

*Town of Madbury, New Hampshire*

*Master Plan: Toward the Year 2010*

**3.1 Demographics**

Prepared for

Town of Madbury Planning Board  
Madbury, New Hampshire

by

Strafford Regional Planning Commission  
Dover, New Hampshire

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# Demographics

## 1. Introduction

The Demographic Profile chapter of the Madbury Master Plan provides an overview of the Town's population. The selected characteristics should be used as benchmarks to identify where Madbury has come from historically, where it is today, and where it may be heading in terms of future population growth. Data from additional Towns in the 'Madbury area' are incorporated where useful to demonstrate how Madbury compares with nearby communities. For the purposes of this chapter, the 'Madbury area' is defined as those Towns that share a border with Madbury, including Barrington, Dover, Durham, and Lee.

The Demographic Profile is based on the most current data available from the US Census, the New Hampshire Office of State Planning (NH OSP), and other state and federal agencies. Whenever possible, the most recent US Census data is the preferred source of data. Several datasets from the 2000 Census are scheduled to be released in the fall of 2001. As a result, this chapter contains a mixture of data from the 2000 Census, the 1990 Census, and various other sources dated between 1991 and 1999. In order to distinguish between these sources, this chapter is divided into sections based on the age of the source data, beginning with the most recent data available and concluding with the oldest data. Because sections of the chapter are based on old data, this chapter should be regularly revised as updated data becomes available through the US Census, NH OSP, and other state and federal agencies.

## 2. Demographics Based on 2000 Data

### 2.1 Population History

The population of Madbury has grown similarly to other small rural Towns in southeastern New Hampshire, particularly since the mid-1970s. Agriculture dominated the Town's early economy through the mid 18<sup>th</sup> century. Throughout the late 18<sup>th</sup> and 19<sup>th</sup> centuries, Madbury's population underwent a slow but steady decline, as local youth were drawn to jobs in the cities and better farmland in the Midwest. The Town's only sharp population declines occurred during the Revolutionary War, and during the Civil War era, when one in five Madbury residents departed.<sup>1</sup> Table 1 lists the Town's population since 1767 at 10-year intervals.

The Town's population decreased to a historic low of 326 residents following World War I. During its first 150 years, the Town's population decreased by one half. Since 1930, the population has increased at every census interval, and the 2000 population of 1,509 is the highest in Madbury's history. Madbury had a population of 695 residents when the Town was incorporated in 1768, and it took 200 years for the Town to reach this figure again in 1970. The Town's population doubled in just 20 years between 1970 and 1990. Figure 1 graphs the Town's population change between 1767 and 2000.

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<sup>1</sup> Madbury Master Plan, 1989.  
Approved August 2001

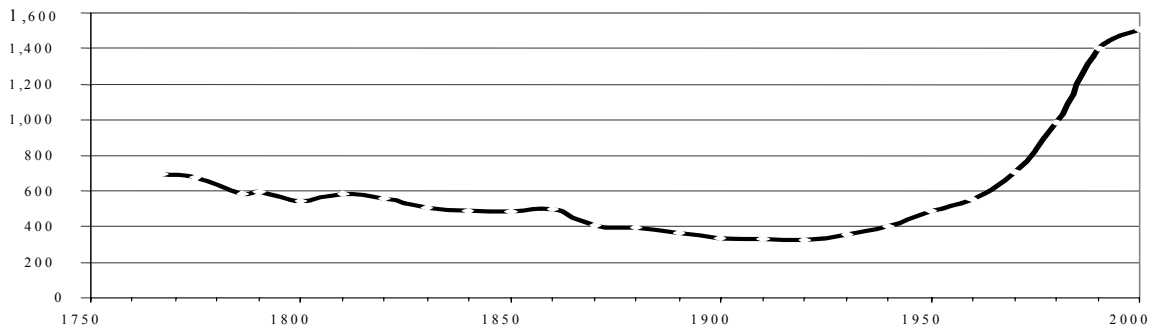
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**Table 1. Madbury Population History: 1767-2000**

SOURCE: NH Office of State Planning; US Census

Year	Population
1767	695
1775	677
1786	585
1790	592
1800	544
1810	582
1820	559
1830	510
1840	489
1850	483
1860	496
1870	408
1880	397
1890	367
1900	336
1910	331
1920	326
1930	358
1940	401
1950	489
1960	556
1970	704
1980	987
1990	1,404
2000	1,509

**Figure 1: Madbury Population History**



SOURCE: NH Office of State Planning; US Census

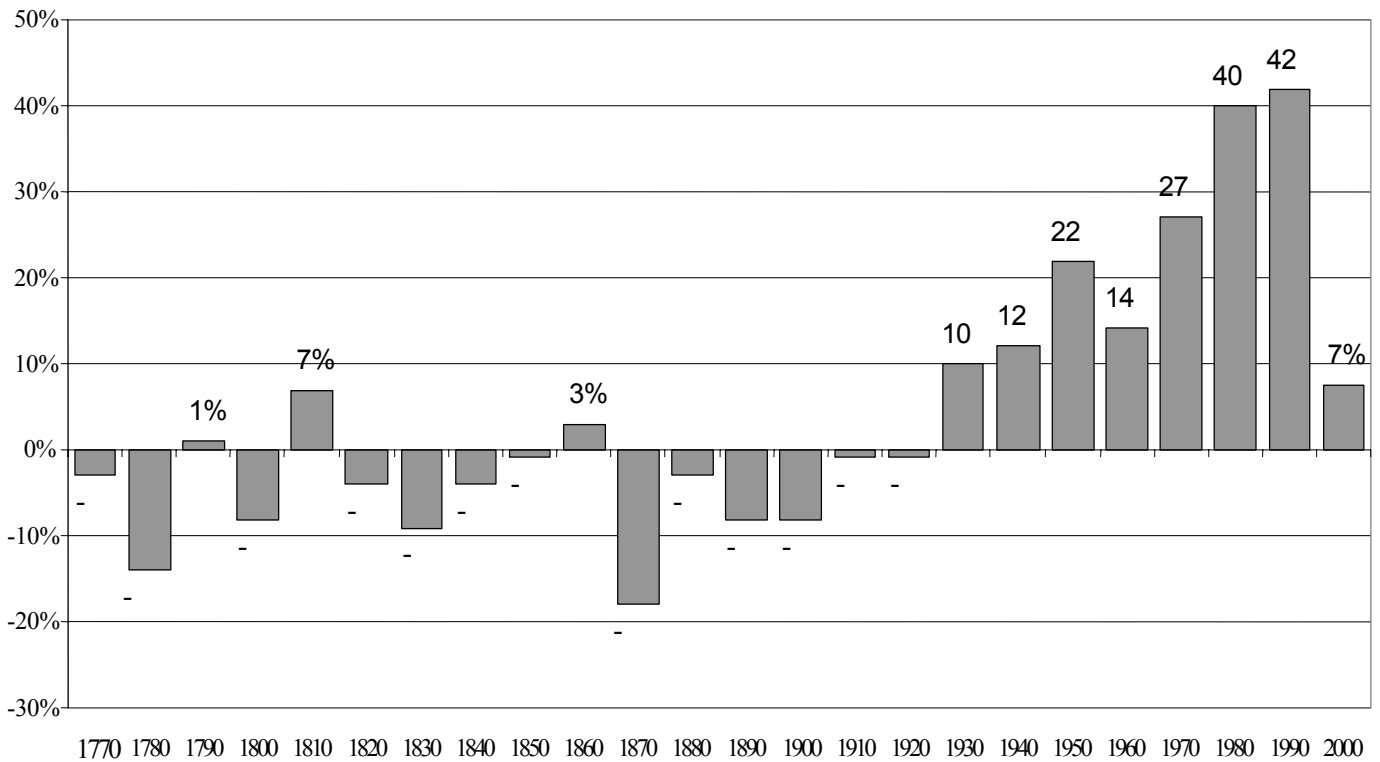
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Figure 2 graphs Madbury’s population change at ten-year intervals since 1767.

- From 1767 to 1930, there were two periods when the Town experienced growth: between 1800-1810 and 1850-1860.
- The Town experienced its greatest period of decline of (-) 18% between 1860-1870.
- Madbury’s most rapid period of growth, 42%, occurred between 1980-1990.

**Figure 2: Percent Population Change, Madbury: 1767-2000**

SOURCE: US Census; NH Office of State Planning



**2.2 Population Growth Since 1960**

During the Great Depression in the 1930’s, and World War II era, Madbury’s population grew slightly, however, most of Madbury’s growth has occurred during the past four decades. Madbury has become a popular bedroom community, and the Town’s population has more than doubled since 1960. Current population density is also given. Figure 4 graphs the population of Madbury area communities since 1960.

