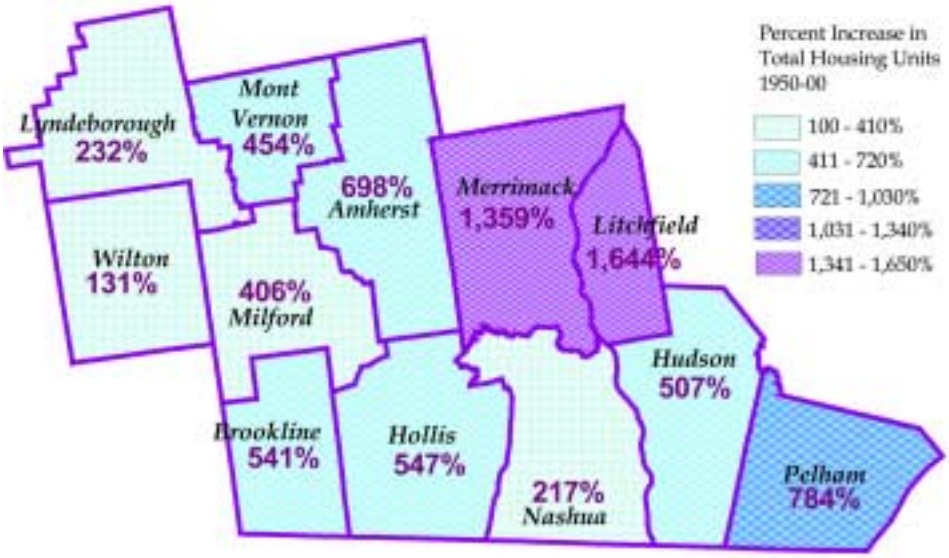
FIFTY YEARS OF GROWTH:

ANALYSIS OF THE IMPACTS ON THE NASHUA REGION

AUGUST 2001



Source: US Census; 1950 data derived from the number of persons per household in the county and the local population.

Prepared by the

Nashua Regional Planning Commission

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This report was prepared by the Nashua Regional Planning Commission with financial assistance from the NH Department of Transportation, the Federal Highway Administration, the NH office of State Planning and the NH Department of Environmental Services. The contents of this report reflect the views of the Nashua Regional Planning Commission which is solely responsible for the facts and accuracy of the data presented herein. The contents do not necessarily reflect the official views of the above agencies. This report does not constitute a standard, specification or regulation.

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INTRODUCTION

In recent years there has been much discussion about what is termed "sprawl", defined here as a low density, single use, automobile oriented pattern of development. While the phenomenon has been associated primarily with the proliferation of scattered retail uses along former country roads, it also manifests itself through the development of low-density subdivisions. The result in many cases has been a loss of natural resources and open space, and increased costs of providing public services. Assessing the incidence and impacts of sprawl first requires an assessment of the rate of growth in the region. This study documents growth in the Nashua Region from 1950 to 2000. 1950 was selected as it precedes the period of accelerated growth experienced in the area and 2000 is the most recent year for which most of the comparative data is available.

This report attempts to document the environmental and fiscal impacts of growth in the Nashua Region. Some general assumptions were used to develop the data: 1) growth places demands on municipal services; 2) the rate of growth is an indicator of the amount of stress associated with growth; 3) development results in the loss of environmental resources; and 4) sprawl results in the decentralization of communities.

In 2000, Governor Shaheen issued an executive order relative to the prevention of sprawl. That included an intensive inventory of State policies and actions by the Office of State Planning. At the same time, committees have been formed to make recommendations about the prevention of sprawl and growth management, one through the Office of State Planning and the other by the New Hampshire Legislature. This document intends to parallel those efforts, and to focus the issue down to the regional and municipal level.

This study was funded through the NH Office of State Planning, NH Department of Transportation and the NH Department of Environmental Services. NRPC is grateful to all of these agencies, and thanks all of the staff persons from each who have assisted with data collection. In addition, permission was obtained from the Society for the Protection of New Hampshire's Forests to use data it had gathered documenting the environmental impacts of growth in its 1999 publication *New Hampshire's Changing Landscape: Population Growth, Land Use Conversion and Resource Fragmentation in the Granite State*. That document was co-authored by the NH Chapter of the Nature Conservancy.

For the purposes of this report, the Nashua Region refers to the twelve communities of the Nashua Regional Planning Commission: Amherst, Brookline, Hollis, Hudson, Litchfield, Lyndeborough, Merrimack, Milford, Mont Vernon, Nashua, Pelham and Wilton.

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SUMMARY OF FINDINGS

Population, Housing and Land Use Impacts

In general, the data show that the region has grown at a faster rate than the State of New Hampshire in every decade since the 1950s. Within the region, some communities have experienced exponential growth, but the greatest percentage changes happened during the 1960s and 1970s. The communities closest to Nashua experienced rapid development first. Development is now moving into the rural areas and is expected to continue into the foreseeable future.

An evaluation of land use and zoning within the region reveals that single use commercial districts occupy a fraction of the total land area in the communities. Rather, single family home development has been responsible for consuming the largest tracts of land and most of the vacant land in the region is zoned for low-density residential uses.

An analysis of road maps over time reveals that while residential development is land consumptive, it has generally occurred close to the Nashua-Hudson central city and close to existing village centers. Most communities have identifiable centers, and most have retained municipal facilities in those centers.

The data demonstrates that:

1. Between 1950 and 2000, the Nashua Region has grown in population from 52,010 to 195,788, a 276% increase.
2. Since 1990, the region has been growing by approximately 4,500 people per year.
3. The region has grown from 9.5% of the State's population in 1950 to 15.8% of it in 2000.
4. The fastest growing communities since 1950 have been Litchfield (1,624%), Merrimack (1,217%), Pelham (729%) and Amherst (637%).
5. During the 1990s, the fastest growing communities in the region were Brookline (74%), Litchfield (33%) and Hollis (23%).
6. Nashua's percentage of the regional population has shrunk from 67% in 1950 to 44% in 2000.
7. Since 1950, the number of housing units has increased by 57,618, or 344%.
8. Between 1990 and 2000, the number of housing units increased by 7,966, almost 800 per year.
9. Sixty percent of all housing units within the Nashua Region are single family.
10. As of 2000, the Nashua Region contained 13.5% of all housing units in the State of New Hampshire.
11. The region is expected to increase by about 50,000 people within the next twenty years, for a total population of 246,436.
12. Forty-two percent of the region, 85,345 acres, is undeveloped, and an equal amount of land is zoned for lower density residential development.
13. Twenty-five percent of the assessed valuation of the region is from commercial uses.
14. Sixty-four percent of all municipal facilities (schools, town halls, libraries, fire and police stations) are located within identified town/city centers.
15. Ninety-two percent of all Town Halls and Libraries are located within identified town centers, compared with 33% of all post offices.

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Environmental Impacts

While the Nashua Region has been growing at a faster pace than the State of New Hampshire, it contains a significantly lower percentage of permanently protected open space. While development has resulted in the fragmentation of forest blocks, the region still contains a surprising amount of forested land in blocks that are greater than 500 acres.

Based on 1992/93 data provided by the Society for the Protection of NH Forests and the NH Chapter of the Nature Conservancy:

16. Sixty-seven percent of the land in the region is forested, compared with 83.4% of the entire State.
17. Only 11.5% of the region's forest blocks greater than ten acres in size are protected, compared with 25.2% for the State as a whole.
18. There are a total of 68 forest blocks in the Nashua Region that are greater than 500 acres in size.
19. The region is expected to lose about 18,000 acres of forested land between now and 2020, at a rate five times greater than the State (15.1% vs. 3.1%).
20. There are 714 acres of high value wetlands as defined by the EPA in the Nashua Region, 22% of which are permanently protected from development.
21. A significantly lower percentage of water supply lands are protected in the Nashua Region (8.7%) than in the State as a whole (12.7%).
22. There are a total of 19,462 acres of land protected from development in the Nashua Region.
23. Overall, 9.6% of the region contains protected lands, a significantly lower proportion than the State of New Hampshire (22.5%).

Transportation Impacts

The data suggests that traffic congestion is a significant byproduct of growth. This has resulted in the transformation of rural roads into major collector roads. Each new housing unit results in an additional ten vehicle trips per day on average. Despite the rapid development of the region, road building in the region has not kept pace with the rate of housing unit growth when compared to the State as a whole, which suggests that the region is more compact and centralized.

The data has rendered the following facts:

24. While the Nashua Region contains 13.6% of the State's housing units, it contains only 8.5% of the State's road miles, and only 4.2% of the State's limited access road miles.
25. Between 1950 and 2000, the total classified road mileage in the region increased from 850 to 1,370, or 61.7%
26. Roads constructed since 1950 have been located at the edge of the central city and on the edge of town centers, largely the result of subdivision road construction.
27. There are 12 roadway sections within the region that have a level of service (LOS) E or F.
28. Since 1973, traffic on the Sagamore Bridge has increased by 526.1% (19.5% per year). It has increased by 303.9% on Route 13 in Brookline; by 248.9% on Route 3A at the Litchfield/Hudson Town Line; and by 189.6% on Route 101A in Amherst.
29. Average Daily Traffic is expected to increase by 38.0% in the Nashua Region between 2000 and 2020.
30. In the 2001-2010 State Ten-Year Plan, $197 million is programmed in the Nashua Region, about 11.0% of the entire State program

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31. Within the region, most of the State's transportation improvements are located within Nashua (32.5%), Hudson (23.7%) and Merrimack (23.2%)

Fiscal Impacts

Fire, Police and School budgets have traditionally grown at rates that exceeded the rates of housing growth which may mean that they are increasing for reasons other than growth, i.e. changing standards. Since 1990, school budgets have grown at disproportionately high rates compared to housing unit growth. Highway budgets, on the other hand, have grown at a slower rate of growth.

The following facts are discussed based upon an analysis of local budgets over the past 50 years:

32. When adjusted for inflation, all of the municipal highway budgets within the region combined increased at a rate of 201% between 1960 and 2000. School budgets increased by 1,095%, police budgets by 883% and fire budgets by 496%. Overall, municipal budgets increased by 880% during this period.
33. Between 1990 and 2000, school budgets, increased by 46%, while police budgets increased only (8%); highway budgets (-2%) and fire budgets (-3%) actually decreased during this period when adjusted for inflation.
34. When adjusted for inflation, total assessed valuations within the region increased 787% since 1960.

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POPULATION, HOUSING AND LAND USE IMPACTS

For the past fifty years, the Nashua Region has been among the fastest growing areas in New Hampshire. During this time, the region's population increased by 276%, as compared to the State increase of 132%. The annual average increase in population has been 6% in the Nashua Region, compared to 3% for the State and Hillsborough County. New Hampshire was the fastest growing state in the Northeastern United States during the 1990 -2000 period, increasing in population by 11.4%. It is estimated that the State is increasing by about 13,000 persons per year and will continue to do so into the next two decades. The region has been increasing by about 4,500 persons per year since 1990.

TABLE 1

POPULATION GROWTH, 1950-2000

	1950	1960	1970	1980	1990	2000
Amherst	1,461	2,051	4,605	8,243	9,068	10,769
Brookline	671	795	1,167	1,766	2,410	4,181
Hollis	1,196	1,720	2,616	4,679	5,705	7,015
Hudson	4,183	5,876	10,638	14,022	19,530	22,928
Litchfield	427	721	1,420	4,150	5,516	7,360
Lyndeborough	552	594	789	1,070	1,294	1,585
Merrimack	1,908	2,989	8,595	15,406	22,156	25,119
Milford	3,269	4,159	6,622	8,685	11,795	13,535
Mont Vernon	405	585	906	1,444	1,812	2,034
Nashua	34,669	39,096	55,820	67,865	79,662	86,605
Pelham	1,317	2,605	5,408	8,090	9,408	10,914
Wilton	1,952	2,025	2,276	2,669	3,122	3,743
Region	52,010	63,216	100,862	138,089	171,478	195,788
County	156,978	178,161	223,941	276,608	335,838	380,841
State	533,542	606,921	737,681	920,610	1,109,117	1,235,786
Region as % of State Population	9.7%	10.4%	13.7%	15.0%	15.5%	15.8%

Source: US Census.

The most profound changes occurred between 1960 and 1970, when the region's population increased by 60%. During this same period, the State's population increased by only 22%. Since the 1950's the region's growth rate has exceeded the State's and the county's during every decade. The region has grown from being 9.7% of New Hampshire's population in 1950 to 15.8% in 2000.

TABLE 2

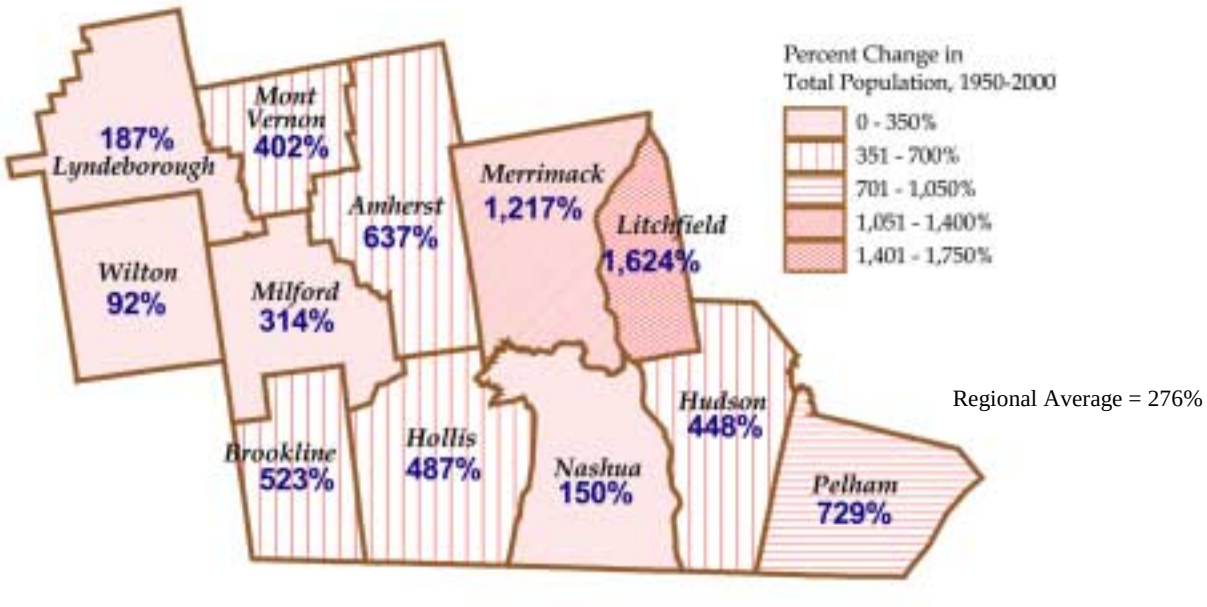
POPULATION GROWTH, 1950-2000, BY PERCENTAGE

	1950	2000	Net Increase	Percentage Increase	Annual Percentage Increase
Amherst	1,461	10,769	9,308	637%	13%
Brookline	671	4,181	3,510	523%	10%
Hollis	1,196	7,015	5,819	487%	10%
Hudson	4,183	22,928	18,745	448%	9%
Litchfield	427	7,360	6,933	1624%	32%
Lyndeborough	552	1,585	1,033	187%	4%
Merrimack	1,908	25,119	23,211	1217%	24%
Milford	3,269	13,535	10,266	314%	6%
Mont Vernon	405	2,034	1,629	402%	8%
Nashua	34,669	86,605	51,936	150%	3%
Pelham	1,317	10,914	9,597	729%	15%
Wilton	1,952	3,743	1,791	92%	2%
Region	52,010	195,788	143,778	276%	6%
County	156,978	380,841	223,863	143%	3%
State	533,542	1,235,786	702,244	132%	3%

Source: US Census.

MAP 1

PERCENT INCREASE IN TOTAL POPULATION, 1950-2000



Source: Data based on US Census reports for 1950 and 2000.

Some communities within the region have been completely transformed since 1950. The fastest growing have been Litchfield (1,624%), Merrimack (1,217%), Pelham (729%) and Amherst (637%). All communities within the Nashua Region have had population increases that exceeded the State average of 132%, with the exception of Wilton, which has increased by only 92% since 1950.

TABLE 3

PROPORTIONATE GROWTH BY DECADE, 1950-2000

	1950-1960	1960-1970	1970-1980	1980-1990	1990-2000
Amherst	40%	125%	79%	10%	19%
Brookline	18%	47%	51%	36%	74%
Hollis	44%	52%	79%	22%	23%
Hudson	40%	81%	32%	39%	17%
Litchfield	69%	97%	192%	33%	33%
Lyndeborough	8%	33%	36%	21%	22%
Merrimack	57%	188%	79%	44%	13%
Milford	27%	59%	31%	36%	15%
Mont Vernon	44%	55%	59%	25%	12%
Nashua	13%	43%	22%	17%	9%
Pelham	98%	108%	50%	16%	16%
Wilton	4%	12%	17%	17%	20%
Region	22%	60%	37%	24%	14%
County	13%	26%	24%	21%	13%
State	14%	22%	25%	20%	11%

Source: US Census; derived by NRPC.

Table 3 shows that the extent of growth has not been uniform among towns throughout the decades. For example, Amherst (125%) experienced its greatest proportional gains in population growth during the 1960s, as did Merrimack (188%) and Pelham (108%). Litchfield (192%), Hollis (79%) and Mont Vernon (59%) experienced their most rapid growth during the 1970s. Only Brookline experienced its greatest proportional growth during the decades of the 1980s or 1990s, which suggests that while growth remains a major issue, communities in the NRPC region have already experienced the most severe impacts. Nevertheless, the region still continues to grow. During the 1990's the fastest growing communities in the region were Brookline (74%), Litchfield (33%) and Hollis (23%). Brookline was the fastest growing town in the State during the 1990-2000 period.

TABLE 4

POPULATION SHARES, CITY POPULATION AS A PERCENTAGE OF REGIONAL POPULATION

Year	City Population	Regional Population	City Population as Percentage of Regional
1950	34,669	52,010	67%
1960	39,096	63,216	62%
1970	55,820	100,862	55%
1980	67,865	138,089	49%
1990	79,662	171,478	46%
2000	86,605	195,788	44%

Source: Derived from US Census.

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Population in the Nashua Region has always been highly centralized as evidenced by a comparison of the City of Nashua's population to that of the region as a whole. While the city's population share has decreased steadily over the past fifty years, Nashua still contains almost half of the region's population.

TABLE 5

CENTRAL CITY AS A PERCENTAGE OF REGIONAL POPULATION, 1970

REGION	Central City / Cities	Regional Population	Central City / Cities Population	Central City as a % of Regional Population
Nashua RPC	Nashua	100,862	55,820	55%
Rockingham RPC	Portsmouth	99,051	25,717	30%
Strafford RPC	Rochester, Dover & Somersworth	71,851	47,814	67%
Southern NH RPC	Manchester	138,358	87,754	63%

Source: Derived from US Census, 1970.

TABLE 6

CENTRAL CITY AS A PERCENTAGE OF REGIONAL POPULATION, 2000

REGION	Central City / Cities	Regional Population	Central City / Cities Population	Central City as a % of Regional Population
Nashua RPC	Nashua	195,788	86,605	44%
Rockingham RPC	Portsmouth	178,997	20,784	12%
Strafford RPC	Rochester, Dover & Somersworth	131,853	66,822	51%
Southern NH RPC	Manchester	249,838	107,006	43%

Source: Derived from US Census, 2000..

The decentralization of central cities is a firmly established phenomenon throughout the country and the State. The population shares of the cities in the urbanized regions have decreased since 1970. The Strafford Region is the most centralized among the State's urbanized areas, with 51% residing in a city in 2000. This is compared to 12% for the Rockingham Region. Both Nashua and Manchester have the similar city population shares of 44% and 43% respectively.

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TABLE 7

HOUSING UNIT GROWTH, 1950-2000

	1950	1960	1970	1980	1990	2000
Amherst	470	681	1,635	2,594	3,179	3,752
Brookline	216	264	404	609	881	1,384
Hollis	385	571	860	1,553	2,006	2,491
Hudson	1,345	1,952	2,949	4,369	6,902	8,165
Litchfield	137	240	462	1,319	1,845	2,389
Lyndeborough	177	197	303	390	488	587
Merrimack	614	993	2,539	4,584	7,915	8,959
Milford	1,051	1,382	2,237	3,255	4,793	5,316
Mont Vernon	130	194	291	466	614	720
Nashua	11,148	12,989	18,035	25,444	33,383	35,387
Pelham	423	865	1,641	2,408	3,118	3,740
Wilton	628	673	804	953	1,251	1,451
Region	16,723	21,002	32,160	47,944	66,375	74,341
County	50,430	59,279	74,666	101,208	135,622	149,961
State	190,563	224,440	280,962	386,381	502,247	547,024

Source: **US Census; 1950 and 1960 data derived from the number of persons per household in the county and the local population.**

The most important unit of analysis for demonstrating the impact of growth is the housing unit, because it represents the household for which most State and local services are oriented. While the data directly correlates with the changes in population over time, household sizes have been decreasing significantly since the 1950s. The implication of a dwindling household size is that it requires a greater number of units to house the same population. As depicted in Table 7, there were 74,341 housing units in the Nashua Region in 2000, compared to 547,024 in the State of New Hampshire. Between 1990 and 2000, the number of housing units in the region increased by 7,966 or by about 800 per year.

