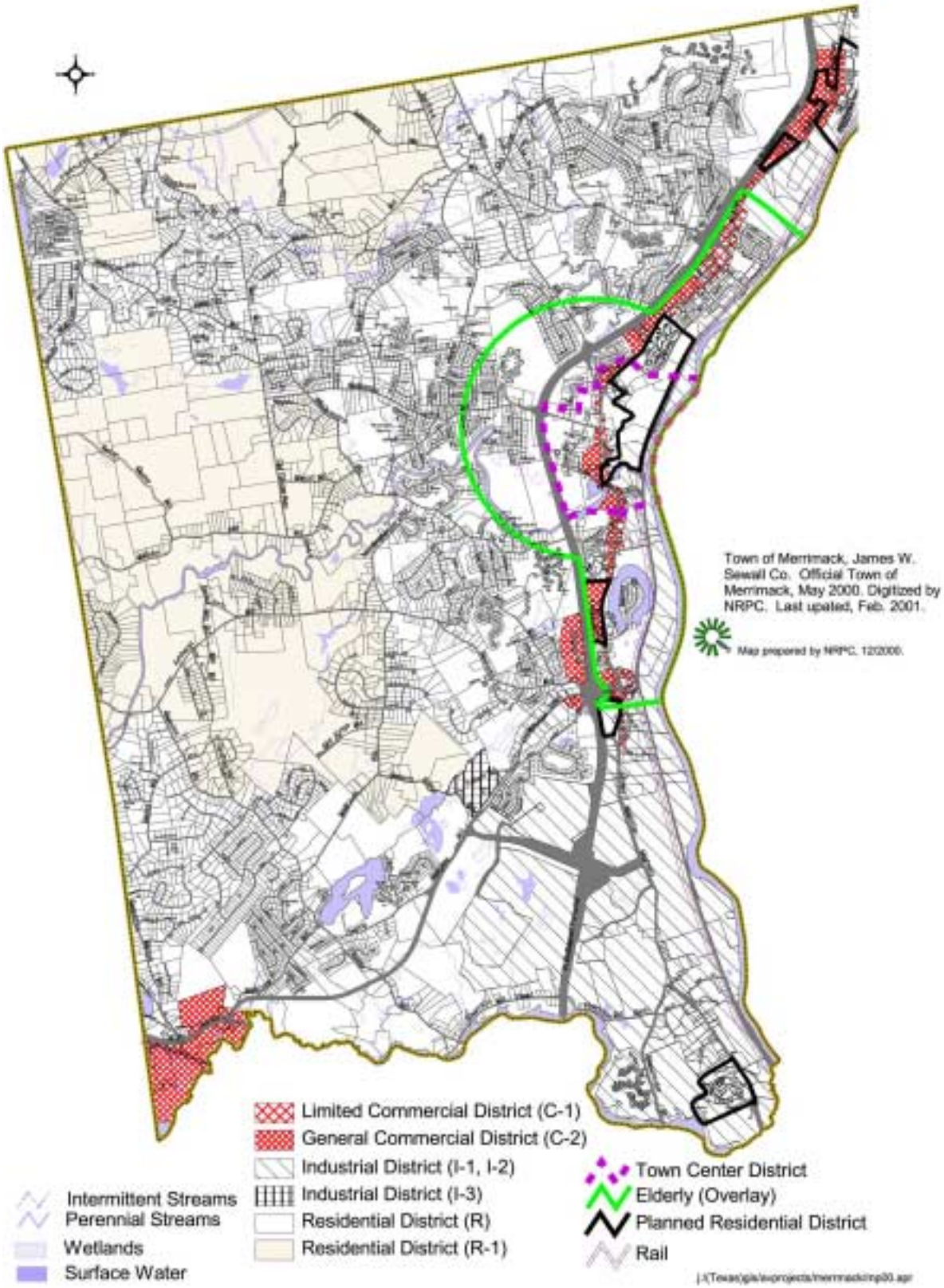
4. Planned Residential District (Overlay)

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, preserve open space, provide varied land uses and 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.

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 FE Everett Turnpike and within a two-mile radius east of the

Map III-3: Town of Merrimack Zoning Map (April 2001)



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.

6. Town Center District (Overlay)

The Town Center District is designed to implement the recommendations of the Town Center Plan (see Chapter X) 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.

CHAPTER IV
NATURAL RESOURCES

A. INTRODUCTION

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. Though 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 Town of Merrimack, located between the densely populated urban centers of Nashua and Manchester, has been one of the fastest growing towns in southern New Hampshire during the latter half of the 20th century, though the rate of growth has slowed considerably in recent years. Merrimack's population grew from 1,908 in 1950, to 25,119 in 2000, an increase of 1,317%. Most of this proportionate growth occurred in the 1960's and 1970's, though the Town is still growing in terms of population and developed area. As would be expected, this growth has resulted in the loss of many of the Town's open spaces and natural areas. The expansion of development and the ways in which development has occurred has also resulted in increased pollution of land, surface and ground waters. Significant improvements, however, have been made in recent years through stronger environmental regulations and improvements in treatment technology.

Merrimack still has a wealth of open spaces and natural resources worthy of protection and wise stewardship. As of 1999, approximately 41% (8,565 acres) of Merrimack's total area (21,412 acres / 33.5 square miles) remained undeveloped. As of 1993, approximately 65% 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 30 years ago. The Town has adopted aquifer protection zoning and a wellhead protection program to safeguard its primary sources of drinking water and cleanup plans have been implemented or are underway at some of the Town's most significant contamination sites. However, these recent successes are no cause for complacency, as unwise land-use decisions and uncontrolled development can easily undo the environmental gains obtained in recent years. This chapter includes the results of the town survey and SWOT analysis and a discussion of: 1) Topography; 2) Soils; 3) Forests; 4) Wildlife; 5) Rare and Endangered Species; 6) Existing and Potential Future Conservation Lands; 7) Water Resources; and 8) Recommendations.

B. TOWN SURVEY AND SWOT ANALYSIS

In 1998, the Board of Selectmen conducted a town-wide survey of Merrimack's residents, soliciting opinions on a wide range of topics from the town budget and the adequacy of town services, to the quality of the school system and the level of support for open space protection. When asked, "*If you are not a lifelong resident of Merrimack, what is the primary reason that you chose to locate in Merrimack rather than a neighboring town*?", the greatest number of respondents cited "*proximity to place of employment*", with the second highest response being "*attractive natural setting*", followed by "*location*". That "*attractive natural setting*" was the second

highest response out of the ten choices offered indicates that most residents strongly value the quality of life derived from living in a natural setting.

Later in the survey, residents were asked their opinion on several questions pertaining to open space preservation and the natural environment. When asked, "*Should the Town of Merrimack develop an open space preservation program*?", 88% of the respondents answered yes. 82% of the respondents answered yes to the question "*Should Merrimack dedicate the Current Use Tax for the purchase of important natural resources*?". When asked "*Is there enough open space in Merrimack*?" 54% of the respondents answered no. 77% of the respondents answered yes to the question "*Should Merrimack develop more conservation land, parks, trail systems or a nature center*?". As can be seen from these responses, the majority of Merrimack's citizens support efforts to preserve and increase the amount of open space and nature-based recreation opportunities available in Town.

This update to the 1993 Merrimack Master Plan is being coordinated and overseen by a Committee of Town residents, board members, and Town staff known as the Merrimack Master Plan Advisory Committee (hereafter known as the Committee). The Committee is working under the guidance of the Merrimack Planning Board, which is the official body authorized by statute to adopt the master plan. Early on in its deliberations, the Committee worked with a private planning consultant to develop a list of Strengths, Weaknesses, Opportunities, and Threats (SWOT) facing Merrimack in the future. The Committee also developed a preliminary list of recommended actions that can be taken to improve the quality of life in Merrimack. Several of the strengths, weaknesses, opportunities, and threats discussed by the Committee, as well as recommended actions, concern the state of Merrimack's natural environment and open spaces.

During the SWOT exercise, the Committee was divided into several groups, each developing their own list of strengths, weaknesses, opportunities, and threats facing Merrimack, as well as a list of recommended actions. Each group picked their top three items in each category, and these were then compiled into a composite listing representing the Committee as a whole. The results of the SWOT exercise that can be related to Natural Resources are shown below.

a) Strengths:
   1) Two rivers – Merrimack & Souhegan
   2) Rural character

b) Weaknesses:
   1) Pollution (surface water bacterial contamination & "EPA" issues)

c) Opportunities:
   1) Development of river / lake access
   2) Development / acquisition of public space
   3) Available land
   4) Expansion of Town parks, riverfront areas, and activities for all areas

d) Threats:
   1) Lack of land for community development
   2) Water supply
   3) Water situation (wells in other towns)

e) The Town should:
   1) Pursue land acquisition
   2) Protect, acquire, develop and purchase river and lakefront land
   3) Pursue State and Federal funding
   4) Define growth areas and regulate (i.e. residential, industrial, open space)

Based on the SWOT analyses described above and the results of the 1998 survey, the Master Plan Advisory Committee placed a priority on the protection of and access to surface waters, particularly the Merrimack and Souhegan Rivers; protecting the Town's (subsurface) water supply; and the retention of open space through land acquisition, particularly in relation to surface waters. To accomplish these objectives, the use of state and federal grants should be pursued where available. Through the course of the Master Plan process, an emphasis was also placed on the conservation of larger forest tracts, primarily for the purposes of retaining the rural character of portions of the Town, providing for open space, passive recreation and for wildlife habitat. The remainder of this chapter provides an overview of Merrimack's natural resource base followed by a series of recommendations for future initiatives and improvements.

C. TOPOGRAPHY

Topography can be described in terms of elevation and slope. Elevations range from several hills over 450 feet above mean sea level (aMSL) in western Merrimack north and south of the Souhegan River to less than 150 feet aMSL along the Merrimack River. One of the highest hills, reaching 502 feet aMSL, north of Greens Pond, is the location of one of the Merrimack Village District's 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 Map IV-1.

D. SOILS

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.

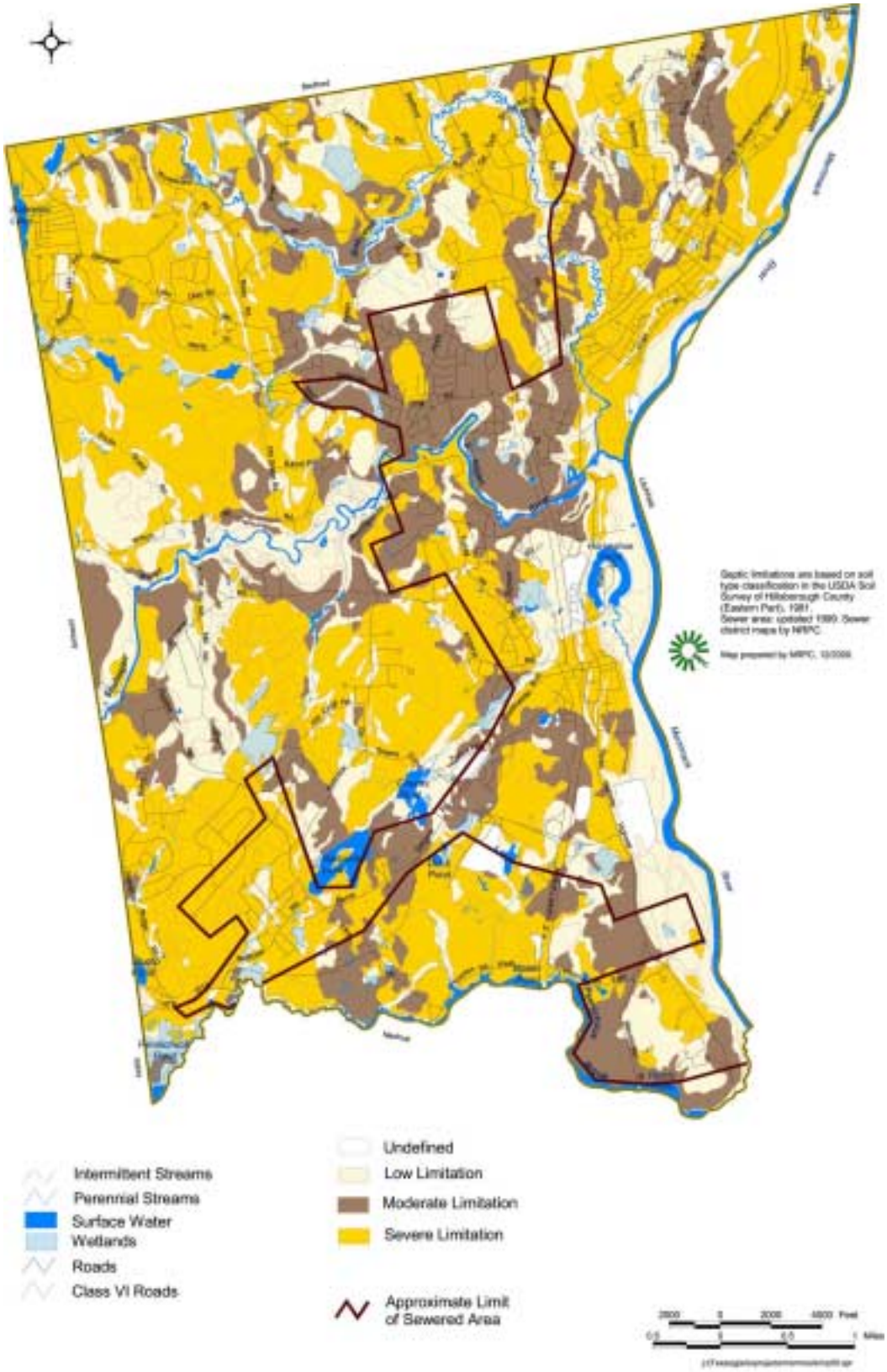
The US Department of Agriculture (USDA), Natural Resource Conservation Service (NRCS), completed a soils survey of Eastern Hillsborough County in 1972. This survey classifies and maps soil types and interprets their suitability for various purposes. The mapping was based on extensive field investigation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

Map IV–2 identifies soils in Merrimack by their ability to support septic systems. 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 northeastern 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. Appendix IV-B lists soils by their limitations to support septic systems.

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 SF, 80,000 SF or 100,000 SF, 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.

Map IV–1: Topography

Map IV–2: Soil Limitations for Septic Systems



2. Agricultural Soils

The US 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. Agriculture soils having national or statewide importance are listed in Appendix IV-C. The location of these soils is shown on Map IV-3. 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.

As seen on Map IV-3, 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 FEE 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. Areas of active agricultural use in Merrimack are identified in Chapter III, Existing Land Uses.

3. Construction Materials

The US 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 Map IV-3 are within developed areas of Town.

New Hampshire Revised Statutes Annotated, Chapter 155-E, Local Regulation of Excavations, requires that communities provide "reasonable opportunities for excavation" of some of the commercial earth resources within their borders. The statute further requires that municipal master plans summarize known sources of construction materials and the location and estimated extent of existing excavation sites. Existing excavations are addressed in Chapter III, Existing Land Use.

Merrimack permits excavation of topsoil and subsoil material in any part of Town. Excavation regulations adopted by the Planning Board in 1982 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.

E. FORESTS

1. 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. Among the common tree species found in Merrimack's forests are White Pine, White Oak, Red Oak, American Beech, White Birch, Black Birch, Sugar Maple, Red Maple and Eastern Hemlock.

Table IV-1 provides a summary of Merrimack forest facts derived from the study, "New Hampshire's Changing Landscape", produced by the Society for the Protection of New Hampshire Forests in 1999. The forest and habitat data provided in that report is derived from 1992–1993 Landsat satellite imagery, the most recently available data source on forest resources on a regional level.

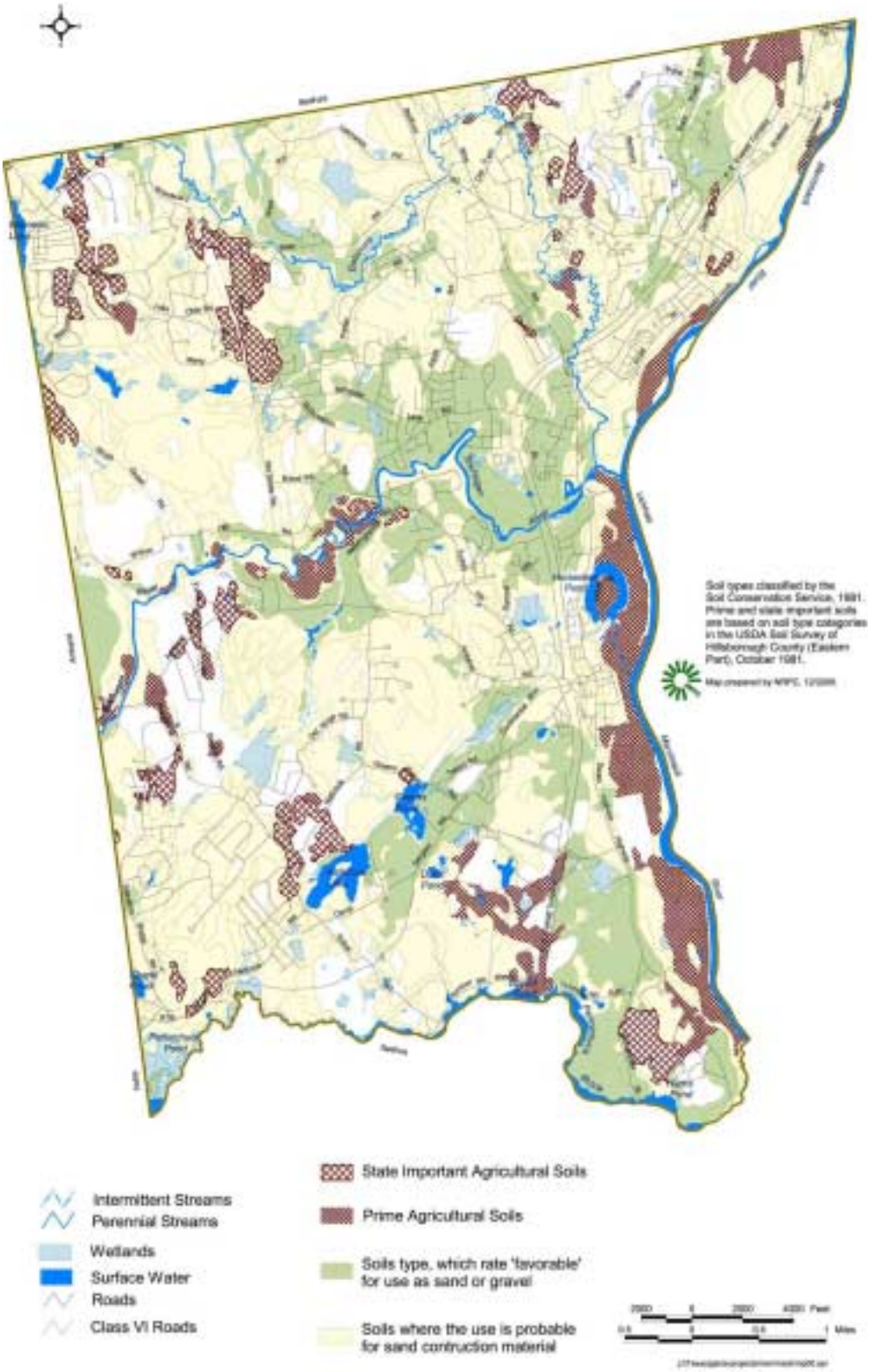
Table IV-1: Merrimack Forest Facts

Total Area of Merrimack in Acres	21,412
Area and Percentage in Forest (1993)	13,628 acres / 63.6% of Town
Total area in Forest Blocks > 500 acres	4,932 acres / 36% of forested area
Number of Forest Blocks > 500 acres	4
Average and Median Size of all Forest Blocks	125 acres average / 34 acre median
Percentage of Forest Blocks > 10 acres that are protected	11%
Predicted Decline in Forest Area by 2020	13 % or 1,786 acres
Predicted % Decline in Forest Block Size by 2020	19.5%

Source: New Hampshire's Changing Landscape, Society for the Protection of New Hampshire Forests, 1999, based on 1992-1993 landsat data.

Though nearly 64% of Merrimack was forested in 1993, most of these forested areas were in relatively small forest blocks with a median size of 34 acres. Only 11% of Merrimack's forest blocks greater than 10 acres are protected. Since 1993, significant areas of forestland have been developed, and by the year 2020 Merrimack's forest areas are predicted to decline by approximately 1,800 acres, or 13%. Most of this decline will likely be due to expanding residential, commercial, and industrial development. The average size of forest blocks is

Map IV–3: Agricultural and Sand and Gravel Soils



predicted to decline by nearly 20%. This has implications for forestry activities, open space and the quality of wildlife habitat that the remaining forests can provide.

2. 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. In its publication, "Natural Resources: An Inventory Guide for NH Communities", the University of New Hampshire Cooperative Extension Office provides the following discussion of the importance of large blocks of forest and habitat to the state's wildlife.

> *"Unfragmented open space blocks are undeveloped sections of the landscape with few or no roads. These unfragmented areas can include forested areas, open water, wetlands, and agricultural lands. These blocks are unrelated to ownership boundaries. Unfragmented lands have significance to wildlife habitat, as well as identifying large areas of open space.*
>
> *The size of these unfragmented blocks of land varies depending on the location. For example, in southeastern New Hampshire where there is a high level of development, an unbroken block in the hundreds of acres is significant. In northern New Hampshire, where there has been less development and there are large timberland areas, significant unfragmented blocks are much larger, in the thousands of acres.*
>
> *Unfragmented blocks often encompass many habitat types, supporting a diverse array of native wildlife. Large tracts with diverse habitats support wide-ranging animals that can't survive in small, less diverse habitat areas. Unfragmented areas that are largely forested are important for a number of wildlife species, and provide safe corridors and migratory pathways. Reducing the size of forest tracts affects many species, even if all other habitat features remain the same. Studies of North American birds have shown that large forest tracts support more species than comparable smaller tracts. Some neotropical migrant birds don't nest in isolated woodlands of less than 500 acres since smaller tracts are less likely to include essential microhabitats.*
>
> *Fragmentation of undisturbed habitats may also result in barriers for many terrestrial species. For example, roads are a source of mortality and a barrier to wildlife movement. The impact of roads varies according to their type and intensity of use. An unmaintained dirt road with infrequent traffic doesn't represent the same threat to wildlife that a busy highway does."*

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.

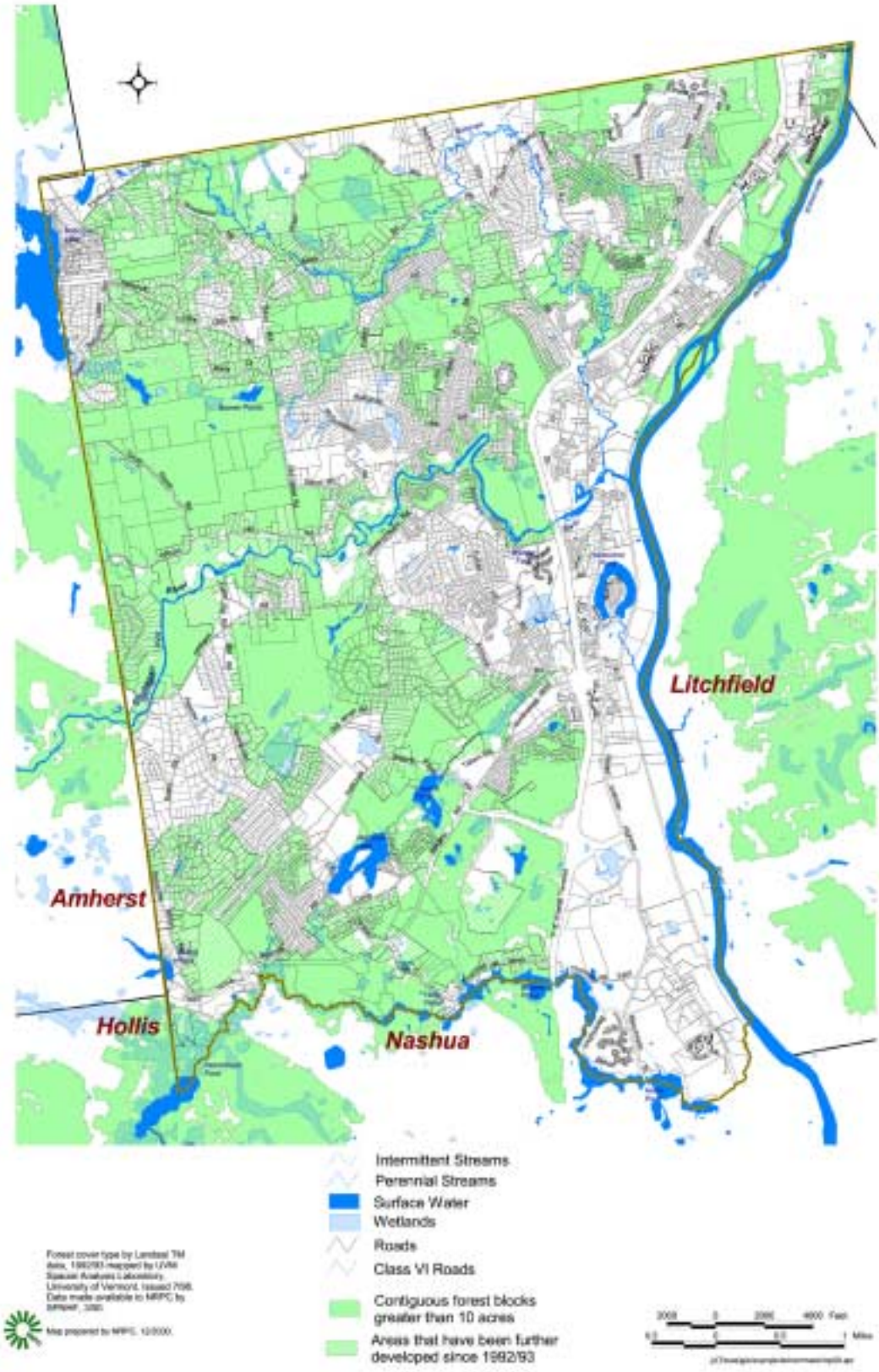
Merrimack's remaining large forest blocks were mapped in 1993 and are illustrated on Map IV-5. All of these forest blocks are located west of the FEE Turnpike. Since 1993, the forest blocks to the west and southwest of Naticook Lake and Greens Pond have been developed to a point where they no longer contain 500 acres of contiguous forestland. The approximate extent of land deforested since 1993 is shown in green hatching on the map. 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 large forest block north of Old Kings Highway and south of the Souhegan River consists of parcels recommended for protection through the Regional Environmental Planning Program (REPP). Recent development proposals on portions of this area indicate that this large forest block is likely to be developed in the near future if not protected.

The forest block that has the greatest long-term potential of remaining intact is located in northwestern Merrimack near the Amherst border. This forest block contains very hilly terrain with alternating steep slopes and wetlands, which makes large-scale development more difficult. Two parcels near the core of this forested area, totaling 191 acres, have recently been purchased by the Town and are managed by the Merrimack Conservation Commission. An adjacent undeveloped 64-acre parcel to the east is owned by the School District. Additional conservation land in Amherst abuts the area to the west. There are also several large privately owned parcels in current use abutting these lands. Since the core of this area is already protected, and much of the abutting land is in current use and has limited development potential, a strategy to protect at least one of Merrimack's remaining large forest areas can be said to have already begun.

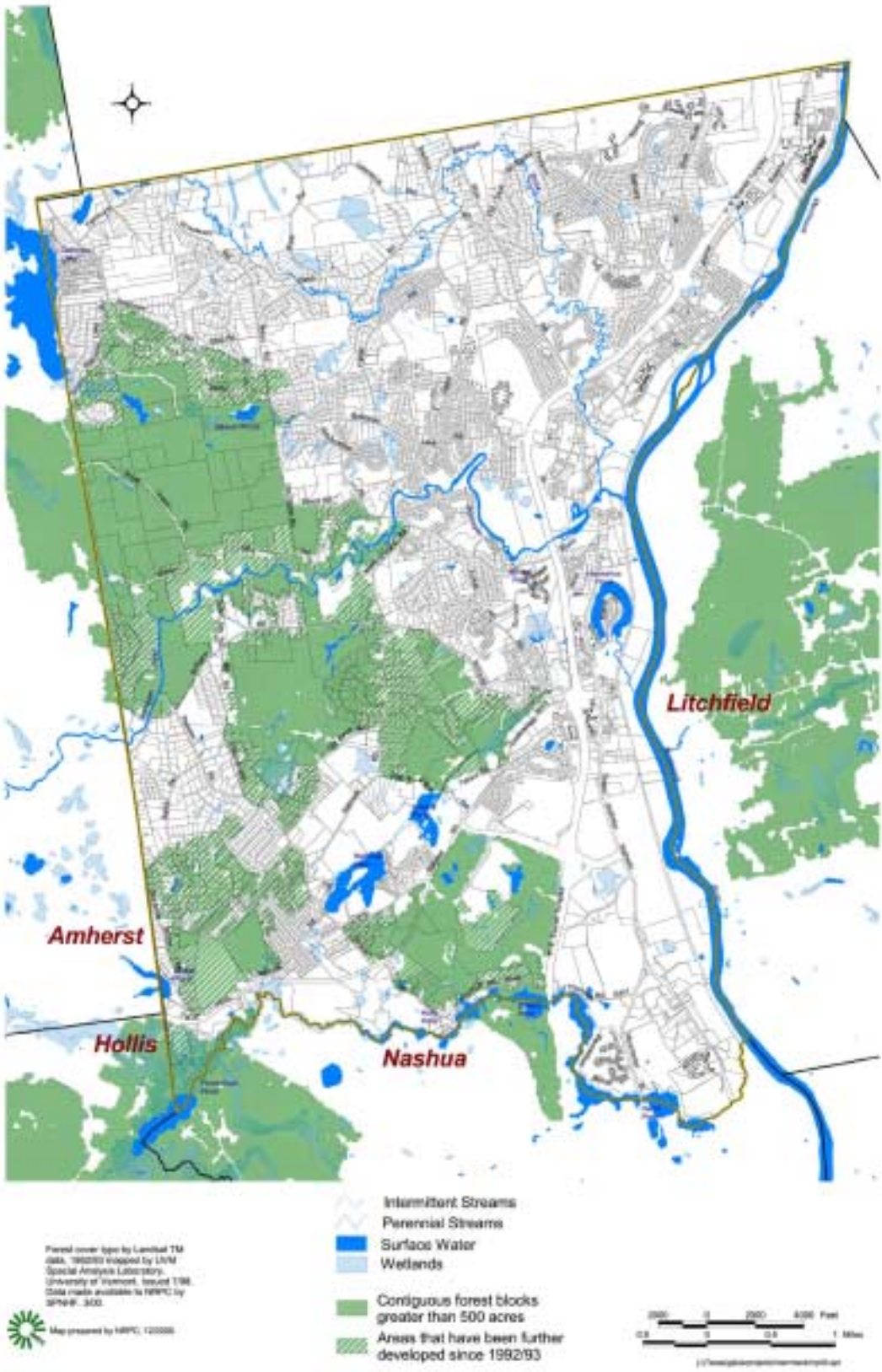
Though Merrimack cannot be expected to remain as forested as more rural towns in other parts of the state, it may be possible to conserve the two remaining large forest tracts described above through targeted land acquisition, private conservation efforts and land use regulation. Since both of these 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" developments 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.

Map IV-4: Forest Blocks Greater Than 10 Acres



Map IV-5: Forest Blocks Greater Than 500 Acres



F. WILDLIFE

1. 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.

In addition to the remaining large forest blocks, other important wildlife habitat areas include the woodland, wetlands and surface waters in and around the Naticook Basin. 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.

2. 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, preying on small livestock and domestic pets

The New Hampshire Department of Fish and Game, Region 4 Conservation Officer reports that moose have been sighted in Merrimack year-round, though he is not sure if there is presently a breeding population in Town. Areas where moose have been encountered include the White Pine Swamp, areas along the Souhegan River, Pennichuck Brook, and in the Grater property in northwestern Merrimack. In the three-year period from 1998-2000, there have been seven (7) automobile collisions with moose in Merrimack. Two of these have been near Exit 11 of the turnpike, two near Exit 12, one near the Hollis / Merrimack line on Route 101A, one on Baboosic Lake Road, and one at the intersection of Turkey Hill and McQuestion Roads. These statistics reflect the need for motorists to be cautious, especially at night and especially in the above mentioned areas where moose have been sighted or hit by cars.

The Conservation Officer reports that there is a large deer population in Merrimack. Though he did not provide statistics on deer road kills, he did report the number of deer taken by hunters in Town from 1998-2000. In 2000, hunters in Merrimack harvested 62 deer, with 75 and 60 harvested in 1999 and 1998 respectively. He reports that bear have been sighted in Merrimack in recent years, though none have been harvested or killed by cars. Bear sightings have tended to be in the Back River Road area.

The Merrimack Animal Control Officer reports that most calls concern loose dogs and domestic animals. He reports that in 2000 he received 103 calls, 20 of which involved dog bites, 4 concerned stray farm animals, and most concerned stray dogs. There were no reported cases of rabies in Merrimack in 2000. Though coyotes are present, he reports that they have not yet become an issue.

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.

G. RARE AND ENDANGERED SPECIES AND NATURAL COMMUNITIES

The New Hampshire Natural Heritage Inventory (NHI), an agency of the Department of Resources and Economic Development, tracks rare plants and animals and exemplary natural communities or "*assemblages of plants and animals ecologically related to one another and their physical*

environment" in the State. Using a ranking system developed by the Nature Conservancy, the NHI assesses the rarity of species on a global and statewide level. There are five (5) animal species on the most recent (January, 2000) NHI listing for Merrimack: Bald Eagle, Blanding's Turtle, Eastern Box Turtle, Spotted Turtle, and Banded Sunfish. (See Appendix IV-C.)

The bald eagle, the only federally threatened species in the region, is known to inhabit the Merrimack River corridor in the winter. The bald eagle's national status was recently upgraded from endangered to threatened, though it is still listed as endangered in the state of New Hampshire. The eagles perch during the day in large, open-branched trees on the riverbank and islands, which provide good viewing areas for locating food. During the evening the eagles move inland to more sheltered areas, usually conifer stands, that offer protection from the wind and harsh temperatures. 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.

The Audubon Society has identified the following areas in Merrimack as existing or potential eagle perch and roost sites: 1) just north of Reeds Ferry in Merrimack extending across the River into Litchfield and south to the two large islands in the Merrimack River; 2) near the confluence of Naticook Brook and the Merrimack River; 3) on the Anheuser-Busch property between the railroad and the Merrimack River; and 4) Pennichuck Brook from Route 3 to the Merrimack River.

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.

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 report 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 New Hampshire Natural Heritage Inventory (NHI) records indicate the presence of 17 plant species in Town that are critically endangered or threatened. A full listing of the plant species listed on the NHI is found in the appendix.

In addition, the NHI identifies six (6) exemplary natural communities in Merrimack: New England pitch pine-scrub oak barrens, southern New England floodplain forest, southern New England high-energy riverbank community, southern New England stream bottom forest, southern New England basin marsh, and southern New England basin swamp. With the

exception of the pitch pine-scrub oak barrens, most of these communities are likely to be associated with the Souhegan River, the Merrimack River, and wetlands in Town. Natural communities are "assemblages of plants and animals ecologically related to one another and their physical environment." These areas, identified by the dominant plants, vegetation structure, and major features of the physical environment represent intact examples of New Hampshire's native flora, fauna and vegetation. New England pitch pine-scrub oak barrens are found on sandy, glacial outwash soils. The infertile, droughty soils and regular fires were responsible for the characteristic open vegetation of the "barrens." Fire suppression results in succession to pitch pine forest. Few examples of this community remain along the Merrimack between Nashua and Concord. One basin swamp community in Merrimack, between NH Route 3 and the FEE Turnpike south of Exit 10, was documented by the Nature Conservancy in 1984. This basin is a small, closed kettle of about 3 acres and, at the time of survey, it was bordered by a pine barren remnant of about 10 acres. This area is now owned by the Merrimack Conservation Commission.

H. EXISTING AND POTENTIAL FUTURE CONSERVATION LANDS

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 Map IV-6, these parcels are widely distributed throughout Town. In addition to showing land owned by the Town that is managed for conservation purposes, Map IV-6 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, and
- Town owned land with no management responsibility determined
- Privately owned land in current use

As indicated on Map IV-6, 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 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.

Table IV-2: Significant Conservation Properties in Merrimack

Tax Map and Lot #	Common Name	Area in Acres	Comments
2D – 17	Mast Road	32.4	Mitigation Land
3B – 168	White Pine Swamp	35	
3B – 261	Wasserman Park (conservation portion)	87	Abuts Wasserman Park recreation area
3C – 73	Gilmore Hill Mem. Forest	25	
3D – 80	Technology Park	35.8	Wetland by industrial area
4B – 35	Riverside Park	27	Along Souhegan River
5A – 009	South Grater Road	96.8	Borders conservation land in Amherst
5A – 64	Off South Grater Road	94	Abuts above property
5C – 658	80 Acres	80	Along Souhegan River, includes Wildcat Falls
6B-224	Mitchell Woods	19.9	

Source: Merrimack Conservation Commission, November 2000.

The Merrimack Village District 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. Table IV-2 lists the most significant Town-owned conservation lands over 20 acres in size. A more complete listing of conservation properties, including privately owned land with conservation easements, is found in Table IV-3.

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 under Senate Bill 493 in 1999 "to determine the feasibility of a new public-private partnership to conserve New Hampshire's priority natural, cultural and historic resources." In 2000, Senate Bill 401 was presented in order to provide the LCHC with $3 million to begin a matching grant program for local land conservation efforts.

The Regional Environmental Planning Program (REPP) has been a response to these statewide conservation efforts. During Phase One of the program representatives of each of NRPC's member communities were provided a series of maps containing region-wide natural/cultural resource information, a base map of their own community, instructions, and a summary of municipal conservation goals. Information collected from communities has been digitized and compiled into a first phase report that includes a map showing the location and type of resource. During Phase Two, the communities were asked to further prioritize the resources identified in the first phase. Phase Two asks each community to identify their top five natural and cultural resource priorities. The goals of Senate Bill 401 and the LCHC are implemented by a program called the Land and Community Heritage Investment Program (LCHIP). The New Hampshire General Court created LCHIP in order to:

> *"…conserve and preserve this State's most important natural, cultural, and historical resources through the acquisition of lands, and cultural and historical resources, or interests therein, of local, regional, and statewide significance, in partnership with the State's municipalities and the private sector, for the primary purposes of protecting and ensuring the perpetual contribution of these resources to the State's economy, environment, and overall quality of life."*

LCHIP was designed to achieve this mandate by providing grants to eligible applicants. Applicants must provide at least a 50% match (at least half of which must be in cash) to be eligible for funding through the program. The first grant round for LCHIP funds will take place in the Spring of 2001. Communities will use the conservation priorities established through the REPP process to propose parcels and projects for grant funding through LCHIP.

The bill, as introduced, dedicated full funding of LCHIP at the $12 million level. The House Resources, Recreation, and Development Committee voted to amend the bill to $4 million for LCHIP in 2002. The amended bill does not include the real estate transfer tax as the dedicated funding source, but relies on the state's general fund after 2002.

The conservation priorities identified by the Merrimack Conservation Commission are outlined in Table IV- 3 and indicated on Map IV-6. The numbers used on Map IV-6 are shown in **bold** following the tax map and parcel numbers. The discussion begins with a description of the top five priority parcels as submitted for the REPP process, followed by a description of parcels along the Merrimack and Souhegan Rivers to consider for protection.

Table IV-3: Conservation Priorities

Number on Map IV-6	REPP I.D. Number *	Tax Map and Lot #	Size in Acres	Description
1	ME-1	3B / 259	46.5	Abuts Town Forest and Wasserman Park. 43 acres are in current use.
2	ME-2	3B / 164	391.3	Abuts Town-owned portion of White Pine Swamp. Large parcel of contiguous forest and habitat.
3	ME-3	3B / 260	50.3	Contains wetland areas that feed into Green Pond. Within the wellhead protection area of MVD wells.
4	ME-4	3C / 43	10.5	Adjacent to MVD-owned land, and is also within the wellhead protection area of MVD wells.
5	ME-5	3C / 44-1	16.4	Abuts Town Forest and also within the wellhead protection area of MVD wells.
6		3B / 201	26	Abuts parcels 2 and 3 above, and would provide buffer from residential development for these parcels.
7	M-1	6E-1 / 64	1.8	Small thin parcel located on the bank of the Merrimack River. Near parcels 14 below.
8	M-2	3D-1 / 3	30.8	A key shoreline parcel along the Merrimack River. Historically the Thornton's Ferry area.
9		5D-1 / 3	4.7	Located at the confluence of the Souhegan and Merrimack Rivers. Key parcel for trail network.
10		5D-4 / 78	8.6	Located at the confluence of the Souhegan and Merrimack Rivers. Key for greenway network.
11		5D-4 / 100	1	Small parcel along Souhegan River. Trail potential.
12		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.
13		6E / 6	7.9	This parcel would provide additional access to the Merrimack, with potential for trails & boat access.
14		6E / 8	0.8	This thin parcel could be a link in a potential Merrimack R. greenway / trail system.
		Total Acreage:	**619.7**	

3. Merrimack's Top Local Conservation Priorities

Merrimack's top five priority parcels for conservation are all located in the area northwest of Naticook Lake and Greens Pond. The top five parcels listed by tax map and lot number are: 3B / 259, 3B / 164, 3B / 260, 3C / 43, and 3C / 44-1 (on Map IV-6, numbers **1, 2, 3, 4 and 5**). Most of these parcels are located within the watershed of the Merrimack Village District (MVD). Their protection would help to safeguard the quantity and quality of the Town's primary drinking water supply. The area bounded by these parcels is also of high ecological significance. It forms the core of one of Merrimack's remaining forest blocks greater than 500 acres, and contains a variety of upland and wetland habitats. As a group, these parcels abut Wasserman Park and Conservation Commission-managed land, providing an opportunity to extend the existing trail network to these parcels. There is an additional 26-acre parcel, not submitted as part of the REPP process, which could form a buffer between developed areas to the west and this large area of potential conservation land. Acquisition of parcel 3B / 201 (**6**) would further contribute to the preservation of one of Merrimack's largest contiguous areas of forest land and wildlife habitat.

4. Merrimack River Parcels Proposed for Protection

Parcels 6E-1/64, 6E-6 and 6E-8 (on Map IV-6, numbers **7, 13, 14**) 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.

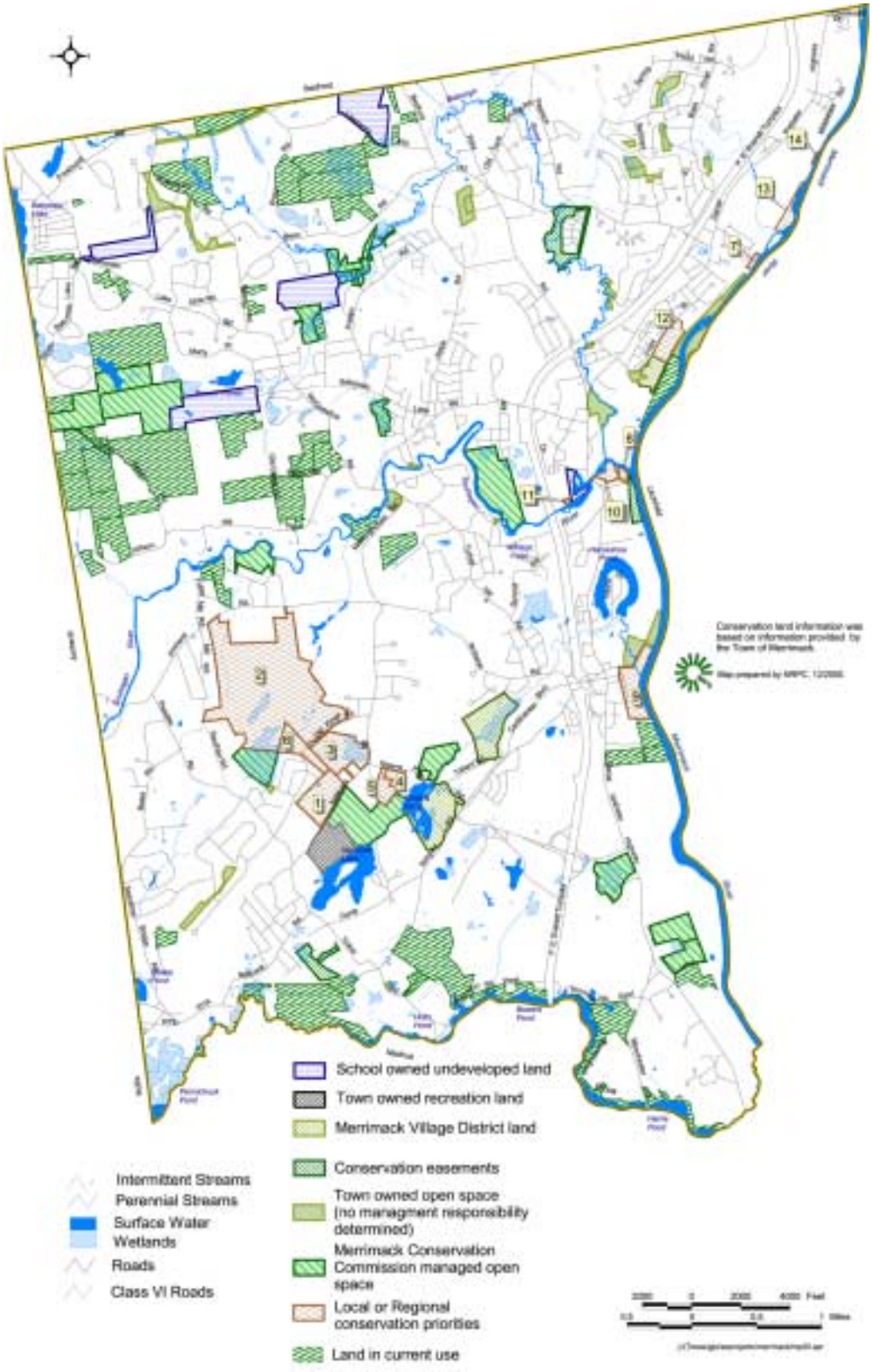
Parcel 3D-1/3 (**8**) is a key shoreline parcel in Merrimack. At nearly 31 acres, it is one of the largest undeveloped parcels located on the Merrimack River. The parcel is the site of Thornton's Ferry, an historic river crossing connecting Merrimack to Litchfield. This would also be an ideal site for a boat launch.

Parcel 5D-2/4 (**12**) 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. Souhegan River Greenway Parcels

Parcels 5D-1/3, 5D-4/78, and 5D-4/100 (**9, 10, 11**) are a group of parcels located along and near the confluence of the Souhegan and Merrimack Rivers. The purchase of parcel 5D-1/3 (**9**) 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.

Map IV–6: Existing and Recommended Conservation Lands



I. WATER RESOURCES

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.

Merrimack'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.

a. 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% of this area (3,810 square miles) in New Hampshire and the remainder in northeastern Massachusetts. According to the 1990 Census, approximately 1,920,000 people live in the 203 municipalities within the watershed, a 28% increase over the 1980 population. As with most large rivers, the Merrimack River has numerous subwatersheds. 52% of the total area of Merrimack is contained in three sub-watersheds plus Baboosic Brook (24.6%), Souhegan River (15.6%), and Pennichuck Brook (11.6%). Map IV-7 shows these watershed areas, as well as their associated floodplains. Table IV-4 below provides area statistics for each watershed.

Table IV-4: Watersheds in Merrimack

Watershed	Acres in Merrimack
Merrimack River primary watershed	6,092
Baboosic Lake watershed	864
Baboosic Brook watershed	5,560
Unnamed watershed 1	392
Souhegan River watershed	3,526
Naticook Brook watershed	2,374
Unnamed watershed 2	807
Pennichuck Brook watershed	2,629
Pointer Club Brook watershed	355
Total area:	**22,600 acres**

Source: NRPC as delineated on USGS quadrangle maps.

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, Bowers Pond, Greens Pond, Holts Pond, Horseshoe Pond, Harris Pond, Naticook Lake 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.

Characteristics of Merrimack's perennial streams are summarized in Table IV-5. 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.

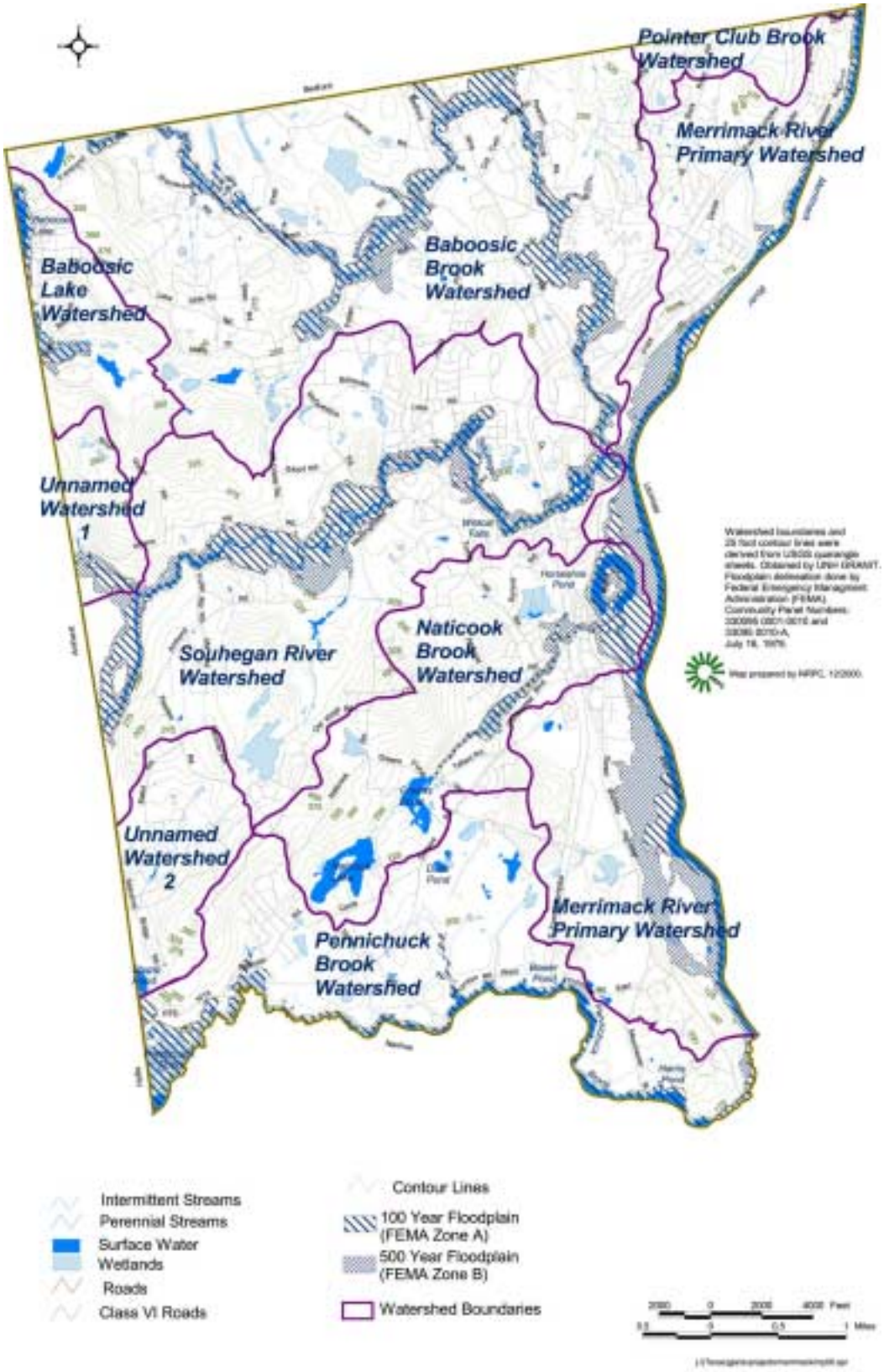
A detailed discussion of water quality issues facing Merrimack's rivers and streams is found in the "Threats to Surface and Groundwater Resources" section of this chapter.

Table IV-5: Perennial Streams In Merrimack

Name	Total Length (miles)	Length In Merrimack (miles)	Begin Elevation (aMSL)	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	18.1	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.

Map IV-7: Watersheds and Floodplains



b. Lakes and Ponds

Merrimack contains all or part of five (5) lakes and ponds. Table IV-6 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, however, which encourages weed and algal growth, which in turn speeds up the deposition of decaying vegetation as organic sediments on the lake's bottom.

Naticook Lake

Table IV-6: Lakes And Ponds In Merrimack

Name	Length (miles)	Area (acres)	Elev. (aMSL)	Avg. Depth (feet)	Max. Depth (feet)	Trophic Class "Year"	Trophic Class "Year"	Type
Baboosic Lake	4.3	222	231	16	26	Mesotrophic (1993)	Eutrophic (1998)	Natural
Naticook Lake	2.1	72	206	N / A	20	Mesotrophic (1979)	Mesotrophic (1989)	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: USGS Quadrangles. NHDES, Water Division.

Perhaps the most significant finding from the above table is the reclassification of Baboosic Lake from mesotrophic in 1993 to eutrophic in 1998. This is indicative of accelerated eutrophication due to increased nutrient loading as a result of increasing development in the watershed. Excess phosphorus is the nutrient most likely responsible for the recent 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 has decreased due to algal blooms feeding on the high concentrations of phosphorus. Comprehensive planning and site design requirements are needed to reduce impervious surfaces, erosion, and maximize stormwater systems. 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 (November 2000) 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 increased from 27 to 42 in the five-year period, while the chlorophyll-A content, an indicator of algae growth, increased fourfold from a value of 4 to a value of 16. The fact that these changes have occurred over a mere five years indicates that Baboosic Lake is increasingly at risk. None of the other lakes and ponds in Merrimack have experienced such drastic changes over such a short period of time.

In the ten-year period from 1979 to 1989, Naticook Lake's color scale increased from 10 to 21, while its chlorophyll-A content actually decreased, and its trophic class remained the same. 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 last tested in 1998, Greens Pond in 1997, and Horseshoe Pond in 1997, Naticook Lake was last tested in 1989, over 12 years ago. As evidenced by the data for Baboosic Lake, 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. It may be worthwhile for the Town to request that Naticook Lake be tested on a more regular basis, especially considering its value as a municipal recreational resource.

c. 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

White Pine Swamp

Conservation Service (NRCS); the Army Corps of Engineers and the Environmental Protection Agency) agreed in 1989 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. Wetland soils in Merrimack are shown on Map IV-8.

Wetlands in Merrimack represent 2,389 acres, or 11 percent, of the land area of the Town. 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. All of the wetlands along the Merrimack River are included in the 1987 Environmental Protection Agency, Region I *Priority Wetlands in New England*. This document identifies high quality wetlands or wetlands that are vulnerable to environmental degradation. The document lists the following resource values for the Merrimack River wetlands: waterfowl; fisheries; flood storage and protection; habitat for anadromous fish (i.e., those that ascend rivers from the sea for breeding); and identification by the US Fish and Wildlife Service as a key river in the Atlantic salmon restoration program.

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 leachfields, 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 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. The Merrimack Conservation Commission is considering performing a functional evaluation of the Town's wetlands, which may lead to designation of prime wetlands.

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. The 100-year floodplain in Merrimack includes approximately 1,600 acres or seven (7) percent of the Town. Significant floodplains border the Merrimack River and Horseshoe Pond, the Souhegan River, Baboosic Brook, and Naticook Brook below Greens Pond.

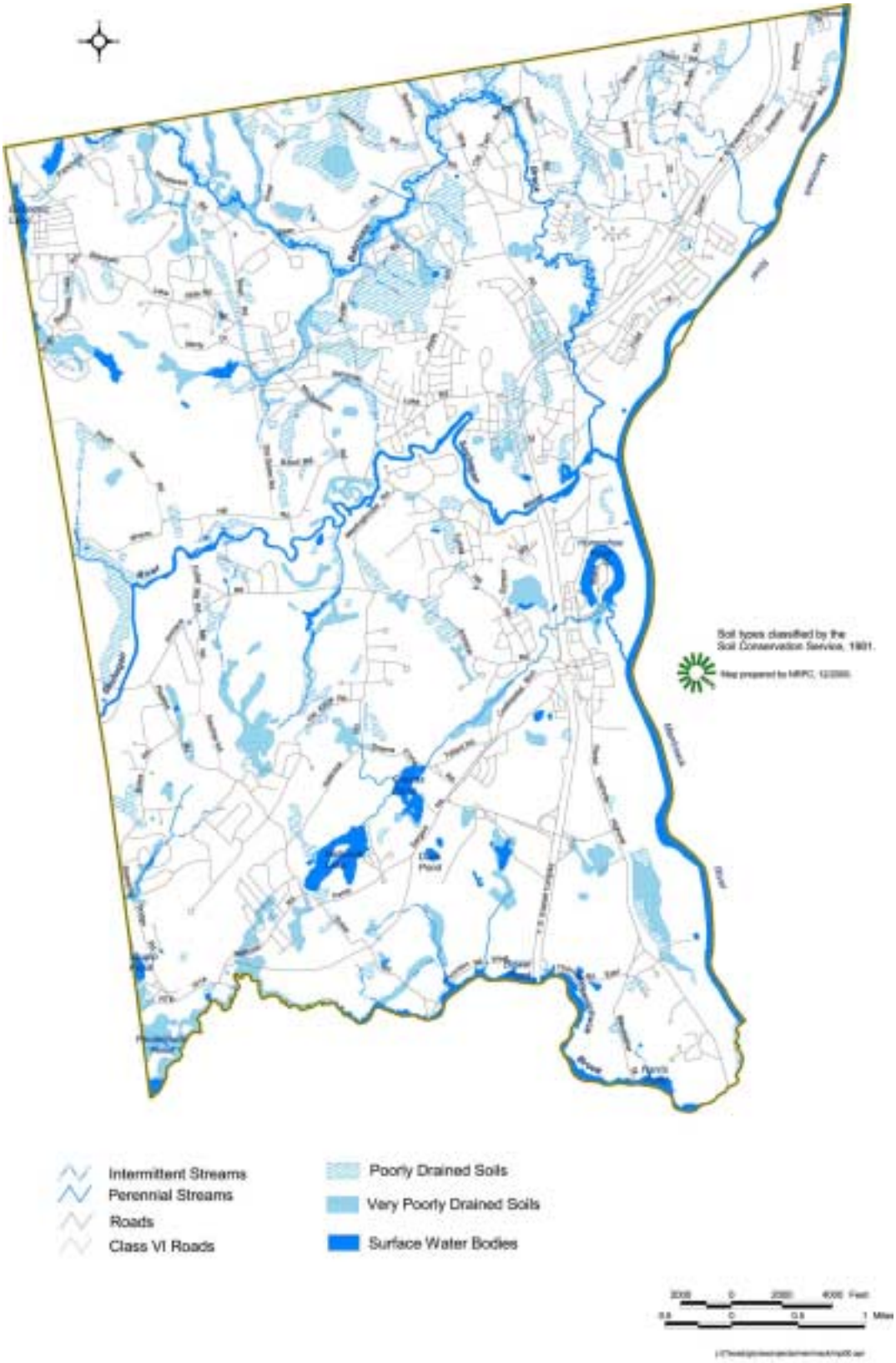
Merrimack's Flood Hazard Conservation District is an overlay district designed to minimize loss of life and property due to flooding. It prohibits fill or encroachments that would increase the base level of a flood as well as the removal of soil or other natural objects. The ordinance also contains 500-year 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 Map IV-7.

3. Groundwater Resources

Groundwater is a very important resource in Merrimack, as 70% of Merrimack's population obtains its drinking water from wells operated by the Merrimack Village District (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% of the Town. The location of these aquifers is shown on Map IV-9.

Merrimack has adopted an aquifer conservation (overlay) district designed to "protect, preserve and maintain the existing and potential groundwater supply and recharge areas within the known aquifer from adverse 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

Map IV–8: Wetland Soils

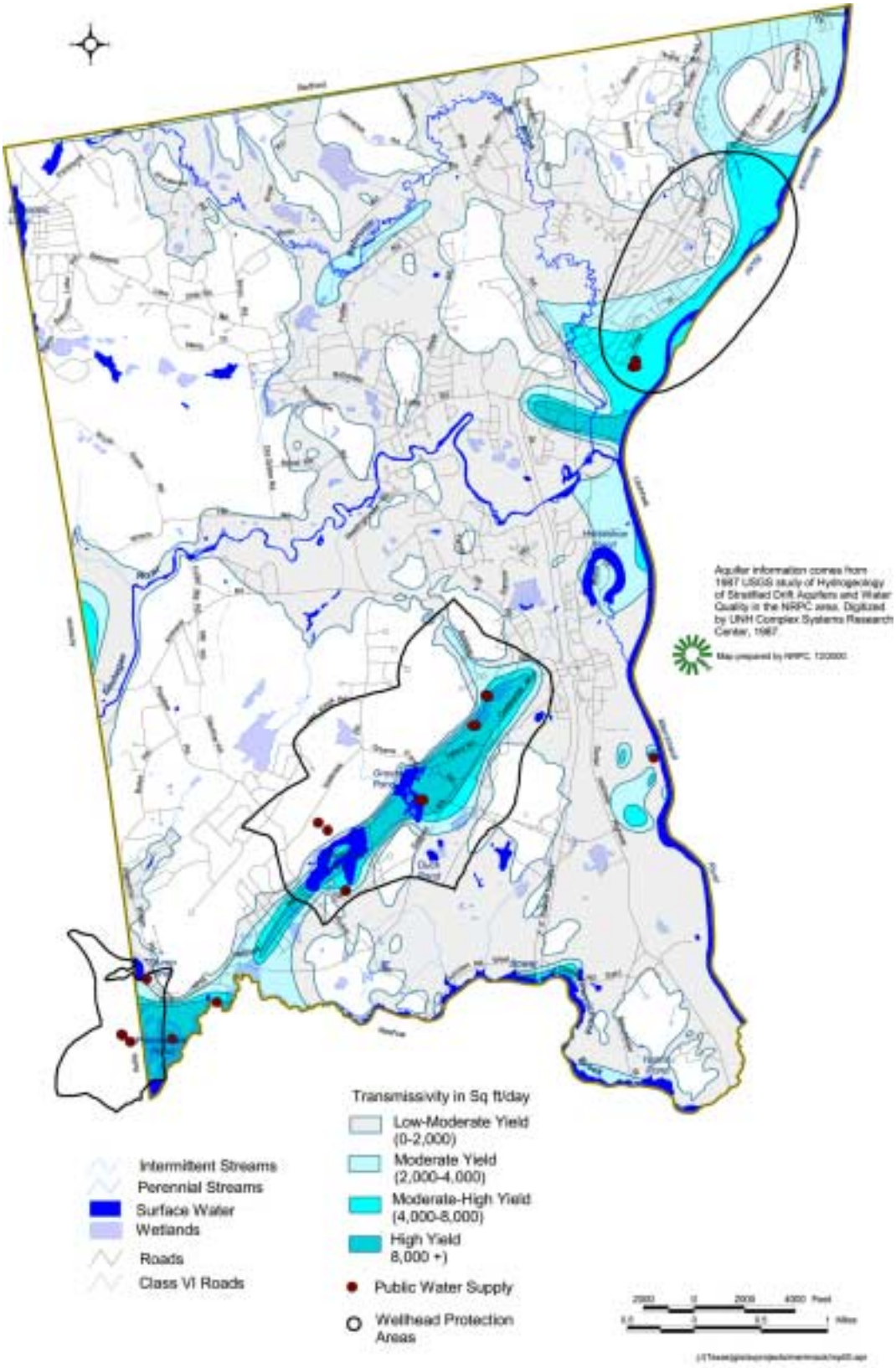


tanks and toxic materials administered by the Merrimack Fire Department and the State Department of Environmental Services.

