

**GREATER LOWELL
COMPREHENSIVE ECONOMIC DEVELOPMENT STRATEGY
(CEDS)**

2004-2008

***PREPARED BY:
NORTHERN MIDDLESEX COUNCIL OF
GOVERNMENTS
LOWELL, MASSACHUSETTS 01852
MAY 2004***

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Cover Photo of Route 3 expansion project courtesy of Modern Continental.

Executive Summary

Comprehensive Economic Development Strategy

The economic downturn in the Greater Lowell region after January 2001 encouraged economic development stakeholders in the region to begin discussions in 2002 about the formation of a regional economic development strategy. The unemployment rate in the region had more than doubled from 2.8% in January 2001 to 5.7% in January 2002. Similarly, the unemployment rate in the City of Lowell was two points higher at 7.6% than the nation as a whole (5.6%) in January 2002. Due to the high number of layoffs in the information technology and computer industries, suburban communities located along Routes 3 and I-495 were being hard hit as well. With the active participation of the City of Lowell, Northern Middlesex Council of Governments (NMCOG) and Congressman Martin T. Meehan's Office, NMCOG applied to the Economic Development Administration (EDA) for economic adjustment assistance funds in order to complete a "grass-roots" Comprehensive Economic Development Strategy (CEDS) for the Greater Lowell region. The last regional economic development strategy completed by the NMCOG had been done under EDA's Overall Economic Development Program (OEDP).

CEDS Process

The "grass-roots" CEDS process actually began with a Kick-Off Session at Lowell City Hall on July 11, 2002 and, subsequently, nine additional public meetings were held to receive input from economic development stakeholders in the region. More than 250 invitations were mailed for these meetings and the invitees included federal, state and local elected officials, Planning Board members, bankers, planning and community development staff, neighborhood organizations, minority groups, social service agencies, economic development entities, housing authorities, business organizations, utility officials and interested citizens. These public meetings were supplemented by six CEDS Committee Meetings, in which a group of fifteen members from the region participated in the overall planning process. It is largely through the input provided by these two groups on the Needs Analysis, Vision and Action sections of the CEDS process that formed the basis for the CEDS document.

Needs Analysis

The CEDS document reflects the comments made by the meeting participants and past information developed through community and regional documents. The Needs Analysis section initially focuses on background information regarding a description of the region and its people, its infrastructure (transportation, water, sewer, electric, natural gas and telecommunications systems) and environmental issues. The document then summarizes the regional economy, which describes how the economy in the Lowell MA-NH PMSA has fared and the elements necessary for a thriving economy – business and job creation, reasonable tax policies and bonding capacity, education and training, housing, natural resources and cultural and recreational amenities. In essence, the document attempts to provide a balanced approach to economic development and quality of life issues.

As documented in the notes for the Needs Analysis sessions, the economic strengths of this region include its highway network, its skilled and diverse labor force, its educational institutions, its financial resources, its proximity to Boston and airports/seaports, its water resources and lower tax rates for businesses. Its Weaknesses include the lack of regional thinking and perspective, the lack of water and sewer infrastructure, sprawl, high housing costs and taxes, lack of a comprehensive plan for regional development, the cost of labor and energy and over-reliance on some technology sectors. According to the participants at these sessions, the future of the economy was either positive or likely to be troublesome with the unemployment rate in Lowell rising to 10%. Among the problems cited for a rebounding economy were the budget problems at the federal and state levels, underemployment of the service industry workforce, the loss of manufacturing jobs, the corporate accounting scandal and the exporting of American jobs overseas and the widening of the income gap. Positive signs were seen with the growing biotech industries and the research and development elements in the region that would help grow the economy.

The Development Opportunities cited included redevelopment- reuse of brownfields, revitalization of the mills, digital access downtown- in the City of Lowell and targeted, new development, including affordable housing, in the suburban communities. Information from the Build-Out Study, which projected development in each of the nine communities based upon present zoning, completed by NMCOC for the Massachusetts Executive Office of Environmental Affairs in 2001 is summarized in this section as well. In terms of balancing development with the quality of life, participants believed that the communities needed to maintain their community character and, on a regional level, there needed to be a serious effort to connect open spaces in the region and improve the quality of water. Numerous economic development stakeholders and financial resources were also identified.

Vision

The Greater Lowell region has demonstrated its ability to balance its economic development needs with the quality of life issues important to residents and visitors to this area. The emphasis upon the area's history is reflected in the region's re-use of older properties, the focus on the Merrimack and Concord Rivers and Lowell's canal system and the utilization of the extensive mill space in the City. Similar mill projects in the surrounding communities have resulted in affordable and market-rate housing, commercial and industrial businesses and a tourism industry that supports the regional economy. Therefore, it is expected that any Vision for the future will build upon the area's past, particularly in the case of the Greater Lowell region.

The Vision for the Greater Lowell region is to build upon the region's historic past and character to develop a regional economic development framework that supports:

- the creation of high skill, well paying jobs;
- affordable and market-rate housing to house the regional employment base;
- an integrated economic development and workforce development system that prepares students and workers for future jobs; and
- a racially, ethnically and economically diverse work force.

The Comprehensive Economic Development Strategy (CEDS) for the Greater Lowell region attains this Vision by establishing ten goals and related objectives that reflect the input of the meeting participants and previous regional and community studies. The Goals and Objectives, as outlined in the CEDS, is as follows:

GOALS	OBJECTIVES
<p>1. Economic Development</p> <p>Develop a regional economic development framework that supports the efforts of private industry, local communities and agencies, educational institutions, federal and state agencies and private foundations to create jobs and to improve the quality of life in the region.</p>	<ul style="list-style-type: none"> ▪ Establish a permanent CEDS Committee meet four times annually and to update the CEDS on an annual basis. ▪ Apply for EDA Planning and Public Works funds to establish an annual CEDS process and to implement priority projects in the Greater Lowell region. ▪ Apply for Economic Development District (EDD) designation to formalize the CEDS process. ▪ Identify infrastructure needs of the local communities and work with community leaders to identify funding for these projects. ▪ Build upon the Renewal Community status of the City of Lowell and the Economic Target Area designation of Lowell, Dracut, Billerica and Chelmsford to expand and attract business.
<p>2. Workforce Development</p> <p>Increase the supply of skilled workers for industry in the region through the integration of the economic development and workforce development systems.</p>	<ul style="list-style-type: none"> ▪ Integrate the economic development and workforce development systems to support the expansion of business in the region. ▪ Support regional industry needs today and plan for industry needs five years in the future. ▪ Incorporate minority and low income residents into the workforce development system and provide jobs for them upon successful completion of their training.

GOALS	OBJECTIVES
<p>3. Education</p> <p>Improve the educational and workforce skills of primary, secondary and college students to meet the needs of industry in the future.</p>	<ul style="list-style-type: none"> ▪ Encourage stronger ties between the primary and secondary school systems and the colleges in the region. ▪ Identify specific initiatives that need to be implemented in order to prepare high school and college students for the working world. ▪ Support the development of curricula at UMass Lowell and Middlesex Community College that supports regional industry needs.
<p>4. Affordable Housing</p> <p>Create more affordable housing throughout the region to ensure that businesses can expand and relocate to the region with the assurance that their workforce will be able to afford the housing.</p>	<ul style="list-style-type: none"> ▪ Create more affordable housing in the region in accordance with Affordable Housing Productivity Plans for each community; ▪ Develop Regional Cooperative Housing Initiative(s) that access federal, state and non-profit funds to create new housing through regional participation; ▪ Target housing for the artist and knowledge industry communities in downtown Lowell.
<p>5. Racial and Ethnic Diversity</p> <p>Increase the opportunities available to minority and low-income communities in the region to participate in the expansion of the regional economy.</p>	<ul style="list-style-type: none"> ▪ Implement the Environmental Justice principles related to transportation and infrastructure projects in the region. ▪ Develop stronger ties with the Latino, Asian and Black communities and identify specific initiatives that the CEDS Committee can implement in order to improve their economic condition. ▪ Support the efforts of minority CDC's to implement economic development and housing programs.

GOALS	OBJECTIVES
<p>6. Pockets of Distress</p> <p>Target assistance to those neighborhoods and communities in the region that have not shared the economic benefits of the regional economy.</p>	<ul style="list-style-type: none"> ▪ Target resources to Lowell and the surrounding communities that have unemployment rates one percent higher than the national average and per capita income figures less than or equal to 80% the national figure. ▪ Identify areas with major vacancy rates as a result of recent layoffs and develop an inventory of available properties. ▪ Work with the minority and low-income communities in the region to identify specific initiatives that should be incorporated within the CEDS annual program.
<p>7. Regional Transportation System</p> <p>Develop the infrastructure needed to build upon the strengths of the regional highway system and the public transportation network to enhance access to the economic centers of the region.</p>	<ul style="list-style-type: none"> ▪ Complete the Route 3 North Transportation Improvement Project as a means to improve access in the region. ▪ Implement the bridge improvements in Lowell and Tyngsborough to enhance access in the region. ▪ Complete the LRTA's "Transit Initiative for the Twenty-First Century". ▪ Develop more service to industrial and commercial sites as a means to match the work force with the available jobs.
<p>8. Quality of Life</p> <p>Maintain the community character in the region by preserving and protecting the region's natural, cultural and historic resources and encouraging concentrated development.</p>	<ul style="list-style-type: none"> ▪ Implement the Regional Open Space Plan developed by NMCOG, ▪ Support initiatives by the National Park Service and other organizations to maintain and improve access to open spaces along the Merrimack and Concord Rivers. ▪ Build upon the cultural and historic heritage of the region by supporting the cultural facilities in the region and the professionals working in the industry. ▪ Encourage local communities to develop and update Master Plans that provide a balance between development and quality of life issues.

GOALS	OBJECTIVES
<p>9. Technology</p> <p>Enhance the region’s strengths within its “cluster industries” by promoting technological advancements and expanding the technological infrastructure in the region.</p>	<ul style="list-style-type: none"> ▪ Work the Chambers of Commerce in the region and the Lowell and Billerica Plans to develop support mechanisms for the identified “cluster industries”. ▪ Target assistance from UMass Lowell and Middlesex Community College to improve the technology of local businesses. ▪ Provide digital access to downtown Lowell and within the minority and low-income communities to address the digital divide issue in the region.
<p>10. Financial Investments</p> <p>Target federal, state, local, non-profit and private funds to those projects that create jobs and improve the quality of life in the neighborhoods.</p>	<ul style="list-style-type: none"> ▪ Access funding from the regional banking community and private investment firms to expand local businesses. ▪ Establish regional lending program under NMCOG’s planned 501 (c) non-profit entity. ▪ Apply for federal and state funding, such as brownfields and New Market Tax Credits which can be targeted to priority projects

Action Plan

The Action Plan has been developed as a result of the Needs Analysis and Vision sections. The Action Plan covers a period of five years and is broken down into Short-Term, Intermediate and Long-Term projects. NMCOG solicited projects from economic development stakeholders on two occasions and reviewed the submitted projects based upon the criteria sent with the applications. These projects were determined to contribute to the economic growth of the region and to meet at least one of the goals identified in the Vision Section. Currently, the City of Lowell is the only community eligible for EDA funding based upon its unemployment rate. Other communities may be eligible in the future depending upon potential layoffs and their economic impact upon the community. Most of the projects listed are not eligible for EDA funding, but are included to demonstrate how other federal, state, local, non-profit and private resources are being accessed in order to move this region toward the Vision outlined. The three projects identified for EDA funding were the JAM Plan, the Tanner Street Initiative and the Acre Plan. NMCOG also determined that it would request Planning funds from EDA to undertake next year’s Annual CEDS Update process and Economic Development District (EDD) designation. Also included is a thorough description of this year’s extensive “grass-roots” CEDS Process.

Evaluation

The Evaluation Section outlines how NMCOG and the CEDS Committee will evaluate the region's annual performance under the CEDS program. The evaluation section within each Annual CEDS Update will reflect how well NMCOG and the economic development stakeholders in the region have performed based upon the performance measurements established through this section. The Evaluation Section describes the Evaluation Methodology and the State of the Regional Economy relative to goal attainment under the CEDS. The areas to be evaluated on a quantitative and qualitative basis are the Levels of Participation, Data Development & Dissemination, CEDS Marketing & Outreach, the ten Goals and Objectives and the CEDS Priority Projects. This evaluation framework will enable the CEDS Committee to conduct a self-evaluation on an annual basis, identify areas that need to be improved or changed and revise the Annual CEDS Update accordingly.

Greater Lowell CEDS 2004-2008

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PART 1 – COMPREHENSIVE ANALYSIS

A. Background

1. Geographic Description

The Greater Lowell region consists of the City of Lowell and its eight suburbs – Billerica, Chelmsford, Dracut, Dunstable, Pepperell, Tewksbury, Tyngsborough and Westford – and has a land area of 194.46 square miles and an inland water area of 5.76 square miles. The City of Lowell is the central city of the Greater Lowell region and continues to serve as the economic center for the region. The Greater Lowell region had a population of 281,225 in 2000 according to the U.S. Census, which represented an increase of 6.7% from its population of 263,656 in 1990. The Greater Lowell region is tied together by the Merrimack River and is located in the northeastern section of Massachusetts, abutting the New Hampshire State line. The City of Lowell is approximately 45 minutes from the City of Boston and an hour from the City of Worcester and Portsmouth, New Hampshire. (See *Map 1 in Appendix I*)

The City of Lowell is the central city in the Greater Lowell region and had a population of 105,167 in 2000. The Greater Lowell region is part of the Lowell MA-NH Primary Metropolitan Statistical Area (PMSA), which also includes the Town of Groton. The surrounding suburban communities have been impacted by many of the issues affecting the City of Lowell, including increased development, traffic and congestion. The region is intersected by the Merrimack, Concord and Nashua Rivers, which provide many open space and recreational opportunities for residents in the area. Many residents from this area have moved northward to New Hampshire and continue to be linked to this region by the Merrimack River and the highway network comprised largely of Routes 3, I-93 and I-495.

2. Greater Lowell Region

The Greater Lowell region represents the classic development of an urban center and its suburbs. The nine communities within this region initially shared a common agricultural development pattern, but later separated into urban, suburban and rural communities. Three hundred fifty years ago these communities didn't exist, but with the establishment of meeting houses within the classic New England town centers, these communities, as we know them today, were formed. Billerica and Chelmsford were incorporated in 1655, while Dunstable was incorporated in 1673. By the first part of the 18th century, Dracut (1701), Westford (1729), and Tewksbury (1734) were incorporated. Pepperell (1775) and Tyngsborough (1809) were incorporated later. Lowell was founded in 1821 and became a City in 1836.

Initially, this region focused upon agriculture and related activities, such as tanning, blacksmithing, coopering, and furniture making. Other activities, such as grist and saw milling, fulling and iron forging, depended upon good sources of water power. Major growth in this region occurred between 1790 and 1820 when the vast potential of the Merrimack River and its tributaries – Concord River, Stony Brook and Beaver Brook- was recognized. The canal system was instituted in the 1790's principally for travel to Boston and New Hampshire. The Pawtucket

and Middlesex Canals provided the necessary waterways, while the Middlesex Turnpike served as the principal land trade route to Boston. The industrialization of this region began in 1811 with the introduction of wool manufacturing in North Billerica. Subsequently, the first planned industrial city in America was created in Lowell, utilizing the hydraulic power resource of the Merrimack River at Pawtucket Falls. By 1836 the City of Lowell had eight major textile firms employing 7,000 people. The Lowell region was also impacted as small industrial settlements grew into extensive textile mill villages, particularly in North Billerica, North Chelmsford, Graniteville, Forge Village and Collinsville. The growth in these communities was spurred by these developments between 1820 and 1850.