### 2.3 Population Density

Madbury's population density in 2000 was 123.9 persons per square mile. Among its neighbors, Madbury is the least densely populated community. Although Madbury's density in 1960 was comparable to Barrington's and Lee's, both have outpaced Madbury's growth since 1960. In 2000, Madbury's population density remained lower than both the county average of 293.4 persons per square mile and the state density of 133.1 persons per square mile. The City of Dover had the highest population density in the Madbury area, with a density of 925.4 in 2000. Table 2 lists Madbury's population and population density relative to its neighbors between 1960 and 2000, and Figure 3 graphs density.

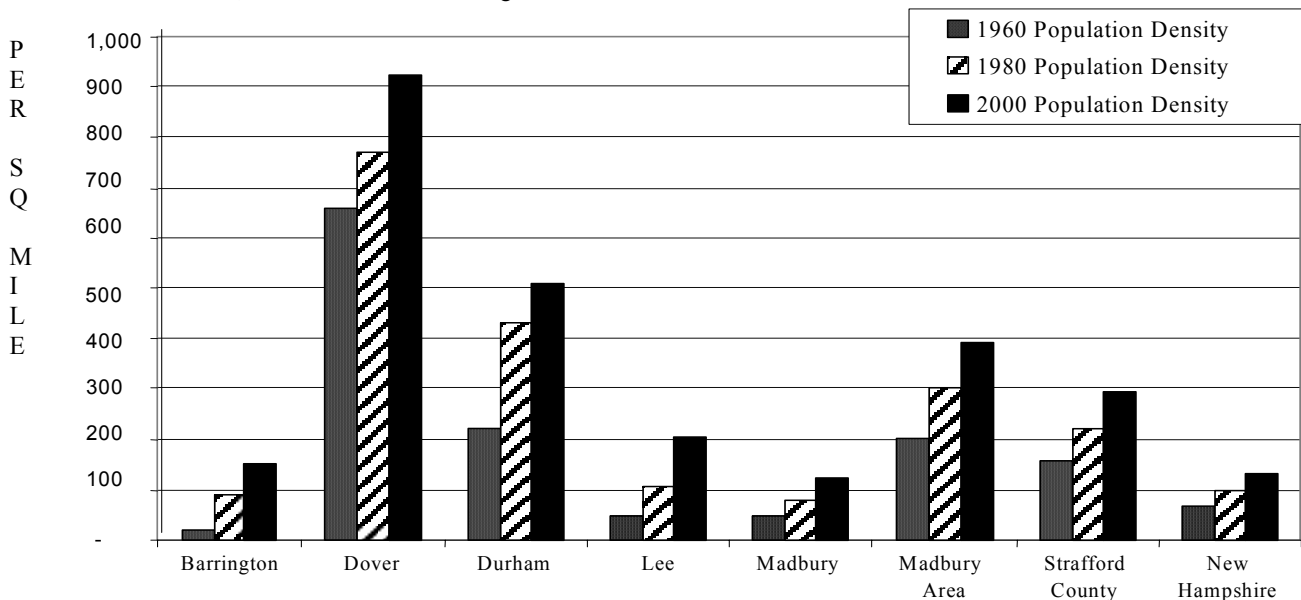
**Table 2. Population History & Persons per Square Mile, Madbury Area: 1960 - 2000**

SOURCE: 1960, 1980, 2000 US Census

	1960 Population	1960 Density	1980 Population	1980 Density	2000 Population	2000 Density
Barrington	1,036	21.3	4,404	90.6	7,475	153.7
Dover	19,131	658.6	22,377	770.3	26,884	925.4
Durham	5,504	222.3	10,652	430.2	12,664	511.5
Lee	931	46.1	2,111	104.6	4,145	205.3
<b>Madbury</b>	<b>556</b>	<b>45.6</b>	<b>987</b>	<b>81.0</b>	<b>1,509</b>	<b>123.9</b>
Madbury Area Communities	27,158	201.5	40,531	300.7	52,677	390.8
Strafford County	59,799	156.3	85,408	223.2	112,233	293.4
New Hampshire	606,921	65.4	920,610	99.2	1,235,786	133.1

**Figure 3: Population Density, Madbury Area: 1960-2000**

SOURCE: US Census; NH Office of State Planning



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**Figure 4: Population, Madbury Area: 1960-2000**

SOURCE: US Census; NH Office of State Planning

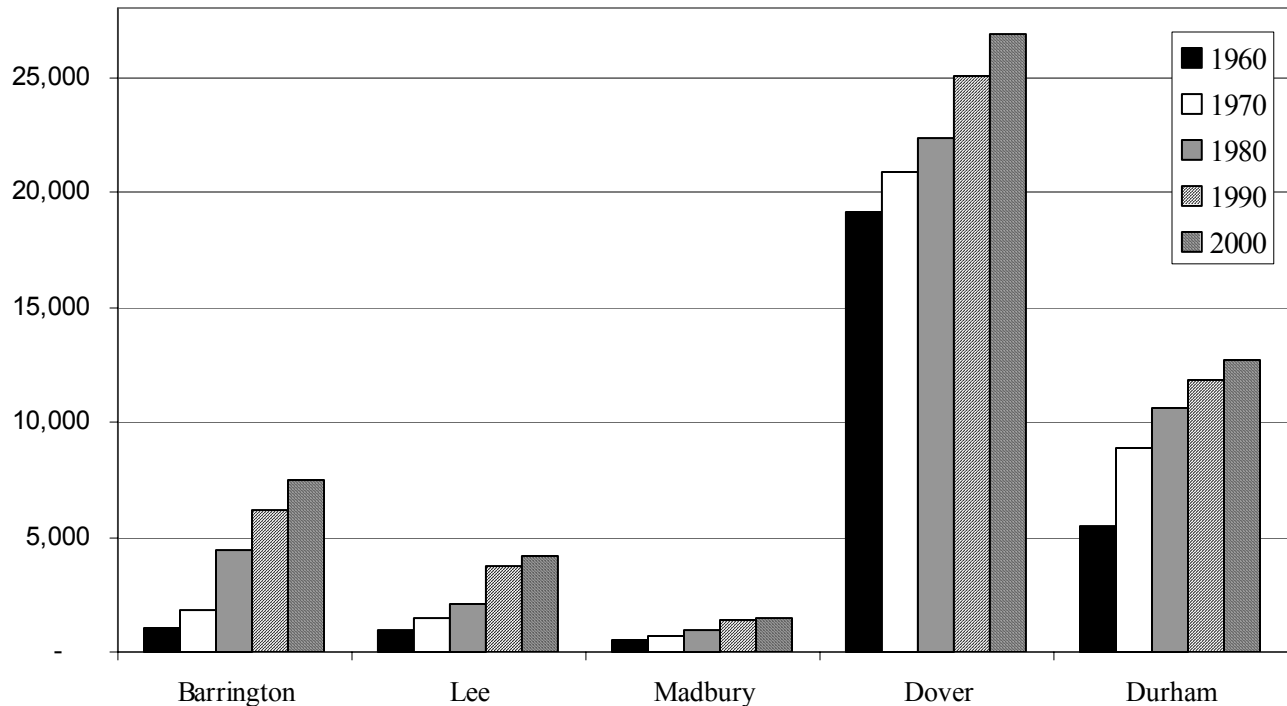


Table 3 lists the population growth rate of Madbury area communities at ten-year intervals between 1970 and 2000. Between 1970 and 1990, Madbury’s population grew at an average of slightly more than 4% per year. Madbury’s population growth rate between 1990 and 2000 was 7.5%, an average of .75% per year, which represents a significant decrease from the average annual growth rate of 4.2% the Town experienced between 1980 and 1990. The growth rate of the Madbury area also declined sharply from 19.2% between 1980 and 1990 to 8.8% between 1990 and 2000.

From 1990 to 2000, Madbury experienced the third highest rate of population growth in the Madbury area, behind Barrington and Lee. However, Madbury’s rate of growth during that time was closer to the growth rate of Dover and Durham, and was slightly below the county rate of 7.7%. Figure 5 graphs Madbury’s population growth rate relative to its neighbors between 1970 and 2000.

The Town’s growth rate over the past ten years was lower than the rest of the state and county, on average: Madbury’s population grew by .75% per year during that time, while the average statewide population growth between 1990 and 2000 was 1.14% per year and for Strafford County was .77% per year.