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 ground water, and of the land overlying it, in one community may affect the quality and quantity of the ground water in other communities. The Nashua Regional Planning Commission examined intermunicipal ground water resources and focused on aquifers with the greatest potential to sustain high yield wells. The Intermunicipal Aquifer Study for the Nashua Regional Planning Commission Region, completed in September 1990, identifies "high-yield intermunicipal aquifers" as those stratified drift aquifers which: (1) cross a municipal boundary; (2) have a saturated thickness equal to or greater than 40 feet; and (3) have a transmissivity of 2,000 square feet per day or greater. Transmissivity is a measure of how readily water moves through stratified drift deposits; the higher the transmissivity, the greater the potential yield from a well placed in a given location.

Two areas in Merrimack are highlighted by the study. The "Souhegan River aquifer", underlies portions of Amherst, Milford, Hollis, Nashua and 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-Litchfield aquifer" is a deposit spanning the Merrimack River into the northern sections of both communities. In Merrimack, industrial and commercial land uses predominate over the aquifer. In Litchfield, much of the land over the aquifer is zoned for commercial uses, but development is limited by the absence of public sewer. The NRPC study identifies known groundwater contamination sites and potential contamination sources in the intermunicipal aquifer communities and summarizes land use regulations applicable to groundwater protection. The study concludes with recommendations for coordinating land use regulations and informing neighboring communities of proposed developments posing potential threats to groundwater resources. This relates to Merrimack in that a large portion of this intermunicipal aquifer is located in Merrimack, and, as groundwater does not recognize political boundaries, pollution in one town could end up affecting other towns.

Map IV-9: Stratified Drift Aquifers and Wellhead Protection Areas



a. 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. 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 operates seven (7) wells, 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. 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.

Until 1999, peak summer demand for water had been increasing rapidly. If the current rate of increase in peak demand were allowed to continue, the MVD reports that it will not be able to supply the Town with water when it approaches and reaches build-out. However, by limiting the allowable peak demand, the MVD believes it will be able to supply the Town with water through build-out without further expansions to the water supply system. Since there are no additional well sites within Merrimack's borders or in neighboring towns 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.

In recent years, it has been discovered that groundwater levels in the Naticook Brook aquifer have been declining, despite the fact that the MVD has not increased its pumping rates, and average precipitation has remained relatively steady over the period studied. Additional groundwater (in excess of 575 million gallons per year) cannot be withdrawn from the aquifer in a drought year. A water budget study recently discovered that approximately 150 million gallons per year are unaccounted for, based on slower groundwater recovery in the aquifer observed over the last ten years.

The MVD formed the Naticook Aquifer Advisory Ad Hoc Committee in 1999 to address these issues. The Committee investigated several possible causes for the slow recovery in groundwater levels:

- Export of water from the basin via the sewer system
- Export of water from the basin via storm drainage
- Industrial pumping of groundwater

- Increased losses from vegetative evapo-transpiration

The Committee soon ruled out evapo-transpiration as a possible cause, and concluded that the causes for the aquifer's slow recovery during drought years included stormwater losses due to imperviousness, industrial withdrawals and sewer export to downstream basins. To address these issues, the Committee developed a list of recommendations to prevent further 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.

The Committee found that outside irrigation of lawns, coupled with the increasing size of lawns in recent subdivisions, is a major factor in increases in demand. In its "Demand Management Strategy", the Committee reports that:

> "*One problem is that new developments typically remove all trees for sale, stockpile topsoil and sell a significant portion which leaves large tracts of land shadeless and with little topsoil, a recipe for high irrigation demand. This results in homeowners who are forced to have extensive lawn areas, whether they desire it or not. Because of the limited amount of topsoil left in most cases, typically an inch or less, the extensive areas of grass are also highly water, pesicide and fertilizer dependent. An attractive, low maintenance, low water/pesticide/ fertilizer lawn requires a good sub-base which is not available in most cases of existing subdivisions.*"

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 is also investigating the possibility that the odd/even watering restriction remain in place permanently.

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 12-15% 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

Another action that can be taken to address groundwater protection is the acquisition of land in the wellhead protection areas. As mentioned in the conservation priorities section of this chapter, two of Merrimack's highest priority parcels are located within the wellhead protection area of the wells in the Naticook Brook aquifer. Another priority parcel is located upgradient from two wells in northeastern Merrimack adjacent to the Merrimack River. Purchase of these parcels would help to protect Merrimack's vital groundwater supply.

Merrimack has recently developed two wells (7 and 8) in nearby Hollis to supplement the overall water supply and offset losses resulting from the closure of well 6, which was closed due to the discovery of volatile organic compounds (VOCs) in the vicinity of the well. This contamination plume was found to come from the former Merrimack Industrial Metals operation. Wells 7 and 8 are located in the Naticook Brook aquifer about one and a half miles southwest of wells 1, 2 and 3 near Naticook Lake and Greens Pond.

An aeration system is now being planned for well 6. MVD's consultants report that concentrations of VOCs in the aquifer are quite low and will be completely removed by the planned aeration. A separate pump and treat system at Merrimack Industrial Metals has created a hydraulic barrier between the groundwater at the Merrimack Industrial Metals site and well 6. The goal is to bring well 6 back on line, thereby increasing the amount of water available to Merrimack residents and helping to ensure MVD's ability to meet the water supply demands of a built-out Merrimack. A Groundwater Use Plan has been submitted to NHDES that would phase-in the use of well 6 over a four-year period.

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 judgement
- 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.

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:

a. Road Salt

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 Merrimack Village District 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.

The Town salt storage facility on Turkey Hill Road is a three-sided, roofed, dirt-floored structure. The State Department of Transportation, which maintains the FEE Turnpike, operates under a clear pavement policy. The State uses a completely enclosed salt storage structure near Exit 11 east of the FEE Turnpike.

Excessive salting of roads and improper salt storage create 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.

b. Subsurface Sanitary Waste Disposal

Septic system failures from improper design, installation, or maintenance allow nutrients, particularly nitrogen 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 meeting 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. Planning board records show that septic system replacements have increased from 36-37 annually in the late 1970s to over 50 per year since 1987 (1987, 60; 1988, 77; 1989, 50; 1990, 65; through April 1991, 22). 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.

c. 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 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. The first phase of this program, appropriately referred to as the "Phase 1 Stormwater Rules," regulated the municipal stormwater systems and discharges of medium and large municipalities (those with populations greater than 100,000).

d. Phase II Stormwater Rules

The Phase II rules, which go into effect in March of 2003, will focus on stormwater systems within the urbanized areas of municipalities with populations less than 100,000. In addition, the Phase II rules will also impact construction activities between 1 and 5 acres, whereas Phase 1 regulated construction activities of greater than 5 acres. In order to comply with Phase II requirements, regulated municipalities such as Merrimack must submit a Notice of Intent (NOI) by March 2003. This NOI must include a stormwater management plan that addresses the six minimum control measures required by the EPA.

The six minimum control measures are: 1) Public education and outreach; 2) Public participation and involvement; 3) Illicit discharge detection and elimination; 4) Construction site runoff control; 5) Post-construction runoff control; and 6) Pollution prevention and housekeeping.

The Phase II rules mention the "operator", who is the entity responsible for maintaining stormwater conveyances and drainage systems. Stormwater conveyances include anything that can carry water, including ditches and swales. In most communities, these activities fall under the purview of the Department of Public Works or Highway Department.

The stormwater management plan must be designed to reduce the discharge of pollutants to the maximum extent practicable to protect water quality and to satisfy the water quality requirements of the Clean Water Act. Though stormwater management plans must be submitted by March 2003, full implementation is required by 2008, giving communities 5 years in which to implement their plans.

The preparation of a stormwater management plan that addresses the 6 minimum controls will take time and the coordination of many in municipal government and the private sector. It may be advisable to establish a "Phase II Committee" to begin to address these matters well before the March 2003 plan deadline approaches.

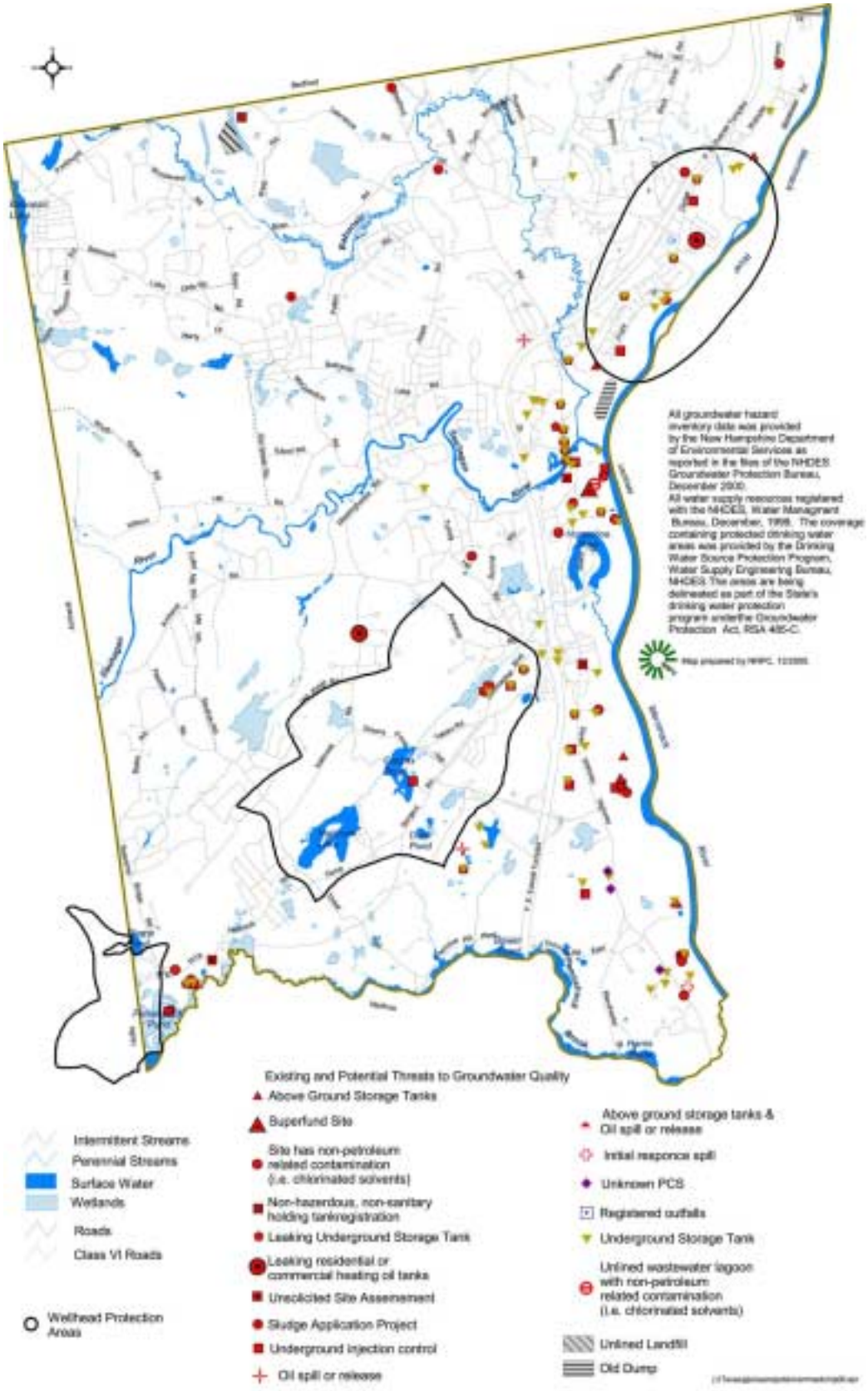
e. Underground Storage Tanks

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 2000, 96 USTs in Merrimack were registered with the NH Department of Environmental Services, Water Supply and Pollution Control Division. Abandoned tanks may exist along the Route 3, a major carrier of north-south traffic before the construction of the FEE Turnpike.

f. Waste Sites

Contaminants from waste disposal sites and sites contaminated by industrial activities can leach into surface and ground waters. The NHDES 1987 Waste Site Inventory identified the following waste sites in Merrimack: 1) municipal landfill; 2) four facilities regulated by the Resource Conservation and Recovery Act (New Hampshire Plating; 3) Jones Chemicals, Inc.; 4) Nashua Corp.; and 5) Harcross Chemical Co.); and three other sites 6) (Longa Disposal Area; 7) Hume Pipe Co.; and 8) New England Circuits). The Corbin Property, not listed in the Waste Site Inventory, was at one time a private dump, and sludge is known to be buried on site. In addition, the Merrimack Village District's Well Number 6 is currently closed due to the presence of volatile organic compounds in the vicinity. Information about many of these sites is limited. A summary of available information is contained in the Merrimack Water Resources Management and Protection Plan. Map IV-10 shows the location of actual and potential point and non-point pollution sources in Merrimack.

Map IV-10: Existing and Potential Threats to Groundwater Quality



J. CONCLUSIONS AND RECOMMENDATIONS

During the master planning process, an emphasis was placed on the management and protection of Merrimack's surface and groundwater resources, particularly to protecting the Town's major aquifers and to increasing access to and protection of the Souhegan and Merrimack Rivers. The preservation of forest and woodlands and open space generally has also been 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.

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. Equally important is the adoption of land use regulations and changes to existing regulations that would enhance protection of important natural resources. Where land acquisition or regulation is not practical or appropriate, alternate means of enhancing natural resource protection including public education and the encouragement of private conservation initiatives should be pursued. The recommendations provided below address each of these natural resource management and protection approaches.

1. Land Acquisition

The Master Plan Advisory Committee 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. For these reasons, a land acquisition strategy should be pursued that places the highest priority on the acquisition of lands that can, when managed for conservation purposes, accomplish the widest range of objectives. A recommended series of priority areas for acquisition are identified below:

- Undeveloped parcels within the large forest block generally located south of Amherst Road, west of Naticook Road and north of Peaslee Road. This area contains one of the largest remaining forest blocks in Merrimack. The area is partially located within the sensitive Naticook Basin and Wellhead Protection areas for MVD wells 1, 2 & 3. Town owned land abuts privately held undeveloped portions of the area. In addition, the area contains important wetlands including part of White Pine Swamp, scenic areas and remaining portions of the historic "Old Kings Highway". Extensive areas of undeveloped land and the prominence of Blodgett Hill help define the rural character of this portion of Merrimack. Further, the proximity of the forested land in this area to several existing residential neighborhoods enhances its recreational value. This area includes the top priority land acquisition parcels identified by the MCC during the 2000 REPP process.
- Undeveloped parcels within the large forest block in the vicinity of South Grader Road. This forest block has significant conservation potential because it is the

largest remaining in Merrimack. Approximately 190 acres of land in the area is currently under MCC management, it has a diverse landscape including large wetland areas and steep hillsides and the area abuts protected forestland in Amherst. In addition, due to numerous development constraints, the area has less immediate development potential than other forested areas of Town. This portion of Merrimack is extensively used for passive recreation and for hunting. Acquisitions in portions of this area could also serve to protect Baboosic Lake from potentially adverse development related impacts.

- Undeveloped lands along the Merrimack River. The Town currently owns approximately 50 acres of land on 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. Portions of Merrimack riverfront land were priority land acquisition parcels identified by the MCC during the 2000 REPP process.
- 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 former Boy Scout camp and land held as common open space as a part of residential cluster developments. The land adjacent to the Souhegan River varies considerably, including heavily wooded areas, wetlands, floodplain areas and open meadows that provide habitat for a diversity of wildlife. Much of the land was once farmed and a number of undeveloped lands are made up of prime agricultural soils.

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 provide a corridor that would help to prevent the fragmentation of important wildlife habitats while offering numerous recreational opportunities for hiking, canoeing, fishing and other recreational activities in the heart of Town. 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. Portions of this area near the Merrimack River were priority land acquisition parcels identified by the MCC during the 2000 REPP process.

2. Regulatory Initiatives

The following regulatory initiatives should be pursued by the Planning Board:

a. Stormwater Management

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 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, 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 groundwater. The principal tools the Town has to address the way in which land is developed with regard to stormwater management and road, driveway and parking lot design, are the Subdivision and Site Plan Regulations and the Zoning Ordinance. Therefore, these regulations should be reviewed and amended as necessary to:

- 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.
- 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.
- 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.
- Ensure adequate treatment of stormwater before it reaches surface and groundwater.
- Establish a “Phase II Stormwater Rules” Committee to develop the Stormwater Management Plan and Notice of Intent (NOI) required by the US EPA by March, 2003.
- Establish an inspection system to ensure continued operation of required stormwater management systems.

b. Open Space, Landscaping & Design

- Consider adopting a "Conservation Development Ordinance" or "Open Space 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.
- Amend 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.
- Amend 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
- Amend 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.
- Amend 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 overuse and contamination.

3. Non-Regulatory Initiatives

a. Open Space and Forest Conservation

- 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.

b. Water Resources Conservation and Protection

- 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.
- 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.
- The Town and the Merrimack Village District 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.

- The Merrimack Village District should investigate the effectiveness and feasibility of raising Greens Pond for enhancing storage in the Naticook Basin aquifer.
- The Town and the Merrimack Village District 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.

APPENDIX IV-A

Sources:

The following plans and technical studies were consulted in the development of this chapter:

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- Integrated Water Resource Management Plan, Pennichuck Water Works, 1998
- Merrimack Village District Master Plan Update, Comprehensive Environmental Inc., 2001
- Pennichuck Water Works, Watershed Management Plan, Comprehensive Environmental Inc., 1998
- Natural Resources: An Inventory Guide for NH Communities, UNH Cooperative Extension, 2000
- Phase II Stormwater Rule Summary and How Municipalities Can Prepare for Compliance; Comprehensive Environmental Inc., 2000
- Survey Lake Data Summary, New Hampshire Department of Environmental Services, Water Division, November 2000

This chapter of the Merrimack Master Plan update is intended to supplement, and not replace, the findings and recommendations of any earlier studies.

APPENDIX IV-B

Merrimack Soil Limitations to Septic Systems

Slight Limitations to Septic Systems

Symbol	Soil Name and Slope	
CaB	Canton fine sandy loam	0-8%

Moderate Limitations to Septic Systems

Symbol	Soil Name and Slope	
CaC	Canton fine sandy loam	8-15%
CmB	Canton stony fine sandy loam	3-8%
CmC	Canton stony fine sandy loam	8-15%

Severe Limitations to Septic Systems

Symbol	Soil Name and Slope	
AgA	Agawam fine sandy loam	0-3%
AgB	Agawam fine sandy loam	3-8%
BaA	Belgrade silt loam	0-3%
BaB	Belgrade silt loam	3-8%
CaD	Canton fine sandy loam	15-25%
CmD	Canton stony fine sandy loam	15-25%
CmE	Canton stony fine sandy loam	25-35%
CnC	Canton very stony fine sandy loam	8-15%
CnD	Canton very stony fine sandy loam	15-35%
CpB	Chatfield-Hollis-Canton complex	3-8%
CpC	Chatfield-Hollis-Canton complex	8-15%
CsB	Chatfield-Hollis complex	3-8%
CsC	Chatfield-Hollis complex	8-15%
CtD	Chatfield-Hollis-Rock outcrop complex	15-35%
DeA	Deerfield loamy fine sand	0-3%
DeB	Deerfield loamy fine sand	3-8%
Has	Hinckley loamy sand	0-3%
HsB	Hinckley loamy sand	3-8%
HsC	Hinckley loamy sand	8-15%
HsD	Hinckley loamy sand	15-35%
MoB	Montauk fine sandy loam	3-8%
NnA	Ninigret very fine sandy loam	0-3%
PbB	Paxton fine sandy loam	3-8%
PbC	Paxton fine sandy loam	8-15%
PfB	Paxton stony fine sandy loam	3-8%
PfC	Paxton stony fine sandy loam	8-15%
PfD	Paxton stony fine sandy loam	15-25%
PhB	Pennichuck channery fine sandy loam	3-8%
PhC	Pennichuck channery fine sandy loam	8-15%
PHd	Pennichuck channery fine sandy loam	15-25%
SsA	Scituate fine sandy loam	0-3%
SsB	Scituate fine sandy loam	3-8%
StA	Scituate stony fine sandy loam	0-3%
StB	Scituate stony fine sandy loam	3-8%
StC	Scituate stony fine sandy loam	8-15%
WdA	Windsor loamy sand	0-3%
WdB	Windsor loamy sand	3-8%
WdC	Windsor loamy sand	8-15%
WdD	Windsor loamy sand	15-35%
WoB	Woodbridge loam	3-8%
WvD	Woodbridge stony loam	3-8%

Source: Soil Survey of Hillsborough County, New Hampshire, Eastern Part, US Department of Agriculture, Soil Conservation Service, 1980.

APPENDIX IV-C
Important Agricultural Soils in Merrimack

Prime Farmlands

Symbol	Soil Name and Slope	
AgA	Agawam fine sandy loam	0-3%
AgB	Agawam fine sandy loam	3-8%
BaA	Belgrade silt loam	0-3%
HsD	Hinckley loamy sand	15-35%
NnB	Ninigret very fine sandy loam	3-8%
Oc	Occum fine sandy loam	
Om	Occum fine sandy loam	high bottom
PbB	Paxton fine sandy loam	3-8%
Pu	Pootatuck fine sandy loam	
WoB	Woodbridge loam	3-8%

Statewide Importance

Symbol	Soil Name and Slope	
CaB	Canton fine sandy loam	0-8%
CaC	Canton fine sandy loam	8-15%
PbC	Paxton fine sandy loam	8-15%
PhB	Pennichuck channery fine sandy loam	3-8%
PhC	Pennichuck channery fine sandy loam	8-15%
SsA	Scituate fine sandy loam	0-3%
SsB	Scituate fine sandy loam	3-8%

Source: Soil Survey of Hillsborough County, New Hampshire, Eastern Part, US Department of Agriculture, Soil Conservation Service, 1980.

APPENDIX IV-D

New Hampshire Natural Heritage Inventory
Rare Species and Exemplary Natural Communities List

		# Locations Listed in the Last 20 Years			
Flag	**Species or Community Name**	**Federal**	**State**	**Town**	**State**
	Natural Communities-Terrestrial				
**	New England Pitch Pine/Scrub Oak Barrens	-	-	1	16
*	SNE Floodplain Forest	-	-	2	47
**	SNE High-Energy Riverbank Community	-	-	1	7
**	SNE Stream Bottom Forest	-	-	3	7
	Natural Communities-Palustrine				
***	SNE Basin Marsh	-	-	2	8
**	SNE Basin Swamp	-	-	2	11
	Plants				
	Bald Spike-Rush (Eleocharis erythropoda)	-	-	Historical	3
**	Bird's-Foot Violet (Viola pedata var lineariloba)	-	T	1	12
*	Blunt-Leaved Milkweed (Asclepias amplexicaulis)	-	T	1	12
**	Burgrass (Cenchrus longispinus)	-	T	2	10
	Butterfly-Weed (Asclepias tuberosa)	-	E	Historical	7
	Goat's-Rue (Tephrosia virginiana)	-	E	Historical	6
	Low Bindweed (Convolvulus spithamaeus)	-	T	Historical	7
	Philadelphia Panic-Grass (Panicum philadelphicum)	-	E	Historical	8
	Siberian Chives (Allium schoenoprasum var sibiricum)	-	T	Historical	7
	Skydrop Aster (Aster patens var patens)	-	T	Historical	10
*	Small Bidens (Bidens discoidea)	-	E	1	9
	Smooth Bidens (Bidens laevis)	-	-	Historical	1
	Stiff Tick-Trefoil (Desmodium rigidum)	-	E	Historical	2
	Virginian Mt. Mint (Pycanthemum virginianum)	-	E	Historical	3
	Wild Garlic (Allium canadense)	-	E	Historical	5
	Wild Lupine (Lupinus perennis)	-	T	Historical	37
	Wild Senna (Cassia hebecarpa)	-	E	Historical	10
	Vertebrates – Birds				
**	Bald Eagle (Haliaeetus leucocephalus)	T	E	1	11
	Vertebrates – Reptiles				
**	Blanding's Turtle (Emydoidea blandingii)	-	-	1	57
**	Eastern Box Turtle (Terrapene carolina)	-	-	1	6
**	Spotted Turtle (Clemmys guttata)	-	-	1	37
	Vertebrates – Fish				
	Banded Sunfish (Enneacanthus obesus)	-	-	Historical	8

Listed Flags:

E = Endangered
T = Threatened
**** = Highest Importance
*** = Extremely High Importance
** = Very High Importance
* = High Importance

These flags are based on a combination of: (1) how rare the species or community is; and (2) how large or healthy its examples are in that town. Please contact Natural Heritage Inventory at (603) 271-3623 for more information.

CHAPTER V
TRANSPORTATION

A. INTRODUCTION

The purpose of the Transportation Chapter of the Master Plan is to develop strategies for an efficient and safe transportation system that will preserve the community's character and accommodate orderly growth. This chapter includes the results of the Town Survey and SWOT analysis and a discussion of: 1) the existing transportation network, including the historic context, roadway classifications, existing traffic volumes, highway capacity analysis, and the effect of the NH RSAs and local regulations; 2) future traffic projections; 3) an overview of existing plans and studies; 4) planned state and regional highway improvements; 5) transportation solutions; and 6) recommendations.

B. TOWN SURVEY AND SWOT ANALYSIS

To ensure that the Master Plan addresses the principal issues of concern to the community in relation to transportation, the results of the 1998 Board of Selectmen Town-wide survey and the Master Plan Advisory Committee's SWOT exercise (see Chapter I – Introduction) along with general Committee discussions, were relied upon to inform and guide the planning process. The results of the Town Survey in relation to Transportation are as follows:

- When asked, "…*what is the primary reason that you chose to locate in Merrimack rather than a neighboring town?*", "*proximity to place of employment*" received the highest ranking of any response, indicating that access to jobs is of importance to local residents.
- A majority of respondents with an opinion rated the Town summer and winter road maintenance as "good" or "excellent."
- A majority of respondents with an opinion supported the reconstruction of Pearson Road and Tinker Road (included in the Capital Improvements Plan FY 2002-2008 (CIP)).

The results of the SWOT exercise that can be related to Transportation are shown below.

a) Strengths:
   1) Good / desirable location (location to highways, airport, major cities)

b) Weaknesses:
   1) Tolls
   2) Traffic control – adequacy and liability

c) Opportunities:
   1) None in relation to Transportation

d) Threats:
   1) Route 3 expansion – more traffic in Town
   2) Heavy truck traffic

e) The Town should (in order of highest to lowest ranked):
   1) Finish exit 12 ramps
   2) Control Route 3 traffic and development
   3) Eliminate tolls
   4) Develop Front Street extension

As indicated in both the 1998 survey and the SWOT analysis, good access to the transportation system is one of Merrimack's most important assets, affording its residents with ready access to jobs, commerce, health care, recreational and cultural activities, and other offerings in differing portions of the state, region and beyond. In Chapter IX – Economic Development, the importance of the transportation system to Merrimack's economy is also emphasized. Maintaining and improving the existing transportation system, therefore, is a central component of planning for Merrimack's future.

Although it is clear that the transportation system is highly valued in Merrimack, issues such as the lack of a full interchange at Exit 12 and the ramp tolls at all three Turnpike exits have been identified as issues of concern. Not surprisingly, traffic on Route 3 (DW Highway) generally, along with truck traffic specifically, has been identified as a significant issue as well. During Committee discussions and from other forums, it has also been noted that increased traffic and vehicle speeds in various residential neighborhoods has become a growing concern. Each of the issues described above, within the context of a broader overview and discussion of transportation issues, are addressed within the chapter.

C. THE EXISTING TRANSPORTATION NETWORK

1. Historic Context

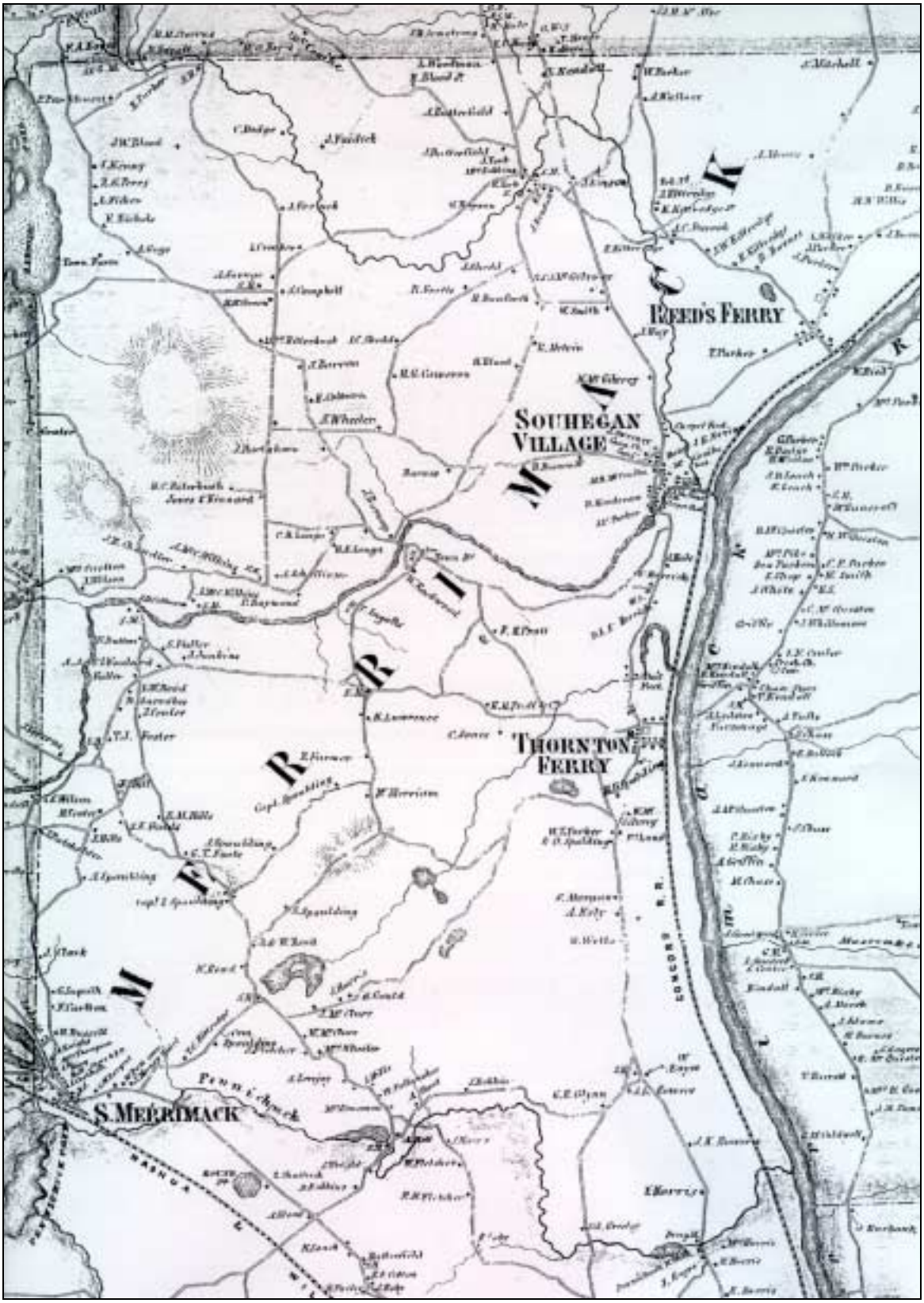
The Merrimack River was the region's first transportation corridor, bringing early settlers to Merrimack and surrounding communities. The river also served as the principal vehicle for transporting freight until extension of the rail system into the region in the mid 1900s. By the mid 18th Century, an early state and regional highway system began to develop alongside local roads for farm use. The early highway system, and its associated ferries, contributed greatly to the settlement patterns of the Town. Perhaps the most significant early highway was Route 3 (Daniel Webster, or DW Highway), running parallel to the Merrimack River. Route 3 connected Merrimack and communities to the north with Boston and the numerous towns and cities in between.

The Merrimack River, together with Route 3 and other east-west transportation corridors, became focal points for settlement in Merrimack. These early settlements included Thornton's Ferry, Reed's Ferry, Souhegan Village, and South Merrimack. Thornton's Ferry was developed at the ferry crossing to Litchfield were Amherst Road met the Merrimack River. Amherst Road (County Road) was an important east-west route in the 1700s since at that time, the Town of Amherst was the county seat. Another settlement related to an important

Merrimack River ferry crossing is Reeds Ferry in the northern section of Town. The early settlement of Souhegan Village, the current Town Center area, was located between Thornton's Ferry and Reeds Ferry where Route 3 crossed the Souhegan River, near the confluence of that river and the Merrimack. Although not developed along a waterway, South Merrimack, the Town's fourth historic village, developed around the intersection of Boston Post Road and Milford Road, two other important 18th Century highways.

During the mid 19th Century, rail lines were developed alongside the Merrimack River (between the River and Route 3) and in South Merrimack. Railroad stations were established by the late 1800's in all four Merrimack villages Currently, only the railroad station on Railroad Avenue in the Town Center area remains. The railroad still runs through Merrimack, but stops only at a handful of industrial sites. Map V-1 shows the Town roads and railroads as they were in 1858.

Map V-1: Town of Merrimack, 1858



The 1858 map depicts the transportation system and settlement patterns that had been established in Merrimack by the mid 19th Century. By 1800, most of Merrimack's present day road system had already been established. The map shows settlements at Thornton's Ferry, Reed's Ferry, South Merrimack, and at Souhegan Village. As can be seen on the map, the main line railroad ran north south through Thornton's Ferry, Reed's Ferry, and Souhegan Village. Important present day roads shown on the map include Route 3, Amherst Road, Baboosic Lake Road, Route 101A (Milford Road), Bedford Road, Joppa Road, McQuestion Road, Bean Road, Wire Road, Turkey Hill Road, Naticook Road and Boston Post Road.

During the 20th Century, Merrimack's road system had, of course, been adapted for auto use. Changing development patterns along with technology have transformed the function of many of the Town's older roads. An overview of the Town's existing street and highway system, in order of function, follows.

2. Roadway Classification

Based on the New Hampshire Department of Transportation's (NHDOT) 1998 road mileage inventory, there are 161 miles of roads in the Town of Merrimack. The State of New Hampshire classifies roads and highways by funding category (State-Aid Classification System, Classes I, II, III, IV, V, VI) and by an official functional classification (for federal funding purposes). The State-Aid classification system was developed by the State of New Hampshire, as defined by RSA 229–231, to determine responsibility for construction, reconstruction and maintenance as well as eligibility for use of state aid funds. Descriptions of the State Aid Classification system are included in Appendix V-A. The State-Aid classification road mileage in Merrimack is summarized in Table V-1.

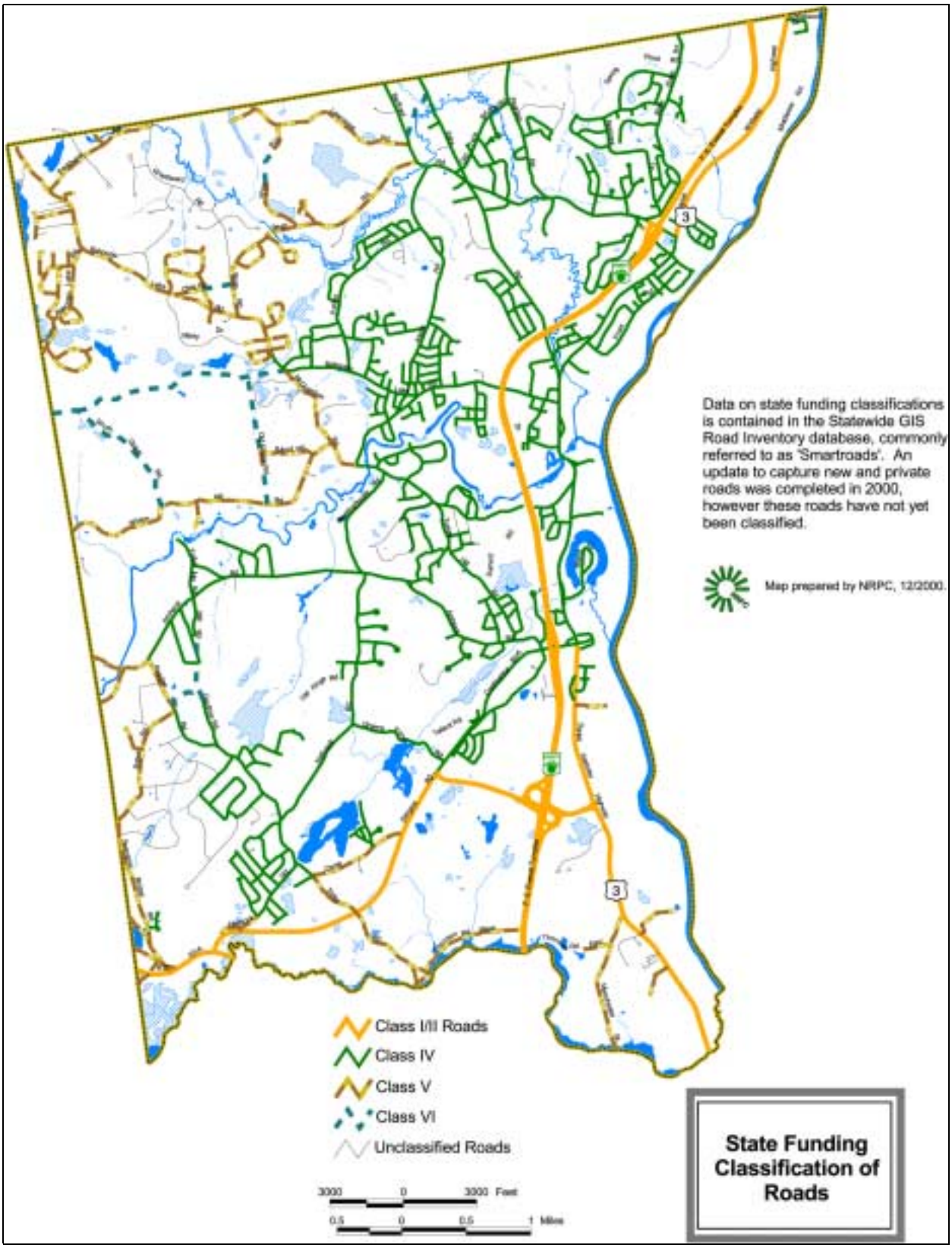
Table V-1: Town of Merrimack State Aid Classification Road Mileage

State Class	Road Mileage	Percent of Total
Class I Primary State Highway	22.786	14.1 %
Class II Secondary State Hwy.	2.279	1.7 %
Class III Recreation Roads	0.000	0.0 %
Class IV Compact Section	98.091	60.7 %
Class V Rural Roads Local	32.257	19.9 %
Class VI Un-maintained	6.072	3.6 %
Total	**161.485**	**100.0 %**

Source: NHDOT.

Map V-2, on the following page, depicts the State-Aid classification system in Merrimack. As can be seen on the map, the majority of roads in the Town are classified as either Class IV or Class V. The FEE Turnpike, Route 101A, Continental Boulevard, Industrial drive, and Daniel Webster Highway make up the Class I and II road mileage (Daniel Webster Highway is classified as Class IV through the Town center within the urban compact). Map V-2 also shows Class VI roads. These roads are public right-of-ways but are not maintained. They cannot be used as frontage for development unless improved to Class V. These roads can potentially be used for increasing the amount of hiking and biking trails in the Town.

Map V- 2: State-Aid Classification of Merrimack's Roads



The New Hampshire Department of Transportation (NH DOT) sets the functional classification of roads in New Hampshire in cooperation with the Federal Highway Administration (FHWA). These functional classes were set according to the criteria defined by the American Association of State Highway and Transportation Officials (AASHTO). This scheme classifies roads and highways into different categories according to their functions. The functional classifications were developed to define eligibility for funds under federal programs. Descriptions of the functional classification system characteristics are included in Appendix V-A.

The Town of Merrimack has also developed its own functional classification system using the criteria for functional class set by AASHTO standards. The federal and state government also utilized AASHTO standards, but the Town's functional class scheme is different 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 Town's functional classification scheme and the State's official functional class for Merrimack roads are shown in Table V-2.

Table V-2: Functional Class of Merrimack's Roads

Town of Merrimack Classification	State of New Hampshire Official Functional Class for Merrimack
Major Arterial:	**Principal Arterial:**
FEE Turnpike	FEE Turnpike
Continental Boulevard	Route 101A
Greeley Street	Route 3, from Nashua to ¼ mile S. of Star Blvd.
Industrial Drive	
Route 101A	
Route 3 Daniel Webster Highway	
Minor Arterial:	**Minor Arterial:**
Amherst Road	Continental Boulevard
Baboosic Lake Road	Industrial Drive
Bedford Road east of Wire Rd.	Tinker Rd. from Cont. Blvd. to Nashua
Boston Post Rd.	Route 3, from ¼ mile S. of Star Blvd to Bedford
Camp Sargent Rd.	
McQuestion Rd.	
Naticook Rd.	
Collector Road:	**Collector Road:**
Back River Rd.	Naticook Rd. from Cont. B. to Peaslee
Bean Rd.	Tinker Rd. from Camp S. to Cont. B.
Bedford Rd. west of Wire Rd.	Peaslee Road
Joppa Rd.	Camp S. Rd. from Peaslee to Tinker
Manchester St.	Boston Post Rd.
Meetinghouse Rd.	Back River Rd.
Patten Rd.	Bedford Rd.
Pearson Rd.	Joppa Rd.
Seaverns Bridge Rd.	Amherst Rd.
Tinker Rd.	Baboosic Lake Rd.
Turkey Hill Rd.	South Baboosic Lk. Rd.
Wilson Hill Rd.	McQuestion Rd.
Wire Road	Turkey Hill Rd from McQuestion to Amherst Rd.
	Stuart Dr.
All other roads are local Roads	**All other roads are local Roads**

Source: NHDOT and Town of Merrimack Subdivision Regulations.

3. Existing Streets and Highways

The following section provides a description of several of the most prominent streets and highways in Merrimack. Additional information on traffic volumes and an analysis of traffic congestion follows.

a. FEE Turnpike

The NHDOT first began recording the traffic volumes in 1956 at the Bedford tollbooths. The traffic at that location in 1956 was 3,149 vehicles per day. A permanent count station on the FEE Turnpike operated by the New Hampshire Department of Transportation showed an annual rate of increase of 3.9% per year between 1995 and 1999. The traffic increased from 42,000 vehicles per day (vpd) in 1995 to 49,000 vpd in 1999, making it the most heavily traveled highway in the region.

The FEE Turnpike provides the Town with two full interchanges at Exits 10 and 11, in the south and central portions of Town respectively, and a partial interchange (on and off southbound only) at Exit 12 in the north. Ramp tolls are collected from northbound vehicles on the Turnpike entering all three exits and from all southbound vehicles entering the Turnpike at all three exits. Northbound vehicles entering the Turnpike at Exits 10 and 11 do not pay a ramp toll due to the location of the main line tollbooth on the Turnpike near the Bedford Town line.

The Turnpike extends along the entire eastern side of Merrimack, parallel to the Merrimack River, Route 3, and the B&M Railroad line, running alongside three of the Town's original villages. Its exits, especially Exits 10 and 11, have become major centers of commercial and industrial activity, providing employment and business opportunities for the surrounding region. In addition to commercial and industrial activity, the development of the Turnpike also resulted in increased residential development in Merrimack by providing access to employment in other communities for thousands of commuters. Indeed, the role of the Turnpike as a trigger for the unprecedented growth in Merrimack in the later half of the 20th Century cannot be overstated.

b. Route 3 (Daniel Webster Highway)

US Route 3 (Daniel Webster Highway) is the original north south route through Merrimack, having served as the Town's principal arterial highway for over 250 years. Route 3 runs for 11 miles through the Town from the Nashua line to Bedford, situated between the FE Everett Turnpike and the Merrimack River. The highway serves as the Town's principal commercial and industrial corridor, while also providing access to most of Merrimack's higher-density multi-family housing, and to the public uses and institutions of its Town Center.

As more fully described in a subsequent section of this chapter, Route 3 is currently under both state and local jurisdiction. The portion of the highway south of Greeley Street, where most of the Town's larger industries are located, is maintained by the State. This portion of the road was widened to provide a typical five-lane section in the

1980s for most of its length. Carrying an average daily traffic volume of 17,154 to 18,789 vehicle trips per day (1998 counts), this portion of the highway is relatively free flowing. Signalized intersections are provided at Harris Pond (a shopping center and condominium complex near Nashua), at Industrial Drive in the vicinity of FE Everett Turnpike Exit 10, and at Greeley Street near FE Everett Turnpike Exit 11. Sidewalks are located sporadically along portions of both sides of the road, however, no crosswalks are provided.

North of Greeley Street, the Town maintained or "urban compact" portion of the highway begins. This portion of the highway, accounting for roughly half of the total road length in Merrimack, is typically comprised of two moving lanes with turn lanes provided at certain intersections and commercial site entrances. With over 20,000 average vehicle trips per day and only two moving lanes, the Town maintained portion of Route 3 is the most congested road segment in Merrimack. This section of the highway runs from the old Thornton's Ferry area at Greeley Street, through the Town Center area (formerly Souhegan Village) and the Reeds Ferry neighborhood. The road section includes most of Merrimack's commercial areas including five existing shopping centers, several multi-family housing complexes; various public and semi-public institutions and a number of residential neighborhoods located on intersecting and parallel streets. In addition to Greeley Street, six signalized intersections are found along the urban compact section of Route 3. Sidewalks are limited to portions of the roadway within the Town Center area. Signalized pedestrian crosswalks are located at the intersection of Baboosic Lake Road and at the intersection with Front Street. Marked, but unsignalized crosswalks at found at Twin Bridges Park and Connell's Shopping Center.

The Town maintained section of Route 3 ends at Bedford Road (near FE Everett Turnpike Exit 12) in the Reeds Ferry area. The northern portion of Route 3 is also comprised primarily of two moving lanes, but is less congested than the urban compact area. North of Bedford Road, average daily traffic levels drop to just over 13,000 vehicle trips per day. Commercial, industrial and residential development is also located in this portion of the corridor, but substantial areas of undeveloped land remain in the area. There are two signalized intersections north of Bedford Road and very few areas with sidewalks.

The Route 3 corridor did not experience significant traffic growth in the 1990's. The traffic count location on Route 3 at the Nashua City line showed a negative 0.7% annual rate of change between 1992 and 1998. The count location on Route 3 just south of Greeley Street showed a negative 2.4% annual rate of change between 1990 and 1998. The count location on Route 3 south of the Souhegan River, however, showed an annual rate of increase of 0.6%. Despite moderate rates of traffic growth in recent years, Route 3 remains the Town's principal traffic concern.

c. NH 101A

NH 101A is an important east-west regional arterial, although it runs through only a small portion of the southwest corner of Town. 101A connects to NH 101 in Milford, which is an important east-west highway in southern New Hampshire linking the eastern seacoast region to the City of Keene and beyond to Brattleboro, Vermont. 101A also provides a link to FE Everett Turnpike Exit 7 for communities to the west and to downtown Nashua. 101A has undergone significant changes and improvements over the past three decades. The corridor was widened from a two-lane facility to a four and five lane facility between Nashua and Milford in the 1970's and 1980's. The highway contains among the most significant concentrations of commercial and industrial development in the Region from the Turnpike in Nashua through southwestern Merrimack, Amherst and Hollis to 101 in Milford. With an average vehicle count of 37,313 trips per day at the Nashua Town line, 101A carries the second highest volume of traffic in the region.

Naticook Road, Continental Boulevard, and Seaverns Bridge Road (via Boston Post Road) provide important connections to NH 101A in Merrimack. Traffic on NH 101A has been increasing steadily in the 1990's due to commercial and industrial development along the corridor. The count location on NH 101A at the Hollis Town Line showed an annual rate of increase of 2.6% between 1990 and 1997 (from 25,446 vpd to 31,170 vpd). The NH 101A count location at the Nashua City Line showed an annual rate of increase of 1.5% (from 34,164 vpd to 37,313 vpd between 1992 and 1998). This corridor is among the most congested in the region, containing a total of 29 traffic signals.

d. Continental Boulevard

The present day Continental Boulevard is a combination of three older sections of road linked by state funded highway improvement known as the Camp Sargent Road By-Pass. The road runs between NH 101A in the southwestern corner of Town to FE Everett Turnpike Exit 11 in the eastern –central area of Merrimack. An approximately quarter mile section of Greeley Street connects Continental Boulevard to Route 3, allowing this major arterial road to serve as a key link between 101A, the Turnpike and Route 3.

Continental Boulevard was initially developed in the 1970s as a relatively small road designed to provide access to industrial development sites near Exit 11. The road ran from the intersections of Camp Sargent and Amherst Roads at Exit 11, looping back down to reconnect with Camp Sargent Road to the southwest. Over the years, increasing traffic on a route that included the southwestern portion of Naticook Road, Camp Sargent Road and Continental Boulevard became a growing concern. To solve the problem, the Camp Sargent Road By-Pass was conceived. That highway improvement involved a new section of road to link Camp Sargent Road just south of the existing Continental Boulevard to the southwestern most section of Naticook Road near 101A along with improvements to portions of all three existing roads. The portion of Camp Sargent Road By Pass southwest of Industrial Drive was developed as a limited access highway with intersections (all signalized) limited to Industrial Drive, Contra Way (an entrance to Fidelity) Camp Sargent Road, Tinker Road and finally 101A. Soon

after its completion in 1994, the state legislature renamed the By Pass "Continental Boulevard" at the request of the Town so that the entire route between 101A and Exit 11 would fall under the same name.

With the exception of the 101A intersection, Continental Boulevard is relatively free flowing, carrying just over 15,000 average vehicles per day (vpd) at 101A, to 11,557 vpd north of Camp Sargent Road. Traffic counts on Continental Boulevard north of Camp Sargent Road showed an annual growth rate of 6.0% per year from 8,149 vpd in 1992 to 11,557 vpd in 1998. Continental Boulevard just north of NH 101A experienced a 2.7% growth rate between 1990 and 1998, from 12,134 vpd to 15,081 vpd. The portion of Greeley Street connecting Route 3 to Exit 11 and to Continental Boulevard carries considerably more traffic with an average daily count of 17,859.

e. Industrial Drive

Designed alongside the development of Exit 10 in the 1980s, Industrial Drive provides a link between FE Everett Turnpike Exit 10 and Route 3 to the east (across from the Anheuser-Busch plant) and a link between Exit 10 and Continental Boulevard to the West. The name Industrial Drive derives from the road's location in southeastern Merrimack's expansive industrial zoning districts. This limited access highway also provides direct access to the Fidelity campus-style office facility (3,000+ employees) and to substantial areas of undeveloped industrial land around Exit 10. Aside from the Exit 10 entrance/exit ramps, a signal at the Meridian Way/Commerce Drive intersection is the only signalized intersection on Industrial Drive. The highway is free-flowing and considered to be a major arterial.

f. Baboosic Lake Road

Baboosic Lake Road is an important east-west arterial road running westerly from Route 3, over the FE Everett Turnpike and connecting with other important arterial roads such as Turkey Hill Road and McQuestion, before turning northwest into the Town of Amherst. It is one of five roads that provide a connection over the Turnpike between the eastern and western portions of Town. As with the Town's other main roads, Baboosic Lake Road is a two-lane road dating from the 18th Century. The Lake Road is the busiest of the Town's minor arterials, carrying 11,636 average vehicle trips per day east of the FE Everett Turnpike and 8,700 west of the Turnpike. The section between Route 3 and the Turnpike is the heart of the Town Center area, providing access to the Town Hall complex, the Mastricola Middle School, Mastricola Elementary School and Merrimack High School complex, the Town Library, Police Station, two churches, and other uses and sites. Sidewalks are provided along the southern side of entire eastern portion of the road in the Town Center area and on portions of the northern side as well. Baboosic Lake Road, especially the eastern section, is one of the most congested roads in Merrimack.

g. Turkey Hill Road

Turkey Hill Road is a somewhat unusually configured road that splits off from Baboosic Lake Road at its eastern end, runs southwest and then turns sharply to the

southeast at McQuestion Road, terminating at Amherst Road near FE Everett Turnpike Exit 11. Because Turkey Hill Road provides one of only two north-south connections over the Souhegan River (excluding the Turnpike) and connects Baboosic Lake Road and a number of other roads to Exit 11, it is one of the Town's busier roads, supporting both local as well as through traffic. Several residential neighborhoods, the Town Highway garage and Town ballfields are located on Turkey Hill Road.

h. Bedford Road

Bedford Road begins at Route 3 at its eastern end, crosses over the FE Everett Turnpike and then runs northwest into the Town of Bedford. The road provides access from Bedford and residential areas in northern Merrimack to FE Everett Turnpike Exit 12 and to Route 3. Significant intersecting streets include Lawrence Road, which provides access to the Town Landfill site, Bean Road, Wire Road, Pearson Road, which provides access to Reeds Ferry School, and Back River Road. With the exception of Bean Road, all of the aforementioned roads also provide access to the Town of Bedford. Because of the connections it provides, Bedford Road, especially the eastern section, is heavily traveled. Between 1991 and 1997, the traffic count location on Bedford Road west of the Turnpike showed the highest annual growth rate recorded in Merrimack during that period. This location showed an annual growth rate of 6.1%, from 5,042 vehicle trips per day to 7,199. This increase is most likely due to the substantial rates of growth seem in Bedford over the past decade as well as to growth in Merrimack.

i. Other Roads

Other significant arterial and collector roads in Merrimack include Amherst, Naticook, and Camp Sargent Roads. Amherst Road, one of the oldest highways in the region, is an east-west arterial road beginning in the Town of Amherst at its western end where it is known as County Road, running east to where it dead-ends into Continental Boulevard at FE Everett Turnpike Exit 11. Turkey Hill Road intersects Amherst Road just west of its eastern terminus. Naticook Road, a collector road in the southwestern portion of Town connects Amherst Road to Continental Boulevard, Peaslee Road, Camp Sargent Road and Tinker Road. Naticook Road also provides access to Wasserman Park, the Town's largest recreational area. Camp Sargent Road, once a major link between 101A, Exit 11 and Route 3, has seen its prior function change dramatically since the Camp Sargent Road By-Pass was completed. Traffic on Camp Sargent Road dropped from a high point of 9,593 vehicles per day in 1992 to 2,393 in 1998, the most significant decline for any road during the 1990s.

4. Highway Capacity Analysis

The performance of highways and roads can be evaluated through highway capacity analysis. This procedure, which was developed by the Transportation Research Board (TRB) of the National Research Council, estimates the maximum amount of traffic that can be accommodated by a given street or intersection within a given period of time. The methods are described in the TRB's "Highway Capacity Manual; Special Report 209".

"Level of Service" (LOS) is a term that characterizes the type of operating conditions that occur along a roadway or at a particular intersection for a given period of time, generally an one-hour peak period. It is a qualitative and quantitative measure of the effect of a number of operational factors including roadway geometrics, travel delay, freedom to maneuver and safety. Level of service categories for roadway segments and their descriptions are included in the Appendix. Level of service categories range from LOS "A" to LOS "F", with "A" being the most desirable. A facility is considered to have reached its capacity at LOS "E". Level of service "F" is considered forced flow or gridlock. Level of service "D" is considered acceptable in urban areas. Levels of service "A", "B" and "C" are considered to be the most desirable with the least delays and the most maneuverability. Table V-3 indicates the relationship between traffic volumes and level of service for various roadway types.

Table V-3: Maximum Daily Traffic for Each Level of Service by Roadway Type (Per Two-Way Single Lane Volume)

	LOS A	LOS B	LOS C	LOS D	LOS E	LOS F
Expressway (4-Lane)	28,889	46,222	68,800	86,756	97,778	>97,778
Expressway (6-Lane)	43,333	69,333	103,200	130,133	146,667	>146,667
Other Principal Arterial	8,400	14,100	19,800	23,700	30,000	>30,000
Minor Arterial	6,720	11,280	15,840	18,960	24,000	>24,000
Major Collector	5,600	9,400	13,200	15,800	20,000	>20,000
Minor Collector	4,760	7,990	11,220	13,430	17,000	>17,000

Source: Derived from procedures in the 1994 Highway Capacity Manual.

Table V-4: Level-of-Service for Merrimack's Streets and Highways

Location	Average Daily Traffic	Year	Roadway Type (Town Class)	LOS
Amherst Rd. west of Turkey H. Rd.	4,387	2000	Minor Arterial	A
Baboosic Lake R. east of FEE Turnpike	11,636	1998	Minor Arterial	D
Baboosic Lake R. west of FEE Turnpike	8,700	1995	Minor Arterial	C
Back River Rd. at Bedford Line	3,036	1997	Collector	A
Bedford Rd over Baboosic Brook	6,029	1999	Collector	B
Bedford Rd. over FEE Turnpike	7,199	1997	Minor Arterial	B
McQuestion R. east of Turkey H Rd.	9,857	1999	Minor Arterial	C
Boston Post R. at Amherst Line	5,620	1998	Minor Arterial	B
Camp Sargent R. east of Tinker R.	2,393	1998	Minor Arterial	A
Continental B. north of Camp Sarg.	11,557	1998	Major Arterial	A
Continental B. north of NH 101A	15,081	1998	Major Arterial	C
Peaslee Rd. north of Naticook R.	3,283	1997	Local	A
Turkey Hill Rd. north of Amherst R.	8,433	2000	Collector	C
Greeley St (Cont B.) west of Route 3	17,859	1997	Major Arterial	B
Industrial Dr. east of the FEE Turnpike	7,072	1998	Major Arterial	A
Joppa Rd. north of Baboosic Lake R.	2,709	1997	Collector	A
NH 101A at Hollis Line	31,170	1997	Major Arterial	C
NH 101A at Nashua Line	37,313	1998	Major Arterial	C
Route 3 (D.W. Hwy) at Nashua Line	17,154	1998	Major Arterial	A
Route 3 (D.W. Hwy) south of Greeley	18,789	1998	Major Arterial	A
Route 3 (D.W. H) south of Souhegan R.	21,169	1997	Major Arterial	E
Route 3 (D.W. H) north of Bedford Rd.	13,100	1998	Major Arterial	B
Naticook Rd. north of Peaslee Rd.	2,356	1997	Minor Arterial	A
Wire Rd at FEE Turnpike	4,700	1999	Collector	A
FEE Turnpike between exits 8 & 10	46,000	1999	Major Arterial	B
FEE Turnpike between exits 11 & 12	47,000	1999	Major Arterial	C
FEE Turnpike between exits 10 & 11	49,000	1999	Major Arterial	C

Source: NRPC.

Table V-4 shows that the urban compact portion of Route 3 (within the Town Center area) represents the most congested road segment in the Town with LOS "E" operations experienced at Route 3 south of the Souhegan River. Traffic operations at the Baboosic Lake Road location just east of the FEE Turnpike experience LOS "D" conditions with long delays.

D. PLANNED LOCAL STREET AND HIGHWAY IMPROVEMENTS

The Town of Merrimack has historically worked with state, regional and local officials and agencies, Town departments and private developers to plan and implement improvements to its transportation system. New streets planned for residential subdivisions or commercial and industrial developments are typically built and paid for by private developers along with any improvements required to existing streets and highways. Improvements to existing Town roads are paid for either through capital reserve funds set aside by the Town for road maintenance, resurfacing or for specific projects, or are paid for through appropriations approved by the voters in a warrant article. For particularly large projects, bridge replacements or improvements to state highways, state or federal assistance is often sought. This section provides an overview of improvements currently planned by the Town as reflected in approved plans or studies or in the Town's Capital Improvements Program.

1. Route 3 Improvements

As can be seen in the Level of Service (LOS) information and street and highway descriptions provided above, the Town maintained portion of Route 3 is the most heavily traveled and most congested road under Merrimack's jurisdiction. Because Route 3 provides access to the Turnpike, Nashua and Bedford, as well as to most of the businesses, cultural establishments and municipal facilities in Town, it is an almost unavoidable destination for most Merrimack residents. Plans and studies intended to address congestion on Route 3 have been developed on a number of occasions over preceding decades. Among the most significant of these was the Route 3 Action Plan completed in 1989. The Route 3 Action Plan called for various intersection improvements on the Town maintained portion of Route 3 along with the eventual widening of the entire roadway to be consistent with the State maintained section south of Greeley Street. A series of smaller–scale intersection improvements for the area between the Souhegan River and Bedford Road were proposed as interim or "stop gap" improvements. While portions of the Action Plan were implemented, funding for the full widening did not appear to be likely in the near the future due to the high cost estimated for construction and the extent of the property takings that would have been required. Further, many of the land use impacts that would have resulted from such a widening were increasingly viewed with disfavor. Problems with traffic congestion on Route 3, however, have not abated, so a plan was sought that could provide at least short-term improvements at a more easily borne cost.

In 1999, At the request of the Town, the traffic engineering consulting firm of Louis Berger and Associates completed a highway study for the Route 3 corridor. The purpose of the study was to detail traffic operating conditions at intersections along the Route 3 corridor north of Greeley Street and to provide specific recommended improvements that could be realistically implemented within a ten year period. As can be seen in Table V-4, Existing traffic conditions for this segment of the highway have been characterized by LOS "E" conditions with traffic congestion and long delays. The preliminary report focused on nine study area intersections. The Town of Merrimack utilized this study to revise its Route 3 improvement program, which, as discussed above, had previously entailed widening a 3.3-mile segment between Greeley Street and Bedford Road and reconstructing the Souhegan River Bridge and the Baboosic Brook Bridge. The Town has accepted the recommendations of the Loius Berger study and plans for implemention of the recommendations are underway.

Recommendations from the Louis Berger study include the following:

- Bedford Road / Route 3 intersection – Signalize the 7 / 11 store driveway at its current location and move the Route 3 southbound stop bar northerly to allow driveway movements to occur on a separate signal phase. Conceptual construction estimate: $10,000.
- Front Street / Route 3 intersection – The intersection does not demonstrate any immediate need for improvement. However, realignment of the McGaw Bridge Road opposite Front Street would improve the overall intersection and road layout and therefore improving overall safety. The intersection's signal hardware would need to be upgraded and the Dunkin Donuts site would need to be reconfigured. Conceptual construction estimate: $150,000.