TABLE 8

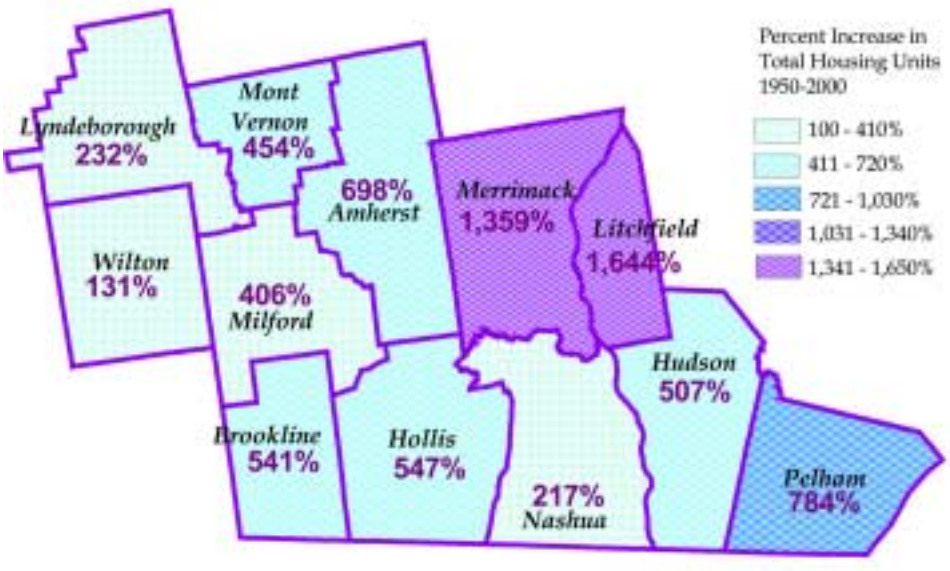
HOUSING UNIT GROWTH, 1950-2000, BY PERCENTAGE

	1950	2000	Net Increase	Percentage Increase	Annual Percentage Increase
Amherst	470	3,752	3,282	698%	14%
Brookline	216	1,384	1,168	541%	11%
Hollis	385	2,491	2,106	547%	11%
Hudson	1,345	8,165	6,820	507%	10%
Litchfield	137	2,389	2,252	1644%	33%
Lyndeborough	177	587	410	232%	5%
Merrimack	614	8,959	8,345	1359%	27%
Milford	1,051	5,316	4,265	406%	8%
Mont Vernon	130	720	590	454%	9%
Nashua	11,148	35,387	24,239	217%	4%
Pelham	423	3,740	3,317	784%	16%
Wilton	628	1,451	823	131%	3%
Region	16,723	74,341	57,618	345%	7%
County	50,430	149,961	99,531	197%	4%
State	190,563	547,024	356,461	187%	4%

Source: **US Census; 1950 data derived from the number of persons per household in the county and the local population.**

MAP 2

PERCENT INCREASE IN TOTAL HOUSING UNITS, 1950-2000



Regional Average = 345%

Source: US Census; 1950 data derived from the number of persons per household in the county and the local population.

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TABLE 9

HOUSING UNIT TYPE, 1999

	Total Housing Units	Percent Single Family	Percent Multi-Family (2+ units)	Percent Manufactured
Amherst	3,861	90%	7%	3%
Brookline	1,359	93%	4%	3%
Hollis	2,546	90%	6%	4%
Hudson	8,114	66%	31%	3%
Litchfield	2,504	83%	12%	5%
Lyndeborough	590	88%	5%	7%
Merrimack	9,037	71%	26%	2%
Milford	5,338	51%	41%	8%
Mont Vernon	729	85%	3%	12%
Nashua	34,931	45%	51%	3%
Pelham	3,811	85%	14%	1%
Wilton	1,386	70%	25%	5%
Region	74,206	60%	36%	4%
State	554,074	61%	31%	8%

Source: NH Office of State Planning; derived by NRPC; some figures may not add to 100% due to rounding.

Table 9 shows a housing market that is dominated by single family homes. Sixty percent of all homes within the Nashua Region and 61% of all homes in the State are single family. The Nashua Region also has a higher but similar percentage (36%) of units that are multi-family as the State (31%). The percentage of housing units that are manufactured is twice as high for the State (8%) than for the region (4%).

TABLE 10

POPULATION PROJECTIONS, 2020

	Projected Population 2020	Population 2000	Projected Net Increase 2000 - 2020	Projected % Increase 2000 - 2020	Projected Annual % Increase 2000 - 2020
Amherst	14,686	10,769	3,917	36%	2%
Brookline	8,279	4,181	4,098	98%	5%
Hollis	11,940	7,015	4,925	70%	4%
Hudson	31,656	22,928	8,728	38%	2%
Litchfield	11,785	7,360	4,425	60%	3%
Lyndeborough	2,427	1,585	842	53%	3%
Merrimack	32,886	25,119	7,767	31%	2%
Milford	17,006	13,535	3,471	26%	1%
Mont Vernon	2,978	2,034	944	46%	2%
Nashua	91,145	86,605	4,540	5%	0%
Pelham	17,285	10,914	6,371	58%	3%
Wilton	4,363	3,743	620	17%	1%
Region	246,436	195,788	50,648	26%	1%
State	1,527,873	1,235,786	292,087	24%	1%

Source: US Census; 2020 projections by NH OSP; derived by NRPC.

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As indicated in Table 10, the New Hampshire Office of State Planning projects that the region will increase by about 50,000 people within the next twenty years, to a total population of 246,436. Nashua's population is projected to exceed 90,000 residents, while both Merrimack and Hudson will top 30,000.

TABLE 11

POPULATION DENSITY, 2000 AND 2020

	Total Area in Square Miles	Persons/ Square Mile 2000	Total Land Area (excludes surface waters acres)	Acres of Land/ Person, 2000 (estimated)	Acres of Land/ Person, 2020 (projected)
Amherst	34.4	313.1	21,692	2.0	1.5
Brookline	20.2	207.0	12,714	3.7	1.5
Hollis	32.2	217.9	20,304	3.0	1.7
Hudson	29.3	782.5	18,338	0.8	0.6
Litchfield	15.3	481.0	9,538	1.4	0.8
Lyndeborough	30.3	52.3	19,261	13.2	7.9
Merrimack	33.5	749.8	20,995	0.9	0.6
Milford	25.5	530.8	16,256	1.3	1
Mont Vernon	16.9	120.4	10,752	5.4	3.6
Nashua	31.7	2732.0	19,797	0.2	0.2
Pelham	26.8	407.2	16,737	1.6	1
Wilton	25.7	145.6	16,375	4.9	3.8
Region	321.8	608.4	202,757	1.1	0.8
State	9282.1	133.1	5,741,965	4.8	3.8

Source: US Census; 2020 Projections by NH OSP; derived by NRPC.

The current population density of the Nashua Region is 1.1 acres per person as demonstrated in Table 11. This is more than four times higher than the State of New Hampshire's 4.8 acres per person. In twenty years, the density of the region will increase to 0.8 persons per acre, while the State's will increase to 3.8.

TABLE 12

LAND USE BY CATEGORY, 2000, IN ACRES

	Residential	Commercial	Industrial	Rec./Cons.	Institutional	Other	Vacant
Amherst	9,487	370	192	2,620	424	1,153	7,716
Brookline	4,793	222	30	1,097	157	417	5,998
Hollis	8,637	212	61	3,805	9	0	7,580
Hudson	8,736	516	1,140	985	888	1,260	4,813
Litchfield	3,782	304	0	1,143	245	1,437	2,627
Lyndeborough	1,737	1	0	328	128	654	16,413
Merrimack	8,223	403	1,129	3,062	193	0	7,985
Milford	4,575	291	353	1,167	216	0	9,654
Mont Vernon	4,581	42	0	1,121	76	781	4,151
Nashua	7,936	1,192	1,128	1,200	1,946	2,187	4,208
Pelham	8,333	457	85	1,754	85	816	5,207
Wilton	4,716	143	278	1,349	316	580	8,993
Region	75,536	4,153	4,396	19,631	4,683	9,285	85,345

Source: NRPC GIS database.

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TABLE 13

LAND USE BY CATEGORY, 2000, PERCENTAGE OF TOTAL ACREAGE

	Residential	Commercial	Industrial	Rec./Cons.	Institutional	Other	Vacant
Amherst	43%	2%	1%	12%	2%	5%	35%
Brookline	38%	2%	0%	9%	1%	3%	47%
Hollis	43%	1%	0%	19%	0%	0%	37%
Hudson	48%	3%	6%	5%	5%	7%	26%
Litchfield	40%	3%	0%	12%	3%	15%	28%
Lyndeborough	9%	0%	0%	2%	1%	3%	85%
Merrimack	39%	2%	5%	15%	1%	0%	38%
Milford	28%	2%	2%	7%	1%	0%	59%
Mont Vernon	43%	0%	0%	10%	1%	7%	39%
Nashua	40%	6%	6%	6%	10%	11%	21%
Pelham	50%	3%	1%	10%	1%	5%	31%
Wilton	29%	1%	2%	8%	2%	4%	55%
Region	37%	2%	2%	10%	2%	5%	42%

Source: **NRPC GIS database.**

Tables 12 and 13 show the land use composition of the region. There are 85,345 (42%) acres within the region that are classified as undeveloped or vacant. The Towns of Lyndeborough (85%), Milford (59%) and Wilton (55%) had the highest percentages of vacant land. The predominant land use is residential, comprising 37% of the region. Approximately 4,153 acres are used for commercial purposes, while 4,396 are being used for industrial. The communities of Nashua (1,192 acres), Hudson (516 acres) and Pelham (457 acres) have the most land used for commercial purposes. Most of the industrial land in the region is equally concentrated among Nashua (1,128 acres), Hudson (1,140 acres) and Merrimack (1,129 acres), the three largest communities.

MAP 3

GENERALIZED LAND USE IN THE NRPC REGION, 2000

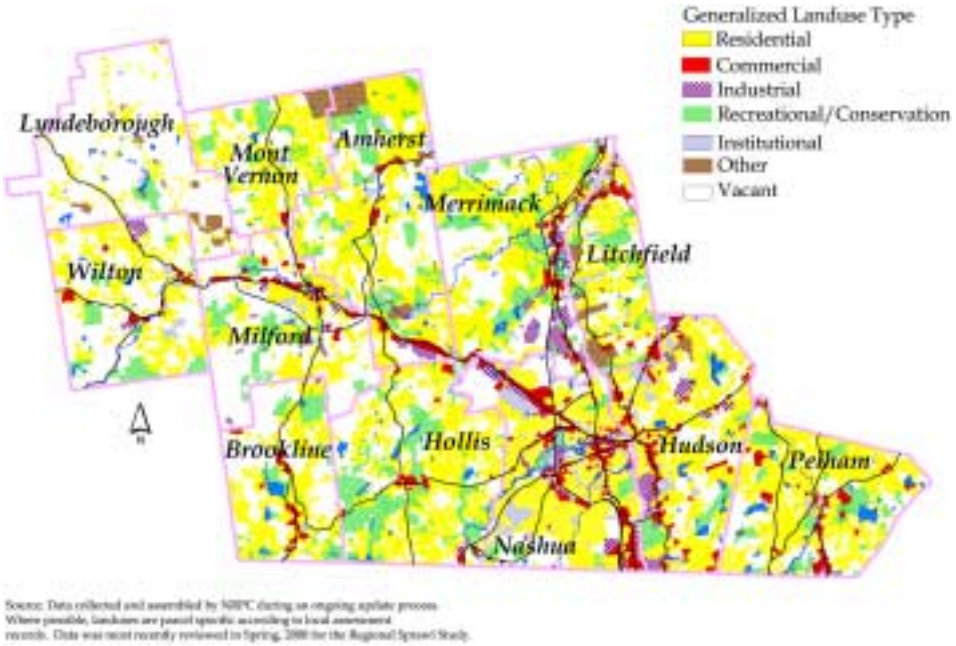


TABLE 14

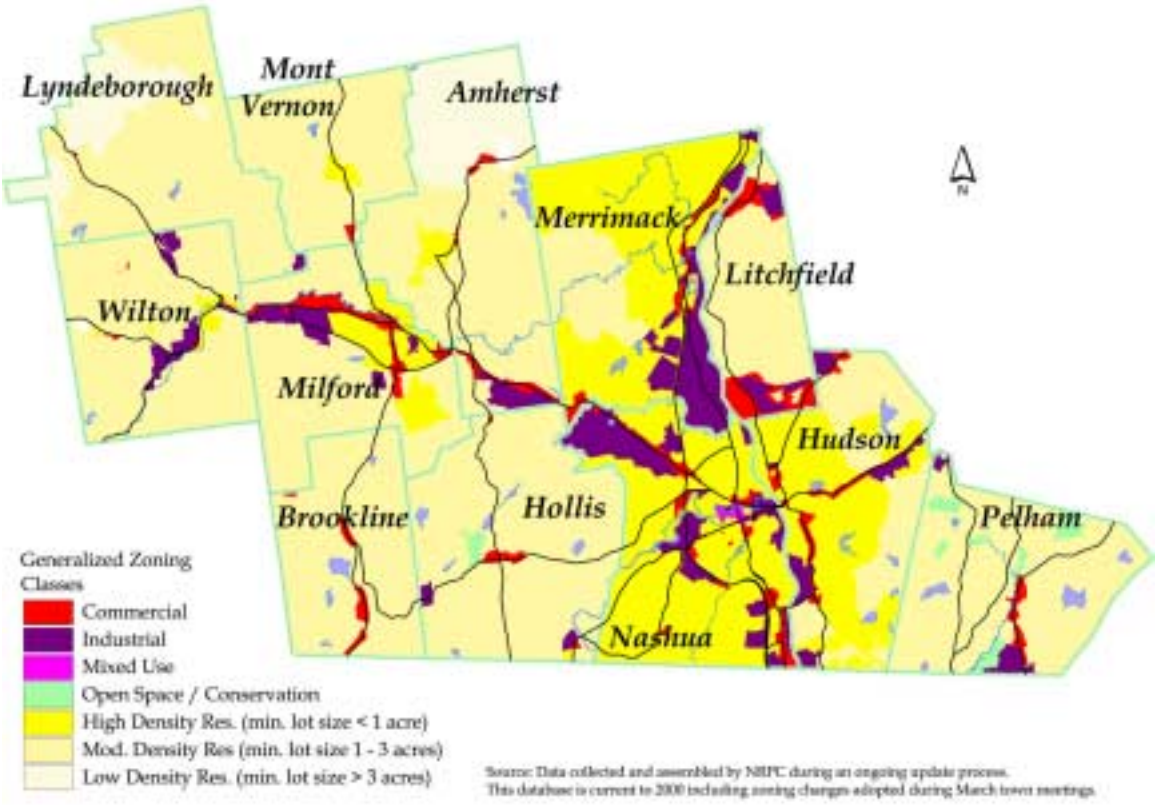
GENERALIZED ZONING, 2000, IN ACRES

	Residential	Commercial	Industrial	Recreational / Conservation	Other
Amherst	20,994	272	603	-	-
Brookline	12,528	396	-	-	-
Hollis	20,182	22	-	47	228
Hudson	16,900	708	1,171	-	-
Litchfield	7,608	1,503	673	-	-
Lyndeborough	19,257	-	112	-	-
Merrimack	17,434	561	3,415	-	-
Milford	14,204	1,144	953	-	-
Mont Vernon	10,761	59	-	-	-
Nashua	15,529	1,003	3,771	-	-
Pelham	15,277	337	518	1,018	-
Wilton	15,524	60	862	-	-
Region	186,198	6,065	12,078	1,065	228

Source: NRPC GIS database.

Table 14 and Map 4 show that most (43%) of the land within the NRPC region is zoned for residential uses. While viewed as being a less intensive use of land, cumulatively low-density housing occupies more land per square foot of space than other types of uses. Taken with the previous table, the vacant land remaining in the region is likely to be converted primarily to residential uses. The data demonstrates that despite the perceived presence of retail and industrial complexes within the region, these uses occupy only a fraction of the land used by predominantly single family development. This perception exists because these uses are generally developed along major roads and are more visually prominent.

MAP 4
GENERALIZED ZONING IN THE NRPC REGION, 2000



Each of these areas has at least one of the characteristics of sprawl: lower density, single use and automobile oriented. However, higher density and mixed uses are found within some of these areas.

- Daniel Webster Highway, South Nashua. This commercial area consists of the largest concentration of retail uses in New England; however, it also includes high-density industrial and residential uses.
- Route 3, Merrimack. This area contains high-density residential, commercial and industrial uses, including the Anheuser-Busch Plant.
- Route 3A, Hudson. This area has evolved into a strip that contains high-density residential, retail and industrial uses.
- Route 101A Nashua. This is a mixed-use strip in Nashua containing high-density business, residential, retail and educational uses.
- Route 101A Merrimack-Amherst. This corridor contains a mix of densities; however, it is generally a lower density commercial area in the Town of Amherst.
- Route 101A Milford-Route 101 Wilton. This corridor, west of the Milford Oval, generally contains lower density commercial uses.

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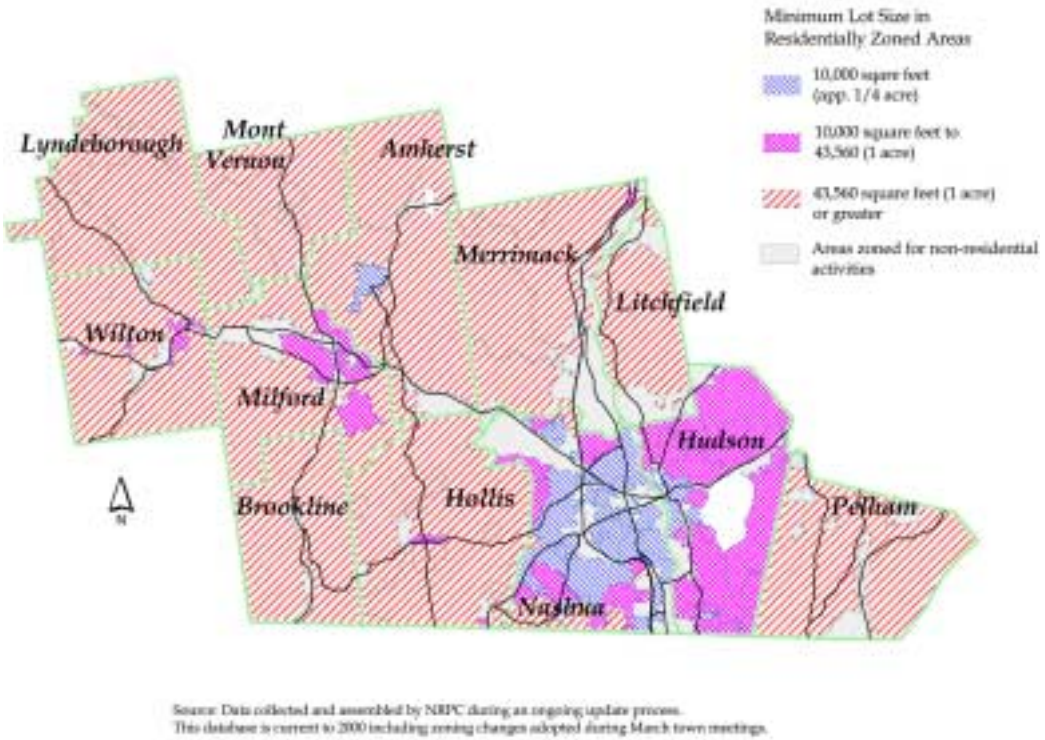
MAP 5
RESIDENTIAL ZONING DENSITIES



Source: Data collected and assembled by NRPC during an ongoing update process.
This database is current to 2000 including zoning changes adopted during March town meetings.

ZONING DENSITIES IN THE NRPC REGION

Community	Most Dense Residential Zoning District	Acres in Most Dense District	Least Dense Residential Zoning District	Acres in Least Dense District
Amherst	1 dwelling unit/2 acres	13,851	1 dwelling unit/5 acres	5,341
Brookline	1 dwelling unit/2 acres	12,528	1 dwelling unit/2 acres	12,528
Hollis	3 dwelling units/acre	46	1 dwelling unit/2 acres	19,573
Hudson	4 dwelling units/acre	985	1 dwelling unit/2 acres	7,335
Litchfield	1 dwelling unit/acre	7,654	1 dwelling unit/acre	7,654
Lyndeborough	1 dwelling unit/2 acres	14,412	1 dwelling unit/5 acres	472
Merrimack	1 dwelling unit/.13 acres	2,579	1 dwelling unit/2.3 acres	5,640
Milford	3 dwelling units/acre (sewered areas)	2,431	1 dwelling unit/2 acres	11,374
Mont Vernon	1 dwelling unit/2 acres	10,761	1 dwelling unit/2 acres	10,761
Nashua	5 dwelling units/acre	1,148	1 dwelling unit/acre	2,355

TABLE 15

NON-RESIDENTIAL ASSESSMENTS, 2000

	Total Equalized Assessed Value 2000	Total Equalized Value of Commercial Property 2000	% Commercial 2000
Amherst	$997,380,772	$113,348,500	11.4%
Brookline	$253,617,400	$11,823,906	4.7%
Hollis	$761,428,703	$52,051,758	6.8%
Hudson	$1,585,848,845	$437,325,000	27.6%
Litchfield	$408,738,442	$31,292,521	7.7%
Lyndeborough	$104,048,079	$1,968,955	1.9%
Merrimack	$1,765,633,898	$419,922,122	23.8%
Milford	$785,899,958	$255,327,849	32.5%
Mont Vernon	$146,107,478	$1,523,080	1.0%
Nashua	$5,578,503,984	$2,042,010,051	36.6%
Pelham	$776,598,501	$86,023,785	11.1%
Wilton	$226,312,943	$30,845,704	13.6%
Region	$13,390,119,003	$3,483,463,232	26.0%
State	$86,703,541,057	$21,958,560,588	26.0%

Source: NH Department of Revenue Administration; NH Dept. of Employment Security-State Occupational Information Committee (SOICC) as listed on NH website; State non-residential assessment is for 1999 by the Dept. of Revenue Administration adjusted to 2000 $;Commercial 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.