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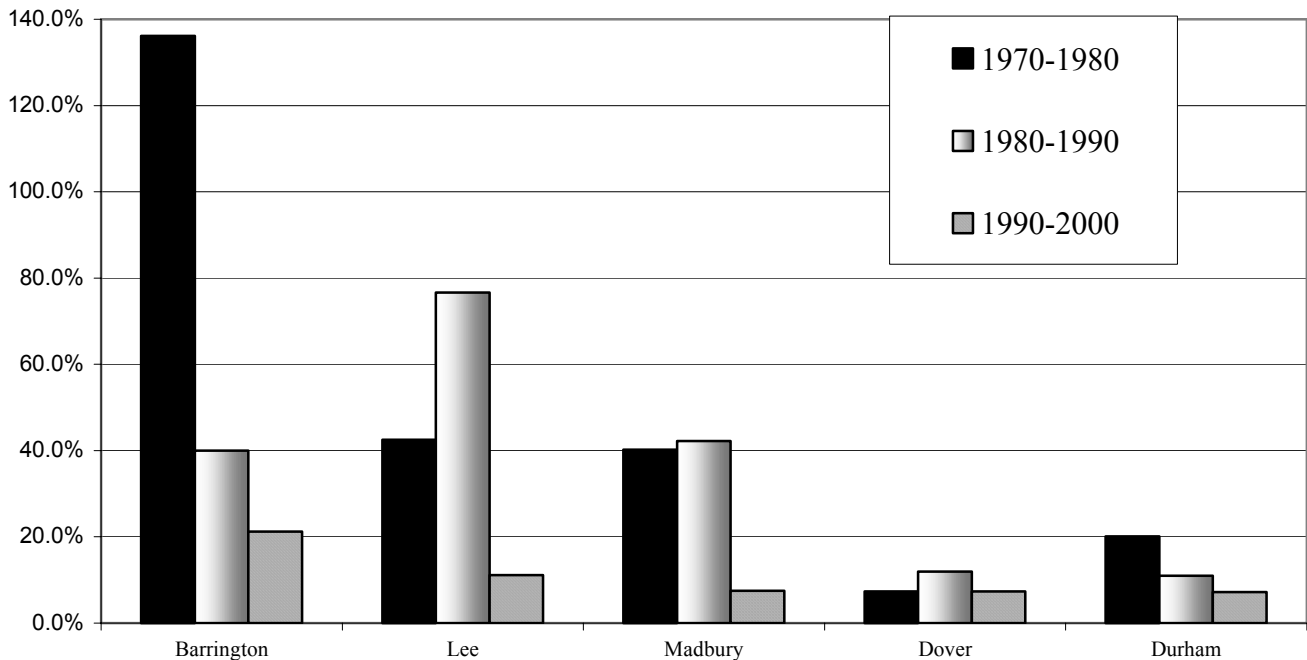
**Table 3: Percent Population Growth, Madbury Area: 1970 – 2000**

SOURCE: 1970, 1980, 1990, 2000 US Census

	1970-1980	1980-1990	1990-2000
Barrington	136.1%	40.0%	21.2%
Lee	42.5%	76.6%	11.2%
<b>Madbury</b>	<b>40.2%</b>	<b>42.2%</b>	<b>7.5%</b>
Dover	7.3%	11.9%	7.4%
Durham	20.1%	10.9%	7.2%
Madbury Area Communities	20.0%	18.8%	9.4%
Strafford County	21.3%	22.0%	7.7%
New Hampshire	24.8%	20.5%	11.4%

**Figure 5: Percent Population Growth, Madbury Area: 1970 – 2000**

SOURCE: 1980, 1990, 2000 US Census





**2.4 Natural Increase and Migration**

Population growth and change can be attributed to two fundamental components: natural increase and migration. Natural increase refers to the excess of births over deaths in any given time frame, while migration refers to the number of people who have moved into or out of a given geographic area. Madbury’s vital statistics for the past several years are provided in order to determine what portion of the Town’s population growth is due to the expansion of local families, and how much is due to an influx of new residents. Table 4 lists Madbury’s births and deaths since 1981 and Figure 6 graphs this data.

Since 1981, Madbury has experienced an addition of 251 residents through birth, and a loss of 132 residents through death, resulting in a net increase of 119 residents. Madbury’s population has grown by 522 residents since 1980 according to the US Census. Therefore, Madbury’s natural increase since 1981 has made up approximately 23% of the Town’s population growth, with migration accounting for the remaining 77% of Madbury’s growth over that span.

**Table 4: Births and Deaths: 1981 - 2000**

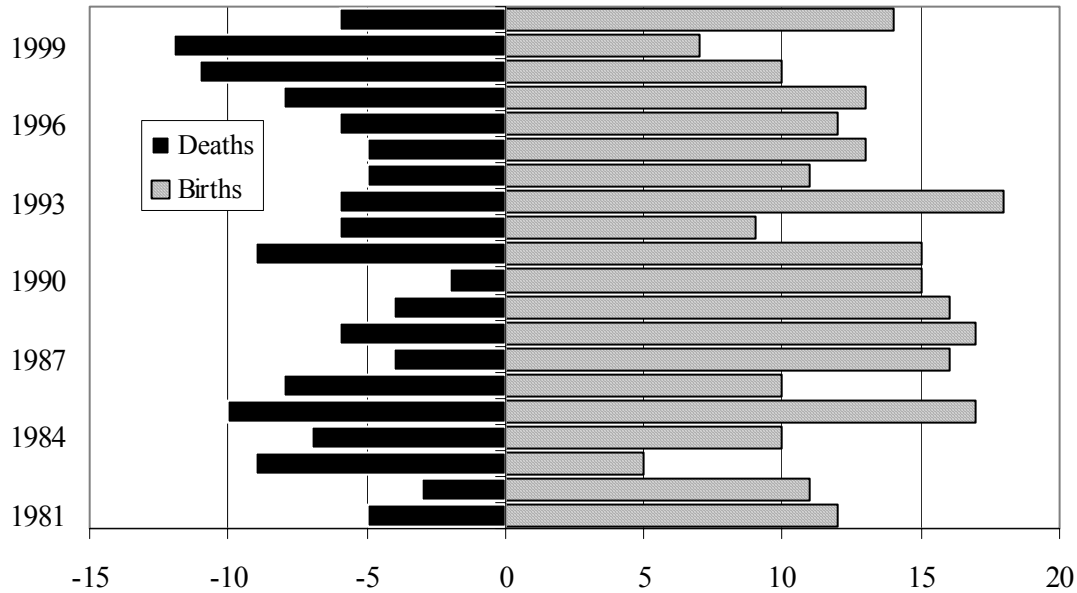
SOURCE: Madbury Town Reports

Year	Births	Deaths	Natural Increase
1981	12	-5	7
1982	11	-3	8
1983	5	-9	-4
1984	10	-7	3
1985	17	-10	7
1986	10	-8	2
1987	16	-4	12
1988	17	-6	11
1989	16	-4	12
1990	15	-2	13
1991	15	-9	6
1992	9	-6	3
1993	18	-6	12
1994	11	-5	6
1995	13	-5	8
1996	12	-6	6
1997	13	-8	5
1998	10	-11	-1
1999	7	-12	-5
2000	14	-6	8
<b>Total</b>	<b>251</b>	<b>-132</b>	<b>119</b>

**Figure 6: Births and Deaths: 1981 – 2000**

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SOURCE: Madbury Town Reports



### 2.5 Age Distribution

Table 5 and Figure 7 group Madbury’s current population by age. Children make up a substantial portion of the Town: nearly one third (31.7%) of the population is aged 19 or younger. The Town’s population swells in the middle ages, with 47.7% of the population between the ages of 35 and 54. Madbury’s population aged 60 and over remains smaller than the other age brackets. In each age bracket from 60 and over, Madbury’s percent of the population is lower than the county’s.