- Wire Road / Route 3 intersection – The installation of a traffic signal at this intersection will provide an acceptable LOS for the year 2010 peak hour by decreasing overall intersection delay. Realignment of Wire Road to create a "T" type intersection will improve safety by providing better intersection definition and succinct travel patterns. Separate turning lanes are proposed for the Wire Road approach. Conceptual construction estimate: $150,000.
- Baboosic Lake Road / Route 3 – Extend the Route 3 southbound right turn lane, this lane is partially blocked by long southbound queuing. The northerly drive for the Mobil gas station off of Route 3 would prevent accidents that occur due to its close proximity to the intersection. This intersection is in need of other large scale improvements relating to shoulder widths, curbing and access control. Conceptual estimates for the southbound right-turn only extension and the closure of the gas station driveway: $25,000.
- Connell's Shopping Center / Route 3 – The Town should consider closing the northern entrance into the plaza. Another alternative would be to consider adding speed bumps within the parking lot. No estimated cost provided.
- Merrimack Village Mall / Route 3 – No improvements recommended at this time.
- Columbia Circle / Route 3 – Installation of a traffic signal at the intersection will provide an acceptable LOS for the existing and 2010 peak hours and decreasing the overall intersection delay. Columbia Circle should be widened to accommodate separate turning lanes for left and right turning vehicles. The improvements should include widening Route 3 to provide an exclusive northbound left-turn lane as well as an exclusive southbound right-turn lane. Construction cost estimate: $300,000 (not including substantial utility relocation costs.)
- Shaw's Plaza / Route 3 – Replace the existing yield sign with a stop sign for the Shaw's existing right turn traffic to reduce accidents. Cost estimate: $250.
- Greeley Street / Route 3 – Widen the easterly Greeley Street approach to accommodate an exclusive left-turn lane. Re-stripe pavement marking on the westerly Greeley Street approach to include exclusive double left-turn lanes and a through right lane. Modify traffic signals to incorporate the revised lane configurations. Conceptual construction estimate: $50,000.

2. Front Street Extension

Transportation improvements, including improvements to Route 3, were an important part of the 1999 Town Center Plan. Among the more significant transportation improvements proposed, was the development of the so-called Front Street Extension. This proposed road is intended to provide access to land that is either undeveloped or targeted for redevelopment on the east side of Route 3 where access is currently limited. An additional goal is to divert a portion of future traffic from Route 3 itself, by providing for a parallel route. The Front Street extension would begin at its southerly end at Route 3 opposite Woodbury Street, cross Baboosic Brook in the vicinity of the existing railroad bridge before turning to the north to connect with Twin Bridges Road and Front Street. A map depicting the proposed road is provided in Chapter IX. An engineered plan has not yet been prepared for the road. The Front Street Extension is expected to be built by private developers as the affected properties are developed.

3. Other Town Improvements

In addition to the improvements described above, a number of other street and highway improvements are currently planned. These include replacements of McGaw Bridge (2003-04), Bedford Road Bridge (2004-05) and the Manchester Street Bridge (2005-06) and the reconstruction of Pearson Road (2006-07) and Tinker Road (2007-08). Traffic lights are also currently proposed for the intersection of McQuestion and Baboosic Lake Roads (in relation to the proposed Middle School and at Mast Road / Henry Clay Drive and Route 3. Sidewalk improvements are also planned along Route 3 in the Town Center area (2003-04).

E. PLANNED STATE AND REGIONAL HIGHWAY IMPROVEMENTS

1. NH Route 101A Improvements

The Nashua Regional Planning Commission is presently undertaking a master plan of the Route NH 101A corridor. A consultant team has been hired to study traffic, land use, non-motorized access and storm drainage issues in the corridor. The study area includes NH 101A from the FEE Turnpike in Nashua to the Route 101 Bypass in Milford. The corridor study area runs through five communities including Nashua, Merrimack, Amherst, Hollis, and Milford. A steering committee made up of local officials from the study area towns has been created to oversee the planning process. The results of the study will be used to direct federal funds that are already included in the State's Ten Year Transportation Improvement Program for corridor-wide improvements with no local funding match required from the Town (the local match will be funded by the state).

An early action program for the project proposes several improvements on NH 101A in the Town of Merrimack. The improvements include widening NH 101A to three travel lanes per direction between Continental Boulevard in Merrimack and Somerset Parkway in Nashua to provide a uniform cross section. The widening would include adding shoulders, sidewalks, and turning lanes at major intersections. The widening will be done in conjunction with a re-timing of the signal system coordination to address deficiencies in traffic operations in the corridor. Other improvements are proposed for the intersection of Boston Post Road and Route 101A. This calls for an additional southbound left turn lane on the Boston Post Road approach. This approach carries high volume turning left during the morning peak hour. The additional left turn lane on the southbound approach and a re-timing of the intersection's signal phasing are expected to improve the efficiency of traffic operations at the intersection. The Route NH 101A study will also consider alignment improvements to the Seaverns Bridge Road / Boston Post Road intersection.

2. Circumferential Highway

The concept of the Circumferential Highway originated in 1959 as a means of overcoming the barrier to regional east-west traffic circulation presented by the Merrimack River. A Full-Build of the Circumferential Highway was originally proposed to begin at the Sagamore Bridge, at the FEE Turnpike Exit 2 in South Nashua and make a full loop through Hudson and Litchfield from NH 3A to a new FE Everett Turnpike Exit 9 in Merrimack. The Circumferential Highway was proposed to have interchanges at the new FE Everett Turnpike Exit 9 in Merrimack, Route 3 in Merrimack, NH 3A in Litchfield, NH 111 in Hudson, and NH

102 in Hudson. Although the Environmental Impact Study (EIS) was completed, the permitting process for the Full-Build was not completed because the Environmental Protection Agency (EPA) filed an intent to veto due to concerns over wildlife habitat in the southern segment between NH 3A and NH 111 in 1995. The NHDOT is presently completing a Supplemental EIS (SEIS) for construction of the northern portion of the highway. The SEIS is due in early 2002. The NHDOT will hold public hearings on the highway and expects to receive permits for construction of the northern portion once the SEIS is completed.

The New Hampshire Department of Transportation (NHDOT) supports the construction of the Northern Segment Partial-Build of the Circumferential Highway. The northern segment involves the construction of a limited access, four-lane highway beginning from NH 111 in Hudson circling northerly then westerly just north of the Hudson Town Line in Litchfield to a new Exit 9 with the FEE Turnpike in Merrimack. The total cost of the partial build is $137 million. It will be funded solely through toll revenues of the NH Turnpike system The Circumferential Highway Northern Segment is a component of the State Ten-Year Transportation Program. Map V- 3 shows both the Full-Build and the Northern Segment Partial-Build of the Circumferential Highway.

Construction of the highway segments for the Northern Segment Partial-Build is described below:

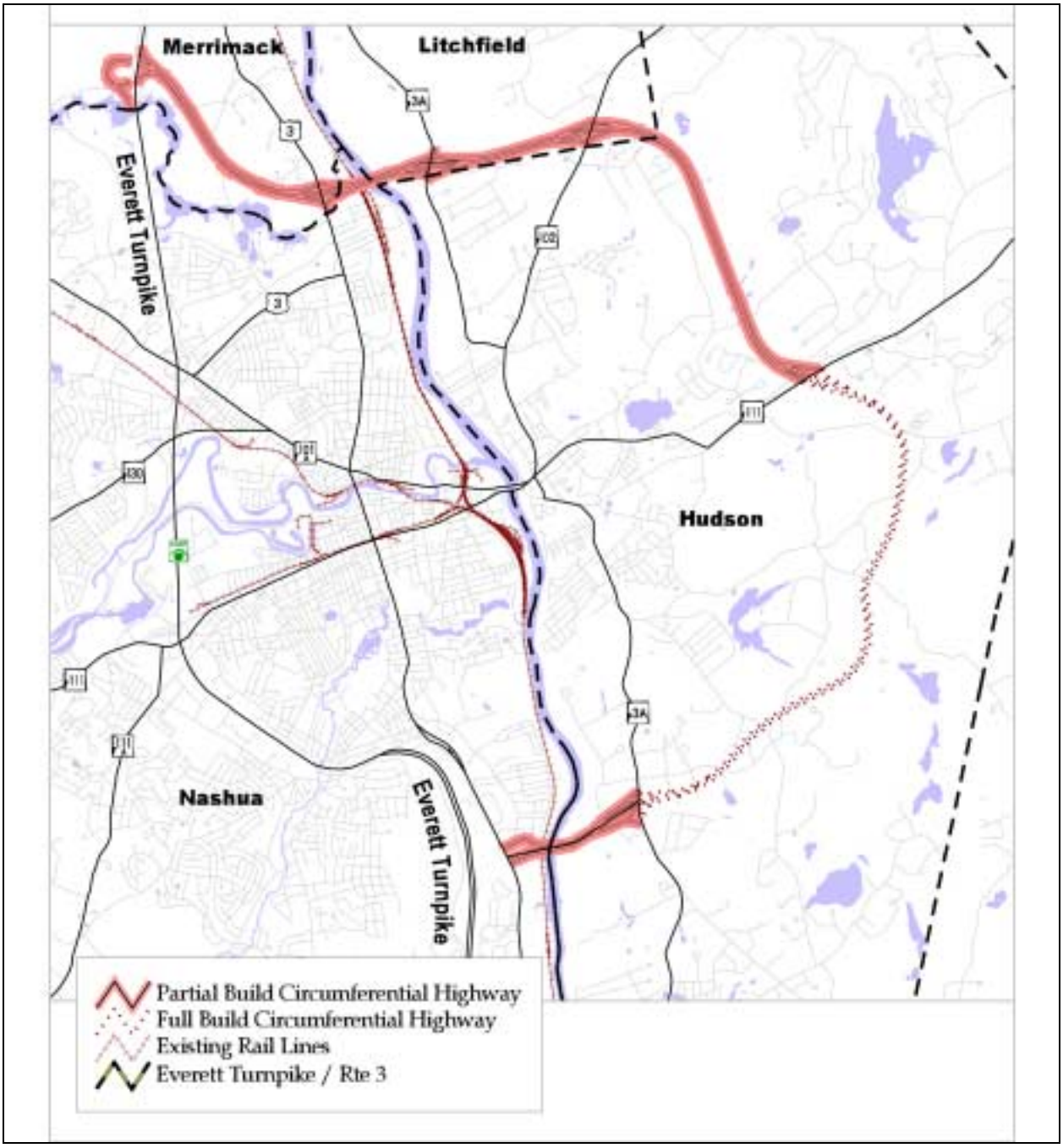
- Southern Segment – This segment has been revised. The Sagamore Bridge update has been completed. Beginning from a new Exit 2 on the FEE Turnpike in south Nashua, the highway traverses easterly across the Merrimack River by way of an expanded Sagamore Bridge. The Sagamore Bridge links the Route 3 with NH Route 3A. An interchange is provided at Route 3A.
- Northern Segment – The permitting and construction of the northern segment is subject to the completion of the SEIS. Beginning at the NH 111 interchange east of Hudson Center, the highway will run northwesterly to an interchange with NH 102 in Litchfield south of Cutler Road, then continue parallel with the Hudson Town line and connect at an interchange with NH 3A in Litchfield at the Town line. The highway will cross the Merrimack River, link at an interchange with Route 3 near Pennichuck Brook and terminate at the FEE Turnpike at the future Exit 9.

Table V-6 shows future 20-year traffic forecasts for Build and No-Build alternatives at key locations in Merrimack. The No-Build 2020 alternative forecasts future traffic in Merrimack without the construction of the Circumferential Highway. The Build 2020 alternative forecasts traffic that includes the Circumferential Highway in the highway network. Table V-6 shows that traffic is expected to increase at the key locations on Route 3 from the No-Build to the Build conditions except for the Route 3 location south of the Souhegan River. The traffic volumes are expected to remain the same at 25,400 vehicles per day (vpd) under 2020 No-Build conditions as they are under 2020 Build conditions at this location. Traffic at the other Route 3 locations is expected to increase from the No-Build to the Build alternative.

The regional model developed by the NRPC has consistently shown that the most significant impact of the Circumferential Highway on the west side of the Merrimack River will occur on Route 3 south of the proposed highway at the Nashua/Merrimack line. The future

traffic forecasts in Table V-6 show that this location would increase from 21,800 vpd under No-Build conditions to 28,900 vpd under Build conditions (an increase of 7,100 vpd). In the Town of Merrimack, the Circumferential Highway is expected to impact Route 3, the Industrial Drive and FEE Turnpike Exit 10 interchange and the Continental Boulevard and FEE Turnpike Exit 11 interchange. These expected impacts are based on a regional model that assumes an interchange will be constructed at Route 3 in Merrimack (see Map V-3). Table V-6 shows that Route 3 south of Greeley would increase from 21,850 vpd under No-Build to 23,800 vpd. Route 3 south of Greeley has four travel lanes providing sufficient capacity for future growth and the impacts from the Circumferential. Table V-6 shows that future Build conditions will be operating under LOS "B" conditions. Although traffic on Route 3 north of Continental Boulevard is not expected to increase due to the Circumferential, this segment of the highway contains two travel lanes providing less capacity than the segments south of this point. At present, the lowest LOS is experienced on the segment of Route 3 north of Exit 11 (Table V-4, LOS E south of the Souhegan River).

Map V-3: Circumferential Highway, Partial Build



3. Manchester Airport Access Road

Although no portion of the Manchester Airport Access Road is located in Merrimack, the proposed road would significantly affect the Town. The Airport Access Road is a planned connection from the FE Everett Turnpike in Bedford and the Manchester Airport. The highway would begin at a new interchange constructed on the Turnpike at a point just south of the present location of the Bedford tollbooths, continue easterly connecting with Route 3 in Bedford just over the Merrimack Town line and then continue easterly across the Merrimack River to Manchester. The road will bypass over Route 3A in Manchester and will connect with Route 3A via a service road. The road will terminate at the airport and provide access to airport parking areas. In addition to providing improved access to the Manchester Airport, the Access Road would have the benefit of improving access to the Turnpike for the northern portion of Merrimack. As previously noted in this chapter, northern Merrimack is served by a partial interchange at Exit 12 that provides southbound ramps only. The proposed road corridor is shown in Map V- 4.

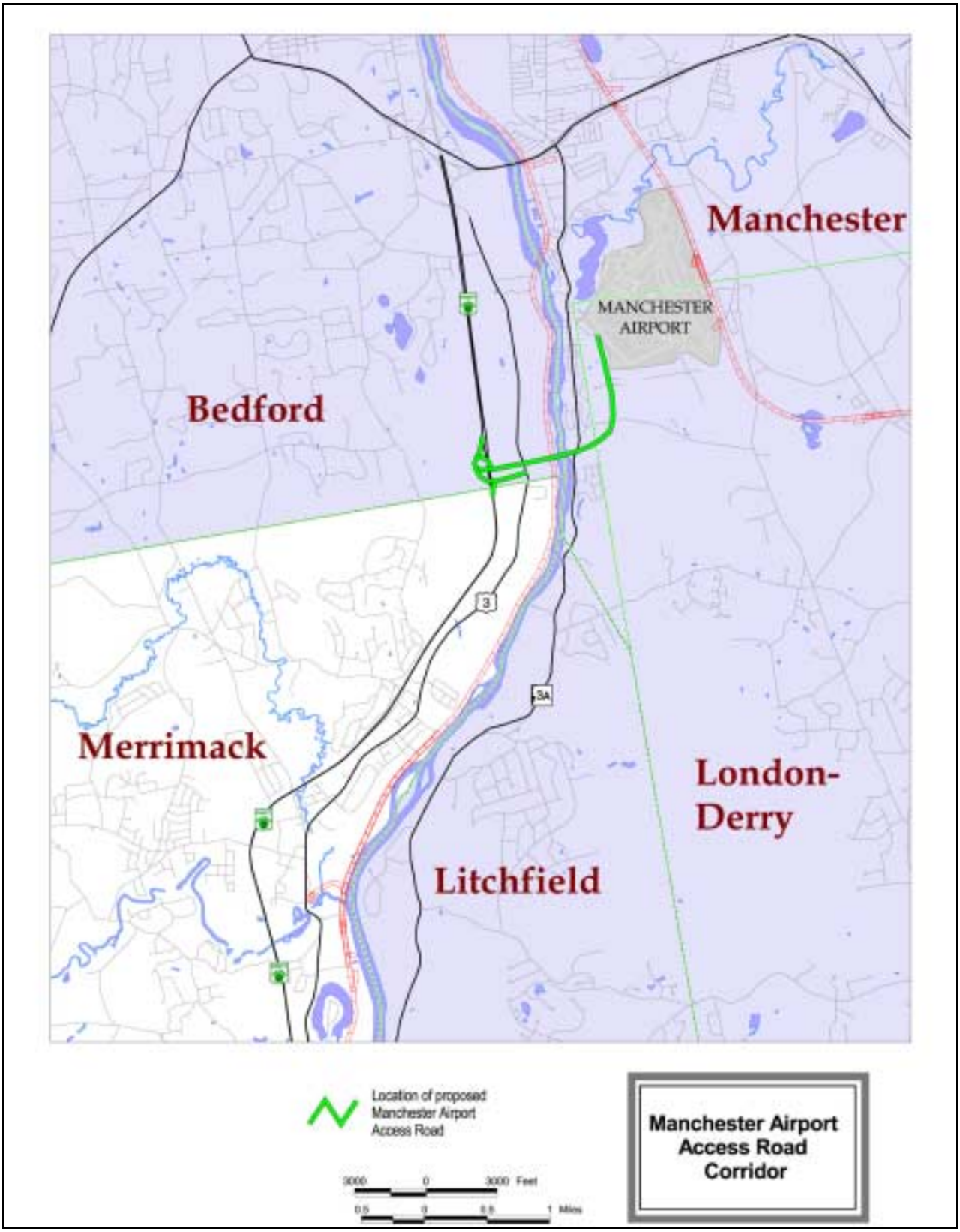
The Environmental Impact Statement (EIS) for the Manchester Airport Access Road included traffic forecasts for two locations in Merrimack. These included Route 3 north of Bedford Road and FEE Turnpike south of the proposed corridor. The model showed that future traffic would improve at the Route 3 location over the No-Build scenario if the project were implemented, while traffic on the FEE Turnpike would increase by 2,000 vehicles per day. Table V-5 shows the results of the future 2015 forecasts from the Airport Access Road EIS.

Table V-5: 2015 Traffic Forecasts for Manchester Airport Access Road (Vehicles Per Day, 24 hour period)

Location	1990 Traffic	Year 2015 No-Build	Year 2015 Build CG preferred Route
Route 3 north of Bedford Rd.	15,000	35,000	33,000
FEE Turnpike south of the Corridor	34,000	69,000	71,000
Airport Access Road	---	---	33,000

Source: Airport Access Road EIS.

Map V-4: Proposed Airport Access Road Corridor



F. FUTURE TRAFFIC PROJECTIONS

The NRPC has developed a MINUTP traffic model for forecasting traffic in the Nashua region. A No-Build highway network and Build highway network were developed for the year 2020. The No-Build network includes highway and transportation projects completed, already under way, or for which funding has been approved. The Build network includes planned projects that have not received environmental permits and/or have not been approved for funding. These projects include the Circumferential Highway, the Broad Street Parkway and the Airport Access Road. All three of these major highway projects are included in the State's Ten Year Transportation Plan.

Future traffic forecasts are based on anticipated future land use patterns. Projected housing units, employment and school enrollment are used to generate trip productions and attractions within the model. The projected growth in land use was made in consultation with local planners from the Nashua region and through a review of present and proposed zoning, physical constraints and assumptions made regarding future area-wide growth rates. The NRPC traffic model provides a twenty-year horizon for growth in the NRPC communities including Merrimack. The results of the future model runs for the year 2020 No-Build and Build are shown in Table V-6.

Table V-6: Future Traffic Forecasts for Merrimack

Location	Latest Available Traffic Count	Year 2020 No-Build	No-Build LOS	Year 2020 Build	Build LOS
Amherst Rd. west of Turkey H. Rd.	4,387	9,300	B	11,105	C
Baboosic Lake R. east of FEE Turnpike	11,636	13,900	D	13,600	D
Baboosic Lake R. west of FEE Turnpike	8,700	11,900	C	11,700	C
Back River Rd. at Bedford Line	3,036	3,100	A	3,050	A
Bedford Rd over Baboosic Brook	6,029	9,400	C	9,500	C
Bedford Rd. over FEE Turnpike	7,199	8,300	C	8,300	C
McQuestion R. east of Turkey H Rd.	9,857	13,300	D	14,100	E
Boston Post R. at Amherst Line	5,620	7,000	B	8,600	B
Camp Sargent R. east of Tinker R.	2,393	3,900	A	4,500	A
Continental B. north of Camp Sarg.	11,557	17,300	B	19,600	B
Continental B. north of NH 101A	15,081	22,500	D	23,700	D
Peaslee Rd. north of Naticook R.	3,283	6,250	B	6,250	B
Turkey Hill Rd. north of Amherst R.	8,433	8,300	B	8,300	B
Greeley St (Cont B.) west of Route 3	17,859	23,900	C	22,050	B
Industrial Dr. east of the FEE Turnpike	7,072	9,600	A	13,650	B
Joppa Rd. north of Baboosic Lake R.	2,709	3,700	A	3,600	A
NH 101A at Hollis Line	31,170	38,300	C	36,000	C
NH 101A at Nashua Line	37,313	43,800	D	42,850	D
Route 3 (D.W. Hwy) at Nashua Line	17,154	21,800	B	28,900	C
Route 3 (D.W. Hwy) south of Greeley	18,789	21,850	B	23,800	B
Route 3 (D.W. H) south of Souhegan R.	21,169	25,400	E	25,400	E
Route 3 (D.W. H) north of Bedford Rd.	13,100	20,500	E	20,500	E
Naticook Rd. north of Peaslee Rd.	2,356	4,100	A	3,900	A
Wire Rd. at FEE Turnpike	4,700	5,700	B	5,300	B
FEE Turnpike between exits 10 & 11	49,000	60,300	C	59,700	B

There are twenty-four roadways considered in the model. The 2020 Build scenario will result in traffic counts lower or equal to those projected for the 2020 No-Build scenario on fourteen of the roadways, and an increase for the remaining ten roadways. The most significant increase in traffic from the 2020 No-Build scenario to the 2020 Build scenario is expected to occur on Route 3 in Nashua south of FE Everett Turnpike Exits 10 and 11. This is mainly due to the impacts expected from the construction of the Circumferential Highway. However, the capacity of the road in this section is sufficient to accommodate the expected increases. The LOS on this segment will remain within the "C' and "B" range and congestion and forced flow conditions are not expected to occur. In addition, McQuestion Road is expected to drop from LOS "D" to LOS "E" from the Build to the No-Build, however, this road will be operating at the lower range of the LOS "D" threshold under No-Build conditions. The expected increase of 800 vehicles per day will put the operations in the LOS "E" range. Traffic operating conditions along the Route 3 corridor north of Greeley Street are expected to continue to be problematic (LOS "E" south of the Souhegan River and LOS "E" north of Bedford Road). The 2020 Build scenario is not expected to have significant impacts over the 2020 No-Build on this segment of the highway.

From the analysis above, it appears that the state or local highway improvements included are not anticipated to alleviate congestion in Merrimack. In the Town's most congested areas such as within the Town Center portion of Route 3, it would seem that the improvements currently planned would at best maintain the status quo. Although levels of

service are not likely to drop to unacceptable levels, it is noteworthy that some planned improvements such as the Circumferential Highway are likely to increase congestion. Given this scenario, alternatives that would reduce vehicle trips by encouraging alternate forms of transportation, as well as access management, signal coordination and various land use control techniques, are likely to become increasingly important components of transportation in Merrimack. A more thorough presentation of alternative transportation options is provided below.

G. ALTERNATIVE TRANSPORTATION

Alternative transportation is a general phrase that refers to all forms of transportation other than the use of personal automobiles by individuals. This is true primarily because outside of a handful of larger cities, almost all trips made by Americans to work, or for shopping and other purposes, are made in a personal automobile. The increasing use of personal automobiles is obviously seen as the principal contributor to traffic congestion. It is also seen as one of the most significant threats to air quality. As a result, a major focus of transportation planning in recent years has been to encourage all forms of transportation other than the use of personal automobiles. This most commonly includes public or mass transportation such as commuter rail or buses, pedestrian and bicycle facilities, and other alternatives such as carpooling. A secondary focus of planning for alternative transportation is to address the needs of that portion of the population that do not have access to a personal automobile or are unable to drive. The remainder of this section provides an overview of each of the principal areas of alternative transportation as these apply to Merrimack.

1. Public Transportation

a. Commuter Rail

Significant progress has been made on the extension of commuter rail from Lowell, Massachusetts to the Exit 2 area of Nashua. The goal of the NHDOT is to eventually extend commuter rail to Manchester with stops in downtown Nashua, Merrimack and at the Airport Access Road in Bedford. The extension will provide Merrimack with the opportunity to locate a commuter rail stop along the Route 3 corridor. The project is presently in the preliminary engineering phase.

The State's Ten Year Plan includes a park and ride passenger rail station off of Route 3 in Merrimack. This facility would accommodate 250 parking spaces. Locations under consideration for this rail station include the Mast Road area, Star Drive area, and/or a Town Center location. A Town Center location may provide opportunities for transit-oriented development, however, congestion within the urban compact portion of Route 3, a lack of space for parking, and distance from Turnpike exits would be limiting factors. The 1999 Major Investment Study (MIS) for passenger rail service to southern New Hampshire estimated that a passenger rail station in Merrimack would attract approximately 280 commuters. These ridership estimates were made for a rail station location in the southern part of the Town in the vicinity of Star Drive. The NRPC will conduct a Major Investment Study for extending passenger rail to Merrimack after the Nashua extension is completed.

b. Bus Service

At present, public transportation in Merrimack is limited to a pilot fixed route extension of Nashua's City Bus system along NH 101A and various specialized services to targeted populations. The pilot Citybus service extension on 101A currently runs from Nashua to Milford, partially funded under a federal Area-wide Job Access Reverse Commute Plan grant. Other sources of funding include the New Hampshire Department of Health and Human Services and the Towns of Merrimack, Amherst and Milford. Fixed-route bus service is not provided in most of Merrimack. Studies to determine the feasibility of extending Citybus Service up Route 3 from Merrimack were conducted in 1990, 1994 and 1999. Although the potential for fixed route bus service may exist along portions of Route 3, there are no current plans to implement such service in the near future. The Town however, does plan to continue to support the pilot program on 101A and to provide transit services to certain elderly and indigent residents through contracts with the City of Nashua and through contributions to various social service organizations that provide transportation assistance to qualifying individuals.

2. Pedestrian and Bicycle Facilities

Relatively low densities, weather conditions, automobile oriented development patterns and lifestyle preferences and demands combine to keep walking or bicycle riding from serving as significant modes of transportation in Merrimack, though both can be popular recreational or fitness related activities. In certain portions of Town, however, such as in the Town Center area where densities are relatively high, walking can be a viable alternative to automobile use, especially for short local trips, if adequate provisions exist for sidewalks, cross walks and other related amenities. Biking can also be a viable form of transportation for shorter commutes or for local non-work related trips subject to seasonal and weather limitations and trip lengths. It is worth mention that more Merrimack residents work in Merrimack than in any other community, about 35% of the Town's labor force (see Chapter IX – Economic Development). An almost equal number work in the adjacent communities of Nashua, Bedford or Amherst, indicating that most Merrimack workers do not commute long distances.

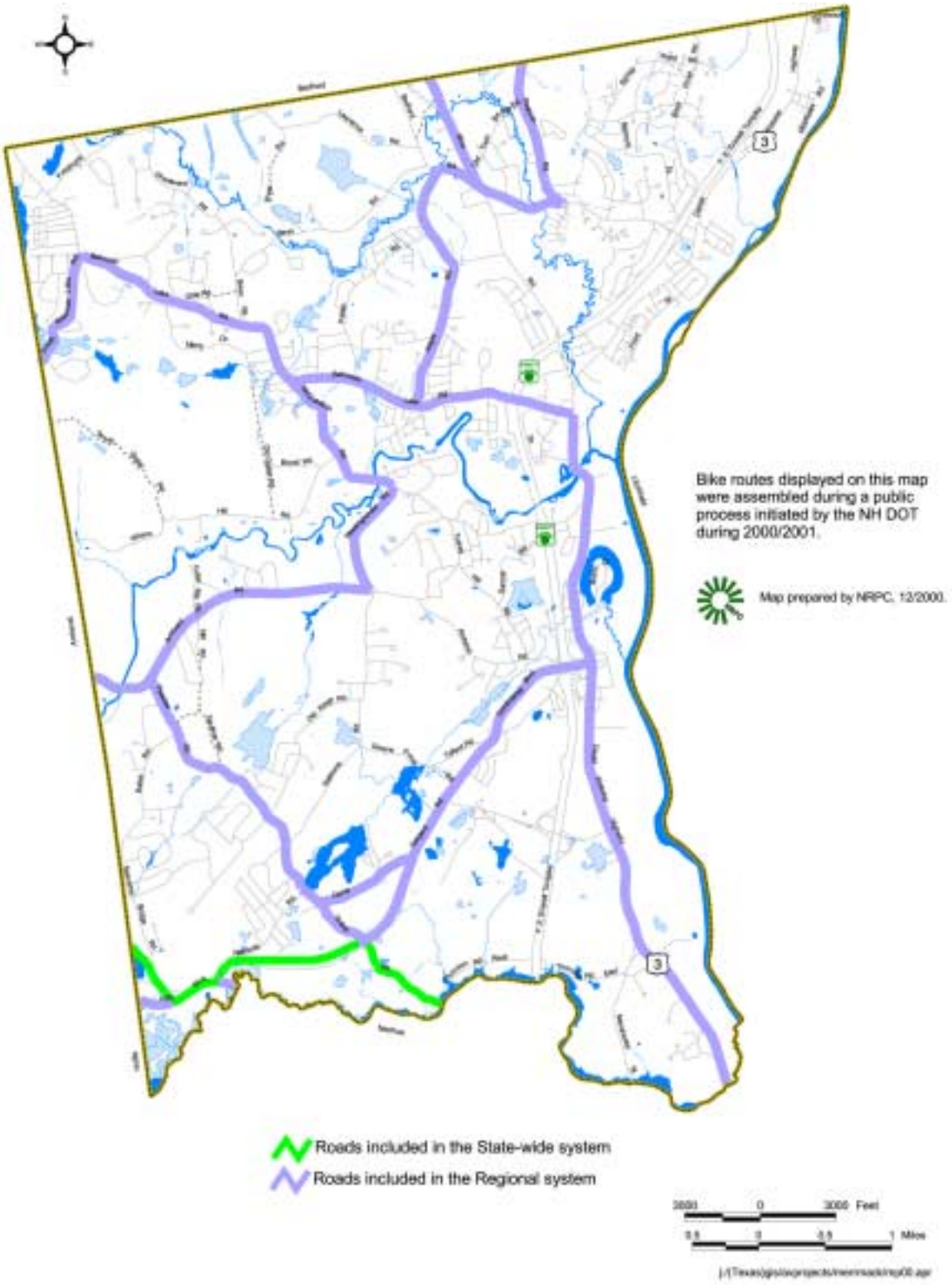
In recent years, the Merrimack has made a commitment to extending its sidewalk system throughout the Town. The Planning Board's subdivision and site plan regulations currently require sidewalks to be developed alongside new development projects on all arterial and collector streets unless deemed to be impractical by the Board. The Town, often with assistance of federal grants, has installed sidewalks in the vicinity of Thornton's Ferry School and surrounding parks and on Baboosic Lake Road and McElwain Street in the Town center area. A federal grant was also received to construct sidewalks on Route 3 in the Town Center consistent with Town Center Plan recommendations (see Chapter IX). Other accommodations for pedestrians including benches and improved landscaping and lighting are also planned.

Providing adequate facilities for bicycles can involve the development of specialized bike lanes or paths, the provision of bike racks, the provision of more elaborate facilities such as "bicycle lockers" so that commuters can switch between transportation modes, or simply ensuring that road improvements provide for sufficiently wide paved shoulders to safely accommodate bicycles. Off-the-road trails can be utilized effectively, especially where old Class

VI roads (unmaintained public rights-of-way), logging roads and other trails already exist. At work places, access to showers and lockers can also be important accommodations for potential bicycle commuters. While bicycles are unlikely to become a very significant transportation alternative in Merrimack, reasonable improvements to accommodate bicycles would allow the Town to expand its recreational offerings while encouraging at least a few to take up biking as a transportation alternative to the automobile.

Map V-5, on the following page, depicts Merrimack's portion of the regional bicycle route network. It is noteworthy that some of best accommodations for bicycles are found along the southern portion of Route 3 where many of the Town's largest employers are located.

Map V-5: Merrimack's Portion of the Regional Bicycle Network



3. Trip Avoidance

Other alternatives that can be effective in reducing individual vehicle trips involve developing public and private facilities that can reduce the need for or eliminate certain common vehicle trips all together. In Merrimack, many large employers provide on-site facilities such as cafeterias, recreational facilities, fitness facilities, childcare, and even Automatic Teller Machines (ATMs) for banking and small convenience stores. Off-site dry cleaning and laundry establishments sometimes provide worksite drop off and pick up services as well. Because these facilities and services cater to the needs of large numbers of employees who would otherwise have to drive to alternate sites before, during or after work, their provision can play a significant role in minimizing vehicle trips, and therefore, traffic congestion, without requiring significant public improvements. These on-site facilities can also encourage car-pooling or the use of mass transit for similar reasons. Where on-site facilities are not practical, having restaurants, banking, childcare and other similar facilities in close proximity to workplaces can minimize the extent of individual vehicle trips while also increasing the comfort and convenience of employees generally. In Merrimack, restaurants, banks, childcare facilities, athletic fields and gas stations are allowed in industrial districts as well as in commercial districts. Freestanding convenience stores and other retail or service establishments such as drycleaners, however, are not permitted.

H. TRANSPORTATION TECHNIQUES

As noted by the S.W.O.T. analysis, congestion is a problem on certain sections of Merrimack's street and highway system, especially within the urban compact portion of Route 3, and traffic projections indicate that congestion will continue to be a problem in the foreseeable future. A related traffic management issue is the use of secondary residential streets by through traffic, often caused by motorists seeking to avoid congested areas. There are alternatives to minimize the impacts of cut-through traffic and congestion, including: 1) traffic calming measures; 2) access management; 3) roundabouts; 4) alternate design standards for streets; 5) and scenic road designations. Each of these alternatives is more fully described below.

1. Traffic Calming

Traffic calming is a term used to describe various design and traffic control techniques intended to reduce speeds or redirect traffic flow. There are a number of techniques that are described to achieve the goals of traffic calming:

- Reduce the speed at which automobiles travel by altering roadway design. These techniques include speed tables, rumble strips or changes in the roadway surface, diagonal diverters, curb bump-outs, lane shifts, narrower streets and roundabouts.

An effective way to slow down traffic is to narrow the real or perceived horizontal width of the pavement. Streets can be narrowed in various ways. A so-called "curb extension" is generally the best and perhaps most widely used option. It slows down traffic, shortens the crossing distance for pedestrians and a sidewalk can be added or widened.[1]

[1] Take Back Your Streets, Conservation Law Foundation, May 1995, page 32.

2. Roundabouts

Many communities in the United States are beginning to embrace the concept of "roundabouts." A roundabout is an intersection control measure used successfully in Europe and Australia for many years. Unlike a traditional New England traffic circle, a roundabout has specific design criteria to improve traffic flow, slow vehicles through intersections, provide for pedestrian access and improve safety. In addition, many roundabouts are aesthetically pleasing and require little additional right of way over a traditional four-way intersection.

3. Street Pavement Width

Merrimack's subdivision regulations provide specific requirements for constructing local residential streets and sidewalks. The regulations require that the center of the right of way for streets be paved a minimum of 24 feet. However, the design standards for local residential streets should be responsive to local needs and flexible enough to allow for creative solutions for circulation of vehicles, pedestrians and bicycles. For example, local residential streets should be designed for the needs of children, pedestrians, and bicyclists and high-speed through-traffic should be discouraged. There is no need to construct rural residential streets with a pavement width to accommodate on-street parking or consistent truck or bus traffic. As such, a rural residential road should be paved to a maximum of 18 feet wide.[2] This roadway width may reduce the speed of through traffic, maintain street space for the comfort and safety of residents and conserve land by minimizing the amount of impervious surface devoted to streets.

4. Access Management

Access management is the process of regulating of the number of driveways, the design and placement of driveways, and the design of any roadway improvements needed to accommodate driveway traffic on roadways, especially on those roadways classified as arterials. Arterial highways are similar to limited access freeways in that their primary function is to move people and goods over long distances quickly and efficiently. However, arterials do not have the benefit of strict access controls to adjacent parcels as do limited access highways. The speed and volume of traffic on an arterial is greatly reduced due to vehicles entering and exiting side streets and driveways. The primary goal of implementing access management policies is to prevent the loss of roadway capacity due to development along arterials by reducing turning movements that conflict with through traffic. Route 3, NH 101A, Continental Boulevard, Greeley Street and Industrial Drive are the major arterial roads in Merrimack. Traffic congestion on Route 3 varies from a level of service "A" to "E," with the more congested sections in the Town Center where there are numerous curb cuts. NH 101A operates at a level of service "C." The remaining major arterials operate at a level of service "B" or higher. In order to preserve the existing road capacity, which has a theoretical limit, access management policies should be applied to future developments along both roads.

The following general policies are typically implemented through site plan review, driveway ordinances, and/or zoning regulations, to achieve the access management

[2] Kulash, Walter, Residential Streets (Urban Land Institute, 2001).

goals.Reduce the number of curb cuts along arterials and encourage the use of common driveways for commercial developments.

- Encourage the development of service roads parallel to arterials that allow for access to adjacent commercial developments.
- On other Town roads, the minimum distance allowed between curb cuts along arterials should conform to the following table:

Table V-7: Minimum Curb Cut Spacing

Posted Speed Limit	Minimum Spacing
35 MPH	150 feet
40 MPH	185 feet
45 MPH	230 feet
50 MPH	275 feet

Source: "Access Management for Streets and Roads", FHWA, 1982.

- Require developers to fund road improvements that reduce the impedance of through traffic, such as right turn lanes, left turn pocket lanes and bypass lanes for left turning vehicles.
- Place parking behind or beside buildings and screen parking when possible to make the building the focal point of the destination. Use green spaces to articulate the differences between driveways, parking and pedestrian areas.
- Encourage easements between parcels for the interconnection of non-residential sites that allow employees and customers to move from site to site without repeatedly entering and exiting the arterial.
- Allow for pedestrian access between commercial developments. Crossing points for pedestrians should be across driveways rather than through parking areas. Encourage separate sidewalks and walking paths in parking lots for retail, office and commercial uses.
- Driveways and tapers should be long enough to permit deceleration of entering vehicles. Separate vehicular and pedestrian traffic as much as possible. Foot traffic should be permitted to access buildings without crossing driveways or large parking areas.
- Non-residential driveway entrances should be designed to prevent vehicles on the arterial from queuing while waiting to access the site. By providing adequate depth or driveway length at the curb cut access, vehicles are allowed sufficient maneuvering space on site to move away from the entrance and allow other vehicles to efficiently and safely enter or exit the site.

With the exception of FEE Turnpike, Route 3 and NH 101A carry the highest traffic volumes in Merrimack. NRPC is currently implementing the NH 101A Capacity Preservation Program to identify solutions to preserving roadway capacity along this route. An additional capacity preservation study of Route 3 in Merrimack may be beneficial. In addition, the NH Department of Transportation (DOT) requests that Towns participate in a Memorandum of

Understanding with the DOT to ensure that new curb cuts and access points taken from state roads are sufficiently reviewed using access management principles. In 2001, Merrimack adopted comprehensive access management regulations as part of the Planning Board's Site Plan Review Regulations while this Master Plan update was in process.

5. Scenic Roads

As New Hampshire's residential, commercial and industrial development has grown, so has the need to improve the road system, thereby reducing the number of country roads that constitute an important asset to the State. To prevent the elimination of scenic roads, communities are enabled by NH RSA 231:157 to designate roads other than state highways as Scenic Roads. This law protects such roads from repair or maintenance, which would involve the cutting or removal of medium and large-sized trees, except with the written consent of an official body. The law is an important tool in protecting the scenic qualities of roads. The large trees and stonewalls that line many rural roads are irreplaceable and contribute heavily to the New England character of the region's towns. The Scenic Road designation does not affect the rights of any landowner with respect to work on his or her own property except in the case where RSA 472:6 limits the removal or alteration of boundary markers including stone walls. Although, there are currently no designated Scenic Roads in Merrimack, certain roads in the more rural western part of Town may be candidates for designation.

I. STATE AND REGIONAL TRANSPORTATION ISSUES

1. FE Everett Turnpike Exit 12

As discussed previously in this chapter, FE Everett Turnpike Exit 12 is a partial interchange with southbound ramps only. Motorists seeking to access the Turnpike in the northern section of Town for points north, must either travel north on Route 3 through Bedford, or travel south through the Town Center area to Exit 11. Similarly, motorists on the Turnpike with destinations in northern Merrimack must also either exit the Turnpike in Bedford and travel down Route 3 to Merrimack or exit at Exit 11 and travel north on Route 3. This increases traffic significantly on what is already the most congested section of road in Merrimack. In addition, the lack of a full interchange at Exit 12 is a significant hindrance to development of Merrimack's northern commercial and industrial districts. The addition of northbound ramps at Exit 12, therefore, is important both for reducing traffic congestion Route 3 as well as for improving access to northern Merrimack to meet the needs of area residents and to provide for the Town's continued economic well being.

2. FE Everett Turnpike Ramp Tolls

The continued existence of ramp toll on all three of Merrimack's Turnpike Exits has been a perennial issue of concern in Merrimack. Ramp tolls do not exist for Turnpike exits in neighboring Nashua, Bedford or Manchester. Several recent initiatives, including bills introduced in the legislature, have failed to succeed in eliminating the tolls. As a part of one of those more recent initiatives, the NHDOT contracted the engineering consultant firm of Wilbur Smith to study alternative financing mechanisms on New Hampshire's Turnpike system. The study was prompted by changes in the rules that allow federal highway funds to be used in the state turnpike system. This fiscal impact study includes an assessment of the impacts of

omitting the Exit 9 ramps from the proposed Circumferential Highway, in addition to a financial assessment of omitting tolls from the system.

The analysis was conducted for five highway alternatives plus a base year "No-Build" alternative with variations on the road connections and toll locations. The analysis horizon years were for 2005 and 2009. The 2005 horizon year assumed five tolled and non-tolled variations (with and without Exit 9 ramps) with the Circumferential completed between Route 3 in Merrimack and NH 3A in Litchfield. The 2009 horizon year assumed five tolled and non-tolled variations (with and without Exit 9 ramps) with the Circumferential completed beyond NH 3A on the east side to NH 102 and NH 111 in Hudson. The base year analyses for 2005 and 2009 assumed that the Circumferential is not built in those horizon years. The level of service and the financial impacts were evaluated for each option for the horizon years of 2005 and 2009.

The study concluded that the alternative that calls for the removal of ramp tolls from Exits 10 and 11 and increases the main line toll in Bedford from 75 cents to one dollar would essentially be net revenue neutral. However, this scenario causes a significant increase in traffic on Route 3 between Exit 11 and the Bedford Town line. The alternatives that involved no ramp toll removal would generate additional revenue. The study concluded that the elimination of ramp tolls attracts more vehicles per day to the FEE Turnpike mainline south of Exit 8 with fewer vehicles using Exit 8 and 9 ramps to and from the south, choosing to remain on the FEE Turnpike in the absence of the exit tolls.

The Wilbur Smith study also concluded that if the Exit 9 ramps to the FEE Turnpike were not constructed, the impacts would be greatest on Route 3. The most significant impact of the Circumferential Highway would be on Route 3 south of the proposed Circumferential Highway at the Nashua/Merrimack line, with or without tolls. The future level of service for 2005 would be at LOS F during the peak hour on this segment of the highway without the construction of Exit 9. This location would experience LOS F conditions under all alternatives in 2009 except for alternative five. The NHDOT has committed to constructing the Circumferential Highway from the FEE Turnpike (including the Exit nine ramps) to NH 111 in Hudson in the State's Ten Year Plan. The construction of the Circumferential Highway without the Exit 9 ramps is unlikely to occur. Table V-8 compares the average daily traffic among the various alternatives along the Route 3 corridor and the FEE Turnpike corridor in Merrimack for the horizon years 2005 and 2009. Table V-9 compares the level of service for the study alternatives.

Table V-8: Wilbur Smith Toll Study Future Traffic Forecasts Average Daily Traffic (ADT)

	Circ Hwy Exit 9 Ramps	Route 3 (DWH) north of Exit 10	Route 3 (DWH) south of Exit 10	Route 3 (DWH) north of Circ Hwy.	Route 3 (DWH) south of Circ Hwy. (Nashua)	FEE Turnpike South of Exit 10
2005 Base ADT	---	18,500	18,700	18,800	20,000	62,800
2005 Alt. 1 Tolls on Circ Hwy.	18,600	18,000	16,500	16,700	20,600	67,400
2005 Alt. 2 No Tolls on Circ. Hwy (with Exit 10 & 11 tolls)	24,800	17,300	14,800	14,900	21,200	67,600
2005 Alt. 3 No Exit 9 ramps, No Tolls on Circ. Hwy (with Exit 10 & 11 tolls)	---	17,600	22,000	21,000	24,800	60,200
2005 Alt. 4 No Tolls on Exits 10, 11, No tolls Circ Hwy	28,800	8,800	3,000	3,100	17,900	86,200
2005 Alt. 5 No Tolls on Exits 10, 11, No tolls Circ Hwy, No Rte 3 Circ Hwy connection	21,600	9,400	9,100	9,200	7,600	81,800
2009 Base ADT	---	19,800	20,600	20,600	25,700	68,200
2009 Alt. 1 Tolls on Circ Hwy.	24,800	18,900	15,800	15,600	27,600	75,400
2009 Alt. 2 No Tolls on Circ. Hwy (with Exit 10 & 11 tolls)	32,200	19,200	16,900	16,900	29,700	76,800
2009 Alt. 3 No Exit 9 ramps, No Tolls on Circ. Hwy (with Exit 10 & 11 tolls)	---	22,200	26,900	23,700	35,100	68,400
2009 Alt. 4 No Tolls on Exits 10, 11, No tolls Circ Hwy	37,200	7,100	4,100	4,200	28,200	95,000
2009 Alt. 5 No Tolls on Exits 10, 11, No tolls Circ Hwy, No Rte 3 Circ Hwy connection	33,800	10,100	11,500	11,500	12,200	90,000

Table V-8 shows that the Exit 9 Circumferential Highway ramps carry the most traffic in the 2005 and 2009 future scenarios that have no tolls on the Circumferential and no tolls on Exits 10 and 11 (28,800 vpd and 37,200 vpd). This encourages through traffic and local traffic to optimize use of the highway system instead of the local road network. Table V-9 also shows that future traffic on Route 3 would be greatest under the scenarios that eliminate Exit 9 from the highway network.

Table V-9: Wilbur Smith Toll Study Future Level of Service

	Circ Hwy Exit 9 Ramps	Route 3 (DWH) north of Exit 10	Route 3 (DWH) south of Exit 10	Route 3 (DWH) north of Circ Hwy.	Route 3 (DWH) south of Circ Hwy. (Nashua)	FEE Turnpike South of Exit 10
2005 Base LOS	---	A	A	E	E	D
2005 Alt. 1 Tolls on Circ Hwy.	A	A	A	E	E	C
2005 Alt. 2 No Tolls on Circ. Hwy (with Exit 10 & 11 tolls)	B	A	A	E	E	C
2005 Alt. 3 No Exit 9 ramps, No Tolls on Circ. Hwy (with Exit 10 & 11 tolls)	---	A	A	E	F	D
2005 Alt. 4 No Tolls on Exits 10, 11, No tolls Circ Hwy	B	A	A	C	E	D
2005 Alt. 5 No Tolls on Exits 10, 11, No tolls Circ Hwy, No Rte 3 Circ Hwy connection	A	A	A	D	D	D
2009 Base LOS	---	A	A	E	F	E
2009 Alt. 1 Tolls on Circ Hwy.	B	A	A	E	F	C
2009 Alt. 2 No Tolls on Circ. Hwy (with Exit 10 & 11 tolls)	B	A	A	E	F	D
2009 Alt. 3 No Exit 9 ramps, No Tolls on Circ. Hwy (with Exit 10 & 11 tolls)	---	A	B	E	F	E
2009 Alt. 4 No Tolls on Exits 10, 11, No tolls Circ Hwy	C	A	A	C	F	E
2009 Alt. 5 No Tolls on Exits 10, 11, No tolls Circ Hwy, No Rte 3 Circ Hwy connection	B	A	A	E	E	D

J. CONCLUSIONS AND RECOMMENDATIONS

The Town of Merrimack is generally well served by the State and regional transportation system and overall levels of resident satisfaction appear to be high. Maintaining good access to the state and regional transportation is essential to Merrimack's economy and to the convenience, comfort and prosperity of its residents. In order to preserve and enhance the transportation system and to address issues of concern to Merrimack residents, various improvements will be required to correct existing deficiencies and to address projected increases in traffic. These include the implementation of improvements to the state highway system such as the Manchester Airport Access Road, the development of a full interchange at Exit 12 and seeking parity in the statewide Turnpike toll system. Local improvements to Route 3, and planning and development of improvements for pedestrians, bicyclists and commuter rail are also addressed. A summary of the principal recommendations of the Master Plan related to Transportation is provided below.

1. Continue to work with state and regional officials toward implementation of the Manchester Airport Access Road 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 FE Everett Turnpike.

2. Work with State and regional officials to achieve development of a full interchange at Exit 12 to improve access to the Turnpike for the 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.
3. Should the proposed Circumferential Highway project be implemented, continue to encourage the development of the Exit 9 highway ramps as proposed under the current "Partial Build" alignment for the highway and continue to oppose any alternative that would terminate the proposed Circumferential Highway at Route 3.
4. 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.
5. 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.
6. Implement the improvements recommended in the 1999 Louis Berger study for the Route 3 Urban Compact area.
7. Continue to utilize access management guidelines as a tool to manage development in major highway corridors including Route 3 and NH 101A. Consider adopting a memorandum of understanding with the NH Department of Transportation to ensure that access management techniques are implemented along state highways in Merrimack.
8. Support the extension of passenger rail service into New Hampshire including the provision of one or more passenger rail stations in Merrimack and continue to work with state and regional officials toward implementation.
9. 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 industrials areas, schools, parks and other public and private institutions and facilities. Encourage sidewalks to be included in all state and local road improvement projects.
10. 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 though utilization of existing Class VI roads.
11. 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.
12. Continue to pursue State and Federal grants for the maintenance and improvement of the Town's street and highway system, bridges, sidewalks and other improvements where appropriate.

APPENDIX V-A

State Aid Classification

Class I, Primary State Highway System, consists of all existing or proposed highways on the primary state highway system, excepting all portions of such highways within the compact sections of towns and cities, provided that the portions of turnpikes and interstate highways within the compact sections of those cities are Class I highways.

Class II, Secondary State-Highway System, consists of all existing or proposed highways on the secondary state highway system, excepting portions of such highways within the compact sections of towns and cities. All sections improved to the satisfaction of the Commissioner are maintained and reconstructed by the State. All unimproved sections, where no state and local funds have been expended, must be maintained by the Town or city in which they are located until improved to the satisfaction of the highway commissioner. All bridges improved to state standards with state-aid bridge funds are maintained by the State. The city or town shall maintain all other bridges until such improvement is made.

Class III, Recreational Roads, consist of all such roads leading to, and within state reservations designated by the Legislature. The NH DOT assumes full control of reconstruction and maintenance of such roads.

Class IV Highways, consist of all highways within the compact sections of cities and towns listed in RSA 229:5, V. The compact section of any such city or town shall be the territory within such city or town where the frontage on any highway, in the opinion of the Highway Commissioner, is mainly occupied by dwellings or buildings in which people live or business is conducted, throughout the year. No highway reclassification from Class I or II to Class IV shall take effect until all rehabilitation needed to return the highway surface to reputable condition has been completed by the State.

Class V, Rural Highways, consist of all other traveled highways which the Town or city has the duty to maintain regularly.

Class VI, Un-maintained Highways, consist of all other existing public ways, including highways subject to gates and bars, and highways not maintained in suitable condition for travel for five years or more.

The Functional Classification Scheme

Functional System		General Characteristics
Principal Arterial	1.	Provides corridor movement suitable for substantial statewide or interstate travel and provides continuity for all rural arterials which intercept the urban area.
	2.	Serves the major traffic movements within urbanized areas such as between central business districts and outlying residential areas, between major intercity communities, or between major suburban centers.
	3.	Serves a major portion of the trips entering and leaving the urban area, as well as the majority of the through traffic desiring to bypass the central city.
Minor arterial	1.	Serves trips of moderate length at a somewhat lower level of travel mobility than principal arterials.
	2.	Provides access to geographic areas smaller than those served by the higher system.
	3.	Provides intracommunity continuity, but does not penetrate identifiable neighborhoods.
Collector	1.	Collects traffic from local roads and channels it into the arterial system.
	2.	Provides land access and traffic circulation within residential neighborhoods, commercial and industrial area.
Local	1.	Comprise all facilities not on higher systems.
	2.	Provides access to land and higher systems.
	3.	Through traffic usage discouraged.

Appendix V-B

Historic Traffic Counts - Merrimack

	Amherst Rd. West of Turkey Hill Rd. 297030			Baboosic Lake Rd. East of FEE Tnpk. 297050			Back River Rd. at Bedford Town Line 297046		
Year	Mo.	Total	Yearly % Change	Mo.	Total	Yearly % Change	Mo.	Total	Yearly % Change
1990				5	11,651				
1991									
1992	7	3,554		9	10,045	-7.1%			
1993				6	12,731	26.7%			
1994	8	3,770	3.0%	8	10,622	-16.3%			
1995	10	3,883	3.0%	10	11,101	4.5%			
1996				8	10,644	-4.1%			
1997							7	3,060	
1998	8	4,897	8.0 %	10	11,636	4.6%			
1999									
2000	8	4,387	-5.3%						
Avg Yrly %			2.7 %			-0.016%			

	Bedford Rd. over Baboosic Brook 297037			Bedford Rd. West of FEE Turnpike 297042			McQuestion Rd. East of Turkey Hill Rd. 297043		
Year	Mo.	Total	Yearly % Change	Mo.	Total	Yearly % Change	Mo.	Total	Yearly % Change
1990									
1991				4	5,042				
1992	9	4,962		9	9,568	89.8%			
1993				4	6,371	-33.4%			
1994				4	6,167	-3.2%			
1995									
1996	6	5,191	1.1%	6	7,334	9.1%		8,675	
1997				5	7,199	-1.8%			
1998									
1999	6	6,029	5.1%				6	9,857	4.3%
Avg Yrly %			2.8%			6.1%			4.3%

	Boston Post Rd. at Amherst Town Line 297065			Camp Sargent Rd. East of Tinker Rd. 297057			Continental Blvd. North of Camp Sargent Rd. 297003		
Year	Mo.	Total	Yearly % Change	Mo.	Total	Yearly % Change	Mo.	Total	Yearly % Change
1990	8	7,330		6	8,860				
1991	5	6,710	-8.5%						
1992				6	9,593	4.1%		8,149	
1993	4	4,782	-15.6%				7	8,288	1.7%
1994				4	1,909	-55.4%			
1995	5	5,285	5.1%						
1996									
1997				7	2,383	7.7%			
1998	7	5,620	2.1%	7	2,393	0.4%	8	11,557	6.9%
Avg Yrly %			-3.3%			-15.0%			6.0%

	Continental Blvd. North of NH 101A 297058			Peaslee Rd. North of Naticook Rd. 297014			Turkey Hill Rd. North of Amherst St. 297525		
Year	Mo.	Total	Yearly % Change	Mo.	Total	Yearly % Change	Mo.	Total	Yearly % Change
1990	6	12,139							
1991	5	11,418	-5.9%						
1992									
1993	6	11,648	1.0%				8	6,989	
1994				7	3,084				
1995	4	11,111	-2.3%						
1996	8	12,730	14.6%						
1997				8	3,283	2.1%	7	8,055	3.6%
1998	6	15,081	8.8 %						
1999									
2000							8	8,433	1.5%
Avg Yrly %			2.7%			2.1%			2.7%

	Greeley St. West of Route 3, DW Hwy. 297059			Industrial Dr. East of FEE Turnpike 297517			Joppa Rd. North of Baboosic Lake Rd. 297518		
Year	Mo.	Total	Yearly % Change	Mo.	Total	Yearly % Change	Mo.	Total	Yearly % Change
1990							7	3,178	
1991	8	15,064		6	5,187				
1992									
1993	8	15,499	1.4%				8	2,849	-3.6%
1994									
1995				9	5,793	2.8%			
1996									
1997	10	17,859	3.6%				7	2,709	-1.3%
1998				6	7,072	6.9%			
1999									
Avg Yrly %			2.9%			4.5%			-2.3%

	NH 101A at Hollis Town Line 297066			NH 101A At Nashua City Line 297051			Route 3 (DW Hwy) at Nashua City Line 297054		
Year	Mo.	Total	Yearly % Change	Mo.	Total	Yearly % Change	Mo.	Total	Yearly % Change
1990	10	25,446							
1991									
1992	8	28,357	5.6%	9	34,164		4	17,873	
1993	6	28,986	2.2%						
1994	9	28,841	-0.5%				8	16,994	-2.5%
1995	5	30,057	4.2%	4	35,895	1.7%	4	16,975	-0.1%
1996	5	30,377	1.1%	9	35,153	-2.1%	4	16,676	-1.8%
1997	5	31,170	2.6%				5	18,152	8.9%
1998				10	37,313	3.0%	8	17,154	-5.5%
Avg Yrly %			2.6%			1.5%			-0.7%

	Route 3 (DW Hwy) South of Greeley St. 297022			Route 3 (DW Hwy) South of Souhegan River 297067			Naticook Rd. North of Peaslee Rd. 297522		
Year	Mo.	Total	Yearly % Change	Mo.	Total	Yearly % Change	Mo.	Total	Yearly % Change
1990	5	22,855					8	1,713	
1991	8	18,593	-18.6%	3	20,398				
1992	9	17,233	-7.3%	9	21,645	6.1%			
1993							8	2,443	12.6%
1994				5	20,043	-3.8%			
1995				10	19,332	-3.5%			
1996									
1997				8	21,160	4.6%	7	2,356	-0.9%
1998	8	18,789	1.5%						
Avg Yrly %			-2.4%			0.6%			4.7%

	FEE Turnpike Between Exits 10 and 11 297016		
Year	Mo.	Total	Yearly % Change
1995		42,000	
1996		44,000	4.8%
1997		44,000	0.0%
1998		46,000	4.5%
1999		49,000	6.5%
Avg Yrly %			3.9%

Appendix V-C

Level-of Service Descriptions

Level of Service "**A**" represents free flow. Individual users are virtually unaffected by the presence of others in the traffic stream.

Level of Service "**B**" is in the range of stable flow, but the presence of other users in the traffic stream begins to be noticeable. Freedom to select desired speeds is still relatively unaffected.

Level of Service "**C**" is in the range of stable flow, but marks the beginning of the range of flow in which the operation of individual users becomes significantly affected by interactions with others in the traffic stream. Occasional backups occur behind turning vehicles.

Level of Service "**D**" represents high-density, but stable, flow. Speed and freedom to maneuver are restricted, and the driver experiences a below average level of comfort and convenience. Small increases in traffic flow will generally cause operational problems at this level.

Level of Service "**E**" represents operating conditions at or near the capacity level. All speeds are reduced to a low, but relatively uniform level. Freedom to maneuver within the traffic stream is extremely difficult, and is generally accomplished by forcing other vehicles to give way. Congestion levels and delay are very high.

Level of Service "**F**" is representative of forced or breakdown flow. This condition exists wherever the amount of traffic approaching a point exceeds the amount that can traverse the point, resulting in lengthy queues.

#235C-5

CHAPTER VI
COMMUNITY FACILITIES

A. INTRODUCTION

This chapter examines the existing conditions, levels of service, and future needs of the municipal facilities and services provided in Merrimack. In addition, various privately owned and operated facilities that provide services to Merrimack residents are considered. The future public facility and service needs projected are based on buildout population estimates. The chapter includes an analysis and a discussion of the Town Center area, the Town Hall complex, police, fire and ambulance services and facilities, public works, the library, education facilities, parks and recreation and other facilities.

B. TOWN SURVEY AND SWOT ANALYSIS

To ensure that the Master Plan addresses the Town's principal issues of concern related to community facilities and services, the results of the 1998 Board of Selectmen Town-wide survey and the Master Plan Advisory Committee's SWOT exercise (see Chapter I – Introduction) along with general Committee discussions and presentations, were relied upon to inform and guide the planning process. The results of the 1998 Town Survey in relation to Transportation are as follows:

- When asked, "*…what is the primary reason that you chose to locate in Merrimack rather than a neighboring town?*", a substantial number of respondents cited "*quality of schools*" as their first choice. However, few people ranked "*recreation facilities*" and "*general availability of utilities and services*" as their first choice, preferring rather to locate in the Town for reasons of job access and for its attractive natural setting.
- A majority of those respondents with an opinion chose to support construction and manning of a fire station in the northwest section of the Town; improvements to the existing fire station and hiring of additional personnel to enhance current fire protection coverage; construction of a new library; and curbside recycling. A majority of those respondents with an opinion chose not to support replacement of the swimming pool at Wasserman Park.
- A majority of respondents with an opinion rated the Town public safety services as "good" or "excellent."
- A majority of respondents with an opinion rated various aspects of the Town school facilities as "good" or "excellent."
- A vast majority of respondents felt that the Town recreation facilities were "generally in good condition" and "conveniently located."
- 77% of respondents felt that the Town should "*…develop more conservation land, parks, trail systems or a nature center*."
- A vast majority of respondents prefer to keep taxes at or below current levels.