Table 15 demonstrates the concentration of commercial activity in the region through the percentage of total local assessments that are from commercial land uses. On average, 26% of all assessed valuation in the region is from commercial land uses, which is slightly lower than the State's 26.0%. Nashua had the highest percentage of total assessment from commercial uses (36/6%), followed by Milford (32.5%), Hudson (27.6%) and Merrimack (23.8%). Brookline, Lyndeborough and Mont Vernon generated less than 5% of their total valuation from commercial uses.

TABLE 16

FACILITIES LOCATED WITHIN TOWN CENTERS, BY COMMUNITY

	Total Facilities Within Town Center	Total Facilities Surveyed	% Within Town Center
Amherst	7	10	70%
Brookline	4	6	67%
Hollis	5	10	50%
Hudson	7	12	58%
Litchfield	*	6	*
Lyndeborough	5	6	83%
Merrimack	8	11	73%
Milford	8	9	89%
Mont Vernon	5	6	83%
Nashua	16	29	55%
Pelham	5	8	63%
Wilton	7	8	88%
Region	77	121	64%

Source: NRPC database, 2000.

A key concept related to "sprawl" is the decentralization of municipal services. Major municipal facilities tend to be located in village centers in traditional New England towns. Map 6 depicts the locations of centers and the location of municipal facilities. For the purposes of this exercise, centers were determined to have at least one of the following characteristics: 1) an area that is located within a historic district; 2) an area that has specific "in-town" or "village" zoning or master plan district; or 3) an area that clearly has a higher density than other portions of the community. For the City of Nashua, the center was defined as the traditional city, located generally east of the Everett Turnpike, north of the Country Club, and south of Greeley Park. Litchfield was the only community for which a center could not be determined.

The survey demonstrates that the majority (64%) of municipal facilities surveyed were located within a town or city center. Some communities exhibited a greater degree of centrality than others, with Milford (89%), Wilton (88%), Lyndeborough (83%), and Mont Vernon (83%) exhibiting the greatest.

TABLE 17

FACILITIES LOCATED WITHIN TOWN CENTERS, BY FACILITY

	Total Facilities Within Town Center	Total Facilities Surveyed	Percentage Within Town Center
Schools (Including Administrative Offices)	30	55	55%
Town Halls	11	12	92%
Police Stations	8	12	67%
Fire Stations	12	17	71%
Libraries	12	13	92%
Post Offices	4	12	33%
Total	77	121	64%

Source: NRPC database, 2000.

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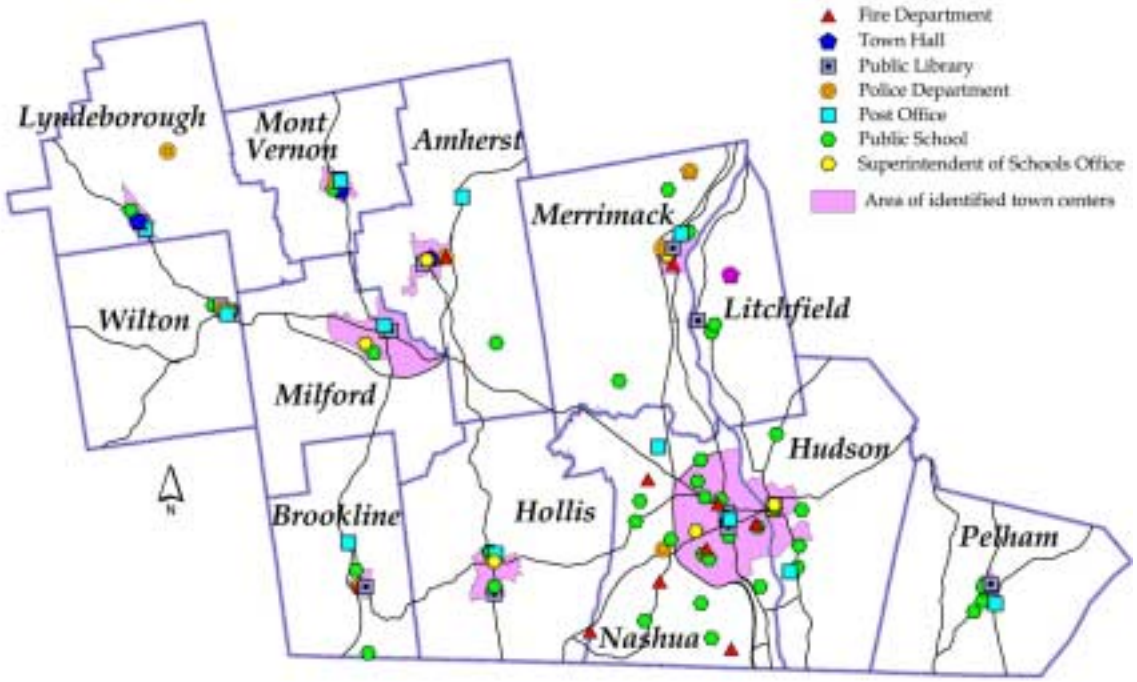
Among the types of facilities surveyed, the vast majority of both town/city halls and libraries (92%) were located within centers. Fire (71%) and police (67%) stations also exhibited a tendency to be located within community centers. Many schools were located outside of a center, due largely to the need to locate elementary and middle schools within neighborhoods. Post offices had the greatest tendency to be located outside of a center, with only 33% located within one.

MAP 6

MUNICIPAL FACILITIES WITHIN TOWN CENTERS



Source: Data collected and assembled for the regional sprawl study project.
6/2000. Location of town centers was determined by NRPC staff and reviewed by local officials, Spring, 2000.

ENVIRONMENTAL IMPACTS

The amount of growth and development in the Nashua Region has had an impact on natural resources. The data in the following section was taken from the 1999 publication *New Hampshire's Changing Landscape* by the Society for the Protection of New Hampshire's Forests and the New Hampshire Chapter of the Nature Conservancy. The data, originally prepared for the entire State, also provided raw data at the municipal level.

The predicted decline in forest area and increasing forest fragmentation in the Nashua region can be expected to adversely affect the habitat of many species of wildlife. In particular, many species of migratory songbirds 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. Decreasing forest area may also adversely impact groundwater recharge, drinking water supplies and the economic viability of forest-based industries, such as forestry and outdoor recreation.

Though the Nashua region cannot be expected to remain as forested as many other parts of the State, it may be possible to guide future growth and development to areas near existing population centers and away from large forest tracts. This could help to minimize future decreases in forest area and forest fragmentation, while encouraging a more compact development pattern.

New Hampshire's Changing Landscape found that the percentage of land in forest cover statewide has decreased from 87% to 83% between 1983 and 1993. By the year 2020, this percentage is expected to decline further to 80%. The greatest loss in forestland is expected to occur within Rockingham and Hillsborough Counties.

TABLE 18

AREA OF FORESTED LAND, 1992/1993

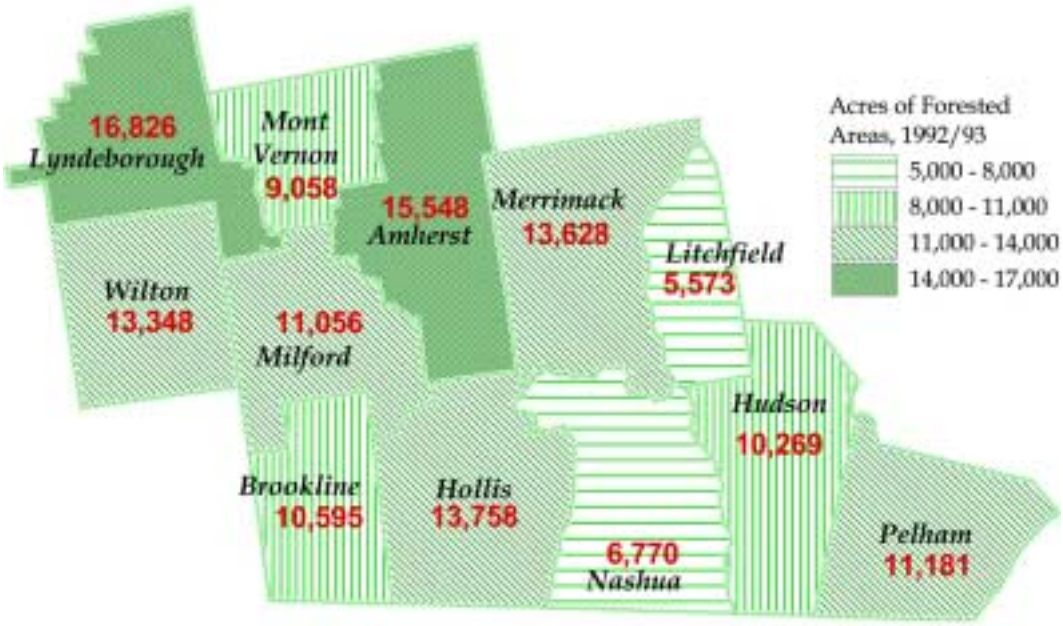
	Total Land Area in Acres	Area of Forest 1992/1993	Percent Forested 1992/1993
Amherst	21,692	15,548	71.7%
Brookline	12,714	10,595	83.3%
Hollis	20,304	13,758	67.8%
Hudson	18,338	10,269	56.0%
Litchfield	9,538	5,573	58.4%
Lyndeborough	19,261	16,826	87.4%
Merrimack	20,995	13,628	64.9%
Milford	16,256	11,056	68.0%
Mont Vernon	10,752	9,058	84.2%
Nashua	19,797	6,770	34.2%
Pelham	16,737	11,181	66.8%
Wilton	16,375	13,348	81.5%
Region	202,757	137,610	67.9%
State	5,741,965	4,790,587	83.4%

Source: Society for Protection of NH Forests and NH Chapter of the Nature Conservancy, NH's Changing Landscape, 1999.

MAP 7
FORESTED AREAS, 1992-1993

Source: Forest Cover Type by Landsat TM data, 1992/93 mapped by UVM Spatial Analysis Laboratory, University of Vermont. Issued 7/98. Data made available to NRPC by SPNHF, 3/00

MAP 8
ACRES OF FOREST, 1992-1993



Source: Forest Cover Type by Landsat TM data, 1992/93 mapped by UVM Spatial Analysis Laboratory, University of Vermont. Issued 7/98. Data made available to NRPC by SPNHF, 3/00

Table 18 and Maps 6 and 7 show that 67.9% of the land within the region is forested, compared with 83.4% of the entire State. Within the region, Lyndeborough has the highest percentage of forested land (87.4%), followed by Mont Vernon (84.2%) and the rapidly growing Brookline (83.3%). As would be expected, the most populated communities had the lowest percentage of forested land. While Nashua has the lowest percentage (34.2%), its proportion of land that is forested was surprisingly high for the State's second largest city. Litchfield has a relatively low percentage (58.4%), primarily due to the vast supply of agricultural resources in that community.

TABLE 19

FOREST BLOCKS GREATER THAN TEN ACRES

	Total Land Area in Acres	Area of Forest Blocks > 10 Acres	Area of Protected Forest Blocks > 10 Acres	% of Land in Forest Blocks > 10 Acres	% of Forest Blocks > 10 Acres Protected
Amherst	21,692	15,637	2,283	72.1%	14.6%
Brookline	12,714	10,795	896	84.9%	8.3%
Hollis	20,304	13,904	2,850	68.5%	20.5%
Hudson	18,338	9,761	810	53.2%	8.3%
Litchfield	9,538	5,588	659	58.6%	11.8%
Lyndeborough	19,261	16,833	1,044	87.4%	6.2%
Merrimack	20,995	13,730	1,538	65.4%	11.2%
Milford	16,256	10,962	1,074	67.4%	9.8%
Mont Vernon	10,752	9,162	1,099	85.2%	12.0%
Nashua	19,797	6,167	685	31.2%	11.1%
Pelham	16,737	10,760	947	64.3%	8.8%
Wilton	16,375	13,239	1,827	80.8%	13.8%
Region	136,538	136,538	15,712	67.3%	11.5%
State	5,741,965	4,799,791	1,210,285	83.6%	25.2%

Source: **Society for Protection of NH Forests and NH Chapter of the Nature Conservancy, NH's Changing Landscape, 1999**

Most of the forested land in the region is in a block that is greater than ten acres in size as demonstrated in Table 19 and Map 9. Within the State of New Hampshire, 25.3% of all forest blocks greater than ten acres are protected; the rate of protection in the Nashua Region is less than half that amount (11.5%). Within the region, not one of the twelve communities has a level of preservation that exceeds the State's percentage. Lyndeborough (6.2%), Brookline (8.3%), Hudson (8.3%) and Pelham (8.8%) have the lowest percentage of such forest blocks in permanent protection.

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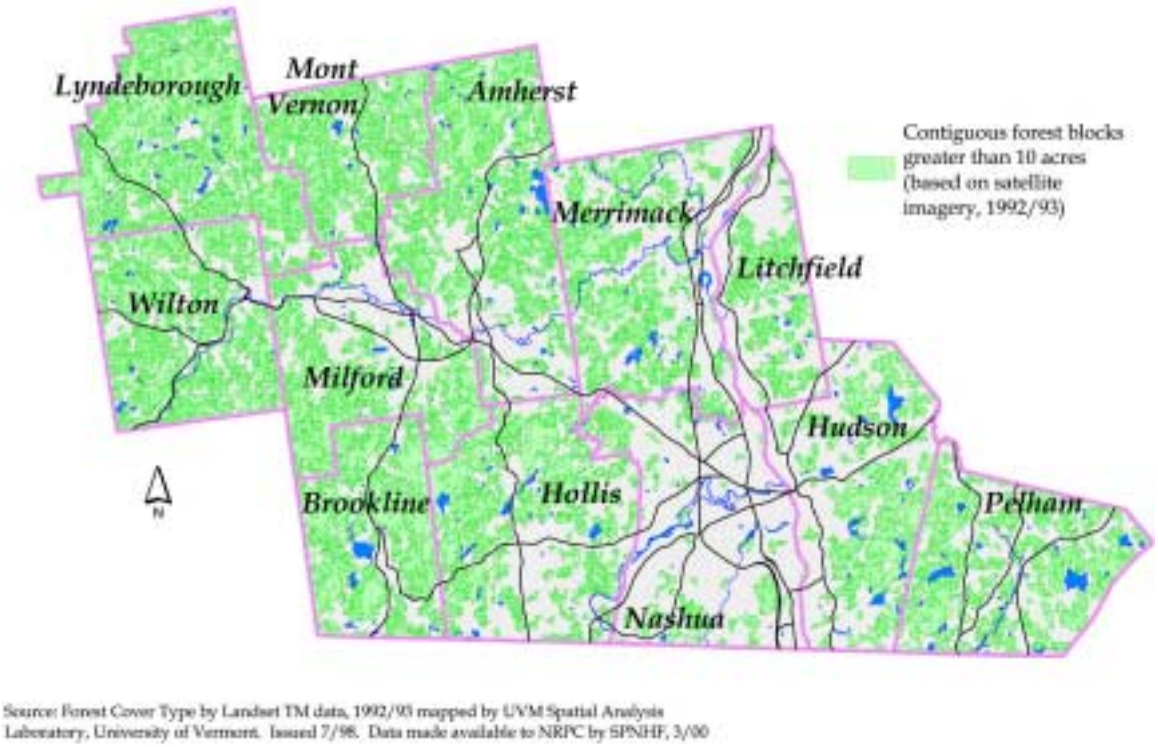
MAP 9
FOREST BLOCKS GREATER THAN 10 ACRES, 1992-1993



Source: Forest Cover Type by Landsat TM data, 1992/93 mapped by UVM Spatial Analysis Laboratory, University of Vermont. Issued 7/98. Data made available to NRPC by SPNHF, 3/00

New Hampshire's Changing Landscape cites forest tracts of 500 acres and greater as being more capable 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 (see Table 20 and Map 10). It is for this reason that 500 acres is used as a threshold indicator of forest health and forest fragmentation in this report. There are a total of 68 such forest blocks within the region, totaling 67,737 acres in area. Every community within the region has at least one forest block of this size, with Nashua (1), Litchfield (2) and Hudson (3) having the lowest total numbers. A total of 67,737 acres in the region are located in forest block greater than 500 acres, which constitutes 33.4% of the land area in the region. This figure is less than half of the proportion of the State's land area (67.6%) that is within forest blocks of this size.

The average size of forest blocks within the region was 219.8 acres, with a median of 81.3 acres; for the State the average size was 1,063.2 acres and the median was 104.8 acres. This suggests that the degree of forest fragmentation is significantly higher in the Nashua Region than in the State.

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TABLE 20

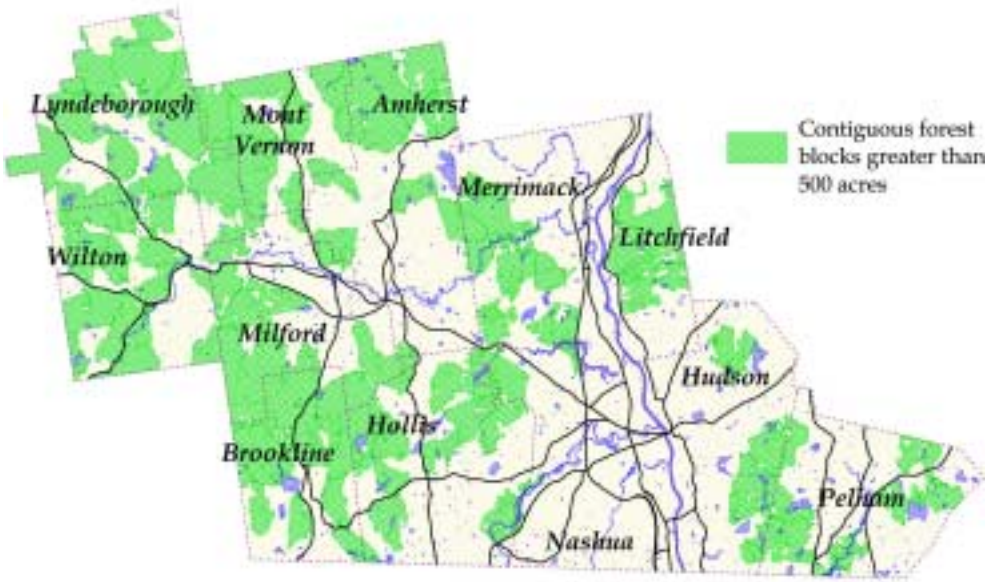
FOREST BLOCKS GREATER THAN 500 ACRES, 1992/1993

	No. of Forest Blocks > 500 Acres	Total Area of Forest Blocks > 500 Acres	% of Total Land Area in Forest Blocks > 500 Acres	Avg. Size of Forest Blocks 1992/1993	Median Size of Forest Blocks 1992/1993
Amherst	5	6,231	28.7%	161.1	49.8
Brookline	6	6,948	54.7%	290.5	88.2
Hollis	10	6,763	33.3%	142.7	73.7
Hudson	3	2,837	15.5%	107.0	38.1
Litchfield	2	3,608	37.8%	124.8	27.1
Lyndeborough	10	12,274	63.7%	322.3	111.8
Merrimack	6	4,932	23.5%	125.5	34.2
Milford	6	6,552	40.3%	193.9	58.3
Mont Vernon	6	5,933	55.2%	320.4	155.1
Nashua	1	733	3.7%	54.9	26.6
Pelham	5	3,118	18.6%	132.4	61.2
Wilton	8	7,806	47.7%	249.5	105.8
Region	68	67,737	33.4%	219.8	81.3
State	1,886	3,882,689	67.6%	1,063.2	104.8

Source: Derived from Society for Protection of NH Forests and NH Chapter of the Nature Conservancy, NH's Changing Landscape, 1999.

MAP 10

FOREST BLOCKS GREATER THAN 500 ACRES



Source: Forest Cover Type by Landsat TM data, 1992/93 mapped by UVM Spatial Analysis Laboratory, University of Vermont. Issued 7/98. Data made available to NRPC by SPNHF, 3/00

TABLE 21

PREDICTED DECLINE IN FOREST LAND AREA, 2020

	Area of Forest in 1992/93 (Acres)	Predicted Decline in Forest Land Area in 2020 (Acres)	Percent Change in Forest Land Area, 1992/93 - 2020
Amherst	15,548	-1,705	-12.3%
Brookline	10,595	-1,704	-19.2%
Hollis	13,758	-2,472	-21.9%
Hudson	10,269	-2,198	-27.2%
Litchfield	5,573	-1,537	-38.1%
Lyndeborough	16,826	-862	-5.4%
Merrimack	13,628	-1,786	-15.1%
Milford	11,056	-1,076	-10.8%
Mont Vernon	9,058	-511	-6.0%
Nashua	6,770	-1,778	-35.6%
Pelham	11,181	-1,886	-20.3%
Wilton	13,348	-567	-4.4%
Region	137,610	-18,081	-15.1%
State	4,790,587	-143,383	-3.1%

Source: Derived from Society for Protection of NH Forests and NH Chapter of the Nature Conservancy, NH's Changing Landscape, 1999.