**Table 5. Age Distribution in Madbury: 2000 <sup>2</sup>**

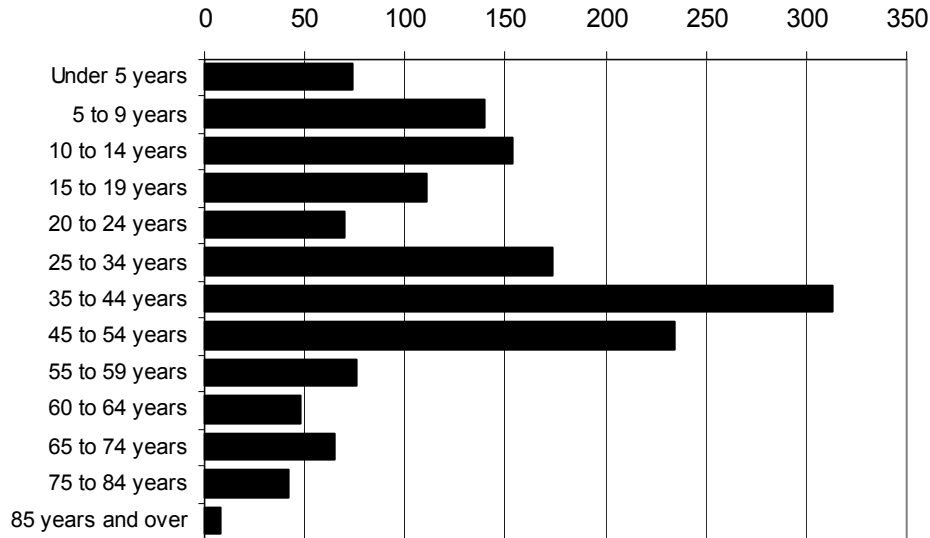
<u>Age Group</u>	<u>Number of Residents</u>	<u>Percent of Population</u>
Under 5 years	74	4.9
5 to 9 years	140	9.3
10 to 14 years	154	10.2
15 to 19 years	111	7.4
20 to 24 years	70	7.6
25 to 34 years	174	11.5
35 to 44 years	313	20.7
45 to 54 years	234	15.5
55 to 59 years	76	5.0
60 to 64 years	48	3.2
65 to 74 years	65	4.3
75 to 84 years	42	2.8
84 years and over	8	0.5
<b>Total</b>	<b>1,509</b>	<b>100.0</b>

**Figure 7: Age Distribution**

<sup>2</sup> Note: Age groupings range from 5 to 10 years. Age groups are defined by US Census data processing guidelines.  
Approved August 2001 3.1-10

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SOURCE: 2000 US Census



### 3. Demographics– Based on Data from 1991-1999

#### 3.1 Projected Population Growth

As of June 2001, the most recent population projections available for Madbury were those issued by New Hampshire Office of State Planning (NH OSP) in 1997. The NH OSP projections were based on a combination of 1990 Census data and OSP population growth estimates made during the mid-1990s. These projections are based on an estimated average annual growth rate of 2.9% through the year 2020. This growth rate is higher than Madbury’s actual annual growth rate, .7% per year, between 1990 and 2000 for the Town of Madbury. Therefore, the 1997 NH OSP population projections should be considered a high estimate of Madbury’s growth over the coming 20 years. An updated population projection report based on 2000 Census data is due to be completed by NH OSP in 2002. The 2002 NH OSP projections should be incorporated into this chapter when they become available.

1997 NH OSP population projections estimate that Madbury’s population will grow by approximately 100 people every five years through 2020. Additionally, the Town is projected to remain below 2000 residents through the year 2020.

Table 6 lists NH OSP population projections for the Madbury area through 2020. Figure 8 is based on data from Table 6.

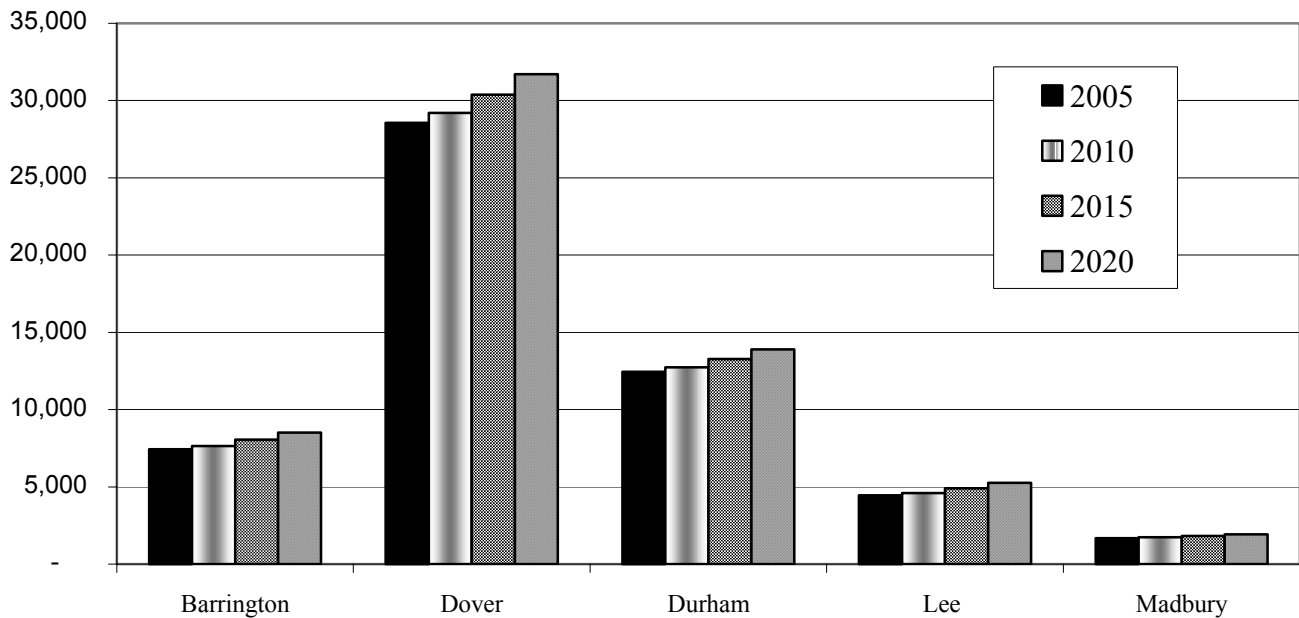
**Table 6: Madbury Area Population Projections**

SOURCE: NH Office of State Planning, October 1997

	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>
Barrington	7,438	7,648	8,056	8,510
Dover	28,562	29,205	30,389	31,704
Durham	12,438	12,737	13,285	13,894
Lee	4,452	4,606	4,913	5,254
<b>Madbury</b>	<b>1,684</b>	<b>1,733</b>	<b>1,828</b>	<b>1,934</b>
Madbury Area				
Communities	54,574	55,929	58,471	61,296
Strafford County	119,450	122,430	128,047	134,249
New Hampshire	1,306,638	1,358,750	1,441,668	1,527,873

**Figure 8: Madbury Area Population Projections, 2005 – 2020**

SOURCE: NH Office of State Planning, October 1997



### 3.2 Madbury Build-Out Study

In 1999, Strafford Regional Planning Commission completed the *Madbury Build-Out Study*. ‘Build-out’ refers to the time and circumstances whereby, based on a set of restrictions, no more building growth may occur. For the purposes of the build-out study, it meant the point at which, under current zoning requirements, no additional house lots could be created in Madbury. The study primarily aimed at predicting the number of residential lots in Town, but as a component of the study, maximum population estimates were conducted as well. The objectives of this study were to:

- Predict how much future growth current (as of 1999) land use ordinances would allow.

- Determine where growth in Town is likely to occur.

In 1997, there were an average of 3.09 persons per residential dwelling, and a total of 493 dwellings in Town. The study found that 1,323 potential new single-family residences could be built based on current zoning laws. The sum of existing dwellings and potential new single-family residences was 1,816 residences. Given an average of 3.09 persons per dwelling, this would equate to a maximum of 5,611 residents in Town. The study also found that Madbury's maximum population would be reached in the year 2128 based on 1997 NH OSP population projections.

Although the population projections from that study were based on 1990 Census data and overestimated population projections, the study is useful as a tool to consider the future growth of the Town under current zoning ordinances, building codes, and conservation lands. This study also projects Madbury's maximum population and housing numbers. The Build Out Study, including maps, is attached to this chapter as Appendix I.

### **3.3 School Age Population Projections**

Table 7 lists school age NH OSP population projections made in the early 1990s based on 1990 US Census data. School age population projections are especially difficult to project beyond five years because of unpredictable shifts in economic and housing factors that may influence the rate at which families with children settle in or leave Town. For sake of comparison between the NH OSP projections and the actual Census figures, the 2000 Census population data are listed in Table 7 above the projected figures for 2000. NH OSP Madbury projections for the year 2000 were considerably different than the actual 2000 Census data. In particular, NH OSP projections for children between the ages of 0 to 4 and 10 to 14 were inaccurate. Projections were more accurate between ages 5 to 9 and 15 to 19. Given the lack of accuracy and the age of the data, Table 7 and Figure 9 are marginally useful at best.

As an alternative to Table 7, Table 8 projects school age populations based solely on following the 2000 US Census data through five year intervals. This method assumes no growth, does not attempt to predict births or migration, and should therefore be considered a low estimate. Based on actual 2000 Census figures, Madbury can expect an increase in the number of students attending Oyster River High School between 2002 and 2005. In 2000 there were 111 children aged 15 to 19 in Madbury. Assuming most children between the ages of 10 and 14 currently living in Madbury remain in Town, the number of high school aged students could increase by over 40 students between 2002 and 2005. It appears that Madbury's elementary and middle school populations could experience a slight decline between 2001 and 2005.

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**Table 7: School Age Population Projections**

SOURCE: NH OSP Population Projections (based on 1990 Census); 2000 US Census.