Increased industrialization occurred in this region between 1850 and 1890 with the introduction of the railroad. The railroad made the canals obsolete as a transportation vehicle and brought many immigrants to the region to work in the mills. The immigrant workers settled in Lowell and its surrounding communities and, thus, began the influx of ethnic groups to the region. However, with the introduction of the railroad nationwide, the competitive advantage enjoyed by this region shifted to the South and by 1920 the textile industry had begun to deteriorate. The Depression years were hard on this area due to the overdependence on the textile industry. After World War II, the construction of major highways and the investment in housing, particularly outside of the City of Lowell, created new growth opportunities for the region. Suburbs to the City of Lowell were being formed, which still depended upon Lowell as the regional economic center of the region. The construction of Route 128, Route 3, I-93, I-495 and the Lowell Connector opened up this region to increased economic opportunities. The tie-in between the Greater Lowell region and the Route 128 region was enhanced by this road construction and the cheaper houses that were being built in this area that could accommodate the labor force needed by businesses along Route 128.

Development pressures in the region shifted from the City of Lowell to the other communities, particularly Billerica, Chelmsford and Tewksbury, in the 1970's and 1980's. Manufacturing continued to decline in the 1970's as the textile, shoe, metal working and chemical industries relocated to other parts of the country with cheaper labor and expenses. Increased investment in defense and service industries did not make up for the loss in these manufacturing industries. During the 1980's, the growth of the computer, communications systems and military equipment industries, as well as the construction and housing industries, pulled the Lowell region out of the economic depths it had experienced. Employment growth increased outside the City of Lowell with the development of new industrial parks along Route 3, I-495 and I-93. However, during the late 1980's and early 1990's, the region experienced a large number of layoffs in the computer and military equipment industries. It wasn't until the mid-1990's that the region was able to regain its footing economically by diversifying its industrial and commercial base. The growth of small- to medium-sized businesses ended up exceeding the job losses in major firms in the area. Today the Greater Lowell region enjoys a diversified economy that does not rely as heavily on the City of Lowell or Route 128, as it has in the past, but, rather, has expanded the economic scope to Lowell's surrounding towns and to New Hampshire.

3. Greater Lowell Population

This section is designed to provide an overview of the population trends within the Greater Lowell region since 1960 and projected to 2020 and to analyze specific social and economic characteristics of the Greater Lowell population – race and Hispanic origin, age groups, school enrollment and attainment, households and families and income issues related to per capita income, median income per household, median income per family and numbers and percentages of residents below the poverty level. This overview will provide a better understanding of the people in the NMCOG region.

Population and Growth Rates

The population in Greater Lowell has increased substantially since 1960. During this period of time, the population grew by 79.5% from 169,403 in 1960 to 281,225 in 2000. The greatest period of growth in the region was the 30% growth rate between 1960 and 1970. During the period from 1990 to 2000, the NMCOG region grew by 6.7%, as compared to the national growth rate of 13.2% and the state rate of 5.5%. Based upon recent population projections developed by the Massachusetts Highway Department after input from NMCOG, this region is expected to grow by an additional 22,755 residents (8.1%) between 2000 and 2010 and an additional 21,000 residents (6.9%) between 2010 and 2020. The region, as a whole, is projected to grow by 15.6% between 2000 and 2020, which represents a greater growth rate than that experienced during the past decade.

The data summarized below in *Charts 1 and 2* reflects the Population Trends from 1960 to 2020 and the Growth Rates for the NMCOG Region and individual communities within the region. The data demonstrates how growth in Billerica, Chelmsford and Tewksbury largely occurred between 1960 and 1970, while more recent growth has occurred in Dunstable, Pepperell and Tyngsborough. The City of Lowell, with the exception of the period from 1970 to 1980, has steadily grown, even increasing its population above 100,000 between 1980 and 1990. Projected growth rates between 2000 and 2020 in the Greater Lowell region range from 5.4% in Billerica to 71.4% in Dunstable. *Chart 1* below shows the population trends in the Greater Lowell region from 1960 through 2000, as well as population projections to 2010 and 2020:

Chart 1: Greater Lowell Population: 1960-2020

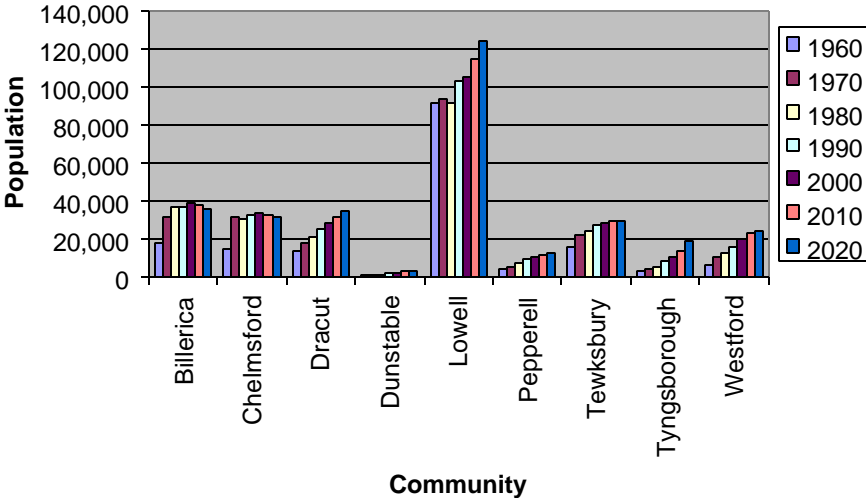
Community	1960	1970	1980	1990	2000	2010	2020
Billerica	17,867	31,480	36,727	37,609	38,981	40,020	41,090
Chelmsford	15,130	31,432	31,174	32,383	33,858	34,920	36,110
Dracut	13,674	18,214	21,249	25,594	28,562	33,408	36,900
Dunstable	824	1,292	1,671	2,236	2,829	3,780	4,850
Lowell	92,107	94,239	92,418	103,439	105,167	108,210	111,200
Pepperell	4,336	5,887	8,061	10,098	11,142	14,510	18,600
Tewksbury	15,902	22,755	24,635	27,266	28,851	30,915	32,300
Tyngsborough	3,302	4,204	5,683	8,642	11,081	13,430	15,400
Westford	6,261	10,368	13,434	16,392	20,754	24,807	28,490
NMCOG Region	169,403	219,871	235,052	263,659	281,225	304,000	325,000

Source: U. S. Census for 1960, 1970, 1980, 1990, and 2000

Projections for 2010 and 2020 developed by the Massachusetts Highway Department.

Figure 1 below shows the population trends by community in the Greater Lowell region between 1960 and 2000:

Figure 1: Greater Lowell Population Trends 1960-2020



Source: U.S. Census for 1960, 1970, 1980, 1990, and 2000.
 Projections for 2101 and 2020 developed by the Massachusetts Highway Department.

Chart 2 below summarizes the population growth rates for the NMCOG region and the individual communities within the region:

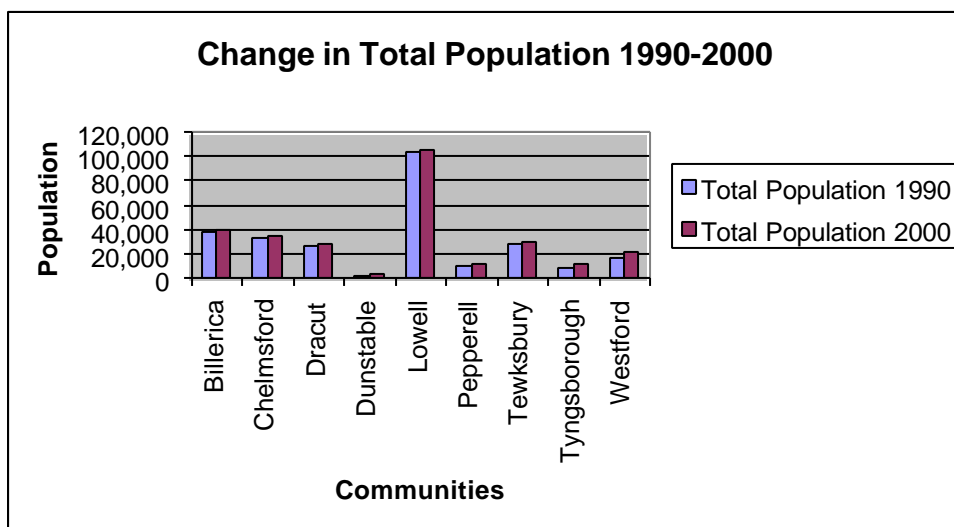
Chart 2: Growth Rates by Community and Region

Community	1960-1970	1970-1980	1980-1990	1990-2000	2000-2020
Billerica	76.2%	16.7%	2.4%	3.6%	5.4%
Chelmsford	107.7%	-0.8%	3.9%	4.6%	6.7%
Dracut	33.2%	16.7%	20.4%	11.6%	29.2%
Dunstable	56.8%	29.3%	33.8%	26.5%	71.4%
Lowell	2.3%	-1.9%	11.9%	1.7%	5.7%
Pepperell	35.8%	36.9%	25.3%	10.3%	66.9%
Tewksbury	43.1%	8.3%	10.7%	5.8%	12.0%
Tyngsborough	27.3%	35.2%	52.1%	28.2%	39.0%
Westford	65.6%	29.6%	22.0%	26.6%	37.3%
NMCOG Region	30.0%	6.9%	12.2%	6.7%	15.6%

Source: U.S. Census for 1960, 1970, 1980, 1990 and 2000
 Projections for 2020 developed by the Massachusetts Highway Department

Figure 2 on the next page shows the change in population by community in the NMCOG Region between 1990 and 2000:

Figure 2: Change in total Population (1990,2000) in the NMCOG Region



Source: U.S. Census for 1990 and 2000

Population Composition by Race and Hispanic Origin

In analyzing the population figures based upon Race and Hispanic Origin, *Table 1 in Appendix II* reflects the predominately white population within the Greater Lawrence region. In 2000 more than 85% of the resident population was white, which represented a decline of 6% from the figures in the 1990 U.S. Census. In comparison, the nation had a white population of 75.1% in 2000, while the Commonwealth of Massachusetts had a 84.5% white population.

Other than white residents, the racial and ethnic groups within the Greater Lowell region in 2000 were Asian (8%), Other or Multiple Races (4.7%), Black or African American (2%), American Indian, Alaskan and Aleut (.2%) and Native Hawaiian or Pacific Islander (.03%). Residents of Hispanic or Latino origin represented 6.1% of the total population in 2000. Asians, which are largely comprised of Cambodians, Asian Indians, Vietnamese and Chinese, increased by 60.1% from 14,117 (5.4%) in 1990 to 22,597 (8.0%) in 2000, while Blacks increased by 79.5% from 3,181 (1.2%) in 1990 to 5,709 (2.0%) in 2000. The Hispanic population in the NMCOG region, which is primarily from Puerto Rico and the Dominican Republic, increased by 45.5% from 11,702 (4.4%) in 1990 to 17,028 (6.1%) in 2000. At the national level, Asians represented 3.6% of the total population, while Blacks represented 12.3% and Hispanics represented 12.5%. At the state level, Asians represented 3.8%, Blacks represented 5.4% and Hispanics represented 6.8% of the total population. Therefore, the NMCOG region has a greater share of Asians than the nation or the state.

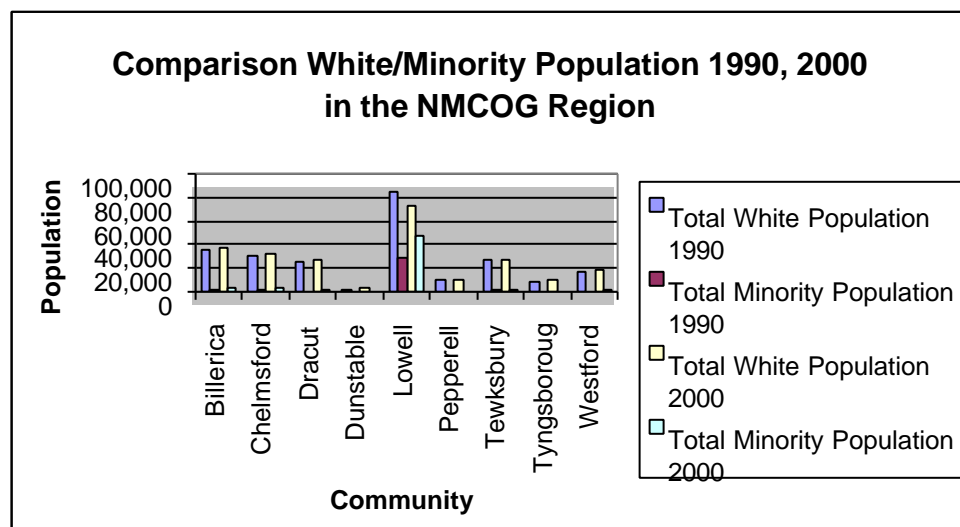
The City of Lowell, while having the largest population within the region, has the largest percentage of minority residents as well. In 2000, the City of Lowell’s share of the region’s Asian population (76.9%), Black population (77.5%), and Hispanic population (86.5%) more than doubled its overall share of the region’s population (37.4%). While the City of Lowell had a 39.2% share of the region’s population in 1990, its share of the region’s Asian (81.8%), Black (72.1%) and Hispanic (86.2%) populations greatly exceeded its overall population share. Within the City of Lowell, the Asian population increased by 50.4% from 11,549 (11.2%) in 1990 to 17,371 (16.5%) in 2000. Lowell has one of the largest Asian populations anywhere in the country. The Black population in

Lowell nearly doubled between 1990 and 2000, increasing by 92.9% from 2,293 (2.2%) in 1990 to 4,423 (4.2%) in 2000. The Hispanic population in Lowell increased by 46.0% from 10,089 (9.8%) in 1990 to 14,734 (10.4%) in 2000.

The suburban communities have increased their share of the Asian population in the region from 18.2% in 1990 to 23.1% in 2000, while their share of Black and Hispanic residents has declined. However, these populations have all grown within the suburban communities, reflecting movement from the City of Lowell and from communities outside the region. For instance, the Town of Billerica experienced a 77.5% growth in its Asian population, a more modest 15.5% increase in its Black population and a growth of 60.9% in its Hispanic population. Similarly, the Town of Chelmsford increased its Asian population by 63.5%, its Black population by 119.8% and its Hispanic population by 16.8%. The Town of Westford experienced exceptional growth in its Asian population (437.3%), while the Town of Dracut increased its Hispanic population by 57.1% during the same period. Overall, the determining factor regarding the location of minorities in the region is income, particularly in relation to the high housing costs in the suburban communities.