The results of the SWOT exercise that can be related to Public Facilities are shown below.

a) Strengths
   1) Good public / municipal and emergency services

b) Weaknesses
   1) School classroom space
   2) Lack of Town Center uniqueness / character

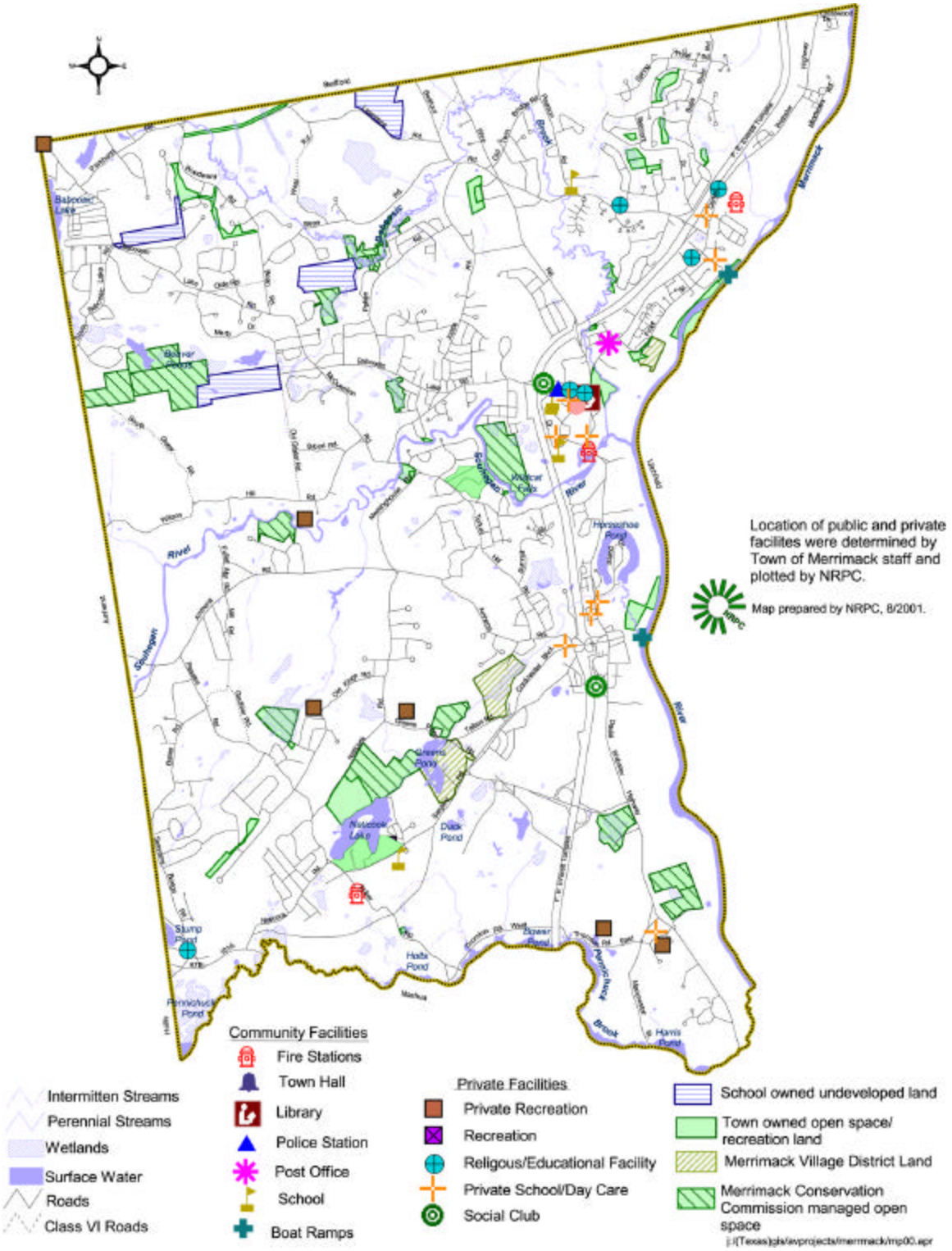
c) Opportunities
   1) Develop river / lake access
   2) Promotion and development of Town Center
   3) More school space
   4) Expansion of Town parks, rivers and activities for all ages

d) Threats
   1) Lack of quality school facilities

e) The Town should (in order of highest to lowest ranked) …
   1) Acquire land for a variety of purposes
   2) Implement Town Center Plan
   3) Improve quality of schools
   4) Pursue state and federal funding
   5) Develop a long range plan for schools
   6) Preserve the tax rate and find innovative financing for Town projects
   7) Protect Wasserman Park
   8) Build elementary school facilities with a kindergarten

Overall, the Town Survey and SWOT analysis were fairly consistent, indicating high levels of satisfaction and support for emergency services, schools, and park and recreational facilities (including waterfront access) along with a desire to implement improvements to those facilities and services. The construction of a new library was also supported. Although improvements are desired, there is also an indication that grants and alternative funding mechanisms should be pursued to minimize impacts to the taxpayers.

Map VI-1: Community Facilities



C. TOWN CENTER

Merrimack's Town Center is approximately one square mile in area, and is bounded by the FE Everett Turnpike to the west, the Merrimack River to the east, the Commons shopping Center to the north and the Village Mall to the south. The Town Center generates a great deal of activity due to a concentration of public facilities and commercial establishments. Public facilities in the Town Center include Town Hall, the High School, Mastricola Middle School and Elementary School, the library, the central fire station, the police headquarters and the Post Office.

In 1999, the Town developed a Town Center Plan (see Chapter X, Town Center Master Plan) to address and manage a broad range of issues affecting the existing concentration of public and private facilities, businesses and residences within the Town Center. The main issues that prompted the plan were: 1) traffic circulation problems in and around the Town Hall site; 2) traffic issues related to Route 3; 3) expansion of municipal facilities including the new Police Station, central Fire Station and proposed library location; 4) expansion of the school complex; and 5) general concern for improved aesthetics in the area.

One of the main issues facing the Town Center is the need to expand certain municipal, school district and private facilities. Due to the growing population of Merrimack and surrounding towns, several institutions are outgrowing their current facilities and are in need of expansion or relocation to accommodate this growth. These include: 1) the library was designed for a population half the size of the current population; 2) the District Court needs space to increase staffing and address safety and security issues; 3) traffic circulation and parking is problem in Town Hall and in the Our Lady of Mercy Church parking lot; 4) Town offices may require some expansion at buildout; and 5) the Superintendent of Schools requires larger office space.

Chapter X, Town Center Master Plan, outlines the recommendations for the town center. Since the plan was developed in 1999, the following new issues have emerged: 1) the ambulance services are now being provided primarily by the central fire station and so the ambulance garage space may occasionally be available for other uses; 2) the long term needs of the Our Lady of Mercy Church may cause them to relocate out of the town center; and 3) relocation of the library may free up existing library space. The Master Plan Advisory Committee recommends that the two highest priorities for relocation are the library and the Department of Public Works administrative building and these facilities should remain in the Town Center. Due to the various issues involved with space needs and the undetermined future of the District Court and other departments, a firm recommendation as to the exact location of the library and the DPW facility cannot be made at this time. However, if and when space is freed up by the relocation of these facilities, the space could be utilized for alternate uses.

D. TOWN HALL/MUNICIPAL CENTER COMPLEX

The Town Hall complex is located on a 3.4-acre parcel at the intersection of Baboosic Lake Road and McElwain Street near Route 3. The majority of the site consists of parking, landscaping and administrative offices. The two main buildings on this site are the Old Town Hall (the West Wing), dedicated in 1873, and the East Wing, constructed in 1980. These

buildings comprise 15,185 square feet and are connected by an open breezeway. Other buildings on the site include the ambulance facility and the Kent Building that contains the Department of Public Works administrative offices. An adjacent 3.14-acre site, known as Abbie Griffin Park, borders Route 3 and contains a bandstand and benches. The park was developed for the Town's 250th anniversary in 1996.

The Town Hall complex generates a great deal of activity. During the day, people visit Town Hall to obtain various licenses, permits or approvals, register vehicles, pay taxes or obtain information. The Town Hall site also houses the District Court, which generates significant daytime activity. On weekday evenings, various boards and committees use the District Court and other rooms in Town Hall for meetings. Evening and weekend events at Abbie Griffin Park also bring many residents to the site in the spring, summer and fall.

Town Hall

Many municipal departments utilize the two main buildings on the Town Hall site. The first floor of the West Wing contains the Finance and Welfare Departments. The second floor contains the Merrimack District Court and associated offices. The Planning Board, the Zoning Board of Adjustment and other committees use the District Courtroom in the evenings. The main floor of East Wing contains the offices of the Selectmen, Town Manager, Town Clerk and the Assessor. There is also a conference room used by the Board of Selectmen and other departments. The lower level of the East Wing contains the offices of the Community Development Department, a small conference room and a cable TV studio. There is also a finished attic in the East Wing that is used for offices and storage space. There are no elevators in either building, which limits access for people with disabilities. However, the main level and lower level of the east wing and the main level of the west wing can be accessed at ground level from the outside. A chair lift is used to access the second floor Courtroom in the West Wing. Large public meetings, such as the Annual Town Meeting, are held at the Middle School or in the High School auditorium.

The two Town Hall buildings underwent significant changes in 1995 and 1996. One of these changes was the relocation of the Police Department from the lower level of the East Wing to the current facility on Baboosic Lake Road. The former Police Station was then renovated to serve as offices for the Community Development Department, which in turn freed up space in the West Wing for other municipal offices.

The District Court is currently located on the second floor in the West Wing of Town Hall and occupies 3,354 square feet. The Court has occupied these facilities since the 1960s and was originally incorporated as the Merrimack Municipal Court. The Court began accepting cases from Bedford in 1972 and from Litchfield in 1997. The District Court has more than 100

visitors a day and hears cases involving motor vehicle violations, small claims and civil suits, Town ordinance violations and domestic violence cases. There are 5 employees, including one bailiff and two judges that preside over nearly 8,000 cases a year. Court is in session Monday-Thursday from 8:30 am to 4:00 PM.

The District Court is considering relocating from the Town Hall to another existing building or a custom built-facility due to certain deficiencies in at the current location. The Court is understaffed relative to the annual caseload and the space in Town Hall is limited. Safety and security at the current facility are also an issue. According to the Merrimack Fire Department, the West Wing of Town Hall does not meet all modern fire codes. There are also safety and security issues resulting from there being only one public entrance into the West Wing of Town Hall. Since the Court hears cases on a variety of issues, including domestic violence cases, the main entrance is guarded by the bailiff. The bailiff is required to be in the Courtroom while it is in session. There are no metal detectors at the main entrance of the building, allowing anyone to walk into the Courtroom without being searched after the bailiff is in Court.

Relocation options are currently being explored, including the possibility of moving to the current Library facility once it is vacated, or constructing a new facility elsewhere. There is some interest in keeping the District Court in the Town Center, however, mainly because of its proximity to the Police Station. The Master Plan Advisory Committee suggests that keeping the District Court in the Town Center is not a priority, however, so other sites should also be investigated. Other departments can utilize any space freed up by the Court as they grow to accommodate buildout population.

In Merrimack, there are currently 38 employees utilizing the two Town Hall buildings, including the District Court staff (see Table VI-1). This is an average of 1.51 employees per 1000 population. Assuming this average will continue to buildout, it can be estimated that the Town Hall (including District Court) will need to accommodate 49 employees at a buildout population of 31,895 (see Table VI-2).

Table VI-1: Town Hall Personnel Composition, Year 2001

Department	Quantity
Community Development	10
Selectmen	4
Assessing	5
Town Clerk & Assessor	6
Communications	3
Finance	4
Welfare	1
District Court	5
Total:	**38**

Source: Merrimack Community Development Department, 2001.

Although there are no specific standards regarding space requirements for “Town Hall” or municipal facilities, available survey research indicates that the average space per employee

in a general office building is 208 square feet.[1] However, municipal facilities require additional space for public access / egress, storage of Town records and meeting space. Cannon Associates, which conducted a Town of Merrimack impact fee study in 1988,[2] recommends a standard of 312 square feet of municipal facility gross floor area (gfa) per employee in order to accommodate for this additional space. Therefore, 312 square feet gfa per employee is used as a standard for the purpose of this master plan.

Table VI-2: Town Hall Employees and Floor Area, Year 2000 and Buildout

Time Period	Population	# Employees	Floor Area Required** (sq. ft.)	Floor Area Provided (sq. ft.)*
2000	25,199	38	11,853	15,185
Buildout	31,895	49*	15,288	-

Source: US Census and Town of Merrimack Buildout Study, 2001.
*Based on current average of 1.51 employees per 1000 population.
**Based on standard of 312 square feet of municipal facility per employee.

Therefore, the Town Hall should provide 11,853 square feet gfa to accommodate the existing 38 employees, which means that the Town Hall facility is currently more than sufficient (see Table VI-2). At buildout, the Town Hall should provide 15,288 square feet gfa of facility to accommodate 49 employees, which means that the existing facility, with some interior changes, could likely accommodate this projected number of employees. Given that the District Court may relocate, the existing 3,354 square feet of District Court space could be renovated and contribute towards future Town Hall space needs. The estimates above do not consider the particular space needs of each department within Town Hall and therefore a detailed Town Hall Facilities Space Needs Study should be conducted for a more accurate picture of space needs at buildout. Impact fees may be an appropriate source of revenue for additional Town Hall facilities (see Section K).

E. PUBLIC SAFETY

The Merrimack Police Department and Fire Department are the principal agencies addressing public safety concerns in Town. Both departments depend on a central Communication Center to answer emergency calls and dispatch messages to the appropriate department. The Merrimack Ambulance Rescue Service provides ambulance service, which is a component of the Merrimack Fire Department.

1. Police Department

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. From 1970 through 1981, the Department was located in what is now the Adult Community Center. In 1981, the department moved to its former location in the lower level of the Town Hall's East Wing. Due to space

[1] Source: Institute of Transportation Engineers, Trip Generation, Washington, D.C., 1987, page 885)
[2] Source: Cannon Associates, Town of Merrimack Development of Impact Fee Schedules Final Report, Concord, NH 1988, page20.

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.

Since its relocation in 1996, the Police Department has been reevaluating and updating its services. One such improvement is the addition of a bicycle fleet. The bicycles allow police officers to more intimately patrol an area and establish personal contact with residents. The Police Department is also working on ways they can evaluate their service to the Town. The motto of the Merrimack Police Department is "Service to the Community." In keeping with that philosophy, supervisory officers conduct periodic evaluations of the officer's level of service to the Merrimack citizens. Six weeks after responding to a call for service, a Sergeant or Lieutenant revisits the caller and evaluates the service they received.

Police Department Headquarters

As of October 2001, the Merrimack Police Department had 42 state certified and sworn police officers, a Legal Department, a Criminal Investigations Bureau, a Narcotics Investigations Unit, a DARE Officer, a Community Services Officer, 2 Animal Control Officers, 2 School Crossing Guards and an administrative staff of 5 employees. Table VI-3 provides the composition of Merrimack's police force.

Table VI-3: Police Department Personnel Composition

Position	Quantity	Tenure*
Police Chief	1	FT
Deputy Chief	1	FT
Captains	2	FT
Detective Lieutenant	1	FT
Patrol Lieutenant	3	FT
Community Services Officer	1	FT
Sergeants	4	FT
Master Patrolmen and Patrolmen	16	FT
Prosecutor Lieutenant	1	FT
Detective First	6	FT
Animal Control Officer	1	FT
Animal Control Officer	1	PT
Office Manager	1	FT
Secretary I	1	FT
Clerk Typist II	2	FT
Clerk Typist II	1	PT
School Crossing Guard	2	PT

Source: Merrimack Police Department, Chief Joseph Devine, January 2001 and www.merrimackpd.org updated 10/12/2001.
*FT= Full-time; PT= Part-time (excluding temporary and casual labor)
Note: number of full time officers = 36. Does not include Animal Control

Table VI-4 provides an estimate of the number of full time law enforcement officers and facilities provided in 2001 and needed at buildout. The US Department of Justice, Uniform Crime Report[3], indicates that the national average is 2.3 officers per 1,000 population for all reporting agencies, and 1.9 officers per 1,000 population for agencies serving a population between 25,000 and 49,999. Figures for New England are 2.2 and 1.9 officers per 1,000 population, respectively. New Hampshire and the Nashua region have a very low crime rate in comparison to the United States average. Therefore it is not surprising that communities in the Nashua region report an average of 1.4 officers per 1,000 population[4]. For the purposes of this master plan, both the Nashua regional average of 1.4 and the New England Average of 1.9 are used to establish a range. To meet the regional standard, Merrimack would need to provide 36 full time law enforcement officers to support its 2000 population. To meet the New England Average, 48 officers would be required. The current level 42 officers, therefore, falls within range. At buildout, estimated to occur in the next 20 years, the Police Department would need to provide between 45 and 61 full time uniformed and civilian law enforcement employees.

The current Police Station provides 13,500 square feet of facility. Of this total, the Police Department utilizes 13,356 square feet with the remainder utilized by the Communications Center. According to the Police Department, the facility currently meets the needs of the existing Police Department and has adequate space available for expansion.

[3] Source: http://www.fbi.gov/ucr/Cius_97/97crime/97crime7.pdf
[4] Source: Nashua Regional Planning Commission, Fifty Years of Growth: Analysis of the Impacts on the Nashua Region, August 2001.

2. Fire Department

The Merrimack Fire Department is a full-time department and operates three stations throughout Town: 1) Central Fire Station, 2) South Merrimack Fire Station, and 3) the Reeds Ferry Fire Station. The Central Fire Station is located on Route 3 adjacent to the Souhegan River and serves as the department's headquarters and main facility. The 12,846 square foot station was originally built in 1959 and has been renovated twice; once in 1976 when a second story was added and again in 1998 when an addition was constructed on the front of the building. Although there is little room for future expansion, the most recent addition allows this station to serve as the Town's central fire station for the foreseeable future.

The South Merrimack Station is located on Naticook Road and serves the southern portion of Merrimack and is the first responder to northwest Nashua along Route 101A. This mutual aid agreement is returned when Nashua assists as the first responder to southeast Merrimack on the eastern side of the FEE Turnpike. The 2,480 square foot station was constructed in 1973 and expanded in 1987 to accommodate bedrooms and a day room. This station houses three fire fighters. Due to extensive development in South Merrimack, additional space for equipment and personnel is needed. The Capital Improvements Plan FY 2002-2008 (CIP) includes the construction of two additional garage bays, additional living space and an emergency generator in FY 2003/2004. This will provide an additional 5,480 square feet of facility, bringing the south station up to a total of 7,960 square feet.

Central Fire Station

The Reeds Ferry Station is located on NH Route 3 and serves the northeast portion of Merrimack. This 3,456 square foot facility was built in 1973 as a garage with limited facilities on a lot donated by General Electric. This station is staffed by volunteer "on-call" firefighters. The capital improvement program includes the renovation of this station to allow it to be transformed into a full-time facility and emergency shelter in FY 2005/2006. No additional floor area will be provided, however.

A fourth station is planned for the northwestern corner of Merrimack. 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 approximately 8,000 square foot proposed station is expected to occupy the front of the property, leaving the back portion for recreational fields and access to a new middle school. A northwest station will significantly reduce response times to this part of Town, which can be longer than 7 minutes because of traffic congestion and poor conditions on Baboosic Lake Road. The recommended response time of 4 minutes would be achievable from this new location.

In the last master plan update, two areas of delayed response were identified. Construction of the northwest station would meet the Insurance Services Office (ISO) criteria for the northwest portion of Merrimack. The ISO standard recommends that towns have municipal water available within a 1½-mile radius from each fire station (see Map VI-2 for response areas). This standard is set to ensure that all areas in a municipality are equally provided with water in case of fire emergencies. Much of the Amherst Street / NH Route 101A corridor in Nashua is also considered an area of delayed response, despite being served by public water. Due to traffic-induced delayed response times on Route 101A, the City of Nashua signed a formal written agreement with Merrimack in 2001. This agreement provides for automatic mutual aid from the South Merrimack Fire Station along Amherst Street to the Nashua Technical College. The agreement specifies that automatic dispatches will be sent to both stations (South Merrimack and Nashua Airport Stations) if the emergency is in the mutual aid area. Merrimack, in turn, receives aid from the Amherst Street Fire Station in Nashua, which covers the area north of the Town line along Daniel Webster Highway to BAE Systems. Because of this mutual aid agreement, the ISO ratings for the Merrimack and Nashua fire departments are excellent. The mutual aid agreement reflects positively on the community insurance rates for both municipalities. The Merrimack Fire Department is also part of the Souhegan Mutual Aid Association (serving Bedford, Wilton, Milford and Lyndeborough) and the Border Area Mutual Aid District (serving communities in New Hampshire and Massachusetts). The department has also entered into mutual aid agreements with Bedford and Manchester.

The core staff of the Fire Department is comprised of 41 full-time firefighters, 22 on-call firefighters and 20 ambulance volunteers (see discussion of ambulance services). Table VI-4 provides the current composition of the Merrimack Fire Department.

Table VI-4: Fire Department Personnel Composition

Position	Quantity
Chief	1
Assistant Chief	2
Fire Marshall	1
Captains	4
Lieutenants	4
Administrative Lieutenant	1
Firefighters	28
Administrative Assistant	1

Source: Merrimack Fire Department-Chief William H. Pepler, February 2001.

Map VI–2: Fire Stations and Response Areas

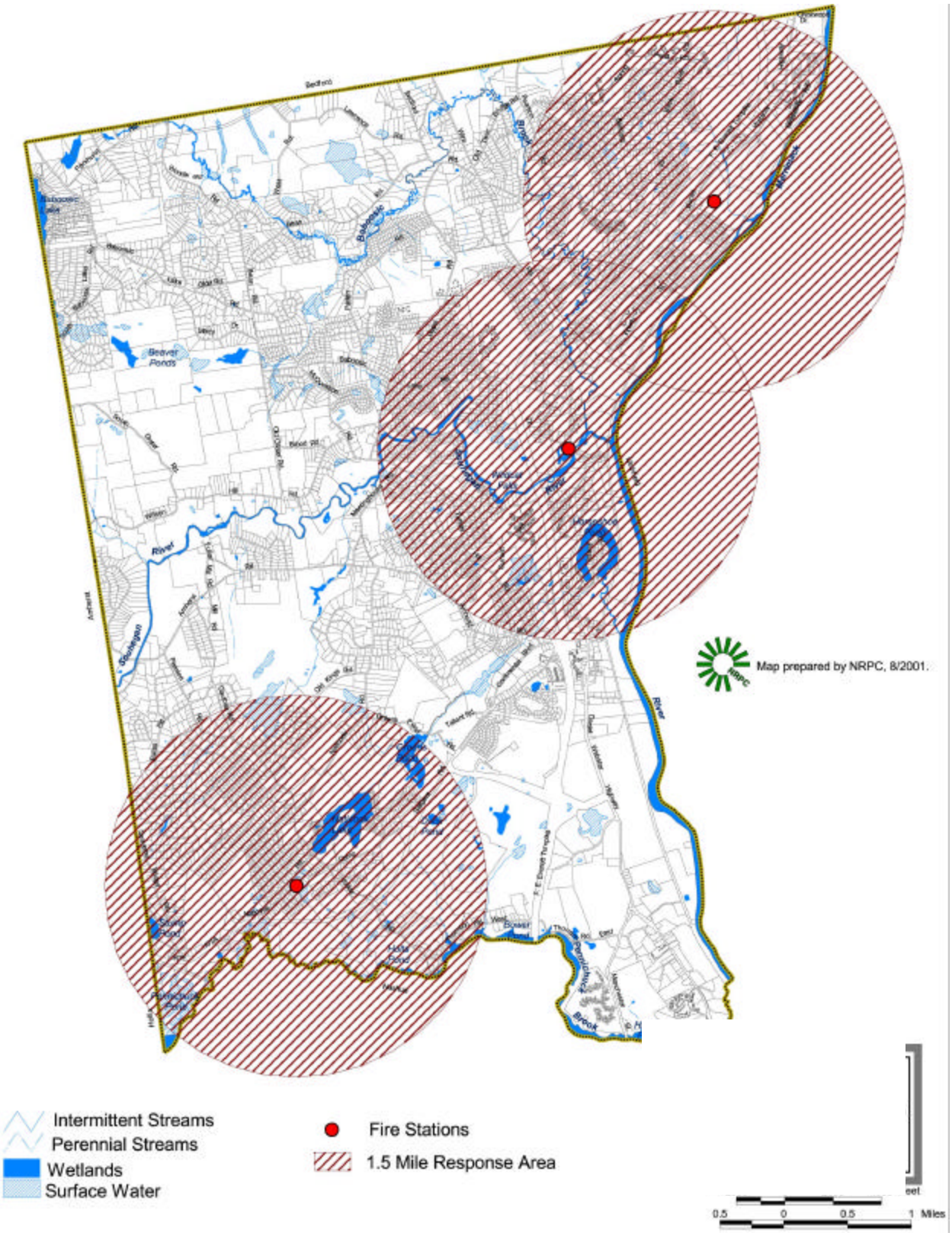


Table VI-5 provides an estimate of the number of firefighters and facilities provided in 2000 and needed at buildout. The NE US average number of full time and on-call fire fighters is 23.4 per 10,000 population and this is used as the standard for the purpose of this master plan. To meet the standard, Merrimack would need to provide 59 firefighters to serve its 2000 population. Merrimack currently exceeds the standard by four firefighters. At buildout, estimated to occur in the next 20 to 30 years, the Fire Department would need to provide a minimum of 75 full and on-call fire fighters to meet the standard. The proposed northwest station will add 12 new firefighters that would meet the demand at buildout.

Table VI-5: Fire Fighters, Year 2000 and Buildout

Time Period	Population	# Firefighters Provided*	# Firefighters Needed**	Facilities Provided (sq. ft.)	Facilities Needed*** (sq. ft.)
2000	25,199	63	59	24,262	-
Buildout	31,895	-	75	-	30,825

Source: US Census; Town of Merrimack Buildout Study; and Managing Fire Services (Green Book).
*Includes 41 full time and 22 on-call firefighters
**Based on NE US Average # Firefighters (23.4 / 10,000 citizens).
***Based on 411 square feet of facility per fire fighter (24,262 sq. ft. / 59 firefighters).

Assuming that current facilities plus the addition to the south station are adequate to house the current number of firefighters, a projection can be made to determine facility needs at buildout. There are currently 24,262 square feet of facilities (including the south station expansion) for a required 59 firefighters, or an average of 411 square feet per firefighter. Projecting this average forward yields a required 30,825 square feet of facilities needed for 75 firefighters at buildout. The proposed northwest fire station will add approximately 8,000 square feet of facilities to the current total of 24,262 square feet. Therefore, by FY 2005 / 2006, the Town should have a total of 32,262 square feet of Fire Department facilities, which is more than adequate to meet the needs at buildout.

3. Merrimack Ambulance Rescue Service

The Merrimack Ambulance Rescue Service (MARS) operates from an ambulance facility adjacent to Town Hall and from the Central Fire Station. The Service has two 1990 Ford 350S ambulances and one 1977 Wheel Coach ambulance, both of which are primarily stored at the central fire station. The 2,800 square foot ambulance facility was constructed in 1977 and includes space for offices, training and three vehicle bays. The facility is used primarily for MARS meetings, storage and periodic events. 20 volunteers who not only respond to emergency calls, but also use department vehicles to cover local activities like athletic events and fundraisers staff the ambulance service. The service is a division of the Merrimack Fire Department and is supervised by the Merrimack Fire Chief. This arrangement permits communication and coordination between the two departments and allows funds and equipment to be used more efficiently.

In the case of an emergency, regional hospitals located outside of Merrimack (Nashua and Manchester) provide needed medical attention. Merrimack does not currently have any major public health care facilities of its own.

4. Communications Center

The current Communications Center dispatches for the police, fire and ambulance services. In 1995, the center relocated from the lower level of the old Town Hall to its new location within the Police Department headquarters on Baboosic Lake Road. The communications center occupies 144 square feet in the Police Department facility. The center is staffed by an administrative services captain, who oversees a supervisor and seven dispatchers. The dispatchers work in groups of two, 24 hours a day, 7 days a week. Although the Police Department and Communications Center share the same building, with the Chief of Police overseeing both departments, the two are considered separate departments with separate budgets.

The Communications Center is charged with the responsibility of receiving requests for fire, police and ambulance service and disseminating the information to the appropriate party. Requests for emergency services are also received from a variety of other agencies throughout the Town and the State, such as the Department of Public Works, the Merrimack Village District, New Hampshire State Police, and Hillsborough County.

In 1992-1993, the State of New Hampshire established the E911 system. E911 is a statewide system, centrally located in Concord that answers all 911 calls placed throughout the state. When a call is received by E911, an automated caller identification system locates the call and immediately contacts the appropriate town. In Merrimack, this system is made more efficient with the use of a computer that alerts the Communications Center that an emergency call to E911 was made in Merrimack, and immediately prompts the dispatcher to alert the appropriate department (fire, police, ambulance). The computer alert is followed up with a phone call from E911 to confirm the emergency with the dispatcher.

The E911 system provides emergency services 24 hours a day, 7 days a week. Prior to 1992 and the E911 systems, emergency dispatch services were only available to about 75 percent of the Town. Merrimack has taken it a step further with the use of the computer alert service by eliminating any miscommunication between E911 and the Town communications center (i.e. the phonetic difference between Ferry Street and Derry Street on the phone is eliminated by allowing the local dispatcher to see the words first). This makes communication more efficient and decreases response times.

Future plans to improve emergency communications in Merrimack involve the purchase of a new console and a redundant (backup) communications center to be located at Fire Department headquarters. The new center will have the same basic dispatching abilities of the main center.

F. PUBLIC WORKS

The Department of Public Works consists of five divisions: Highway, Solid Waste, Wastewater Treatment, Equipment Maintenance, and Building and Grounds. The Highway Division is in charge of maintaining the 161 miles of roads and 12 town-maintained bridges as well as the parks and playing fields. The Solid Waste and Wastewater Treatment Divisions are in charge of the maintenance of all sewer lines, the wastewater treatment plant and the landfill (see Chapter VII, Utilities). The Equipment Maintenance Division employs five mechanics and

a manager to maintain all town-owned vehicles except school buses. This also includes Merrimack Village District vehicles. The Buildings and Grounds Division maintains Town Hall, the police station and all other town facilities except the fire stations.

The Department of Public Works Highway garage is located on Turkey Hill Road in the geographic center of Merrimack. This facility was built in the late 1970s and is located on a 10-acre parcel. There are currently 31 people working out of the Turkey Hill site including six administrative employees, a maintenance foreman, five mechanics and support staff. The site includes administrative offices, a maintenance center, three sports fields and a stump / rock dump. All maintenance and construction equipment and fuel for town-owned vehicles is stored at this site. The main Public Works administrative office is in the 3,370 square foot Kent Building located behind Town Hall.

The Department estimates a need for more administrative office space and storage space at the Turkey Hill Road site. The Capital Improvements Plan FY 2002-2008 (CIP) includes construction of a new 1,500–2,000 square foot administration building in FY 2006 / 2007. 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 salt shed on the Turkey Hill Road site was built in 1978 and because materials stored are exposed to the elements, it is functionally obsolete relative to EPA requirements. Although the shed has a rated capacity of 1,200 tons, the actual capacity of the shed is only 800 tons. The shed's design requires external loading of vehicles, causing further exposure to the elements. The Capital Improvements Plan FY 2002-2008 (CIP) includes replacement of the shed in FY 2003 / 2004.

G. MERRIMACK PUBLIC LIBRARY

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 2000, the building received a facelift that included new carpeting, landscaping, two new benches, and the installation of accessible ramps at the main entrance.

Merrimack Public Library

The Library is currently staffed by 10 full-time and 19 part-time employees and is open 60 hours a week.

The Library's circulation has grown extensively over the last 10 years. The circulation numbers for 2000 totaled 213,913 items, including books and other items such as videocassettes, CDs and magazines. The Library's collection continues to change with a variety of videos, magazines, and CD-ROMs available to library cardholders. In addition to checking items out, patrons use the Library for public internet access, word processing and online magazine indexes. People can also access the Library's catalog and other databases from home. In 2000, 19,915 people accessed the Library homepage, with 5,400 people using the searchbank to find information resources.

The Library has been expanding its public outreach in recent years. In 2000, the Library provided over eighty new programs in addition to the regular story times, children's programming and adult book discussions. Programs include displays by local artisans, speakers on current topics, and family programs. The library actively seeks program speakers and supplies from local businesses and individual patrons. In 2001, the Library will provide programming focused on young adults and will also provide reading equipment for visually impaired patrons.

When the addition to the Merrimack Public Library was built in 1979, the space was designed for a population of 14,000, which is almost half the size of the Town's 2000 population of 25,119. In 1979 the collection size was 24,500 and has since expanded to over 85,143 volumes. In the 1990s, the Library expanded its services to provide a wider range of resources, such as computers, paperback books, large print books, CDs and tapes, and videos. Although the Library is working to provide the most up-to-date information for the citizens in Merrimack, the current facilities are not adequate to do so. The additional resources are creating an overcrowding situation that is forcing the Library to discard some materials and to limit the use of the only meeting room on the premises. According to American Library Association standards, a population of 25,000 should have a collection of 89,000 volumes and 9,465 square feet for collection / public station space. Currently, the Library has a collection of 85,143 and 5,438 square feet of space (see Table VI-6).

Expansion of the current facility is not feasible due to land constraints. An addition would eliminate 20 of the 46 existing parking spaces, making the existing small parking lot totally inadequate. New programs, expansion of information resources, the addition of computers, and a growing population in the Town of Merrimack are bringing over 460 people to the Library per day. Table VI-6 is an analysis of the current space conditions and the needs of a Library according to American Library Association standards.

Table VI-6: Merrimack Public Library Space Comparison

Facility	Facilities Provided 2000 (quantity)	Facilities Needed 2000 (quantity)	Facilities Needed at Buildout** (quantity)	Floor Area Provided 2000 (square feet)	Floor Area Needed* 2000 (square feet)	Floor Area Needed at Buildout (square feet)
Collection / Public Stations	85,143 / 17	89,000 / 30	140,000 / 40	5,438 sf	10,965 sf	16,000 sf
User Seating	72	125	160	1,160 sf	2,160 sf	4,800 sf
Staff Working Stations	20	22	25	721 sf	3,000 sf	3,750 sf
Programming / Meeting Rooms	1	2	6	780 sf		2,000 sf
Special Use	***	***	***	168 sf	810 sf	2,655 sf
Non-assignable space	***	***	***	4,377 sf	***	8,761 sf
Totals	***	***	***	12,644 sf	***	37,966 sf

Source: Merrimack Board of Trustees and Merrimack Public Library and Town of Merrimack Buildout Study, 2001.
*Based on an American Library Association standards.
**Based on buildout population of 31,895.

Due to these space constraints, the Library Board of Trustees has been working on a plan to relocate the Library to a new facility. Several options were being considered. In 1996, the Town purchased a 3-acre parcel on Route 3 across from the Commons Shopping Center. A 32,000 square foot facility was proposed on this parcel and was voted on at Town Meeting that same year, but was defeated. It was voted on again in 1997 and 1998 and turned down both times. The Trustees are now looking into a second option, which is relocating the Library to a site behind Town Hall on Abbie Griffin Park land.

Although a future library plan has not been finalized, the Master Plan Advisory Committee recommends that the Library remain in the Town Center. In order to determine the best option and gain support for the relocation of the Library, the Board of Trustees has formed a focus group to determine its ultimate location in Merrimack. Impact fees may be an appropriate source of revenue for additional Library facilities (see Section K).

H. EDUCATION

The Merrimack School District currently serves children in grades Readiness through 12th grade in three elementary schools (grades 1-5), one middle school (grades 6-8) and one high school (grades 9-12). The School District also owns the McGaw School in Reeds Ferry, which functions as a private kindergarten, and the Special Services and SAU #26 office, which is located, near the High School on McElwain Drive. Public kindergarten is not currently offered in Merrimack. Despite the privatization of kindergarten, 90% of children in the Merrimack school system have finished kindergarten, and this number is expected to remain level in the near future. Six-year old children enter the school system as first-graders or in readiness classes. A report compiling and analyzing the research conducted on current space needs and how the school district will be affected in a full-build out scenario is discussed in the Immediate Needs and Future Needs Sections. A short description of some of the private and higher educational institutions in the Merrimack area that can influence enrollment at the public schools is also provided. Enrollment figures for the public schools are available in Table VI-8.

1. Elementary Schools

Mastricola Elementary School, built in 1961, is the oldest and smallest of the Town's three elementary schools with 55,283 square feet. It is located off Baboosic Lake Road in the Town Center where it shares a 55-acre parcel with the Middle School and the High School. Several improvements have been made at Mastricola, including the addition of five new classrooms in 1991 and a new gymnasium in 1997.

Reeds Ferry Elementary was built in 1968 with 63,313 square feet. It is located on a 35.6-acre site and serves the northeastern part of Merrimack. Improvements to Reeds Ferry include a gymnasium and eight new classrooms built in 1997.

The third elementary school is Thornton's Ferry Elementary, also built in 1968 with 63,313 square feet. Located on Camp Sargent Road in southern Merrimack, Thornton's Ferry occupies a 29.8-acre site. It was also improved in 1997 with the addition of a gymnasium and eight new classrooms.

2. Middle School

James Mastricola Middle School was built in 1949 with 123,635 square feet, and is the oldest of the three schools in the complex off Baboosic Lake Road. The Middle School is comprised of grades 6, 7 and 8 and is the only public school in Town for those three grades. Recent improvements to the middle school include twelve new classrooms, which were built in 1997. The current proposal is to construct a new middle school on the "Buker Property" in northwestern Merrimack that would house 7th and 8th grades. The existing Middle School would then house 5th and 6th grades, thereby alleviating capacity problems at the Middle School level while also freeing up space at all three elementary schools.

3. High School

Merrimack High School is the only public school that offers 9th-12th grades in Merrimack. It is located off Baboosic Lake Road in the same complex with Mastricola elementary and middle schools. The high school was built in 1965, and has recently been expanded to accommodate the growing number of students. In 1997, a small addition to the cafeteria was constructed, and in 2001, a major expansion project was completed that includes additional classrooms, administrative space and renovations to the music room and other rooms in the existing building. The project cost an estimated $5.9 million.

High School addition under construction, September 2001

4. School Enrollments and Capacities

The School Planning and Building Committee conducted a study in October of 2000, analyzing existing space conditions, comparing these conditions to past student growth trends, and then estimated space needs for future years. Table VI-7 summarizes the Committee's analysis of recommended and maximum capacity standards compared to the actual enrollment numbers as of February 2001.

Table VI-7: Current Merrimack School District Capacity

	Enrollment 02/2001	Recommended Capacity	Maximum Acceptable Capacity
Elementary	2,064	1,950	2,325
Middle	1,342	969	1,126
High w/Addition	1,486	1,611	1,905
SPED*	52	-	-
Totals	**4,944**	**4,530**	**5,356**

Source: Merrimack School District, Planning and Building Committee, "School Space Needs Final Report", October 2000 and Merrimack School District, 2001.
*Out of District Placement

Table VI-7 was compiled using recommended and maximum acceptable capacity figures set by the State of New Hampshire. The *recommended* capacity is calculated by taking the square footage of each room and dividing it by the maximum space recommended for each student by state standards. The *maximum acceptable* capacity is the square footage of each room divided by the minimum space per student by state standards.

Table VI-7 indicates that elementary school enrollment is slightly above the recommended capacity and is well below the maximum acceptable capacity. There is no room, however, to implement a district-wide public kindergarten at the present time.

Middle school enrollment is well above both the recommended and maximum acceptable capacity. As the Town grows, it is expected that enrollments will remain above maximum acceptable capacity for the foreseeable future until a new middle school is constructed.

Now that the high school addition is completed, enrollment is slightly below recommended capacity.

Table VI-8: Enrollment at the Merrimack Schools as of February 7, 2001

	Mastricola Elementary	Reeds Ferry Elementary	Thornton's Ferry Elementary	Mastricola Middle	Merrimack High	Special Education: ODP**	Total
*PRE		51					**51**
R	11	13	10				**34**
1	120	112	146				**378**
2	101	126	148				**375**
3	117	104	165				**386**
4	127	150	173				**450**
5	108	117	165				**390**
Total	**584**	**673**	**807**				**2,064**
6				457			**457**
7				454			**454**
8				431			**431**
Total				**1,342**			**1,342**
9					383		**383**
10					373		**373**
11					338		**338**
12					392		**392**
Total					**1,486**		**1,486**
SPED						52	**52**
# Students	**584**	**673**	**807**	**1,342**	**1,486**	**52**	**4,944**

Source: Merrimack School District, February 2001
*Preschool Ages 3-5
**Out-of-District Placement

5. Current or Short Term School Needs

The greatest challenge facing the Merrimack School District over the near term is the provision of adequate space to accommodate its students and programs. The School Planning and Building Committee is an elected body that looks at long-range school district needs. The Committee investigates space needs, reviews the CIP, assists the School Department's Technology Committee, works with local groups to provide adequate athletic facilities, and in general provides assistance to the School Board. The Planning and Building Committee compiled data from past and current enrollment numbers and compared these numbers to recommended capacities and to a potential build-out scenario. The analysis uncovered the following issues:

> *The Middle School as currently configured is utilized beyond maximum recommended capacity by 357 students.*[5] *It is 18% over Maximum Acceptable Capacity and 37% over Recommended Capacity. Instruction of 1326 students takes place in 65 instructional classrooms of differing sizes. State of New Hampshire standards call for 30 square feet of classroom space per student, or a total of 800 square feet per classroom, whichever is greater. The district currently utilizes classroom instructional space smaller than the statutes would allow. Physical expansion of the Middle school on the current site is impractical for several reasons:*

[5] This figure is based on 2000 enrollment figures. The overcapacity has increased to 373 based on 2001 enrollment (see Table VI-6).

- *Vertical expansion is unlikely as the current structure was neither designed nor built to accommodate another floor.*
- *Baboosic Lake Road blocks horizontal expansion to the north.*
- *Horizontal expansion to the east is blocked by Our Lady of Mercy property.*
- *Horizontal expansion to the south is blocked by the Mastricola Elementary School.*
- *Horizontal expansion to the west would encroach upon the only field available to the Middle School for Physical Education, and district wide interscholastic athletic competitions.* [6]

As a result of these findings, the Planning and Building Committee and the School Board began looking into the construction of a new school. The proposed site is the "Buker property," which is located at the corner of Baboosic Lake Road and McQuestion Street. The Merrimack School District Board voted unanimously in May 2000 to convene a community wide citizen's committee called the Merrimack School District Community Wide Space Needs Committee. The Committee was composed of citizens at large, elected community leaders, educators and school building administrators and makes recommendations as to the need for additional school space as well as the implementation of kindergarten.

The Community Wide Space Needs Committee also found that the most pressing need for space was at Mastricola Middle School. The Committee's research on the space needs at Mastricola resulted in the following information:

> *Construction of a new facility is necessary to accommodate not only the current population, but also the projected upward shift in the Middle School population over the next 5 years. The construction is recommended to be done so as to allow future expansion of educational services, particularly if it becomes necessary to re-locate another grade to that site in later years. New construction would also allow the school district to address the inadequate number of fields and gymnasiums for practice and competition at the middle and high school levels. From the standpoint of curriculum implementation, new construction would allow for suitable large space instructional areas and appropriate science and technology areas to meet the needs of the newly revised curriculum. Construction costs would be eligible for state building aid of at least 30% and possibly more.*[7]

In light of the space constraints at the Middle School, the Planning and Building Committee recommends that the Merrimack School District take the following actions:

- Approve the constuction and renovation budget and build a 1,000 student middle school to house grades 7-8 on the "Buker property," with capabilities for future expansion.
- Relocate the 5th grade from the elementary schools into a renovated Mastricola Middle School, creating a 5-6 Upper Elementary School.

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[6] **Source:** Merrimack School District, Planning and Building Committee, October 2000.

[7] **Source:** Merrimack School District, Planning and Building Committee, October 2000.

- Implement public kindergarten in the current elementary schools using the space formerly occupied by the 5th grades.

The above recommendation from the Planning and Building Committee was voted on at the 2001 and 2002 Town Meetings. The proposal did not pass, but is expected to be placed on the ballot again for a vote at the 2003 Town Meeting. Although other options are being researched, the Master Plan Advisory Committee concurs with the Planning and Building Committee that this option will satisfy immediate space needs. Until the citizens of Merrimack accept a formal plan, space needs will be met by the use of portable units for classroom space at the middle school level.

6. Long-Term School Needs

In addition to the immediate need for a new middle school, the growth of school facilities over the long term should be considered. In 2001, the Nashua Regional Planning Commission updated the Town of Merrimack Buildout Study. The Buildout Study estimates the number of students that could be added to the Town's population when all available land is developed. The current student population in Merrimack is 4,944 (see Table VI-8).

The results of the Buildout Study indicate that a twenty-eight percent (28%) increase in total student population from 4,892 to 6,282 students (not including special education students) would result at buildout. The number of students in elementary, middle and high school at buildout can be estimated by applying the current percentage of students in each level to the number of students estimated at buildout. Table VI-9 projects the enrollment for elementary, middle and high school at buildout and compares this figure to the current recommended and maximum acceptable capacity based on state standards as determined by the Planning and Building Committee.

Table VI-9: Future School Needs at Buildout

	Enrollment 02/2001	Enrollment Composition (%)	Recommended Capacity (02/2001)	Maximum Acceptable Capacity (02/2001)	Projected Enrollment (Buildout)	Projected Over Recommended Capacity (#)	Projected Over Maximum Acceptable Capacity #)**
Elementary	2,064	42%	1,950	2,325	2,665	715	340
Middle	1,342	27%	969	1,126	1,713	744	587
High w/Addition	1,486	30%	1,611	1,905	1,904	293	1
Total	**4,892**	**99%***	**4,530**	**5,356**	**6,282**	**1,732**	**926**

Source: Merrimack School District, Planning and Building Committee, "School Space Needs Final Report," October 2000 and Merrimack School District, 2001.
*Does not include special education out of district placement students.
**Assuming no new classroom space is constructed prior to buildout.

Table VI-9 indicates that if no new classroom space is constructed then school facilities on average for all grades will be 926 students (17%) over maximum *acceptable* capacity and 1,752 students (39%) over maximum *recommended* capacity. At buildout, it appears that the high school, including the new addition, will almost exactly meet the maximum *acceptable* capacity but will be 18% above maximum *recommended* capacity. Given changes in educational needs and variations in annual enrollments, further expansion of the High School is likely at buildout.

It does appear, though, that sufficient area remains at the High School site for adequate expansion.

At the elementary school level, facilities are currently slightly below the maximum recommended capacity. Elementary school facilities are projected to be 340 students over maximum *acceptable* capacity (15%) and 715 students or 37% over maximum *recommended* capacity at buildout, not including kindergarten. If the Town wishes to provide public kindergarten then the overcapacity would most likely increase by about 500 students at Buildout. Currently, enrollments at Merrimack's elementary schools range from 584 at Mastricola Elementary to 807 at Thornton's Ferry. Therefore, the projection for elementary school enrollments projected for buildout indicate that a new elementary school will be required. Should kindergarten be implemented, additional accommodations though expansions or grade distributions would be required. Currently, conceptual plans have been prepared for a 750-student elementary school to the rear of the Middle School proposed for the Buker site.

The most severe need for new classroom space at buildout will be at the middle school level, where such facilities will be 744 students (52%) over maximum acceptable capacity unless new classroom space is constructed. As discussed above, a new 1,000-student middle school is currently proposed for grades 7 and 8. Such an improvement would eliminate existing and projected middle school over-capacities while also freeing up space at lower grade levels.

As indicated above, school facilities for all grades are projected to be 926 students (17%) over maximum *acceptable* capacity and 1,752 students (39%) over maximum *recommended* capacity at buildout. There is an immediate need for additional Middle School space, followed by a need for expanded elementary school space within the next several years, and finally a modest expansion of high school facilities upon buildout. Given these projected needs, a 1,000 pupil middle school, followed by construction of a 750 pupil elementary school and a modest expansion of the High School, would accommodate projected student enrollments at buildout, comfortably and, depending on how grade levels are distributed throughout School District facilities, would most likely accommodate the introduction of public Kindergarten as well.

7. Other Educational Facilities

In addition to public schools there are a number of private school options in the Town as well as in the region that serve Merrimack. Parents have the choice of sending their children to a private institution from preschool through 12th grade. Below is a description of some of the options available to Merrimack residents.

a. Private Childcare and Kindergarten

Public kindergarten is not yet available in Merrimack. In order to fill this void, there are a number of private preschools, kindergartens and childcare facilities that offer a variety of curricula, hours of operation and costs. The New Hampshire Department of Human and Health Services, which is responsible for licensing childcare facilities, maintains a list of licensed facilities in the State of New Hampshire. As of March 2001, there were 17 licensed childcare facilities in Merrimack. Most of these facilities accept

children up to 12 years of age, while a few of them limit the ages to between 3-6 years old. All of the child-care facilities in Merrimack offer a preschool program.

The YMCA offers a subsidized kindergarten program for parents wanting to send their children to school who may not be able to afford it. Their program works on a sliding scale allowing parents to pay what they can afford. The Merrimack PTA Kindergarten on Depot Street is also run as a private nonprofit facility in a former schoolhouse owned by the School District.

b. Private Primary and Secondary Schools

There are two private primary and secondary schools in Merrimack. Both are expanding and accepting new students. The South Merrimack Christian Academy on Boston Post Road and Grace Christian School on Bedford Road both offer private Christian educations for preschool through 6th grades. South Merrimack Christian Academy, which is affiliated with the Merrimack Valley Baptist Church, teaches preschool, kindergarten and 1st-6th grades. Grace Christian School was started in 1980 as part of Grace Baptist Church and teaches K-5th grades. Both of these private schools plan to add grades in coming years so that existing students can remain enrolled as they progress through the grade levels.

Parents in Merrimack also have a choice of private institutions outside of Merrimack. In Nashua, there is Bishop Guertin High School, Bethel Christian School, Mount St. Mary's High School, Nashua Christian Academy and High School, White Wing School, and Nashua Catholic Regional Junior High School. In Milford, students can attend Milford Christian Academy, and in Londonderry the Meritor Academy offers preschool, kindergarten and elementary classes.

8. Higher Educational Institutions

Thomas More College, located on Daniel Webster Highway, is the Town's only institution of higher education. Thomas More is a four-year liberal arts college and was founded by Catholic educators in 1978. The college offers undergraduate level education in the liberal arts fields, including Literature, Philosophy, Political Science, and Biology. The Intercollegiate Studies Institute recently selected the college as one of "America's 100 Top Schools".

Thomas More College is comprised of students from all over the United States, most from outside New England. 98% of the students live on campus, with a few commuters from the surrounding towns. Although the college is not well known in the area, it is involved with the Merrimack community in a variety of ways. Students at the college teach religion classes at local churches; the Merrimack Kids College uses the facilities at the college for a nominal fee to teach subjects such as biology and geology to 5 and 6 year olds every other Saturday; and every other Friday night Thomas More College holds a public lecture that is open to all Merrimack residents. Merrimack residents also have use of the library, and other facilities on campus at no cost. The college is making efforts to improve communication and awareness of the school and its facilities through advertisements in the paper, on the radio, and even places an ad on the book covers for students at Merrimack High School.

I. PARKS AND RECREATION

Recreation programs are offered to all residents year round through the cooperative efforts of the Parks and Recreation Department, the Parks and Recreation Committee, the Merrimack Youth Association, the School District and private civic organizations and committees. This section describes the roles of these organizations in providing recreational opportunities and facilities for the citizens of Merrimack.

1. Parks and Recreation Department

A full-time director, two full-time employees, and 90 seasonal employees support the Parks and Recreation Department during the spring, summer and fall programs. The Parks and Recreation Director works under the authority of the Board of Selectmen and the Parks and Recreation Committee. Since 1989, the Department has used Wasserman Park as its headquarters.

The mission of the Parks and Recreation Department is "*to economically provide quality recreation programs, facilities and open space which are designed to enhance the leisure time experience of the community*." This mission is accomplished through various avenues such as the Naticook Day Camp, a variety of summer programs offered at many of the parks around Merrimack, as well as maintaining the public beach for residents from June to August.

2. The Parks and Recreation Committee

The Parks and Recreation Committee assist the Parks and Recreation Department. The Committee consists of 12 members that are appointed by the Board of Selectmen and includes representatives of the Board of Selectmen, the School Board and the Merrimack Youth Association. The Committee serves as an advisory board to the Department, helping to devise future plans and also assisting with activity planning and field development. They are also responsible for overseeing the Merrimack Youth Association budget.

3. Merrimack Youth Association

The Merrimack Youth Association (MYA) is a private nonprofit recreational organization that contracts with the Town to provide sports programs for Merrimack's children. In 2001, The MYA had approximately 4,500 participants who were involved in a variety of sports programs from soccer to softball.

4. Public Lands and Facilities

As mentioned above, Merrimack has a variety of lands and facilities that have been acquired for recreational use. The Department of Public Works now maintains all of the publicly owned lands and facilities. Table VI-10 is a list of publicly owned lands and facilities in the Town of Merrimack.

Table VI-10: Publically-Owned Recreation Lands

Site	Location	Ownership	Acres	Current Facilities	Future Considerations
Merrimack High School	McElwain Street	School	60	1 Football field 1 Softball field 1 Gymnasium 1 Exercise room 1 Track	
Mastricola Middle School	Baboosic Lake Road	School	60	1 Soccer field 1 Little League field 1 Babe Ruth field	
Mastricola Elementary School	School Street	School	60	1 Playground 1 Softball field 1 Practice field 1 Babe Ruth field	
Thornton's Ferry School	Camp Sargent Road	School	29.8	2 soccer fields 1 playground Basketball court	
Reeds Ferry Elementary School	Pearson Road	School	35	1 Football field 5 Soccer fields 1 Little League field 2 Softball fields Playground	Ice-skating rink
Wasserman Park	Naticook Road	Town	134	1 Soccer Field 2 Softball Fields 2 Basketball Courts 7 Tennis courts Hiking trails Picnic areas Beach Theater	Kids Kove II Improvements to beach Outdoor theater Pool Wading pool Multi-purpose facility
Currier Road Conservation Area	Currier Road	Conservation Commission	80	Wildcat Falls Hiking trails River frontage	Footbridge connecting to Turkey Hill
Twin Bridges Park	Daniel Webster Highway	Town	25	Kids Cove playground Basketball courts Little League field Hiking trails Picnic area MYA facilities Rest rooms Little League field	
Turkey Hill Park	Turkey Hill Road	Town	18	2 Little League fields 1 Softball field Picnic area 1 playground DPW storage	2 Softball fields Baseball field
Veteran's Memorial Park	Camp Sargent Road	Town	25.5	Boat ramp Lake Frontage Playground Picnic area 2 Little League fields 1 Babe Ruth field 1 multi-use field Hiking trails	All-purpose fields 2 Baseball fields Playground Pump house Restrooms/concessions

Site	Location	Ownership	Acres	Current Facilities	Future Considerations
O'Gara Drive	O'Gara Drive	School		Basketball courts Ice-Skating 4 Tennis courts Skateboard park	
Lawrence Road-Town Forest	Lawrence Road	Town	86.2	Open space Wetlands	
Mitchell Drive-Town Forest	Mitchell Drive	Town	81.2	Open space Wetlands	
Riverside Drive-Green Space	Riverside Drive	Town	27	Access to Souhegan River	
Merrymeeting Dr.-Green Space	Merrymeeting Drive	Town	14	Open Space Wetlands	
Sand Hill Drive-Green Space	Sand Hill Drive	Town	2	Open Space	

5. Private Lands and Facilities

In addition to public park and recreational facilities, Merrimack has a number of private recreational lands and facilities. Although these are open to all residents in Merrimack and other communities, one must typically be a member of the club or organization in order to use the facilities. Private clubs in Merrimack include outdoor sporting facilities such as the 74 acre Horseshoe Fish and Game Club on Greens Pond Road, the 38 acre Nashua Fish and Game Club on Al Paul Lane, and the 26 acre Watonic Bowmen on Old Kings Highway which provide shooting ranges, facilities for target shooting, clubhouses and other amenities. The Merrimack branch of the Nashua YMCA on Henry Clay Drive provides an indoor swimming pool and tennis courts along with basketball courts, racquetball courts, exercise equipment and childcare facilities. Indoor pools are also provided as a part of private membership clubs at the Radisson Hotel and at Gold's Gym in the Commons Shopping Center. The Nashua Y also operates a summer day camp and outdoor recreational area, known as Camp Sargent, on Lake Naticook. The Manchester YMCA owns approximately 66 acres of land around Horseshoe Pond off of Route 3; however, no recreational facilities have been developed on the site. On the Souhegan River, a 23-acre site on the Souhegan River, owned by the Boy Scouts, is occasionally used for camping. Although not open to the general public, several private recreational facilities, many including swimming pools, play grounds and tennis courts, serve thousands of Merrimack residents residing in various residential developments.

6. Future Parks and Recreation Needs

As Merrimack grows, it is becoming increasingly important to identify and set aside land for park and recreation facilities. It is also important to provide additional recreational facilities to meet the needs and desires of the community. In order to address the diverse and growing demands of the community, the Parks and Recreation Department has focused its efforts on assessing facility needs, specifically field space needs. The Department and the Master Plan Advisory Committee have identified several issues to be addressed:

- Space needs: The current facilities are not adequate to support the anticipated population growth in Merrimack over the next 10 years. A space needs assessment was conducted in 1999.

- Growth in the Merrimack Youth Association: Participation in MYA has increased 7% since 1996.
- Growth in recreational sports: There has been an increased demand for men's and women's softball and development of new sports such as lacrosse.
- Overuse of Town-owned facilities: Town-owned facilities are not meeting current demand for recreation. The fields are generally utilized at or over capacity and are causing maintenance problems.
- Lack of Town-owned facilities: Approximately 700 youth in the Fall Soccer and Little League programs use fields not owned by the Town. Changes in the arrangements for use of these fields would put these programs in jeopardy.
- Lack of Pedestrian and Bicycle Access to recreation facilities: The Master Plan Advisory Committee discussed the need for pedestrian bicycle connection to recreation facilities in order to accommodate the needs of young people and reduce the vehicle parking needs.

In 1999, the Parks and Recreation Department conducted a study of future playing field needs based on the 1999 Buildout Study[8] and 1999 population estimates. Since that time, the Buildout Study has been updated and Census 2000 population figures are available. Table VI-11 outlines the existing and future needs for various types of playing fields, based on update figures.

Table VI-11: Playing Fields Needs Assessment

Type of Field	Standard per 1000 population (quantity)	Existing* 2000 (quantity)	Needed** 2000 (quantity)	Deficit 2000 (quantity)	Needed*** At Buildout (quantity)	Additional Needed at Buildout (quantity)
Soccer	1	18	25	7	32	14
Football	0.25	5	6	1	8	3
Little League	0.42	8	11	3	13	5
Lacrosse	0.08	1	2	1	3	2
Babe Ruth	0.125	2	3	1	4	2
Girls Softball	0.33	6	8	2	10	4
Mens/Women's Softball	0.125	2	3	1	4	2
Total:		**42**	**58**	**16**	**74**	**32**

Source: Adapted from Future Needs of Playing Fields, Merrimack Parks and Recreation Department, October 12, 2001 and Town of Merrimack Buildout Study, Updated October 2001.
*Public and private.
**Based on Census 2000 population of 25,119.
***Based on buildout projected population of 31,895.

There are currently 42 public and private playing fields provided throughout Merrimack. Based on playing field provision standards, the Town actually needs 58 fields. Therefore, the Town needs to develop 16 new fields in order to meet the needs of the 2000 population of 25,119. At buildout, the population is estimated to be 31,895. Applying the playing field provision standards, the Town would need 74 playing fields at buildout.

[8] Future Needs of Playing Fields, Preliminary Report, October 13, 1999 by Michael Housman.

Therefore, the Town will need to provide 32 additional fields at buildout. Assuming an area of between 3 and 5 acres per field to accommodate parking, ancillary facilities and buffers, a park or parks of between 100 and 150 acres in area would be required to meet future field space demands.

J. OTHER COMMUNITY FACILITIES

1. 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, but is also available to community groups such as the Rotary Club for meetings and other special events. The facilities contain a large meeting room, sitting area, kitchen, and support facilities. The Center has a shared parking agreement with the First Congregational Church.

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.

2. Cemeteries

There are four public cemeteries in Merrimack: Reeds Ferry Cemetery, Meetinghouse Road Cemetery, Thornton's Ferry Cemetery and Reed's Cemetery in South Merrimack. Reeds Ferry Cemetery is the only public facility that is still active; the other three are now inactive. Maintenance of all four cemeteries is funded by the Highway Department. Funding is budgeted annually through the DPW with occasional assistance from private trust funds from deceased residents in Merrimack. Since 1990, maintenance has been done on an as needed basis by private contractors, and consists of cutting of grass and removal of weeds, with little, if any, manicuring. No maintenance is done in the winter. In addition, there is one private cemetery, the Last Rest cemetery. A private crematorium is also provided on Henry Clay Drive.

K. IMPACT FEES

Most of the public facilities serving Merrimack are developed, operated and maintained through funds raised through local property taxes. Federal and State grants as well as private donations are also sometimes used to help in constricting new facilities or in improving existing ones. Another possible revenue source for the development of new facilities can be derived from impact fees. Impact fees are a charge on new development that is proportional to the impact of that new development on the infrastructure needs of the community. Impact fees are considered an Innovative Land Use Control and are defined in NH RSA 674:21.V as "… *a fee or assessment imposed upon development, including subdivision, building construction or other land use change, in order to help meet the needs occasioned by that development for the construction or improvement of capital facilities owned or operated by the municipality, including and limited to water treatment and distribution facilities; wastewater treatment and disposal facilities; sanitary sewers; storm*

water, drainage and flood control facilities; public road systems and rights-of-way; municipal office facilities; public school facilities; the municipality's proportional share of capital facilities of a cooperative or regional school district of which the municipality is a member; public safety facilities; solid waste collection, transfer, recycling, processing and disposal facilities; public library facilities; and public recreational facilities not including public open space."

Impact fees are adopted by an amendment to the Zoning Ordinance to enable the Town to levy the fees, and then the Town needs to develop an Impact Fee Schedule to determine the amount of the fees and which capital improvements they will apply to. The Fee Schedule involves an intensive study of the impact of new development, by type, on facilities scheduled in the Capital Improvements Plan FY 2002-2008 (CIP). On September 25, 2001, the Master Plan Advisory Committee discussed the concept of impact fees as a potential for raising revenue for future community facilities. Although no specific recommendations were made, there was a general consensus that the concept should be further studied. Impact Fees in Merrimack may be appropriate for additional Town Hall, Police, Library and School facilities, among others that may be determined if a study is completed.

L. CONCLUSIONS AND RECOMMENDATIONS

1. Town Hall Complex

a) Overall, the existing Town Hall complex appears to have sufficient space to serve the estimated buildout population of 31,895, especially if the District Court were to be relocated. If the existing Public Works administration and storage buildings were to be removed to make room for a new Library, however, and the courthouse were to remain, a future space problem could emerge. How the existing space could best be utilized, to meet the changing needs of the various departments within Town Hall, taking in to account various alternatives for relocation of the Library and District Court, would best be determined though completion of a Town Hall facilities space needs study. Any such study should examine parking, circulation and the demand for meeting space in addition to office and administrative space.

b) The existing District Court facility is inadequate in terms of space, safety and security and will need to be replaced. A new site, preferably within the Town Center, for relocation of the Merrimack District Court should be identified to ensure that the facility meets the long term needs of the community and remains within Merrimack.

2. Emergency Services

Emergency services in Merrimack are highly rated and enjoy widespread public support. For the most part, the Town is well served by ambulance and fire protection services, however, growth in certain outlaying areas of Town requires that certain improvements be made to ensure that all Merrimack residents and businesses continue to receive the highest level of service. The following improvements are recommended:

a) Construct a new Northwest Fire Station on the "Bishop Property" to reduce response times in the northwestern part of Town.

b) Consider conversion of the Reeds Ferry Fire Station from an on-call to a full-time fire station.

c) Expand the south Merrimack Fire Station with new garage and sleeping facilities.

3. Library

The existing Lowell Memorial Library at the intersection of Route 3 and Baboosic Lake Road was last expanded in 1979 and is currently designed to serve a population of 14,000. The facility falls significantly short of meeting current needs and far short of meeting the community's needs at buildout. There is insufficient room for expansion at the existing site. Therefore, the following is recommended:

a) Select a site for a new Public Library within the Town Center and construct a new library to accommodate an estimated buildout population of 31,895. Probable locations include the parcel on Route 3 purchased in 1996 for a new Library or a portion of the Abbie Griffin Park site adjacent to Town Hall.

b) Seek an appropriate re-use for the existing library building. Alternatives discussed during the Master Plan process included, municipal offices, a new District Court, a youth center, a new Merrimack Youth Association (MYA) facility and new offices for the Superintendent of Schools.

4. Public Works

The public works related facilities discussed in the Community Facilities chapter refer to the existing highway garage facility and DPW administration. Street and road improvements are discussed in the Transportation section and sewer and solid waste disposal issues are discussed under Utilities. Other public works related improvements include:

a) Construct a new Public Works Department administration building.

b) Construct a new covered salt shed that meets EPA requirements.