Year	Ages 0-4	Ages 5-9	Ages 10-14	Ages 15-19	Total
Actual 2000	74	140	154	111	479
Projected 2000	102	133	117	159	511
2005	95	110	143	176	524
2010	99	113	116	203	531
2015	105	103	118	173	499

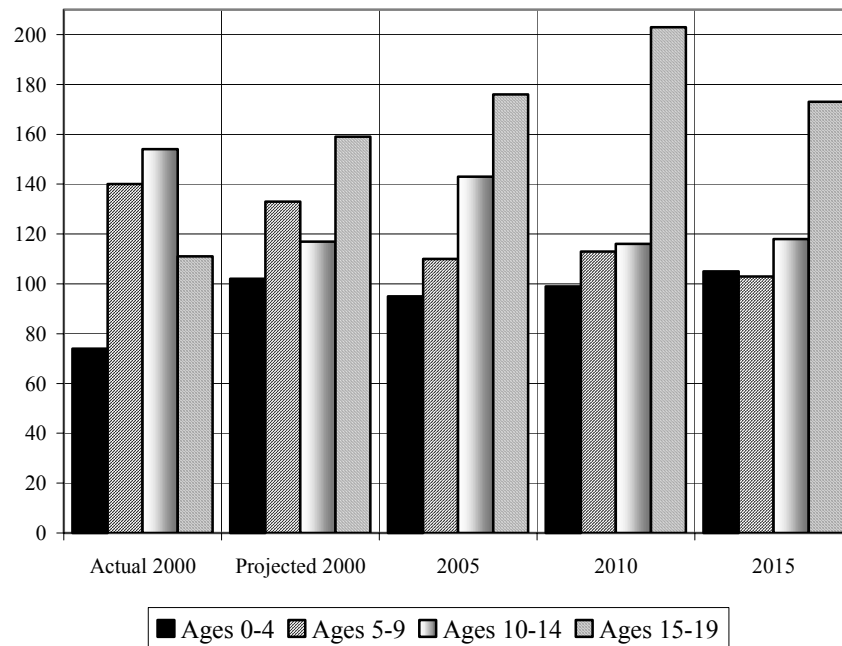
**Table 8: Revised School Age Population Projections**

SOURCE: Roughly based on 2000 US Census

	Ages 0-4	Ages 5-9	Ages 10-14	Ages 15-19
Actual 2000	74	140	154	111
Projected 2005		74	140	154
Projected 2010			74	140
Projected 2015				74

**Figure 9: School Age Population Trends (Based on data in Table 7)**

SOURCE: NH OSP Population Projections (based on 1990 Census); 2000 US Census



### 3.4 Per Capita Income

The Department of Revenue Administration ranked Madbury's 1996 per capita income of \$20,346, 67<sup>th</sup> in the state. The Town's per capita income grew by about \$3,700 between 1989 and 1996. Madbury continues to follow Lee as the Town with the highest per capita income in the Madbury area. Table 9 compares 1989 per capita income in the Madbury area with 1996 estimates. Figure 10 graphs this data.

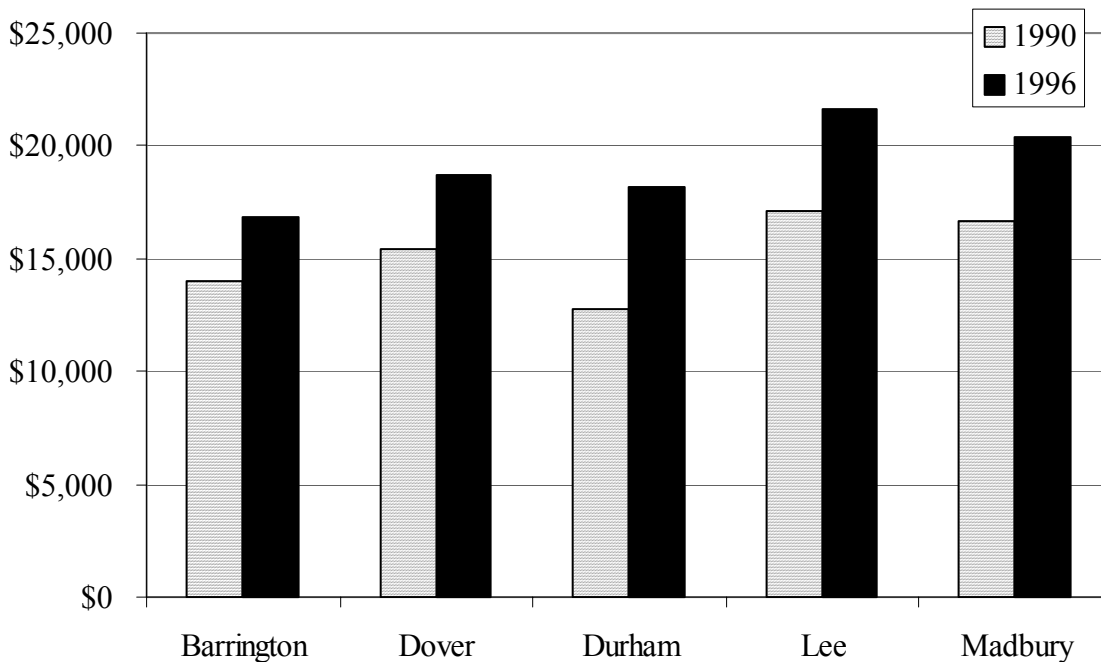
**Table 9: Per Capita Income, Madbury Area**

SOURCE: 1990 US Census; NH OSP, 1997

	1989	1996
Barrington	\$14,033	\$16,860
Dover	\$15,413	\$18,706
Durham	\$12,774	\$18,151
Lee	\$17,153	\$21,630
<b>Madbury</b>	<b>\$16,695</b>	<b>\$20,346</b>

**Figure 10: Per Capita Income, Madbury Area**

SOURCE: 1990 US Census; NH OSP, 1997



**4. Demographics - Based on 1990 Data**

**4.2 Population Movement**

The 1990 Census indicated that the typical Madbury resident has resided at his/her present dwelling for a slightly shorter period than have most residents of Strafford County and New Hampshire. Thirty-six percent of Madbury’s residents lived in Madbury between 2 to 5 years as of 1990. Table 10 compares Madbury’s duration of residence in 1990 with the county and state figures.

**Table 10: Years at Present Residence**

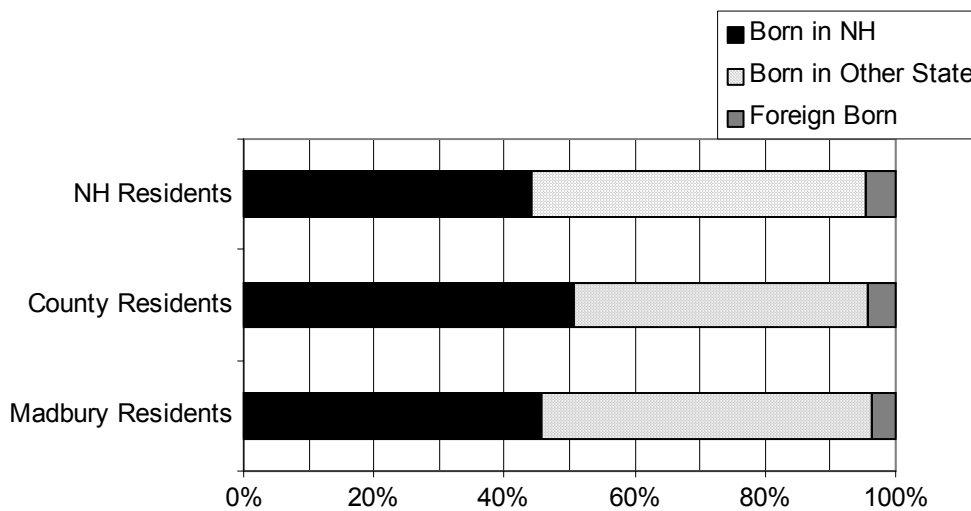
SOURCE: 1990 US Census, Table STF3A

	Madbury	County	NH
0 to 1 Year	16%	23%	20%
2 to 5 Years	36%	32%	33%
6 to 10 Years	19%	14%	15%
11 to 20 Years	16%	15%	17%
21 Years or More	13%	16%	15%

According to the 1990 Census, for the first time since data has been tracked the majority of Madbury’s residents were born outside of New Hampshire. Figure 11 compares Madbury residents’ place of birth with those of Strafford County and the state.