A model for estimating losses in the amount of forested land by the year 2020 was developed for *New Hampshire's Changing Landscape*. The model showed that the region is expected to lose about 18,000 acres of forested land during this period, a rate five times greater than the State (15.1% vs. 3.1%). Every community within the region is expected to lose forested land at a rate higher than the State's rate of loss. Within the region, the greatest whole number losses are expected in Hollis (-2,472 acres), Hudson (-2,198

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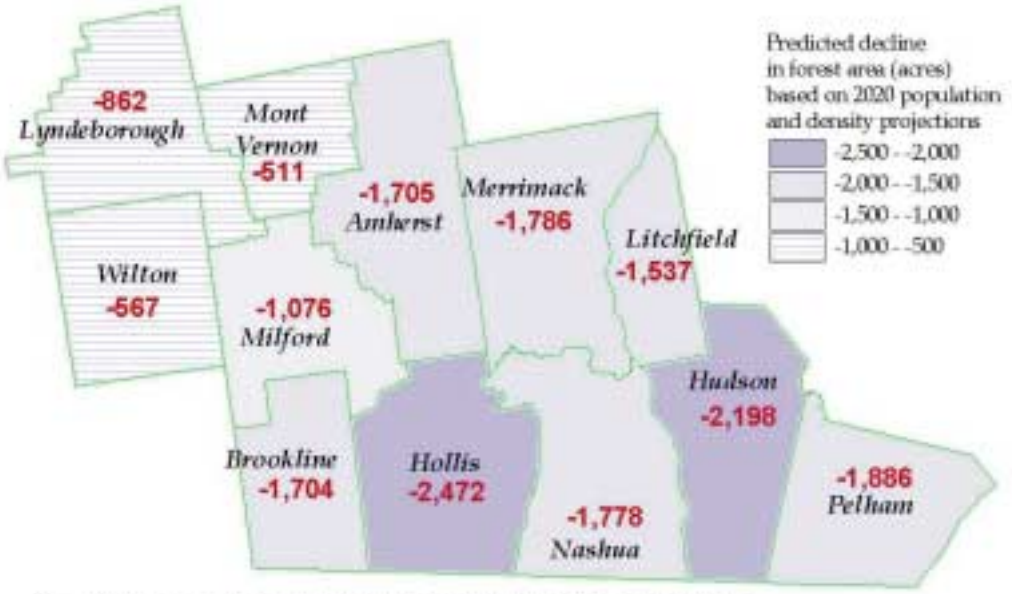
acres) and Pelham (-1,886 acres), while the greatest proportional losses are expected in Litchfield (-38.1% acres) and Nashua (-35.6% acres). This data is included in Table 21 and illustrated on Map 11.

MAP 11

PREDICTED DECLINE IN FOREST LAND BY TOWN



Source: Forest Cover Type by Landsat TM data, 1992/93 mapped by UVM Spatial Analysis Laboratory, University of Vermont. Issued 7/98. Data made available to NRPC by SPNHF, 3/00. Decline in forest area based on population and density projections.

Development has also had an impact on the water resources within the region. There are 714 acres of high value wetlands[1] as defined by the EPA within the Nashua Region (see Table 22 and Map 12). Of these 714 acres, only 22.2% are in permanent protection. This is compared with 27% for the State of New Hampshire as a whole. Within the communities, significant portions of key wetland areas have been placed into permanent preservation.

[1] "High Value Wetlands" are those identified in 1995 by the EPA, which are greater than 10 acres. A ranking system was developed that gave higher scores to those wetlands greater than 50 acres; are adjacent to streams or ponds; surrounded by undeveloped land and within or overlapping protected lands.

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TABLE 22

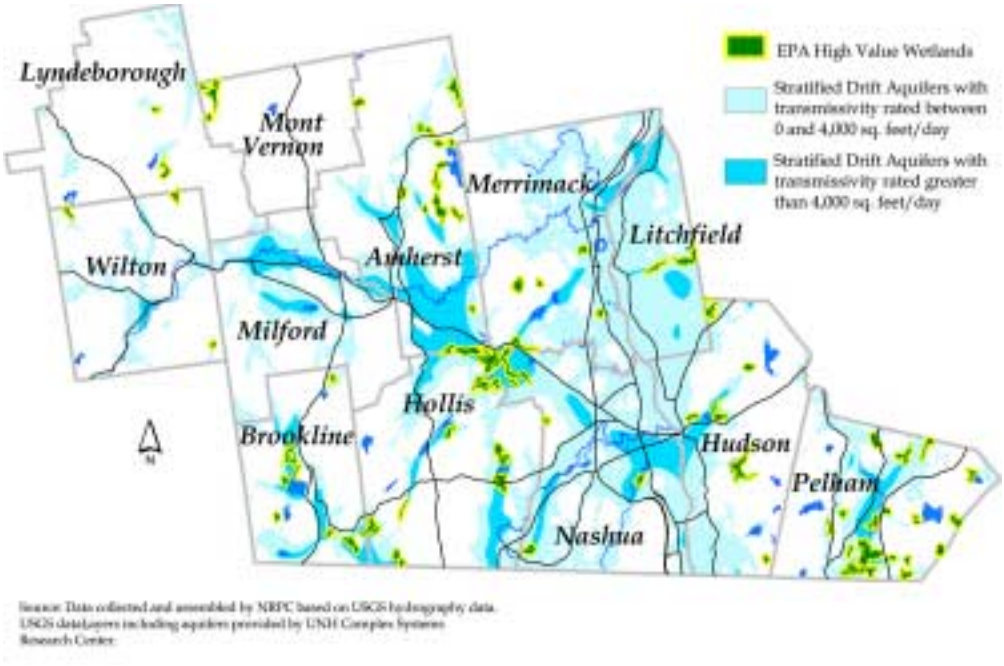
EPA HIGH VALUE WETLANDS

	Total Area of EPA High Value Wetlands in Acres, 2000	Total Area of EPA High Value Wetlands in Acres Protected, 2000	% of Area Protected
Amherst	339.3	98.4	29.0%
Brookline	368.2	67.5	18.3%
Hollis	476.8	189.9	39.8%
Hudson	197.6	20.2	10.2%
Litchfield	106.6	0	0.0%
Lyndeborough	113.4	54.9	48.4%
Merrimack	130.1	51.4	39.5%
Milford	0	0	N/A
Mont Vernon	100.4	0	0.0%
Nashua	203.7	133.7	65.6%
Pelham	588.3	96.7	16.4%
Wilton	1.7	1.7	100.0%
Region	2626.1	714.4	27.2%
State	115,243.7	25,581.4	22.2%

Source: Society for Protection of NH Forests and NH Chapter of the Nature Conservancy, NH's Changing Landscape, 1999

MAP 12

EPA HIGH VALUE WETLANDS



Drinking water protection areas are defined by the NH Department of Environmental Services as those critical areas around surface and groundwater public drinking supplies. The major sources of public drinking water in the Nashua region are Pennichuck Brook, the Merrimack River and numerous wells scattered throughout the region. Table 23 and Map 13 show that a significantly lower percentage of water

supply lands are protected in the Nashua Region (8.7%), compared with the State of New Hampshire (12.7%). Within the region, the greatest amount of protected water supply land is in Hollis with 1,573 acres preserved, followed by Merrimack (1,196 acres) and Nashua (912 acres). In spite of these significant efforts, a remarkably high number of sensitive water supply lands lie in the path of development.

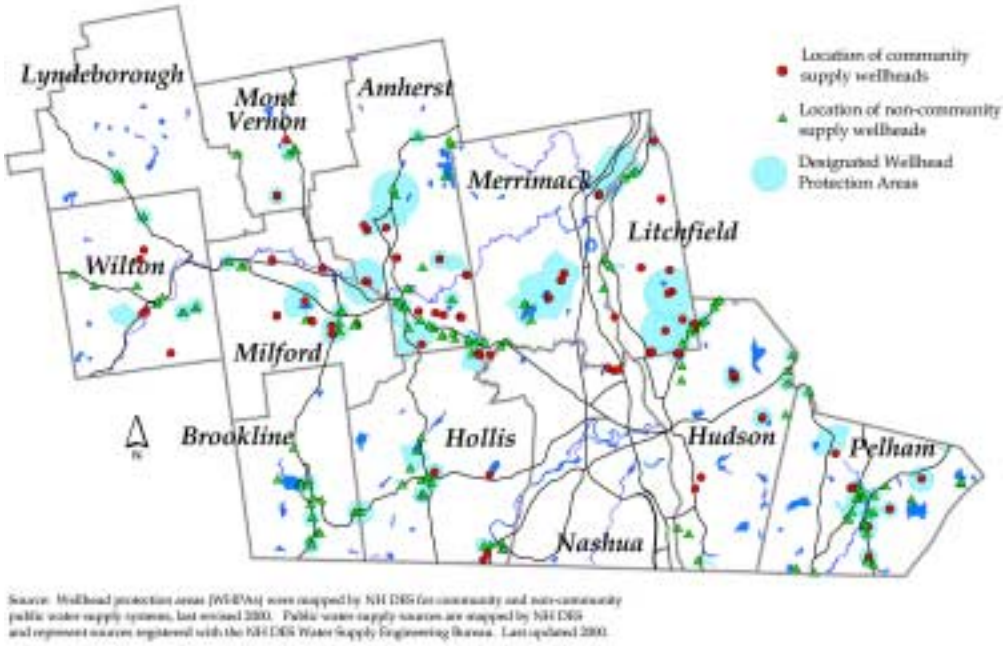
TABLE 23

DRINKING WATER PROTECTION AREAS

	Identified Water Protection Areas (acres)	Permanently Protected Water Supply Land (acres)	Percent Water Supply Land Permanently Protected
Amherst	9,142	560	6.1%
Brookline	4,340	336	7.7%
Hollis	8,061	1,573	19.5%
Hudson	7,522	301	4.0%
Litchfield	8,933	640	7.2%
Lyndeborough	1,665	257	15.4%
Merrimack	13,155	1,196	9.1%
Milford	6,402	631	9.8%
Mont Vernon	507	7	1.3%
Nashua	14,216	912	6.4%
Pelham	7,147	465	6.5%
Wilton	3,803	508	13.4%
Region	84,890	7,384	8.7%
State	570,135	72,322	12.7%

Source: **Society for Protection of NH Forests and NH Chapter of the Nature Conservancy, NH's Changing Landscape, 1999**

MAP 13
DRINKING WATER PROTECTION AREAS, 2000



Source: Wellhead protection areas (WHPAs) were mapped by NH DES for community and non-community public water supply systems, last revised 2000. Public water supply sources are mapped by NH DES and represent sources registered with the NH DES Water Supply Engineering Bureau. Last updated 2000.

TABLE 24
PROTECTED LAND, 2000

	Land Area in Acres	Protected Land Area in Acres	Percent Land Protected
Amherst	21,692	2,543	11.7%
Brookline	12,714	986	7.8%
Hollis	20,304	3,753	18.5%
Hudson	18,338	1,088	5.9%
Litchfield	9,538	849	8.9%
Lyndeborough	19,261	1,141	5.9%
Merrimack	20,995	1,890	9.0%
Milford	16,256	1,612	9.9%
Mont Vernon	10,752	1,247	11.6%
Nashua	19,797	973	4.9%
Pelham	16,737	1,092	6.5%
Wilton	16,375	2,288	14.0%
Region	202,759	19,462	9.6%
State	5,741,965	1,293,696	22.5%

Source: Society for Protection of NH Forests and NH Chapter of the Nature Conservancy, *NH's Changing Landscape*, 1999, NRPC 2001.

A total of 19,462 acres of land are protected from development within the Nashua Region as depicted in Table 24 and on Map 14. Within the region, the communities with the highest percentages of land in preservation are Hollis (18.5%), Wilton (14.0%), Amherst (11.7%) and Mont Vernon (11.6%). The

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communities with the smallest percentages of protected land are Nashua (4.9%), Hudson (5.9%) and Lyndeborough (5.9%). Overall, 9.6% of the region is protected, a significantly lower proportion than the State of New Hampshire's 22.5%. The data demonstrates that while the Nashua Region has experienced growth rates well above the State average, the percentage of land in preservation in the region is considerably lower the State.

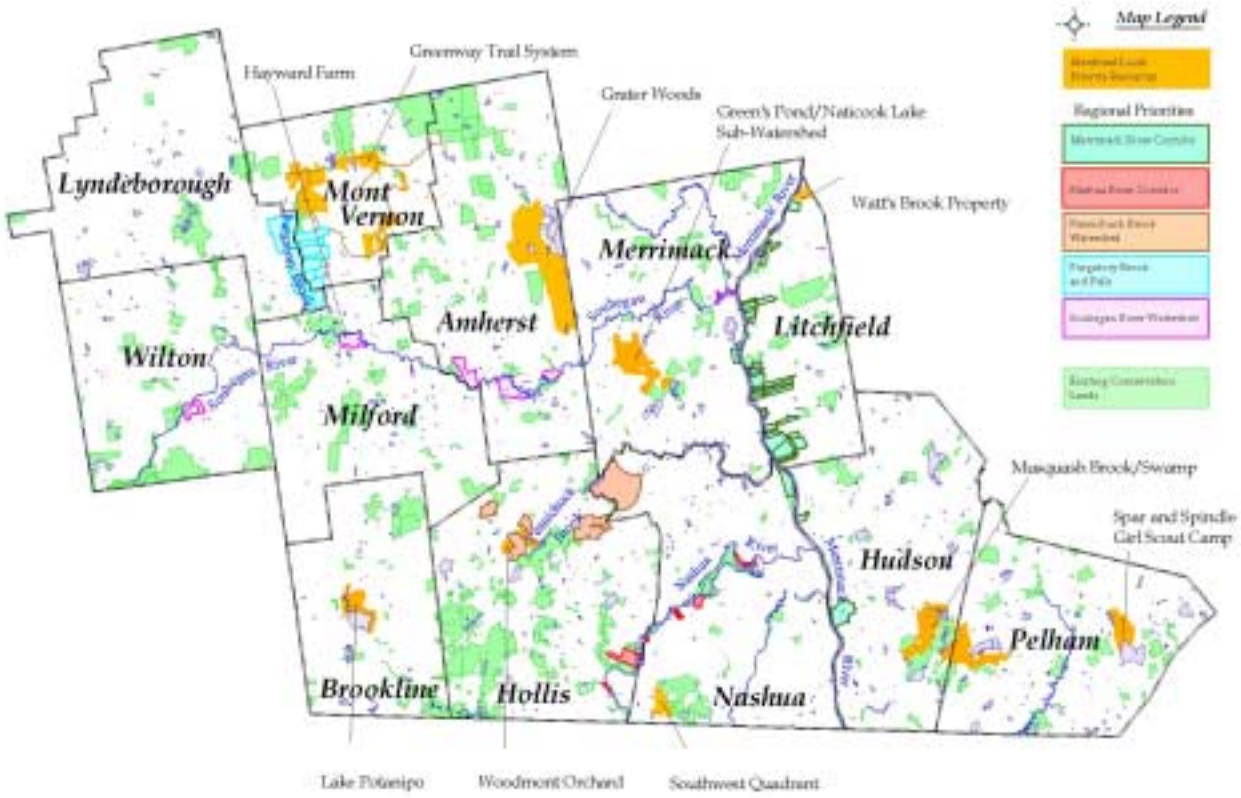
All of the communities in the Nashua Region participated in the Regional Environmental Planning Program, which was funded by the New Hampshire Department of Environmental Services. The program was established in response to Senate Bill 401 and to the Conservation and Reinvestment Act (H.R. 701), which are State and federal programs that will increase financial resources for the purchase of natural and cultural resources.

Through this process, NRPC identified five regional priorities including the Merrimack River, Nashua River, Pennichuck Brook, Purgatory Brook and the Souhegan River corridors. Priorities were established for eleven of the twelve communities in the region.

MAP 14
PROTECTED LANDS, 2000

Source: Protected lands information obtained from UNH Complex Systems Research Center.
Data mapped by SPNHF and NH DSP, updated by NRPC in spring, 2001.

MAP 15
REGIONAL ENVIRONMENTAL PLANNING PROGRAM



TRANSPORTATION IMPACTS

The effects of population growth are also manifested in increases in travel times and delays caused by new traffic. Since a new housing unit can generate up to 10 vehicle trips per day, growth has an exponential impact on the number of vehicle miles traveled. The development of new highways, particularly those that lead to undeveloped areas, is believed to spawn new development and thus increase sprawl. In addition, the costs of highway infrastructure programs can carry hefty price tags, both for construction and for ongoing maintenance.

TABLE 25

STATE AND FEDERAL FUNCTIONAL CLASSIFICATION OF ROADS, 2000, IN MILES

	Nashua Region	State of NH	Nashua Region as % of State of NH
Interstate Highways	0	224	0.0%
Other Freeways and Expressways	11	40	27.5%
Other Principal Arterial	57	632	9.0%
Minor Arterial	85	914	9.3%
Collector	156	2,710	5.8%
Local	985	10,642	9.3%
Total Miles	1,294	15,162	8.5%
Interstate Highways, Freeways and Expressways, Combined	11	264	4.2%

Source: NHDOT, 2000.

Table 25 shows the distribution of the road network within both the State of NH and the NRPC region. As of 2000, the Nashua Region contained 13.6% of the housing units in the State of New Hampshire, but contained 8.5% of the State's road miles. This suggests that the population within the Nashua Region is more densely settled, and requires fewer miles of road.

There are no Interstate Highways in the region and the only limited access roadway is the FE Everett Turnpike, part of the New Hampshire Turnpike System. The Interstate Highways and the Turnpike System represent the limited access roadways within the State. The table shows that when all limited access roadways are combined, the region contains 4.2% of such roads in the State.

TABLE 26

STATE AID ROAD CLASSIFICATION, IN MILES

	1950	1960	1970	1980	1990	2000
Amherst	90.2	92.3	102.6	132.4	135.9	140.2
Brookline	40.6	40.9	40.9	43.7	44.6	61.0
Hollis	81.8	79.4	80.0	86.5	98.2	99.6
Hudson	75.5	78.0	93.1	119.6	134.3	144.8
Litchfield	24.6	24.6	26.3	40.4	62.4	63.1
Lyndeborough	62.6	63.4	63.4	63.5	63.6	63.1
Merrimack	84.1	91.5	107.0	144.5	157.2	161.5
Milford	65.9	66.9	70.6	85.3	93.9	96.9
Mont Vernon	45.4	44.8	44.8	46.9	48.0	48.0
Nashua	149.6	177.1	232.0	258.6	307.2	309.5
Pelham	61.6	63.6	75.7	93.0	105.8	109.9
Wilton	68.2	72.3	72.5	73.7	74.0	72.9
Region	850.2	894.7	1,009.2	1,188.1	1,324.9	1,370.3
State	13,524	13,967	14,792	15,663	16,456	16,887

Source: NH DOT.

TABLE 27

PERCENT CHANGE IN STATE AID ROAD CLASSIFICATION, IN MILES

	1950-2000	1950-1980	1980-2000	1990-2000
Amherst	55.5%	43.5%	5.9%	3.2%
Brookline	50.2%	6.8%	39.7%	36.8%
Hollis	21.7%	9.0%	15.1%	1.4%
Hudson	91.8%	53.2%	21.1%	7.8%
Litchfield	156.8%	64.5%	56.0%	1.1%
Lyndeborough	0.8%	0.2%	-0.6%	-0.8%
Merrimack	91.9%	57.9%	11.8%	2.7%
Milford	46.9%	27.6%	13.5%	3.2%
Mont Vernon	5.7%	4.6%	2.3%	0.1%
Nashua	106.9%	46.0%	19.6%	0.7%
Pelham	78.4%	46.1%	18.2%	3.9%
Wilton	6.9%	2.0%	-1.2%	-1.5%
Region	61.1%	32.8%	15.3%	3.4%
State	24.9%	15.8%	7.7%	2.6%

Source: Previous table.

Tables 26 and 27 show the total classified road mileage in the region and in the State from 1950 to 2000. The data shows that between 1950 and 2000, the total classified road mileage in the Nashua Region increased from 850 to 1370, a 61.1% increase. This was significantly higher than the State's increase of 24.9% during this same time period. The most significant increases in road mileage occurred in Litchfield (156.8%), Nashua (106.9%), Merrimack (91.9%) and Pelham (78.4%). With the exception of Nashua, the communities with the highest population and housing growth rates experienced an increase in classified road mileage greater than the regional average. Since 1980 two communities actually lost classified road mileage, Lyndeborough and Wilton. As would be expected, the data shows that increases in population and housing are generally correlated with increases in classified road mileage.

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Tables 28 through 30 compare New Hampshire to the United States with some key motor vehicle statistics developed by the Federal Highway Administration. The results show that since 1970, increases in motor vehicle registrations in New Hampshire have by far exceeded the national rate of growth. This reflects the lack of major urban centers in the State and its single-family home orientation. As of 1999, there were about 1.0 million automobiles registered in the State, which correlates roughly to one vehicle per person. This is among the highest rates of automobile ownership in the country.

TABLE 28

VEHICLE REGISTRATIONS ISSUED

	New Hampshire	United States
Registrations, 1970	390,500	108,410,000
Registrations, 1980	605,000	155,796,000
Registrations, 1990	945,700	188,655,000
Registrations, 1999	1,050,898	216,308,623
% Change 1970-1999	169.0%	99.5%
% Change 1980 - 1999	73.7%	38.8%
% Change 1990 - 1999	11.1%	14.7%
Yearly Average 1990-1999	1.2%	1.5%

Source: Federal Highway Administration Data provided by the NH Department of Transportation.

TABLE 29

FUEL CONSUMPTION, IN MILLIONS OF GALLONS

	New Hampshire	United States
1970	352	92,329
1980	412	114,960
1990	550	133,677
1999	773	163,690
% Change 1970-1999	120.0%	77.3%
% Change 1980 - 1999	87.6%	42.4%
% Change 1990 - 1999	40.5%	22.5%
Yearly Average 1990-1999	4.5%	2.5%

Source: FHWA Data provided by NHDOT.

TABLE 30

VEHICLE MILES TRAVELED, IN MILLIONS

	New Hampshire	United States
1970	4,436	1,114,098
1980	6,427	1,527,295
1990	9,844	2,147,501
1999	11,894	2,691,335
% Change 1970-1999	168.0%	142.0%
% Change 1980 - 1999	85.1%	76.2%
% Change 1990 - 1999	20.1%	25.3%
Yearly Average 1990 - 1999	2.2%	2.8%

Source: FHWA Data provided by NHDOT.