Additional information is available through *Table 1 in Appendix II*, which provides a comparison of U.S. Census data in 1990 and 2000 related to race and Hispanic origin by community and census tract. The graph below (*Figure 3*) compares the white and minority populations in the region:

Figure 3: Total White and Minority Population (1990,2000) in the NMCOG Region



Source: U.S. Census for 1990 and 2000

Population Composition by Age Group

The composition of the NMCOG region's population by age provides an overview of the region's youth, workforce population and retired community. This analysis forms the basis of market studies, school enrollment projections and labor force participation analyses that determine from a supply side how well a region's economy will perform. The median age for this region has increased from 31.3 years in 1990 to 34.8 years in 2000. While the population is getting older, there are growing segments of younger residents, particularly in the suburban communities of Dunstable, Pepperell, Tyngsborough and Westford. However, as outlined

below, the City of Lowell had the lowest median age (31.4) of any community in the region in 2000.

As outlined in *Chart 3* below, the region had 7.3% of its population in the Under 5 category, 15.4% in the 5-14 age group, 45.3% in the 15-44 category, 21.7% in the 45-64 age group and 10.3% in the 65+ category. Between 1990 and 2000, the following changes occurred within each age category: Under 5—loss of 711 or –3.3% change; 5-14—gain of 6,965 or 19.1% change; 15-44—loss of 5,609 or –4.2% change; 45-64—gain of 14,047 or 29.9% change; 65+—gain of 2,824 or 10.8% change. *Chart 3* below shows the figures for the age composition in the NMCOG region as of 2000:

Chart 3: Population Composition By Age Group, 2000

Community	Under 5	5-14	15-44	45-64	65+
Billerica	2,689 (6.9%)	5,755 (14.8%)	17,920 (45.9%)	9,357 (24.0%)	3,260 (8.4%)
Chelmsford	2,264 (6.7%)	4,784 (14.1%)	13,630 (40.3%)	8,762 (32.9%)	4,418 (13.1%)
Dracut	1,935 (6.8%)	4,199 (14.7%)	12,793 (44.8%)	6,330 (22.2%)	3,305 (13.1%)
Dunstable	236 (8.3%)	510 (18.0%)	1,149 (40.6%)	741 (26.2%)	193 (6.9%)
Lowell	7,696 (7.3%)	16,206 (15.5%)	51,165 (48.6%)	18,787 (17.8%)	11,313 (10.8%)
Pepperell	867 (7.8%)	2,011 (18.1%)	4,898 (44.0%)	2,534 (22.7%)	832 (7.5%)
Tewksbury	2,020 (7.0%)	4,143 (14.4%)	12,291 (42.6%)	7,086 (24.6%)	3,311 (11.5%)
Tyngsborough	987 (8.9%)	1,886 (17.0%)	5,079 (45.8%)	2,397 (21.6%)	732 (6.6%)
Westford	1,842 (8.9%)	3,873 (18.6%)	8,568 (41.3%)	4,970 (24.0%)	1,501 (7.3%)
NMCOG Region	20,536 (7.3%)	43,367 (15.4%)	127,493 (45.3%)	60,964 (21.7%)	28,865 (10.3%)

Source: U.S. Census for 2000

Tyngsborough (8.9%), Westford (8.9%), Dunstable (8.3%) and Pepperell (7.8%) had percentages above the regional average for residents under 5 years of age. Similarly, Westford (18.6%), Pepperell (18.1%), Dunstable (18.0%), and Tyngsborough (17.0%) enjoyed above average percentages of youngsters in the 5-14 age category. The communities with above average elderly populations (65+) include Chelmsford (13.1%), Dracut (13.1%), Tewksbury (11.5%) and Lowell (10.8%). The region’s workforce comes principally from the 15-44 and 45-64 age categories and two-thirds (67%) of the region’s population come from these two age cohorts. The communities with the above average representation in these age groups include Chelmsford (73.2%), Billerica (69.9%), Tyngsborough (67.4%) and Tewksbury (67.2%). The median ages for the nine communities in the NMCOG region in 2000, ranked from youngest to oldest were as follows: Lowell – 31.4; Tyngsborough – 34.7; Pepperell – 35.3; Billerica – 35.9; Dracut – 36.1; Westford – 36.9; Dunstable – 37.3; Tewksbury – 37.6; and Chelmsford – 38.9.

School Enrollment

The School Enrollment figures outlined in *Chart 4* below provide information on the total population enrolled in school and the breakout of this school population by nursery or pre-school, kindergarten, elementary school, high school or college or graduate school. Based upon information from the 2000 U.S. Census, the NMCOC region had 77,813 students enrolled in school as of 1999. *Chart 4* below provides an overview of school enrollment in the region and the individual communities:

Chart 4: School Enrollment in the NMCOC Region

Community	Population Enrolled in School (3 years old+)	Nursery School/ Preschool	Kindergarten	Elementary School (1-8)	High School (9-12)	College or Graduate School
Billerica	10,173	683 (6.7%)	517 (5.1%)	4,894 (48.1%)	2,110 (20.7%)	1,969 (19.4%)
Chelmsford	8,634	614 (7.1%)	523 (6.1%)	3,916 (45.4%)	1,950 (22.6%)	1,631 (18.9%)
Dracut	7,397	532 (7.2%)	332 (4.5%)	3,460 (46.8%)	1,498 (20.3%)	1,575 (21.3%)
Dunstable	859	98 (11.4%)	67 (7.8%)	383 (44.6%)	159 (18.5%)	152 (17.7%)
Lowell	30,686	1,880 (6.1%)	1,325 (4.3%)	13,556 (44.2%)	6,071 (19.8%)	7,854 (25.6%)
Pepperell	3,242	260 (8.0%)	141 (4.3%)	1,671 (51.5%)	700 (21.6%)	470 (14.5%)
Tewksbury	7,256	685 (9.4%)	467 (6.4%)	3,329 (45.9%)	1,322 (18.2%)	1,453 (20.0%)
Tyngsborough	3,287	329 (10.0%)	122 (3.7%)	1,623 (49.4%)	657 (20.0%)	556 (16.9%)
Westford	6,279	801 (12.8%)	388 (6.2%)	3,079 (49.0%)	1,275 (20.3%)	736 (11.7%)
NMCOC Region	77,813	5,882 (7.6%)	3,882 (5.0%)	35,911 (46.2%)	15,742 (20.2%)	16,396 (21.1%)
Middlesex County	391,638	30,806 (7.9%)	18,198 (4.6%)	151,076 (38.6%)	70,477 (18.0%)	121,081 (30.9%)
Massachusetts	1,726,111	122,930 (7.1%)	86,479 (5.0%)	703,094 (40.7%)	340,205 (19.7%)	473,403 (27.4%)
United States	76.633m	4.958m (6.5%)	4.157m (5.4%)	33.654m (43.9%)	16.381m (21.4%)	17.483m (22.9%)

Source: U.S. Census for 2000

The following conclusions can be made from *Chart 4* above:

- The bulk of this student population, or 46.2%, was enrolled in elementary school. This figure exceeded the participation in elementary school at the county, state and national levels. However, the NMCOC figure was low relative to some of its communities – Pepperell (51.5%), Tyngsborough (49.4%), Westford (49.0%) and Dracut (46.8%).

- Within the lower grades, the NMCOG region had 13.6% of its students in nursery school, pre-school or kindergarten. This figure exceeded the share enjoyed by Middlesex County (12.5%), the state (12.1%) and the nation (11.9%). Generally, those communities within the NMCOG region that had a younger population had a greater share of its students in this category. Dunstable (19.2%), Westford (19.0%), Tewksbury (15.8%) and Tyngsborough (13.7%) were prime examples.
- Within the High School segment, the NMCOG region's share of 20.2% was higher than the county (18.0%) and the state (19.7%), but lower than the nation (21.4%). Chelmsford (22.6%), Pepperell (21.6%), Billerica (20.7%), Dracut (20.3%) and Westford (20.3%) exceeded the region's share of high school students.
- At the college or graduate school level, the NMCOG region had 16,396 students or 21.1 % of its total student population. This figure was lower than the county (30.9%), state (27.4%) and nation (22.9%). The City of Lowell (25.6%) and Dracut (21.3%) also exceeded the NMCOG rate.

School Attainment

Within the population of those 25 years and older, educational attainment figures are utilized to determine a region's preparedness for the demands of new industries and emerging employment opportunities. These figures are often used for comparison purposes in order to determine which region or community has the most educated workforce to meet the needs of specific businesses. Obviously, the nature of the business and the specific jobs will determine how educated the workforce needs to be. However, in today's growing demand for skilled workers, the higher the levels of education, the higher the demand.

The NMCOG region has a fairly well educated population. Based upon the information contained in *Chart 5* on page 10, the NMCOG region has 83.2% of its population 25 years and older as high school graduates or better. This compares favorably to the national rate of 80.4%, but still trails the state (84.8%) and county (88.5%). The NMCOG region exceeds the nation in its percentage of High School Graduates (30.3% vs. 28.6%), Associate Degrees (7.7% vs. 6.3%), Bachelor's Degrees (17.1% vs. 15.5%) and Graduate or Professional Degrees (12.1% vs. 8.9%). Reflecting a measure of distress within the region, the NMCOG region almost matched the nation's figures for Less than 9th Grade (6.4% vs. 7.5%) and 9th-12th Grade – No Diploma (10.4% vs. 12.1%). *Chart 5* on the next page summarizes this information:

Chart 5: Educational Attainment in the NMCOC Region

Community	Population 25 years +	Less than 9th Grade	9th-12th Grade No Diploma	High School Graduate	Some college No degree	Associate Degree	Bachelor's Degree	Graduate or Prof. Degree
Billerica	26,041	515 (2.0%)	2,325 (8.9%)	9,501 (36.5%)	5,210 (20.0%)	2,386 (9.2%)	4,085 (15.7%)	2,019 (7.8%)
Chelmsford	23,654	526 (2.2%)	1,128 (4.8%)	5,266 (22.3%)	4,180 (17.7%)	2,151 (9.1%)	6,127 (25.9%)	4,276 (18.1%)
Dracut	19,175	1,174 (6.1%)	1,919 (10.0%)	6,660 (34.7%)	3,750 (19.6%)	1,805 (9.4%)	2,611 (13.6%)	1,249 (6.5%)
Dunstable	1,837	8 (0.4%)	99 (5.4%)	453 (24.7%)	321 (17.5%)	144 (7.8%)	464 (25.3%)	348 (18.9%)
Lowell	64,421	8,337 (12.9%)	10,204 (15.8%)	20,674 (32.1%)	10,133 (15.7%)	3,398 (5.3%)	7,386 (11.5%)	4,289 (6.7%)
Pepperell	6,975	148 (2.1%)	336 (4.8%)	2,191 (31.4%)	1,382 (19.8%)	628 (9.0%)	1,549 (22.2%)	741 (10.6%)
Tewksbury	19,882	594 (3.0%)	1,813 (9.1%)	6,376 (32.1%)	4,237 (21.3%)	1,842 (9.3%)	3,345 (16.8%)	1,675 (8.4%)
Tyngsborough	7,139	186 (2.6%)	525 (7.4%)	2,229 (31.2%)	1,468 (20.6%)	544 (7.6%)	1,474 (20.6%)	713 (10.0%)
Westford	13,275	208 (1.6%)	569 (4.3%)	1,953 (14.7%)	1,916 (14.4%)	1,087 (8.2%)	4,234 (31.9%)	3,308 (24.9%)
NMCOG Region	182,399	11,696 (6.4%)	18,918 (10.4%)	55,303 (30.3%)	32,597 (17.9%)	13,985 (7.7%)	31,275 (17.1%)	22,139 (12.1%)
Middlesex County	1,006,497	43,564 (4.3%)	72,502 (7.2%)	235,369 (23.4%)	152,585 (15.2%)	63,744 (6.3%)	236,568 (23.5%)	202,165 (20.1%)
Massachusetts	4,273,275	247,556 (5.8%)	403,537 (9.4%)	1,165,489 (27.3%)	730,135 (17.1%)	308,263 (7.2%)	834,554 (19.5%)	583,741 (13.7%)
United States	182.212m	13.755m (7.5%)	21.960m (12.1%)	52.169m (28.6%)	38.352m (21.1%)	11.513m (6.3%)	28.318m (15.5%)	16.145m (8.9%)

Source: US Census for 2000

Every community, with the exception of the City of Lowell (71.3%), exceeds the NMCOG region's figure of 83.2% of its population 25 years or older as high school graduates or better. Led by Dunstable (94.2%) and Westford (94.1%), the other communities – Pepperell (93.1%), Chelmsford (93.0%), Tyngsborough (90.0%), Billerica (89.1%), Tewksbury (87.9%) and Dracut (83.9%) – have a much higher percentage of high school graduates than the nation as a whole. In terms of attaining higher degrees, specifically Bachelor's and Graduate or Professional degrees, the communities with the highest percentages in the region include Chelmsford (25.9%; 18.1%), Dunstable (25.3%; 18.9%), Pepperell (22.2%; 10.6%), Tyngsborough (20.6%; 10.0%) and Westford (31.9%; 24.9%). At the other end of the education attainment spectrum, the City of Lowell has more than one-third of its population 25 years and older without a high school diploma, which is more than twice the region's rate.

Households

The growth in households between 1990 and 2000, as well as the projected growth between 2000 and 2020, parallels the growth in the population in the region. Overall, households, which are defined by the U.S. Census as being equivalent to “occupied housing units”, increased by 10.5% in the NMCOG region between 1990 and 2000 and are expected to increase an additional 20.9% between 2000 and 2020, based upon projections by the Massachusetts Highway Department. More than 30,000 households will have been created in the NMCOG region if the 2020 projections are relatively accurate.

Dunstable experienced the greatest percentage growth in households (35.3%) between 1990 and 2000 and was expected to add an additional 85.0% of households between 2000 and 2020. The greatest numerical growth in households between 1990 and 2000 was in Westford (1,504), which is also expected to have the greatest numerical growth (3,357) in households between 2000 and 2020. *Chart 6* below summarizes the community and regional household information. Additional information by individual community and Census Tract for 1990 and 2000 is included in *Table II in Appendix II*.

Chart 6: Households in the NMCOG Region – 1990, 2000 and 2020

Community	1990	2000	% Change 1990-2000	2020	% Change 2000-2020
Billerica	11,687	12,961	10.9%	14,838	14.5%
Chelmsford	11,453	12,826	12.0%	13,929	8.6%
Dracut	9,019	10,450	15.9%	14,265	36.5%
Dunstable	692	936	35.3%	1,732	85.0%
Lowell	36,930	37,992	2.9%	41,119	8.2%
Pepperell	3,450	3,845	11.4%	6,807	77.0%
Tewksbury	8,711	9,955	14.3%	11,845	19.0%
Tyngsborough	2,844	3,741	31.5%	5,572	48.9%
Westford	5,332	6,836	28.2%	10,193	49.1%
NMCOG Region	90,118	99,542	10.5%	120,300	20.9%

*Source: U.S. Census for 1990 and 2000
Projections for 2020 developed by the Massachusetts Highway Department*

Families

Families in the NMCOG region grew by 6.8%, or 4,559 families, between 1990 and 2000. For the most part, the number of families increased between 1990 and 2000. However, the number of families in Lowell decreased by 1.3% between 1990 and 2000, even though its population increased by 1.7%. The greatest percentage growth in families was in Dunstable (35.6%), while the greatest numerical growth was in Westford with the addition of 1,273 families between 1990 and 2000. *Chart 7* on page 12 summarizes the number of families in 1990 and 2000, as well as the percentage change between 1990 and 2000, according to the U.S. Census:

Chart 7: Families in the NMCOG Region, 1990 and 2000

Community	1990	2000	% Change 1990-2000
Billerica	9,445	10,306	9.1%
Chelmsford	9,011	9,361	3.9%
Dracut	7,052	7,756	10.0%
Dunstable	593	804	35.6%
Lowell	24,561	24,247	-1.3%
Pepperell	2,790	3,018	8.2%
Tewksbury	7,153	7,764	8.5%
Tyngsborough	2,326	2,961	27.3%
Westford	4,551	5,824	28.0%
NMCOG Region	67,482	72,041	6.8%

Source: U.S. Census for 1990 and 2000

Note: No 2020 projections were available for families.