**Figure 11: Place of Birth**

SOURCE: 1990 US Census, Table STF3A

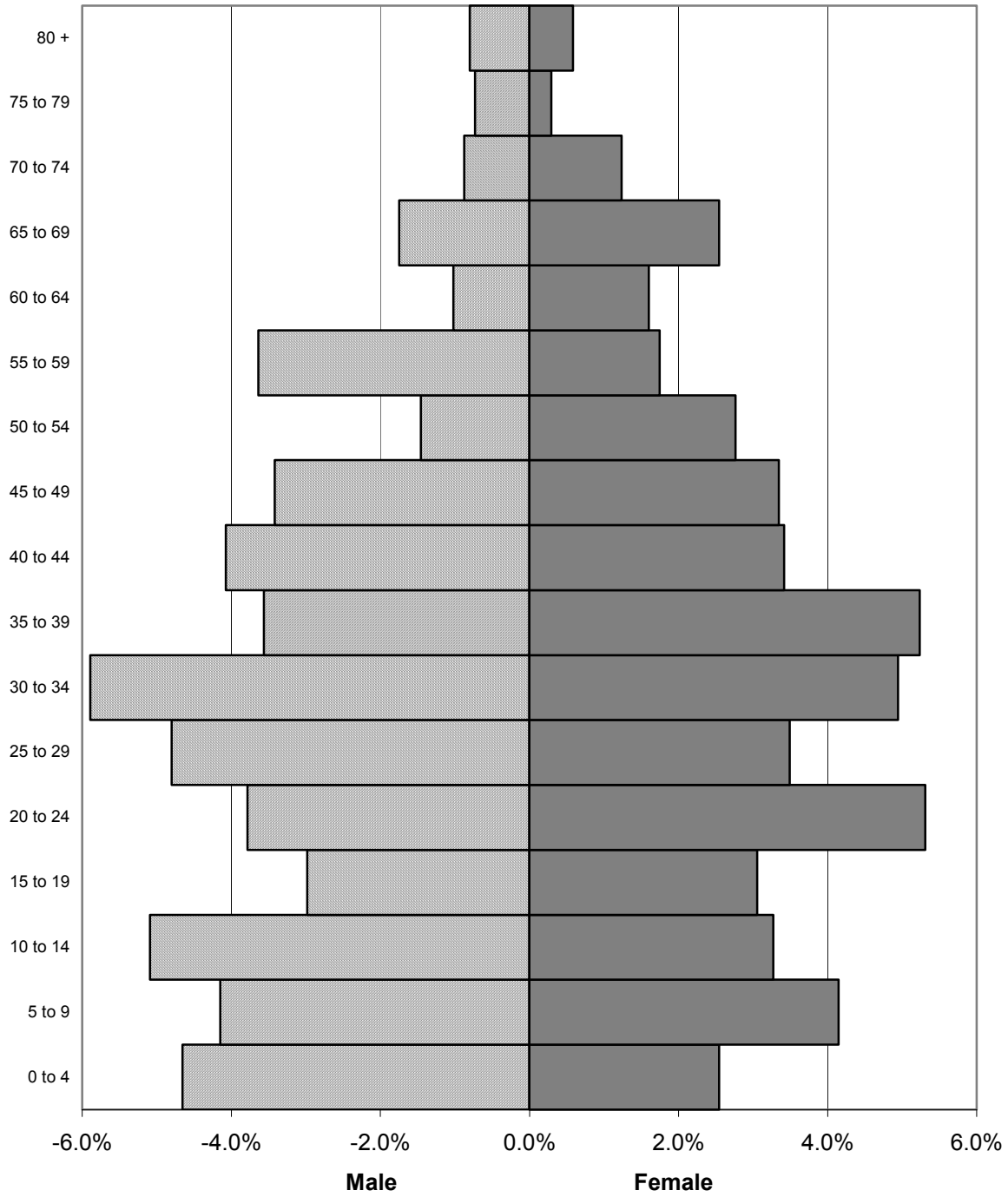




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**Figure 12: Population Pyramid**

SOURCE: 1990 US Census



#### 4.2 Population Characteristics

According to the 1990 Census, the majority of Madbury's residents aged fifteen and over was married as of 1990. However, the percentage of divorced residents continued to increase from 1980 levels. The percent of married adults in Madbury is higher than both the state and county averages. Table 11 lists the marital status of Madbury's residents in 1980 and in 1990 and compares this with state and county percentages.

**Table 11: Marital Status, Persons 15 Years & Older**

SOURCES: 1980 & 1990 U.S. Census, Table P14

	<b>Madbury 1980</b>	<b>Madbury 1990</b>	<b>County 1990</b>	<b>NH 1990</b>
Single	27%	27%	30%	25%
Married	63%	62%	54%	58%
Separated	0%	1%	2%	2%
Widowed	5%	3%	6%	7%
Divorced	5%	7%	8%	8%

The 1990 Census indicated that the typical Madbury household is more likely to be occupied by a married couple than is the case with the county and state population. Table 12 summarizes the heads of households in Madbury and compares this with state and county percentages.

**Table 12: Heads of Households**

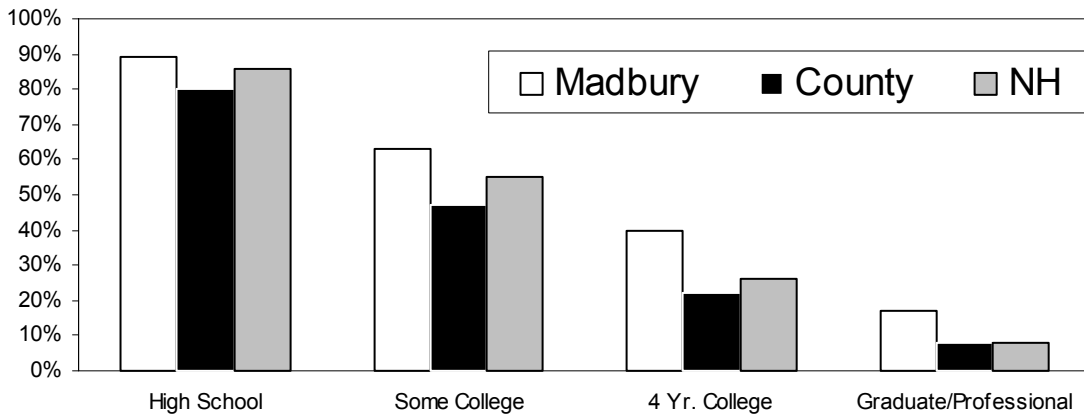
SOURCE: 1990 U.S. Census, Table 19

	<b>Madbury</b>	<b>County</b>	<b>NH</b>
Married Couple	66%	57%	60%
Single Male	3%	3%	3%
Single Female	8%	9%	8%
Other Arrangement	23%	31%	29%

According to the 1990 Census, Madbury residents reach higher education attainment than Strafford County or the state as a whole. Figure 13 graphs educational background of Madbury's residents.

**Figure 13: Educational Background**

SOURCE: 1990 US Census

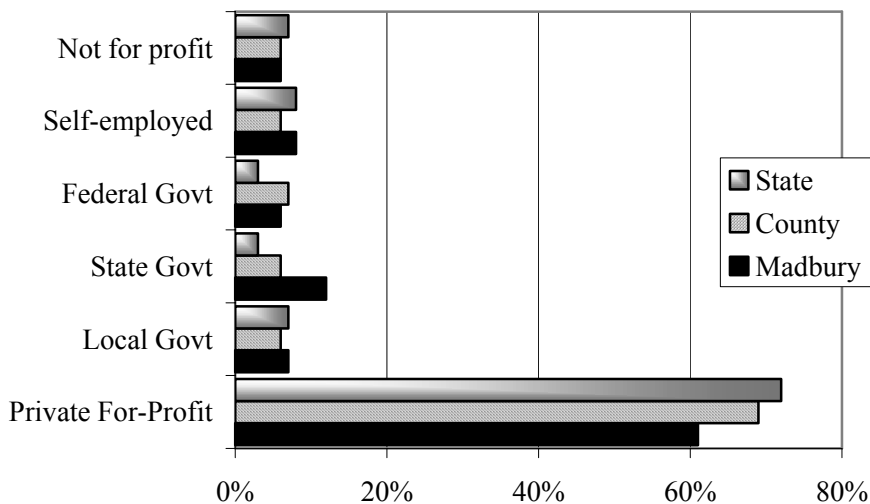


**4.3 Employment Characteristics**

The Employment Class graph below, based on 1990 Census data, shows an unusually high percentage of local residents working for the state government (Figure 14) and in education (Figure 15). This probably reflects the large number of local citizens who work at the University of New Hampshire.