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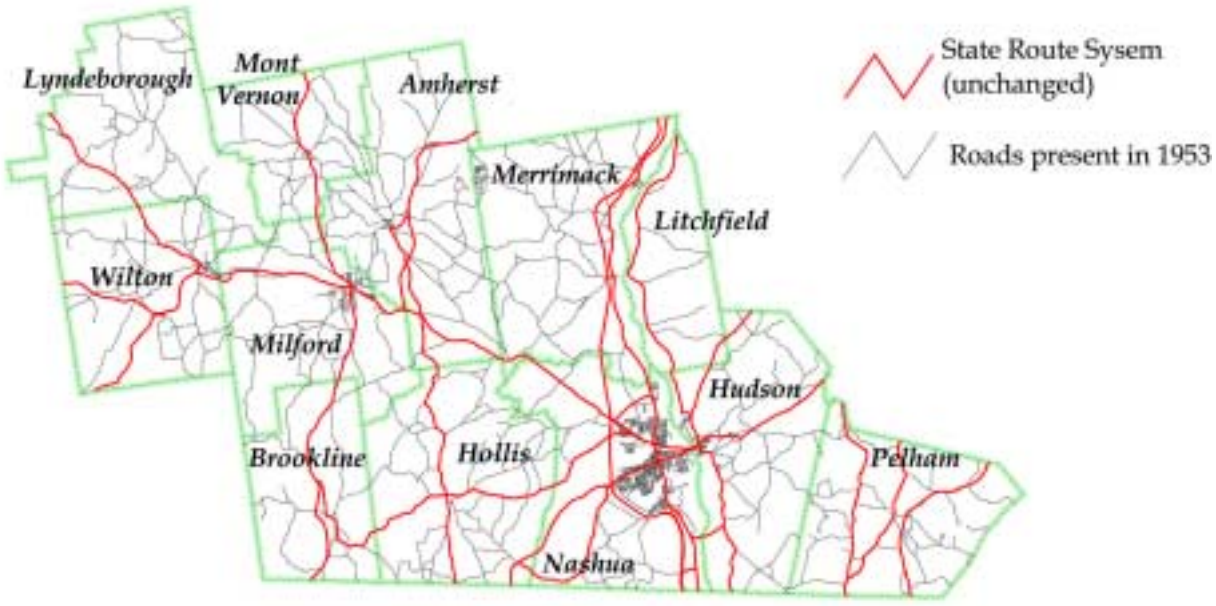
CHANGES IN ROADWAYS 1950S –1990S

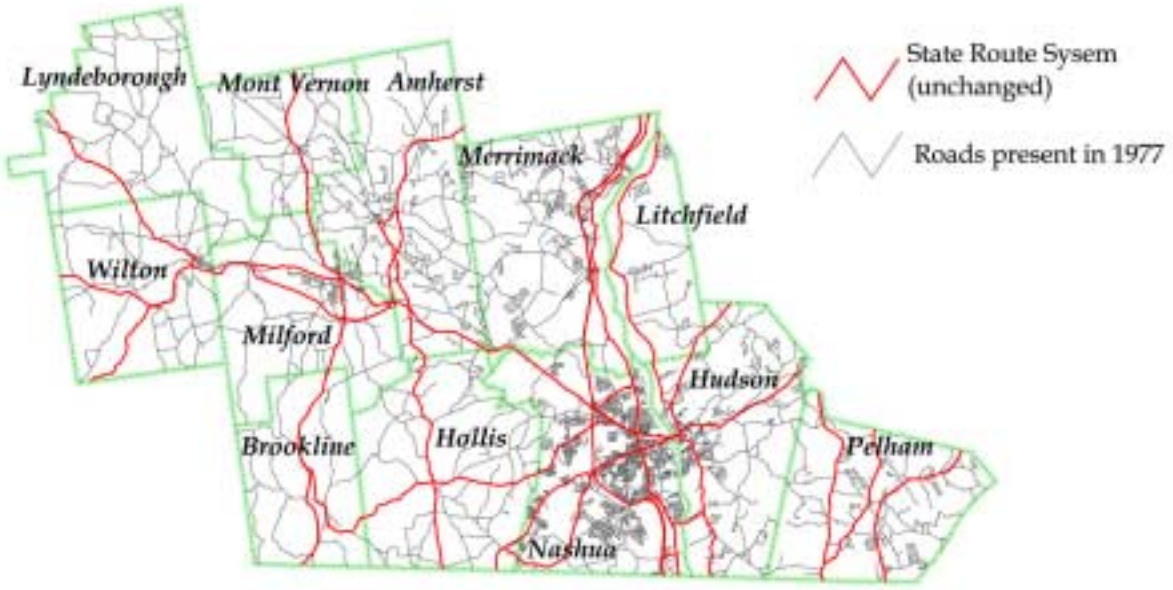
Maps 16, 17 and 18 show the Nashua Region road network during the 1950s, 1970s, and 1990s. The maps demonstrate that outside of the addition of subdivision roads, primarily in the three largest communities of Nashua, Merrimack and Hudson, the development pattern within the region has not changed significantly over the course of the past fifty years. The majority of the new roads in the communities have been local. Roads that are of a higher functional class such as collectors and arterials have not increased significantly in the region. This suggests that the pre-existing roads are experiencing and will continue to experience high degrees of stress associated with increased traffic caused by new subdivisions.

MAP 16
LOCAL OR STATE ROADS, 1950'S



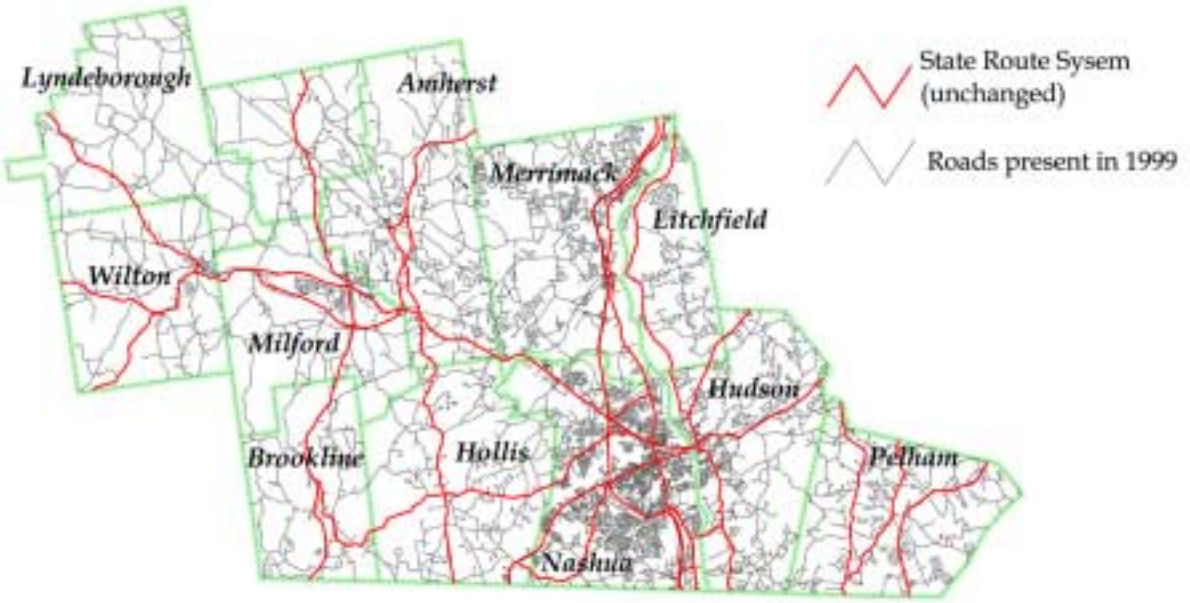
Source: Data collected and assembled for the regional sprawl study project, 6/2000. Local roadbase information was taken from USGS topographic quadrangles. Roads have bn displayed regardless of condition (paved or not paved).

MAP 17
LOCAL OR STATE ROADS, 1970'S



Source: Data collected and assembled for the regional sprawl study project, 6/2000. Local roadbase information was taken from USGS topographic quadrangles. Roads have bn displayed regardless of condition (paved or not paved).

MAP 18
LOCAL OR STATE ROADS, 1990'S



Source: Data collected and assembled for the regional sprawl study project, 6/2000. Local roadbase information was taken from USGS topographic quadrangles. Roads have bn displayed regardless of condition (paved or not paved).

The rate of fuel consumption in New Hampshire since 1970 exceeded national rates of fuel consumption by about 40%. Nationally, the rate of increase in fuel consumption was about 20% less than motor vehicle registrations; however, in New Hampshire, fuel consumption increased was about 50% less than motor vehicle registrations.

When the rates of change in vehicle miles traveled (VMT) are examined, a similar picture emerges. The State of New Hampshire experienced a similar rate of growth in VMT as motor vehicle registrations. On the national level, growth in VMT exceeded the rate of growth for vehicle registrations. Much of this may be due to New Hampshire's small geographic area, with fewer miles of road to travel; however, high vehicle ownership rates demonstrate the automobile-oriented nature of the State.

Growth has resulted in traffic congestion in the region. Table 31 and Map 18 show the most congested road segments in the region. These segments are defined as having a level of service (LOS) "E" or "F". LOS "E" represents operating conditions that are considered at capacity level. Speeds are reduced to a low level with long delays experienced by motorists. LOS “F” is representative of forced flow, congested traffic (stop and go) with excessive delays. Most of these roadways are located primarily in Hudson and Nashua, with one location in Merrimack.

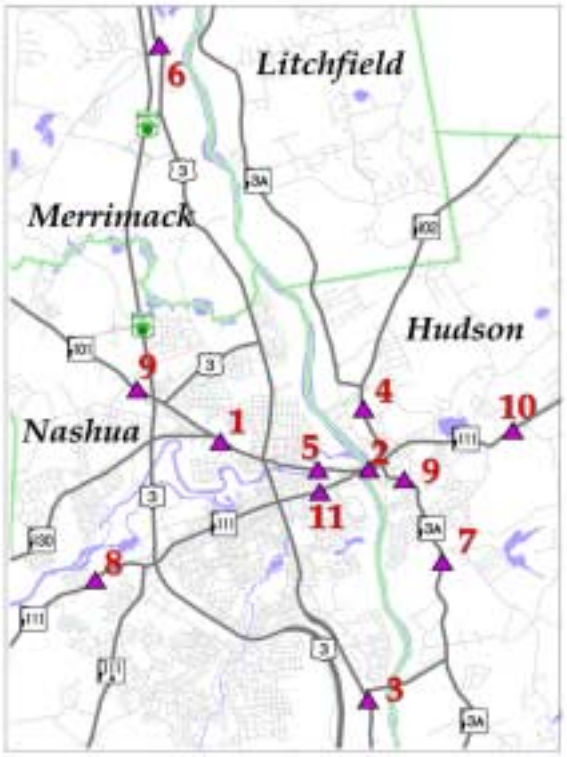
TABLE 31

CONGESTED ROADWAY SEGMENTS IN THE NASHUA REGION

Highway	Location	Existing Count	Trend Analysis Period	Average Yearly Change	Volume / Capacity Ratio	LOS
NH101A	Nashua, e. of NH 130	33,900	1983-97	2.3%	1.20	F
Taylor's Falls Bridge	Nashua-Hudson	40,200	1983-98	2.3%	1.04	F
DW Highway	Nashua, s. of Sagamore Bridge	36,900	1983-98	3.0%	0.99	E
NH102	Hudson, n. of Ledge Road	31,400	1983-99	1.6%	0.90	E
Canal Street	Nashua, at Nashua River	25,080	1983-98	1.1%	0.90	E
US3	Merrimack, n. of Greeley Street	21,800	1990-97	-2.3%	0.81	E
NH3A, Lowell Road	Hudson, s. of Pelham Road	26,900	1983-98	4.3%	0.78	E
NH111 W. Hollis Street	Nashua, w. of Gendron Street	19,900	1983-95	0.9%	0.75	E
NH101A	Nashua, w. of Turnpike	40,900	1983-98	-0.2%	0.72	E
NH3A, Central Street	Hudson, e. of Library Street.	23,500	1989-98	0.1%	0.70	E
NH111 Central Street	Hudson, w. of Kimball Hill Road	23,200	1988-97	0.4%	0.70	E
NH111 E. Hollis St.	Nashua, w. of Allds Street	17,956	1984-99	0.4%	0.64	E

Source: NRPC, TranPlan 2000.

MAP 19
CONGESTED ROADWAY LOCATIONS



Site	Highway	Location
1	NH 101A	Nashua, East of NH 130
2	Taylor's Falls Bridge	Nashua-Hudson
3	DW Highway	Nashua, South of Sagamore Br.
4	NH 102	Hudson, North of Ledge Road
5	Canal Street	Nashua, at Nashua River
6	US 3	Merrimack, North of Greeley Street
7	NH 3A Lowell Road	Hudson, South of Pelham Road
8	NH 111 W. Hollis Street	Nashua, West of Gendron Street
9	NH 101A	Nashua, West of Turnpike
10	NH 3A Central Street	Hudson, East of Library Street
11	NH 111 Central Street	Hudson, West of Kimball Hill Road
12	NH 111 E. Hollis Street	Nashua, West of Alkis Street

Tables 32 through 34 identify and examine changes in Average Daily Traffic (ADT) at several key locations. ADT is defined as the total volume of traffic during a given period of time, divided by the number of days in that time period. To recap from previous tables, the regional percentage change in population between 1970 and 2000 was 3.1% per year. The annualized rate of change for new housing units was 4.4% during this same time period. Regionally, population increased by 14% between 1990 and 2000 (1.4% per year), and housing by 12% (1.2% per year).

TABLE 32
CHANGES IN AVERAGE DAILY TRAFFIC (ADT), SELECTED LOCATIONS
ANNUAL CHANGE IN PARENTHESES

	FEE Turnpike Merrimack	Route 101A Milford	Route 101 Amherst
ADT, 1973	17,292	10,516	6,658
ADT, 1980	22,613	13,915	9,086
ADT, 1990	31,893	24,495	16,163
ADT, 2000	44,217	30,583	19,284
% Change 1973 - 2000	155.7% (5.8%)	190.8% (7.1%)	189.6% (7.0%)
% Change 1980 - 2000	95.5% (4.8%)	119.7% (6.0%)	112.2% (5.6%)
% Change 1990 - 2000	38.6% (3.9%)	24.9% (2.5%)	19.3%(1.9%)

Source: NHDOT permanent count location report.

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The tables demonstrate the extent to which ADT has exceeded population and housing growth in the region. The FEE Turnpike, Route 101A and Route 101 are the major arterials providing access through the region. Since 1973, traffic on the FEE Turnpike in Merrimack has increased by 155.7%, or an annual average rate of 5.8%, with the latest traffic counts recording 44,217 vehicles per day. Route 101A has become increasingly congested in recent years. This route has become a major retail center as well as the primary east-west corridor in the region. Since 1973, Route 101A has increased in ADT by 190.8%, for an annual average of 7.1%, slightly greater than the annual rate of growth in housing units during this time. Similarly, Route 101 in Amherst has experienced a 7.0% annual rate of growth during this time.

TABLE 33

CHANGES IN AVERAGE DAILY TRAFFIC (ADT), SELECTED LOCATIONS

ANNUAL CHANGE IN PARENTHESES

	Taylor's Fall Bridge Nashua	Sagamore Bridge Hudson	NH 111 Hudson
ADT, 1973	20,496	5,500	6,280
ADT, 1980	31,337	11,234	9,826
ADT, 1990	37,490	22,735	13,912
ADT, 2000	37,163	34,435	15,158
% Change 1973 - 2000	81.3% (3.0%)	526.1% (19.5%)	141.4% (5.2%)
% Change 1980 - 2000	18.6% (0.9%)	206.5% (10.3%)	54.3% (2.7%)
% Change 1990 - 2000	-0.9% (0.1%)	51.5% (5.1%)	9.0% (0.9%)

Source: NHDOT permanent count location report; ADT is a seven-day average throughout the entire year.

The Taylor's Falls Bridge and the Sagamore Bridge (Table 33) are the only two Merrimack River crossings in the region. Since 1973, traffic on the Taylor's Falls Bridge has nearly doubled from 20,496 to 37,163. This constitutes an increase of 81.3% during this time, or 3.0% per year. Since 1990, ADT on Taylor's Falls Bridge has decreased by approximately 1%. The Sagamore Bridge opened in 1973 as the second bridge crossing connecting Nashua with Hudson. Since it has opened, traffic volumes have increased from 5,500 per day to 34,435, a percentage gain of 526.1%, or 19.5% annually. Traffic on Route 111 in Hudson has also increased at a rate that exceeded new housing units during this time.

TABLE 34

CHANGES IN AVERAGE DAILY TRAFFIC (ADT), SELECTED LOCATIONS

ANNUAL CHANGE IN PARENTHESES

	US 3 Merrimack	NH 13 Brookline	Route 3A Litchfield-Hudson Town Line
ADT, 1970	6,868	2,037	2,228
ADT, 1980	8,071	3,408	3,654
ADT, 1990	12,554	6,224	6,381
ADT, 2000	13,178	8,226	7,773
% Change 1970 - 2000	91.9% (3.1%)	303.8% (10.1%)	248.9% (8.3%*)
% Change 1980 - 2000	63.3% (3.0%)	141.4% (7.1%)	112.7% (5.6%)*
% Change 1990 - 2000	5.0% (0.5%)	32.2% (3.2%)	21.8% (2.2%)*

Source: NHDOT permanent count location report; ADT is a seven-day average throughout the entire year;
***Rte. 3A figures are derived from 1969, 1981, 1989 and 1998 data.**

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Table 34 shows that US 3 in Merrimack has increased in traffic volume at a rate that was slightly lower than the rate of housing unit growth during the same period of time. NH 13 in Brookline and Route 3A in Litchfield at the Hudson Town line are both rural roads that have seen significant increases in traffic, with 303.9% and 248.9% increases in ADT since 1970.

It should be noted that the percentage change in annual ADT has been decreasing since 1970. This is occurring due to the fact that many of the roads surveyed are at or have exceeded capacity, resulting in the need for drivers to find alternate routes.

TABLE 35

AVERAGE DAILY TRAFFIC (ADT), PROJECTED

	State of NH	Nashua Region	FEE Tpk, Merrimack (N. Exit 10)	Rte. 101A Milford (W of Oval)	Taylor's Falls Bridge	Sagamore Bridge	NH 13, Brookline / Milford
2000	21,050,500	4,295,241	51,094	21,671	46,957	27,883	10,086
2010	24,217,692	5,191,188	53,179	24,026	31,791	29,918	11,407
2020	28,090,000	5,927,133	61,117	26,334	30,141	32,690	13,295
% Change 2000 - 2010	15.0%	20.9%	4.1%	10.9%	-32.3%	7.3%	13.1%
% Change 2000 - 2020	33.4%	38.0%	19.6%	21.5%	-35.8%	17.2%	31.8%
Annual % Change, 2000 - 2020	1.7%	1.9%	1.0%	1.1%	-1.8%	0.9%	1.6%

Source: Projections by NRPC; with data from NH DOT. This table includes "action scenarios" that assume the complete construction of the Broad Street Parkway, completed Everett Turnpike Widening, Partial Build Circumferential Highway, and completed Albuquerque Avenue in Litchfield.

ADT projections were performed using NRPC's regional traffic model, which forecasts rates of traffic growth based on expected changes in land uses (Table 35). The table demonstrates that both the Nashua Region and the State of New Hampshire are expected to experience significant increases in ADT, growing by 38.0% and 33.4% within the next twenty years. The model anticipates the construction of major highway projects such as the Circumferential Highway, which will have the effect of reducing ADT on the Taylor's Falls Bridge; however, traffic volumes are expected to increase significantly (21.5%) at the Milford Oval and along Route 13 (31.8%) at the Brookline / Milford town line. In 2020, 13,295 vehicles per day will be expected on Route 13, which shows the extent to which roads that are currently rural will transform into regional arterial roads within this time period.

STATE TRANSPORTATION EXPENDITURES

Tables 36 and 37 show the extent of funds expended for State level transportation improvements in the Nashua Urbanized Area. Both tables show funds programmed for a five-year period. An assumption is being made that the two five year programming cycles added together will equal the equivalent of a ten-year funding program, which is the current program cycle. These do not include local highway projects. Table 36 shows a total of $85,039,350 for the 1985-1989 cycle, $267,861,000 for the 1990 – 1994 cycle, for a total of $352,900,350 programmed over the ten year period. It is important to note that these are funds for projects that are programmed, however, many projects have been deferred or dropped. Therefore, these tables do not show the costs of projects actually constructed. It is also important to note

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that prior to the ISTEA legislation passed in the early 1990's, financial constraints analyses were not required by the State in transportation planning.

TABLE 36

STATE TRANSPORTATION EXPENDITURES IN THE NASHUA URBANIZED AREA 1985-1994

Program	Nashua Urbanized Area 1985-1989	Nashua Urbanized Area 1990-1994	Nashua Urbanized Area 1985-1994 (Combined)
Federal Aid Primary	$20,187,200	$40,360,000	$60,547,200
Federal Aid Secondary	$2,562,000	$850,000	$3,412,000
Urban Systems	$5,900,000	$0	$5,900,000
Bridge Replacement	$1,455,000	$2,230,000	$3,685,000
Hazard Elimination	$0	$0	$0
Rail-Highway Crossings	$175,000	$0	$175,000
Turnpike Improvements	$53,900,000	$186,659,000	$240,559,000
UMTA	$775,150	$1,762,000	$2,537,150
State Local	$85,000	$36,000,000	$36,085,000
Total	$85,039,350	$267,861,000	$352,900,350

Source: Derived from Nashua Area Transportation Improvement Programs, 1985 and 1990, by NRPC. " Nashua Urbanized Area" includes the communities of Amherst, Hollis, Hudson, Litchfield, Merrimack, and Nashua. Figures provided include projects that were included on the "Governor's Ten-Year Highway Plan" for 1990, or that received a "High Priority" from the State in the 1985 TIP.