Chart 8 below provides a comparison of the changes in population, households and families in the Greater Lowell region between 1990 and 2000, as well as the changes in population and households between 2000 and 2020:

Chart 8: Comparison of Changes in Population, Households and Families for 1990 and 2000 in the NMCOG Region

Community	% Change Population 1990-2000	% Change Households 1990-2000	% Change Families 1990-2000	% Change Population 2000-2020	% Change Households 1990-2020
Billerica	3.6%	10.9%	9.1%	5.4%	14.5%
Chelmsford	4.6%	12.0%	3.9%	6.7%	8.6%
Dracut	11.6%	15.9%	10.0%	29.2%	36.5%
Dunstable	26.5%	35.3%	35.6%	71.4%	85.0%
Lowell	1.7%	2.9%	-1.3%	5.7%	8.2%
Pepperell	10.3%	11.4%	8.2%	66.9%	77.0%
Tewksbury	5.8%	14.3%	8.5%	12.0%	19.0%
Tyngsborough	28.2%	31.5%	27.3%	39.0%	48.9%
Westford	26.6%	28.2%	28.0%	37.3%	49.1%
NMCOG Region	6.7%	10.5%	6.8%	15.6%	20.9%

Source: U.S. Census for 1990 and 2000

Projections for 2020 developed by the Massachusetts Highway Department

Note: No 2020 projections were available for families.

Income

The basic income figures for the NMCOG region – Per Capita Income, Median Household Income and Median Family Income-- as well as the number and percentage below the poverty level, have been summarized in this section. These income figures show the changes between 1990 and 2000, compare the individual communities with the NMCOG region and compare the NMCOG region with Middlesex County, the State of Massachusetts and the United States. This information is further documented at the Census Tract level for the communities within the NMCOG region as part of *Table II in Appendix I*. Eligibility for various federal and state

programs is based partially upon the income figures within an area. For instance, those communities (or portions of communities) below 80% of the national per capita are eligible for funding under the Economic Development Administration. In the case of the NMCOG region, the only community that qualifies is the majority of the City of Lowell. (Note: The City of Lowell is at 81.3% of the national per capita income rate based upon the U.S. Census figures for 2000.) At the end of this section, there is a brief summary of the changes in each of these income categories between 1990 and 2000 for comparison purposes.

Per Capita Income

The Per Capita Income for the NMCOG region increased from \$16,229 in 1990 to \$24,081 in 2000, which represented an increase of 48.4%. The percentage change from 1990 to 2000 in the NMCOG region was less than the changes in Middlesex County (53.4%), the State of Massachusetts (50.7%) and the United States (49.7%). Overall, the per capita income figure for the NMCOG region (\$24,081) in 2000 was less than the State of Massachusetts (\$25,952) and Middlesex County (\$31,199), but higher than the United States (\$21,587).

Within the NMCOG region, the City of Lowell had the lowest per capita income figure (\$17,557) in 2000, which was 81.3% of the national per capita income rate. As outlined in *Table II in Appendix II*, most of the census tracts in the City of Lowell have per capita income rates less than 80% of the national figure, and, therefore, are eligible for EDA funding. The per capita income figures for Lowell increased only 38.2% between 1990 and 2000 and represented the second lowest change in per capita income, next to Billerica. The highest per capita income figure was in Westford at \$37,979 and the greatest increase in per capita income figures between 1990 and 2000 was also in Westford (73.6%).

Summarized below in *Chart 9* are the per capita income figures in 1990 and 2000 and changes between 1990 and 2000 for the NMCOG region, its individual communities, Middlesex County, the State of Massachusetts and the United States for comparative purposes:

Chart 9: Per Capita Income for the NMCOG Region, 1990 and 2000

Community/ Region	1990	2000	% Change 1990-2000
Billerica	\$ 19,395	\$ 24,953	28.7%
Chelmsford	\$ 21,814	\$ 30,465	39.7%
Dracut	\$ 16,508	\$ 23,750	43.9%
Dunstable	\$ 20,059	\$ 30,608	52.6%
Lowell	\$ 12,701	\$ 17,557	38.2%
Pepperell	\$ 17,374	\$ 25,722	48.0%
Tewksbury	\$ 18,224	\$ 27,031	48.3%
Tyngsborough	\$ 16,633	\$ 27,249	63.8%
Westford	\$ 21,878	\$ 37,979	73.6%
NMCOG Region	\$ 16,229	\$ 24,081	48.4%
Middlesex County	\$ 20,343	\$ 31,199	53.4%
Massachusetts	\$ 17,224	\$ 25,952	50.7%
United States	\$ 14,420	\$ 21,587	49.7%

Source: U.S. Census for 1990 and 2000

Median Household Income

The Median Household Income for the NMCOC region increased by 38.2% from \$42,309 in 1990 to \$58,472 in 2000. The median household income in the region was greater than that for the State of Massachusetts and the United States and lower than that for Middlesex County in both 1990 and 2000. As reflected below in Chart 10 on median household income, the region's rate of increase was less than that of Middlesex County (38.7%) and the United States (39.7%), but greater than the State of Massachusetts (36.7%).

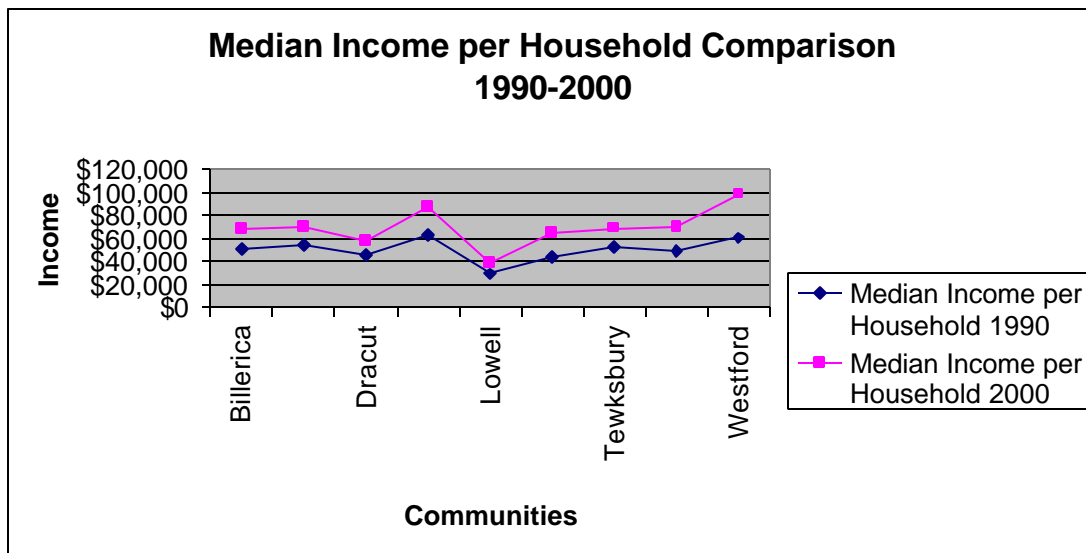
While Dunstable had the highest median household income in 1990 at \$62,515, Westford had the highest median household income at \$98,272 in 2000. The City of Lowell had the lowest median household income in both 1990 (\$29,351) and 2000 (\$39,192). The greatest percentage of change in median household income between 1990 and 2000 was in Westford (62.3%), while the lowest percentage of change was in Dracut (27.7%). *Chart 10* summarizes the median household income information below for the NMCOC region, while *Figure 3* on the next page shows this data in graphic form:

Chart 10: Median Household Income in the NMCOC Region, 1990 and 2000

Community/ Region	1990	2000	% Change 1990-2000
Billerica	\$ 50,210	\$ 67,799	35.0%
Chelmsford	\$ 53,971	\$ 70,207	30.1%
Dracut	\$ 45,165	\$ 57,676	27.7%
Dunstable	\$ 62,515	\$ 86,633	38.6%
Lowell	\$ 29,351	\$ 39,192	33.5%
Pepperell	\$ 44,492	\$ 65,163	46.5%
Tewksbury	\$ 52,572	\$ 68,800	30.9%
Tyngsborough	\$ 48,842	\$ 69,818	42.9%
Westford	\$ 60,566	\$ 98,272	62.3%
NMCOC Region	\$ 42,309	\$ 58,472	38.2%
Middlesex County	\$ 43,847	\$ 60,821	38.7%
Massachusetts	\$ 36,952	\$ 50,502	36.7%
United States	\$ 30,056	\$ 41,994	39.7%

Source: U.S. Census for 1990 and 2000

Figure 4: Median Income per Household (1990,2000) in the NMCOG Region



Source: U.S. Census for 1990 and 2000

Median Family Income

The NMCOG region increased its median family income by 41% between 1990 (\$47,936) and 2000 (\$67,583). During the same period of time, Middlesex County increased its median family income by 42.4%, the State of Massachusetts increased its median family income by 39% and the median family income for the United States increased by 42.1%. The relative position of each region stayed the same between 1990 and 2000 with Middlesex County having the highest median family income, followed by the NMCOG region, the State of Massachusetts and the United States.

Chart 11 on the next page summarizes the median family income for the communities within the NMCOG region, as well as the regional areas mentioned previously. In 1990, Dunstable (\$65,720) had the highest median family income, but in 2000, Westford (\$104,029) moved ahead as a result of its 65% increase in its median family income between 1990 and 2000. The City of Lowell had the lowest median family income in 1990 (\$35,138) and 2000 (\$45,901), while also experiencing the least growth in median family income between 1990 and 2000.

Chart 11: Median Family Income in the NMCOG Region, 1990 and 2000

Community/ Region	1990	2000	% Change 1990- 2000
Billerica	\$ 53,302	\$ 72,102	35.3%
Chelmsford	\$ 59,368	\$ 82,676	39.3%
Dracut	\$ 48,506	\$ 65,633	35.3%
Dunstable	\$ 65,720	\$ 92,270	40.4%
Lowell	\$ 35,138	\$ 45,901	30.6%
Pepperell	\$ 49,259	\$ 73,967	50.2%
Tewksbury	\$ 56,786	\$ 76,443	34.6%
Tyngsborough	\$ 52,358	\$ 78,680	50.3%
Westford	\$ 63,047	\$ 104,029	65.0%
NMCOG Region	\$ 47,936	\$ 67,583	41.0%
Middlesex County	\$ 52,112	\$ 74,194	42.4%
Massachusetts	\$ 44,367	\$ 61,664	39.0%
United States	\$ 35,225	\$ 50,046	42.1%

Source: U.S. Census for 1990 and 2000

Poverty Levels

Between 1990 and 2000, the number of residents below the poverty line in the NMCOG region increased from 22,638 to 22,877, while the percentage of residents below the poverty line decreased from 8.6% to 8.1%. The City of Lowell has experienced the greatest poverty levels within the region. In 1990 the City had 17,900 persons below the poverty line, which represented 18% of its total population and almost 79% of all persons below the poverty line in the region. The number of people below the poverty line actually decreased in the City of Lowell in 2000 and this population group represented 16.8% of the entire City population and declined to 75% of all persons below the poverty line in the region. The figures in *Chart 12* below reflect increasing numbers of poor people in Billerica, Chelmsford, Dracut, Dunstable, and Westford. The residents of Tewksbury State Hospital are reflected in Tewksbury's figures.

Chart 12: Number and Percentage of Residents Below Poverty, 1990-2000

Community	1990 # Below Poverty	1990 % Below Poverty	2000 # Below Poverty	2000 % Below Poverty
Billerica	844	2.3%	1,414	3.8%
Chelmsford	819	2.6%	938	2.8%
Dracut	830	3.3%	1,055	3.7%
Dunstable	34	1.5%	55	1.9%
Lowell	17,900	18.0%	17,066	16.8%
Pepperell	399	3.9%	411	3.7%
Tewksbury	1,026	3.8%	1,974	3.8%
Tyngsborough	603	7.0%	519	4.7%
Westford	183	1.1%	345	1.7%
NMCOG Region	22,638	8.6%	22,877	8.1%

Source: U.S. Census for 1990 and 2000

The previous data has reviewed per capita income, median household income, median family

income and the number and percent below the poverty line as a means to shed light on the economic situation in the region in comparison with the county, state and nation. *Chart 13* below summarizes the changes in each of these categories and provides a visual comparison between each economic indicator. It is interesting to note that the per capita, median household and median family incomes rose between 1990 and 2000 at rates comparable to the state and nation, while the actual percentage of those under the poverty line decreased. In two specific cases --Lowell and Pepperell-- the number below poverty decreased by 4.7% and 13.9% respectively. In essence, the 1990's, particularly post-1992, were good economically for this region and the numbers illustrate that point. However, as will be seen in other sections of this document, the period since 2000 has not been as favorable.

Chart 13: Per Capita Income, Median Household Income, Median Family Income and Number Below Poverty, 1990-2000

Community	% Change Per Capita Income 1990-2000	% Change Median Household Income 1990-2000	% Change Median Family Income 1990-2000	% Change Number Below Poverty 1990-2000
Billerica	28.7%	35.0%	35.3%	67.5%
Chelmsford	39.7%	30.1%	39.3%	14.5%
Dracut	43.9%	27.7%	35.3%	27.1%
Dunstable	52.6%	38.6%	40.4%	61.8%
Lowell	38.2%	33.5%	30.6%	-4.7%
Pepperell	48.0%	46.5%	50.2%	3.0%
Tewksbury	48.3%	30.9%	34.6%	92.4%
Tyngsborough	63.8%	42.9%	50.3%	-13.9%
Westford	73.6%	62.3%	65.0%	88.5%
NMCOG Region	48.4%	38.2%	41.0%	1.1%

Source: U.S. Census for 1990 and 2000

4. Land Use

The Greater Lowell region has changed considerably since its early beginnings when it was comprised of the industrial mill complex in Lowell and pastoral farmlands. Over the years, the City of Lowell has lost its dominance as the economic engine of the region, as increased development has occurred in its adjoining suburbs, particularly Billerica, Chelmsford and Tewksbury. Based upon information from the MacConnell Land Use Maps in 1971, the region was 18.9% developed with 5.3% of that land devoted to commercial purposes, approximately 10% utilized for industrial purposes and 84.8% devoted to residential uses. Twenty years later in 1991, the region had increased its developed land by 91% and its commercial (73%), industrial (112%) and residential (90%) uses by similar growth rates. The amount of undeveloped land during this period decreased by 21%. By 1991 the region was 34.5% developed with 4.8% of the developed land used for commercial uses, 11% devoted to industrial uses and nearly 84.2% dedicated to residential purposes. For the most part, commercial uses in the region have remained relatively small due to its proximity to Greater Boston and industrial uses have

increased slightly due to increased development in the suburbs. By nearly doubling its developed land in twenty years, the Greater Lowell region placed additional pressure on its basic infrastructure--- highway and road system, sewer and septic systems, water systems and utilities. Addressing these increased demands became an ongoing struggle for the region and local communities due to the high cost of implementing these infrastructure improvements. Some major projects, such as the expansion of Route 3, which enjoyed regional support, were able to move forward to ensure the economic growth of the region.