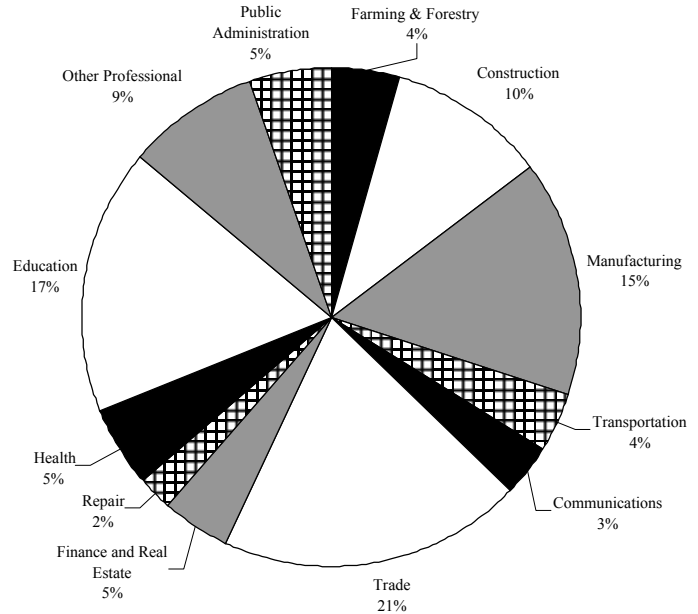
**Figure 14: Employment Class**

SOURCE: 1990 US Census, STF 3A



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According to the 1990 Census, Trade was the most common occupation in Madbury at 21%. The next most frequent industry was Education at 17%, followed by Manufacturing at 15%. Another 10% of Madbury's residents worked in the Construction industry as of 1990 (Figure 15).



**Figure 15: Employment by Industry: 1990**

SOURCE: 1990 US Census, STF3A

**4.4 Median Household Income**

Section II provides more recent information regarding Madbury's income. According to the 1990 Census, Madbury's income is distributed in the higher brackets more often than the Town's neighbors, on average (Table 13).

**Table 13: Income Distribution Median Household Income**

SOURCE: 1990 U.S. Census, STF3A Table 80

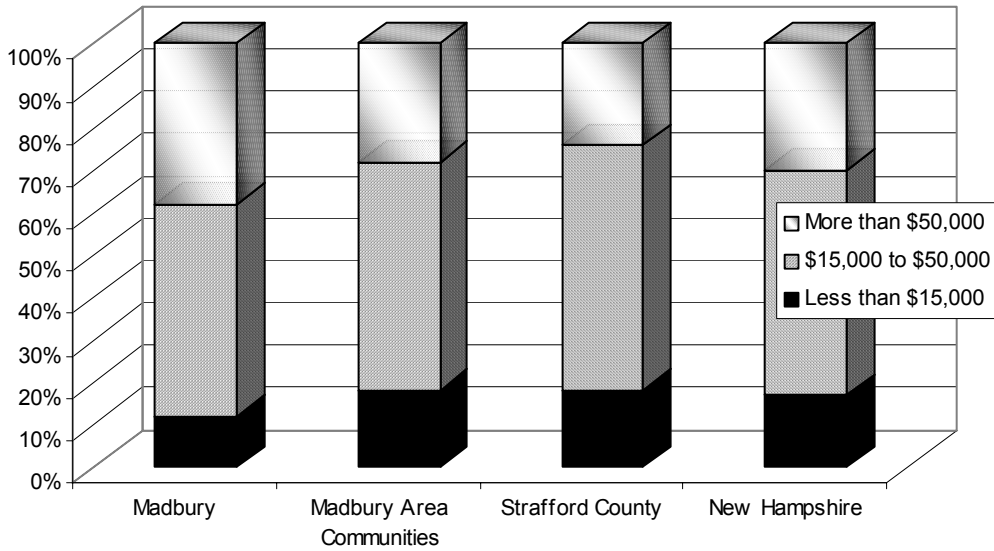
	Less than \$15,000	\$15,000 to \$50,000	Greater than \$50,000
Barrington	12%	64%	24%
Dover	20%	57%	23%
Durham	22%	33%	45%
Lee	8%	52%	40%
<b>Madbury</b>	<b>12%</b>	<b>50%</b>	<b>38%</b>
Madbury Area Communities	18%	54%	28%
Stafford County	18%	58%	24%
New Hampshire	17%	53%	30%

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As Figure 16 represents, in 1990 Madbury had a lower percent of its population under \$15,000 than its neighbors, the county, and the state.

**Figure 16: Income Distribution**

SOURCE: 1990 US Census, STF3A

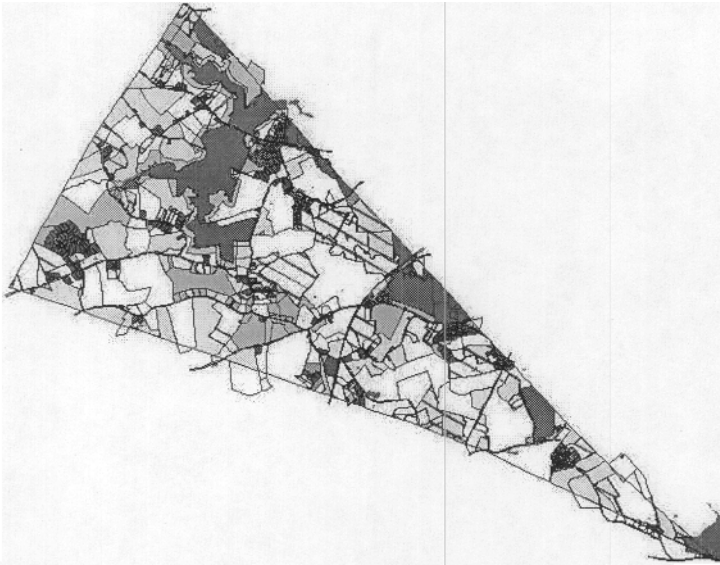


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## Appendix I

### Madbury Build Out Study

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259 County Farm Rd, Unit 1  
Dover, NH 03820-6019  
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New Hampshire Office of State Planning Town of Madbury, New Hampshire

## **Madbury Build-Out Study**

**March 25, 1999**

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## Project Summary

The Town of Madbury, NH was awarded with a grant from the New Hampshire Coastal Program in order to perform a town-wide build-out analysis. Madbury is a rural bedroom community and lacks substantial infrastructure. New residential development would have a significant effect upon the resources of the community. The Madbury Planning Board is interested in predicting how much future growth its current land use ordinances will allow as well as seeing where the growth is likely to occur. Madbury sought the resources of the Strafford Regional Planning Commission (SRPC) to carry out the build-out analysis.

'Build-out' refers to the time and circumstances whereby, based on a set of restrictions, no more building growth may occur. For our purposes it means the point at which, under current zoning requirements, no more house lots may be created in Madbury. It is the point at which lots have been subdivided to the minimum size allowed and there is no more 'developable' land. By analyzing maps and available information an estimate can be generated on the maximum number of houses and people that could exist in Madbury, and an estimate of what year that may be reached.

A build-out analysis methodology was formulated by SRPC with input from the Madbury Planning Board. The strategy was to use SRPC's Geographic Information Systems (GIS) to produce a set of maps produced through GIS analysis. This analysis involved overlaying tax parcel data with spatial data layers representing areas where residential development is not permitted. The maps show potential for development based upon residentially developable areas and upon existing zoning. The study is aimed at predicting the maximum number of residential lots and / or units that may develop in the future. For this study, residential development was restricted to single family residences.

In order to determine the location and extent of where single family residences may potentially be built, the Ordinances and Regulations of the Town of Madbury (3/1998) were used. Restrictions to development as listed in the ordinances and as set by the Planning Board are as follows: areas of poorly drained and very poorly drained soils; areas that fall within the Shoreland Protection Overlay District of Madbury (refer to Ordinance); land sloped greater than 15%; areas of the 100 year floodplain (not in Ordinance but listed by Planning Board). These areas were excluded from potential residential development areas. Other areas that were excluded from potential residential development are the non-residential zoning districts: Civic District, Neighborhood Commercial District, and the Commercial and Light Industrial District. Permanent conservation lands and special parcels were also excluded. Among these are the Bellamy Reservoir parcel and its flowage easements and municipally and state owned parcels. A major component of this study was the update of the GIS parcel layer of Madbury. SRPC had digitized the Madbury Tax Composite map in 1996. This layer was brought up to date and matched to assessing data files. Parcels that had existing houses and that could not be subdivided further were also excluded from the available residential lands. Parcels that cannot be subdivided but do not have existing homes were added to the pool of residential development land.

The sections of the subdividable lots that were developable were divided by the minimum allowable lot size of 80,000 square feet to determine the number of potential lots they could yield. For lots that would not have existing road frontage of 200ft, 10% was subtracted from their areas to allow for subdivision roads. A per parcel tally of potential new lots and/ or homes was determined. From this a build-out number of residences were derived.