TABLE 37

STATE TRANSPORTATION EXPENDITURES IN THE NASHUA REGION, 2001-2010

Program	NRPC Region 2001-2010	State of NH 2001-2010	NRPC Region as Percent of State Total
National Highway Program	$12,750,000	$345,900,000	3.7%
Surface Transportation Program	$25,900,000	$299,700,000	8.6%
Betterment Program	$240,000	$77,570,000	0.3%
Turnpike System	$126,870,000	$287,370,000	44.1%
CMAQ	$3,940,000	$81,320,000	4.8%
Transportation Enhancements	$500,000	$33,330,000	1.5%
Federal Transit Administration	$12,000,000	$75,000,000	16.0%
Other	$15,410,000	$598,410,000	2.6%
Total	$197,610,000	$1,798,600,000	11.0%

Source: Derived from New Hampshire Department of Transportation, State Ten-Year Transportation Improvement Program, 2000; "Other" includes Metropolitan Planning; TEA 21 "High Priority projects", State aid (bridges); Interstate maintenance. For NRPC region portion of statewide projects, total was divided by 9 (representing 9 planning regions). Includes only those projects published in first draft to legislature.

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Growth has significant costs for the State of New Hampshire, particularly with expenses associated with its transportation infrastructure. Approximately 1.8 billion dollars are programmed for transportation projects in the most recently adopted Ten-Year Plan. In the Nashua Region, $197,610,000 is programmed, with the vast majority (64%) funded through the Turnpike System. While the Nashua Region is one of the fastest growing areas and contains about 13% of the housing units within the State, it receives 11% of the entire State's transportation funding.

TABLE 38

2001-2010 STATE TEN-YEAR TRANSPORTATION IMPROVEMENT PROGRAM BY MUNICIPALITY

Municipality	Total ST TIP Dollars	% of Regional Total
Amherst	$5,867,000	3.1%
Brookline	$0	0.0%
Hollis	$934,000	0.5%
Hudson	$44,249,000	23.7%
Litchfield	$22,950,000	12.3%
Lyndeborough	$0	0.0%
Merrimack	$43,306,000	23.2%
Milford	$6,387,000	3.4%
Mont Vernon	$0	0.0%
Nashua	$60,502,000	32.5%
Pelham	$880,000	0.5%
Wilton	$1,350,000	0.7%
Regional Total	$186,425,000	0%

Source: **Derived from NHDOT State Ten-Year Transportation Improvement Program, 2000. For multi-community projects, the total project amount was divided by the number of communities.**

On the municipal level, most of the transportation dollars programmed in the current Ten-Year Plan are concentrated among the largest communities, Nashua (32.5%), Hudson (23.7%), and Merrimack (23.2%).

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MAP 20
TRANSPORTATION PROJECTS IN THE NASHUA REGION

As shown on Map 20, the following are major transportation projects that are either planned or recently constructed:

1. **Circumferential Highway.** The Circumferential Highway is intended to link Route 111 with a new Exit 9 at the Everett Turnpike. It is intended to divert traffic away from downtown Nashua and central Hudson, making those centers more livable. $137,000,000.
2. **Broad Street Parkway**. The Broad Street Parkway is intended to provide a more efficient link from downtown Nashua to the Everett Turnpike. The project also is the centerpiece of the City's alternative transportation network, with bicycle lanes that will connect to existing paths and trails. $36,500,000.
3. **Route 3 Widening.** This project is being planned by the Massachusetts Highway Department. Currently the two-lane highway is among the most congested in New England, partly due to its need to accommodate about 25,000 Nashua region workers who commute to Massachusetts. $320,000,000. NH recently completed a $200,000,000 widening of the Everett Turnpike in Nashua, which terminates at Route 3, and includes a new Exit 2 that connects the Sagamore Bridge with the Everett Turnpike.
4. **Commuter Rail to Boston.** Commuter rail is currently planned as an extension of the Massachusetts Bay Transit Authority (MBTA) service which terminates in Lowell. A location near Exit 2 is anticipated, in order to capture as many commuters as possible. $21,500,000 for track upgrades.
5. **Route 101A Improvements.** Funds have been programmed into for yet-to-be-identified improvements between the Everett Turnpike and Route 101. These funds are to be used for access management strategies and bicycle and pedestrian amenities. $17,000,000.
6. **Lowell Road Widening.** The Town of Hudson has recently approved bonds to widen Route 3-A in the vicinity of the Sagamore Bridge. The widening is necessary to accommodate more traffic from Exit 2. $586,600.

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FISCAL IMPACTS

The following section examines changes in municipal budgets over time. Specifically, highway, school, fire and police budgets were reviewed to determine the extent to which changes over time have correlated with proportional changes in housing units. Local operating budgets during the years 1960, 1970, 1980, 1990 and 2000 were examined, and then adjusted for inflation into 2000 dollars. Note that the tables showing actual budget numbers (unadjusted for inflation) are located in Appendix A.

Local highway expenditures represent the portion of the municipal budget dedicated to highway projects, as shown in Table A-1 in the appendix. These are limited primarily to repair and maintenance projects. In 1960, the total of all community highway budgets in the Nashua Region was slightly more than $1 million dollars. In 2000 this figure had increased fifteen-fold to over $15 million.

TABLE 39

TOTAL HIGHWAY BUDGETS, IN 2000 DOLLARS, BY MUNICIPALITY

	1960	1970	1980	1990	2000
Amherst	$172,071	$402,048	$521,992	$645,017	$1,168,520
Brookline	$42,373	$57,028	$141,303	$160,352	$290,620
Hollis	$133,926	$212,207	$609,358	$928,006	$713,467
Hudson	$421,082	$780,271	$1,012,536	$2,090,835	$2,203,232
Litchfield	$14,265	$34,931	$150,934	$285,796	$342,897
Lyndeborough	$103,268	$94,844	$173,720	$213,283	$279,485
Merrimack	$215,231	$564,776	$1,610,528	$2,215,924	$1,948,521
Milford	$129,652	$192,845	$445,926	$806,464	$775,297
Mont Vernon	$58,002	$54,401	$206,891	$302,618	$240,316
Nashua	$4,005,479	$7,363,271	$7,252,162	$8,934,060	$8,471,496
Pelham	$206,296	$283,533	$548,849	$638,851	$444,695
Wilton	$214,101	$287,793	$387,282	$363,737	$305,681
Region	$5,715,746	$10,327,948	$13,061,481	$17,584,943	$17,186,227

Sources: Previous table, with inflation adjustments provided through *www.westegg.com/inflation*.

Table 39 shows highway budgets in 2000 dollars. The results show that when adjusted for inflation, municipal highway budgets have increased from an estimated $5 million to over $17 million. Between 1990 and 2000, many highway budgets actually decreased, when adjusted for inflation.

TABLE 40

TOTAL HIGHWAY BUDGETS, IN 2000 DOLLARS, PERCENTAGE CHANGE VARIOUS YEARS

	1960-2000	1960–1980	1980-2000	1990-2000
Amherst	579%	203%	124%	81%
Brookline	586%	233%	106%	81%
Hollis	433%	355%	17%	-23%
Hudson	423%	140%	118%	5%
Litchfield	2304%	958%	127%	20%
Lyndeborough	171%	68%	61%	31%
Merrimack	805%	648%	21%	-12%
Milford	498%	244%	74%	-4%
Mont Vernon	314%	257%	16%	-21%
Nashua	446%	81%	17%	-5%
Pelham	116%	166%	-19%	-30%
Wilton	43%	81%	-21%	-16%
Region	201%	129%	32%	-2%

Sources: Previous table, with inflation adjustments provided through *www.westegg.com/inflation*.

Table 40 shows the percentage change in highway budgets, adjusted for inflation during various time periods. Between 1960 and 2000, the municipal highway budgets for all of the region's communities increased by 201%. Within the region, the greatest increases during this time period were experienced in Litchfield (2,304%), Merrimack (805%), Brookline (586%) and Amherst (579%). Since 1990, highway budgets have actually decreased by 2% within the region as a whole. The three greatest decreases in highway budgets were found in Pelham (-30%), Hollis (-23%) and Mont Vernon (-21%). Decreases in highway expenditures may be due to in-fill development resulting in fewer new roadways being constructed.

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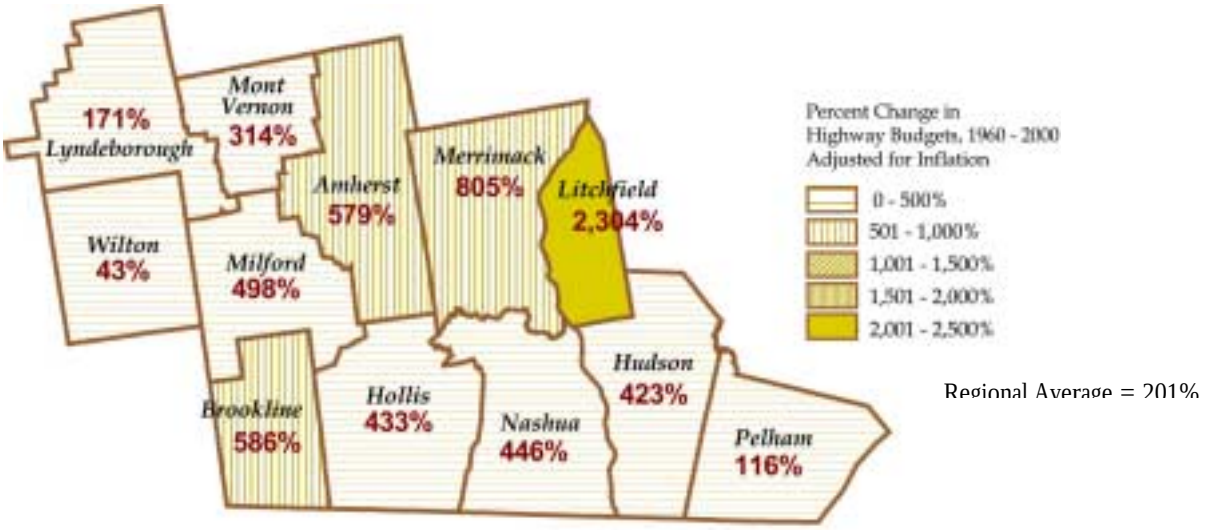
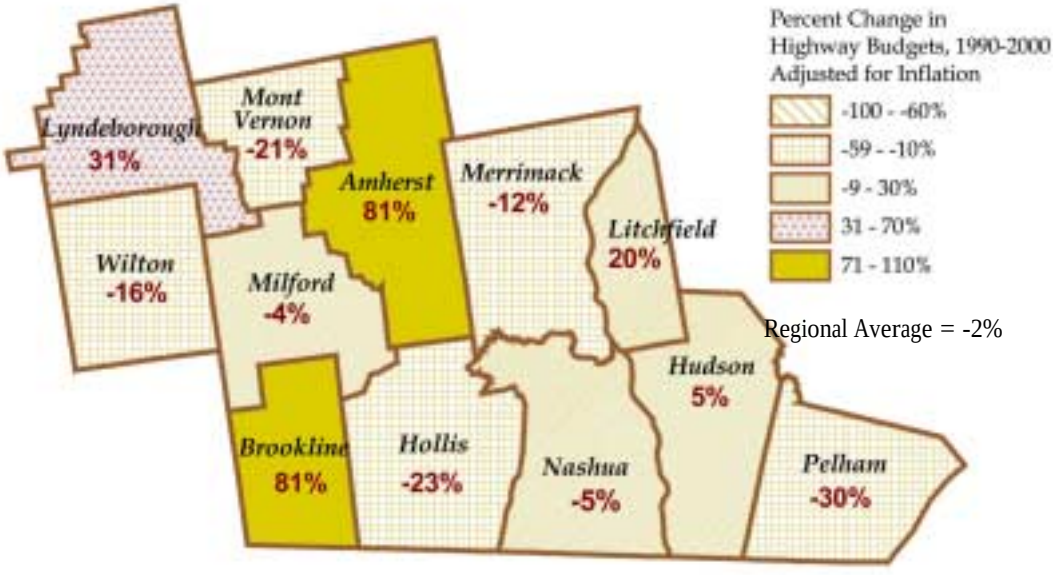
MAP 21
PERCENT CHANGE IN HIGHWAY BUDGETS, 1960-2000
ADJUSTED FOR INFLATION



Regional Average = 201%

Source: Data collected by NRPC based on local reports. Inflation adjustment provided through www.westegg.com/inflation

MAP 22
PERCENT CHANGE IN HIGHWAY BUDGETS, 1990-2000
ADJUSTED FOR INFLATION



Regional Average = -2%

Source: Data collected by NRPC based on local reports. Inflation adjustment provided through www.westegg.com/inflation

TABLE 41

TOTAL SCHOOL BUDGETS, IN 2000 DOLLARS, BY MUNICIPALITY

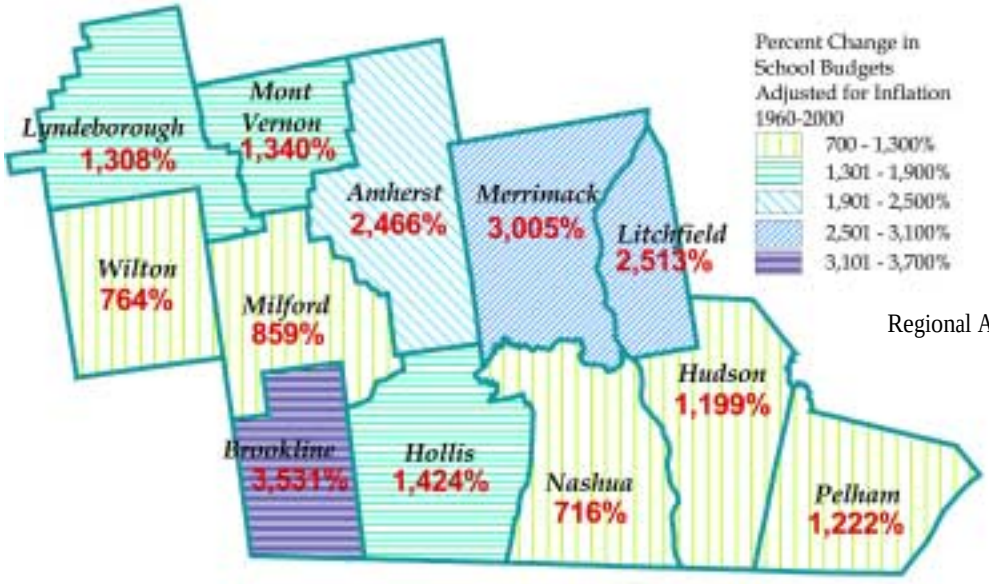
	1960	1970	1980	1990	2000
Amherst	$869,923	$5,948,067	$9,036,894	$12,560,895	$22,319,869
Brookline*	$333,608	$1,187,636	$1,520,503	$3,575,166	$12,113,740
Hollis*	$967,450	$3,028,605	$5,747,205	$10,168,460	$14,742,716
Hudson	$2,113,197	$8,231,082	$13,381,938	$23,450,321	$27,453,874
Litchfield	$375,382	$862,685	$3,452,802	$7,250,015	$9,807,305
Lyndeborough*	$283,829	$279,786	$541,717	$1,559,268	$3,997,577
Merrimack	$1,172,365	$6,441,698	$16,812,974	$25,787,901	$36,407,778
Milford*	$2,212,436	$6,994,620	$6,086,907	$15,655,330	$21,214,711
Mont Vernon*	$230,455	$1,743,224	$1,190,468	$2,726,397	$3,317,920
Nashua	$12,415,322	$34,218,015	$48,178,593	$71,181,553	$101,254,107
Pelham	$941,345	$4,951,298	$7,213,429	$10,092,818	$12,441,859
Wilton*	$956,112	$1,680,931	$2,268,779	$3,152,674	$8,258,394
Region	$22,871,424	$75,567,647	$115,432,209	$187,160,798	$273,331,850

Sources: **Previous table, with inflation adjustments provided through www.westegg.com/inflation.**

*** Towns with cooperative school districts were apportioned budgets based on enrollment.**

Table 41 shows local expenditures for schools since 1960 adjusted for inflation into 2000 dollars. Table A-2 in the Appendix shows actual school budgets for all of the municipalities. Regionally, in 1960, the total amount spent on local school budgets was about $4 million dollars. In 2000, this figure increased to over $270 million dollars. When adjusted for inflation, the differential in spending for schools between 1960 and 2000 is still dramatic. The 1960 school budget total for the Nashua region adjusted to 2000 dollars was about 23 million. Based on this, school budgets increased 1,095% over the 40-year period. Not surprisingly, the greatest percentage increases were in the fastest growing communities: Brookline (3,531%), Merrimack (3,005%), Litchfield (2,513%) and Amherst (2,466%). In all cases, the rate of increase since 1960 exceeded the rate of increase in housing units.

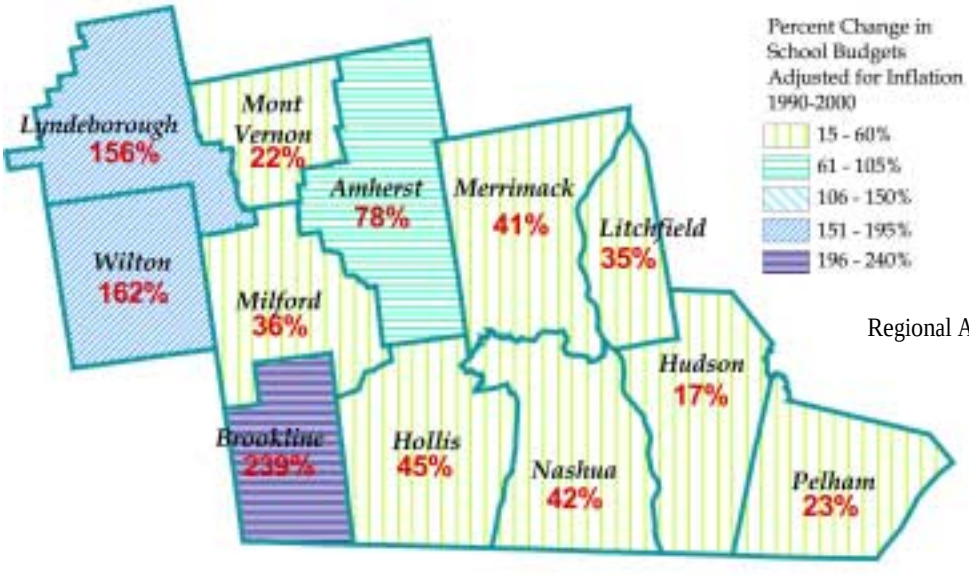
MAP 23
PERCENT CHANGE IN SCHOOL BUDGETS, 1960-2000



Regional Average = 1095%

Source: Data collected by NRPC based on local reports. Inflation adjustment provided through www.westegg.com/inflation

MAP 24
PERCENT CHANGE IN SCHOOL BUDGETS, 1990-2000



Regional Average = 46%

Source: Data collected by NRPC based on local reports. Inflation adjustment provided through www.westegg.com/inflation

TABLE 42

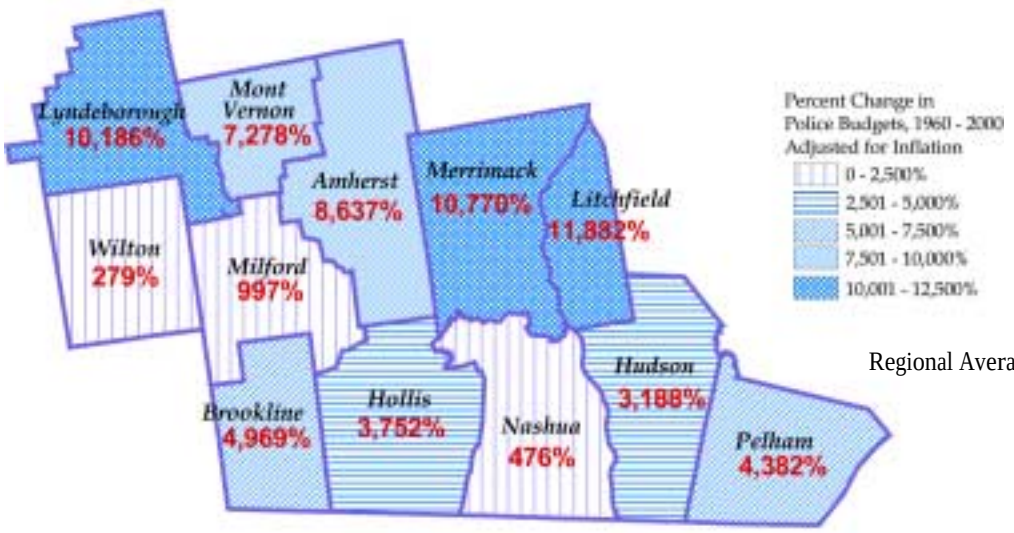
LOCAL POLICE BUDGETS, IN 2000 DOLLARS, BY MUNICIPALITY

	1960	1970	1980	1990	2000
Amherst	$9,826	$162,011	$532,638	$713,977	$858,530
Brookline	$7,155	$37,625	$47,096	$183,352	$362,711
Hollis	$16,017	$100,047	$226,734	$544,481	$616,988
Hudson	$91,781	$603,848	$1,051,815	$2,234,634	$3,017,472
Litchfield	$5,432	$17,298	$163,001	$402,448	$650,913
Lyndeborough	$999	$4,337	$18,222	$59,615	$102,760
Merrimack	$25,631	$318,528	$1,662,787	$2,359,391	$2,786,278
Milford	$127,433	$283,715	$488,186	$1,118,219	$1,397,671
Mont Vernon	$2,242	$6,006	$29,963	$93,684	$165,430
Nashua	$1,901,754	$4,606,304	$7,477,810	$11,729,920	$10,970,798
Pelham	$26,978	$234,109	$605,911	$1,038,804	$1,209,068
Wilton	$60,187	$94,576	$155,935	$239,459	$228,137
Region	$2,275,435	$6,468,404	$12,460,098	$20,717,984	$22,366,756

Source: Municipal Annual Reports, compiled by NRPC.