Chart 14 provides a breakdown of the change in land use in the Greater Lowell region for 1971, 1985 and 1991 based upon data from the MacConnel maps provided by the University of Massachusetts. The information is broken out by developed and undeveloped land, as well as by an additional breakdown of the developed land by commercial, industrial and residential uses. (Additional information on agricultural land is included within the Natural Resources section.) Two separate columns document the percentage change between 1971 and 1991 and the percentage of the region in 1991. Although more recent land use data has been developed since 1991, this data provides a comparable information base. (*Map 3 in Appendix I* shows the land use and development pressure in the region as of 2000.) *Chart 14* below provides an overview of the land use data affecting the Greater Lowell region:

Chart 14: Land Use in the NMCOG Region, 1971, 1985 and 1991

		Acres			% change	% of region
Community	Land Use	1971	1985	1991	1971-1991	1991
Billerica	Commercial	216.6	283.8	397.00	83%	18.3%
	Industrial	324.6	692.28	1,083.57	234%	21.6%
	Residential	4,747.58	5,670.02	6,665.34	40%	17.4%
	Developed	5,288.78	6,646.10	8,145.91	54%	17.9%
	Undeveloped	11,608.93	10,251.61	8,751.80	-25%	10.9%
	Total	16,897.71	16,897.71	16,897.71	NA	13.4%
Chelmsford	Commercial	158.39	216.55	376.89	138%	17.4%
	Industrial	310.07	503.97	637.32	106%	12.7%
	Residential	3,249.10	3,914.34	6,866.71	111%	18.0%
	Developed	3,717.56	4,634.86	7,880.92	112%	17.4%
	Undeveloped	11,110.09	10,192.79	6,946.73	-37%	8.6%
	Total	14,827.65	14,827.65	14,827.65	NA	11.8%
Dracut	Commercial	115.88	176.87	215.36	86%	9.9%
	Industrial	228.49	277.73	425.91	86%	8.5%
	Residential	2,159.37	3,024.00	4,502.61	109%	11.8%
	Developed	2,503.74	3,478.60	5,143.88	105%	11.3%
	Undeveloped	11,241.50	10,266.64	8,601.36	-23%	10.7%
	Total	13,745.24	13,745.24	13,745.24	NA	10.9%
Dunstable	Commercial	2.77	2.77	0.00	-100%	0.0%
	Industrial	26.80	62.75	189.11	606%	3.8%
	Residential	368.59	586.81	1,064.48	189%	2.8%
	Developed	398.16	652.33	1,253.59	215%	2.8%
	Undeveloped	10,346.39	10,092.22	9,490.96	-8%	11.8%
	Total	10,744.55	10,744.55	10,744.55	NA	8.5%

Chart 14 (cont.):

		Acres			% change	% of region
Community	Land Use	1971	1985	1991	1971-1991	1991
Lowell	Commercial	424.91	466.57	493.97	16%	22.8%
	Industrial	465.99	638.01	797.94	71%	15.9%
	Residential	2,455.18	2,645.16	4,453.35	81%	11.7%
	Developed	3,346.08	3,749.74	5,745.26	72%	12.7%
	Undeveloped	5,990.99	5,587.33	3,591.81	-40%	4.5%
	Total		9,337.07	9,337.07	9,337.07	NA
Pepperell	Commercial	44.56	55.49	62.13	39%	2.9%
	Industrial	46.37	131.79	196.12	323%	3.9%
	Residential	1,041.51	1,801.37	2,595.19	149%	6.8%
	Developed	1,132.44	1,988.65	2,853.44	152%	6.3%
	Undeveloped	13,754.62	12,898.41	12,033.62	-13%	15.0%
	Total		14,887.06	14,887.06	14,887.06	NA
Tewksbury	Commercial	194.63	284.85	274.18	41%	12.6%
	Industrial	338.63	442.83	656.03	94%	13.1%
	Residential	2,803.53	3,555.56	4,876.41	74%	12.8%
	Developed	3,336.79	4,283.24	5,806.62	74%	12.8%
	Undeveloped	10,234.58	9,288.13	7,764.75	-24%	9.7%
	Total		13,571.37	13,571.37	13,571.37	NA
Tyngsborough	Commercial	24.83	82.13	178.98	621%	8.2%
	Industrial	149.43	256.78	309.28	107%	6.2%
	Residential	819.27	1,459.02	2,245.08	174%	5.9%
	Developed	993.53	1,797.93	2,733.34	175%	6.0%
	Undeveloped	10,626.49	9,822.09	8,886.68	-16%	11.1%
	Total		11,620.02	11,620.02	11,620.02	NA
Westford	Commercial	71.23	137.91	172.71	142%	8.0%
	Industrial	477.56	572.81	719.90	51%	14.4%
	Residential	2,504.62	3,642.93	4,930.98	97%	12.9%
	Developed	3,053.41	4,353.65	5,823.59	91%	12.8%
	Undeveloped	17,013.72	15,713.48	14,243.54	-16%	17.7%
	Total		20,067.13	20,067.13	20,067.13	NA
NMCOG	Commercial	1,253.80	1,706.94	2,171.22	73%	100.0%
Region	Industrial	2,367.94	3,578.95	5,015.18	112%	100.0%
	Residential	20,148.75	26,299.21	38,200.15	90%	100.0%
	Developed	23,770.49	31,585.10	45,386.55	91%	100.0%
	Undeveloped	101,927.31	94,112.70	80,311.25	-21%	100.0%
	Total	125,697.80	125,697.80	125,697.80	NA	100.0%

Source: *2020 Vision: Planning for Growth in the Northern Middlesex Region, Northern Middlesex Council of Governments, June 1999.*

In reviewing the growth between 1971 and 1991 and the regional shares enjoyed by each of the communities, it would be appropriate to summarize the relative size of each community to each other. The largest community, in terms of acreage, is the Town of Westford, which represents approximately 16% of the total region. The towns of Billerica (13.4%), Chelmsford (11.8%), Pepperell (11.8%), Dracut (10.9%) and Tewksbury (10.8%) are in double-digits. The towns of Tyngsborough (9.2%) and Dunstable (8.5%) are the smallest towns, while the City of Lowell

comprises only 7.4% of the region's area. Comparing these numbers with the regional share numbers will provide a useful measurement of how well the community is doing given its size.

Within the NMCOG region, the most significant increase in developed land between 1971 and 1991 occurred in Dunstable (215%), Tyngsborough (175%), Pepperell (152%), Chelmsford (112%), and Dracut (105%). The Town of Westford matched the region's growth rate – 91% – and the three other communities were below the region's growth rate. In terms of their share of developed land in the region, Chelmsford (15.6% to 17.4%), Dracut (10.5% to 11.3%), Dunstable (1.7% to 2.8%), Pepperell (4.8% to 6.3%) and Tyngsborough (4.2% to 6.0%) increased their shares between 1971 and 1991. Westford remained at 12.8%, while Billerica (22.2% to 17.9%), Lowell (14.1% to 12.7%) and Tewksbury (14.0% to 12.8%) decreased in terms of their shares of developed land in the region.

In terms of the loss in undeveloped land, Lowell (-40%), Chelmsford (-37%), Billerica (-25%), Tewksbury (-24%) and Dracut (-23%) exceeded the region's loss of undeveloped land (-21%). Westford (17.7%), Pepperell (15%), Dunstable (11.8%), Billerica (10.9%) and Dracut (10.7%) retained double-digit shares of the region's undeveloped land in 1991. The only communities to increase their share of undeveloped land within the region between 1971 and 1991 were Dunstable (10.2% to 11.8%), Pepperell (13.5% to 15%), Tyngsborough (10.4% to 11.1%) and Westford (16.7% to 17.7%).

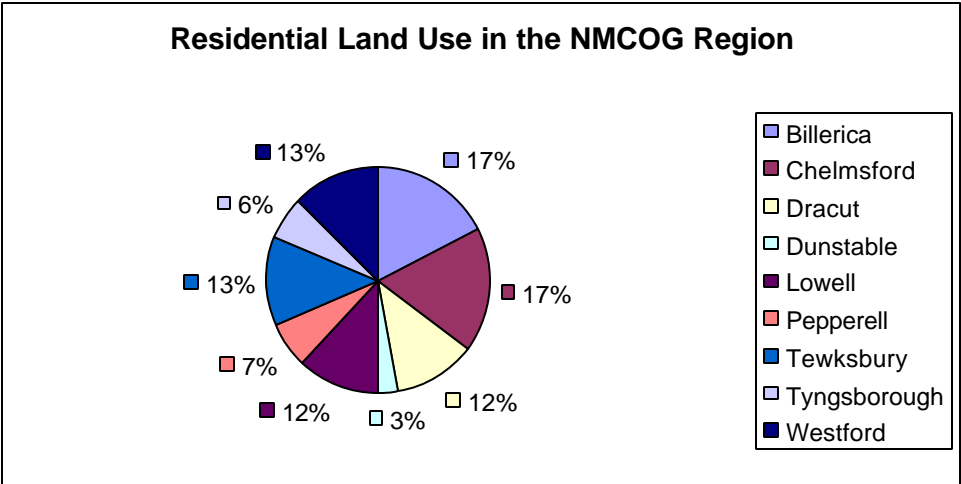
Developed land was broken down into three sub-categories –commercial, industrial and residential. Commercial land grew by 73% in the region from 1971 to 1991, while industrial land grew by 112% for the same period. Residential land, which accounted for 84.2% of all developed land in the region in 1991 (a slight decrease of .6% from 1971), grew by 90%, which was slightly below the growth of developed land in the region. Commercial land represented 5.3% of developed land in 1971 and 4.8% in 1991. Industrial land went from approximately 10% in 1971 to 11% in 1991.

Tyngsborough (621%), Westford (142%), Chelmsford (138%), Dracut (86%), and Billerica (83%) experienced commercial growth rates between 1971 and 1991 that exceeded the regional commercial growth rate for the same period, while Dunstable actually lost commercial land. The major commercial centers in 1991 were in Lowell (22.8%), Billerica (18.3%), Chelmsford (17.4%), and Tewksbury (12.6%). In 1971 the rankings for commercial leaders in the region were Billerica (17.3%), Tewksbury (15.5%), Lowell (12.7%) and Chelmsford (12.6%). Except for Tewksbury, each community's commercial land share increased between 1971 and 1991.

In terms of industrial land, Dunstable (606%), Pepperell (323%), Billerica (234%), Tyngsborough (107%) and Chelmsford (106%) fueled the region's industrial growth between 1971 and 1991. In terms of their regional share of industrial land, Billerica (21.6%), Lowell (15.9%), Westford (14.4%), Tewksbury (13.1%) and Chelmsford (12.7%) were in double digits in 1991. In 1971 Westford (20.2%) had the largest share of industrial land, followed closely behind by the City of Lowell (19.7%), Tewksbury (14.3%), Billerica (13.7%) and Dracut (9.6%). Chelmsford (6.7% to 12.7%) nearly doubled its share of industrial land between 1971 and 1991.

Residential growth between 1971 and 1991 was quite strong in some communities - Dunstable (189%), Tyngsborough (174%), Pepperell (149%), Chelmsford (111%), and Dracut (109%) -and more moderate in others - Westford (97%), Lowell (81%), Tewksbury (74%) and Billerica (40%). Based upon these figures, the less developed communities, such as Dunstable, Tyngsborough, and Pepperell, experienced the most growth during this period. The overall residential shares for the communities increased between 1971 and 1991 for Chelmsford (16.1% to 18%), Dracut (10.7% to 11.8%), Dunstable (1.8% to 2.8%), Pepperell (5.2% to 6.8%), Tyngsborough (4.1% to 5.9%) and Westford (12.4% to 12.9%). The communities with the greatest regional share of residential land in 1991 were Chelmsford (18%), Billerica (17.4%), Westford (12.9%), Tewksbury (12.8%), Dracut (11.8%) and Lowell (11.7%). Outlined below in *Figure 4* is a graphic illustration of Residential Land Use in the NMCOG Region:

Figure 4: Residential Land Use in the NMCOG Region



Source: 2020 Vision: Planning for Growth in the Northern Middlesex Region, Northern Middlesex Council of Governments, June 1999

5. Infrastructure

The Greater Lowell region has extensive infrastructure to support job creation efforts in the future. In particular, the highway network, local road system and public transportation system are generally more developed than other regions. The status of the water and sewer systems varies generally by community with the more developed systems in the City of Lowell and the more developed suburban communities, such as Billerica, Chelmsford and Tewksbury. As identified in the Priority Project section of the Action Plan, there are a number of infrastructure projects that communities in the Greater Lowell region are attempting to implement in order to enhance their attractiveness for business relocation. Other infrastructure systems, such as electric services, natural gas services and telecommunications, are well developed and offer extensive opportunities for businesses to expand or locate in the region.

a. Transportation Systems

The transportation systems in the Greater Lowell region provide a distinct economic advantage for businesses located in the region. Whether their transportation needs revolve around highway travel, public transit for their workers, access to the major airports in Boston or Manchester, New Hampshire, or freight transportation in the region by truck, train or water transport, the Greater Lowell region has the transportation infrastructure in place to address any need. The expansion of Route 3, the extension of commercial service to Nashua, New Hampshire and the completion of the Big Dig project in Boston will provide enhanced improvements to the transportation systems in the region.

1. Highways

The Greater Lowell region enjoys an extensive highway network that includes Route 3, Interstate 495 and Interstate 93 and provides access to New Hampshire (Nashua, Manchester, Concord, Salem and Portsmouth), Maine, Boston, Worcester, Connecticut and Rhode Island. The Lowell Connector provides direct access into the heart of the City of Lowell from Routes 3 and 495. The access provided by this extensive highway network (see *Map 1 in Appendix I*) enables automobiles, trucks and other vehicles to access locations throughout New England, Canada and the Mid-Atlantic States.

The NMCOG Region contains approximately 1,291 miles of roadway of which 94.48 miles are under state jurisdiction and 1,059.8 miles are under local jurisdiction. In 2002 Interstate roads comprised 89.76 lane miles or 3.4% of the total road system in the NMCOG region. Arterial roads, which form the basic framework of the road system, comprised 604.65 lane miles or 23.2% of the total road system. Collector and local roads comprised 291.29 (11.2%) and 1,624.47 (62.2%) lane miles respectively in Greater Lowell's Highway and Street network. (See *Map 2 in Appendix I*).