5. Schools

Merrimack's public school system is considered to be one of the community's greatest assets. Concerns related to facility space, however, are significant, especially at the middle school level. Overall, the recently expanded High School should be capable of meeting Merrimack's needs for the next several years, but some expansions may be required at Buildout. The existing site should be capable of supporting any necessary additions. Improvements are not currently required at the elementary school level, but will be required within the next few years to accommodate anticipated growth in enrollments. Public kindergarten is not currently provided. At the middle school level, existing facilities are not adequate to meet existing enrollments or estimated enrollments at buildout. With implementation of a plan to construct two new school facilities and redistribute grade levels among District facilities, however,

Merrimack should be able to accommodate both its short-term needs as well as the enrollment levels anticipated at Buildout. Toward these ends, the following improvements are recommended:

a) Construct a new 1000 student middle school, immediately, that would serve as a Town-wide upper middle school for grades 7 and 8, and renovate the existing Middle School to accommodate grades 5 and 6, thereby providing for Merrimack's long-term needs at the middle school level while freeing up space in all three existing elementary schools.

b) Construct a new approximately 750 pupil elementary school in the near future (as enrollments warrant) to accommodate elementary school needs at buildout.

c) Evaluate the future needs of the High School as needed.

d) Implement public kindergarten in the elementary schools through a combination of new facility construction, building renovation and grade redistributions.

6. Recreation

Merrimack has a variety of park and recreational facilities and large and growing sports programs, particularly for youth. Population growth, high participation levels and changing sports and recreational needs, however, have placed increased demand on existing facilities resulting in inadequacies in certain areas. To meet the Town's recreational needs, the following recommendations are offered.

a) Identify sites for 32 new sports fields and construct these sports fields over time to address existing facility deficiencies and to accommodate an estimated buildout population of 31,895 in accordance with the Parks and Recreation Department recommendations.

b) Incorporate new pedestrian and bicycle paths into any planning for municipal facilities or additional recreational areas in the Town.

7. Funding

a) Funding for the improvements recommended in this chapter will come primarily though local property taxation. In order to maintain a stable tax rate, avoid undue financing costs and plan adequately for large purchases and improvements, the Town should continue to use capital reserve funds where warranted, prepare an annual Capital Improvements Plan and seek various Federal and State grants and private contributions as appropriate.

CHAPTER VII
UTILITIES

A. 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; 4) water supply; 5) wastewater; and 6) solid waste. The chapter concludes with a series of recommendations.

B. ELECTRICAL INFRASTRUCTURE

Public Service of New Hampshire (PSNH) is the main electricity supplier for the Town of Merrimack. PSNH is the State's largest electric utility, providing service to more than 400,000 homes and businesses. PSNH is a wholly owned subsidiary of Northeast Utilities, a utility holding company based in Connecticut. With three fossil fuel-fired generating plants and nine hydroelectric facilities, PSNH has over 1,110 megawatts of generating capacity.

In Merrimack, PSNH provides service to approximately 10,000 customers, or "accounts," which include homes, commercial and industrial businesses and all streetlights. Distribution and transmission lines, which are placed along roadways, carry power throughout the Town to the individual customers. The voltage from these lines is stepped down to the voltage that is utilized by the specific customer by way of transformers.

Electricity in Merrimack is distributed through two major substations. The first substation is located on Reeds Ferry Road. This facility has three distribution circuits. Each circuit carries 34,500 volts to customers located north of Chamberlain Road and Depot Street. The second substation is located in Nashua and supplies a single circuit of 34,500 volts to the southern part of Merrimack, including Anheuser-Busch.

PSNH anticipates being able to provide an adequate supply of electricity to Merrimack at full build-out. PSNH is a consumer-driven company and is therefore more reactive than proactive, only extending distribution lines where and when necessary. They have no foreseeable plans to add another substation or any new circuits given the ability of the current stations to supply the necessary power to the customers in Merrimack.

C. NATURAL GAS

As of 1993, Key Span Energy Delivery owns and controls the natural gas distribution lines in the Town of Merrimack. Before 1993, Energy North was the sole provider of natural gas. Key Span is a local distribution company that contracts with Tennessee Gas to distribute and sell natural gas throughout New Hampshire. Key Span draws natural gas from Tennessee Gas at their main take station in Dracut, MA. From Dracut, the gas is pumped to about 8 take stations in New Hampshire. These stations, which are owned by Key Span, break down the gas

into workable volumes and deliver it to local customers. The Town of Merrimack is broken into two distribution areas. The take station in Hudson serves the area south from Newick's Seafood Restaurant on Daniel Webster Highway. The take station in Manchester serves the northern area 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.

Key Span anticipates that they will meet the natural gas needs for the Town of Merrimack at build-out. As part of a campaign strategy to extend their services in Merrimack and other growing towns, they are working with local developers, planning departments and State and community agencies to incorporate local development projects into their network. Key Span uses the information provided by the above mentioned-agencies to determine the required capacities of their system. Areas targeted for expansion in Merrimack include the Bambi Drive / Mitchell Street, Buttonwood Lane, Courtland Drive, Currier Road, Dahl Road, Heidi Lane and Queens Way neighborhoods, and the northern part of the Route 3 corridor.

D. TELECOMMUNICATIONS INFRASTRUCTURE

1. Cable

Adelphia has been providing telecommunications service to Merrimack since 2000. Adelphia offers digital television, high-speed internet access, long distance telephone service and paging services. The Merrimack Community Development Department coordinates with Adelphia to ensure that new developments can accommodate the installation of service lines. Adelphia currently serves 8200 residences in the Town. They estimate that this number will grow by 1.5% each year, as more people are requesting digital phone service and high-speed internet access. They are anticipating that they will be able to meet the needs of the Town at build-out and are currently upgrading.

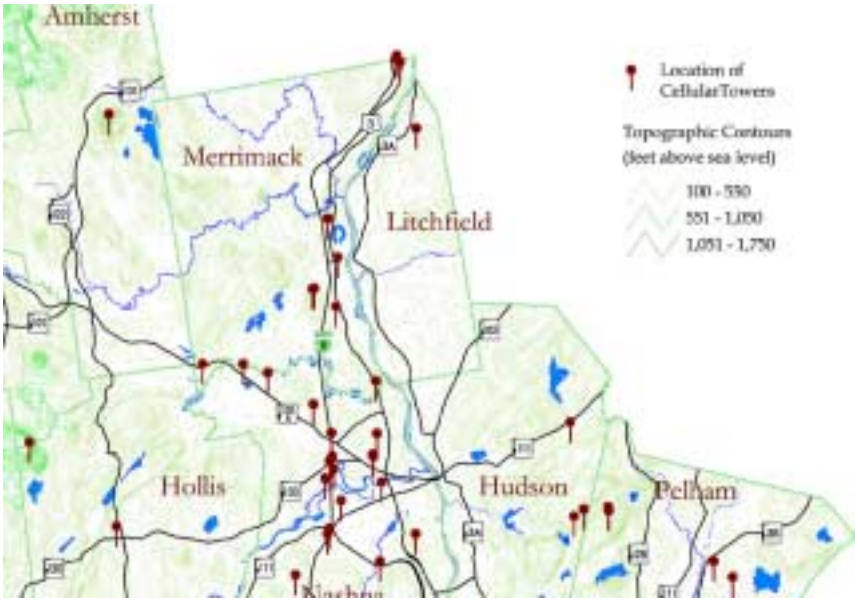
2. Telephone and Wireless Communications

Landline telephone service is provided for new and existing residences and businesses in Merrimack by Verizon. In addition, Verizon and various other telecommunications companies provide cellular and personal wireless service. Based on the 2000 US FCC Towers database distributed by the New Hampshire Office of State Planning, the installation of new cellular and personal wireless facilities has occurred with great speed over the last few years in the NRPC region. There are currently thirteen (13) wireless facilities in Merrimack (see Map VII-1).[1] Most of them are located along the FEE Turnpike corridor. In addition, there are two (2) wireless facilities in the northern part of Nashua, close to the Merrimack town line, that serve the Route 101A corridor.

[1] Source: NRPC Survey, 2000.

Federal law regulates the placement of cellular towers in a given community; however, emphasis has been placed on balancing the need for telecommunications infrastructure with a community's desire to maintain community character. The Telecommunications Act of 1996 preserved state and local regulatory authority for the placement, construction or modification of wireless facilities. However, local zoning and regulations may not prohibit wireless services within the community or address the potential effects of non-ionizing electromagnetic radiation and unreasonably discriminate among providers of functionally equivalent services.[2] In response to this Act and rapid tower growth, Merrimack adopted a telecommunications ordinance. Now that the major transportation corridors in Merrimack are covered with wireless facilities, and as old analog technology is being replaced with new digital technology, there may be industry demand to fill in coverage gaps in the region. As such, new model ordinances have been developed to allow for filling in the coverage gaps while mitigating the visual impacts of the wireless facilities.[3]

Map VII-1: Location of Wireless Facilities



Source: US FCC Towers database distributed by NH OSP, 2000.

3. Internet Systems

While 56k dialup connections over telephone lines are universally available, high-speed connections through DSL, T1, or Cable are also available in Merrimack. High speed or Broadband Internet connectivity is provided through either a Local Exchange Carrier (LEC), typically a phone carrier or an Internet Service Provider (ISP). LECs typically provide bandwidth and contract with ISPs to market and sell connectivity. ISPs also typically offer value added products including web-hosting space, web design assistance, e-mail and access to news groups and other services. For competitive reasons, LECs and ISPs offering services in

[2] Source: Telecommunications Act of 1996, 47 U.S.C. §332(c)(7).

[3] Source: Rockingham Planning Commission, Model Personal Wireless Services Facilities Ordinance, Fall 2001.

Merrimack change frequently. An up to date list can be provided from the NH Public Utilities Commission, 2001 at http://www.puc.state.nh.us/infotlco.htm.

Digital Subscriber Loop (DSL) is the most widely available high-speed connection type in the region. DSL provides "always on" access through a permanent internet connection which may be over existing telephone lines and is best for home and small business use. Access to DSL is limited to consumers within up to a 12,000-foot radius of a Central Office, where data is transmitted between customers and the Internet Service Provider (ISP). Connection speeds may vary from 144kb/sec to 1.5mb/sec. Many varieties of DSL connections are available including:

- ADSL: different transmission rate to and from the customer, generally for home use
- SDSL: symmetrical transmission rates to and from the customer, generally for small business use
- IDSL: slower service through an intermediate central office for customers located outside the 12,000' service area

Because bandwidth over DSL is shared between all Internet users, this technology is considered less reliable than other high-speed connection alternatives. T1 lines, also available in Merrimack, are generally required for larger or Internet specific businesses and offer more reliable connectivity as quantities of bandwidth are dedicated to customers. This technology offers transfer rates from 148kb/sec to 1.5mb/sec and faces similar spatial limits as DSL. T3, an upgrade of T1 lines, offers a similar technology with transfer rates up to 45mb/sec for intensive Internet usage.

E. PUBLIC WATER SUPPLY

1. Merrimack Village District

The Merrimack Village District (MVD) is one of two public water suppliers for the Town of Merrimack. Although 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 Kaolin Farm 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.

a. Water Supply

All of the MVD's water comes from groundwater. The groundwater 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. Water flows by gravitational force in these zones into sand and gravel packed wells, which are then pumped into storage tanks for distribution. Water is pumped from the main pressure zone, where the largest storage tank is located, into the high-pressure zone, where two smaller tanks store water to distribute to MVD customers.

The MVD's system is comprised of seven (7) functioning sand and gravel packed wells with good water quality and sufficient yield. An additional well, Well 6, is currently offline, but is scheduled to be re-commissioned in 2008. It is noteworthy that the MVD's newest wells, Wells 7 and 8, are located in the Town of Hollis. According to the MVD, there are no economically viable potential well locations remaining within the Town. Well capacity and installation dates are listed in Table VII-1. Capacity was determined based on 24-hour pumping of each source. However the MVD does not currently pump any of its wells on a 24-hour basis due to hydraulic limitations of the distribution system. If a new tank were put online, then 24-hour pumping of each well would be feasible.

Table VII-1: Merrimack Village District Well Capacity*

Well	Installation Date	Capacity (gpm)[1]	Capacity (gpd)[2] at 24-hour pumping
1	1956	300	622,080
2	1960	1500	1,589,760
3	1972	1200	1,440,000
4	1956	250	433,440
5	1970	750	1,324,800
6	1981	not used	Not used
7	1997	500	720,000
8	1997	800	720,000
Totals	**-**	**5300**	**6,850,080**

*__Note__: The well capacity assumes that a new tank will go online to allow for each well to pump on a 24-hour basis.
[1]gallons per minute
[2]gallons per day
Source: Comprehensive Environmental Inc., Merrimack Village District Master Plan Update, January 2000.

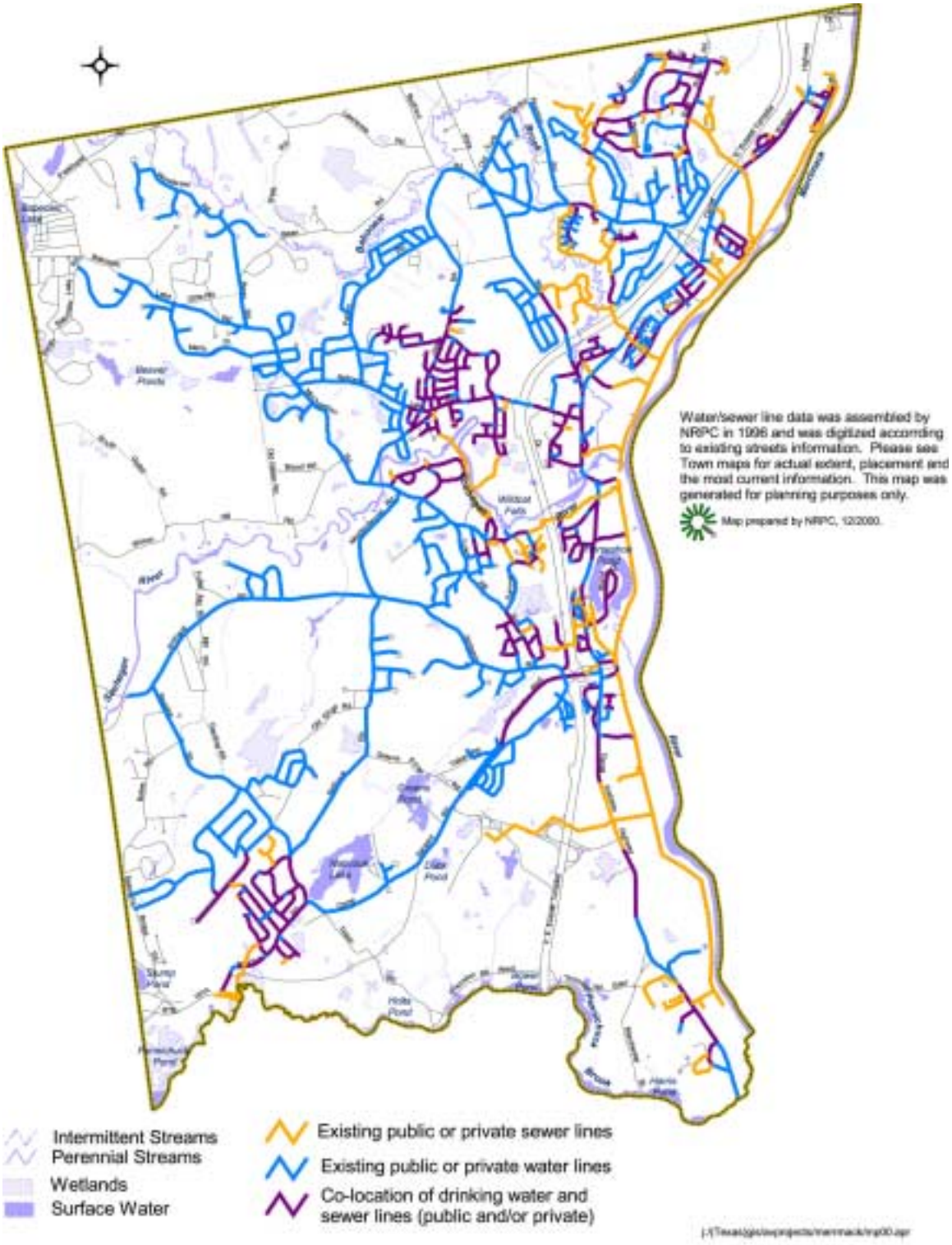
As can be seen in the table above, Well 6 is not currently used. The well has been offline since 1989 because of contamination from sodium chloride and volatile organic compounds. The MVD and the New Hampshire Department of Environmental Services have been monitoring the well regularly, and have conducted a study to determine the measures that should be taken to put Well 6 back online. A remedial action plan was developed to manage the migration of the contamination and mitigate the adverse

environmental impacts.[4] It is projected that Well 6 will be back online in 2008. Once it is back online, a new four million-gallon storage facility would be constructed.

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 150 miles of water mains to homes, businesses, and schools.

[4] **Source**: Brian Wilson, Merrimack Village District, 2001

Map VII-2: Existing Water and Sewer Lines



b. Water Use

The MVD supplies water to approximately 5,900 residences, 200 commercial users and 100 industrial users. About 80% of the population in Merrimack is served by the MVD. Total water demand in Merrimack is broken down into several user classes: 1) domestic; 2) mercantile; 3) industrial; 4) and unaccounted for. The domestic or residential use class is the largest demand category (74% in 1999). In 1999, average residential water use was 90 gallons per capita per day[2]. Per capita water usage from 1995-2000 is listed in Table VII-2.

Table VII-2: Historic per Capita Water Demand 1995 - 2000

Year	Population served by MVD	Annual Residential Demand (gallons)	Gallons per capita per day (gpcd)
1995	18,367	608,567,164	91
1996	18,560	618,920,304	91
1997	18,889	660,100,778	96
1998	19,118	609,314,652	87
1999	19,502	642,979,775	90
*2000	19,681	597,708,360	83
		Average gpcd:	**90**

*Per capita demand for 2000 reflects 74% domestic water use

Source: Population data from NH OSP and MVD customer database. Residential demand from MVD historic revenue figures (2000 revenue figures not available, see note above)

Based on the Buildout Study, it is estimated that the Town's population will increase by 6,632 within the MVD service area. Assuming that all new residents are served by public water, residential demand would increase by 596,880 gallons per day or by 217,861,200 gallons per year based on a daily rate of usage of 90 gallons per capita. Some new residential units will, of course, be developed on private wells, however, these would be off-set to some extent by existing residences on private wells that will eventually hook up to MVD service.

Commercial and industrial customers use approximately 17% of the total demand from the MVD. Industrial and commercial demand is currently estimated at 145 million gallons per year. The MVD currently serves about 300 commercial and industrial users with meters that range in size from 1 inch to 6 inches. Very large customers (3-inch meters and greater) include: 1) Amherst Computers; 2) ChemFab; 3) Merrimack Inn; 4) Fairfield Inn; 5) Wentworth Place; and 6) Fidelity. Based on the Buildout Study, an estimated 3,740,138 square feet of non-residential uses could be developed within the MVD service area, which could result in an increased demand of 86.7 million gallons per year (an additional estimated 2,844,351 square feet of non-residential space could be built within the Pennichuck Water Works service area).

Unaccounted for water is the last class MVD uses to determine water demand. The accepted industry standard for unaccounted for (unmetered) water is about 15%. Since 1994, MVD has had less than this industry standard, with 9% unaccounted for water in 1999. Unaccounted for water usually occurs in the form of leaks. MVD conducted a

leak detection program in the mid-1990s and the system is periodically checked for other leaks[2].

c. Future Water Demand

The current capacity of the existing MVD system (assuming a 24-hour pumping rate for each well) is about 6.85 million gallons per day (mgd). This meets the current average day demand of 2.5 mgd as well as the maximum daily demand of 5.5 mgd. The *average* daily demand is the average daily use over an entire year. The *maximum* daily demand is the peak demand, which 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 Master Plan Update, 2001 estimates that the average daily demand at buildout would be approximately 3.2 mgd and the maximum daily demand at buildout would be approximately 7.6 mgd.[5] The average daily demand projected for buildout, therefore, is well within the existing system capacity. However, the maximum daily demand of 7.6 mgd projected for buildout is greater than the existing system capacity of 6.85 mgd indicating that a potential water shortage during late summer months could occur. However, once Well 6 is brought back online, the system capacity is expected to increase by 1.15 mgd if pumped on a 24-hour basis, bringing the total system capacity to 8.0 mgd. With Well 6 back on-line, the MVD would be able to meet the projected demand for water within its service area at buildout, however, should any of the existing wells go off line for any reason, the system may not be able to meet the maximum daily demand that typically occurs during summer. For these reasons, the MVD continues to encourage water conservation along with infrastructure improvements.

d. 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 June 25, 1999. This policy allows residents with odd numbered houses to use outside water only on odd numbered days and residents with even numbered houses on even numbered days. By allowing only ½ of the residential customers to use outside water on any one day, this limits the peak daily demand. This policy is expected to continue indefinitely and has been successful in lowering the weekly demand from 35 to 25 million gallons per week. 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. They have developed a curriculum for all fourth grade classes in Merrimack, which teaches students about the water cycle, groundwater, and groundwater contamination. Students take part in a variety of hands-on experiments. By the end of Spring 2000,

[5] Source: Comprehensive Environmental Inc., Merrimack Village District Master Plan Update, January 2001 using data from Nashua Regional Planning Commission, Town of Merrimack Buildout Study, 1999.

every fourth grade class in the Merrimack School District was visited three times by the MVD education coordinator. A sixth grade curriculum is currently being developed. The MVD also publishes a newsletter called WaterWise, which is coordinated by the MVD Wellhead Protection Committee. The newsletter addresses water conservation and protection issues within the MVD area and is distributed to all MVD customers.

To address its long term needs, the Merrimack Village District developed a Master Plan Update in 2000. The following recommendations have been suggested for preserving capacity:

- Continue to implement the odd/even water management plan (described above);
- Put Well #6 back online as growth requires; and
- The buildout analysis suggests increased industrial growth in the future, work with industries as they are being developed to help keep outside watering in new facilities at a minimum.
- Also in 2000, the MVD convened an Ad hoc Committee to develop a strategy to address water supply demand and aquifer recharge issues in the Naticook Basin. The Committee developed a series of recommendations to address water supply and aquifer recharge issues. Specifically, the Committee 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. Other recommendations related to groundwater conservation are included in Chapter III, Natural Resources. 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 buildout.

2. 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 120,000 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 211 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 Buildout 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 buildout. The emergency connection agreement with MVD and the planned addition of the new booster station and connection is designed to provide the quantity of water needed to support the southeast portion of Merrimack.

F. WASTEWATER TREATMENT AND THE SEWER SYSTEM

1. Merrimack Wastewater Treatment Facility

Merrimack's secondary wastewater treatment plant, located on Mast Road was brought online in 1970. The plant, which was the first of its kind on the Merrimack River, was designed to treat up to five million gallons per day of the wastewater generated by the Town of Merrimack and the Anheuser-Busch facility. As of 1997, Merrimack's treatment plant was one of only 1,600 facilities in the United States, and was considered to be one of the best of its kind by the Environmental Protection Agency.

Currently the treatment plant processes about 3.8 million gallons a day (mgd), with a capacity of approximately 5 mgd. Residential users contribute approximately 70 gallons per person per day, and at an occupancy rate of 3.3 people per single family home, it is estimated that each single-family dwelling unit discharges about 230 gallons per day. 70-80% of the waste stream is from commercial and industrial users, contributing about 2,000 gallons per acre per day. Anheuser-Busch contributes the majority of the industrial waste, discharging about 2.1 mgd. The organic strength of the waste from the brewery is five times stronger than the waste received from households. The treatment plant was designed as a large controlled biological reactor to be able to accommodate the high organic waste from Anheuser-Busch, in addition to the waste from households. Ninety-nine percent of the organic loading and solids are removed from the effluent to the Merrimack River through a process of settling out the solids in the wastewater and using bacteria to digest any remaining waste. The final stage is a chlorine treatment before being released into the river. The wastewater treatment plant is self-financed through user-fees. The system is self-sufficient, with very little debt. The average yearly bill for domestic sewer service is $134, which is ½ of the State's average.

The by-product of the secondary treatment process is sludge, which is composted at the plant in Merrimack. The plant began composting sludge in 1982 as an alternative to burning the remaining waste. The plant formerly used a static compost process, which involved using yard waste that was sent to the landfill as a bulking agent for the sludge composting. The plant

improved this process in 1994 by switching to an in-vessel process, which is completely enclosed and uses heat to speed up the breakdown of materials. The facility produces about 8,500-9,500 dry tons of sludge a year. This sludge is then marketed to country clubs for their golf courses and universities for their athletic playing fields in New York, Rhode Island and Massachusetts. The compost is also available to residents of Merrimack.

In the Buildout Study, it is estimated that an additional 1,245 housing units would be added to the areas of Town estimated to be provided with sewer service. Based on the current estimated average of 230 gallons of wastewater per household, an estimated 286,350 gallons per day could be added to the waste stream at buildout. When added to the current processing rate of 3.8 mgd, this leaves approximately 913,650 gallons per day for future non-residential customers before the current system's processing capacity of 5 mgd is reached. Given that Commercial and Industrial uses account for between 2.7mgd and 3 mgd of the system's capacity (or .6mgd to .9mgd excluding Anheuser-Busch), the system may not have the capacity to provide for the 97% increase (6,584,489 square feet) of nonresidential square footage anticipated in the Buildout Study. Therefore, it may not be possible to meet both the residential and nonresidential demand anticipated at Buildout. It should also be noted that by federal law, when the Wastewater Treatment Facility is at 80% capacity for 90 consecutive days then the Town needs to begin planning for expansion.

Currently, there are no plans to expand the Wastewater Treatment Plant and none are anticipated. Improvements and upgrades to the system, however, such as additional clarifiers and a trickling filter for the treatment plant, are planned over the next 3-6 years and are included in the Capital Improvements Plan (see Table VII-3).

Table VII-3: Capital Improvements Plan for Sewer and Wastewater Treatment Plan, July 1, 2002 – June 30, 2008

Department	Project Description	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08
Wastewater Treatment	Primary Clarifier	0	590,000	0	0	0	0
Wastewater Treatment	Secondary Clarifier	0	900,000	0	0	0	0
Wastewater Treatment	Trickling Filter	0	0	1,500,000	0	0	0
Sewer	McQuestion Road Sewer Line	0	225,000	0	0	0	0
Sewer	Naticook Lake Sewer Line						
Sewer	Brickmill Park Sewer Line	0	0	0	0	40,000	400,000
Sewer	Davis Road Sewer Line	0	0	35,000	315,000	35,000	315,000
Total:		0	**1,715,000**	**1,535,000**	**315,000**	**75,000**	**715,000**

Source: Town of Merrimack Capital Improvements Plan, 2001.

2. Sewer System

The sewer system in Merrimack was implemented in the 1970s before the Clean Water Act was passed. It was designed as a gravity collection system, with four pump stations that take waste from higher elevations in Town and follow drainage divides along the waterways, eventually leading to the lowest point in Town where the wastewater treatment plant is located on the Merrimack River. The pump stations are located at Reeds Ferry, Thorntons Ferry,

Pennichuck Square on Route 101 and on Burt Street. There are currently 66.4 miles of sewer in Merrimack that bring uncombined sewerage (stormwater is not combined with sewerage) to the wastewater treatment plant. The system provides sewer service to about 4,000 homes and most of the area east of the Daniel Webster Highway (see Map VII-2). The southwest portion of Merrimack discharges their sewer effluent to the Nashua wastewater treatment plant. Through an intermunicipal agreement between Merrimack and the City of Nashua, discharge is currently at capacity based on the agreement.

A study of the septic and sewer needs of the Town was first completed in 1976-77 by Hamilton Engineering in response to the Clean Water Act. A plan was developed based on this study, which established five primary drainage basins in the Town and fixed the location of the Wastewater Treatment Facility. The plan outlined the location of five interceptors (each one attached to one of the five drainage basins) to which smaller diameter pipes known as collectors could be attached and to which individual homes and businesses could connect. The entire system was designed to continue to be primarily gravity fed. In 1989-91, in response to the high number of septic system failures, Underwood Engineers conducted a study of the failures and outlined the costs of providing interceptors and collectors to certain areas of town with high incidences of septic failure. These two studies led to the development of the Sewer Master Plan, which provides a conceptual approach to sewer the entire town. In 1991, a Warrant Article to implement the Sewer Master Plan went before the voters but failed to pass. Since that time, sewer expansion has continued but in nearly every instance at a cost borne by private developers.

In 1999, a Sewer Master Plan Study Committee was formed to review the Sewer Master Plan in response to changes proposed for potential residential developments.[6] Findings of the Committee included that the planned construction of [certain] interceptors would open up areas to higher density under existing zoning and this may result in a need to expand the Wastewater Treatment Facility earlier than planned; that residential development [on septic systems had already been] constructed in certain areas without installation of planned interceptors, which [would] limit implementation of the plan by private developers; that it is unlikely that some of the planned interceptors would be built by the Town or developers, and that properly designed septic systems work well but that there continues to be significant septic system failures in Pineknoll Shores and the Ingham Road areas. Based on these findings, the Committee recommended the following:

- While the intent of the original Sewer Master Plan was to show an approach to sewering the entire town, an updated plan should be expanded to identify priority areas which should be sewered and any development leading to those areas should continue to extend the interceptors towards these areas. For example: a) Baboosic LakePineknoll Shores; b) Naticook Lake/Ingham Road; and c) Sargent Acres.
- The Sewer Master Plan should be technically reviewed by a professional engineering firm and should include: a) an evaluation of geological hazards in relation to the placement and location of sewer interceptors b) a look at economic feasibility of extending sewers to non-sewered areas; c) an evaluation of use and capacity (both

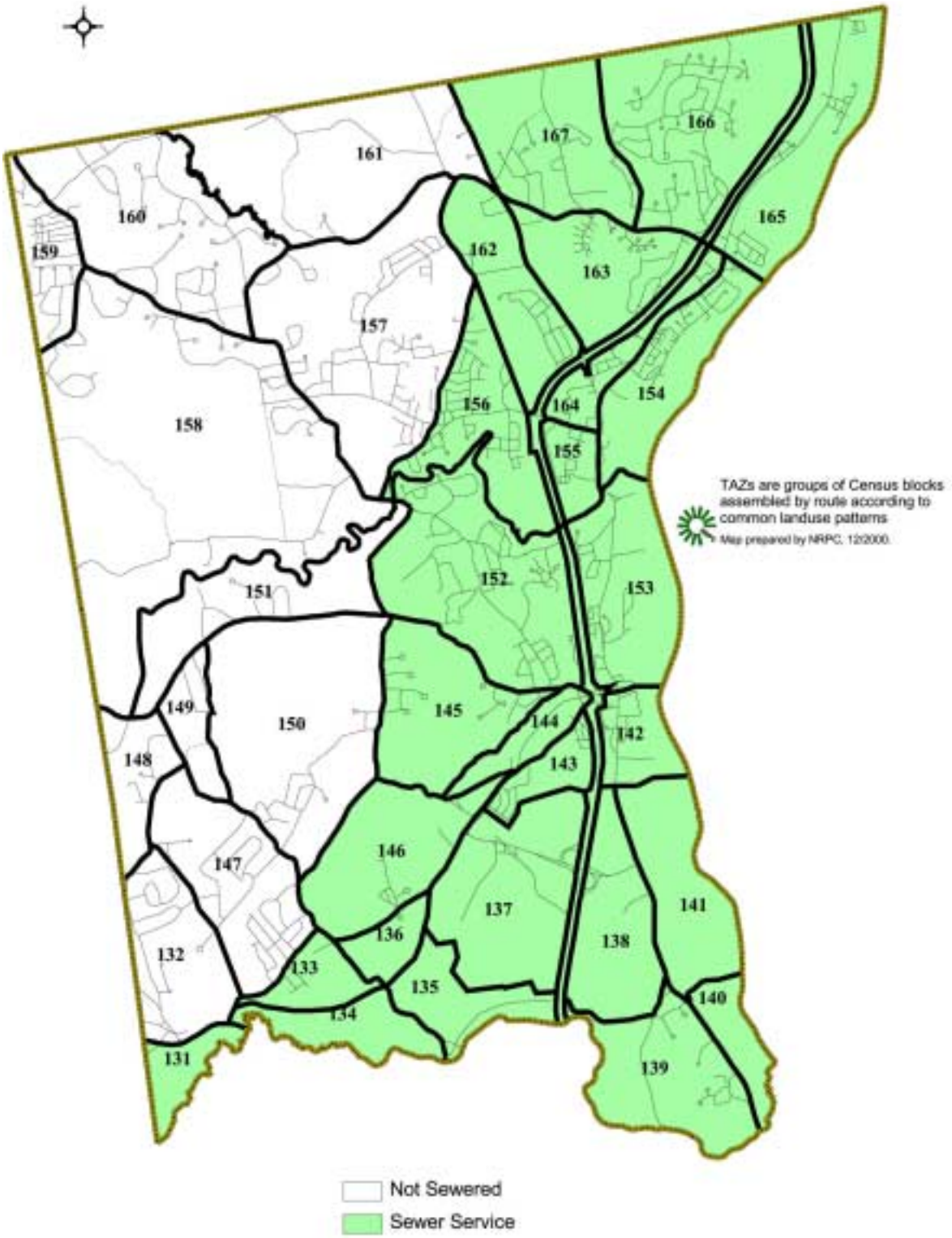
[6] Source: Sewer Master Plan Study Committee Report to the Board of the Selectmen, Merrimack, NH, October 21, 1999.

current and contractual) of the treatment plant and, if so necessary, an evaluation of the need for expansion of the Waste Water Treatment Facility; d) an evaluation of the impact to ground water resources; and e) an evaluation of short and long term impact to all community services (MVD, School District and Town).

- The Sewer Master Plan should be changed to allow Thorntons Ferry School to be sewered by connecting to the line coming down Continental Boulevard as the Pennichuck Interceptor will not be built under current funding mechanisms.
- The Town of Merrimack should approach the Town of Amherst to investigate a cooperative study of the sewer issues in the Baboosic Lake area. Collectively, the Towns should seek possible grant money.
- Alternative community septic systems should be considered in sensitive groundwater resource and priority areas.
- Funding mechanisms should be investigated to provide waste water disposal to priority areas, such as: a) capital reserves; b) betterment fees; c) enterprise funds; d) grants; and e) joint public/private funding.
- Septic failures mapping should be routinely updated (as was done for the 1991 Warrant Article).
- Regardless of septic or sewer, residents need to be periodically educated on the proper use and/or maintenance of waste disposal systems, particularly as to what may properly be disposed of in them.
- Green space should be encouraged and maintained through the master planning process, Zoning Ordinances and Subdivision Regulations of the Town.
- An updated Sewer Master Plan should include engineering plans, designs, maps and data and should be made available at the Town Hall as well as the Town Library.

The Department of Public Works is working to prioritize what areas will receive sewer service next. The DPW generally puts together a sewer expansion project every 3-4 years. Currently, the Town is putting $100,000 per year into the Capital Reserve Fund for the expansion of the sewer to prioritized areas. The estimated existing and future sewer service areas are shown on Map VII-3. Improvements and upgrades to the system, including a primary and secondary clarifier and a trickling filter, are included in the CIP (see Table VII-3).

Map VII-3: Estimated Future Sewer Service by Traffic Analysis Zone (TAZ)



G. SOLID WASTE

Solid waste in Merrimack is taken to a 138-acre parcel municipal landfill on Lawrence Road in the northwest corner of Town. The landfill itself, which was opened in 1970, occupies approximately 26 acres. Also located on this property is an area formerly used for landfilling known as the "Winter Dump", two areas used for storage of composted secondary wastewater treatment sludge, and the recycling center. Winter Dump is inactive and final capping was completed the summer of 2000.

The currently active landfill receives about 23,000 tons of solid waste per year, averaging about 3.5 pounds per person per day. Garbage is either commercially delivered, which includes waste from condominiums and apartment complexes, or self-delivered by residents in Town. There is no municipal curbside collection program in Merrimack. Residents either take their waste to the landfill or hire one of four commercial haulers in the area that collect residential waste.

In the late 1980s, the Town began planning for the closure of the landfill. Closure activities are planned to begin as early as the summer of 2002. Merrimack developed a Solid Waste Advisory Committee (SWAC) to develop a plan to address the future waste generated in Merrimack. The Committee drafted a 26-page document outlining the various options available for disposing of solid waste in the future. The Committee recommended the following:

- The Town should continue to provide solid waste services to all citizens, including residents, businesses, and commercial entities;
- The Town should implement solid waste management programs that provide maximum flexibility to best respond to the future solid waste disposal markets in New Hampshire and the northeast;
- The Town should continue to promote and provide recycling services so as to reduce the volume of waste that has to be transported to and disposed of at a remote merchant facility; and
- Construction of a transfer station to serve the residential and commercial solid waste needs of the Town best replicates the level of service provided by the present solid waste disposal facility, the sanitary landfill. Single-family residents can then make their own decisions should they wish curbside collection solid waste services. The transfer station should be located in the industrial zone.

The Town is currently debating the best solution for the future disposal of solid waste. In addition to the SWAC recommendations, other issues being debated include where to site a transfer station, whether a transfer station is needed and implementation of curbside pickup. However, after the landfill is closed, solid waste will be taken out of Town for disposal.[7]

1. Recycling

In order to lengthen the life of the landfill, Merrimack opened a voluntary drop-off recycling center in 1990. A 10,000 square foot facility with two drive-in bays was constructed

[7] Source: Dean Shankle, Merrimack Town Manager, 2001.

for residents to drop off their items. Items are placed into containers dedicated for each type of recyclable. The center accepts the following items: three colors of glass; PETE and HDPE plastic beverage containers; newspapers; corrugated and office paper; magazines; aluminum, tin and steel cans; tires; motor oil and antifreeze; metals; and yard waste for composting. There is also a section dedicated for books and second hand items for swapping.

The recycling center receives about 3500 tons of materials every year. A breakdown of the items accepted by the recycling center and the annual tonnage of each is included in Table VII-4. However, the number of vehicles per day visiting the center is not currently tracked.

Table VII-4: Merrimack Recycling Center Categories and Tonnage Received

Category	Annual Tonnage
Glass Containers	223 tons (crushed) spread on landfill
Plastic Containers	Natural #2/Colored HPDE - 7 tons Clear 5 & 7/#1 PETE – 21 tons
Metals and White Goods	Aluminum cans - 12 tons Tin cans - 35 tons Scrap - 398 tons
Tires	1,170 tons
Automotive Batteries	17 tons
Construction and Demolition	26 tons

Source: Nashua Regional Planning Commission, Regional Recycling Plan, October 2000.

2. Hazardous Waste

Household hazardous wastes come from everyday products used in the home, yard or garden. These hazardous wastes are corrosive, flammable, toxic or reactive. Merrimack handles the disposal of hazardous waste in two different ways. The recycling center accepts universal waste such as antifreeze, waste oil and cadmium batteries and recycles them on site. They also accept asbestos, by appointment, which is buried in an inactive portion of the landfill and then capped.

Other hazardous waste items are disposed of through involvement in the Nashua Regional Household Hazardous Waste/Small Quantity Generator Collection Program. This program is a collaborative effort of the NH Department of Environmental Services, the City of Nashua, the Nashua Solid Waste Management District (District), and the Nashua Regional Planning Commission. Member towns pay a fee to the District based on population in order to participate in the program. In 2000, Merrimack paid a total of $6,466 in fees. This fee is based partly on the Town's population as a percentage of the entire region and is paid annually.

In 2000, Merrimack held nine Household Hazardous Waste collection days. A total of 130 households participated. Examples of items accepted on the collection days include: adhesives, lead/oil-based paints, varnishes, pesticides, pool chemicals, photo chemicals, resins, and aerosols. Collection days are organized by the Nashua Regional Planning Commission.

H. RECOMMENDATIONS

1. Public Water Supply

With the return of Well 6 to active use, the Merrimack Village District should be able to serve both the residential and nonresidential average and peak demands anticipated at Buildout within its service area. The loss of any productive well or significant changes to demand, however, could limit the ability of the system to meet future peak demand. For these reasons, a combination of infrastructure improvements and conservation measures are recommended. Pennichuck Water Works anticipates being able to meet buildout demand within its service area. Specific Recommendations are provided below. Additional recommendations related to groundwater recharge, conservation and wellhead protection can be found in Chapter III, Natural Resources.

- The Merrimack Village District Well 6 should be brought back online as growth requires.
- The Merrimack Village District odd/even water management system should be continued.
- The use of separate commercial/industrial water meters for outdoor irrigation should be considered.
- Work with the State to develop limitations on large groundwater withdrawals by commercial and industrial users.

2. Public Sewer and Waste Water Treatment

Though originally developed over 30 years ago, Merrimack's Waste Water Treatment Plant and system remains state of the art and capable of meeting the existing residential and nonresidential needs of the Town. The gravity based system outlined in the Town's so called "Sewer Master Plan" with its reliance on natural drainage areas, has served the Town reasonably well, though certain planned interceptors are not likely to be completed due to changing development patterns and other constraints. It does not appear, however, that the Merrimack Waste Water Treatment plant can accommodate the anticipated demand for both residential and nonresidential development at buildout, and within the southwestern portion of Merrimack served by the Nashua system, no unused capacity remains. Given the need to continue to expand the tax base (see Chapter IX, Economic Development) consideration must be given to meeting the anticipated demands of commercial and industrial uses. In addition, there is still an identified need to connect certain existing neighborhoods with high instances of septic system failures to the system. It is also recognized that for residential uses in particular, modern septic systems on appropriately sized lots function well when properly cared for and are an appropriate alternative to public sewer. Therefore, it is recommended that:

- The existing gravity based system outlined in the "Sewer Master Plan" should continue to serve as a guide for future improvements to the sewer system, however, the plan should be reviewed and updated to address plant capacity, economic considerations and environmental impacts. Planned interceptors that are no longer feasible or desirable should be eliminated.

- Expansions of the sewer system to serve new residential development should be constructed in accordance with the updated Sewer Master Plan.
- Within residential areas, a priority should be placed on extending sewer service to existing neighborhoods with high instances of septic system failures such Sargent Acres or the Ingham Road area.
- The Town of Merrimack should approach the Town of Amherst to investigate a cooperative study of the sewer issues in the Baboosic Lake area. Collectively, the Towns should seek possible grant money.
- Alternative community septic systems should be considered in sensitive groundwater resource and priority areas.
- Alternative funding mechanisms should be investigated to provide waste water disposal to priority areas, such as: a) capital reserves; b) betterment fees; c) enterprise funds; d) grants; and e) joint public/private funding.

CHAPTER VIII
HISTORIC RESOURCES

A. 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, in 1990 only 4.3% of the housing units in Town were built before 1940, as compared to 17.6% in the region and 27.1% statewide. In fact, as of 1990, Merrimack tied with Litchfield for the fewest historic housing units, on a percentage basis, of any community in the Nashua planning region. 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 the results of the Town Survey and SWOT Analysis and a discussion of: 1) the history of Merrimack including archaeological resources and architectural resources; 2) tools for historic preservation; and 3) recommendations. Most of this chapter has previously appeared in the 1993 Merrimack Master Plan. The Merrimack Master Plan Advisory Committee, charged with preparing an update of that Plan for the first decade of the 21st century, believes that the 1993 Historic Resources chapter is a succinct overview of Merrimack's history, and that the analysis and recommendations contained therein are still current. Several additional recommendations have been added as a result of recent discussions.

B. TOWN SURVEYS

Nearly half (44%) of those responding to the 1992 Master Plan Survey perceived a need for increased efforts to preserve historic aspects of Merrimack. An additional third (32.8%) were not sure. Of the 384 individuals expressing a desire for increased preservation, 147 were able to name one or more resources worthy of attention. In addition to responses related to the

general preservation of historic houses, cemeteries and churches; individual buildings and sites were frequently identified. Individual resources receiving the most citations included the 1847 Schoolhouse (23 responses), old Town Hall (18), Turkey Hill Cemetery (14), South Merrimack Congregational Church (12), the library (11) and Hannah Jack Tavern (6).

The 1998 Town-wide survey contained one question relating to the preservation of historic resources. That question asked: *"Do you perceive a need for increased effort to preserve historic aspects of Merrimack*?" 61.5% of the respondents answered "Yes," indicating that the majority of residents support the protection of Merrimack's historic resources.

C. HISTORICAL OVERVIEW

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 I 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 church, post office, general store and school.

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 latter in 1907. 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, and 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), 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.

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 FEE 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 during the 1960s including Mastricola Elementary in 1961, Merrimack High School in 1965, Reeds Ferry and Thornton's Ferry Schools in 1968. Continued population

growth has resulted in the construction of numerous additional expansions to each school since the 1960s. 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.

2. Archeological 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 cellarholes, 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.

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.

a. 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.

b. 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.

c. 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 Hannah Jack's Tavern (Daniel Webster Highway at Greeley Street and the Country Gourmet Restaurant (438 Daniel Webster Highway). Federal style detailing is also evident on the First Congregational Church on Baboosic Lake Road.

d. 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 cornerblock 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). Other examples of the vernacular Greek Revival style include the houses at 255 Daniel Webster Highway (corner of Star Drive) and 593 Daniel Webster Highway in

Reeds Ferry 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 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 High 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.

e. 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.

f. 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.

g. 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 Levi Lowell's at 585 Daniel Webster Highway and the house across the street at 588 Daniel Webster.

h. 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.

i. 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.

D. 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, Blood, County, Meetinghouse, Naticook, Patten, Parkhurst, Peaslee, Seaverns Bridge, Tinker and Wire Roads. The Town has gone to some length to keep several of these older roads intact, including Blood and South Grater Roads. Additional historic roads, now discontinued, include the Old Kings Highway. In 1990, according to the U.S. Census there were 337 dwelling units in Town constructed prior to 1939. The location of various historic sites and villages are illustrated on Map VIII-1.

The following is a brief summary of the historic village areas in Merrimack:

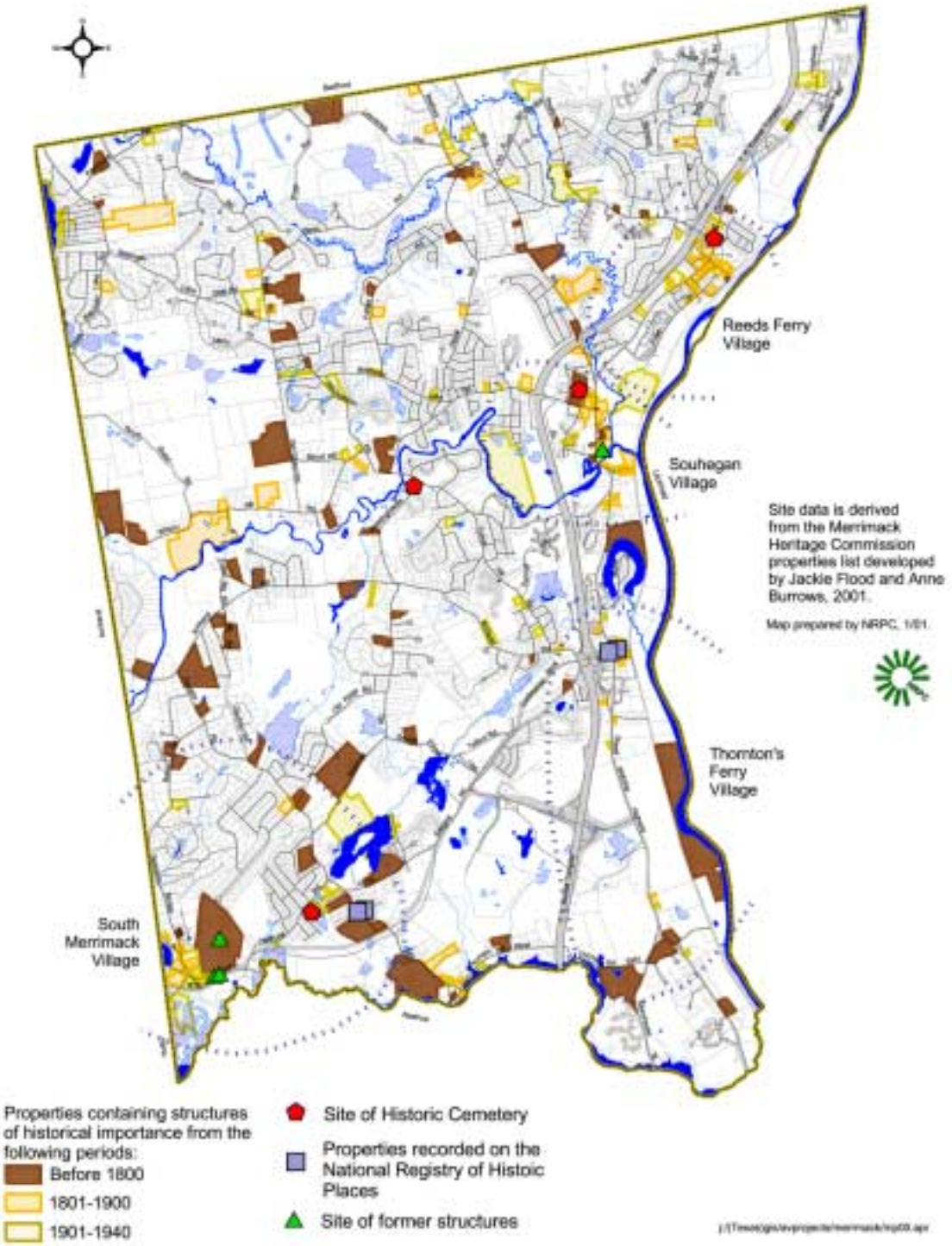
Merrimack Center - Located where the Souhegan River meets the Merrimack, along the Great Road from Concord to Boston, and later near the railroad tracks, what is now Merrimack village was well sited for a center of local activity. Known as Souhegan Village in the nineteenth century, the village hosted 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 McGraw Institute. Robert McGraw, one of the original share holders 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 (585 Daniel Webster) who built or owned the mill, the buildings now 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 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 Route3 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 FEE 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. The railroad depot which served the commuter line to Nashua was moved for the Route101A Bypass in the 1950s.

Map VIII-1: Historic Villages and Sites in Merrimack



E. 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. Included in Appendix VIII-A are the Secretary of the Interior's Standards for Rehabilitation, guidelines originally developed by the Federal government to evaluate whether the historic character of a building is preserved in the process of rehabilitation.

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.

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.

There are a number of information sources available that would be beneficial to a survey effort. The Town history includes a section on early homesteads. Other important sources include old maps such as those included in the 1892 New Hampshire Atlas. The Merrimack Heritage Commission is currently beginning work on an historic resources survey for the Town, scheduled for completion within a year. A townwide map of historic structures was prepared by the Nashua Regional Planning Commission in 1991, marking the beginning of what will hopefully become an increasingly complete inventory of structures in Merrimack. 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.

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 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.

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.

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.

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.

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%	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 insure the sympathetic rehabilitation of the buildings. In some cases, historic barns may also be able to qualify for these credits.

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 160 historical markers. There are two markers located in the Town of Merrimack. A marker commemorating the township of Old Dunstable is located south of the Merrimack toll plaza at Exit 11 on the FEE Turnpike, 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 houses. 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.

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.

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.

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.

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."

E. RECOMMENDATIONS

- Consider the creation of a local Historic District at Reed's Ferry.
- Strengthen incentives for historic preservation in the zoning ordinance and site plan and subdivision regulations.
- 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.
- 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 stonewalls, cellar holes, and large trees that are often located along these Class VI road should be safeguarded from destruction or removal.
- Investigate preservation alternatives for historic barns through the New Hampshire Division of Historical Resources.
- 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.
- 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.

- 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.
- 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.
- Preserve and maintain the Town graveyards and private burying grounds.
- Encourage the Town Manager, Selectmen, 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.
- In order to encourage the preservation and restoration of historic structures within the Town Center area, consider an amendment to the zoning ordinance that would allow setbacks and other dimensional standards to be waived or reduced by special exception for historic structures within the Town Center Overlay District (TCOD). (Implemented at 2001 Town Meeting).
- Continue to use innovative land use controls including cluster and open space planned development and partial development to conserve open space and minimize the visual impact of new development on significant historic areas.
- Consider adopting architectural design standards for structures within the Town Center Overlay District (TCOD).
- 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.
- Promote the donation of easements by the owners of historic properties to a designated authority or established land trust.
- Consider the outright 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.
- Encourage National Register listing for appropriate local structures.

APPENDIX VIII-A

The Secretary of the Interior's Standards for Rehabilitation

1. The Secretary of the Interior is responsible for establishing standards for all programs under Departmental authority and for advising Federal agencies on the preservation of historic properties listed or eligible for listing in the National Register of Historic Places. The Secretary's Standards for Rehabilitation are guidelines originally developed to evaluate whether the historic character of a building is preserved in the process of rehabilitation. Although used extensively in projects seeking federal tax credits for historic rehabilitation of income-producing properties, the standards have also been adopted by a number of historic district commissions across the country and are now widely recommended for all work on historic properties.

2. Every reasonable effort shall be made to provide a compatible use for a property which requires minimal alteration of the building, structure, or site and its environment, or to use the property for its originally intended purpose.

3. The distinguishing original qualities or character of a building, structure, site or its environment shall not be destroyed. The removal or alteration of any historic material or distinctive architectural features should be avoided when possible.

4. All buildings, structures, and sites shall be recognized as products of their own time. Alterations that have no historical basis and which seek to create an earlier appearance shall be discouraged.

5. Changes which may have taken place in the course of time are evidence of the history and development of a building, structure, or site and its environment. These changes may have acquired significance in their own right, and this significance shall be recognized and respected.

6. Distinctive stylistic features or examples of skilled craftsmanship which characterize a building, structure, or site shall be treated with sensitivity.

7. Deteriorated architectural features shall be repaired rather than replaced, wherever possible. In the event replacement is necessary, the new material should match the material being replaced in composition, design, color, texture, and other visual qualities. Repair or replacement of missing architectural features should be based on accurate duplications of features, substantiated by historic, physical, or pictorial evidence rather than on conjectural designs of the availability of different architectural elements from other buildings or structures.

8. The surface cleaning of structures shall be undertaken with the gentlest means possible. Sandblasting and other cleaning methods that will damage the historic building materials shall not be undertaken.

9. Every reasonable effort shall be made to protect and preserve archeological resources affected by, or adjacent to, any project.

10. Contemporary design for alterations and additions to existing properties shall not be discouraged when such alterations and additions do not destroy significant historical, architectural, or cultural material, and such design is compatible with the size, scale, color, material, and character of the property, neighborhood, or environment.

11. Whenever possible, new additions or alterations to structures shall be done in such a manner that if such additions or alterations were to be removed in the future, the essential form and integrity of the structure would be unimpaired.

CHAPTER IX
ECONOMIC DEVELOPMENT

A. INTRODUCTION

Economic indicators suggest that the Town of Merrimack continues to exhibit a relatively healthy economy, and is in a position to continue to sustain and enhance economic growth. Over the past few decades, Merrimack has evolved into a major employment center in its own right and is an important player in both the regional and state economy. This importance is due to both the number of jobs in Town as well as to the quality of those jobs. Many of the relatively high paying jobs are in growing sectors of the economy. In addition, a higher percentage of Merrimack's residents work in Merrimack than in any other community in the region.

The Town has an unemployment rate lower than that of the region, state and the nation, and its residents have household incomes and high school and college attainment rates higher than the region and the state. Merrimack is a primary employment center within the Nashua region with a diverse job base and a higher than average employment in the manufacturing sector. The tax base is supported by one of the highest non-residential equalized assessments in the region due to the high quantity of industrially zoned land.

Challenges facing the Town include ensuring that the job base remains strong and diverse so that it can continue to meet the needs of residents and endure any downturn in the national or state economy. In addition, it is essential that the Town maintains and enhances its tax base.

The Economic Development Chapter of the Master Plan provides: 1) an overview of the existing state and local economic environment; 2) existing employment indicators; 3) existing commercial and industrial land use; and 4) recommendations.

B. THE EXISTING STATE & LOCAL ECONOMIC ENVIRONMENT

The New Hampshire economy has grown extensively between 1993 and 2000, representing the state's second longest recorded period of economic growth. One of the driving forces behind the state's economy is the economic expansion in southern New Hampshire throughout the financial, construction, transportation, manufacturing, research & development and service sectors. Unemployment levels have recently hit sustained record lows, although they were beginning to increase at the time this plan was developed.

1. New Hampshire's Economic Environment

New Hampshire appears well suited for continued economic growth for the following reasons:[1]

[1] Source: New Hampshire Economic Review (published by Public Service of New Hampshire) and 2001 New Hampshire Business Resource Directory (published by Business NH Magazine)

- The state population grew 11.4 percent between 1990 and 2000, making New Hampshire the fastest growing state in New England;
- 8.3 percent of the New Hampshire workforce is employed in high tech industries, the second-highest percentage in the nation;
- New Hampshire has the lowest tax burden in the nation;
- New Hampshire has the lowest percentage of its population in poverty of any state;
- New Hampshire's manufacturing GSP comprises 23.8 percent of the total state GSP, the highest percentage in New England; and
- For the last five years, New Hampshire has enjoyed unemployment rates well below national levels.

2. Merrimack's Economic Environment

Merrimack is especially well suited for continued economic growth for the following reasons:

- The community has a high number of quality jobs, giving it an average wage well above county and state averages;
- Merrimack's location is close to centers of commerce in Nashua, Manchester, and Northern Massachusetts;
- Merrimack offers easy access to the Everett Turnpike, Manchester Airport, and the proposed corridors for commuter rail, Manchester Airport Access Road, and the Nashua Circumferential Highway.
- There are large, contiguous areas of industrially zoned land; and
- Public sewer and water is available in all industrial and commercial areas.

However, Merrimack faces certain challenges to continued economic development:

- There are only a few major vacant commercially zoned parcels left in the community;
- Some industrial parcels are brownfields that would require clean-up before any development would be feasible;
- The tolls at each of the Everett Turnpike interchanges in Merrimack increase the cost of commuting for employees and the cost of trucking for businesses;
- Tight labor supply;
- The industrial land in the northern section of Town has limited access to the interstate highway system;
- The need to maintain and enhance the tax base; and
- The quality of life will need to be maintained in the face of increased development.

The following long-term transportation improvements, discussed in more detail in Chapter VI, Transportation, will help to facilitate continued economic growth in Merrimack:

- Route 101A will be widened to three lanes in each direction from Continental Boulevard in Merrimack to Somerset Parkway in Nashua. Widening would include bicycle and pedestrian improvements along the corridor and new turning lanes at major intersections. Improvements to the intersection of Route 101A and Boston Post Road are also scheduled. This project would reduce congestion and provide improved access to this regional commercial corridor.
- The northern segment of the Nashua Circumferential Highway, including an interchange on the Route 3 near the Nashua city line, may be constructed. This project will provide an additional Merrimack River crossing, thereby improving access to Merrimack from Hudson, Litchfield and other communities east of the Merrimack River, thereby, increasing the Town's potential labor pool and market area.
- The Manchester Airport Access Road, including interchanges on the Everett Turnpike and Route 3 in Bedford just over the Merrimack Town line, will be constructed. This project will improve access to the Manchester Airport from Merrimack industrial zones along the Everett Turnpike. This project will provide highway access to industrial land in northern Merrimack and reduce travel times from Merrimack to the airport.
- The Commuter Rail line from Lowell to South Nashua will be extended. Eventually, the line will be further extended to include stops in Merrimack and Manchester. The Merrimack stop is likely to be located off of the Route 3 in the southern section of Town. This rail extension will make the trip to Boston easier for Merrimack commuters. Depending on where New Hampshire stations are placed, the rail line may even offer a commuting alternative for Merrimack commuters working in the business districts of Manchester and Nashua. By offering an alternative to commuters, the rail service will also reduce congestion along the Everett Turnpike.

C. EMPLOYMENT

1. Unemployment

As Table IX-1 demonstrates, Merrimack consistently maintained an unemployment rate below the rate of the Nashua PMSA throughout the 1990's. However, Merrimack was affected by regional and statewide trends during the decade. During the recession of the early 1990's, Merrimack, like the PMSA and the state, experienced high rates of unemployment. Similarly, Merrimack's unemployment decreased along with regional and statewide unemployment during the economic expansion of the late 1990's. Merrimack, the Nashua PMSA, and New Hampshire have all had unemployment rates significantly lower than the national average since 1997.

Table IX-1: Unemployment Rates in the NRPC Region, 1990- 2000

	Unemployment Rates				
Year	Merrimack	Nashua PMSA	NH	New England	US
1990	4.1%	6.1%	5.6%	5.7%	5.5%
1991	5.6%	7.3%	7.2%	8.0%	6.7%
1992	6.7%	7.1%	7.5%	8.0%	7.4%
1993	6.7%	6.7%	6.6%	6.8%	6.8%
1994	5.0%	5.3%	4.6%	5.9%	6.1%
1995	4.0%	4.5%	4.0%	5.4%	5.6%
1996	3.8%	4.2%	4.2%	4.8%	5.4%
1997	2.7%	2.8%	3.0%	4.2%	5.2%
1998	2.4%	2.8%	2.9%	3.5%	4.5%
1999	2.7%	2.9%	2.7%	3.3%	4.2%
2000	2.6%	2.8%	2.8%	2.8%	4.0%

Source: US Bureau of Labor Statistics and NH Department of Employment Security, July 2001.

There were several major layoffs in Merrimack and surrounding communities in 2001 and there has been an increase in unemployment in Merrimack, the Nashua PMSA, and New Hampshire as of October 2001. The unemployment rate in the Nashua PSMA (includes Merrimack) for October 2001 was 3.8%, which is somewhat higher than the average for 2000 of 2.6%.[2] Given recent events in 2001, it is possible that unemployment will continue to increase in 2002.

2. Local Employment Pool

Table IX-2 shows the educational attainment of the residents of Merrimack, the Nashua PMSA, and the state in 1990. Merrimack has a higher percentage of high school and college graduates than the region or the state, meaning that local employers have a higher than average access to skilled labor.

Table IX-2: Educational Attainment, 1990

Education Level	Merrimack	Nashua PMSA	NH
Less Than 9th Grade	305	5,571	47,691
9th - 12th Grade - No Diploma	910	10,330	79,732
High School Graduate (Includes Equivalency)	3,621	31,038	226,267
Some College, No Degree	2,897	22,928	128,695
Associate Degree	1,499	10,306	57,568
Bachelor's Degree	3,244	24,644	117,260
Graduate or Professional Degree	1,305	10,683	56,681
Percent High School Graduate or Higher	91.2%	86.2%	82.2%
Percent Bachelor's Degree or Higher	33.0%	30.6%	24.4%

Source: US Census Bureau. This table is based on 1990 census data.
Data from the 2000 census will be available in Summer 2002, at which time this table should be updated.
Until 2000 data is available, this table should be used with the understanding that the data may not reflect current conditions.

[2] Source: NH Department of **Employment Security, Economic and Labor Market Information Bureau, October 25, 2001.**

Tables IX-3 and IX-4 show various income characteristics of Merrimack, the Nashua PMSA, and the state. As Table IX-4 shows, Merrimack had a higher household income in 1990 than the region or the state, meaning that the Town's employers are likely providing a higher than average wage due to the employment types provided in the Town and the demand for skilled labor. The higher than average wage means that Merrimack's employees have more buying power, which may support the local retail and service industries.