As demonstrated in Table 42, and on Map 25, when police budgets are adjusted for inflation, there was an 883% rate of change region wide since 1960. Again, the most significant increases were found within the fastest growing communities: Litchfield (11,883%) Merrimack (10,771%), and Amherst (8,637%). This rate of change has leveled off with each decade since 1960, decreasing to 80% during the period of time between 1980 and 2000. Since 1990, the rate of change has leveled to 8%. Between 1990 and 2000, the percentage change in police budgets adjusted for inflation actually decreased in Nashua (-6%) and Wilton (-5%) (also see Table A-5 in Appendix A).

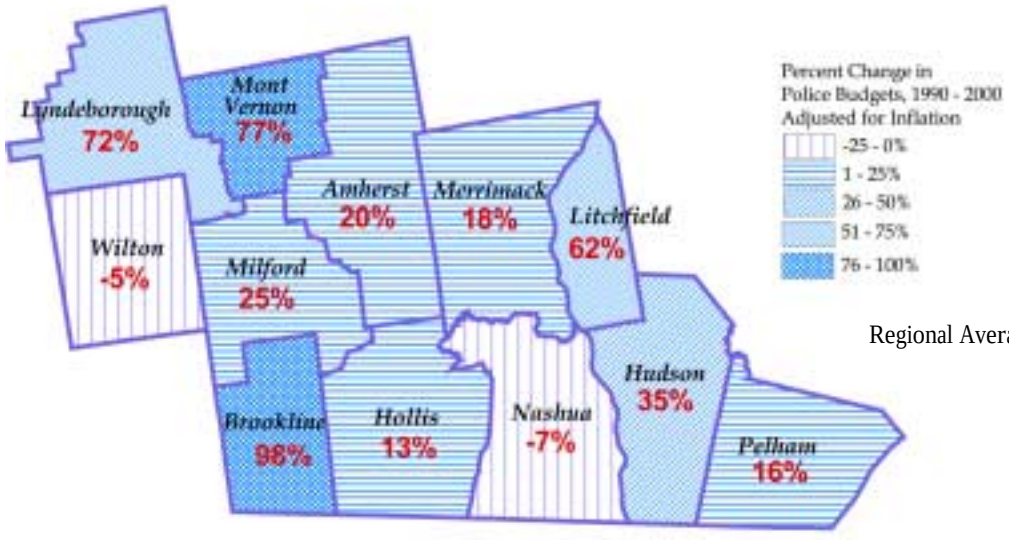
MAP 25
PERCENT CHANGE IN POLICE BUDGETS, 1960-2000



Regional Average = 883%

Source: Data collected by NRPC based on local reports. Inflation adjustment provided through www.westegg.com/inflation

MAP 26
PERCENT CHANGE IN POLICE BUDGETS, 1990-2000



Regional Average = 8%

Source: Data collected by NRPC based on local reports. Inflation adjustment provided through www.westegg.com/inflation

Table 43 shows increases in municipal fire budgets by Town adjusted to 2000 dollars; actual budgets are depicted in Table A-6 in Appendix A. In 2000, all of the communities in the Nashua area combined had budgeted $16.7 million for fire services. When adjusted for inflation, there was a 496% increase regionally since 1960 (see Map 25). With each decade, the rate of change appears to be decreasing. Between 1990 and 2000, as depicted on Map 26, when adjusted for inflation, there was a 3% decrease region-wide. This was due primarily to the City of Nashua's 19% decrease during this time. The data shows that like the highway and police budgets, there appears to be a leveling off in the rate of change that could possibly be attributed to the establishment of a critical mass associated with increased population, coupled with decreasing crime rates in the 1990s.

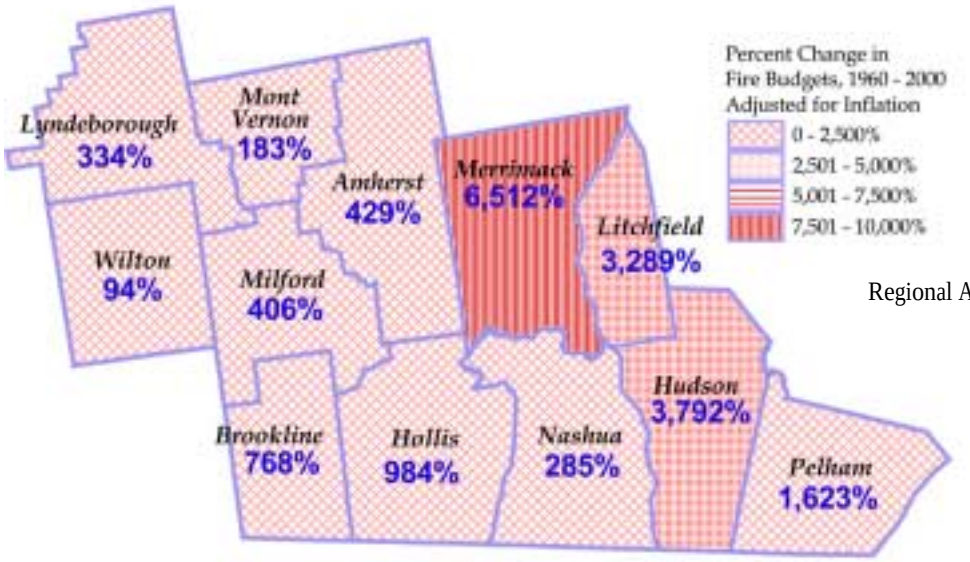
TABLE 43

TOTAL FIRE BUDGETS, IN 2000 DOLLARS, BY MUNICIPALITY

	1960	1970	1980	1990	2000
Amherst	$37,774	$80,304	$153,881	$225,753	$199,814
Brookline	$11,503	$17,819	$46,110	$29,663	$99,820
Hollis	$24,496	$56,483	$70,670	$163,619	$265,610
Hudson	$73,830	$124,775	$652,202	$2,521,087	$2,873,780
Litchfield	$10,739	$6,959	$44,489	$147,083	$363,983
Lyndeborough	$8,719	$13,814	$16,937	$31,480	$37,810
Merrimack	$38,230	$114,668	$1,077,631	$1,760,170	$2,527,581
Milford	$70,156	$283,715	$137,946	$242,750	$355,128
Mont Vernon	$7,600	$9,508	$18,089	$27,123	$21,525
Nashua	$2,463,227	$3,653,003	$5,438,029	$11,729,920	$9,478,764
Pelham	$25,677	$55,626	$119,311	$255,203	$442,345
Wilton	$35,149	$55,780	$51,217	$63,334	$68,074
Region	$2,807,100	$4,472,454	$7,826,512	$17,197,185	$16,734,234

Source: NRPC from municipal annual reports. Inflation adjustments using http://www.westegg.com/inflation.

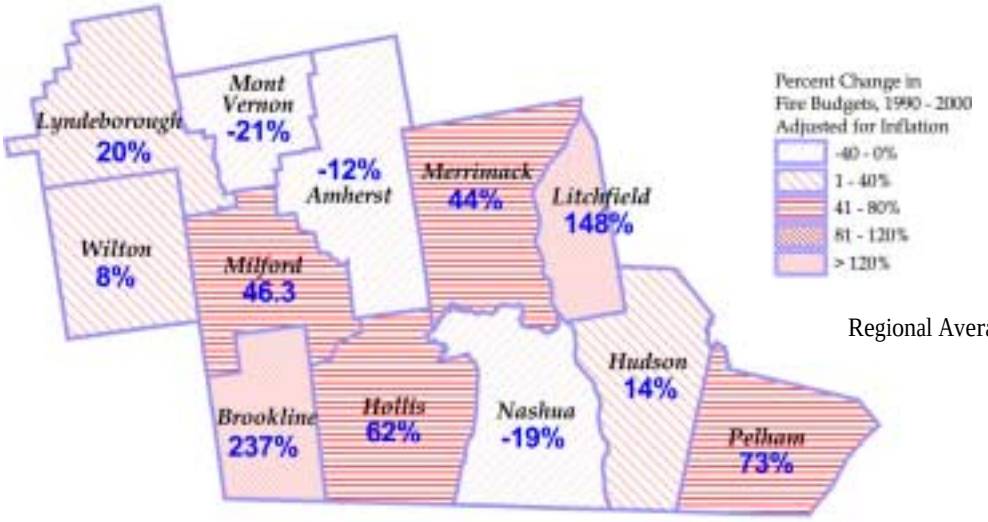
MAP 27
PERCENT CHANGE IN FIRE BUDGETS, 1960-2000



Regional Average = 496%

Source: Data collected by NRPC based on local reports. Inflation adjustment provided through www.westegg.com/inflation

MAP 28
PERCENT CHANGE IN FIRE BUDGETS, 1990-2000



Regional Average = -3%

Source: Data collected by NRPC based on local reports. Inflation adjustment provided through www.westegg.com/inflation

Table 44 examines the total of school, highway, fire and police budgets for all municipalities in the Nashua Region between 1960 and 2000, adjusted for inflation. These budgets have increased in adjusted dollars from 33.6 million dollars in 1960 to 329.6 million dollars in 2000. When adjusted for inflation, the percentage change between 1960 and 2000 regionally was 880% (see Map 29). Within the region, the communities with the highest rates of change during this time were Brookline (3,159%),Merrimack (2,909%) and Litchfield (2,651%).

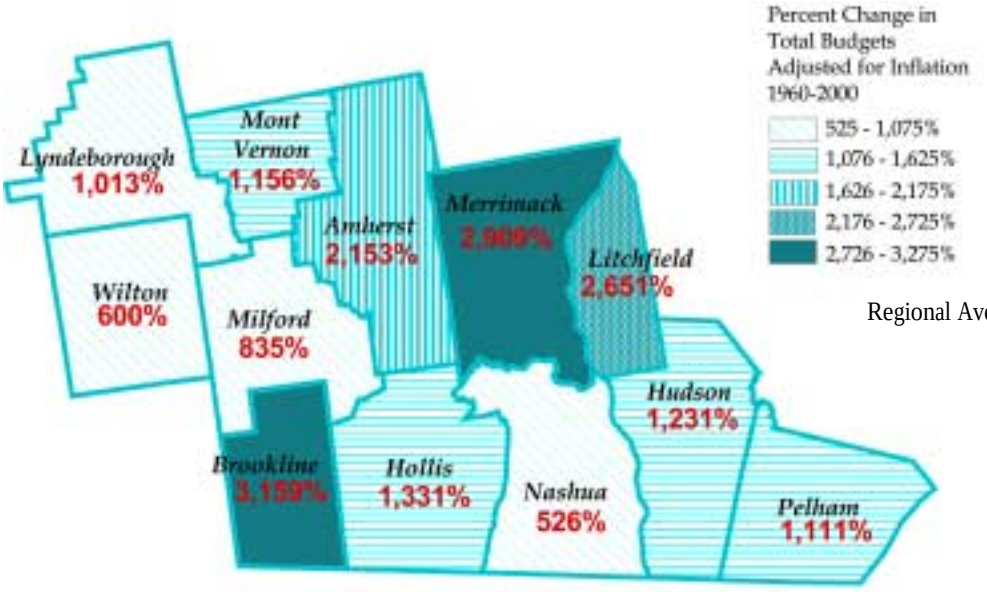
TABLE 44

TOTAL BUDGETS, INCLUDING SCHOOLS, IN 2000 DOLLARS, BY MUNICIPALITY

	1960	1970	1980	1990	2000
Amherst	$1,089,593	$6,592,431	$10,245,406	$14,145,642	$24,546,733
Brookline	$394,811	$1,300,109	$1,755,012	$3,948,533	$12,866,891
Hollis	$1,141,889	$3,397,342	$6,653,957	$11,804,566	$16,338,781
Hudson	$2,669,890	$9,739,977	$16,098,491	$30,296,877	$35,548,358
Litchfield	$405,818	$921,872	$3,811,226	$8,085,342	$11,165,098
Lyndeborough	$396,813	$392,780	$750,595	$1,863,645	$4,417,632
Merrimack	$1,451,458	$7,439,669	$21,163,920	$32,123,387	$43,670,158
Milford	$2,539,676	$7,754,894	$7,158,965	$17,822,764	$23,742,807
Mont Vernon	$298,299	$1,455,832	$1,445,411	$3,149,822	$3,745,191
Nashua	$20,785,782	$49,830,593	$68,346,594	$103,963,478	$130,175,165
Pelham	$1,200,296	$5,524,566	$8,487,501	$12,025,676	$14,537,967
Wilton	$1,265,550	$2,119,081	$2,864,447	$3,819,204	$8,860,286
Region	$33,641,835	$96,471,116	$148,783,505	$243,050,926	$329,617,067

Source: **Derived from previous tables.**

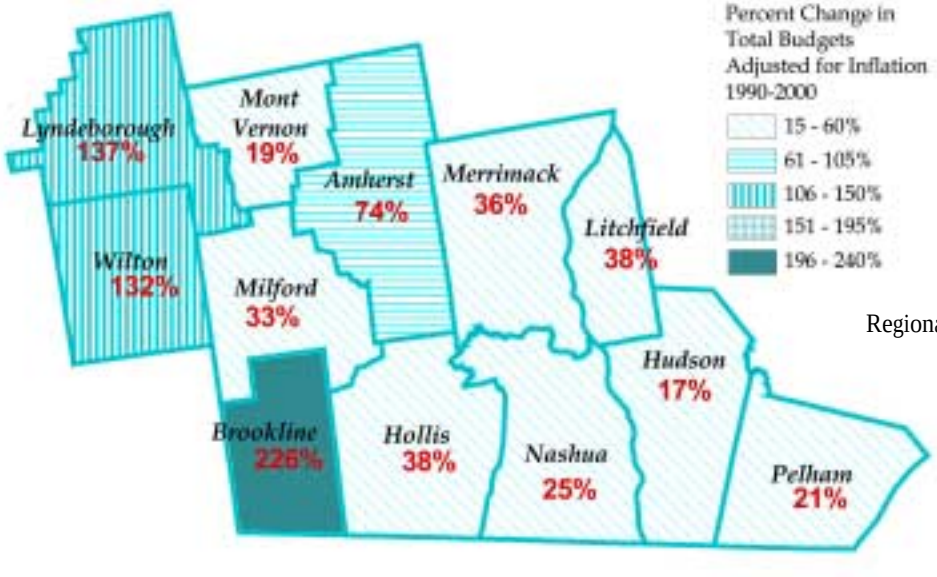
MAP 29
PERCENT CHANGE IN TOTAL BUDGETS, 1960-2000



Regional Average = 880%

Source: Data collected by NRPC based on local reports. Inflation adjustment provided through www.westegg.com/inflation

MAP 30
PERCENT CHANGE IN TOTAL BUDGETS, 1990-2000



Regional Average = 36%

Source: Data collected by NRPC based on local reports. Inflation adjustment provided through www.westegg.com/inflation

TABLE 45

COMPARATIVE GROWTH RATES, 1960-2000, PER CAPITA

ADJUSTED TO 2000 DOLLARS

	Population	Highway Budgets	School Budgets	Police Budgets	Fire Budgets	Total Budgets
Amherst	425%	29%	389%	1564%	1%	329%
Brookline	426%	30%	590%	864%	65%	520%
Hollis	308%	31%	274%	844%	166%	251%
Hudson	290%	34%	233%	742%	898%	241%
Litchfield	921%	135%	156%	1074%	232%	169%
Lyndeborough	167%	1%	428%	3755%	62%	317%
Merrimack	740%	8%	269%	1193%	687%	258%
Milford	225%	84%	195%	237%	55%	187%
Mont Vernon	271%	19%	314%	2022%	-18%	261%
Nashua	212%	-4%	268%	160%	74%	183%
Pelham	319%	-48%	215%	970%	311%	189%
Wilton	85%	-23%	367%	105%	5%	279%
Region	210%	-3%	286%	883%	92%	216%

Budget growth rates in the region are compared to population growth between 1960 and 2000 in Table 45 on a per capita basis. Budget figures were adjusted for inflation to 2000 dollars and the per capita figures for the individual categories are contained in Tables 11-16 in the Appendix. Looking at the entire region, it appears that the increase in total budgets kept pace with the increase in population. Highway budgets experienced the least significant increases while some communities budgets actually declined per capita. Litchfield had the most significant increase in both population and the per capita highway budget; this may be due to the increase in road miles from 24.6 in 1960 to 63.1 in 2000. The majority of the communities experienced varying degrees of growth in the other three categories, police, fire and schools. While part of this increase is directly attributed to growth, some of the increase can be attributed to changes in standards for these categories. Police budgets increased dramatically because many of the smaller communities relied on state and county services and did not even have police departments in 1960. Seven of the twelve communities in the region had increases in the per capita school budgets that were less than their population increases. Except for Nashua, the rate of increase in school budgets in the smaller communities (Brookline, Lyndeborough, Mont Vernon and Wilton) exceeded the rate of population growth

TABLE 46

TOTAL LOCAL ASSESSED VALUATION, ADJUSTED FOR INFLATION, 2000 DOLLARS BY MUNICIPALITY

	1960	1970	1980	1990	2000
Amherst	$54,783,515	$212,354,954	$584,562,227	$910,672,295	$797,467,100
Brookline	$16,882,761	$37,363,541	$89,145,824	$192,626,020	$249,857,574
Hollis	$36,587,371	$102,462,604	$285,768,236	$745,130,677	$558,498,431
Hudson	$89,351,041	$290,579,280	$714,387,224	$1,499,571,797	$1,261,011,255
Litchfield	$14,179,465	$38,911,159	$175,307,297	$351,138,388	$391,986,578
Lyndeborough	$15,029,708	$26,007,884	$74,621,389	$112,208,929	$51,131,377
Merrimack	$54,271,822	$331,265,646	$1,012,799,056	$2,143,840,821	$1,649,122,410
Milford	$127,175,916	$224,413,600	$483,143,956	$939,361,644	$724,320,600
Mont Vernon	$12,876,844	$29,350,574	$66,498,779	$138,536,083	$126,682,086
Nashua	$788,646,804	$2,111,356,083	$3,741,446,040	$6,687,504,344	$5,312,734,446
Pelham	$61,002,221	$158,022,880	$356,773,271	$707,677,554	$563,712,913
Wilton	$58,612,192	$94,214,721	$158,667,852	$274,056,558	$105,582,551
Region	$1,329,399,661	$3,656,302,926	$7,743,121,151	$14,702,325,108	$11,792,107,321
State	$14,939,250,967	$39,808,724,873	$53,660,545,179	$99,062,624,025	$75,323,487,862

Source: Municipal Annual Reports compiled by NRPC; See Appendix A for actual dollar amounts. State figures compiled by NH Dept. of Revenue Administration.

Tables 46 and 47 show the extent to which total assessed valuations, adjusted for inflation to 2000 dollars, have increased since 1960. Regionally, this figure has increased by 787% during this time, compared to the 404% increase found in the State during this same period.

TABLE 47

PERCENT CHANGE IN TOTAL ASSESSED VALUATION ADJUSTED FOR INFLATION, 2000 DOLLARS

	1960-2000	1960-1980	1980-2000	1990-2000
Amherst	1356%	967%	36%	-12%
Brookline	1380%	428%	180%	30%
Hollis	1426%	681%	95%	-25%
Hudson	1311%	700%	77%	-16%
Litchfield	2664%	1136%	124%	12%
Lyndeborough	240%	396%	-31%	-54%
Merrimack	2939%	1766%	63%	-23%
Milford	470%	280%	50%	-23%
Mont Vernon	884%	416%	91%	-9%
Nashua	574%	374%	42%	-21%
Pelham	824%	485%	58%	-20%
Wilton	80%	171%	-33%	-61%
Region	787%	482%	52%	-20%
State	404%	563%	40%	-24%

Source: Derived from previous tables.

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Table 47 demonstrates that when figures are adjusted for inflation, the communities with the highest proportional increases in total assessed valuation since 1960 were Merrimack (2,939%), Litchfield (2,664%), Hollis (1,426%) and Amherst (1,356%). Since 1980, the highest increases were experienced in Brookline (180%), Litchfield (124%) and Hollis (95%). Not surprisingly, two of these communities were among the fastest growing during these two time periods. Interestingly, total assessed valuations have not kept pace with inflation during the 1990 -2000 period, and regionally there was a 20% decline when valuations were adjusted for inflation. This suggests that value assessments are not keeping pace with the demands associated with growth.

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RECOMMENDATIONS

The following recommendations have been provided to generate thought and discussion of solutions for managing growth in the region.

1. **Preservation of Open Space**. Communities should ensure that sensitive lands become protected through permanent means, if possible.

    a. In particular, forest blocks greater than five hundred acres within the urbanized communities of Nashua, Merrimack, Hudson and Pelham should be a priority.
    b. Lands in important watersheds, high value wetlands and agricultural lands should also be protected.
    c. Zoning and subdivision strategies, such as open space development, should be continued and encouraged, and made easier for applicants. Consideration should be given to the downzoning of rural areas.