During the period from 1991 to 2002, regional traffic grew by more than 9.3%, which was slightly lower than the statewide rate for the same period. Increased congestion, particularly during the morning and afternoon commuting hours, has plagued traffic in this area. Route 3, and the numerous river crossings and entrances into downtown Lowell have been the most congested points in the system. High accident locations, as identified in the period from 1997 to 1999, were principally along Route 3 or Interstate 495 with the top seven accident locations (in terms of the number of accidents) being at the intersections with one of these highways. Additional high accident locations comprising the Top Ten included the intersection of Mammoth Road and Varnum Avenue in Lowell, Route 3 and Treble Cove Road in Billerica and Chelmsford Street and the Lord Overpass in Lowell. In terms of the pavement maintenance needs of the region, 17% of the federal aid roadways are either in fair or poor condition. A budget of \$ 2-3 million per year is required over the next ten years to maintain the federal aid roadways in the Northern Middlesex Region at their current level.

The Commonwealth of Massachusetts has adopted the "Fix it First" policy placing priority on repairing the existing transportation infrastructure. Under this new policy, the State will focus on structurally deficient bridges. In the case of the Greater Lowell region, there are a number of

structurally deficient bridges that need to be addressed in order to maintain and improve the transportation infrastructure. The Massachusetts Highway Department utilizes a national rating system (AASHTO) of 0 to 100 with 100 being the highest score to rank bridges. According to the 2003-2025 Transportation Plan for the Northern Middlesex Region, the most structurally deficient bridges (below 50) in this region, include the following:

- Groton Street Bridge over the Nashua River in Pepperell (11.8)
- Lincoln Street Bridge over the Railroad in Lowell (13.9)
- Kendall Road Bridge over the Merrimack River in Tyngsborough (24.2)
- University Avenue Bridge over the Merrimack River in Lowell (28.4)
- Princeton Street Bridge over the B&M Railroad in Chelmsford (32.5)
- Pleasant Street (Route 225) Bridge over Stony Brook in Westford (34.4)
- Nashua Road Bridge over the Concord River in Billerica (41.9)
- Parker Avenue Bridge over Beaver Brook in Dracut (42.5)
- Mill Street Bridge over the Nissitissit River in Pepperell (44.8)

In addition to the structurally deficient bridges, the State identifies functionally obsolete bridges that are structurally sound but do not meet current design standards. The State utilizes the same national rating system and the most structurally deficient bridges (below 50) in the region were as follows:

- VFW Highway over Beaver Brook in Lowell (24.1)
- Morton Street over B&M Railroad in Lowell (28.0)
- Town Farm Lane over the B&M Railroad in Billerica (28.7)
- Route 110/Appleton Street over Thorndike Street (39.4)
- Route 113 over the B&M Railroad in Tyngsborough (47.9)
- Market Street over the Western Canal in Lowell (49.8)

The lack of capacity on the six Merrimack River crossings in Lowell and Tyngsborough create real problems for commuter traffic in the morning and afternoon. In general, residents who live north of Lowell and commute to jobs south of the City are primarily impacted by the lack of capacity on these river crossings. The Lowell Connector and U.S. Route 3 serve as the primary collector-distributor south of Lowell, while Mammoth Road performs this function north of the river. Traffic becomes clogged at the bridge approaches where the limited capacity bridges conflict with the City’s 19th Century street network. The three major issues to be addressed are:

Lowell River Crossing Issues

As part of NMCOG’s Regional Transportation Plan, a survey was distributed to each community asking officials to identify and rank the transportation priorities within their respective communities. City of Lowell officials have identified the river crossing deficiencies as being of highest priority. The temporary, two-lane Rourke Bridge currently carries about 28,000 vehicles per day. The City has requested that a new, updated feasibility study be completed and the necessary environmental documents be prepared for replacing the temporary bridge with a permanent structure. The estimated cost for the feasibility study and EA/EIS is \$1.5 million.

Tyngsborough River Crossing Issues

The Tyngsborough Bridge, constructed in 1932, provides the only crossing of the Merrimack River for residents of Tyngsborough and neighboring communities such as Chelmsford, Dracut, Westford and Dunstable. Increased traffic congestion on and around the bridge, resulting from local and regional growth, has resulted in significant congestion and delays.

In February 2002, the New Tyngsborough Bridge Transportation Study, Feasibility Study, and Conceptual Design for a Second Bridge Crossing of the Merrimack River was published by MassHighway. The purpose of the study was to assess the need for and feasibility of a second bridge across the Merrimack River. The first part of the study evaluated fourteen different alternative crossing locations. The feasibility study indicated that alternatives 5, 6, and 14 best met the goals of the study with the least environmental impact.

An Environmental Notification Form was filed with MEPA on September 25, 2002. The Massachusetts Secretary of Environmental Affairs issued a Certificate on November 22, 2002 requiring that an Environmental Impact Report be prepared for the proposed project. The EIR will assess the environmental impacts of each of the preferred alternatives. The selection, design, permitting and construction of the additional river crossing will take several years to complete.

Route 3 North Transportation Improvement Project

The Route 3 North Transportation Improvement Project is being undertaken to address traffic congestion on State Highway Route 3 between I-95/Route 128 and the New Hampshire state line. The project involves the addition of a third travel lane in each direction for the entire 34km/21-mile long corridor. The project also includes the addition of a median shoulder and a 30-foot clear recovery zone, inclusion of shoulders, improvements to thirteen interchanges, replacement of thirty bridges consisting of forty-one separate structures, creation of an additional pair of travel lanes in each direction in certain areas to function as a collector/distributor system to aid in handling the high volume of traffic that moves between Route 3 and I-495, reconstruction of the Drum Hill Rotary, construction of a new northbound ramp at Concord Road interchange in Billerica, construction of two park and ride lots, and installation of Intelligent Transportation System (“ITS”) components consistent with both the National ITS Architecture and the IVHS Strategic Deployment Plan for Metropolitan Boston. The ITS components being deployed in the project include variable message signs, blank out signs, roadside cameras for traffic surveillance, Remote Traffic Microwave Sensors, automated weather observation systems, and a link to the Regional Traffic Operations Center.

All bridges are being widened to accommodate the potential installation of additional fourth north/south travel lanes in the future. Improvements are also being made adjacent to Route 3 North, such as new signal timing and lane re-striping to facilitate movement through the corridor. The project began on August 17, 2000 and it is expected to be completed by October 2004.

2. Public Transportation

The public transportation network in the Greater Lowell region is fairly extensive, although some communities receive more services than others. Through the provision of fixed route bus

service, commuter rail, LRTA Paratransit Service and private carriers, this region is well served. In addition, the region is focusing on additional projects, such as LRTA's Transit Initiative for the 21st Century, Boston-Montreal High Speed Rail, and the Lowell Trolley Extension Project. The Public Transportation System has traditionally focused upon downtown Lowell as the hub of this system. More recently this focus has shifted to the Gallagher Regional Transportation Center, which provides access to commuter rail and other forms of public transportation services that can't be provided downtown. The level of service to the City of Lowell and its surrounding communities depends largely upon the federal, state and local financial resources available, as well as the utilization of these services in each community. A brief summary of each of these components follows below.

Fixed Route Bus Service

The Lowell Regional Transit Authority (LRTA) has statutory responsibility for providing mass transportation services for the Greater Lowell communities, as well as Acton, Groton, and Townsend (320,301 residents). A chief elected official or designee from each member community serves on the LRTA Advisory Board. The LRTA, through a contractual agreement with LoLaw Transit Management, provides fixed route bus service to 313,218 residents in the City of Lowell and the Towns of Billerica, Chelmsford, Dracut, Tewksbury and Tyngsborough. All fixed routes have Lowell as either their origin or destination; twelve routes operate only within the city, three routes service the Town of Chelmsford, and single routes cover the towns of Billerica, Dracut/Tyngsborough (combined), Tewksbury, Andover and Burlington. In February 2003, the LRTA increased fixed route service to the Towns of Billerica, Bedford and Burlington via the Middlesex Turnpike corridor. The #19 Billerica/Sun Microsystems/Lahey Clinic route increased to twelve inbound and twelve outbound runs/day. Additionally, the LRTA operates the Downtown Shuttle, which provides bus service between the Gallagher Intermodal Transportation Terminal and Paige Street Transit Center in downtown Lowell every day excepting Sundays.

Service is provided on twelve Lowell routes and eight suburban routes five days a week from essentially 6:00 a.m. to 6:00 p.m. and on Saturdays from 7:30 a.m. to 5:30 p.m. There is no Saturday service to Burlington, Andover and Tewksbury, and there is no service on Sundays or the following holidays: New Years Day, Martin Luther King Day, Presidents Day, Patriots Day, Memorial Day, Independence Day, Labor Day, Columbus Day, Veterans Day, Thanksgiving Day and Christmas Day. LRTA bus passes are valid for unlimited travel on all City and Suburban routes during the term specified on the pass.

The LRTA contracts with LoLaw Transit Management for the operation and maintenance of a forty bus fleet, twenty-eight of which are operated in peak hour service. In March 1992 the LRTA received twenty-two front door wheelchair lift-equipped, 35-foot flexible transit coaches. In September 1994 the LRTA received thirteen Gillig Phantom buses, and in January 1999 the LRTA received two Blue Bird buses, and in October 2001 the LRTA received three CNG Blue Bird Trolley-Wrapped buses. The LRTA fixed route fleet is 100% handicapped accessible.

The LRTA recently completed a Draft Transit Service Plan. The plan, undertaken by MultiSystems Inc., examined the route structure and schedule for the LRTA's fixed route service and recommended changes that will be necessary to accommodate the relocation of the

downtown transit hub to the Gallagher Intermodal Center. The recommendations are also focused on making the routes more direct and efficient. The plan estimated the impacts on ridership and costs of implementing the recommendations.

The plan provides for more frequent and direct service in Lowell with all routes meeting at Gallagher Intermodal Center. The following items highlight other recommendations contained in the plan:

- The Belvidere and Centralville routes have been redesigned to make service more direct.
- New service has been proposed for the Bleachery area in Lowell.
- A new route has been designed to service Pawtucket Boulevard in Lowell.
- Additional service to Drum Hill has been recommended. This could be accomplished by extending the Middlesex Street and Westford Street routes. In addition, new circulator service has also been recommended for the Drum Hill area.
- New links to major commercial and employment centers, such as the Pheasant Lane Mall in Nashua, New Hampshire and the Route 110 corridor in Westford, have been recommended.
- Expansion of suburban service has been suggested, including two new routes in Billerica and two new routes in Dracut.
- New circulator services in Chelmsford, Tewksbury and Westford have also been recommended.

The plan will need to be implemented in phases as resources become available. It may take several years to fully implement the recommendations given current economic conditions.

LRTA Paratransit Service

The LRTA currently provides paratransit services for the elderly and handicapped in ten communities through agreements with private transportation carriers. All of the paratransit services offer dial-a-ride and prescheduled transportation on a twenty-four hour advanced call basis within specified hours of operation. These services are provided through two different approaches:

- The LRTA furnishes demand responsive and prescheduled van service, known as “Road Runner”, to eligible clients in Acton, Billerica, Chelmsford, Dracut, Dunstable, Groton, Lowell, Pepperell, and Westford under a contract with OMNI BUS, Inc. This contract also includes an extended service hours program funded by the Massachusetts Executive Office of Transportation and Construction (EOTC) and a special transportation service for area nursing homes. Additionally, the LRTA intends to expand paratransit service as part of its Americans with Disabilities Act (ADA) compliance program.
- The LRTA has also entered into agreements with the Councils on Aging (CoA) in Acton, Chelmsford, Dracut, Townsend and Tyngsborough to provide service for elderly and handicapped residents in these towns.

Currently, service is provided for trips not only within each town but also to contiguous towns. The LRTA's plans for paratransit expansion call for additional intercommunity trips. Most of the transportation from suburban communities includes trips to Lowell. Those towns that do not include Lowell in their service area (Acton, Groton, Townsend) are located in the western section of the LRTA district and gravitate, economically and socially, more to Fitchburg than Lowell. An exception to this is Groton where all residents are eligible for the Road Runner service regardless of age or handicap. In addition to trips made in the area, the Lowell Road Runner provides transportation for residents of Lowell, Dracut, Chelmsford and Westford to medical sites in Boston.

The extended service program, part of the state funded Accessibility Improvement Program (AIP), provides extended hours of daily service from 6:00 a.m. to 6:00 p.m. and Saturday services from 8:00 a.m. to 5:00 p.m. in Lowell, Chelmsford, Dracut and Tyngsborough as part of the OMNI Bus provided Road Runner service.

Transportation is primarily available for those residents over 60 years of age or any handicapped person. Within the LRTA service area, there were 38,864 elderly. Within the urbanized area, nearly 7,400 of those 65 or older reported a mobility or selfcare limitation to the U.S. Census Bureau. Additionally, nearly 11,000 individuals aged 16-64 reported a mobility and/or selfcare limitation. All trip purposes, including medical, nutritional, shopping, recreational, and social, are accommodated and this is the client population the LRTA serves by providing paratransit service to its member communities. As of January 1996, the LRTA was in full compliance with the provisions of the Americans with Disabilities Act.

The LRTA contracts for the operation of thirty-two demand response vehicles with OMNI Bus, Inc., McCarty Limousine Company and the Councils on Aging in Acton, Chelmsford, Dracut, and Tyngsborough. Ten (10) of these vehicles serve the ADA service area: Billerica, Chelmsford, Dracut, Lowell, Tewksbury and Townsend. All of the paratransit vehicles are wheelchair lift equipped and range in capacity from eight to fourteen passengers. In FY'02, the total paratransit passenger trips was 97,764, with 71,737 provided by Road Runner service and the remainder provided by the Councils on Aging.

Paratransit services are also provided by bus charter companies, taxi companies and ambulance and wheelchair transportation companies. While none of the bus charter companies serve handicapped passengers, the other companies do. The list of the other paratransit providers in the region is as follows:

Bus Charter Companies:

1. A+A Charters, 60 Olympia Avenue, Woburn
2. A+F Bus Company, Inc., 16 Wyman Road, Billerica
3. Bedford Charter Service, 11 Railroad Avenue, Bedford
4. Bruce Transportation Group, 1 Ward Way, Chelmsford
5. Buckingham Bus Company, 40 Station Avenue, Groton
6. The Coach Company, 11 Wentworth Avenue, Plaistow, NH
7. Corporate Coach & Limousine, 323 Littleton Road, Westford
8. Dee Bus Service, 30 Town Farm Road, Westford

Bus Charter Companies (cont.)