Table IX-3: Household Income (Adjusted for Inflation), 1990

Income Level		Number of Households		
1990 Dollars	2000 Dollars	Merrimack	Nashua PMSA	NH
Less Than $15,000	Less Than $20,089	361	6,831	68,829
$15,000 - $24,999	$20,089 - $33,481	509	6,954	61,818
$25,000 - $34,999	$33,482 - $46,874	704	7,840	65,472
$35,000 - $49,999	$46,875 - $66,964	1,782	14,992	89,834
$50,000 - $74,999	$66,965 - $100,446	2,685	17,087	81,270
$75,000 - $99,999	$100,447 - $133,928	960	7,071	25,773
$100,000 Or More	$133,929 Or More	509	4,555	18,391

Source: US Census Bureau. Conversions to 2000 dollars based on inflation calculator at www.westegg.com/inflation. This table is based on 1990 census data. Data from the 2000 census will be available in Summer 2002, at which time this table should be updated. Until 2000 data is available, this table should be used with the understanding that its data may not reflect current conditions.

Table IX-4: Median Household Income and Poverty Characteristics, 1990

	Merrimack	Nashua PMSA	NH
Median Household Income 1990 Dollars	$52,978	$45,876	$36,329
Median Household Income 2000 Dollars	$70,953	$61,442	$48,655
Households Below Poverty Line	507	7926	69,104

Source: US Census Bureau. Conversions to 2000 dollars based on inflation calculator at www.westegg.com/inflation. This table is based on 1990 census data. Data from the 2000 census will be available in Summer 2002, at which time this table should be updated. Until 2000 data is available, this table should be used with the understanding that its data is outdated and does not necessarily reflect current conditions.

Table IX-5 lists the most common destinations for Merrimack commuters. The top destination is Merrimack itself, most likely due to the large number of employment opportunities within the Town. The second and third most common destinations are the neighboring cities of Nashua and Manchester, most likely due to the concentration of employment in those cities. This trend means that Merrimack residents, in general, do not have to travel far to their employment destinations. Of the fifteen communities listed, five are in the Nashua PMSA, three are southern New Hampshire communities outside the Nashua PMSA, and seven are in Massachusetts. Every community that is adjacent to Merrimack appears on the list except for Hollis and Litchfield.

Table IX-5: Journey To Work Destinations for Merrimack Commuters, 1990

Destination	Number of Workers	% of Total
Merrimack	3,731	34.5%
Nashua	3,158	29.2%
Manchester	1,333	12.3%
Hudson	518	4.8%
Bedford, NH	463	4.3%
Boston	213	2.0%
Bedford, MA	205	1.9%
Burlington	190	1.8%
Amherst	182	1.7%
Milford	169	1.6%
Chelmsford	160	1.5%
Lowell	157	1.5%
Lexington	127	1.2%
Billerica	117	1.1%
Salem	101	0.9%
TOTAL	10,824	100.3%

Source: See note for Table IX-2.

3. Local Employers

As Table IX-6 demonstrates, Merrimack is one of New Hampshire's primary employment centers. Merrimack and other suburban communities such as Salem, Bedford, and Hudson are beginning to displace traditional centers of commerce such as Rochester and Laconia.

Table IX-6: Top 25 New Hampshire Private-Sector Employment Centers, 1999

Rank	Location	Units	Employment
1	Manchester	3,252	56,938
2	Nashua	2,674	49,684
3	Concord	1,811	27,183
4	Portsmouth	1,664	24,776
5	Salem	1,273	20,664
6	Keene	879	16,401
7	Lebanon	746	15,414
8	Dover	798	13,029
9	Bedford	884	12,470
10	Rochester	647	11,167
11	Hudson	589	10,555
12	Merrimack	604	10,434
13	Laconia	642	9,887
14	Londonderry	747	9,653
15	Hanover	320	7,893
16	Exeter	535	7,564
17	Derry	620	7,436
18	Conway	698	7,408
19	Milford	387	6,863
20	Hooksett	404	6,213
21	Claremont	433	5,712
22	Hampton	522	5,202
23	Seabrook	286	4,843
24	Newington	171	4,813
25	Peterborough	336	4,269

Source: NH Department of Employment Security, April 2001.

Table IX-7 lists employers in Merrimack with one hundred or more employees. Fidelity Investments, a financial services firm, has four times as many Merrimack employees as any other firm. Several of these major employers, including Fidelity Investments, PC Connection, Amherst Corporate Computer Sales and Solutions, Ellacoya Networks, and Home Depot, have begun their Merrimack operations within the past few years. While many of the major employers that have been in Merrimack for a decade or more, such as BAE Systems, Anheuser-Busch, and Nashua Corporation, are manufacturers, many of the new major employers are in non-manufacturing industries.

Table IX-7: Major Employers in Merrimack, 2001

Employer	Product/Service	Employees
Fidelity Investments	Financial Services	3500
BAE Systems	Defense Systems	816
Merrimack School District	Education	800
PC Connection	Computer Resale	630
Anheuser-Busch, Inc.	Brewery	531
Kollsman Instrument Company	Electra Optics	500
Texas Instruments	Military Computer Circuits	500*
Nashua Corporation	Office Papers, Computer Disks	450**
Saint-Gobain	PTFE-Coated Fabrics	250
Amherst Corporate Computer Sales and Solutions	Computer Resale	238**
Town of Merrimack	Local Government	215
Shaw's	Supermarket	170
Ellacoya Networks	Internet Infrastructure	157
Schmalbach-Lubeca	Printed Circuit Boards	104
Tech Inc.	Molded Plastic Parts	100
Home Depot	Retail Hardware	***

Source: NRPC Telephone Survey (conducted in June 2001) unless otherwise indicated.
*Closed in 2002.
**Source: Business NH Magazine.
***Opening Merrimack store in 2001.

Table IX-8 shows that Merrimack employers, with the exception of governmental agencies, pay significantly higher wages than their counterparts in other Hillsborough County and other New Hampshire communities. Like manufacturing employers in Nashua, Hillsborough County and New Hampshire, Merrimack manufacturing employers pay higher wages than Merrimack non-manufacturing employers. However, the percentage gap between manufacturing and non-manufacturing wages in Merrimack is significantly smaller than the corresponding differences in the other areas depicted in Table IX-8. The comparison between Merrimack and Nashua is particularly striking. While the two communities have similar manufacturing wages, Merrimack's non-manufacturing wages are 55% higher than Nashua's.

It is likely that high-paying service sector jobs at employers such as Fidelity Investments and PC Connection are largely responsible for the high non-manufacturing wages in Merrimack, whereas in Nashua and other communities, many of the non-manufacturing jobs are relatively low paying retail jobs. It is also interesting to note that approximately 32% of Merrimack's employment is in manufacturing industries compared to 24%, 22% and 18% in Nashua, Hillsborough County, and New Hampshire respectively. Maintaining high wage levels in Merrimack is particularly important since more Merrimack residents work in town that in any other single community, meaning that the spending power of these local employees remains in the local economy.

Table IX-8: Manufacturing and Non-Manufacturing Employment and Wages, 1999

		Merrimack	Nashua	Hillsborough County	New Hampshire
Manufacturing	Units	49	181	798	2,607
	Average Employment	3,658	12,839	41,864	106,559
	Average Weekly Wage	$1,075.61	$1,046.01	$888.87	$798.24
Nonmanufacturing	Units	555	2,493	10,070	36,730
	Average Employment	6,775	36,750	127,838	410,191
	Average Weekly Wage	$931.71	$599.82	$629.30	$577.31
Government	Average Employment	914	3,954	18,331	74,450
	Average Weekly Wage	$617.67	$800.25	$667.58	$583.24
Total	**Average Employment**	**11,348**	**53,543**	**188,033**	**591,200**
	Average Weekly Wage	**$952.81**	**$721.62**	**$690.82**	**$617.88**

Source: NH Department of Employment Security, April 2001.

Table IX-9 shows the wage growth of each industry in New Hampshire and the Nashua PMSA. Merrimack's largest employer, Fidelity Investments, is in the finance, insurance and real estate (FIRE) sector. This sector experienced the fastest wage growth in the PMSA and the state between 1994 and 1999. A number of employers in the FIRE sector in Merrimack could therefore continue to increase the average wage growth of Merrimack residents.

Table IX-9: Wage Growth by Industry, 1994-1999

	Average Weekly Wage					
Industry	**NH 1994**	**NH 1999**	**Change 1994-1999**	**Nashua PMSA 1994**	**Nashua PMSA 1999**	**Change 1994-1999**
Agriculture, Forestry and Fishing	$327.80	$421.63	28.62%	$330.90	$458.46	38.55%
Mining	$590.89	$749.37	26.82%	$810.26	$912.02	12.56%
Construction	$518.74	$700.38	35.02%	$542.58	$791.49	45.88%
Manufacturing - Durable	$671.96	$828.90	23.36%	$839.51	$989.32	17.84%
Manufacturing - Nondurable	$586.07	$721.98	23.19%	$712.68	$798.58	12.05%
Transportation and Public Utilities	$617.47	$728.72	18.02%	$474.29	$610.85	28.79%
Wholesale Trade	$717.92	$961.05	33.87%	$756.18	$1,056.01	39.65%
Retail Trade	$283.74	$348.64	22.87%	$290.80	$379.15	30.38%
Finance, Insurance and Real Estate (FIRE)	$602.76	$878.87	45.81%	$544.20	$1,132.05	108.02%
Services	$452.97	$589.94	30.24%	$486.54	$660.12	35.68%
Government	$521.54	$583.24	11.83%	$608.08	$678.58	11.59%
Average	$521.54	$618.27	18.55%	$575.11	$732.53	27.37%

Source: NH Department of Employment Security, April 2001.

Table IX-10 shows historic employment figures for 1988 and 1998 and projected employment figures for 2008 for each New Hampshire industry. Although several major industries suffered substantial employment declines between 1988 and 1998, all industries

except Non-Durable Goods Manufacturing are expected to increase their employment between 1998 and 2008. The greatest employment gains are expected in the Services industry, which provide lower than average weekly wages (see Table IX-9). Significant growth in the Services industry in Merrimack could have negative effects on the overall average weekly wages for the Town.

Table IX-10: New Hampshire Employment Growth by Industry, 1988-2008

Industry	1988 Employment	1998 Employment	2008 Employment (Projected)	1988-1998 Growth	1998-2008 Growth
Agriculture	2,486	3,564	4,088	43.4%	14.7%
Mining	668	428	490	-35.9%	14.5%
Construction	35,897	23,021	26,028	-35.9%	13.1%
Manufacturing – Durable Goods	81,281	75,692	85,918	-6.9%	13.5%
Manufacturing – Nondurable Goods	36,577	32,942	30,508	-9.9%	-7.4%
Transportation and Public Utilities	18,225	20,378	22,722	11.8%	11.5%
Wholesale Trade	23,023	30,425	35,690	32.2%	17.3%
Retail Trade	112,637	122,344	140,112	8.6%	14.5%
Finance, Insurance, and Real Estate	31,805	30,792	35,394	-3.2%	14.9%
Services	139,227	194,595	249,341	39.8%	28.1%
Government	34,987	38,145	41,769	9.0%	9.5%

Source: NH Department of Employment Security, October 2000.

D. LAND USE

1. Regional Comparison of Commercial and Industrial Acreage

Table IX-11 shows the amount of land zoned for commercial and industrial use in each of the NRPC communities. As the table indicates, Merrimack has a higher percentage and acreage of industrially zoned land than any other community except Nashua. However, Merrimack ranks near the middle of the NRPC communities in terms of percentage and acreage of commercially zoned land.

Table IX-11: Commercial and Industrial Acreage in the NRPC Region, 2000

Town	Total Land Area*	Commercial Acreage*	Percent Commercial	Industrial Acreage*	Percent Industrial	Mixed Use Acreage*	Percent Mixed Use
Amherst	21,962	427	1.9%	604	2.7%	0	0.0%
Brookline	12,714	396	3.1%	0	0.0%	0	0.0%
Hollis	20,304	236	1.2%	236	1.2%	0	0.0%
Hudson	18,338	708	3.9%	1,171	6.4%	0	0.0%
Litchfield	9,538	1,503	15.8%	673	7.1%	0	0.0%
Lyndeborough	19,261	0	0.0%	113	0.6%	0	0.0%
Merrimack	20,995	562	2.7%	3,416	16.3%	0	0.0%
Milford	16,256	1,144	7.0%	953	5.9%	0	0.0%
Mont Vernon	10,752	59	0.5%	0	0.0%	0	0.0%
Nashua	19,797	1,003	5.1%	3,772	19.1%	197	1.0%
Pelham	16,737	337	2.0%	519	3.1%	0	0.0%
Wilton	16,375	61	0.4%	862	5.3%	0	0.0%
Region	203,029	6,437	3.2%	12,318	6.1%	197	0.1%

Source: NRPC GIS Database of Parcels in Region, 2000.
*All acreage figures include roadways and waterbodies, and therefore will not be consistent with other data for comparative purposes.

2. Regional Comparison of Tax Base

Given Merrimack's unusually high percentage of industrial land, it is not surprising that Merrimack has one of the highest *non-residential* equalized assessments in the NRPC region, both in terms of dollar value and percentage, as shown in Table IX-12. The Town also has the third highest *overall* assessment in the region.

Table IX-12: Non-Residential Equalized Assessments in the Merrimack Area*, 2000

Rank	Community	Total Equalized Assessed Value	Total Equalized Value of Commercial and Industrial Property	Percent Commercial and Industrial
1	Nashua	$5,578,503,984	$2,042,010,051	36.6%
2	Milford	$785,899,958	$255,327,849	32.5%
3	Hudson	$1,585,848,845	$437,325,000	27.6%
4	Merrimack	$1,765,633,898	$419,922,122	23.8%
5	Bedford	$1,816,654,434	$387,117,885	21.3%
6	Wilton	$226,312,943	$30,845,704	13.6%
7	Amherst	$997,380,772	$113,348,500	11.4%
8	Pelham	$776,598,501	$86,023,785	11.1%
9	Litchfield	$408,738,442	$31,292,521	7.7%
10	Hollis	$761,428,703	$52,051,758	6.8%
11	Brookline	$253,617,400	$11,823,906	4.7%
12	Lyndeborough	$104,048,079	$1,968,955	1.9%
13	Mont Vernon	$146,107,478	$1,523,080	1.0%
	Merrimack Area	$15,206,773,437	$3,870,581,116	25.5%

Source: NH Department of Revenue Administration; NH Dept. of Employment Security-State Occupational Information Committee (SOICC) as listed on NH website; "Commercial and Industrial" also includes value associated with property owned by utilities; the variable total assessed value is the total equalized valuation including utilities and railroads; non-residential portion of total assessed value derived by NRPC based on industrial and commercial land and building valuation and utility valuation; for non-residential proportion determination.

*For the purposes of this table, the Merrimack Area is defined as the NRPC Region and the Town of Bedford.

Table IX-13 suggests that residential assessment has a strong effect on assessed valuation per capita. Merrimack has the sixth highest *overall* assessed valuation per capita in the region. All five of the communities with higher assessed valuations per capita than Merrimack have lower percentages of non-residential property in their assessments, however, average residential sales prices for three of them (Hollis, Amherst and Pelham) are significantly higher than that for Merrimack.

Table IX-13: Equalized Assessed Valuation Per Capita in Merrimack Area*, 2000

Rank 2000	Community	Total Equalized Assessed Valuation	Population	Equalized Assessed Valuation Per Capita	Rank 1990	Rank 1980
1	Hollis	$761,428,703	7,015	$108,543	1	5
2	Bedford	$1,816,654,434	18,274	$99,412	2	1
3	Amherst	$997,380,772	10,769	$92,616	3	2
4	Mont Vernon	$146,107,478	2,034	$71,833	10	11
5	Pelham	$776,598,501	10,914	$71,156	12	12
6	Merrimack	$1,765,633,898	25,119	$70,291	4	4
7	Hudson	$1,585,848,845	22,928	$69,166	11	10
8	Lyndeborough	$104,048,079	1,585	$65,645	5	3
9	Nashua	$5,578,503,984	86,605	$64,413	7	8
10	Brookline	$253,617,400	4,181	$60,660	8	9
11	Wilton	$226,312,943	3,743	$60,463	6	6
12	Milford	$785,899,958	13,535	$58,064	9	7
13	Litchfield	$408,738,442	7,360	$55,535	13	13
	Merrimack Area	$15,206,773,437	214,062	$71,039		
	Hillsborough County	$23,505,650,009	380,841	$61,720		
	New Hampshire	$86,703,541,057	1,235,786	$70,161		

Source: Equalized Assessed Valuation from NH Department of Revenue Administration, Population from 2000 US Census.
*For the purposes of this table, the Merrimack Area is defined as the NRPC Region and the Town of Bedford.

3. Existing Uses in Commercial and Industrial Zones

Table IX-14 shows current uses of commercial and industrial properties in Merrimack and the contribution of each use to the tax base. The three land uses with the highest assessments are Factory ($104,652,100), Office ($45,757,900), and Research and Development ($29,832,300). These three land uses correspond with the activities of the major employers listed in Table IX-7. The most common land uses in Merrimack commercial and industrial zones are Professional Office (Condo) (136), Office (33), and Commercial Warehouse (24). Table IX-14 also shows the assessed value per acre for each land use. The three land uses that contribute the most to the local tax base per acre are Lodging ($542,745 per acre), Office ($372,569 per acre) and Retail ($335,070 per acre). There is very little developed lodging within the Town (30 acres) and so contribution to the tax base is minimal. However, there is substantial developed office (192 acres) and retail uses (98 acres) and there is the potential for significantly more office use within the remaining 1,248 acres of vacant industrial land.

Table IX-14: Existing Land Uses in Merrimack Commercial and Industrial Zones, 2001

NOTE: The land uses listed in this table are derived from the Town's assessing data. Because of the rigid system of land use classification used by the Assessing Office, this table may not describe uses of certain parcels as explicitly or completely as they might be described in another context. For example, all parcels that contain shopping centers are listed only as shopping centers – individual businesses in the shopping centers are not listed separately. Also, it is likely that some auto-related businesses that sell cars are listed as "Auto Repair" rather than "Auto Sales / Service."

Land Use	Quantity	Total Acreage	Total Assessed Value	Assessed Value per Acre
Hotel	1	4.18	$2,983,300	$713,708
Motel	2	19.44	$6,156,300	$316,682
Inn	1	6.00	$6,936,500	$1,156,083
Total Lodging	**4**	**29.62**	**$16,076,100**	**$542,745**
Hardware	3	3.96	$1,038,800	$262,323
Discount Store	1	8.35	$1,421,500	$170,240
Shopping Center	7	43.53	$12,253,700	$281,500
Store	15	19.02	$8,065,300	$424,043
Restaurant / Bar	19	23.14	$10,057,600	$434,641
Total Retail	**45**	**98.00**	**$32,836,900**	**$335,070**
Auto Sales / Service	4	15.61	$3,973,200	$254,529
Auto Parts	2	2.36	$1,259,300	$533,602
Auto Repair	14	22.51	$3,287,500	$146,046
Gas Station	7	8.33	$3,192,500	$383,253
Service Station	2	1.60	$600,400	$375,250
Car Wash	2	1.53	$713,500	$466,340
Parking Lot	6	11.17	$1,154,900	$103,393
Total Auto-Related	**37**	**63.11**	**$14,181,300**	**$224,708**
Office	33	150.45	$45,757,900	$304,140
Bank	4	8.71	$1,669,400	$191,665
Professional Office	5	23.00	$12,010,600	$522,200
Professional Office (Condo)	136	10.25	$12,248,100	$1,194,937
Total Office	**178**	**192.41**	**$71,686,000**	**$372,569**
Daycare	5	5.21	$2,660,300	$510,614
Transportation	1	1.97	$213,900	$108,579
Funeral	1	0.52	$340,800	$655,385
Roller Skating	1	6.40	$477,000	$74,531
Health Club	1	1.55	$498,700	$321,742
Golf	1	13.24	$576,700	$43,557
Fish and Game	2	96.10	$415,800	$4,327
Other Outdoor-Oriented	2	1.06	$134,500	$126,887
Oil Storage	1	0.50	$210,400	$420,800
Lumber	1	1.79	$602,000	$336,313
Commercial Warehouse	24	126.17	$15,268,100	$121,012
Greenhouse	2	1.33	$225,000	$169,173
Mobile Home Park	4	26.27	$2,606,800	$99,231
Total Miscellaneous Commercial	**46**	**282.11**	**$24,230,000**	**$85,888**
Commercial Land (Developable)	19	65.11	$3,761,400	$57,770
Commercial Land (Potentially Developable)	7	138.98	$1,547,800	$11,137
Commercial Land (Undevelopable)	4	9.70	$108,900	$11,227
Total Commercial Vacant Land	**30**	**213.79**	**$5,418,100**	**$25,343**
Factory	17	402.33	$104,652,100	$260,115
Industrial Warehouse	12	43.93	$9,829,100	$223,745

Land Use	Quantity	Total Acreage	Total Assessed Value	Assessed Value per Acre
Industrial Office	5	43.13	$17,999,900	$417,341
Research and Development	4	211.33	$29,832,300	$141,165
Sand and Gravel	2	25.50	$559,500	$21,941
Industrial Access Land	2	1.68	$139,800	$83,214
Total Non-Utility Industrial	**42**	**727.90**	**$163,012,700**	**$223,949**
Electric Plant	18	130.16	$14,809,400	$113,778
Gas Plant	1	0.00	$3,327,300	$0
Relay Tower	9	13.60	$3,360,800	$247,118
Radio / Television Tower	1	16.02	$735,700	$45,924
Electric Right of Way	1	14.17	$154,700	$10,917
Telephone Exchange Stations	5	1.60	$479,400	$299,625
Total Utility/Communications	**35**	**175.55**	**$22,867,300**	**$130,261**
Industrial Land (Developable)	22	295.56	$10,004,200	$33,848
Industrial Land (Potentially Developable)	10	56.48	$1,299,700	$23,012
Industrial Land (Undevelopable)	5	5.39	$53,100	$9,852
Total Industrial Vacant Land	**37**	**357.43**	**$11,357,000**	**$31,774**
Total Commercial and Industrial	**454**	**2139.92**	**$361,665,400**	**$169,009**

Source: Merrimack Assessor's Office, June 2001.
Totals for commercial and industrial parcels and acreage differ from other tables because land used for exempt uses, roads, and waterbodies is excluded.

Table IX-15 lists Merrimack's food service establishments. Although most retail business in Merrimack provides basic services for local residents, Merrimack does have several destination restaurants that bring in patrons from surrounding communities.

Table IX-15: Food Service Establishments in Merrimack, 2001

Category	Number of Establishments	Total Seating
Catering	2	0
Church / Veterans	4	475
Coffee Shop	4	108
Continental Breakfast	2	425
Convenience / Market	15	0
Corporate Cafeteria	12	2,284
Fast Food	5	565
Hotel	1	1,394
Ice Cream	2	0
Mobile Vendor	4	0
Pizza / Subs	9	628
Restaurant	16	1,595
School Cafeteria*	7	2,051
Supermarket	1	0
Vending / Concessions**	5	334
Miscellaneous	8	474
Totals	97	10,333

Source: Merrimack Health Officer, June 2001.

*Includes all educational institutions, daycare through postsecondary.
**Excludes corporate cafeterias.

4. Future Commercial and Industrial Development

Table IX-16 lists all of the vacant commercial and industrial land in Merrimack. Although there are still several significant parcels considered to be Industrial Developable, there are only three remaining Commercial Developable parcels larger than 5 acres. Most of the remaining commercial land, and some of the remaining industrial land, is considered either Potentially Developable or Undevelopable. While neither of these classifications necessarily prohibits development, they do make development less likely.

Table IX-16: Vacant Commercial and Industrial Property in Merrimack, June 2001

Address		Acres	Price*	Price Per Acre*	Assessment	Land Use Classification
5	Amherst Road	0.63		$0	$182,200	Commercial Developable
552	Route 3	1.45		$0	$116,300	Commercial Developable
562	Route 3	4.95		$0	$286,600	Commercial Developable
580	Route 3	0.42		$0	$59,500	Commercial Developable
698	Route 3	5.90		$0	$271,900	Commercial Developable
702	Route 3	2.01		$0	$150,700	Commercial Developable
723	Route 3	0.90		$0	$69,900	Commercial Developable
726	Route 3	9.44		$0	$310,600	Commercial Developable
729	Route 3	1.96		$0	$111,100	Commercial Developable
764	Route 3	1.63		$0	$163,000	Commercial Developable
	Route 3	0.39		$0	$57,400	Commercial Developable
	Route 3	1.98		$0	$198,400	Commercial Developable
	Route 3	4.26		$0	$221,100	Commercial Developable
41	Front Street	23.05		$0	$818,300	Commercial Developable
725	Milford Road	0.42		$0	$92,100	Commercial Developable
4	Whitney Street	1.12		$0	$306,600	Commercial Developable
		65.11			$3,415,700	Commercial Developable
406	Route 3	0.78		$0	$63,600	Commercial Potentially Developable
	Route 3	98.27		$0	$477,700	Commercial Potentially Developable
5	Executive Park Drive	1.65		$0	$127,500	Commercial Potentially Developable
6	Executive Park Drive	5.90		$0	$206,900	Commercial Potentially Developable
11	Executive Park Drive	6.90		$0	$347,900	Commercial Potentially Developable
	William Street	2.88		$0	$157,300	Commercial Potentially Developable
		138.98			$1,380,900	Commercial Potentially Developable
	Depot Street	0.43		$0	$5,000	Commercial Undevelopable
271	Route 3	0.20		$0	$2,200	Commercial Undevelopable
275	Route 3	0.47		$0	$15,500	Commercial Undevelopable
	Railroad Avenue	8.60		$0	$86,200	Commercial Undevelopable
		9.70			$108,900	Commercial Undevelopable
	Caron Street	5.81	$495,000	$85,154	$269,900	Industrial Developable
	Caron Street	4.53		$0	$241,500	Industrial Developable
5	Columbia Circle	1.63		$0	$73,900	Industrial Developable
6	Columbia Circle	1.08		$0	$92,800	Industrial Developable
19	Columbia Circle	1.89		$0	$89,000	Industrial Developable
42	Route 3	16.74		$0	$790,300	Industrial Developable
131	Route 3	0.69		$0	$47,100	Industrial Developable

Address		Acres	Price*	Price Per Acre*	Assessment	Land Use Classification
133	Route 3	0.72		$0	$48,300	Industrial Developable
240	Route 3	0.35		$0	$21,800	Industrial Developable
645	Route 3	73.65		$0	$2,574,500	Industrial Developable
	Route 3	71.60		$0	$1,340,400	Industrial Developable
	Everett Turnpike	1.65		$0	$34,500	Industrial Developable
11	Henry Clay Drive	11.52	$415,000	$36,024	$364,700	Industrial Developable
12	Henry Clay Drive	5.54	$199,500	$36,011	$187,700	Industrial Developable
106	Herrick Street	1.51		$0	$186,800	Industrial Developable
6	Star Drive	1.30		$0	$94,700	Industrial Developable
21	Star Drive	1.00		$0	$66,200	Industrial Developable
12A	Star Drive	7.40	$650,000	$87,838	$372,800	Industrial Developable
35	Technology Park Drive	8.73		$0	$603,300	Industrial Developable
45	Technology Park Drive	8.57		$0	$599,100	Industrial Developable
	Technology Park Drive	7.70		$0	$287,000	Industrial Developable
	Technology Park Drive	24.18		$0	$685,300	Industrial Developable
	Technology Park Drive	41.50		$0	$1,252,400	Industrial Developable
	Thornton Road West	1.02		$0	$5,000	Industrial Developable
20	Wright Avenue	1.57		$0	$6,500	Industrial Developable
		297.28			$10,079,800	Industrial Developable
22	Continental Boulevard	0.90		$0	$55,900	Industrial Potentially Developable
1	Route 3	6.60		$0	$175,700	Industrial Potentially Developable
37	Route 3	10.20		$0	$232,700	Industrial Potentially Developable
39	Route 3	3.82		$0	$126,800	Industrial Potentially Developable
46	Route 3	1.01		$0	$100,500	Industrial Potentially Developable
143	Route 3	0.50		$0	$43,400	Industrial Potentially Developable
239	Route 3	16.40		$0	$349,200	Industrial Potentially Developable
	Route 3	3.97		$0	$136,300	Industrial Potentially Developable
10	Wright Avenue	2.08		$0	$68,200	Industrial Potentially Developable
	Wright Avenue	22.60		$0	$166,900	Industrial Potentially Developable
	Wright Avenue	11.00		$0	$11,000	Industrial Potentially Developable
		56.48			$1,466,600	Industrial Potentially Developable
	Depot Street	1.80		$0	$14,900	Industrial Undevelopable
793	Route 3	0.80		$0	$3,600	Industrial Undevelopable
	Railroad Avenue	0.20		$0	$3,600	Industrial Undevelopable
	Railroad Avenue	0.10		$0	$2,500	Industrial Undevelopable
	Railroad Avenue	2.49		$0	$28,500	Industrial Undevelopable
		5.39			$53,100	Industrial Undevelopable
52	Route 3	1.13	$230,000	$203,540	$155,900	Residential/Commercial
		1.13			$155,900	Residential/Commercial
	King Street	4.54	$550,000	$121,279		
	Mast Road	90.00		$85,000		
		1.89	$145,000	$76,720		
		670.50			$16,916,600	Grand Total

Source: Assessment and Land Use Classification information from Merrimack Assessor's Office. Prices from Tamposi and Nash Real Estate Group, Coldstream Real Estate Advisors, CommProp Database (www.cprop.com).
All data was collected during June 2001.

Table IX-17 shows recent commercial and industrial transactions in Merrimack. There have been several major transactions within the last year and a half, which suggests that there is continued interest in commercial and industrial real estate in Merrimack.

Table IX-17: Commercial and Industrial Transactions in Merrimack, January 2000-May 2001

Address		Acres	Price	Assessment	Land Use
10	Al Paul Lane	6.35	$200,200	$2,668,200	Industrial Office
7	Columbia Circle	0.95	$340,000	$273,300	Office
1503	Columbia Circle	0.03	$70,000	$46,500	Professional Office (Condo)
2305	Columbia Circle	0.03	$50,000	$51,000	Professional Office (Condo)
2306	Columbia Circle	0.03	$54,000	$54,900	Professional Office (Condo)
	Continental Boulevard	0.78	$1,122,100	$541,000	Gas Station
297	Route 3	1.00	$850,000	$671,800	Office
395	Route 3	0.15	$105,000	$95,000	Professional Office (Condo)
442	Route 3	0.53	$155,000	$161,200	Professional Office (Condo)
479	Route 3		$80,000		Store
559	Route 3	1.05	$265,000	$250,100	Restaurant/Bar
717	Route 3	1.63	$200,000	$310,000	Hardware
	Route 3	0.39	$1	$57,400	Commercial Developable
4	Executive Park Drive	16.82	$3,980,000	$3,585,700	Motel
3	John Tyler Street	5.67	$405,000	$1,107,500	Commercial Warehouse
12	Star Drive	1.26	$355,000	$291,600	Industrial Warehouse
6	Whitney Street	1.13	$590,000	$825,500	Restaurant/Bar

Source: Merrimack Assessor's Office, June 2001.

There is consensus among community leaders as well as economic and community development professionals at the state and local levels that Merrimack should continue to allow industrially zoned land to dominate its stock of nonresidential land. Merrimack is well situated for industrial and office development because of its proximity to Manchester, Nashua, and Massachusetts, its convenient access to highway, rail, and air transportation, extensive amounts of vacant industrial land and water and sewer infrastructure. Also, industrial jobs generally pay better than retail jobs and result in less traffic and impacts to municipal services. Retail in Merrimack should continue to serve primarily the immediate needs of residents while allowing Manchester and Nashua to serve as regional retail centers.

E. CONCLUSIONS AND RECOMMENDATIONS

1. Employment

Over the past few decades, Merrimack has evolved into a major regional employment center due to the number of large employers that have located in Town, the expansion of existing businesses and a proliferation of smaller employers. The Town's economic base has also diversified to include large financial services, marketing and sales components along with high tech and traditional manufacturing industries. Overall wages in Merrimack are higher than state and regional averages, especially in the non-manufacturing sector, indicating that a substantial number of the jobs that have been created are relatively high paying. Further, many of these high paying jobs are in growing sectors of the economy. Since more Merrimack residents work in Merrimack than in any other community, the high wages paid by Merrimack employers contribute directly to the prosperity of the Townspeople. Further, the relatively high buying power of those who live and work in Town that results from higher wages has an important secondary affect on the local and regional economy. The retention of high paying

jobs, and the continued cultivation of new jobs of similar quality, therefore, should be a cornerstone of the Town's economic development strategy.

In order to maintain and continue to attract quality jobs, the needs of the Town's employers must be addressed. Among the more significant employment related issues identified during the Master Plan process was the region's relatively tight labor market. It is important to note that while more Merrimack residents work in Merrimack than in any other community, most of the jobs in Town are still filled by non-Merrimack residents. Some of the challenges faced by local employers in maintaining an adequate labor force include:

a) lack of General Education Degree (GED) and English as a Second Language (ESL) programs in Merrimack and very limited slots available in Nashua;
b) limited technical education and job training;
c) difficulty of attracting younger high tech workers from urban areas such as Boston (quality of life issues and housing availability), and
d) high demand for skilled (high tech) workers nationally.

To address these issues, the School Department, area technical schools and other appropriate institutions and agencies should be encouraged to increase GED, ESL and technical training opportunities in cooperation with local businesses and industries. It is also important that quality of life issues be addressed to enhance the attractiveness of Merrimack to employees. Attractive, well-planned work environments should continue to be encouraged along with provisions for conveniently located support services such as day care, health clubs, restaurants, recreational facilities other support facilities.

Along with a focus on the creation and retention of high quality jobs, it is also important to guard against economic fluctuations that can cause job losses. While the Town cannot control general economic forces and trends, it should continue to promote the development of a diverse economic base. A diverse business and industrial base can help prevent economic downturns affecting certain sectors of the economy from having a disproportionate impact on the Town's overall economic base.

2. Tax Base Issues

In order to maintain and improve Merrimack's tax base, the Town should focus on attracting and maintaining those uses that tend to have the highest tax value. These include office development of various kinds, and certain types of retail establishments. Professional, business and industrial office uses appear to have the highest overall value since they are the most likely to result in the creation of high paying jobs, tend to represent a diversity of businesses and industries, and tend to have relatively low land use impacts. Other uses, such as hotels or motels also tend to have a high tax value and can support industry but typically generate lower paying jobs. The same is true for restaurants and day care centers. Such uses, therefore, should be viewed as contributing to the overall economic balance and as important support facilities, but not as a central focus of The Town's economic development strategy.

The Town's commercial and industrial base is critical to maintaining a strong tax base, however, residential land uses represent over 70% of the Town's tax base and will continue to dominate the Tax base for the foreseeable future. Therefore, it is important that the Town

maintains the character of its established neighborhoods and continues to attract high quality new residential development. The preservation and enhancement of the natural and man-made features (See Chapter I - Introduction) that have made Merrimack a desirable location for residents and businesses alike should be viewed as a key element of any economic development strategy.

3. General Business and Industrial Development Issues

Merrimack's success in attracting high quality business and industrial development is largely due to the availability of appropriately zoned land, good highway access and the availability of public water and sewer. It is also noteworthy that the Town is generally perceived as being business friendly with an efficient regulatory process. A successful economic development strategy, therefore, must strive to maintain these attributes. Toward that end, the Town should:

a) Maintain public water and sewer capacities and support systems for industry. The extension of public sewer, in particular, should be limited to existing service areas and areas of demonstrated need.
b) Maintain acceptable Levels of Service on local roads and encourage appropriate improvements to state highway system such as the planned widening of the FE Everett Turnpike, the Manchester Airport Access Road, and development of a full interchange at Exit 12 to improve access to industrially zoned land in the north of town while improving access for potential employees and business patrons;
c) Maintain a positive business environment though continuing to implement reasonable regulations, streamlined permit and approval processes and by maintaining strong links between local government and important groups such as the Chamber of Commerce.

CHAPTER X
TOWN CENTER MASTER PLAN[1]

A. BACKGROUND

The Town Center Plan was developed at the request of the Board of Selectmen to serve as a vehicle for addressing a broad range of issues affecting the existing concentration of public and private institutions, businesses and residences in the area centered around the intersection of Baboosic Lake Road and Route 3 (Route 3). In many ways, the plan was an outgrowth of the Town's 250th celebration in 1996 which resulted in a heightened focus on Merrimack's heritage and sense of community. During that time, there was a growing awareness that Merrimack, unlike many neighboring communities, lacked a traditional New England town center or definable downtown that could serve as a focus for civic expression. The development of Abbie Griffin Park and the associated bandstand was an effort to respond to that sentiment through the creation of a park that could serve as a town green. The 250th celebration also shed light on Merrimack's historic resources, many of which are concentrated in the Town center study area. Other issues prompting an examination of the Town center area included traffic circulation problems in and around the Town Hall site; traffic issues related to Route 3; expansion of municipal facilities including the new Police Station, Central Fire Station and proposed library; expansions at the High School and Mastricola Middle School and Elementary School complex, and a general concern for improved aesthetics.

The Town Center Plan was developed by the Planning Board in a manner similar to that of the Master Plan with the assistance and support of a broad spectrum of interested citizens, members of the business community and representatives of various local boards, commissions and private organizations. Between September of 1996 and July of 1998, a total of eighteen meetings were held by the Planning Board including eleven open public sessions and seven workshops. The Board of Selectmen sponsored two additional meetings on the Plan including a Business Roundtable to solicit input from the business community. Separate presentations were made to the Merrimack Chamber of Commerce, the Rotary Club, and the Historic Society.

Like the Master Plan, the Town Center Plan was initially intended to contain the following elements:

1. Natural Resources
2. Historic Resources
3. Land Use
4. Transportation
5. Community Facilities & Utilities
6. Housing
7. Economic Development

[1] Note: This Chapter is a reproduction of the original 1999 Merrimack Town Center Master Plan. The headings have been re-numbered and the text formatted to match those of this 2002 Master Plan. All text remains the same as the 1999 Plan.

B. STUDY AREA

Although initially confined to the area in the immediate vicinity of the Town Hall, the High School, and Mastricola Middle School and Elementary School complexes, the study area was enlarged to encompass other public facilities including the Central Fire Station, new Police Station, Post Office and proposed Library site. Also included were the area's three shopping centers and prominent natural resources such as the Merrimack and Souhegan Rivers. In addition to the natural resources and important public facilities noted above, the study area contains numerous business establishments, a diverse housing base and one of the largest concentrations of historic resources in Merrimack. Although the northern and southern boundaries of the study area were debated, the Merrimack River forms a natural barrier to the east while the Turnpike forms an almost impenetrable barrier to the west.

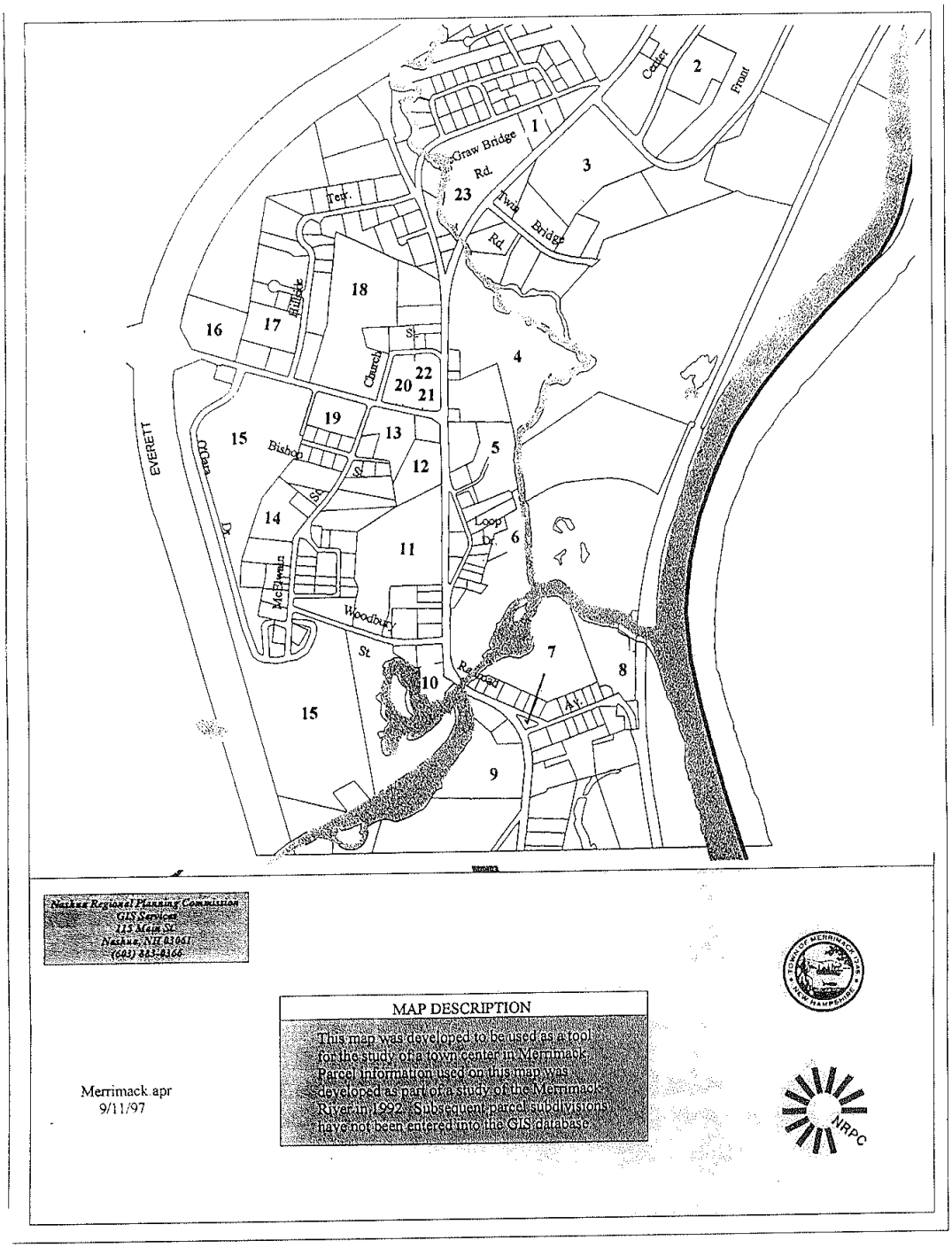
The final study area encompasses an area almost a mile square, including the general area between the FEE Turnpike to the west and the Merrimack River to the east, the Commons shopping center to the north and the Village Mall to the south. Below is list of prominent sites and facilities and establishments in the Town Center area followed by a study area map.

1. U.S. Post Office
2. Commons PUD: 292 multi-family units and 104 elderly units.
3. Commons Shopping Center
4. Twin Bridges Park: a highly popular park that includes facilities for the Merrimack Youth Association Building Kids Kove playground, a little league field, hiking trails and picnic areas. A frequent destination for children after school and during nonschool days as well as for area residents.
5. Village Falls: 16 multi-family units.
6. Loop Road Cluster: a compact concentration of potentially historic homes primarily dating from the mid to late 18th and 19th Centuries. Currently a mixture of residential and limited commercial uses.
7. Fraser Square: Small, historic public square.
8. Railroad Ave. Cluster: a dense concentration of potentially historic buildings* primarily dating from the late 19h and early 20th Centuries. Currently a mixture of residential and limited commercial uses.
9. Merrimack Village Mall.
10. Central Fire Station.
11. Connell's Shopping Center.
12. Abbie Griffin Memorial park: includes bandstand, natural amphitheater & benches.
13. Town Hall: includes Town offices, meeting facilities and District Courthouse.
14. Highland Green: 24 multi-family units.
15. School Complex: includes Merrimack High School, Mastricola Middle School and Mastricola Elementary School, with a combined enrollment of well over 3,000 students, Superintendent's offices & the Bradford School, a special needs facility. Complex also contains ballfields and public tennis courts, public meeting facilities and a planned skateboard park.
16. American Legion Hall.
17. Hillside Court: 11 multi-family units.
18. Last Rest Cemetery.
19. Our Lady of Mercy Church.

20. First Congregational Church.
21. Public Library (Lowell Memorial Library).
22. Adult Community Center: used primarily as facility for senior citizen activities and services as well as for Rotary Club meetings and other activities.
23. Future Library location: site purchased as site for future library building in 1997.

*A potentially Historic Building is any building for which a National Register of Historic Places Inventory Sheet was completed by the Merrimack the Merrimack Historic District Commission or any building meeting the same criteria for such inventory.

Map X-1: Town Center Study Area



C. GOALS AND OBJECTIVES

Key components of the plan and planning process are the goals and objectives that guide preparation of the plans as well as its implementation. Early in the planning process, a series of open public discussions were held where input into the plan was sought. Based upon those discussions and subsequent Planning Board workshops, the following goals and objectives were developed and incorporated into the Town Center Plan.

1. Overall Goal

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.

2. Community Facilities and Services

a. Encourage the retention and expansion of existing public facilities within the Town Center area.

b. Encourage coordinated use of existing Town, School and Library facilities, including buildings, parking areas and open space.

c. Encourage the increased development of recreational areas, public and private open spaces, squares, trails, monuments, memorials and access to Baboosic Brook, the Merrimack River and Souhegan River.

d. Encourage the coordinated placement, arrangement and clustering of public and semi-public accommodations such as telephones, mailboxes, benches, waste receptacles, water fountains, bike racks, newspaper dispensers and so forth.

e. Consider the development or provision of municipal parking to accommodate the development or redevelopment of small commercially zoned sites and to encourage pedestrian movement between nonresidential sites.

3. Natural Resources

a. Continue on-going efforts to conserve the area's natural resources with a particular focus on the protection of groundwater resources, shoreline areas, steep slopes and floodplains.

b. Groundwater:

1) Discourage the development of potential contamination sources within the Wellhead Protection Area of wells four & five.
2) Encourage the implementation of Best Management Practices to control runoff and other potential contamination sources.
3) Seek to implement improvements to existing developed areas with the Wellhead Protection Area, particularly where redevelopment is contemplated.

c. Shoreline/Floodplain.

1) Increase public access, ownership and control over Baboosic Brook, Merrimack River and Souhegan River shorefront areas and adjacent floodplains by way of acquisition or easements to provide enhanced protection, increased recreational

opportunities and to enable those natural resources to become central features of the Town Center area.

d. Steep Slopes:

1) Discourage the development, cutting or clearing of the steep slopes that serve as a part of the natural terracing of the area, particularly those slopes adjacent to riverfront areas and wooded slopes that buffer the Town Center area from the FEE Turnpike and residential areas from commercial districts.

2) Only encourage new hillside and hilltop development that is sensitive to the stability of steeper slopes as well design that is sensitive to the visual impacts of such development.

4. Housing

a. Encourage the development and retention of a wide variety of housing types to provide for the needs of a diverse population and a variety of household types.

b. Encourage new residential and nonresidential mixed-use development on vacant or redeveloped sites similar in concept to existing PUD/PRDs, and the conversion of existing buildings to mixed residential/nonresidential uses, to provide for increased housing alternatives as well as to encourage the adaptive reuse of existing buildings and sites.

c. Encourage the retention of larger contiguous residential areas through zoning district boundary adjustments, limits on commercial and institutional encroachment, buffering and

d. Other land use controls to protect established neighborhoods from the potential adverse impacts of abutting nonresidential uses.

5. Historic Resources

a. Encourage the preservation of potentially historic buildings, structures and sites as central features of the Town Center.

b. Encourage the historically appropriate rehabilitation and/or restoration of historic and potentially historic buildings and structures.

c. Encourage economically viable uses and the adaptive reuses of historic buildings, structures and sites.

d. Encourage new construction that is compatible with surrounding historic buildings, structures and sites.

6. Economic Development

a. Encourage the continued development of commercial portions of the Town Center area as a dominant focus of the Town's retail and service community.

b. Consider amendments to local land use regulations to provide increased flexibility in the use and development of existing buildings and sites and to ensure that economically viable development alternatives remain feasible.

c. Encourage coordinated marketing and promotion of the Town Center.

7. Transportation

a. Build upon the existing network of streets, sidewalks and trails to foster the development of a locally oriented, safe, efficient, pedestrian friendly transportation system.

b. To minimize congestion and increase safety and efficiency:

1) consider implementation of the intersection improvements recommended for the Town Center area in the 1989 Route 3 Action Plan.
2) encourage alternative transportation modes such as pedestrian traffic and bicycling.
3) minimize new curb cuts on Route 3 by encouraging the use of common driveways and access points, pedestrian and vehicular connections between adjacent nonresidential sites and use of parallel and side street for access where possible.
4) Consider synchronization of traffic signals.

c. Provide for a complete network of sidewalks, cross walks and other improvements for pedestrian circulation throughout the Town Center area with a priority placed on connections between existing public facilities.

d. Provide for bike paths, trails and lanes where possible, within the existing rights-of-way and without, in addition to but not instead of sidewalks.

e. Discourage new high traffic generating land uses within the Town Center area such as drive-through restaurant facilities, gas stations and other highway oriented uses.

8. Land Use

a. Build upon the existing diversity of institutional, residential and commercial land uses to enhance the development of a dynamic, economically viable and balanced center of community activity.

b. Consider fostering a “village” atmosphere to facilitate increased pedestrian activity and increase support for area businesses by promoting a mix of residential and commercial land uses and services.

c. Modify local land use regulations to provide increased flexibility in the use and development of residential and nonresidential land uses, particularly with respect to the adaptive reuse of potentially historic buildings and sites.

d. Amend existing zoning district boundaries and requirements to become more consistent with the existing and desired character of the Town Center area.

e. Develop consistent landscaping, lighting, signage and street furniture standards for public and private properties that would enhance the appearance of the Town Center and serve to visually unite the area.

D. COMMUNITY FACILITIES

One of the defining elements of the Town Center area is the concentration of public and semi-public buildings and sites that serve the civic and cultural needs of the community that are located within the vicinity. These facilities serve as a major focus of activity in the Town due to

their role as the center of local government, education and culture. They also serve as major concentrations of employment. For these reasons, it is an overall goal of the plan that the Town Center should continue to serve as the center of local government in Merrimack and as a center for other civic and cultural facilities in the future. This conclusion was reached despite some suggestion during the planning process that a new municipal center should be contemplated. While some of the problems associated with existing municipal facilities in the area, including traffic circulation, limited parking and limited space for expansion, could be alleviated through the development of a new municipal complex elsewhere in Town, the difficulty of obtaining suitable alternative sites, the extent of the existing capital investment in the area, historical connections to existing sites and the prohibitive cost of developing alternative facilities make the development of a new municipal complex neither realistic nor desirable. With the exception of discussion of these broader issues, specific recommendations for improvements or expansions to individual Town and school district facilities were not developed as a part of the plan. An overview of these facilities is provided below. The sites and buildings described below are also depicted on Map X-2 on the following page.

1. Town Hall

The Town Hall complex is one of the Town's most significant centers of activity. In addition to use of the site by public employees, the site is heavily trafficked by individuals seeking various licenses, permits or approvals, registering vehicles, paying taxes or seeking information. The District Court also generates significant daytime activity. In the evenings, meetings of various Town boards, commissions or committees are occurring on most weekday nights, and it is not uncommon to find two or more public meetings on-going simultaneously in different portions of the complex. With addition of the Bandstand at the recently dedicated Abbie Griffin Memorial Park adjacent to Town Hall, evening and weekend cultural events are also occurring on the site.

The Town Hall complex, located at the intersection of Baboosic lake Road and McElwain Street near Route 3, consists of two main buildings, the Old Town Hall (the West Wing) dedicated in 1873, and the East Wing, constructed in 1980, joined by an open breezeway. The site also contains a separate ambulance building at the southwestern corner of the site and a former residence (the Kent Building) at the southeastern corner of the site on Bishop Street that serves as the administrative offices of the Public Works Department. The Ambulance Building is a 2,800 square feet facility built in 1977. The building includes space for offices, training and three vehicle bays. The ambulance service itself is staffed largely by volunteers of the Merrimack Ambulance Rescue Service (MARS).

The balance of the 3.4 acre Town Hall site is primarily comprised of parking areas and landscaping. An adjacent 3.14 acre site with frontage on Route 3 contains a bandstand, benches and a natural seating area that was developed for the Town's 250th celebration in 1996. This area is now known as the Abbie Griffin Memorial Park. Because parking for all of the uses of the complex can, at times, exceed what is provided, an agreement has been made with the adjacent Our Lady of Mercy Church for overflow parking.

The West Wing of the Town Hall contains the offices of the Town's Finance Department and Welfare Department on the first floor, and the Merrimack District Court and associated offices on the second floor. The courtroom is also used for meetings of the Planning Board, Zoning Board of Adjustment and for other meetings in the evening when the court is not in

session. Due to a number of deficiencies in the existing court facility, the court is currently considering relocating or developing a new court facility in the near future. The East Wing contains the offices of the Selectmen, Town Manager, Town Clerk and the Assessing Department on the main floor along with a conference room used for Board of Selectmen's meetings and other meetings. The lower level of the East Wing contains the offices of the Community Development Department and a small conference room used most notably for meetings of the Conservation Commission. A finished attic also exists that is used primarily for storage and for occasional meetings. A lack of elevators within the building, however, limits the use of the attic level. Handicapped access is also not provided between the main and lower levels of the East Wing, but both levels can be accessed at ground level from the exterior. A chair lift is used to access the second floor courtroom in the West Wing. Although these building contain a number of meeting rooms, large public meetings, such as the Annual Town Meeting, are now held at the Middle School or in the High School auditorium.

During 1995 and 1996, the two Town Hall buildings underwent significant changes upon the relocation of the Police Department from the lower level of East Wing to a new facility nearby on Baboosic Lake Road. Several offices were relocated and a number of related improvements made. Due to these changes, some additional room for expansion of Town offices within these buildings remains. Approximately 45 to 50 people are currently employed on the Town Hall site. Should significant expansions be required in the future, expansion onto adjacent properties would be necessary either through the purchase and reuse of an existing building as was done with the Kent Building or through redevelopment.

Map X-2: Community Facilities

Key

1. Town Hall
2. Police Station
3. Central Fire Station
4. Library
5. Adult Community Center
6. Twin Bridges Park
7. High School
8. Mastricola Middle & Elementary Schools
9. Abbie Griffin Park
10. Last Rest Cemetery

2. Police Station

In 1996, the Police Station moved from the lower level of Town Hall's East Wing into a new police station located in a rehabilitated former medical center on Baboosic Lake Road. The renovations were completed in two stages and were intended to meet the department's long-term needs. The facility includes offices, training rooms, locker rooms and jail cells. The Police Station serves as the department's headquarters and only facility. There are currently about fifty employees of the Police Department covering all shifts.

3. Central Fire Station

The Central Fire Station is located on Route 3 adjacent to the Souhegan River on an approximately ½ acre parcel. The site is the Department's headquarters and main facility. The original building was constructed in 1959. A second story addition was built in 1976. Two other substations, one in South Merrimack and one in Reeds Ferry also serve the Town. In 1998, another addition was constructed on the front of the building. Although there is little or no room for future expansions, with the most recent addition, the facility should be capable of functioning as the Town's central fire station for the foreseeable future.

4. Library

The Merrimack Public Library, or Lowell Memorial Library, is located at the corner of Route 3 and Baboosic Lake Road in the heart of the Town Center study area. The original building is an attractive single story structure (with a basement), constructed in 1924, that consists of 2,100 square feet. A 10,870 square foot addition was built in 1979 to bring the facility's total square footage to 12,880. The Library is provided with a limited number of parking spaces (39). The library facility is located on a 1.5 acre parcel that is shared with a separate building that houses the Adult Community Center. Between these two buildings, parking areas, and due to other site constraints, there is little or no room left for expansion.

As of the end of 1997, the Library had 74,070 volumes with a total circulation 247,341. Both the total number of volumes and circulation have increased considerably in recent years. The Library also provides extensive computer facilities and sponsors special events and programs for children. A meeting room is also located within the facility that serves various Town groups. The Library is currently staffed by approximately 30 full and part-time employees and is governed by the Library Board of Trustees. It is also noteworthy that the Library is one of the most significant generators of pedestrian activity in the Town Center area.

Due to space constraints, the Board of Trustees is currently planning to develop a new facility to replace the existing Library building. In 1996, an approximately three acre parcel was purchased on Route 3 across from the Commons Shopping Center, also in the Town Center area. In that same year, however, voters turned down the development of the 32,000 square foot proposed facility itself. A 24,000 square foot proposal was defeated in 1997 and another 32,000 square foot proposal was defeated again in 1998. Plans to pursue a new Library are continuing, and another proposal is being put forward for 1999. Should a new Library be approved, however, the fate of the existing building will have to be determined. Currently, there is no alternative use proposed although a number of possibilities have been discussed. Deed restrictions may limit alternative uses of at least a portion of the building.

5. Adult Community Center

The Adult Community Center is located on the same site as the Library, on the Church Street side of the property. This facility, governed by a board of directors, is used primarily as a senior center. The building is also used for meetings of groups such as the Rotary Club and for special events at other times. It contains, primarily, a large ell shaped meeting room, a sitting area, a kitchen and support facilities. Parking is shared under an agreement with the adjacent First Congregational Church. Although modest in appearance, the building itself is historically significant. The structure was built in the early 1900s as a two-room schoolhouse (Schoolhouse #9) to house eight grades. It is one of two remaining two-room schoolhouses and one of the few remaining of the several one and two-room schoolhouses that were once located throughout Merrimack. For these reasons, many Merrimack residents have sentimental ties to the building. After ceasing to be used as a school in the mid 20th Century, the building was used as the Town's police station until converted to its current use.

6. Parks & Recreation

The Town Center area is not the center of recreational activity in Merrimack, nor does it contain the Town's premiere park. Between the area's two parks and the school athletic facilities, however, significant recreational opportunities exist. The larger of the area's two parks is Twin Bridges Park; named after the two bridges within it that cross portions of Baboosic Brook. This 27 acre park contains a baseball field, concession stand, the Merrimack Youth Association building, an outdoor basketball court, picnic area, trails, parking and a popular playground known as Kids Kove. Kids Kove is a state-of-the-art playground consisting of an interconnected series of bridges, walkways, tunnels, bridges and towers designed to be reminiscent of a Medieval castle. Traditional playground equipment, such as swings and slides, are incorporated into or around the area of the structure. The playground was built through a volunteer effort led by the Merrimack Rotary Club with design assistance from Merrimack youth.

The second park in the Town Center Area is the Abbie Griffin Memorial Park which, as noted previously, is adjacent to the Town Hall site. The 3.14 acre site features a bandstand constructed in 1996 to commemorate the Town's 250th anniversary. The bandstand serves as a site for outdoor concerts and for special private events such as weddings. Improvements including regrading, landscaping and the addition of lighting, granite benches and signage are on-going.

The Mastricola School complex and High School complex provide a major concentration of athletic and recreational facilities for school programs as well as for the community as a whole. These facilities naturally serve as a focus of activity, particularly where sporting events are involved. Currently, the High School provides a football field, softball field, baseball field, gymnasium and exercise room. A running track was approved in 1998. The Middle School offers a soccer field, baseball field, softball field, gymnasium and multi-purpose room while the adjacent elementary school provides a playground and practice field. Tennis courts and a skating rink are located near the O'Gara Drive entrance to the complex and a skateboard facility is currently being developed. Informal trails also exist in wooded portions of the site behind the High School near the Souhegan River.

In addition to the facilities noted above, a small portion of recently acquired Merrimack Riverfront land is located within the study area. No public access to the Merrimack River, however, is provided in the Town Center area and access to the Souhegan River is limited to an area to the rear of the High School.

7. School Facilities

As discussed previously, the Town Center area includes three public schools, the High School and the Mastricola Middle School and Elementary School. All three schools are located on a single 55 acre parcel with access from O'Gara Drive, McElwain, Bishop, School and Woodbury Streets. The High School and Middle School are Merrimack's only schools for those grade levels, but there are two other elementary schools in Town. The school complex also houses the Superintendent's offices which are located in a former residence on McElwain Street. Also on McElwain Street in a converted residence is the Brentwood School. The Brentwood School is a private facility that serves students with special needs for Merrimack and surrounding school districts.

The central importance of the schools to the community is broad and cannot be overstated. In addition to its overall community importance, it is noteworthy that the school complex is the largest single generator of activity in the Town Center. With over 3,200 students enrolled in the three schools and a few hundred employees, the school complex is also probably the largest single generator of activity in the Town. Further, the site continues to be used during non-school hours due to after school programs, use of school facilities for athletic programs and use by various Town and civic groups, clubs and organizations.

Over the years, a number of expansions and improvements have been made to the schools. In 1996, additions were approved for the Mastricola Middle School and Elementary School. Additions are currently being proposed for the High School and other site improvements including parking lot expansion are on-going. Given the level of growth in Merrimack in recent years, future expansions are inevitable, particularly at the High School and Middle School since these are the only such facilities in Town.

E. NATURAL RESOURCES

Although the Town Center study area is largely built-up, the area nevertheless contains significant natural features that define the landscape and shape as well as constrain growth and development. The most prominent of these features, such as the Merrimack River, serve to bound the area. Wetlands and floodplains provide natural drainage, flood storage areas, provide for groundwater recharge and serve as wildlife habitat while also serving to contain development. Other important natural features such as aquifer areas are critical resources, but are not visible features of the landscape. This chapter provides an overview of the most significant natural resources in the Town Center study area along with related goals and recommendations. Map X-3 depicts prominent natural resources within the area.

1. Groundwater

With few exceptions, the entire Town Center Study area is underlain by moderate to high yield stratified drift aquifer areas. A particularly high yield aquifer area underlies the center of the study area from the FEE Turnpike to the Merrimack River around Baboosic Lake

Road. These aquifers serve as the Town's principal water supply. Although most, if not all, homes, businesses and institutions in the area are served by public water, the public water supply is, in part, dependent on this aquifer which feeds Merrimack Village District (MVD) Wells 4 & 5. These public water supply wells are located at the end of Twin Bridges Road on MVD property.