The next segment of the build-out study was to estimate the possible build-out population of Madbury. This was determined by multiplying the current average number of persons per

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household in Madbury by the sum of the build-out residential units. This was based on existing information and the assumption that the ratio would remain constant.

The final part of the build-out study was to estimate when build-out might be reached. Two methods were used for this. The first was to look at population data, determine a rate of growth and apply that growth rate to reach the pre-determined build-out population (see above). The second method used housing starts data to apply a yearly average to reach the build-out total of residences.

The major product of the study is the set of maps produced to display the build-out and the inputs to the build-out. The Madbury Planning Board will have these maps to assist them in visualizing potential growth areas in Madbury. Future subdivision proposals can be compared to the maps to weigh their effect upon the town.

## **List of Maps**

(Copies of the following maps are available for review at the office of the Town Clerk, Town Library and Strafford Regional Planning Commission.)

- 1 Zoning**  
Existing zoning districts
- 2 Lands Excluded from Residential Development**  
Parcels owned by State, Madbury, Dover, and Portsmouth, permanent conservation easements, commercial districts. Also shown but not excluded: Managed Forest Lands and UNH Kingman Farm Property.
- 3 Lots Available for Development**  
Built and non-built, non-dividable lots, built and non-built subdividable lots, also shown are lots excluded from development
- 4 Undevelopable Land**  
100 year floodplain, Shoreland Protection Overlay District, land sloped greater than 15%, very poorly and poorly drained soils.
- 5 Undevelopable Land with Permanent Conservation Easements**  
Items from Undevelopable Land map and permanent conservation easements shown in one color
- 6 Developable, Subdividable Land**  
The developable portions of subdividable lots are shown classed by how many potential lots they may yield. Frontage and subdivision road areas have not been determined. Undevelopable lands also shown.
- 7 Number of Potential Additional Homes/Lots Estimated from Each Existing Lot**  
Developable, subdividable lots shown classed by how many potential lots they may yield. Areas for subdivision roads for parcels that would lack the minimum frontage requirement have been subtracted.
- 8 Parcels Under Current Use**  
Current Use parcels are shown color classed on Current Use type: Farm, Forest, or Mixed. Hatched overlay-showing parcels allowing for Recreation under Current Use. To be used in considering for likelihood of development.

## Findings

### **Average Number of Persons per Residential Dwelling in Madbury = 3.09**

It was determined from the Town Property database (pro99.dbf) that there are 493 residential dwellings. Of these, 60 are mobile homes and 433 are multi or single-family residences. This data was obtained from the Town's assessing files in February 1999. As determined from the digitized composite tax map (1999), there are 651 ownership parcels in Madbury. The 1997 NH Office of State Planning population estimate for Madbury is 1,523 persons. Using these figures gives estimated persons per dwelling number of 3.09.

### **Sum of Potential new Single Family Residences = 1,323**

GIS overlay analysis using existing data layers determined there to be an estimated 1,323 possible new single-family residences under current zoning requirements. This figure assumes that each new residence will be built upon a lot that is at least 80,000 square feet of developable land. Developable land was determined by extracting areas that are listed as 'undevelopable' by the 'Ordinances and Regulations of the Town of Madbury' (last amended March 10, 1998). Undevelopable areas are: Shoreland Protection District; land sloped greater than 15%; poorly drained and very poorly drained soils. In addition to these, areas of 100-year floodplains were extracted. For areas that would not have adequate existing road frontage (200ft), 10% of the area was extracted for subdivision roads.

NOTE: the site-specific geography of each parcel was not considered. The number reflects raw area estimates. The specific arrangement of existing residences and undevelopable areas per parcel is beyond the scope of this study.

### **Sum of Existing Dwellings and Potential new Single Family Residences Build-Out Residential Total = 1,816 Residences**

It was determined from the Town Property database (pro99.dbf) that there are 493 residential dwellings. GIS overlay analysis using existing data layers determined there to be an estimated 1,323 possible new single-family residences under current zoning requirements. The sum of these represents the Build-Out Residential Total = 1,816 residences. This assumes that all new units are single-family residences with a lot size of 80,000 square feet of developable land.

### **Total Possible Population = 5,611**

The estimated total of new persons, given an average of 3.09 persons per dwelling, is 4,088. Adding this to the existing population (1997 *asp* estimate) of 1,523 equals 5,611 persons.

### **Estimated Year of Build-Out**

**Using Population Growth Rate = 2128**

**Using Housing Starts Data = 2146**

**Population Growth Rate.** It was determined from population projections produced by the NH Office of State Planning that the average yearly growth rate for Madbury will be 1% per year in the period from the year 2000 to 2020. Applying this rate to the 1997 NHOSP population estimate (1,523), it would take 131 years to reach the estimated build-out population of 5,611. If Madbury were to grow by 1% yearly, it would reach a population of 5,608 persons in the year 2128.

**Housing Starts Data.** Information supplied by the Oyster River School District, Long Range Planning Committee on housing starts for Madbury yields an average of 9 houses per year for the 1990s. Using this average it would take 147 years from 1999 to reach the build-out amount of 1,816 residences. This would occur in the year 2146.

**Tables**

**Build-Out Year Predicted by Population Growth  
Madbury Build-Out Study, 1999**

**Projected Populations per Year using a Growth Rate 1% per year.**

Year	Population
1997	1523
2000	1569
2010	1733
2020	1915
2030	2115
2040	2336
2050	2581
2060	2851
2070	3149
2080	3478
2090	3842
2100	4244
2110	4688
2120	5179
2130	5721

The estimated Build-Out population of Madbury is 5,611 persons. It would take 131 years from 1997 to reach this population using a growth rate of 1% per year. The estimated Build-Out year of Madbury is 2128, when the population will reach 5,608.

The estimated build-out population assumes that all developable land has been divided into 80,000 square foot lots for single-family residences, with an average of 3.09 persons per house. The 1% per year growth rate is based upon NHOSP population projections for Madbury for the period of 2000-2020.

**Build-out would occur in 2128.**

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**Build-Out Year predicted by Housing Starts  
 Madbury Build-Out Study, 1999**

**Housing Starts for Madbury, NH**

Source	Year	# Of Starts	
NH Office of Strategic Planning/ NH Office of State Planning	1978	28	Average # of starts: 16.8 per year (1978-1989)
	1979	24	
	1980	7	
	1981	9	
	1982	2	
	1983	7	
	1984	16	
Madbury Town Office	1985	44	Average # of starts: 9 per year (1990-1997)
	1986	29	
	1987	21	
	1988	4	
	1989	11	
	1990	10	
	1991	6	
	1992	12	
	1993	7	
	1994	8	
1995	6		
1996	7		
1997	7		

For this study, the 1990s housing starts average of 9/yr is used. The estimated amount of possible new single-family residences is 1,323. Adding 9 houses per year, it would take 147 years to reach this amount.

**Build-out would occur in 2146.**

## Conclusions

The Madbury Planning Board is pleased with the products that it received as part of this study. They feel the maps will be of benefit to them as they review future development proposals. While the maps were produced using the best GIS data available, the Planning Board understands the limitations of the mapped data. The Planning Board will use its own local knowledge and judgment when referring to the maps. Noteworthy are a few cases in which a Planning Board member disagreed with the amount of developable land the GIS analysis had determined for certain parcels. Due to the mapping standards of some of the spatial data layers, these discrepancies will occur.

The scope of work for this study called for the production of only two maps. However, through working with the Planning Board and developing a sound methodology, it was determined that more maps would be more demonstrative to the process. In all, a collection of eight maps was produced. The maps assist the user in visualizing the method used to determine the number of potential additional homes estimated for each existing lot. The last map of the collection, which displays which parcels are under current use, was not an input to the build-out. This map was produced to help the Planning Board predict likelihood of development in certain areas of Madbury.

The scope of work called for the production of a map, which would rank parcels by their likelihood of development. It was later determined by the Planning Board that this map would not be produced. The Planning Board decided that it would be time better spent looking at the build-out maps, than attempting to predict where development will occur. Due to the number of factors involved, this type of prediction is far too complex and too variable to make.

The final products delivered to Madbury are a full sized set of the build-out maps printed on translucent durable film, a full sized set printed on special color inkjet paper, and a half sized set printed on bond paper. Copies of this report will also be provided. SRPC will be giving Madbury copies of parcel base maps, which the Planning Board can use to sketch planning scenarios upon.

In the immediate future, SRPC will set up a desktop computer for the Madbury Planning Board to use. It will be loaded with a simple 'freeware' GIS data browsing software along with the spatial data used in the build-out study. With this capability, the Planning Board can fully utilize the digital products produced in this study.