9. Dunbar Bus Company, 33 Middlesex Road, Tyngsborough
10. Fiore Ralph Bus Service, 3 Plank Road, Billerica
11. R. C. Herrmann Bus Company, 290 Littleton Road, Westford
12. Laidlaw Education Service, 1479 Hildreth Street, Dracut
13. Tewksbury Transit Inc., 555 Whipple Road, Tewksbury
14. Trombly Commuter Lines, Inc., 1480 Broadway Road, Dracut

Taxi Services:

1. Billerica Taxi & Transportation Services, Billerica
2. Broadway Cab Company, 50 Payne Street, Lowell
3. Chelmsford Livery Transportation, 15 Vinal Square, Chelmsford
4. City Cab Company, 50 Payne Street, Lowell
5. Diamond Yellow Taxi Cabs, 50 Payne Street, Lowell
6. Family Taxi, 452 Central Street, Lowell
7. High Class of Lowell, 26 Howard Street, Lowell
8. J&N Taxi, 35 Bridge Street, Lowell
9. Lanes Seager Transportation, 35 Bridge Street, Lowell
10. Lowell Cab Company, Lowell
11. Pronto Car Service, 26 Howard Street, Lowell
12. Town Taxi, 14 Perry Street, Lowell
13. US Shuttle
14. Wilmington Taxi
- 15.

Ambulance Service and Wheelchair Transport:

1. American Medical Response, Lowell
2. Frontline Ambulance, 599 Canal Street, Lawrence
3. Trinity EMS, 170 Perry Street, Lowell
4. Patriot Ambulance Service, 35 Maple Street, Lowell

Access To Jobs Initiative

The LRTA, with funding provided through the Federal Transit Administration (FTA) and the Massachusetts Department of Transitional Assistance (DTA), has undertaken a three-year program to provide transportation to people transitioning off welfare. The Access to Jobs Initiative is comprised of two elements – demand response and fixed route service, as described below, is a mix of demand response and fixed route service.

- The demand response service is operated under contract. In fiscal year 2002, there were a total of 13,275 trips provided in the three vehicles with approximately 51% provided in their two employment vans and 49% in the child care van. The vans operate seven days per week on split shift schedules running from 5:30 a.m. to 12:15 p.m. on weekdays and from 5:30 a.m. to 2:30 p.m. on Saturdays and Sundays. The service is dovetailed with the state's guaranteed ride home program that will ensure a client can obtain an emergency ride twenty-four hours a day.

- The LRTA fixed route operation is the second important element of the region's Access to Jobs initiative. Upon review of employment opportunities in the area, the LRTA continued service of two routes. The #19 Billerica/Burlington Mall/Lahey Clinic route opens up the entire Middlesex Turnpike area to public transit, while connecting the Lowell urban core with the suburban employment centers. The #19 route serves a major hospital, retail shopping mall, high tech centers including the new Sun Microsystems world headquarters in Bedford, Massachusetts, and several large hotels. The LRTA estimated that within the first year of operation, this route accounted for more than 30% of its total ridership. The second fixed route established under the Access to Jobs initiative is the #20 Tewksbury/Route 133/IRS route. This route operates on one-hour headways and connects the City of Lowell with the employment center along Route 133. Again this route serves the Internal Revenue Service and Raytheon facilities in Andover, Avid Systems, Wang Technology and a great many other high tech firms along with several hotels and service industries in Tewksbury.

These routes, along with a discounted transit pass, have eased the burden of those individuals transitioning off the welfare roles. While the demand response portion of this initiative will not continue past the three year life of the program, the LRTA expects that the two fixed bus routes will prove successful and will remain on their own merits.

Commuter Rail

Commuter rail transportation has long been an important link between the Greater Lowell and Greater Boston areas. Ridership has fluctuated over the years, but for many, commuter rail remains an efficient, convenient, and inexpensive alternative to private transportation. The following is a brief outline describing the existing rail service offered in the Greater Lowell area, the fare structure, ridership and expansion to Nashua:

Existing Service

Present commuter rail service between Gallagher Terminal in Lowell and North Station in Boston consists of twenty-one daily inbound trains leaving on the half-hour between 5:35 a.m. and 8:25 a.m. and approximately hourly after that time, with the last train to Boston leaving the station at 10:35 p.m. Rail service to Lowell from North Station also consists of twenty-one daily outbound trains between the hours of 5:45 a.m. and 11:59 p.m. with more frequent runs during the evening "rush hour". In addition to Lowell, the train stops at North Billerica, Wilmington, Anderson Mishawum, Winchester, Wedgemere and Medford. The ticket office at Gallagher Terminal sells all one-way, round trips and multiple ride tickets, as well as calendar monthly rail passes. Weekend and holiday rail service consists of nine trains daily both inbound and outbound serving the same stations as weekdays.

Fare Structure

For the purpose of making fares equitable, the MBTA divides each of its commuter rail lines into "zones". Travel to or between zones is assessed according to the number of zones traversed by the commuter. The cost of a one-way ticket from Lowell to Boston is \$4.25. The calendar monthly pass costs \$145.00 for unlimited monthly service. A 12-ride ticket for Zone 6 can be

purchased for \$46.75. The price of a one-way ticket between North Billerica is \$4.00, the 12-ride ticket is \$44.00 and the monthly pass is \$136.00.

Ridership

Commuter rail ridership from Lowell has increased from 655 inbound passengers in March 1975 to 1,437 inbound passengers in October 2002. Passenger ridership has fluctuated over the years reaching a high of 1,777 inbound passengers in February 2002 and a low of 476 inbound passengers in June 1986 due to a B & M rail strike. Similarly, rail ridership from the Billerica station increased from 185 inbound passengers in March 1975 to 934 inbound passengers in October 2002. Passenger ridership reached a high of 1,100 inbound passengers in February 2002 and a low of 184 inbound passengers in March 1976.

The LRTA has been promoting the use of commuter rail by increasing parking at its two locations. In 1992 the LRTA completed construction of a 231-parking space addition to the Gallagher Terminal, thus increasing parking capacity to 736 surface and garage spaces. By 1997 Gallagher Terminal was over capacity and an additional 392 spaces were built in 2002. The LRTA acquired the North Billerica Commuter Rail Station in 1998. As a result of the modernization and expansion efforts, which included bringing the station into ADA compliance, the parking lot containing 541 spaces is usually at capacity by 8:30 A.M.

Nashua Commuter Rail Extension:

In March 1999, the Nashua Regional Planning Commission (NRPC) commissioned a study to examine the feasibility of extending existing commuter rail service on the MBTA's Lowell line to the southern New Hampshire region. This study focused on an incremental approach to restoring service along a 30.4 mile section of the former B&M New Hampshire mainline rail corridor between Lowell and Manchester, New Hampshire. The last regularly scheduled commuter rail service to Nashua and Manchester was operated in June 1967. A thirteen month demonstration project offered a limited schedule of service in 1980 and 1981. The former double track mainline corridor has been reduced to a single-track route with passing sidings, except for a 3.5-mile segment between Lowell Station and Chelmsford Wye.

The incremental approach being examined by the NRPC has been broken into two phases: (1) extension of service from the existing MBTA commuter rail station in Lowell to a new station located at the east end of Spit Brook Road in South Nashua on land owned by Hampshire Chemical Corporation (about 11 miles), and (2) a further extension from Nashua to Manchester, a distance of 19 miles. Conceptual level cost estimates have shown the estimated cost of infrastructure improvements for Phase I to be \$28 million and Phase 2 to be \$51 million.

The New Hampshire Department of Transportation (NHDOT) contracted with Parsons Brinckerhoff (PB) to initiate preliminary design for Phase 1. PB is also responsible for completing an Environmental Assessment for the project. NHDOT estimates that the Phase 1 extension would attract about nine hundred riders per day.

The Town of Chelmsford held a public meeting to gauge the level of support for constructing a new commuter rail station in North Chelmsford if New Hampshire decided to extend service from Lowell. The Chelmsford Board of Selectmen has voted to pursue the development of a

new station in the North Chelmsford area if the project moves forward. The Massachusetts Bay Transportation Authority (MBTA) and Central Transportation Planning Staff (CTPS) completed a feasibility study in 2002, which identified two preferred locations for such a station and assessed the potential demand for each location. The locations include the North Chelmsford Auto Parts site north of Vinal Square and the industrial complex at the end of Wotton Street in North Chelmsford. The cost of construction is estimated at \$3.7 million for a 400-car lot and \$4.9 million for a 725-car lot.

Intermodal Passenger Service

The Gallagher Intermodal Transportation Center provides intermodal passenger service outside the region. These services include regional and interstate bus services, as well as access to the regional airport facilities in Boston and Manchester, New Hampshire and the Amtrak facility at South Station in Boston. The connections to these locations are made as follows:

- The region is served by Peter Pan, Trailways and Vermont bus lines, which provide connections to locations nationwide. Buses depart and arrive at Gallagher Intermodal Center four times daily and connect with Lawrence, Boston, Worcester, Hartford and New York City. From these locations, connections can be made to other parts of New England and the rest of the country.
- Access to Logan Airport in Boston is provided through commuter rail or private shuttle services. Commuter rail passengers can travel to Logan by either getting off at the Anderson Regional Transportation Center in Woburn and taking the Logan Express Bus directly to the Airport or getting off at North Station and continuing on the Green and Blue MBTA lines until you reach the Airport. The total time between the Woburn station and Logan Airport is approximately 30-45 minutes. Private taxi and shuttle companies operate service to and from Logan from all areas of the NMCOG region. Price fares vary among operators depending on the service provided and vehicles operated.
- Access to Manchester Airport in Manchester, New Hampshire is provided through private shuttle service.
- Access to Amtrak at South Station in Boston is provided by commuter rail whereby passengers get off at North Station and then take the Green and Red MBTA lines to South Station.

Park and Ride Facilities/Regional Transportation Center

Although there are currently no designated park and ride facilities in the Northern Middlesex Region, the combination of parking facilities at the Lowell and North Billerica stations and within the City of Lowell provide public transportation options for commuters. The tie-in with the fixed bus routes and commuter rail enables private car operators to access other transportation modes easily. The parking options are as follows:

- The Charles Gallagher Intermodal Transportation Terminal is located on Thorndike Street, adjacent to the Lowell Connector on the outskirts of downtown Lowell. This

parking facility is located at the last stop on the Lowell/North Station commuter line and has a total of 1,129 parking spaces. The cost of parking at the Gallagher Intermodal Center is \$3.50 per day and \$35.00 monthly.

- The North Billerica commuter rail station contains 541 surface parking spaces. When the facility reaches capacity, an adjacent private lot is utilized.
- The City of Lowell operates four public parking garages – George Ayotte (1,250 spaces), John Street (1,141 spaces), Leo A Roy (1,143 spaces) and Lower Locks (1,021 spaces) –that service the daily workforce, students, tourists, shoppers and local residents. The City of Lowell, the National Park Service and the Commonwealth of Massachusetts operate several surface lots throughout the City that supplement the parking garages. The cost of parking ranges from fifty cents per hour to a maximum of five dollars per day.

Plans are underway for park and ride facilities along Route 3. A park and ride lot is presently under construction as part of the Route 3 North Improvement Project. The lot is located on Kendall Road (Route 113) in Tyngsborough and will accommodate 250 vehicles in the near future. There are plans to expand the lot to 500 vehicles by 2018. A second park and ride lot for Route 3 is currently under study. One possible location being studied is the Chelmsford Forum site at the Route 3/129 interchange. NMCOG is assisting MassHighway in identifying and evaluating potential parcels for siting this additional lot.

New Initiatives

The following projects have been identified as new initiatives to the current Transportation System in the Greater Lowell Area:

1. The LRTA’s Transit Initiative for the Twenty-First Century

The Lowell Regional Transit Authority has developed a plan for improving transit service and facilities called the “Transit Initiative for the Twenty-First Century”. The initiative is comprised of the following projects and goals needed to provide transit riders with a high level of service and the status of each element is included:

- Construction of a new transit maintenance and storage facility at 100 Hale Street, Lowell – complete.
- Relocation of the transit hub from Downtown Lowell to Gallagher Terminal including the construction of a new passenger waiting area – under design, RFP issued July 2003.
- Expansion of the Gallagher Terminal commuter parking garage – complete.
- Acquisition of new trolley-type buses to provide increased service on the downtown shuttle route – in planning stages.
- Restructuring of route system and schedule to accommodate the relocation of the downtown transit hub – under study.
- New bus stop signs for the LRTA transit system – under study.

As the Gallagher Terminal has developed into a major parking, transportation and commuter destination for the region, the site has become the focus of future linkages between transportation modes. Currently, downtown Lowell is served by a shuttle leaving Gallagher Terminal every fifteen minutes.

Recently, a feasibility study was completed by the Volpe Center for the National Park Service to explore the feasibility of extending the National Park System Trolley System from downtown Lowell to the Gallagher Transportation Terminal. This connection would allow commuter rail patrons, as well as motorists, to transfer between modes at Gallagher Terminal and utilize the trolley in order to reach downtown destinations.

The relocation of the transit hub from Paige Street to Gallagher Intermodal Center is currently under design. When the new transit hub opens, shuttle bus service between Gallagher Intermodal Center and the downtown area will be provided with 7-10 minute headways. This service will ensure timely connections between the transit hub and downtown destinations.

2. Boston-Montreal High Speed Rail

In late 2000 the Federal Railroad Administration (FRA) designated the Boston to Montreal route as one of the nation's three new High Speed Rail corridors. The proposed 329-mile corridor travels along existing rail rights-of-way from Boston, north to Lowell and Nashua, to Manchester and Concord, New Hampshire. The route turns northwest along the former B&M northern line from Concord to West Lebanon. The route crosses the Connecticut River into White River Junction, Vermont and travels northwesterly to St. Albans, linking with the Canadian National Railroad at Alburg, Vermont. From Alburg, the line travels the final sixty-five miles to Central Station in Montreal, Quebec.

In March 2003, the Boston to Montreal High-Speed Rail Feasibility Study was completed. The study was managed by the Vermont Agency of Transportation (VTrans) through an agreement with the FRA and in partnership with the NHDOT and EOTC. The study examined potential station locations, including Lowell, and assessed potential demand under various operating scenarios. A maximum ridership forecast of 683,667 passengers per year was derived from the mid-speed scenario with the lowest fare rate.

Future studies are needed to examine environmental permitting issues, investigate regulatory and institutional issues given that the facility will be international, and to further evaluate operating and capital costs.

3. Lowell Trolley Extension Project

The Lowell National Historical Park and the City of Lowell are proposing to expand the current trolley system into a light rail heritage trolley system that would serve downtown Lowell and the Acre neighborhood. The new system would expand upon the existing trolley system by adding three major extensions in a phased fashion.

- Phase A: Connect the existing line at Swamp Locks to the Gallagher Intermodal Center, build a new Swamp Locks Bridge to access the proposed Seashore Trolley Museum and operations and maintenance facility; extend the current line

one-half mile past the Tsongas Arena to LeLacheur Stadium; and initiate design for the replacement of the bridge over the Northern Canal (Pawtucket Street). (Estimated capital cost - \$7.1 million.)

- Phase B: Construct the Fletcher Street line (1.5 miles). Complete a loop from the track at the LeLacheur Stadium, along Pawtucket Street, across the Northern Canal, down Fletcher Street to the Thorndike/Dutton Street intersection as constructed under Phase A. (Estimated capital cost - \$2.6 million.)
- Phase C: Construct the Market/Middlesex Line and Downtown Loop (1.0 mile). Create a loop connecting the existing trolley line at Dutton Street and Market Street improving access to the downtown, Middlesex Community College and the Jackson, Appleton, Middlesex Urban Renewal Area. (Estimated capital cost - \$1.5 million.)