3. **Strip Development**. Communities should reassess their commercial zoning. Land along highways that is zoned commercial and currently undeveloped will ultimately be developed in that fashion.

    a. Commercial and high-density residential development should be focused at existing strip locations. Efforts should be made to make locations bicycle, pedestrian and transit accessible.
    b. Water and sewer lines, if not already available, should be extended to current commercial strips. This will encourage higher density development within these growth areas.
    c. All subdivision and site plan applications within existing strip locations should be accompanied with plans for automobile, bicycle and pedestrian connections between sites and with the street.
    d. Highway strips that are zoned commercial but are currently undeveloped should be rezoned. Smaller portions of existing commercial areas should remain in commercial zoning.
    e. Communities should develop design guidelines for development in commercial strip locations, which should include comprehensive plans for access management.

4. **Transit.** Commuter rail alternatives that link Nashua to the Boston area should be fully explored. The Nashua City Bus system should be expanded to include connections to a future commuter rail station. In addition, bus links along Route 101A to Milford Center and to the industrial areas of Hudson and Merrimack should also be considered.

5. **Identification of Town Centers.** While town centers have been identified in most communities in the region, they are not official town center locations. Communities should identify their centers on a parcel specific basis, and include the description in master plans.

    a. Efforts should be made to ensure that municipal facilities are located within Town Centers.
    b. Communities should conduct inventories of Town Centers to identify the characteristics and uses of existing lots. Zoning should reflect actual conditions within these centers.
    c. Communities should consider expanding the location of centers, and should enable higher density zoning districts as a means by which to absorb growth in a centralized location. In exchange for higher density zoning, rural areas should be rezoned to lower densities.

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d. Communities should ensure that town centers are equipped with sidewalks and are accessible to bicyclists and pedestrians.
e. Where applicable, sewer and water lines should not be extended beyond town centers.

6. **Identification of Regional Centers.** Regional Centers should also be identified. These centers should be the locations with the infrastructure required to absorb growth.

a. The Nashua-Hudson central cities should be considered a regional center.
b. The Circumferential Highway should be viewed as a means by which to consolidate future growth at higher densities within the Nashua-Hudson regional center.
c. The Broad Street Parkway should be viewed as a means by which to consolidate higher density development near the existing city core. Opportunities exist to provide mid-rise office and residential spaces within the corridor.
d. Route 101A from Nashua to Milford should also be considered a regional center. Planned roadway improvements should be continued to preserve the road's capacity.

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APPENDIX A

TABLE A-1

LOCAL HIGHWAY EXPENDITURES, BY MUNICIPALITY, ACTUAL DOLLARS

	1960	1970	1980	1990	2000
Amherst	$30,156	$88,626	$228,256	$481,609	$1,168,520
Brookline	$7,426	$12,571	$61,789	$119,729	$290,620
Hollis	$23,471	$46,778	$266,459	$692,906	$713,467
Hudson	$73,796	$172,000	$442,760	$1,561,146	$2,203,232
Litchfield	$2,500	$7,700	$66,000	$213,393	$342,897
Lyndeborough	$18,098	$20,907	$75,964	$159,250	$279,485
Merrimack	$37,720	$124,497	$704,249	$1,654,545	$1,948,521
Milford	$22,722	$42,510	$194,994	$602,156	$775,297
Mont Vernon	$10,165	$11,992	$90,469	$225,953	$240,316
Nashua	$701,974	$1,623,131	$3,171,214	$6,960,440	$8,402,265
Pelham	$36,154	$62,501	$240,000	$477,005	$444,695
Wilton	$37,522	$63,440	$169,350	$271,588	$305,681
Region	$1,001,704	$2,276,653	$5,711,504	$13,419,720	$17,186,227

Source: Municipal Annual Reports, compiled by NRPC.

TABLE A-2

LOCAL SCHOOL BUDGETS, BY MUNICIPALITY, ACTUAL DOLLARS

	1960	1970	1980	1990	2000
Amherst	$152,457	$1,311,169	$3,951,639	$9,378,735	$22,319,869
Brookline	$58,466	$261,798	$664,883	$2,669,438	$12,113,740
Hollis	$169,549	$667,614	$2,513,129	$7,592,396	$14,742,716
Hudson	$370,345	$1,814,428	$5,851,633	$17,509,448	$27,453,874
Litchfield	$65,787	$190,167	$1,509,836	$5,413,306	$9,807,305
Lyndeborough	$49,742	$61,675	$236,881	$1,164,245	$3,997,577
Merrimack	$205,461	$1,419,983	$7,351,951	$19,254,829	$36,407,778
Milford	$387,737	$1,541,867	$2,661,673	$11,689,230	$21,214,711
Mont Vernon	$40,388	$305,506	$520,566	$2,035,695	$3,317,920
Nashua	$2,175,828	$7,540,683	$21,067,460	$53,148,514	$101,254,107
Pelham	$164,974	$1,091,445	$3,154,277	$7,535,917	$12,441,859
Wilton	$167,562	$370,538	$992,088	$2,353,980	$8,258,394
Region	$4,008,296	$16,576,873	$50,476,016	$139,745,733	$273,329,850

Source: Municipal Annual Reports, Annual School District Reports, Superintendent of School Offices and the Department of Revenue Administration; compiled by NRPC. Includes Cooperative School Budgets, where applicable.

TABLE A-3

PERCENT CHANGE IN SCHOOL BUDGETS, ADJUSTED 2000 DOLLARS

	1960-2000	1960-1980	1980-2000	1990-2000
Amherst	2466%	939%	147%	78%
Brookline	3531%	356%	697%	239%
Hollis	1424%	494%	157%	45%
Hudson	1199%	533%	105%	17%
Litchfield	2513%	820%	184%	35%
Lyndeborough	1308%	91%	638%	156%
Merrimack	3005%	1334%	117%	41%
Milford	859%	175%	249%	36%
Mont Vernon	1340%	417%	179%	22%
Nashua	716%	288%	110%	42%
Pelham	1222%	666%	72%	23%
Wilton	764%	137%	264%	162%
Region	1095%	405%	137%	46%

Sources: Previous table, with inflation adjustments provided through ***www.westegg.com/inflation***.

TABLE A-4

LOCAL POLICE BUDGETS, BY MUNICIPALITY, ACTUAL DOLLARS

	1960	1970	1980	1990	2000
Amherst	$1,722	$35,713	$232,911	$533,099	$858,530
Brookline	$1,254	$8,294	$20,594	$136,902	$362,711
Hollis	$2,807	$22,054	$99,146	$406,543	$616,988
Hudson	$16,085	$133,110	$459,936	$1,668,515	$3,017,472
Litchfield	$952	$3,813	$71,277	$300,492	$650,913
Lyndeborough	$175	$956	$7,968	$44,512	$102,760
Merrimack	$4,492	$70,215	$727,101	$1,761,666	$2,786,278
Milford	$22,333	$62,541	$213,473	$834,931	$1,397,671
Mont Vernon	$393	$1,324	$13,102	$69,950	$165,430
Nashua	$333,289	$1,015,396	$3,269,885	$8,758,278	$10,970,798
Pelham	$4,728	$51,606	$264,952	$775,635	$1,209,068
Wilton	$10,548	$20,848	$68,187	$178,795	$228,137
Region	$398,778	$1,425,870	$5,448,532	$15,469,318	$22,366,756

Source: Municipal Annual Reports, compiled by NRPC.

TABLE A-5

PERCENT CHANGE IN POLICE BUDGETS, ADJUSTED 2000 DOLLARS

	1960-2000	1960-1980	1980-2000	1990-2000
Amherst	8637%	5321%	61%	20%
Brookline	4969%	558%	670%	98%
Hollis	3752%	1316%	172%	13%
Hudson	3188%	1046%	187%	35%
Litchfield	11883%	2901%	299%	62%
Lyndeborough	10186%	1724%	464%	72%
Merrimack	10771%	6387%	68%	18%
Milford	997%	283%	186%	25%
Mont Vernon	7279%	1236%	452%	77%
Nashua	477%	293%	47%	-6%
Pelham	4382%	2146%	100%	16%
Wilton	279%	159%	46%	-5%
Region	883%	448%	80%	8%

Source: Derived from Municipal Annual Reports.

TABLE A-6

LOCAL FIRE BUDGETS, BY MUNICIPALITY, ACTUAL DOLLARS

	1960	1970	1980	1990	2000
Amherst	$6,620	$17,702	$67,289	$168,561	$199,814
Brookline	$2,016	$3,928	$20,163	$22,148	$99,820
Hollis	$4,293	$12,451	$30,898	$122,168	$265,610
Hudson	$12,939	$27,505	$285,194	$1,882,398	$2,873,780
Litchfield	$1,882	$1,534	$19,454	$109,821	$363,983
Lyndeborough	$1,528	$3,045	$7,406	$23,505	$37,810
Merrimack	$6,700	$25,277	$471,225	$1,314,251	$2,527,581
Milford	$12,295	$62,541	$60,321	$181,252	$355,128
Mont Vernon	$1,332	$2,096	$7,910	$20,252	$21,525
Nashua	$431,689	$805,254	$2,377,933	$8,758,278	$9,478,764
Pelham	$4,500	$12,262	$52,172	$190,550	$442,345
Wilton	$6,160	$12,296	$22,936	$47,289	$68,074
Region	$491,954	$985,891	$3,422,901	$12,840,473	$16,734,234

Source: Municipal Annual Reports, compiled by NRPC.

TABLE A-7

PERCENT CHANGE IN FIRE BUDGETS, ADJUSTED 2000 DOLLARS

	1960-2000	1960-1980	1980-2000	1990-2000
Amherst	429%	307%	30%	-11%
Brookline	768%	301%	116%	237%
Hollis	984%	188%	276%	62%
Hudson	3792%	783%	341%	14%
Litchfield	3289%	314%	718%	147%
Lyndeborough	334%	94%	123%	20%
Merrimack	6512%	2719%	135%	44%
Milford	406%	97%	157%	46%
Mont Vernon	183%	138%	19%	-21%
Nashua	285%	121%	74%	-19%
Pelham	1623%	365%	271%	73%
Wilton	94%	46%	33%	7%
Region	496%	179%	114%	-3%

Source: **Derived from previous tables.**

TABLE A-8

TOTAL LOCAL BUDGETS, BY MUNICIPALITY

INCLUDING SCHOOLS, HIGHWAY, FIRE, POLICE, ACTUAL DOLLARS

	1960	1970	1980	1990	2000
Amherst	$190,955	$1,453,210	$4,480,095	$10,562,004	$24,546,733
Brookline	$69,162	$286,591	$767,429	$2,948,217	$12,866,891
Hollis	$200,120	$748,897	$2,909,632	$8,814,013	$16,338,781
Hudson	$473,165	$2,147,043	$7,039,523	$22,621,507	$35,548,358
Litchfield	$71,121	$203,214	$1,666,567	$6,037,012	$11,165,098
Lyndeborough	$69,543	$86,583	$328,219	$1,391,512	$4,417,632
Merrimack	$254,373	$1,639,972	$9,254,526	$23,985,291	$43,670,158
Milford	$445,087	$1,709,459	$3,130,461	$13,307,569	$23,742,807
Mont Vernon	$52,278	$320,918	$632,047	$2,351,850	$3,745,191
Nashua	$3,642,780	$10,984,464	$29,886,492	$77,625,510	$130,175,165
Pelham	$210,356	$1,217,814	$3,711,401	$8,979,107	$14,537,967
Wilton	$221,792	$467,122	$1,252,561	$2,851,652	$8,860,286
Region	$5,900,732	$21,265,287	$65,058,953	$181,475,244	$329,617,067

Source: **Derived from previous tables.**

TABLE A-9

PERCENT CHANGE IN TOTAL BUDGET, INCLUDING SCHOOLS

ADJUSTED 2000 DOLLARS

	1960-2000	1960-1980	1980-2000	1990-2000
Amherst	2153%	840%	140%	74%
Brookline	3159%	345%	633%	226%
Hollis	1331%	483%	146%	38%
Hudson	1231%	503%	121%	17%
Litchfield	2651%	839%	193%	38%
Lyndeborough	1013%	89%	489%	137%
Merrimack	2909%	1358%	106%	36%
Milford	835%	182%	232%	33%
Mont Vernon	1156%	385%	159%	19%
Nashua	526%	229%	90%	25%
Pelham	1111%	607%	71%	21%
Wilton	600%	126%	209%	132%
Region	880%	342%	122%	36%

Source: **Derived from previous tables.**

TABLE A-10

TOTAL EQUALIZED ASSESSED VALUATION, BY MUNICIPALITY, ACTUAL DOLLARS

	1960	1970	1980	1990	2000
Amherst	$9,601,003	$46,810,719	$255,616,728	$679,961,394	$766,186,588
Brookline	$2,958,763	$8,236,277	$38,981,588	$143,825,894	$210,782,289
Hollis	$6,412,065	$22,586,467	$124,960,420	$556,358,304	$589,741,451
Hudson	$15,659,083	$64,054,192	$312,386,460	$1,119,668,332	$1,204,682,564
Litchfield	$2,485,001	$8,577,428	$76,658,182	$262,180,533	$305,837,060
Lyndeborough	$2,634,009	$5,733,079	$32,630,359	$83,781,773	$75,574,803
Merrimack	$9,511,327	$73,022,940	$442,875,658	$1,600,717,405	$1,389,084,196
Milford	$22,288,025	$49,468,881	$211,268,658	$701,382,546	$628,963,387
Mont Vernon	$2,256,712	$6,469,929	$29,078,513	$103,439,172	$107,166,055
Nashua	$138,213,116	$465,419,310	$1,636,055,412	$4,993,283,315	$4,389,471,992
Pelham	$10,690,853	$34,833,963	$156,009,424	$528,393,604	$572,834,671
Wilton	$10,271,992	$20,768,335	$69,382,104	$204,626,714	$178,238,894
Region	$232,981,949	$805,981,520	$3,385,903,506	$10,977,618,986	$10,418,563,950
State	$2,618,156,082	$8,775,284,004	$23,464,624,215	$73,965,970,302	$70,012,523,485

Source: **NH Department of Revenue Administration**

TABLE A-11

POPULATION GROWTH, 1960-2000

	1960	1970	1980	1990	2000	% Change 60/2000
Amherst	2,051	4,605	8,243	9,068	10,769	425.1%
Brookline	795	1,167	1,766	2,410	4,181	425.9%
Hollis	1,720	2,616	4,679	5,705	7,015	307.8%
Hudson	5,876	10,638	14,022	19,530	22,928	290.2%
Litchfield	721	1,420	4,150	5,516	7,360	920.8%
Lyndeborough	594	789	1,070	1,294	1,585	166.8%
Merrimack	2,989	8,595	15,406	22,156	25,119	740.4%
Milford	4,159	6,622	8,685	11,795	13,535	225.4%
Mont Vernon	585	906	1,444	1,812	2,034	247.7%
Nashua	39,096	55,820	67,865	79,662	86,605	121.5%
Pelham	2,605	5,408	8,090	9,408	10,914	319.0%
Wilton	2,025	2,276	2,669	3,122	3,743	84.8%
Region	63,216	100,862	138,089	171,478	195,788	209.7%
County	178,161	223,941	276,608	335,838	380,841	113.8%
State	606,921	737,681	920,610	1,109,117	1,235,786	103.6%
Region as % of State Population	10.40%	13.70%	15.00%	15.50%	15.80%	51.9%

TABLE A-12

HIGHWAY BUDGETS, PER CAPITA, IN 2000 DOLLARS

	1960	1970	1980	1990	2000	% Change 60/2000
Amherst	$83.90	$87.31	$63.33	$71.13	$108.51	29.3%
Brookline	$53.30	$48.87	$80.01	$66.54	$69.51	30.4%
Hollis	$77.86	$81.12	$130.23	$162.67	$101.71	30.6%
Hudson	$71.66	$73.35	$72.21	$107.06	$96.09	34.1%
Litchfield	$19.79	$24.60	$36.37	$51.81	$46.59	135.5%
Lyndeborough	$173.85	$120.21	$162.36	$164.82	$176.33	1.4%
Merrimack	$72.01	$65.71	$104.54	$100.01	$77.57	7.7%
Milford	$31.17	$29.12	$51.34	$68.37	$57.28	83.7%
Mont Vernon	$99.15	$60.05	$143.28	$167.01	$118.15	19.2%
Nashua	$102.45	$131.91	$106.86	$112.15	$97.82	-4.5%
Pelham	$79.19	$52.43	$67.84	$67.91	$40.75	-48.5%
Wilton	$105.73	$126.45	$145.10	$116.51	$81.67	-22.8%
Region	$90.42	$102.40	$94.59	$102.55	$87.78	-2.9%

TABLE A-13

SCHOOL BUDGETS, PER CAPITA, IN 2000 DOLLARS

	1960	1970	1980	1990	2000	% change 60/2000
Amherst	$424.15	$1,291.65	$1,096.31	$1,385.19	$2,072.60	388.7%
Brookline	$419.63	$1,017.68	$860.99	$1,483.47	$2,897.33	590.4%
Hollis	$562.47	$1,157.72	$1,228.30	$1,782.38	$2,101.60	273.6%
Hudson	$359.63	$773.74	$954.35	$1,200.73	$1,197.40	233.0%
Litchfield	$520.64	$607.52	$832.00	$1,314.36	$1,332.51	155.9%
Lyndeborough	$477.83	$354.61	$506.28	$1,205.00	$2,522.13	427.8%
Merrimack	$392.23	$749.47	$1,091.33	$1,163.92	$1,449.41	269.5%
Milford	$531.96	$1,056.27	$700.85	$1,327.29	$1,567.40	194.6%
Mont Vernon	$393.94	$1,924.09	$824.42	$1,504.63	$1,631.23	314.1%
Nashua	$317.56	$613.01	$709.92	$893.54	$1,169.15	268.2%
Pelham	$361.36	$915.55	$891.65	$1,072.79	$1,139.99	215.5%
Wilton	$472.15	$738.55	$850.05	$1,009.83	$2,206.36	367.3%
Region	$361.80	$749.22	$835.93	$1,091.46	$1,396.06	285.9%

TABLE A-14

FIRE BUDGETS, PER CAPITA, IN 2000 DOLLARS

	1960	1970	1980	1990	2000	% change 60/2000
Amherst	$18.42	$17.44	$18.67	$24.90	$18.55	0.7%
Brookline	$14.47	$15.27	$26.11	$12.31	$23.87	65.0%
Hollis	$14.24	$21.59	$15.10	$28.68	$37.86	165.9%
Hudson	$12.56	$11.73	$46.51	$129.09	$125.34	897.6%
Litchfield	$14.89	$4.90	$10.72	$26.66	$49.45	232.0%
Lyndeborough	$14.68	$17.51	$15.83	$24.33	$23.85	62.5%
Merrimack	$12.79	$13.34	$69.95	$79.44	$100.62	686.7%
Milford	$16.87	$42.84	$15.88	$20.58	$26.24	55.5%
Mont Vernon	$12.99	$10.49	$12.53	$14.97	$10.58	-18.5%
Nashua	$63.00	$65.44	$80.13	$147.25	$109.45	73.7%
Pelham	$9.86	$10.29	$14.75	$27.13	$40.53	311.2%
Wilton	$17.36	$24.51	$19.19	$20.29	$18.19	4.8%
Region	$44.40	$44.34	$56.68	$100.29	$85.47	92.5%

TABLE A-15

POLICE BUDGETS, PER CAPITA, IN 2000 DOLLARS

	1960	1970	1980	1990	2000	% change 60/2000
Amherst	$4.79	$35.18	$64.62	$78.74	$79.72	1564.1%
Brookline	$9.00	$32.24	$26.67	$76.08	$86.75	863.9%
Hollis	$9.31	$38.24	$48.46	$95.44	$87.95	844.5%
Hudson	$15.62	$56.76	$75.01	$114.42	$131.61	742.6%
Litchfield	$7.53	$12.18	$39.28	$72.96	$88.44	1073.9%
Lyndeborough	$1.68	$5.50	$17.03	$46.07	$64.83	3754.9%
Merrimack	$8.58	$37.06	$107.93	$106.49	$110.92	1193.5%
Milford	$30.64	$42.84	$56.21	$94.80	$103.26	237.0%
Mont Vernon	$3.83	$6.63	$20.75	$51.70	$81.33	2022.2%
Nashua	$48.64	$82.52	$110.19	$147.25	$126.68	160.4%
Pelham	$10.36	$43.29	$74.90	$110.42	$110.78	969.7%
Wilton	$29.72	$41.55	$58.42	$76.70	$60.95	105.1%
Region	$35.99	$64.13	$90.23	$120.82	$114.24	217.4%

TABLE A-16

TOTAL BUDGETS, PER CAPITA, IN 2000 DOLLARS

	1960	1970	1980	1990	2000	% change 60/2000
Amherst	$531.25	$1,431.58	$1,242.92	$1,559.95	$2,279.39	329.1%
Brookline	$496.62	$1,114.06	$993.78	$1,638.40	$3,077.47	519.7%
Hollis	$663.89	$1,298.68	$1,422.09	$2,069.16	$2,329.12	250.8%
Hudson	$454.37	$915.58	$1,148.09	$1,551.30	$1,550.43	241.2%
Litchfield	$562.85	$649.21	$918.37	$1,465.80	$1,517.00	169.5%
Lyndeborough	$668.04	$497.82	$701.49	$1,440.22	$2,787.15	317.2%
Merrimack	$485.60	$865.58	$1,373.75	$1,449.87	$1,738.53	258.0%
Milford	$610.65	$1,171.08	$824.29	$1,511.04	$1,754.18	187.3%
Mont Vernon	$509.91	$1,606.88	$1,000.98	$1,738.31	$1,841.29	261.1%
Nashua	$531.66	$892.70	$1,007.10	$1,305.06	$1,503.09	182.7%
Pelham	$460.77	$1,021.55	$1,049.13	$1,278.24	$1,332.05	189.1%
Wilton	$624.96	$931.05	$1,073.23	$1,223.32	$2,367.16	278.8%
Region	$532.17	$956.47	$1,077.45	$1,417.39	$1,683.54	216.4%

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APPENDIX A