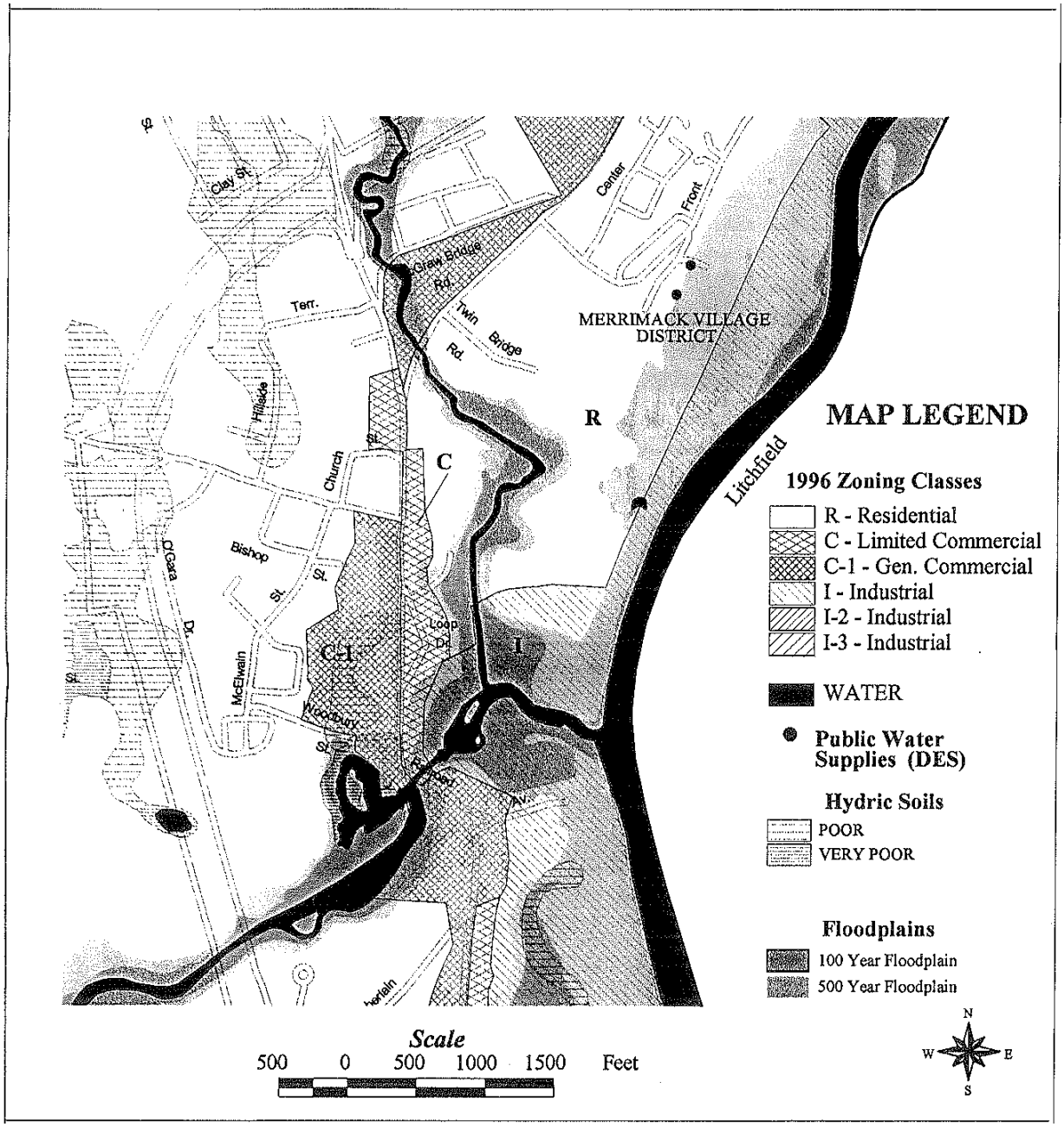
The groundwater resources, or the aquifers, in the Town Center area are replenished primarily by water that filters in from the surface within the surrounding watershed. The quality and quantity of the groundwater, therefore, is directly related to activities and conditions on the surface. Water quality can be threatened by certain land use activities, known as potential contamination sources, such as automobile service or repair facilities, dry cleaners, solid waste disposal sites and other commercial or industrial uses that utilize hazardous substances. Other potentially threatening land use activities that result from both residential and nonresidential uses include the use of road salt or chemical de-icers, fertilizers and pesticides.

In addition to water quality issues, water quantity and groundwater recharge are also issues of concern. Under natural conditions, rainwater filters into the groundwater through the pervious soil cover. Development increases impervious surface areas through building construction and pavement which prevent or impede groundwater recharge. This is particularly true where stormwater runoff is directed into closed drainage systems that are discharged off-site. Although Wells 4 & 5 remain highly productive, groundwater quality and recharge are growing concerns. Recent monitoring well testing has revealed that nitrate levels are increasing in wells 4 and 5,which, if this trend, continues, could jeopardize this critical water supply for the Town (see Figure X-1). Although the source of the nitrates is uncertain, it is most likely due to the use of chemical fertilizers and road salts.

2. Shoreland/Floodplain

The Town Center area includes extensive areas of shoreland and floodplain adjacent to the area's principal surface waters: the Merrimack and Souhegan Rivers and Baboosic Brook. Both the Souhegan River and Baboosic Brook are covered under the State Shoreland Protection Act and local Shoreland Conservation Ordinance which impose constraints of development, septic system location, tree cutting and alteration of terrain within 250 feet of the Shoreline. The Merrimack River was covered under the Act by more recent legislation. As can be seen on Map X-3, the floodplain areas are located adjacent to these waterways which limit development significantly. Floodplains include 100 year and 500 year floodplain areas (A & B zones) and flood hazard areas. Development is permissible within the 500 year floodplain with certain restrictions but is severely limited in the 100 year floodplain by regulation. The most extensive 100 year floodplain areas are located adjacent to Souhegan River in the vicinity of Route 3 in the southern portion of the study area. Not surprisingly, these areas are also among the largest vacant properties left in the Town Center. Other extensive floodplain areas are located adjacent to Baboosic Brook.

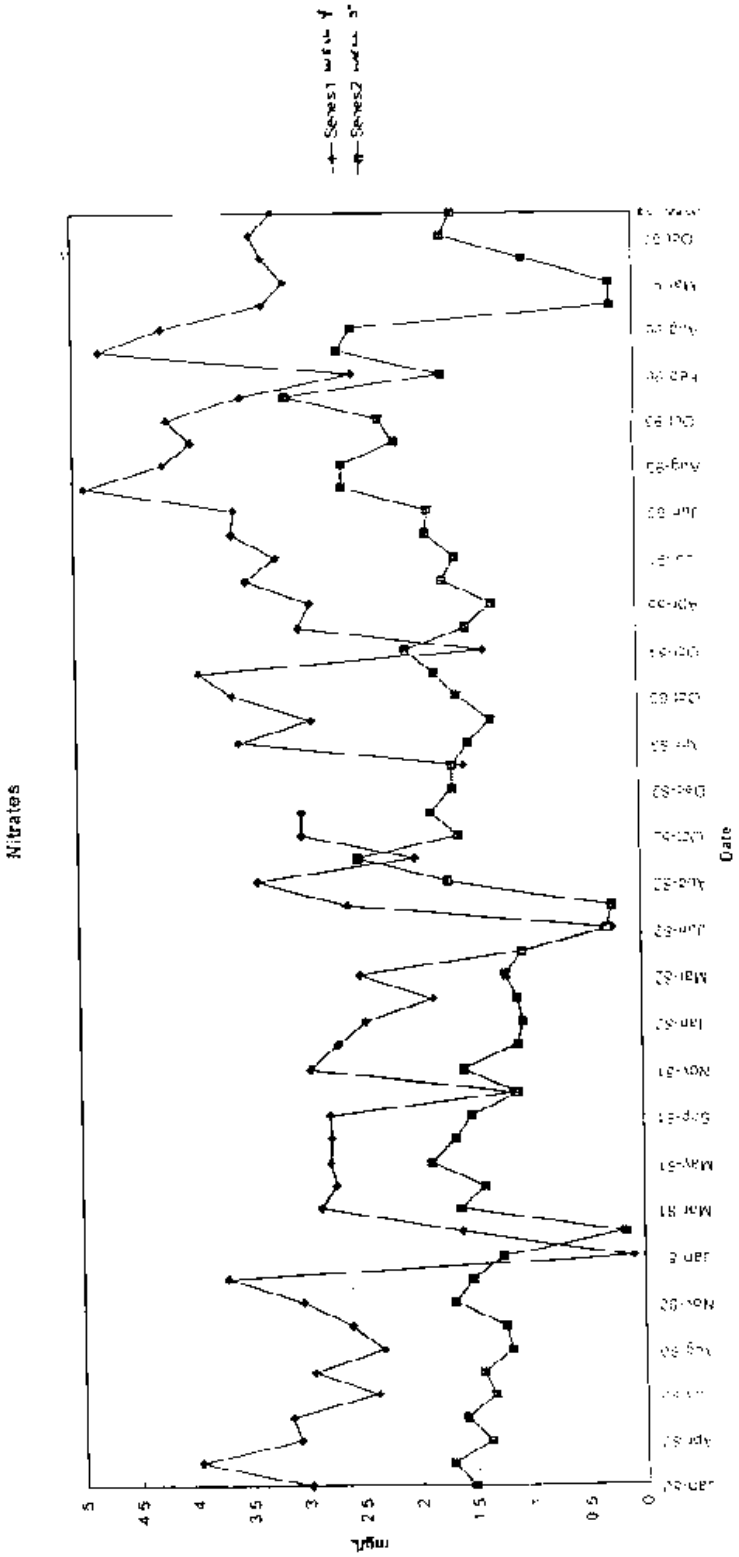
Map X-3: Natural Resources



3. Steep Slopes

The terrain of the Town Center area varies considerably with steep banks generally found adjacent to the rivers and brook noted above or adjacent to their respective floodplains. In general, the natural lay of the land, (as further defined by existing and historic development patterns), takes the form of a series of terraces of varying widths, rising up from the Merrimack River to the FEE Turnpike. Elevations are generally lower at the southern portion of the study area, gradually rising to the north. The Merrimack River, at the eastern boundary of the study area is at about elevation 100'. Steep banks rise up to an approximate elevation of 120'. West of the Merrimack River banks is the first broad terrace which gradually rises to a second range of steep slopes east of Route 3. This first terrace is largely in the 500 year floodplain and is typically less developed. The second terrace area lies adjacent to Route 3 and is extensively developed with commercial and residential uses. This second terrace is bounded to the west by steep as well as moderate slopes which give rise to a third terrace of widely varying widths, that is developed primarily with residential uses and institutional uses. Slopes of varying widths, often severe, at the western side of the third terrace give rise to the Turnpike which forms the western boundary of the study area. All of these terraces are bisected by the Souhegan River and Baboosic Brook. While the steep riverbanks within the study area are largely undeveloped and covered with natural vegetation, the steep slopes west of Route 3 have been significantly impacted by development and serious erosion problems have occurred in certain areas.

Figure X-1: Nitrate Levels at MVD Wells 4 & 5



F. HISTORIC RESOURCES

The Town Center area contains perhaps the largest number of buildings and sites of historic value in Merrimack. The area contains fifty-two buildings and sites identified and inventoried by the Historic District Commission as having historic potential and nine additional buildings and sites that meet the same criteria. These buildings and sites include prominent landmarks such as the old Town Hall, the First Congregational Church, a cemetery , several private homes and a handful of older commercial buildings. These sites are depicted on Map X-4, on the following page. Other less well documented sites also exist including Native American archeological areas, particularly adjacent to the Merrimack and Souhegan Rivers and sites dating from Merrimack's earliest period of colonial settlement.

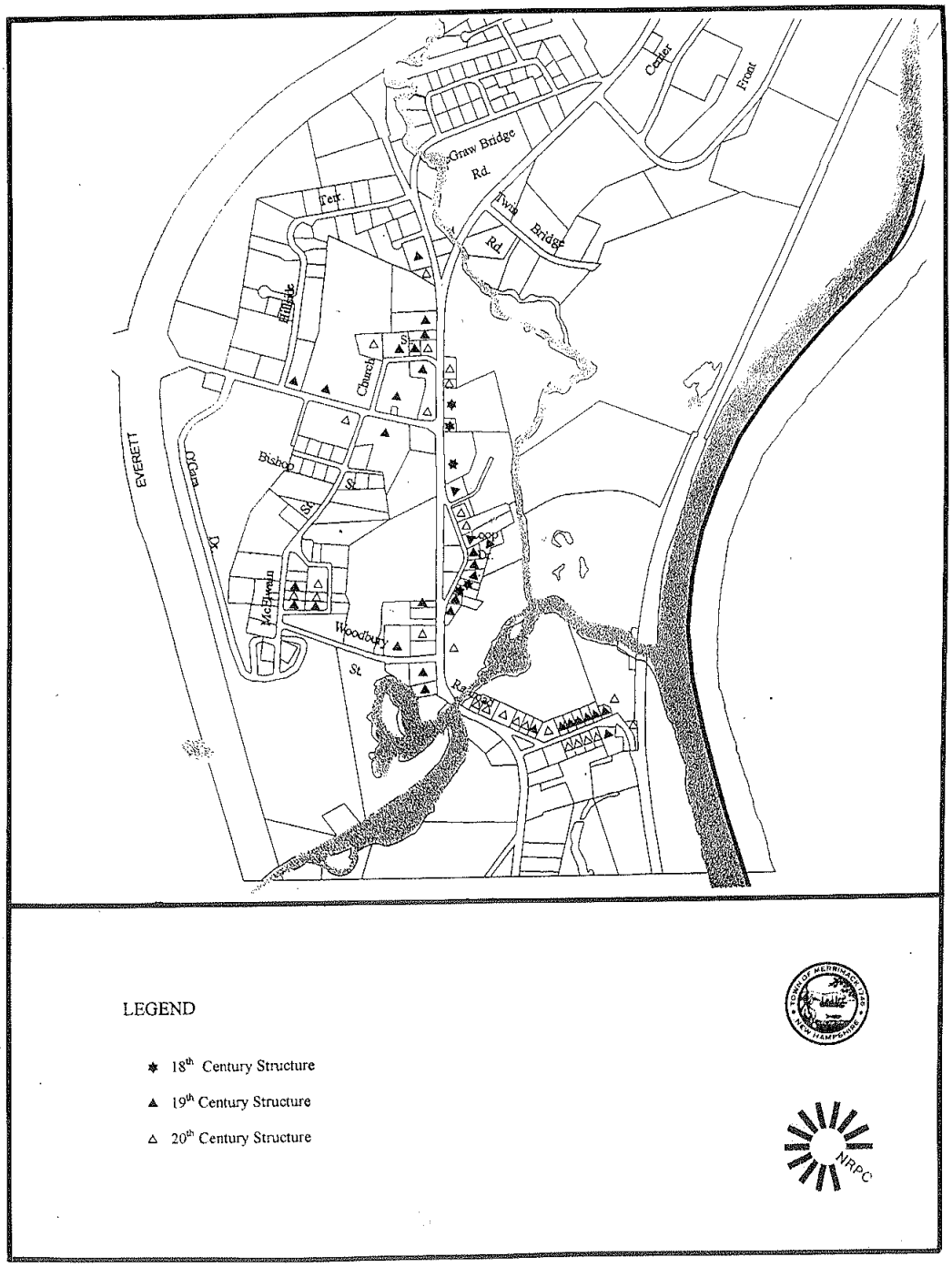
Settlement of the Town Center study area appears to date from the early 18th century. Old maps identify the settlement area as Souhegan Village or simply as Merrimack (sometimes spelt Merrimac). The village was one of Merrimack's four original settlements. In the *History of Merrimack New Hampshire, Volume I* (Merrimack Historic Society, 1976) it is noted that a saw mill and grist mill were built by John Chamberlain where Route 3 crosses the Souhegan River at some point prior to 1734. It appears that these were the first buildings of note in the Town Center area. A second mill was built at some point after on Baboosic Brook near McGaw Bridge Road. The first bridge on Route 3 over the Souhegan was built next to the Chamberlain residence in 1751. The current granite bridge, built in the early 1900s, is the third to cross the Souhegan River on Route 3. It is uncertain when the first bridge on Route 3 over Baboosic Brook was built but it must have been constructed at about the same time as *Chamberlain's Bridge*. With construction of the bridges, the role of Route 3 as a major, north-south through-road was solidified and the business brought by the mills and travelers led to the development of the surrounding area. By the 19th Century, a definitive cluster of homes and businesses was concentrated on Route 3 between the Souhegan River and McGaw Bridge Road, along Loop Road and around Church Street. None of the early mills or the original Chamberlain residence have survived.

Although buildings of historic value are scattered throughout the area, two significant concentrations are found on and around Loop Road and Railroad Avenue. The Railroad Avenue area includes several residences and a few businesses (located in former residential structures) that date from the late 19th and early 20th centuries. The Loop Road area buildings, also a mixture of commercial and residential properties, date primarily from the mid to late 18th century. This cluster includes the oldest home on record in the study area, a 1750 cape on Loop Road and Merrimack's oldest business establishment, the former Kiestlinger Store (currently the Merrimack Bicycle Shop). The building, which is located at the intersection of Baboosic Lake Road and Route 3, has continued to be in operation as a store since about 1790. Another 18th century commercial building that still exists is the former McConhile's Tavern. The Tavern was originally built on the site of the existing Lowell Memorial Library in 1793, but was later moved across the street to its current location. The existing Country Gourmet Restaurant on Route 3 was also built as a Tavern in 1807.

Although of much later construction, the former Abbott's store on Route 3 has served as a store since its was built in the early 1900s. The second floor was used as a meeting hall for private clubs and Town groups through the mid 20th century. Other significant buildings in the Town Center area include the Town Hall (west wing) built in 1872, The Lowell Memorial Library (1925), the First Congregational Church and the Merrimack Railroad Station (1850s) at

the end of Railroad Avenue. Another landmark site, perhaps less attractive than others, is the Harcros Chemical Company complex on Route 3. Although substantially altered from its original appearance, the former mill building appears to date from the turn-of-the-century when it was known as the Old White Mill. Earlier mill buildings had also occupied the property making it one of Merrimack's oldest industrial sites. Other significant sites in the area include the Civil War Monument (1892) in front of the Congregational Church on Baboosic Lake Road and the Last Rest Cemetery, also on Baboosic Lake Road.

Map X-4: Historic Resources



Despite the age and significance of many buildings and sites within the Town Center area, there are currently no regulatory historic preservation restrictions or protections provided. No building or site within the area is currently listed on the National Register of Historic Places and there is no local historic district or landmark designation. Over the years, several important building and sites have been lost to redevelopment or for other reasons and several remaining buildings have been significantly altered to the point where their original character has either been permanently damaged or concealed. Many other potentially historic buildings and sites have been compromised by incompatible surrounding development.

Because the Town Center contains a greater number of buildings and sites of little or no historic value that are interspersed throughout the area, (with the possible exception of the Loop Road and Railroad Avenue clusters) there is probably insufficient continuity to warrant the creation of an historic district in the near future. Preservation of existing buildings and sites of historic significance, therefore, will depend primarily on alternative regulatory means such as amendments to site plan and subdivision regulations that would encourage preservation and promote compatible new construction and rely on voluntary private preservation efforts.

G. ECONOMIC DEVELOPMENT

Although the importance of economic development has not been overlooked as a part of the Town Center Planning process, economic development issues were not a central focus of the plan. This is primarily because few concerns were expressed during the process related to the economic vitality of the area from the business community or the community at large and because several related issues are addressed as a part of other plan elements, in particular, the Land Use section. An overview of the most significant issues related to economic issues in the Town Center area, however, is provided below.

The Town Center area encompasses much of Merrimack's retail and service core along with limited industrial activity. As noted previously, the area includes three shopping centers, with the Commons to the north and the Merrimack Village Mall to the south serving as the study area's anchors. Connell's Shopping Center serves as a central anchor for the area's business district. These multi-tenant shopping centers provide a wide array of retail and service establishments including a major pharmacy, a bank, gift shops, restaurants, video stores, a deli, a hardware store, pet store, two health clubs, hair stylists, a bowling alley and several other establishments. Other businesses are located along the length of Route 3 in the study area and to a lesser extent on side streets including two restaurants, a small grocery store, bank, dry cleaner, florist, hair stylist, barber shop, funeral home, bicycle shop, gift/hobby shop and a day care center, four gas stations, auto repair facilities, a used car lot and several professional offices. Industrial uses are limited to the Harcros Chemical facility on Route 3, a warehouse and office facility for Jones Chemical on Railroad Avenue, and a site for the parking and storage of school buses, also located on Railroad Avenue. An excavation operation also exists at the end of Twin Bridges Road.

Together, the business establishments noted above, meet most of the day-to-day shopping, personal and professional service needs of area residents, employees, students and visitors. Notable exceptions to the business mix, however, include the lack of a supermarket, movie theater, department store or discount chain variety store, and stores for clothing, shoes and other apparel.

Given the trend toward municipal and school district facility expansion, and the remaining potential for additional higher density housing in the Town Center area, demand for retail and service businesses in the area is likely to increase to meet the needs of a growing number of employees, students and visitors. Industrial activity, however, is waning. Should operations at the Harcros facility be relocated elsewhere, it is unlikely that the site could be reused or redeveloped for industrial use due to the age and type of buildings on the site, contamination issues, access and traffic issues and the compliance with current environmentally related laws, ordinances and regulations such as the Shoreland Protection Act/ordinance, wetlands ordinances and regulations and floodplain regulations. The Jones Chemical building is now slated for demolition and it is unlikely that that site would be redeveloped for industrial uses for similar reasons. Most of the remaining industrial land in the area is severely limited due to poor access and environmental constraints.

The most significant limitations on business growth in the area are due to lack of area for expansion on individual lots and in the commercially zoned portion of the Town Center overall. The limitations of expansion are both regulatory and non-regulatory. With regard to regulatory impediments, most of these are addressed through recommended changes to the zoning ordinance described in the land use section intended to ease expansions and changes to nonconforming buildings and sites. These changes would also ease conversion of existing, commercially zoned residential buildings to commercial uses. Allowing for limited commercial uses in non-commercially zoned portions of the Town Center area would also provide for greater expansion opportunities. Even with liberalization of regulatory requirements, however, many building and sites suffer from an actual lack of space for essential requirements such as parking. To meet these needs, off-site parking will probably have to be provided for as is typical in most town centers and downtown areas. This is particularly true for the Railroad Avenue and Loop Road areas. Such accommodations could be provided through private parking arrangements, greater use of on-street parking or the provision of municipal parking lots.

H. AESTHETICS

Aesthetic issues and considerations were a pervasive element of the Town Center Plan planning process. Although these issues were not addressed as a specific individual subject, aesthetic concerns underlie the Town Center Plan in that the desire to develop and foster a definable Town center is in itself essentially an aesthetic issue. Aesthetic concerns also clearly motivate the desire to preserve historic buildings, sites and monuments and the desire to create or enhance existing ones such as the bandstand at Abbie Griffin Park. Similarly, aesthetic concerns prompted the inclusion of a landscape element into the sidewalk plan as noted in the transportation chapter.

While sometimes viewed as a non essential consideration, the development of an environment that is hospitable to the human scale, invokes a positive sense of place and that is a comfortable, safe and pleasing atmosphere within which to work, reside, recreate or conduct business cannot be an afterthought. It requires the coordination of numerous differing aspects of development based on common goals. For the Town Center study area, however, the extent of existing development, much of which is uncoordinated, unattractive and incompatible with the human scale, limits the ability of the Town to create a new more aesthetically pleasing environment. The focus, therefore, must be on encouraging new development or redevelopment that is more consistent with the goals of the plan, on improvements that can be

made to existing sites and areas and on the preservation of those elements of the Town Center that do contribute to a quality built environment. Such contributing elements include several of the remaining buildings and sites of historic value, prominent landmarks and features such as the granite bridge over the Souhegan. In addition to the recommendations previously noted for protecting historic resources and for landscaping in conjunction with sidewalk development, the following recommendations for improving the aesthetic quality of the Town Center area are provided.

1. Landscaping

Along with tree plantings in conjunction with sidewalk improvements, consideration should be given to developing a landscaping plan for all Town-owned property in the Town Center area and public rights-of-way. Once implemented, a landscape plan for Town land would significantly improve the appearance and quality of the area due to the extent of public property that currently exists. In addition, by basing such improvements on a unified plan, a greater sense of cohesion and common identity would be created within the Town Center area. Further, by implementing such improvements on public property and along public rights-of-way, private property owners may be encouraged to implement similar improvements by example. Any such plan should be relatively simple and emphasize the use of inexpensive, low maintenance plant species, preferably native, that provide seasonal variation and are adaptable to an urbanized environment. Consideration should also be given to related features such as lighting, benches, fencing and other similar improvements within the plan. On the basis of such a comprehensive landscaping plan, landscaping standards or guidelines could then be developed that would be applicable to new private development and redevelopment within the area. At very least, existing unpaved portions of the public rights-of-way and public property adjacent to public streets should be cleared of weeds, trash and debris and covered with landscaping materials and/or replanted.

2. Design Standards

The development of comprehensive building design guidelines for the Town Center area is difficult due to the wide variation that exists in building styles and types. There is no dominant architectural style or period upon which to base such standards. Greater compatibility of new construction with immediately surrounding buildings and sites, however, could be achieved. At minimum, building elevations for new construction within the Town Center should be reviewed as a part of the Planning Board site plan and subdivision review processes to encourage greater compatibility and improved design. As with landscaping, the Town itself should also take the lead in designing public building improvements that are compatible with the surrounding area and that contribute to or improve the aesthetic quality of the area.

I. TRANSPORTATION

Transportation, or the movement of vehicles and pedestrians through and within the Town Center area, is one the most challenging aspects of the plan. With an average weekday daily traffic level in excess of 14,000 vehicles, Route 3 is by far the most heavily traveled road in Merrimack (excluding the FE Everett Turnpike). Route 3 serves both as a local arterial street as well as a major through-road and is the commercial spine of Merrimack as well. Further, excluding the Turnpike, Route 3 is one of only two north-south roads in Merrimack that bridges

the Souhegan River. The second most heavily traveled road in the area is Baboosic Lake Road which provides access to and from the Town's municipal core, the High School, Mastricola Middle School and Elementary School complex and residential areas to the west of the Turnpike. Not surprisingly, perhaps, the intersection of these two roads is the center point of the Town Center Study area.

Although issues related to transportation are broad, the Town Center Plan is focused on three principal areas of concern: pedestrian circulation (sidewalks), an evaluation of improvements recommended for the area in the 1989 Route 3 Action Plan, and circulation within the vicinity of the Town Hall and School complexes. In some ways, these three areas of concern conflict. The starting point for discussion of these issues relates back to the open meetings held at the outset of the planning process where the desire to create a definable, more pedestrian oriented Town center area was clearly expressed.

1. Pedestrian Circulation

The concentration of varied uses in the Town Center study area, relatively high densities and the relatively short distances between principal centers of activity, would, in a traditional downtown or town center, generate significant pedestrian activity. While pedestrian activity does exist, unlike traditional urban centers, significant pedestrian movement within the area is limited by the lack of sidewalks in most areas, high traffic volumes and limited crosswalks. Further, existing development patterns along Route 3 in particular, create an atmosphere that is unsympathetic to pedestrian activity.

As previously mentioned, the existing sidewalk network within the Town Center area is extremely limited and connections are few. Sidewalks now exist along the western side of McElwain Street, the southern side of Baboosic Lake Road, a small area on the southern side of the Library, and along scattered stretches of Route 3 such as in front of the Dunkin Donuts and Post Office, from Baboosic Lake Road to Connell's Shopping Center, to the east of Fraser Square and in front of the Merrimack Village Mall. The development of a sidewalk system, therefore, would require a major undertaking.

Along with sidewalks, pedestrian travel in high traffic areas requires crosswalks. Currently, signalized, pedestrian activated crosswalks are located at the northern extreme of the study area (near the Post Office) and at the intersection of Baboosic Lake Road and Route 3. Traffic signals without crosswalks are located at the Merrimack Village Mall and at the Connell's Shopping Center. There is also an unsignalized crosswalk provided across Route 3 north of Baboosic Lake Road near Twin Bridges Park. At least one additional, signalized crosswalk would be required on Route 3 at the southern end of the study area to allow for pedestrian movement throughout the Town Center Area and another signalized or unsignalized crosswalk would be required between Baboosic Lake Road and Fraser Square.

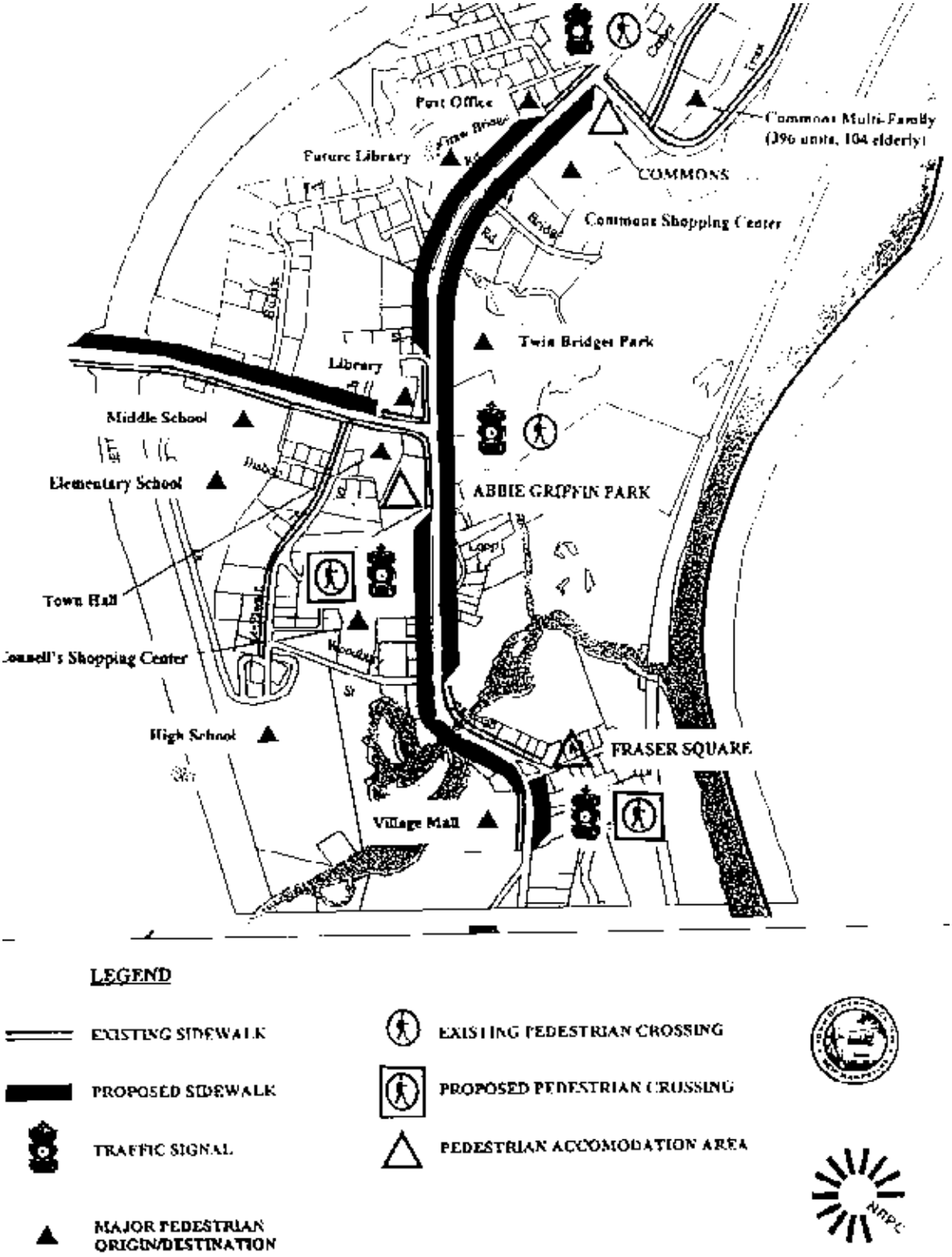
The importance of the development of a sidewalk system for the Town Center area is based upon public safety, the need to provide for alternative means of transportation to reduce traffic congestion and on aesthetic and lifestyle concerns. Aesthetic and lifestyle concerns are expressed primarily in the desire of many people to create a more personal, human scale atmosphere in the Town Center area similar to that of more traditional town centers or downtowns. From a lifestyle perspective, there is an increased interest in walking generally for health and recreational reasons. Public safety, however, is perhaps a more compelling concern.

Given the large number of residences, public institutions and businesses, within the Town Center area, a significant amount of pedestrian traffic currently exists, and large numbers of school children in particular, frequently walk between the schools, nearby residences, the Library, Twin Bridges Park and area businesses. Frequently, these trips are made within the narrow unpaved shoulders of Route 3 and along other streets or portions of streets without sidewalks, resulting in an obvious safety concern. The inevitable conflicts between pedestrians and vehicular traffic also contribute to congestion as vehicles are forced to slow down, swerve or stop to avoid pedestrians traveling alongside or within the traveled way.

Pedestrian movement within the Town Center area is also a viable transportation alternative that may reduce or minimize short distance vehicle trips within the area, thereby, reducing traffic congestion. Because of the high concentration of public and semi-public facilities, residences and business, the relatively short distances between these uses, and fairly heavy traffic congestion, pedestrian travel between adjacent or nearby sites can be as or more convenient than vehicular travel if reasonable accommodations are provided. A volunteer effort conducted to assist in development of the plan revealed that travel time between the Post Office and Fraser Square (the longest distance within the study area) is less than twenty minutes at a normal walking pace and that most potential destinations can be reached within ten minutes walking time from the central intersection of Route 3 and Baboosic Lake Road.

In addition to the provision of sidewalks and crosswalks, there is also a need to address other related pedestrian needs. For the elderly or those with physical limitations, distances of a mile or even half of a mile can be excessive on foot without provisions for rest. Further, weather conditions, safety concerns and incompatible surroundings can discourage pedestrian activity even where sidewalk and crosswalk improvements make it physically possible. For pedestrian travel to be viable, it must be desirable, which requires, among other things, that a reasonably comfortable environment be provided. Amenities such as conveniently located benches for rest, trees and other landscaping to provide shade, protection from wind and to improve the aesthetic appeal of certain areas are an important part of planning for pedestrian circulation. Thought should also be given to street lighting and the placement of facilities such as public phones for safety as well as for convenience and to the placement of mail boxes, trash cans and bike racks to encourage inter-modal travel.

Map X-5: Existing and Proposed Sidewalk Network



To address the condition, issues and concerns raised above, a specific sidewalk improvement plan has been developed for the Town Center. While sidewalks and related improvements may be desirable throughout the area, the primary focus is on Route 3 and Baboosic Lake Road. Further, an effort has been made to recommend improvements primarily to those areas where natural and man-made constraints do not unreasonably impair the development of a sidewalk system.

The sidewalk plan would provide for sidewalks to be constructed along the west side of Route 3 from the existing sidewalk in front of the Merrimack Village Mall for a distance of approximately 4,700 feet to the existing sidewalk located in front of the Post Office. This portion of sidewalk, the largest proposed, would require improvements adjacent to or as a part of the existing bridge over Baboosic Brook north of Wire Road. On the east side of Route 3, sidewalks are proposed from the existing sidewalk east of Fraser Square to the entrance to Twin Bridges Park for a distance of 2,400 feet. The sidewalk on the east side would terminate in the vicinity of an existing cross walk to permit pedestrians travelling north to continue on the west side of the road. The shorter distance on the east side is proposed in order to limit bridge improvements to one side of the bridge across the brook and due to severe topographical limitations on the east side of Route 3 along the frontage of the Commons Shopping Center. Sidewalks are also proposed for the north side of Baboosic Lake Road for a distance of 1,600 feet. In general, these would be five-foot wide bituminous sidewalks with granite curbing. The sidewalk improvements noted above are described in order of priority. Once these are completed, a sidewalk should also be constructed along at least one side of Woodbury Street to connect the schools to the southern end of the Town Center portion of Route 3.

Along with sidewalks, crosswalks are crucial to pedestrian travel. With heavily trafficked roads such as Route 3, it is also critical that at least some of these be signalized. As previously mentioned, there is an existing signalized crosswalk in front at the intersection of Front Street and Route 3 at the northern end of the study area and another at the intersection of Route 3 and Baboosic Lake Road. An unsignalized crosswalk is located north of Baboosic Lake Road for access to Twin Bridges Park. At minimum, the existing traffic light at the Merrimack Village Mall should be adapted to provide for an additional crosswalk for the southern end of the study area. Consideration may also be given to adapting the light at Connell's shopping center to provide for an additional signalized crosswalk, or, as a minimal measure, an unsignalized crosswalk could be provided on that vicinity. In these ways, signalized crosswalks would service the entire Town Center portion of Route 3 at intervals of approximately a ten minute walking distance. Additional signalized or unsignalized crosswalks would supplement these to allow for the safe and convenient movement of pedestrians throughout Town Center area.

In order to meet the comfort and safety needs of pedestrians, three pedestrian accommodation areas are proposed: one at each end of the Town Center area and one in the middle. These areas are strategically located adjacent to the two existing and one proposed signalized crosswalks. Each pedestrian accommodation area would, at minimum, contain: benches for seating; lighting; and trees and other plantings for shade, protection from wind and aesthetic appeal, and waste receptacles to minimize litter. As funding allows, bike racks and water fountains should also be provided and other amenities such as kiosks, monuments, memorials or out-door sculpture could be considered to enhance the function of these areas as places of public interest and assembly. Ideally, other entities should be encouraged to locate other forms of street furniture such as mail boxes, public telephones and newspaper racks in or

around the public accommodation areas to improve service to pedestrians while also reducing visual clutter along Route 3.

Conveniently, two suitable public properties are already located within close proximity to existing or proposed cross walks and both would be suitable as pedestrian accommodation areas: Abbie Griffin Park and Fraser Square. Both of these sites already provide benches, trees and other landscaping and have other features of interest. An additional site, however, would have to be acquired, either outright or as a part of a future development plan at the signalized crosswalk at the intersection of Front Street and Route 3. In addition to these improvements, additional tree plantings and landscaping should be provided for along the length of the sidewalk improvement areas, particularly on publicly owned land. Together, the completed sidewalk improvement plan would provide for a integrated pedestrian transportation system that would tie together most of the Town Center's public and semi-public institutions, businesses and residences, would improve aesthetic appeal of the area, improve public safety, perhaps reduce congestion and would serve to enhance the role of the Town Center area as a focal point for Merrimack's civic and cultural life.

In 1997, the Town applied for a total of $932,500 in Enhancement grants under the Inter Surface Transportation Enhancement Act (ISTEA) to fund the Town Center sidewalk proposal. An additional $186,500 would have had to have been raised by the Town to cover its local share. These figures included amenities such as benches and 250 flowering trees. ISTEA funds are specifically intended to support alternative transportation projects that could alleviate vehicular congestion, thereby, reducing air pollution. The application process is highly competitive, however, and unfortunately, the Town did not receive funding during the last application round. The Town should nevertheless continue to pursue such grants and other similar sources of revenue. The existing sidewalk capital reserve fund is also a potential source of revenue. In addition to these potential sources of funding, new developments and substantial redevelopments should continue to build sidewalks long their respective frontages or provide equivalent funds in lieu of actual construction in accordance with existing Planning Board regulations.

2. Route 3 Improvements

The portion of Route 3 running through the Town Center area, is the narrowest portion of the highway with only two moving lanes, few turn lanes, limited shoulders and a relatively narrow right-of-way. The road is also encumbered by two narrow, two-lane bridges and at least seven poorly configured or problematic intersections. These conditions, coupled with high traffic levels, result in poor levels of service (relatively long delays) at certain key intersections such as Baboosic Lake Road during peak hour traffic periods. Although Route 3 is a state highway, the portion of the road between Greeley Street and Bedford Road has been designated as an *Urban Compact* area, meaning that maintenance and improvements to this portion of the highway, including the entire Town Center portion, is the responsibility of the Town. The cost of any improvements, therefore, would have to borne entirely or primarily by the Town.

To address existing conditions and traffic problems along the Town's portion of Route 3, a series of studies were undertaken by the Town with the assistance of transportation consultants in the 1980s which culminated in the 1989 Route 3 Action Plan. The Action Plan recommended a series of improvements to Route 3 involving, primarily, additional lanes and certain intersection improvements. Preliminary plans were included for the portions of the

Urban Compact both north and south of the Town Center area, and detailed engineering plans were later developed for the portion between Greeley Street and the Souhegan River.

In sum, the Action Plan recommended improvements to increase Route 3 from two lanes with shoulders of varying widths to four lanes (two lanes in each direction) with four foot shoulders which could be used as bike lanes and six foot panels for utilities and possible sidewalks. At certain intersections such as that of Baboosic Lake Road, a widening of up to six to seven lanes was recommended. Both the bridge over the Souhegan River and the bridge over Baboosic Brook would have to be reconstructed. A minimum of a sixty-eight foot ROW would be required with a substantially greater ROW required at key intersections. A 100 foot ROW was desired.

Due to the magnitude of the impact of the recommended improvements for most of the Town Center area on adjacent properties and the high cost ($9 million in 1989 dollars, not including property acquisition), preliminary plans were not developed for the portion of the road between the two bridges. The close proximity of several buildings, parking areas and other property improvements to the existing edge of pavement necessitates that any significant widening of Route 3 would result in substantial property acquisitions, loss of parking areas (including the loss of parking on already deficient sites), and the demolition of a number of buildings, including the existing Library and other buildings of cultural and historic value. For these same reasons, major improvements to Route 3 within the study area are not included as recommendations in the Town Center Plan.

Although preliminary plans for road widening and major intersection improvements were not developed for the area, a series of so-called stop gap measures were recommended that would improve traffic flow and ease, but not eliminate, congestion. Of these, all but two did not require additional right-of-way acquisitions. With the exception of the improvements recommended for the Baboosic Lake Road / Route 3 intersection (which would severely impact the existing Library) the so-called stop gap measures are incorporated into the Town Center Plan. In addition, another intersection improvement for Church Street is included as well. These recommended improvements are summarized below and illustrated on Figures X-2 and X-3 on the following pages.

a. Merrimack Village Mall: convert the existing left turn only land into a shared left / through lane.

b. Railroad Avenue / Fraser Square: reconfigure northerly intersection of Railroad Avenue and Route 3 through northern tip of Fraser Square; permit right-turns out only. Relocate the Chamber Information Booth.

c. Connell's Shopping Center: convert the existing left turn only land into a shared left / through lane.

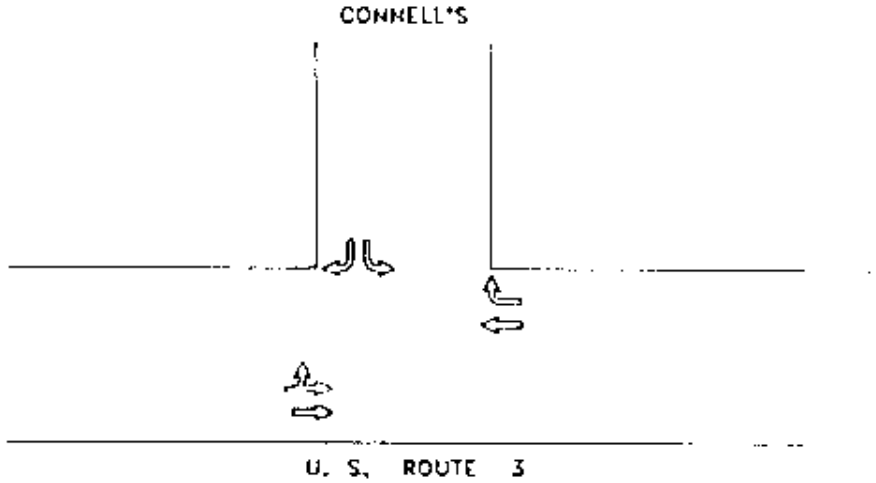
d. Church Street: eliminate the intersection of Church Street and Route 3 by removing the pavement and landscaping the area.

e. Wire Road: signalize and reconfigure intersection to approximate a "T" rather than a "Y" shaped intersection (originally proposed as a part of a prior private development plan).

f. McGraw Bridge Road / Front Street: reconfigure the intersection of McGraw Bridge Road and Front Street to align the two streets.

Figure X-2

U.S. ROUTE 3 / CONNELL'S SHOPPING CENTER



LEVELS OF SERVICE

	AM PEAK	PM PEAK
1988		
EXISTING	D	E
PROPOSED	D	A

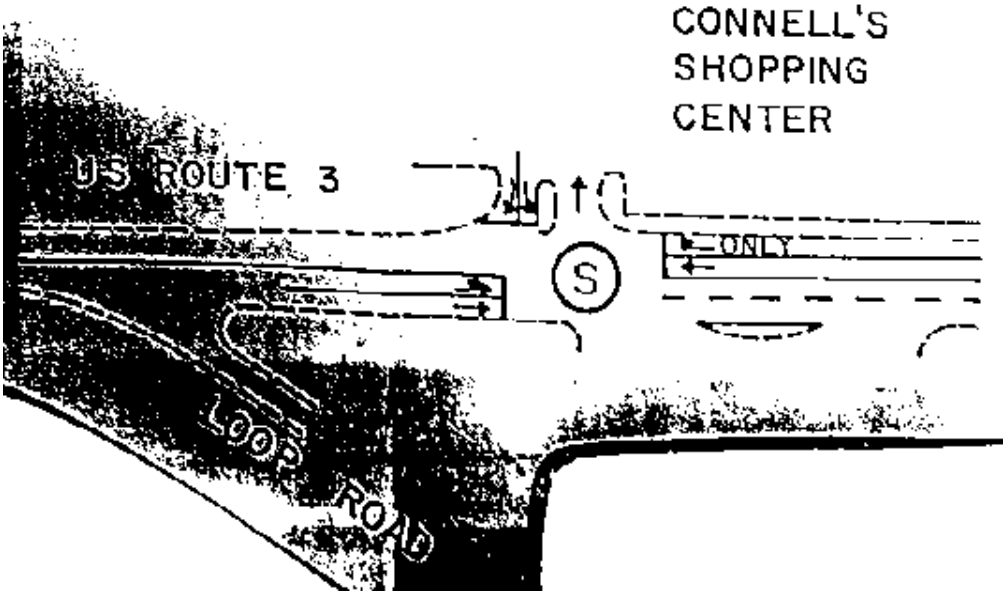
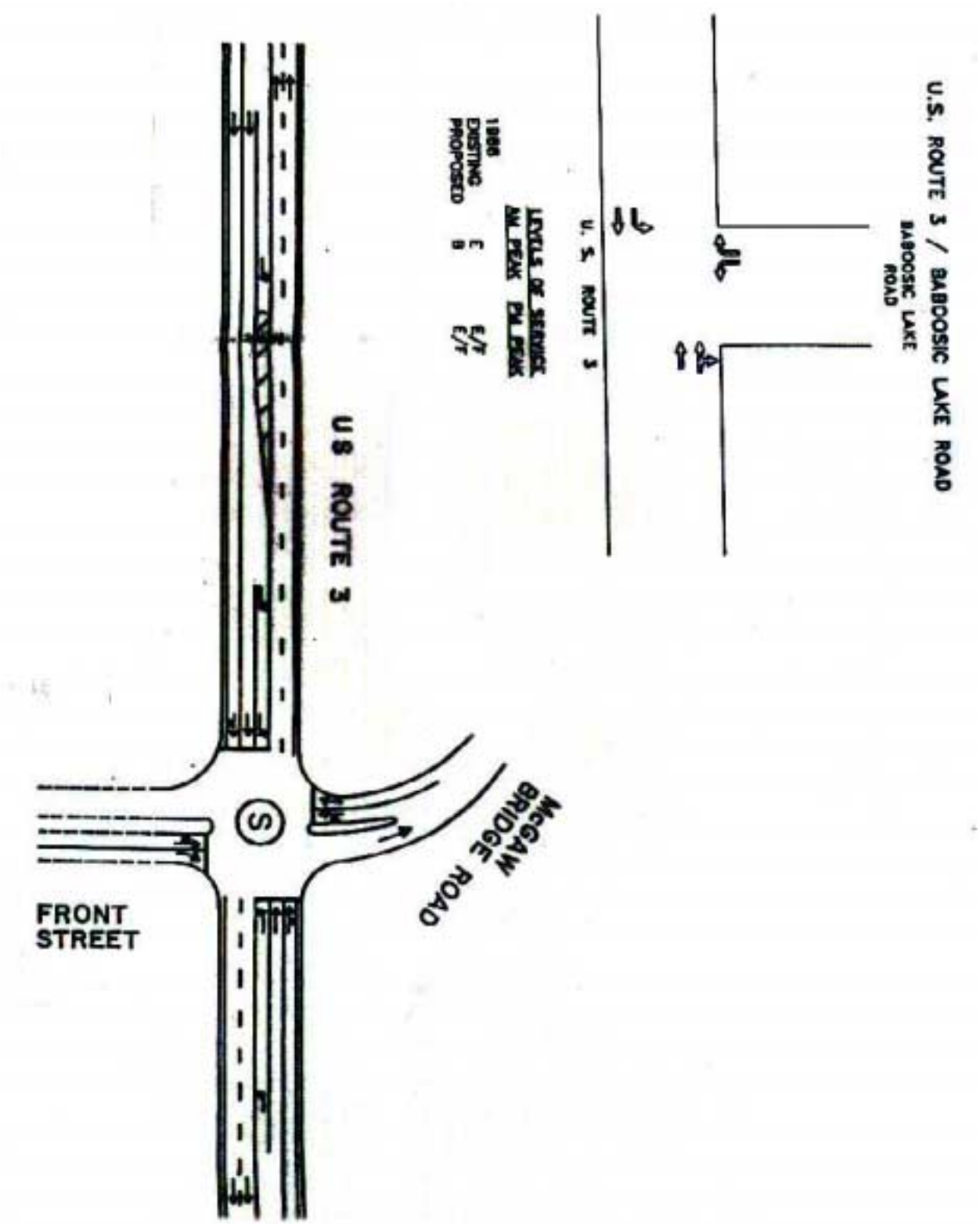


Figure X-3


U.S. ROUTE 3 / BABOOSIC LAKE ROAD
BABOOSIC LAKE ROAD
U. S. ROUTE 3
LEVELS OF SERVICE
AM PEAK PM PEAK
1986
EXISTING E/F
PROPOSED B E/F
U S ROUTE 3
MCGAW BRIDGE ROAD
FRONT STREET

Although not specifically a Route 3 improvement, a new road with important implications for traffic on Route 3 is envisioned as a part of both the land use and transportation planning aspects of the Town Center initiative. Currently, the largest area of vacant developable land in the Town Center area is located to the east of the developed properties along Route 3. Development of this area, however, is limited by poor access, visibility and various environmental constraints. Another significant site is the Harcros Chemical property located on the eastern side of Route 3 on the north shore of the Souhegan River, adjacent to the aforementioned vacant land. Due to environmental problems on that property, it is considered to be a major redevelopment site. Because of the large amount of land involved and numerous development constraints, development of this area would require a comprehensive coordinated undertaking that would include the need for new road construction.

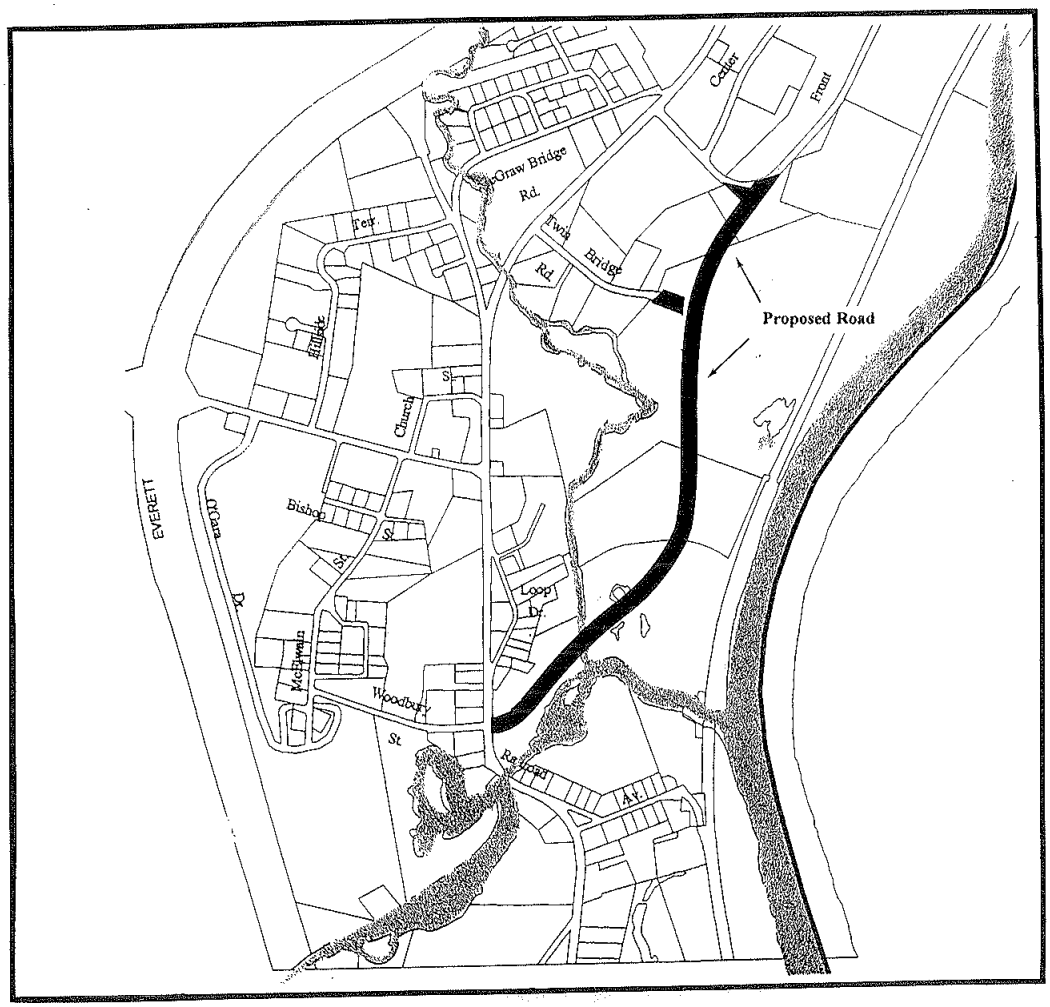
To facilitate the provision of access to these properties while simultaneously providing for traffic relief on Route 3, a new through road has been conceived that would intersect Route 3, opposite Woodbury Street, run easterly across Baboosic Brook (probably following the line of an existing railroad spur, turn to the north running parallel to the Merrimack River to intersect Twin Bridges Road and then would continue to connect to Front Street. If constructed, this road would provide access to new development east of Route 3 while providing a north south alternative to Route 3 for most of the length of the Town Center area. An existing traffic signal would serve the north end while a new traffic signal would probably be required at the Woodbury Street intersection. If possible, a second bridge or a replacement bridge over the Souhegan River may be connected to this new road in the future to provide a more complete parallel road. A preliminary review of topography and other existing conditions indicates that the proposed may be feasible. Absent a more detailed engineering study, however, the proposed road must remain in concept form only. A conceptual alignment of the proposed road follows.

3. Town Hall/School District Circulation

Circulation within and around the vicinity of Town Hall and the near by school complex has been an issue of concern for several years as these facilities have expanded. Residents on Bishop Street and McElwain, in particular, have voiced concerns related to safety, speed and overall traffic volumes. At the Town Hall site, problems have included the lack of a vehicular connection between the upper and lower parking lots, the proximity of the entrance/exit to the lower parking lot from Baboosic Lake Road and poor site distance.

While plans for the school sites continue to evolve in conjunction with facility expansion plans, a reconfiguration of the circulation system around Town Hall is currently in progress. Once completed, the upper and lower parking lots will be connected, the entrance to the lower parking lot from Baboosic Lake Road will become for exit only and the entrance to the Town Hall site from Bishop Street will be terminated. Given these improvements, no further recommendations are proposed for traffic circulation in the Town Hall vicinity.

Map X-6: Proposed Road Improvement



J. LAND USE

1. Existing Land Use

The Town Center Study area, as noted in Chapter I, is an area slightly more than one mile in length located between the FE Everett Turnpike and the Merrimack River, centered on Route 3 and Baboosic Lake Road. Its widest extent is about three-quarters of a mile. The area includes approximately 450 acres of land exclusive of public rights-of-way and water. The concentration of land uses in the study area approaches urban densities and its diversity of land uses is similar to those found in more traditional downtown areas or town centers. The Town Center area contains most of Merrimackɜs principal public facilities including the Town Hall, Central Fire Station, Ambulance facility, Police Station, Public Library, Post Office, High School, Middle School, Mastricola Elementary school, Adult Community Center and Twin Bridges Park and other recreational facilities. The area also houses two churches and a Legion Hall. In addition to public and institutional uses, the area contains three shopping centers, thirty-five additional commercial properties, almost 100 single-family residences and approximately 450 multi-family residential units (including the total area of the Commons PUD). Unlike more traditional town centers or downtowns, however, the study area lacks the cohesiveness or common characteristics that would define it as a unified whole. A breakdown of land uses by category along with a description of each category is provided below. A generalized land use map is provided on the following page.

a. Single Family/Moderate Density Residential

This category, comprised primarily of single-family homes, takes up approximately 51.1 acres of land or 11.4% of the study area. A total of 98 residential properties were counted resulting in an overall density of .52 acres per dwelling unit with a range from .18 to 2.6 acres per unit. Most homes are on lots of between a quarter to one third of an acre in area. Only ten of the 98 homes in the area are on conforming lots (40,000 square feet per acre). The largest concentration of individual homes is in the area north of Baboosic Lake Road along Hillside Terrace and northwest of Route 3, between McGraw Bridge Road and the Turnpike. Another concentration is found on and around McElwain Street south of Baboosic Lake Road. Smaller grouping are found on Loop Road, Railroad Ave and scattered along Route 3.

b. Multi-Family Residential

Multi-family residential uses are concentrated primarily in a handful of developments including the Commons (292 total units, 104 elderly units), Killian Court (11 units), Highland Green (24 units) and Village Falls Way (16 units). These units include garden style and townhouse rental units and condominium units of both types. 128 units of elderly housing are included in the total unit count. A few smaller, scattered buildings and mixed-use sites are also found. Multi-family residential accounts for 58.2 acres or approximately 13% of the Town Center area.

c. Commercial

Commercial land uses are the third largest land use category with 38 properties on approximately 66.9 acres of land (14.9% of the total area). Almost half of this total is taken up by the three shopping centers, the Commons at the north end of the district, Connell's at the center and the Village Mall to the south. The remaining commercial properties are scattered primarily along Route 3. Most commercial uses are on small individual lots and many are converted residential properties. Commercial uses in the Town Center include a wide range of service establishments such as hair stylists, dry cleaners, banks, and automobile service and repair facilities; medical, legal, insurance and real estate offices; at least eight restaurants; two health clubs, and several retail establishments including a hardware store, florists, sporting goods stores, pharmacies, gift shops, gas stations and small convenience and grocery stores. Several business offices are also located in the area.

d. Industrial Uses

Industrial uses account for approximately 30 acres of the Town Center or 6.7% of the total area. The largest portion of the total is the Harcros company site on Route 3. Most of the remainder is made up of industrial lands near the Merrimack River at the southeastern end of the Town Center including the Jones Chemical Company and Transupport Inc. (the former Woodcomp site). The latter two sites, however, are only partially located within the study area.

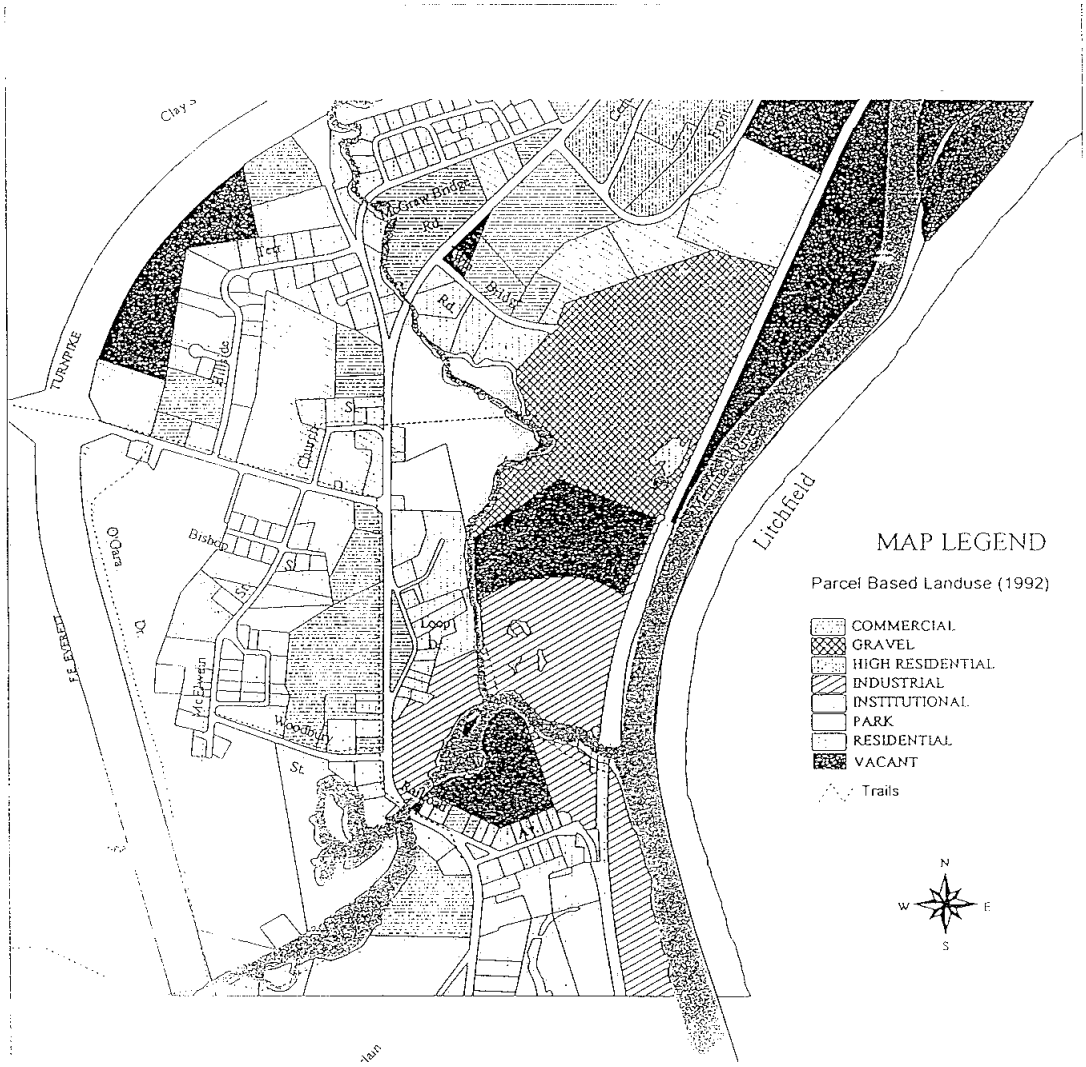
e. Public Uses

This category includes all public land uses except for parks and recreation which is in its own land use category. Public uses are the second largest land use category in the district after vacant land and the largest of the developed land uses. Included in the category are the schools, Town Hall, the Police Station, Central Fire Station, Adult Community Center, Library and any related facilities. Public facilities comprise 93.1 acres of land or 20.7% of the total area. The largest area by far, 55 acres, is devoted to the High School, Middle School and Mastricola Elementary School site.

f. Semi-Public Uses

Semi-public uses are institutional uses that have a limited public nature such as churches, private school facilities, clubs, fraternal organizations and so forth. These uses make up only 1.8% of the area of the center (8 acres) but are generally prominently situated and of central importance to the area. Semi-public uses include the Congregational Church, Our Lady of Mercy Church and the Legion Hall, all of which are located on Baboosic Lake Road.

Map X-7: Generalized Land Use



g. Parks & Recreation

Park and Recreational uses take up 45.9 acres within the Town Center or 10.2% of the total area. Most of this area is devoted to Twin Bridges Park in the center of the district. Smaller sites include Abbie Griffin Memorial Park area adjacent to Town Hall. Although extensive, the athletic facilities and fields on the School District sites are included in the Public land use category and not in the Parks and Recreation category.

h. Vacant Land

With 96 acres of undeveloped land, vacant land is the largest single land use category accounting for 21.4% of the total area of the district. Almost two-thirds of that total, however, is undevelopable floodplain and wetland adjacent to the Merrimack and Souhegan Rivers. Of the developable vacant land, most,

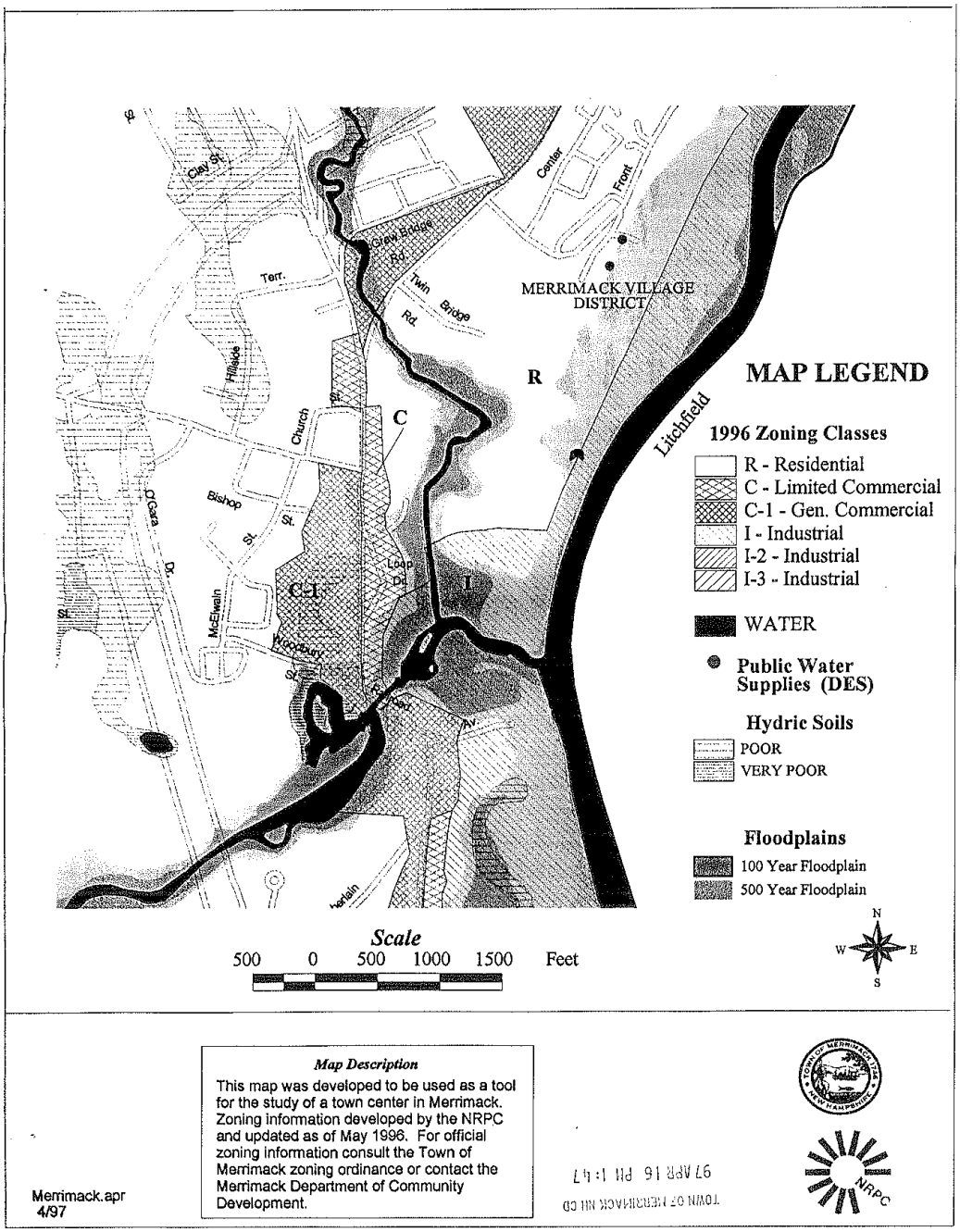
approximately 30 acres, is located in and around the Commons development. The remaining vacant developable land is scattered on smaller parcels throughout the district. In addition to natural development constraints, the Town Center area's vacant developable land is further limited by regulatory and other land use constraints, including utility easements, possible contamination issues, abutting land uses and zoning restrictions that may impede development. Although not included in vacant land totals, the study area includes some underdeveloped sites such as the excavation area at the end of Twin Bridges Road, that could be developed more intensively in the future along with adjacent vacant land.

2. Existing Zoning

Due to the diversity of the area, as well as a result of it, the Town Center area is governed by a number of differing zoning districts. These include four general zoning districts and six overlay districts (see Map IX-2, Existing Zoning, on the following page). The largest single zoning district in the Town Center area is Residential. Since sewer and water is available to most if not all of the residentially zoned land, the residential land falls into the R-4 classification. In that district, single-family homes are permitted with a minimum lot area of 40,000 square feet, two-family residences on lots of not less than 80,000 square feet and multi-family housing is permitted at a density of 12,500 square feet per unit. Nonresidential uses in the Residential District are limited to uses such as home occupations and churches (by special exception). Although, most of the land between Route 3 and the Turnpike is residentially zoned, it is noteworthy that most of the land is not used residentially due to the extensive areas developed for Town and school district facilities, semi-public uses and other nonresidential uses permitted by variance. Within residentially developed areas, it is also significant that very few properties comply with current lot size, setback or frontage requirements.

In addition to the more general residential zoning district, two additional residential overlay districts are located within the study area: the Elderly Zoning District and a portion of a Planned Residential/Planned Unit Development District (PRD/PUD). The entire Town Center area is located within Elderly Zoning District. This overlay district permits multi-family housing to be built for the elderly at densities of up to eight units per acre (more than twice the density otherwise permitted) provided that certain conditions and restrictions are adhered to. The Town Center area includes two elderly housing developments. The PRD/PUD overlay district also allows for higher residential densities than otherwise permitted (up to eight units per acre for elderly and six units per acre for non-elderly), but requires that there be a commercial or other non-residential use component. The purpose of this district is allow for a variety of housing types to be built as a part of a mixed-use development that would have a positive fiscal impact on the Town. The Commons shopping center at the northern end of the study area is a part of the larger Commons PUD that also includes Wentworth Place and Essex Green elderly housing developments and the London Court apartments. The PRD/PUD district still includes two vacant parcels intended for commercial development as a part of the Commons PUD and a vacant 23 acre parcel that can be developed as a separate PUD.

Map X-8: Existing Zoning



Map Description

This map was developed to be used as a tool for the study of a town center in Merrimack. Zoning information developed by the NRPC and updated as of May 1996. For official zoning information consult the Town of Merrimack zoning ordinance or contact the Merrimack Department of Community Development.

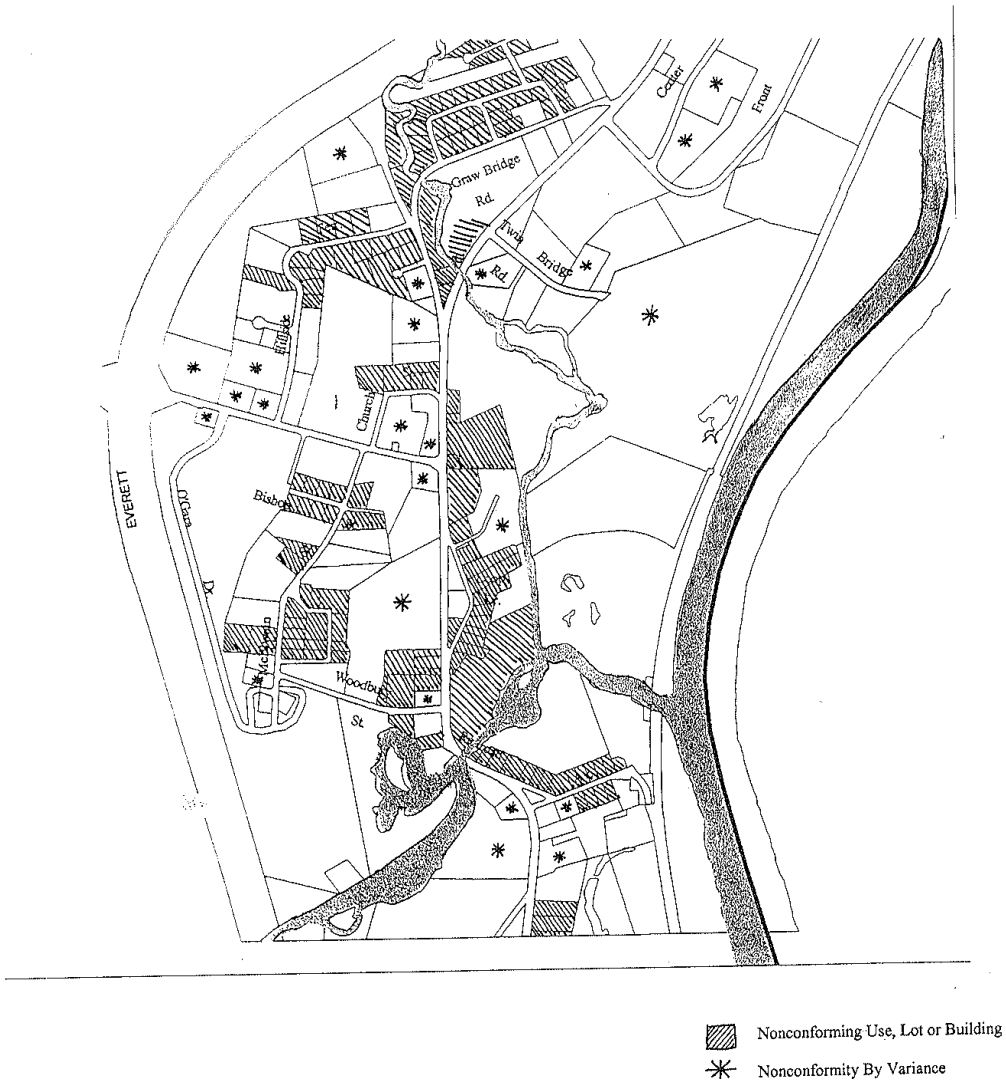
Merrimack.apr
4/97

Two other very significant general zoning districts are the C-1 Limited Commercial and C-2 General Commercial districts. The C-2 District, which permits a full range of retail and service uses, covers almost all of the lots on the west side of Route 3 within the Town Center area and a portion of the east side as well. The C-1 District, which limits certain commercial uses, such as restaurants, and prohibits most automobile related uses, is located primarily on the east side of Route 3 for approximately two-thirds of its length. Several properties in these districts are also nonconforming due to lot size, setback or permitted use issues. The industrially zoned land within the study area (I-1 Industrial) is limited to the south and eastern portions of the area adjacent to the north and south banks of the Souhegan River and the Merrimack River. The I-1 Zoning District is the largest and most permissive of the Town's three industrial zoning districts. Most of the vacant land in this zoning district, however, falls into another restrictive zoning overlay district such as floodplain or shoreline protection and lacks frontage on a Town improved street which, taken all together, greatly limit development potential.

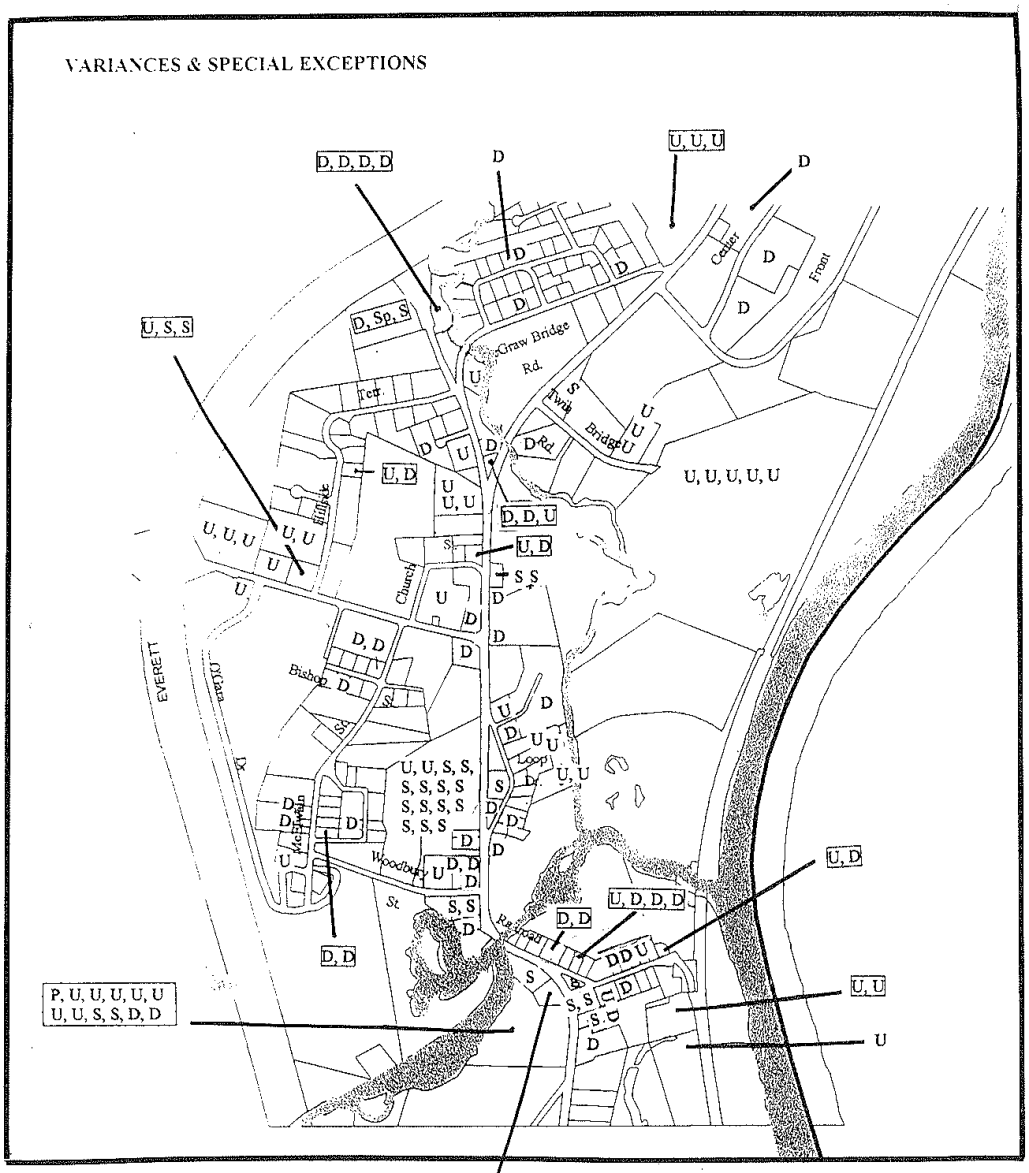
Finally, the Town Center area is overlain by four conservation related districts; the Wetlands, Aquifer, Floodplain and Shoreline protection districts. As previously noted, the development potential of much of the vacant land remaining in the Town Center area is limited by these overlay districts. The wetlands ordinance severely restricts development in a wetland area, effectively rendering wetlands as unbuildable land for the most part. The floodplain ordinance also severely restricts development in the 100 year floodplain and to a lesser extent, the 500 year floodplain. The Shoreland Protection Ordinance, applies to all areas within 250 feet from the Souhegan River, Baboosic Book and the Merrimack River. This ordinance limits tree-cutting, requires retention of a natural buffer and places some other restrictions on development, but does not otherwise prohibit most development activity. The Aquifer Protection Ordinance applies to almost all of the Town Center area. Similar to the shoreline ordinance, this district restricts certain forms of development and imposes a higher level of review, but does not prohibit most forms of development activity. The aquifer district also includes a more restrictive subdistrict that encompasses the Wellhead Protection areas for Merrimack Village District Wells Four and Five. Taken together, the four conservation related overlay districts have a substantial impact on the development potential of vacant land in the Town Center District and on changes, expansions or the redevelopment of existing sites. As would be expected, the four conservation related overlay districts frequently overlap.

Because of the diversity of the area and the large number of buildings and properties that were developed or created before the existence of zoning, most homes, buildings and lots within the Town center area do not conform to current zoning requirements. The application of current zoning requirements to much of the Town Center area, therefore, limits change, redevelopment or expansion. As a result, several variances from existing zoning requirements have been granted over the years since zoning was established which has tended to increase the discrepancy between current zoning requirements and the actual way in which the land is developed and used. Map X-9, on the following page, illustrates nonconformity in the Town Center area. Map X-10 illustrates the variances and special exceptions, by type, that have been issued.

Map X-9: Non-Conforming Uses, Lots and Buildings



Map X-10: Variances and Special Exceptions



LEGEND

U	Use Variance
D	Dimensional Variance
S	Sign Variance
Sp	Special Exception (use)

3. Conceptual Future Land Use Summary

The following is a summary of the recommended conceptual generalized land use plan for the Town Center Study area.

a. Residential Only

The northwest portion of the study area contains the largest concentration of single-family residential uses in the center with few nonresidential intrusions. This area should remain residential and should be buffered from nonresidential uses. Setbacks should be modified to reflect the existing character of the area to allow existing residential uses to remain viable through alteration and expansion.

b. Mixed Use - Loop Road and Railroad Avenue

The Loop Road and Railroad Avenue areas should continue to develop with a mixture of residential and limited commercial uses with an emphasis on the adaptive reuse and preservation of existing potentially historic structures. Appropriate limited commercial uses include professional offices, personal and professional services and locally oriented or specialty retail. Regulatory incentives for adaptive reuse/preservation should be adopted along with flexible standards related to building setbacks and parking. Design standards for new development, changes to existing buildings and landscaping should be adopted along with strict signage requirements.

c. Mixed Use - Baboosic Lake Road/McElwain Area

This area contains the Town Center's largest concentration of public institutional uses including Town Hall, the school complexes, Police Station and existing Library. The area also includes two churches and a fraternal organization along with a mixture of single-family and multi-family uses. Although this area contains the second largest concentration of homes, institutional expansion has moved up McElwain and onto Bishop Street while nonresidential development has taken over Baboosic Lake Road. The residential uses within this area should be retained to the extent possible, however, it cannot be isolated from the expansion of public institutions. The continued development of very limited nonresidential uses such as medical or professional offices, churches, private membership clubs and child care facilities are also probably appropriate for the area. Such uses could be permitted by special exception or under a flexible/performance zoning scheme.

d. Development/Redevelopment Areas

1) Planned Mixed Use Development

The three Longa properties at the northeastern end of the Town Center, comprising approximately 82 acres, include the largest areas of vacant land and land with a high potential for redevelopment in the Town Center area. The large parcel at the end of Twin Bridges Road is partially developed with residential uses, a commercial operation, excavation site and former landfill site. Due to access limitations, environmental constraints and its proximity to the Commons, single-family or lower density residential development would probably not be feasible. Access and visibility constraints would also limit commercial or industrial uses. A planned mixed use type of development that

would be similar to existing PUD developments, however, may be feasible and would provide the greatest flexibility in addressing the numerous constraints on the property. Due to lack of access, floodplain limitations, its location on the Merrimack River and proximity to the recently acquired Town-owned riverfront parcel to the north, the 22 acre riverfront parcel would be best used for park, passive recreational and conservation uses. Use of the parcel for such purposes could be achieved through acquisition or as a part of the open space for a mixed residential/commercial development.

2) Souhegan Riverfront Parcels

The second largest areas of vacant land in the Town Center are located adjacent to the Souhegan River on both the east and west side of Route 3. Due to natural constraints, these areas are best suited to conservation and passive recreational uses. The parcel on the east side of Route 3, adjacent to the School property, may also have limited potential for the expansion of school recreational and athletic facilities. The developed portion of the Harcros property can reasonably be viewed as a redevelopment site due to the age of the buildings and other issues affecting the property. Should public acquisition become a possibility, the site would be ideally situated for a municipal parking lot to serve the Town Center area due to its proximity to Loop Road and Railroad Avenue. The balance of the site should be used for park and recreational purposes and for conservation. If public acquisition is not possible, limited commercial use with protective easements along the shoreline would be desirable.

4. Balance of the Town Center Area

The Balance of the Town Center Area is primarily the commercial area along Route 3 including the three shopping centers and other existing developed areas. These areas contain a wide range of commercial uses, some public uses and scattered residences. Although there are several potentially historic buildings, there is no overall character that defines the strip. These areas should continue to develop along general commercial lines with limitations placed on the expansion of automobile oriented uses including service stations, new and used car lots and drive-through restaurants and other similar uses. Most other nonresidential uses can be developed on appropriate sites. To enhance the appearance of the area, flexible design standards, landscaping and stricter signage controls should be adopted. Parking should be limited to the side or rear of principal buildings.

a. Proposed Zoning and Regulatory Changes

Create a Town Center Overlay Zoning District intended to implement the overall goals of the Town Center Plan by encouraging an appropriate mixture of land uses and forms of development.

1) Boundaries: All areas shown on the Town Center Study area map, adjusted to follow property lines where possible, excluding the overwhelmingly single-family residential area in the northwest quadrant of the study area.

2) Permitted Uses: All uses permitted in any underlying zone accept as specifically provided for or prohibited herein.

i. Notwithstanding any contrary use provisions in any underlying zoning district residential uses are permitted anywhere within the Town Center Overlay District.

ii. Notwithstanding any contrary provisions in any underlying zoning district, the Zoning Board of Adjustment may grant a special exception for the following uses of land anywhere within the Town Center Overlay District:

a) preschools, nursery schools, kindergarten, primary or secondary schools, technical or trade schools and institutions of higher learning;

b) day care centers;

c) professional offices including medical, dental, legal, architectural, engineering real estate, accounting, insurance services and related services or facilities;

d) churches, temples, synagogues, mosques and other houses of worship and related facilities and services, and

e) meeting halls or lodges and related accessory facilities for private membership clubs, fraternal organizations, unions, professional associates and other similar organizations.

iii. Provided that the following conditions are met:

a) the site is an appropriate location for the proposed use in accordance with the Town Center Plan;

b) the proposed use would not result in significantly increased hazards to vehicles or pedestrians by way of traffic congestion, ingress or egress;

c) the proposed use would not result in unreasonable impacts to abutting properties by way of increased noise, odor visual blight or other nuisance, and

d) the proposed use is designed in harmony with the overall goals of the Town Center Plan with respect to building and site design and arrangement.

Note: The granting of a special exception based upon the above noted conditions does not negate, supersede or substitute for any necessary approvals or applicable regulations required under the Planning Board's Subdivisions and Nonresidential Site Plan Review Regulations.

iv. Notwithstanding any contrary provisions in any underlying zoning district, the Zoning Board of Adjustment may grant a special exception for the following uses of land within the Town Center Overlay District:

a) automotive service and repair facilities;

b) gas stations;

c) drive-through food service establishments;

d) new or used car dealerships;

e) freight & trucking terminals;

f) contractors yards;

g) fuel storage and distribution (bulk), and

h) breweries and bottling facilities,

v. Provided that the proposed use is a permitted use in the underlying zoning district and the conditions set forth in Section II, C above, are satisfied.

3) Dimensional Requirements: Notwithstanding the dimensional requirements contained in Section 3.02 of the zoning ordinance, the following dimensional requirements shall apply to buildings for any use or combination of uses permitted in the Town Center Overlay District.

i. Minimum Lot Area - Existing Lots: any existing lot of record may be used for any use or combination of uses permitted within the Town Center Overlay District provided that all other applicable requirements are adhered to.

ii. Minimum Lot Area - New Lots: 20,000 square feet.

iii. Frontage: 125 feet.

iv. Setbacks - Buildings:

a) Front Yard - 30 feet.

b) Side Yard - 15 feet.

c) Rear Yard - 40 feet.

d) Lot Depth - 125 feet.

v. Setbacks - Other:

a) no parking areas or other site improvements, except for access ways, fencing, ground signs, utility lines, landscaping and lighting fixtures may be located within required front yard setbacks as established under III, D (1) above;

b) ground signs shall be setback not less than 10 feet from the front property line.

vi. Special Exceptions: The Zoning Board of Adjustment may grant a special exception for additions, alterations or improvements to existing buildings or sites that do not conform to the minimum dimensional requirements set forth in this section where it can be shown that the proposed additions, alterations or improvements:

a) would serve to promote the reuse, restoration, rehabilitation or otherwise enhance an historic building or structure or any other potentially historic building or structure identified in the Historic Resources Inventory component of the Town Center Plan;

b) are for a use currently permitted within the Town Center Overlay District;

c) would not result in significantly increased hazards to vehicles or pedestrians or impair or impede emergency vehicle access or the provision of emergency services;

d) would not result in unreasonable impacts to abutting properties by way of increased noise, odor or other nuisance;

e) would serve to enhance the overall goals of the Town Center Plan, and

f) adequate provisions for parking and other necessary support facilities are provided.

Note: The granting of a special exception based upon the above noted conditions does not negate, supersede or substitute for any necessary approvals or applicable regulations required under the Planning Board's Subdivisions and Nonresidential Site Plan Review Regulations.

4) Residential Density Calculations

i. Where residential development is proposed in accordance with the requirements of Sections 3.02, 3.08 or 15, the following types of land may be used to satisfy minimum density or open space requirements:

a) on-site open space, recreation or conservation land;

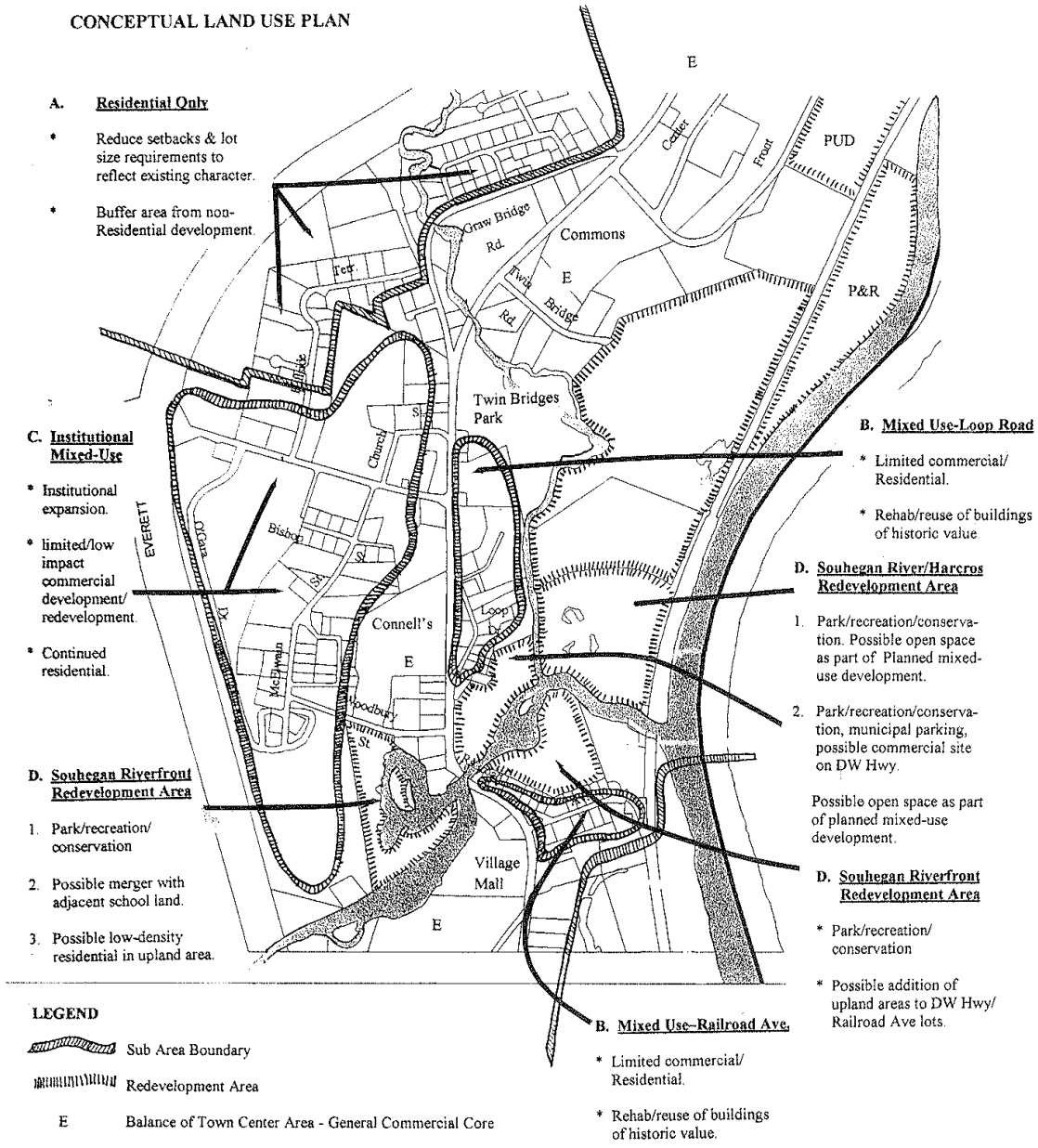
b) lot yard areas or common areas, including private streets or ways and parking areas, and

c) off-site conservation / recreation land, subject to Planning Board approval, within parcels specifically dedicated to conservation and / or recreational use in the Town Center Plan.

Along with changes to the Zoning Ordinance, certain changes to the Town's Nonresidential Site Plan Review Regulations would also be required to implement the goals and recommendations of the Plan. These would include the development of design standards that would encourage new construction that is in harmony with surrounding buildings and structures and consistent with the goals of the plan. Such standards would have to be flexible and site specific, however, due to the lack consistency in the architecture of the area.

Landscaping standards should also be developed to encourage the beautification of the Town center area within the context of a unifying theme. As a part of those standards, attention should be paid to lighting, signage and other site improvements along with plantings. It is also important that plant varieties are selected that adapt well to an urbanized environment and that require minimal maintenance. In order for such standards to result in the desired outcome, a landscaping plan applicable to public as well as private property should be prepared as a preliminary measure. With regard to public property, attention should be paid in the landscape plan to existing public facilities, parks and open spaces as well as to roadside areas within the public right-of-way.

Map X-11: Conceptual Land Use Plan



CHAPTER XI
FUTURE LAND USE AND RECOMMENDATIONS

A. INTRODUCTION

Each chapter of the Master Plan identifies recommendations to be pursued during the planning period. This chapter brings together future land use issues discussed by the Master Plan Advisory Committee, and recommendations introduced in the Population and Housing, Natural Resources, Transportation, Community Facilities, Utilities, Historic Resources and Economic Development chapters of this plan. Recommendations for the Town Center are included in Chapter X, Town Center Master Plan. Map XI-1, the Future Land Use Map, illustrates the recommendations in the Master Plan that relate to future land use. These future land use recommendations identified in this and previous chapters are identified below.

B. FUTURE LAND USE ISSUES

1. Commercial and Industrial Land Provision

A comparison between the way land in Merrimack was used in 2001 to the way it is anticipated to be used at Buildout assuming full implementation of the recommendations of the Master Plan is shown in Table XI-1, below.

Table XI-1: Existing and Future Land Use by Category

Land Use Category	Acres Yr. 2001	% of Total	Acres at Buildout	# Change	% Change	% of Total at Buildout
Commercial	517.8	2.4%	572.4	54.6	10.5%	2.7%
Industrial	1,028.3	4.8%	2,034.4	1,006.1	97.8%	9.5%
Mixed Use	19.7	0.1%	19.7	0.0	0.0%	0.1%
Multi-Family Res.	1,238.0	5.8%	1,342.1	104.1	8.4%	6.2%
Municipal	32.8	0.2%	43.0	10.2	31.2%	0.2%
Other Public	761.3	3.5%	761.3	0.0	0.0%	3.5%
Park/Rec/Open Space	1,175.0	5.5%	2,264.4	1,089.4	92.7%	10.5%
Private Open Space/Rec	1,495.2	7.0%	1,888.9	393.7	26.3%	8.8%
Residential	6,625.0	30.9%	9,788.3	3,163.3	47.7%	45.6%
Roads	1,695.0	7.9%	2,116.2	421.2	24.9%	9.9%
Vacant	6,242.6	29.1%	0.0	-6,242.6	-100.0%	0.0%
Water	644.0	3.0%	644.0	0.0	0.0%	3.0%
Total	21,474.7	100.0%	21,474.7	-0.0	-0.0%	100.0%

According to the Merrimack Buildout Study, 2001, Merrimack has enough vacant residential land to accommodate 2,188 new housing units and enough vacant non-residential land to accommodate 6,584,489 square feet of new non-residential development, an increase of about 100%. Therefore, the Town does not appear to need to provide for more non-residential land. The results of the buildout analysis indicate that future tax base will be enhanced at buildout by tax revenue generated from new non-residential development. However, it is important to note that there is very little remaining vacant land zoned *specifically* for commercial uses. Most of the non-residential land is zoned for industrial. However, “big box” retail and

offices over 10,000 square feet are allowed in the I-1 zone, and commercial support services such as restaurants, branch banks, offices and hotels / motels are also permitted in any industrial zoning district.

Table XI-2: Vacant Land per Zoning Type, 2001

Zoning Type	Vacant Land (acres)*
Residential	5,015.2
Commercial	63.6
Industrial	1,248.4

Source: Town of Merrimack Buildout Study, 2001.
*Note: this is unconstrained, developable land.

2. Location of Higher Density Development

Historically, Merrimack's higher density residential and non-residential development has occurred east of the FEE Turnpike. This man-made barrier constructed in the 1950's, prior to rapid growth, has effectively contained the more intense uses and almost all public facilities in the strip of land between the Turnpike and the Merrimack River. With some exceptions, only lower density residential development has occurred west of the Turnpike due to soil and access limitations. In the 1970's this "concentric ring" pattern of development (see Chapter III, Existing Land Use) was institutionalized with the advent of soil based zoning districts. Given the efficiency of containing high density development and public facilities in an area already served by an efficient road, water, sewer, and potential commuter rail system, the Town should continue to enforce the zoning code and implement the Town Center Master Plan to contain most higher density development east of the FEE Turnpike (see Map XI-1).

3. Elderly Housing

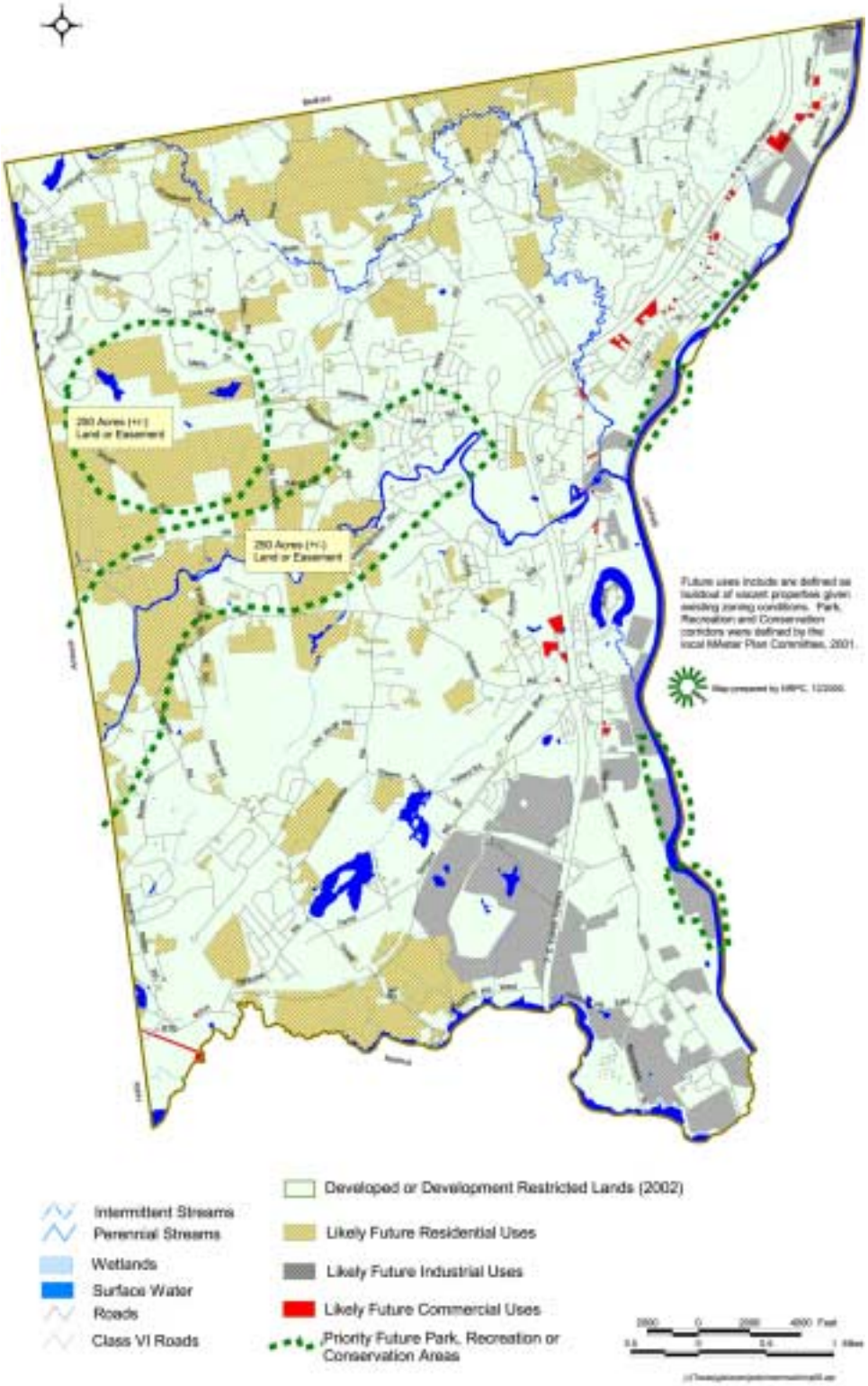
The development of Elderly Housing facilities is currently limited to the area within a one-mile radius of the intersection west of the FEE Turnpike and within a two-mile radius east of the FEE Turnpike. The purpose of this limitation is to ensure the residents of such developments have easy access to emergency services and to commercial and public facilities in the area of the Town Center. However, there appears to be few vacant lots available for such development in this limited area. Given the need to ensure timely emergency response and the desire to locate such facilities in an area where commercial and public facilities are planned to be largely accessible by foot, it is considered unnecessary to expand the area where elderly housing facilities are currently permitted (see Map XI-1). However, as demand for such facilities grows with the aging of the population, there may be pressure to redevelop existing sites in this area for elderly housing. Therefore, the provision of elderly housing should be monitored to determine if such redevelopment is occurring.

4. Open Space Development

In 2000, the Town expanded the R-1 Zoning District to include most of the undeveloped rural land west of the FEE Turnpike. The intent of the zoning district expansion was to preserve the rural character of the remaining land, most of which has limitations for septic systems. However, the R-1 Zoning District may benefit from "open space" subdivision design

in certain circumstances (see Chapter IV, Natural Resources). Open space subdivision design results in exactly the same net density of development as conventional subdivision design, with the exception that the lots are smaller than the 100,000 square feet normally permitted and a substantial portion of the more environmentally sensitive portion of the property is protected. Benefits include: 1) larger areas of open space protected under public ownership or conservation easement, with benefits for wildlife habitat and passive recreation; 2) shorter road length due to smaller lot frontage, resulting in less impervious surface, stormwater runoff and maintenance costs; and 3) less site preparation cost for the developer. Although not specifically recommended for the R-1 District at this point of time, the Town may wish to consider such subdivision design in the future.

Map XI-1: Future Land Use



C.

SUMMARY OF RECOMMENDATIONS

1. Population and Housing

a. Population

Merrimack's population has grown at rates well above those of the state and region in the latter half of the 20th Century. It is not surprising; therefore, that growth has been a dominant issue of concern to the community. Overall rates of growth have declined steadily over the past three decades, however, to levels that approximate the regional average. Therefore, additional local growth control ordinances or regulations are not recommended. However, the Town should continue to monitor Merrimack's annual rate of growth relative to the region and consider the adoption of a Growth Ordinance if growth rises above these levels.

b. Housing

Merrimack's overall pattern of residential development has provided for a wide range of housing alternatives to meet the needs of a diversity of families and individuals. When existing zoning requirements are viewed alongside current development patterns, utility availability and natural and manmade development constraints, it appears that Merrimack will continue to provide for a wide range of housing types into the foreseeable future. A number of significant regulatory changes have occurred over the years that have greatly influenced housing development in Merrimack including the adoption of soils based zoning and provisions for Cluster and Planned Unit Developments. Most recently, the creation of the R-1 District in the more rural northwest and western areas of Town is anticipated to have a significant impact on future housing development by reducing the allowable density on a large percentage of vacant developable land located within that district. Recent changes to the Elderly Housing Overlay District to permit assisted living facilities will also have an impact on housing choice. No significant changes to existing zoning district boundaries are recommended at this time.

2. Natural Resources

During the master planning process, an emphasis was placed on the management and protection of Merrimack's surface and groundwater resources, particularly to protecting the Town's major aquifers and to increasing access to and protection of the Souhegan and Merrimack Rivers. The preservation of forest and woodlands and open space generally has also been 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.

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. Equally important is the adoption of land use regulations and changes to existing regulations that would enhance protection of important natural resources. Where land

acquisition or regulation is not practical or appropriate, alternate means of enhancing natural resource protection including public education and the encouragement of private conservation initiatives should be pursued. The recommendations provided below address each of these natural resource management and protection approaches.

a. Land Acquisition

The Master Plan Advisory Committee 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. For these reasons, a land acquisition strategy should be pursued that places the highest priority on the acquisition of lands that can, when managed for conservation purposes, accomplish the widest range of objectives. A recommended series of priority areas for acquisition are identified below:

- Undeveloped parcels within the large forest block generally located south of Amherst Road, west of Naticook Road and north of Peaslee Road. This area contains one of the largest remaining forest blocks in Merrimack. The area is partially located within the sensitive Naticook Basin and Wellhead Protection areas for MVD wells 1, 2 & 3. Town owned land abuts privately held undeveloped portions of the area. In addition, the area contains important wetlands including part of White Pine Swamp, scenic areas and remaining portions of the historic "Old Kings Highway". Extensive areas of undeveloped land and the prominence of Blodgett Hill help define the rural character of this portion of Merrimack. Further, the proximity of the forested land in this area to several existing residential neighborhoods enhances its recreational value. This area includes the top priority land acquisition parcels identified by the MCC during the 2000 REPP process.
- Undeveloped parcels within the large forest block in the vicinity of South Grader Road. This forest block has significant conservation potential because it is the largest remaining in Merrimack. Approximately 190 acres of land in the area is currently under MCC management, it has a diverse landscape including large wetland areas and steep hillsides and the area abuts protected forestland in Amherst. In addition, due to numerous development constraints, the area has less immediate development potential than other forested areas of Town. This portion of Merrimack is extensively used for passive recreation and for hunting. Acquisitions in portions of this area could also serve to protect Baboosic Lake from potentially adverse development related impacts.
- Undeveloped lands along the Merrimack River. The Town currently owns approximately 50 acres of land on 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. Portions of Merrimack riverfront land were priority land acquisition parcels identified by the MCC during the 2000 REPP process.

- 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 former Boy Scout camp and land held as common open space as a part of residential cluster developments. The land adjacent to the Souhegan River varies considerably, including heavily wooded areas, wetlands, floodplain areas and open meadows that provide habitat for a diversity of wildlife. Much of the land was once farmed and a number of undeveloped lands are made up of prime agricultural soils.

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 provide a corridor that would help to prevent the fragmentation of important wildlife habitats while offering numerous recreational opportunities for hiking, canoeing, fishing and other recreational activities in the heart of Town. 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. Portions of this area near the Merrimack River were priority land acquisition parcels identified by the MCC during the 2000 REPP process.

b. Regulatory Initiatives

The Planning Board should pursue the following regulatory initiatives:

i. Stormwater Management

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 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, 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 groundwater. The principal tools the Town has to address the way in which land is developed with regard to stormwater management and road, driveway and parking lot design, are the Subdivision and Site Plan Regulations and the Zoning Ordinance. Therefore, these regulations should be reviewed and amended as necessary to:

- 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.
- 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.
- 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.
- Ensure adequate treatment of stormwater before it reaches surface and groundwater.
- Establish a “Phase II Stormwater Rules” Committee to develop the Stormwater Management Plan and Notice of Intent (NOI) required by the US EPA by March, 2003.
- Establish an inspection system to ensure continued operation of required stormwater management systems.

ii. Open Space, Landscaping & Design

- Consider adopting a “Conservation Development Ordinance” or “Open Space 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.

- Amend 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.
- Amend 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
- Amend 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.
- Amend 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 overuse and contamination.

c. Non-Regulatory Initiatives

i. Open Space and Forest Conservation

- 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.

ii. Water Resources Conservation and Protection

- 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.
- 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.
- The Town and the Merrimack Village District 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.
- The Merrimack Village District should investigate the effectiveness and feasibility of raising Greens Pond for enhancing storage in the Naticook Basin aquifer.

The Town and the Merrimack Village District 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.

3. Transportation

The Town of Merrimack is generally well served by the State and regional transportation system and overall levels of resident satisfaction appear to be high. Maintaining good access to the state and regional transportation is essential to Merrimack's economy and to the convenience, comfort and prosperity of its residents. In order to preserve and enhance the transportation system and to address issues of concern to Merrimack residents, various improvements will be required to correct existing deficiencies and to address projected increases in traffic. These include the implementation of improvements to the state highway system such as the Manchester Airport Access Road, the development of a full interchange at Exit 12 and seeking parity in the statewide Turnpike toll system. Local improvements to Route 3, and planning and development of improvements for pedestrians, bicyclists and commuter rail are also addressed. A summary of the principal recommendations of the Master Plan related to Transportation is provided below.

- Continue to work with state and regional officials toward implementation of the Manchester Airport Access Road 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 FE Everett Turnpike.
- Work with State and regional officials to achieve development of a full interchange at Exit 12 to improve access to the Turnpike for the 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.
- Should the proposed Circumferential Highway project be implemented, continue to encourage the development of the Exit 9 highway ramps as proposed under the current "Partial Build" alignment for the highway and continue to oppose any alternative that would terminate the proposed Circumferential Highway at Route 3.
- 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.
- 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.
- Implement the improvements recommended in the 1999 Louis Berger study for the Route 3 Urban Compact area.
- Continue to utilize access management guidelines as a tool to manage development in major highway corridors including Route 3 and NH 101A. Consider adopting a memorandum of understanding with the NH Department of Transportation to ensure that access management techniques are implemented along state highways in Merrimack.
- Support the extension of passenger rail service into New Hampshire including the provision of one or more passenger rail stations in Merrimack and continue to work with state and regional officials toward implementation.
- 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 industrials areas, schools, parks and other public and private institutions and facilities. Encourage sidewalks to be included in all state and local road improvement projects.

- 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 though utilization of existing Class VI roads.
- 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 and improve aesthetics.
- Continue to pursue State and Federal grants for the maintenance and improvement of the Town's street and highway system, bridges, sidewalks and other improvements where appropriate.

4. Community Facilities

a. Town Hall Complex

Overall, the existing Town Hall complex appears to have sufficient space to serve the estimated buildout population of 31,895, especially if the District Court were to be relocated. If the existing Public Works administration and storage buildings were to be removed to make room for a new Library, however, and the courthouse were to remain, a future space problem could emerge. How the existing space could best be utilized, to meet the changing needs of the various departments within Town Hall, taking in to account various alternatives for relocation of the Library and District Court, would best be determined though completion of a Town Hall facilities space needs study. Any such study should examine parking, circulation and the demand for meeting space in addition to office and administrative space.

The existing District Court facility is inadequate in terms of space, safety and security and will need to be replaced. A new site, preferably within the Town Center, for relocation of the Merrimack District Court should be identified to ensure that the facility meets the long term needs of the community and remains within Merrimack.

b. Emergency Services

Emergency services in Merrimack are highly rated and enjoy widespread public support. For the most part, the Town is well served by ambulance and fire protection services, however, growth in certain outlaying areas of Town requires that certain improvements be made to ensure that all Merrimack residents and businesses continue to receive the highest level of service. The following improvements are recommended:

- Construct a new Northwest Fire Station on the "Bishop Property" to reduce response times to the northwestern part of Town.
- Consider conversion of the Reeds Ferry Fire Station from an on-call to a full-time fire station.
- Expand the south Merrimack Fire Station with new garage and sleeping facilities.

c. Library

The existing Lowell Memorial Library at the intersection of Route 3 and Baboosic Lake Road was last expanded in 1979 and is currently designed to serve a population of 14,000. The facility falls significantly short of meeting current needs and far short of meeting the community's needs at buildout. There is insufficient room for expansion at the existing site. Therefore, the following is recommended:

- Select a site for a new Public Library within the Town Center and construct a new library to accommodate an estimated buildout population of 31,895. Probable locations include the parcel on Route 3 purchased in 1996 for a new Library or a portion of the Abbie Griffin Park site adjacent to Town Hall.
- Seek an appropriate re-use for the existing library building. Alternatives discussed during the Master Plan process included, municipal offices, a new District Court, a youth center, a new Merrimack Youth Association (MYA) facility and new offices for the Superintendent of Schools.

d. Public Works

The public works related facilities discussed in the Community Facilities chapter refer to the existing highway garage facility and DPW administration. Street and road improvements are discussed in the Transportation section and sewer and solid waste disposal issues are discussed under Utilities. Other public works related improvements include:

- Construct a new Public Works Department administration building.
- Construct a new covered salt shed that meets EPA requirements.

e. Schools

Merrimack's public school system is considered to be one of the community's greatest assets. Concerns related to facility space, however, are significant, especially at the middle school level. Overall, the recently expanded High School should be capable of meeting Merrimack's needs for the next several years, but some expansions may be required at Buildout. The existing site should be capable of supporting any necessary additions. Improvements are not currently required at the elementary school level, but will be required within the next few years to accommodate anticipated growth in enrollments. Public kindergarten is not currently provided. At the middle school level, existing facilities are not adequate to meet existing enrollments or estimated enrollments at buildout. With implementation of a plan to construct two new school facilities and redistribute grade levels among District facilities, however, Merrimack should be able to accommodate both its short-term needs as well as the enrollment levels anticipated at Buildout. Toward these ends, the following improvements are recommended:

- Construct a new 1000 student middle school, immediately, that would serve as a Town-wide upper middle school for grades 7 and 8, and renovate the existing Middle School to accommodate grades 5 and 6, thereby providing for Merrimack's long-term needs at the middle school level while freeing up space in all three existing elementary schools.

- Construct a new approximately 750-pupil elementary school in the near future (as enrollments warrant) to accommodate elementary school needs at buildout.
- Evaluate the future needs of the High School as needed.
- Implement public kindergarten in the elementary schools through a combination of new facility construction, building renovation and grade redistributions.

f. Recreation

Merrimack has a variety of park and recreational facilities and large and growing sports programs, particularly for youth. Population growth, high participation levels and changing sports and recreational needs, however, have placed increased demand on existing facilities resulting in inadequacies in certain areas. To meet the Town's recreational needs, the following recommendations are offered.

- Identify sites for 32 new sports fields and construct these sports fields over time to address existing facility deficiencies and to accommodate an estimated buildout population of 31,895 in accordance with the Parks and Recreation Department recommendations.
- Incorporate new pedestrian and bicycle paths into any planning for municipal facilities or additional recreational areas in the Town.

g. Funding

Funding for the improvements recommended in this chapter will come primarily though local property taxation. In order to maintain a stable tax rate, avoid undue financing costs and plan adequately for large purchases and improvements, the Town should continue to use capital reserve funds where warranted, prepare an annual Capital Improvements Plan and seek various Federal and State grants and private contributions as appropriate.

h. Utilities

i. Public Water Supply

With the return of Well 6 to active use, the Merrimack Village District should be able to serve both the residential and nonresidential average and peak demands anticipated at Buildout within its service area. The loss of any productive well or significant changes to demand, however, could limit the ability of the system to meet future peak demand. For these reasons, a combination of infrastructure improvements and conservation measures are recommended. Pennichuck Water Works anticipates being able to meet buildout demand within its service area. Specific Recommendations are provided below. Additional recommendations related to groundwater recharge, conservation and wellhead protection are provided in Chapter III, Natural Resources.

- The Merrimack Village District Well 6 should be brought back online as growth requires.
- The Merrimack Village District odd/even water management system should be continued.

- The use of separate commercial/industrial water meters for outdoor irrigation should be considered.
- Work with the State to develop limitations on large groundwater withdrawals by commercial and industrial users.

ii. Public Sewer and Waste Water Treatment

Though originally developed over 30 years ago, Merrimack's Waste Water Treatment Plant and system remains state of the art and capable of meeting the existing residential and nonresidential needs of the Town. The gravity based system outlined in the Town's so called "Sewer Master Plan" with its reliance on natural drainage areas, has served the Town reasonably well, though certain planned interceptors are not likely to be completed due to changing development patterns and other constraints. It does not appear, however, that the Merrimack Waste Water Treatment plant can accommodate the anticipated demand for both residential and nonresidential development at buildout, and within the southwestern portion of Merrimack served by the Nashua system, no unused capacity remains. Given the need to continue to expand the tax base (see Chapter IX, Economic Development) consideration must be given to meeting the anticipated demands of commercial and industrial uses. In addition, there is still an identified need to connect certain existing neighborhoods with high instances of septic system failures to the system. It is also recognized that for residential uses in particular, modern septic systems on appropriately sized lots function well when properly cared for and are an appropriate alternative to public sewer. Therefore, it is recommended that:

- The existing gravity based system outlined in the "Sewer Master Plan" should continue to serve as a guide for future improvements to the sewer system, however, the plan should be reviewed and updated to address plant capacity, economic considerations and environmental impacts. Planned interceptors that are no longer feasible or desirable should be eliminated.
- Expansions of the sewer system to serve new residential development should be constructed in accordance with the updated Sewer Master Plan.
- Within residential areas, a priority should be placed on extending sewer service to existing neighborhoods with high instances of septic system failures such Sargent Acres or the Ingham Road area.
- The Town of Merrimack should approach the Town of Amherst to investigate a cooperative study of the sewer issues in the Baboosic Lake area. Collectively, the Towns should seek possible grant money.
- Alternative community septic systems should be considered in sensitive groundwater resource and priority areas.
- Alternative funding mechanisms should be investigated to provide waste water disposal to priority areas, such as: a) capital reserves; b) betterment fees; c) enterprise funds; d) grants; and e) joint public/private funding.

5. Historic Resources

As Merrimack has developed, many signs of its history have been altered or replaced. The community survey indicated that citizens recognize the limited number and quality of historical resources in the Town, given the Town's long period of rapid development, but also recognize the importance of making a reasonable effort to preserve important local artifacts and encourage awareness of the Town's past. A range of initiatives have been identified that may cost little but can yield significant results by preserving details of historic structures and fostering community unity by reinforcing local understanding of the Town's past.

- Consider the creation of a local Historic District at Reed's Ferry.
- Strengthen incentives for historic preservation in the zoning ordinance and site plan and subdivision regulations.
- 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.
- 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 stonewalls, cellar holes, and large trees that are often located along these Class VI roads should be safeguarded from destruction or removal.
- Investigate preservation alternatives for historic barns through the New Hampshire Division of Historical Resources.
- 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.
- 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.
- 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.
- 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.
- Preserve and maintain the Town graveyards and private burying grounds.
- Encourage the Town Manager, Selectmen, 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.
- In order to encourage the preservation and restoration of historic structures within the Town Center area, consider an amendment to the zoning ordinance that would allow

setbacks and other dimensional standards to be waived or reduced by special exception for historic structures within the Town Center Overlay District (TCOD). (Implemented at 2001 Town Meeting).

- Continue to use innovative land use controls including cluster and open space planned development and partial development to conserve open space and minimize the visual impact of new development on significant historic areas.
- Consider adopting architectural design standards for structures within the Town Center Overlay District (TCOD).
- 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.
- Promote the donation of easements by the owners of historic properties to a designated authority or established land trust.
- Consider the outright 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.
- Encourage National Register listing for appropriate local structures.

6. Economic Development

a. Employment

Over the past few decades, Merrimack has evolved into a major regional employment center due to the number of large employers that have located in Town, the expansion of existing businesses and a proliferation of smaller employers. The Town's economic base has also diversified to include large financial services, marketing and sales components along with high tech and traditional manufacturing industries. Overall wages in Merrimack are higher than state and regional averages, especially in the non-manufacturing sector, indicating that a substantial number of the jobs that have been created are relatively high paying. Further, many of these high paying jobs are in growing sectors of the economy. Since more Merrimack residents work in Merrimack than in any other community, the high wages paid by Merrimack employers contribute directly to the prosperity of the Townspeople. Further, the relatively high buying power of those who live and work in Town that results from higher wages has an important secondary affect on the local and regional economy. The retention of high paying jobs, and the continued cultivation of new jobs of similar quality, therefore, should be a cornerstone of the Town's economic development strategy.

In order to maintain and continue to attract quality jobs, the needs of the Town's employers must be addressed. Among the more significant employment related issues identified during the Master Plan Process was the region's relatively tight labor market. It is important to note that while more Merrimack resident's work in Merrimack than in any other community, most of the jobs in Town are still filled by non-Merrimack residents. Some of the challenges faced by local employers in maintaining an adequate

labor force include:

- lack of General Education Degree (GED) and English as a Second Language (ESL) programs in Merrimack and very limited slots available in Nashua;
- limited technical education and job training;
- difficulty of attracting younger high tech workers from urban areas such as Boston (quality of life issues and housing availability), and
- high demand for skilled (high tech) workers nationally.

To address these issues, the School Department, area technical schools and other appropriate institutions and agencies should be encouraged to increase GED, ESL and technical training opportunities in cooperation with local businesses and industries. It is also important that quality of life issues be addressed to enhance the attractiveness of Merrimack to employees. Attractive, well-planned work environments should continue to be encouraged along with provisions for conveniently located support services such as day care, health clubs, restaurants, recreational facilities other support facilities.

Along with a focus on the creation and retention of high quality jobs, it is also important to guard against economic fluctuations that can cause job losses. While the Town cannot control general economic forces and trends, it should continue to promote the development of a diverse economic base. A diverse business and industrial base can help prevent economic downturns affecting certain sectors of the economy from having a disproportionate impact on the Town's overall economic base.

b. Tax Base Issues

In order to maintain and improve Merrimack's tax base, the Town should focus on attracting and maintaining those uses that tend to have the highest tax value. These include office development of various kinds, and certain types of retail establishments. Professional, business and industrial office uses appear to have the highest overall value since they are the most likely to result in the creation of high paying jobs, tend to represent a diversity of businesses and industries, and tend to have relatively low land use impacts. Other uses, such as hotels or motels also tend to have a high tax value and can support industry but typically generate lower paying jobs. The same is true for restaurants and day care centers. Such uses, therefore, should be viewed as contributing to the overall economic balance and as important support facilities, but not as a central focus of The Town's economic development strategy.

The Town's commercial and industrial base is critical to maintaining a strong tax base, however, residential land uses represent over 70% of the Town's tax base and will continue to dominate the Tax base for the foreseeable future. Therefore, it is important that the Town maintain the character of its established neighborhoods and continue to attract high quality new residential development. The preservation and enhancement of

the natural and man-made features (See Chapter I - Introduction) that have made Merrimack a desirable location for residents and businesses alike should be viewed as a key element of any economic development strategy.

c. General Business and Industrial Development Issues

Merrimack's success in attracting high quality business and industrial development is largely due to the availability of appropriately zoned land, good highway access and the availability of public water and sewer. It is also noteworthy that the Town is generally perceived as being business friendly with an efficient regulatory process. A successful economic development strategy, therefore, must strive to maintain these attributes. Toward that end, the Town should:

- Maintain public water and sewer capacities and support systems for industry. The extension of public sewer, in particular, should be limited to existing service areas and areas of demonstrated need.

- Maintain acceptable Levels of Service on local roads and encourage appropriate improvements to state highway system such as the planned widening of the FE Everett Turnpike, the Manchester Airport Access Road, and development of a full interchange at Exit 12 to improve access to industrially zoned land in the north of town while improving access for potential employees and business patrons;

- Maintain a positive business environment though continuing to implement reasonable regulations, streamlined permit and approval processes and by maintaining strong links between local government and important groups such as the Chamber of Commerce.

- Maintain an attractive community atmosphere through the provision of well-rated schools, recreational facilities, library facilities and other public amenities.

D. CONCLUSION

This Master Plan update is intended to address the theoretical planning horizon referred to as *buildout*, rather than a particular period of time. Although it is estimated that buildout will occur in about the year 2020, it is also recognized that forecasts and projections are necessarily imprecise since they are based on existing facts, trends and assumptions. Given the information we now have available, however, a plan for the future has been envisioned. That vision is centered on an estimated population of just over 31,000, an increase of 6,000 people, housed in an estimated 2,188 new housing units. Business and industrial space is expected to double. Since nonresidential development is expected to increase by approximately 100% while residential development is expected to increase by about 25%, the Town's economic base is expected to improve considerably.

The development that occurs in the coming years will resemble as well as differ from existing development patterns in a number of significant ways. Overall, the existing "concentric ring" pattern of development will continue with higher density residential development occurring east of the Turnpike, moderate density residential development

occurring in close proximity to the west side of the Turnpike and low density development occurring the northwestern portions of Town. The Town Center area will emerge as an increasingly defined community focal point. Through the acquisition of additional park, recreation and conservation land as well as changed land use regulations, the rural character that remains in many areas of Town will be retained. Improved subdivision, site plan and zoning requirements, however, are expected to improve the appearance of development in all areas of Town. In addition, environmental protections will be enhanced and greater protection will be afforded to Merrimack's important natural and man made features, including historic buildings and sites. Business office, research and development, and industrial developments will increase considerably east of the Turnpike and around Continental Boulevard along with support commercial facilities such as day care centers, restaurants and banks. General retail development, however, is expected to increase by about 10%.

The Transportation system serving Merrimack will benefit from improved access to the Turnpike, the Manchester Airport and to communities on the east side of the Merrimack River. Some of the improvements planned to the State and regional highway system, along with development in Merrimack and surrounding communities, however, can be expected to increase traffic on the Town's roads. Improvements currently planned for Route 3 will barely keep pace with anticipated increases in traffic and levels of service are not expected to improve on other town maintained roads. Traffic congestion at buildout, therefore, will continue to be a reality. On-the-other- hand, an expanded sidewalk network and system of bicycle lanes and paths together with the extension of interstate passenger rail service to Merrimack, may help to offset traffic congestion to some degree.

To meet the needs of the buildout population, a central Fire Station along with three strategically located substations will serve Merrimack. The existing Police Station and Town Hall Complex will continue to serve the Town. A new Library and a new District Courthouse will be constructed in the Town Center area. Merrimack's educational needs will be met through a system of facilities that would include four elementary schools, two middle schools and one centrally located high school. The total area of park, recreation and openspace would more than double, providing increased opportunities for passive and active recreation.

Although this Master Plan update is intended to plan for Buildout, the implementation of various recommendations together with changing conditions and trends, will eventually decrease the plan's utility. Meanwhile, the plan should continue to be relied upon to advise and inform the citizens of the Town, and their elected and appointed representatives in making decisions related to the use of land, the transportation system and capital improvements.