Possible route extensions beyond Phase C include constructing a riverfront line that would connect the Tsongas Arena to the Massachusetts Mills site, and connect the current dead-end at Middlesex Community College to the Middlesex Line. Two routes have also been proposed to link the UMass Lowell campuses. A trolley bridge across the Merrimack River could link the residential and academic facilities on the North Campus as part of the Arena/ Stadium loop. A second route could connect the University's South Campus to the Fletcher Street line, effectively linking the North and South Campuses via trolley.

In August 2002 the Volpe Center completed a planning study, "Lowell National Historical Park Alternative Transportation System, Historic Trolley Planning Study". This study examined the physical feasibility of constructing the project, assessed travel demand under various fare and schedule alternatives, and evaluated operation and maintenance costs, and cost recovery. Institutional issues regarding operating responsibility have not yet been addressed. The project will require the preparation of an Alternatives Assessment and an Environmental Impact Study/Environmental Assessment.

3. Airports

In terms of the availability of regional airport facilities, residents and business people within the NMCOG region have a wealth of choices:

- **Logan International Airport, Boston, MA**
The travel distance from Lowell to Logan Airport is approximately 25 miles. Logan International Airport is served by all major carriers, offering both direct and connecting flights at all hours throughout the continental United States and points abroad.
- **Manchester, NH Airport**
Travel distance from Lowell is approximately 32 miles. Manchester Airport offers daily flights and is served by major airlines such as U.S. Airways and Southwest Airlines.

- **Worcester, MA Airport**
Travel distance from Lowell is approximately 40 miles. With the February 2003 departure of U.S. Airways, Worcester currently has no scheduled commercial air service, but it does offer private charter service.
- **Hanscom Air Force Base**
Hanscom Air Force Base is approximately 15 minutes south of Lowell and is a major regional employment center for the Defense Department. Limited commercial air service is available through U.S. Airways, as well as private charter service.
- **Heli-pads**
The Cross Point Complex (formerly the Wang Towers) in Lowell has existing FAA approved, heli-pad facilities suitable for executive helicopter service. Additionally, the potential exists for the construction of a second heli-pad at the Charles A. Gallagher Transportation Terminal, which would provide an additional intermodal transportation linkage.

The NMCOG region is limited to one small landing strip at Pepperell Airport in terms of local aviation facilities. This facility provides landing, take off and storage for local plane owners. Use of this facility is limited and no commuter service or intermodal opportunities are available at this location.

4. Freight Transportation

An area's economic growth is often tied to its ability to transport goods in an efficient and effective manner. Even more important today is the ability to transport these goods in a safe and secure manner. New England's cost of doing business is generally higher than the rest of the country due to its location at the end of the national highway system and the limited natural resources in the area. However, as with the textile and computer industries in the past, New England entrepreneurs have shown an ability to compete in the world marketplace and to profit. Part of this competitiveness, at least in this region, comes from the various freight options – highway, rail, air and water.

Just as the Gallagher Transportation Terminal provides the optimum intermodal facility for the movement of people throughout the system, this region must also provide for the efficient movement of goods through an intermodal network. The intermodal network for goods in Massachusetts continues to change with the mergers between railroads, trucking lines, airlines and shipping lines. Recently CSX and NS purchased Conrail and reduced the number of Class I railroads in the eastern United States from three to two. CSX and NS can now provide competitive service to Massachusetts, where previously only Conrail provided direct access to the Midwest. Mobility and access are the major issues in freight transportation. Trucking provides the greatest degree of mobility and access, therefore, improvements to the highway system, such as the Route 3 North Improvement Project, have a major impact on the efficiency and effectiveness of the trucking industry.

Improvements to the freight transportation network have not kept pace with the growth in economic activities in this country. In order to improve freight operations, emphasis is being placed on better management of the public infrastructure and the use of intelligent transportation system (ITS) technologies. ITS is being used to monitor traffic conditions and provide information on traffic incidents for highway and trucking operations. The Route 3 North Improvement Project has incorporated state-of-the-art ITS technology.

Charts 15 and 16 summarize the freight shipments that have either an origin or destination in Massachusetts for 1998, 2010 and 2020 and identify the top five commodities being shipped to, from and within Massachusetts. As outlined in Chart 15, trucks move more than half of freight shipments by tonnage and value and the principal trade is within the domestic market:

Chart 15: Freight Shipments To, From and Within Massachusetts –1998, 2010, and 2020

	Tons (Millions)			Value (Millions)		
	1998	2010	2020	1998	2010	2020
State Total	199	274	332	161	307	499
By Mode						
- Air	<1	<1	1	28	66	114
- Highway	162	222	268	122	222	355
- Other	8	11	14	1	3	5
- Rail	14	20	25	8	12	19
- Water	14	21	24	2	4	7
By Destination/Market						
- Domestic	179	245	293	138	255	403
- International	20	30	39	23	53	96

Source: *Freight News*, U.S.D.O.T., Office of Freight Management and Operations, November 2002

According to Chart 16 on the following page, the top commodities shipped by weight are non-metallic minerals, petroleum and coal products, and by value, are instruments, photographic equipment, optical equipment and machinery:

**Chart 16: Top Five Commodities Shipped To, From, and Within Massachusetts
By All Modes – 1998 and 2020**

Commodity	Tons (Millions)		Commodity	Value (Billions \$)	
	1998	2020		1998	2020
Nonmetallic Metals	52	60	Instruments/Photo Equipment/Optical Equipment	18	70
Petroleum/Coal Products	43	67	Machinery	16	52
Clay/Concrete/Glass/Stone	19	46	Transportation Equipment	15	29
Food/Kindred Products	13	31	Food/Kindred Products	12	47
Secondary Traffic	12	29	Chemical/Allied Products	12	32

Source: *Freight News, U.S.D.O.T., Office of Freight Management and Operations, November 2002*

The descriptions of the various freight options in the Greater Lowell region are as follows:

▪ **Trucking**

According to the November 1999 publication by MassHighway entitled, Identification of Massachusetts Freight Issues and Priorities, the highest volume of goods shipped by truck in the Commonwealth are building materials, processed foods, tools and petroleum products. Whether the freight is transported by rail, ship or air, the trucking industry plays a role in moving the freight from the points of entry to its final destination. According to the U.S. Department of Transportation (USDOT), truck traffic moving to and from Massachusetts accounted for 6% of the annual average daily truck traffic (AADTT) on the USDOT Freight Analysis Framework (FAF) road network. Only 7% of this truck traffic involved shipments to locations in Massachusetts, while an additional 7% cut through Massachusetts on their way to other markets. Truck traffic is expected to grow throughout the State over the next twenty years. Although Route 3 and I-93 have their share of truck traffic moving to and from New Hampshire, I-495 has the greatest share of truck traffic, much of it moving from Connecticut and New York through Massachusetts to New Hampshire and Maine.

▪ **Rail Freight**

With the deregulation of the railroad industry through the passage of the Staggers Act in 1980, railroads nationally are hauling 40% more freight on 44% less track than they did during the 1940's. The Greater Lowell region is serviced by three principal freight lines operated by the Guilford Transportation Company: the Lowell line, the New Hampshire line and the Stony Brook line. This region serves as an important link for freight movement between the Moran Terminal facility in Charlestown and western Massachusetts. The region also serves as a connection for rail from New Hampshire and Maine to Massachusetts and beyond. No distribution or intermodal freight facilities currently exist in the Northern Middlesex Region that serve more than one user.

The nearest facility for intermodal transportation and distribution is at the Devens site in Ayer, Massachusetts, which is approximately twenty-two miles from Lowell. This site is the intermodal site for the Charlestown to Williamstown, MA northern route, which then extends to the Canadian Pacific rail system to Chicago for domestic distribution or Vancouver for international trade. This facility enables the region to compete with major facilities in New York, Philadelphia and Baltimore. The fact that it takes one day less traveling to Europe by utilizing the combination of the Devens-Moran Terminal facility is a competitive edge for the region in dealing with New York.

- **Air Freight**

The Greater Lowell region is serviced by Logan Airport located approximately 25 miles to the east in the City of Boston. Logan Airport is operated by the Massachusetts Port Authority. The freight activity at Logan focuses primarily on the northeastern, midwestern and mid-Atlantic states. Air carriers operating through Logan provide both international and domestic air cargo services. Firms such as United Parcel Service, Federal Express, DHL Worldwide Express and Emery Worldwide handle specialized shipments, mail and parcels worldwide. Additional airfreight facilities are available at Manchester Airport and Pease in Portsmouth, New Hampshire.

- **Port Facilities**

The Port of Boston is the region's major maritime facility. The port is accessible to all Atlantic Ocean routes. The Port's principal inland market areas are the mid-Atlantic, northeastern and midwestern states. The marine terminals in Boston include both publicly and privately-owned and operated facilities. The Massachusetts Port Authority is responsible for the overall management, safety, operation and marketing of the Port's facilities.

b. Water Systems

The sources and development status of the water systems in the region varies from community to community. *Map 4 in Appendix I* shows the Water Infrastructure in the Greater Lowell Region. Outlined below are brief summaries on the water systems in each community:

- **Billerica**

The Concord River is the source of all drinking water for the Town of Billerica. The Town is in the process of developing a new water treatment plant on the Concord River, with a capacity of 14 million gallons per day. The Town has DEP approval to withdraw 5.26 million gallons per day on an annual average, and presently pumps approximately 4.7 million gallons per day. Average annual consumption is approximately 1,600 million gallons. Public water is available throughout town.

- **Chelmsford**

The Town of Chelmsford is served by three water districts, which cover, in total, 95% of the Town. The Center Water District owns 15 wells, with a combined yield of 5,800 gallons per minute. The District serves approximately 7,900 customers. The Center District sells 26.7 million gallons of water to the East Chelmsford Water District.

- **Chelmsford (cont.)**

The North Chelmsford Water District owns four wells within the Bomil Wellfield off Richardson Road, with a combined yield of approximately 1,450 gallons per minute. The District serves approximately 2,400 customers.

The East Chelmsford Water District owns two wells located on Canal Street, with a combined yield of 700 gallons per minute. The District serves approximately 700 customers.

- **Dracut**

Dracut is served by the Dracut Water Supply and Kenwood Water Districts. In addition, rural areas of Town are supplied by private drinking water wells.

The Dracut Water Supply District serves the neighborhoods of Dracut Center, the Navy Yard, and Collinsville. The District's main well fields are located off Hildreth Street in Dracut and off Frost Road in the Town of Tyngsborough. The District also purchases water from the City of Lowell. The District also maintains three storage facilities: (1) a 3,000,000 gallon stand up concrete tank located on Marsh Hill, (2) an 800,000 gallon cement tank located on Thortleberry Hill, and (3) a 2,500,000 gallon steel water tower located on Passaconaway Drive. The District services approximately 8,800 users, including 1,000 users in Tyngsborough. Current average demand is about 1.4 million gallons per day.

The Kenwood Water District contains approximately 1,200 households in the eastern section of Dracut, including the Kenwood neighborhood. The District has no water supply of its own, and provides only the water distribution service. The District purchases water from the City of Lowell and the Town of Methuen.

- **Dunstable**

Dunstable has a very limited public water supply system, with most of the Town relying on private wells as its water source. Only 5% of Dunstable's population living near the Town Center are served by municipal water supply from a town well located north of Main Street. The pumping station is located adjacent to Salmon Brook. Water mains extend from the pumping station to Lowell Street, along Pleasant Street, to the town center. Hillcrest Street and Highland Street are also served by this system. Dunstable pumps approximately 25,000 gallons per day of municipal water.

- **Lowell**

The City of Lowell relies on the Merrimack River for all its drinking water needs. Approximately 15 million gallons per day are pumped with a maximum capacity of 30 million gallons per day. The Greater Lowell Regional Water Utility is responsible for the treatment and distribution of the water supply. The utility also provides water to parts of Dracut, Tyngsborough and Chelmsford on a daily basis, and to parts of Tewksbury as needed. The Lowell system contains two underground storage facilities with a capacity of 11 million gallons located on Christian Hill. The City also has two freestanding storage tanks with a capacity of 1 million gallons located on Wedge Street.

- **Pepperell**

Approximately 2,600 customers are served by the Pepperell municipal water system. The town's average water demand was 972,000 gallons per day in 2003. Water is supplied by three gravel packed wells located on Jersey Street and Bemis Road. A fourth well has been designed and permitted and will soon be developed off Route 111 at the Pepperell/Hollis line. The fourth well is permitted to provide an additional 500,000 gallons per day. There is also an emergency water connection to Townsend. This connection is rarely used but is provided for the benefit of both towns. The water distribution systems currently serve 85% of the Town. There are two reservoirs: (1) a one million gallon underground storage tank on Heald Street, and (2) a 1.5 million-gallon standpipe on Townsend Street. Residents who are not connected to the public water system are served by private wells.

- **Tewksbury**

The Merrimack River supplies all of the drinking water for the Town of Tewksbury. The Town operates its water treatment plant and manages the distribution system. In 2002, the Town increased the capacity of its water treatment plant from 3.5 to 7.0 million gallons per day. The Town also owns several well fields but has abandoned them due to water quality issues and the high cost of treatment. Presently, there are two water storage facilities: a one million gallon underground storage tank on Catamount Road and a one million gallon water tower on Astle Street. Total water consumption in 2001 was 1,051 million gallons, with residential water users accounting for approximately 62% of the demand. Municipal water is available to 98% of the town.

- **Tyngsborough**

Approximately 60% of the Town is served by public water.

- **Westford**

Approximately 75% of the town residences and 90% of business are serviced by the public water system. Pumping capacity of the eight municipal wells is 3,580 gallons per minute. During Fiscal Year 1999, 1,764 million gallons of water were used per day on average.

c. Sewer Systems

The extent of completion for the Sewer Systems in the region is consistent with each community's overall development. For instance, the City of Lowell, which is the most developed community in the region, has sewer in approximately 90% of the community. In the case of Billerica, Chelmsford and Tewksbury, which are the most developed communities after the City of Lowell, the figures are 70%, 75% and 40%. Dunstable and Westford do not have public sewer systems. The map of the sewer infrastructure in the region is provided on *Map 5 in Appendix I*. The summary of the sewer systems by community is as follows:

- **Billerica**

The Town is currently implementing an aggressive \$ 15 million dollar sewer expansion program. When completed, this project will bring the public sewer system to over 70% of the community. The Town operates a Wastewater Treatment Plant with design capacity

- **Billerica (cont.)**

of 5.5 million gallons per day (MGD). Average daily flow for 2002 at the plant was 2.65 MGD.

- **Chelmsford**

The Town of Chelmsford has purchased 3,010,000 gallons per day of average daily flow sewer capacity from the Greater Lowell Wastewater Utility. The Town has, in turn, sold 350,000 gallons of that capacity to the Town of Tyngsborough. Currently, 75% of the Town of Chelmsford is sewerred, with plans to sewer the remainder of the Town by 2010.

- **Dracut**

The municipal sewer system services about 65% of the Town's population. Existing sewerred areas include most of Dracut Center, Collinsville, and the Navy Yard area. The remainder of the town relies on on-site septic systems. Discharge from the sewer system is sent to the Greater Lowell Wastewater Utility. Dracut owns approximately 11% of the facility, or 3.6 million gallons per day of capacity. Of this 3.6 million gallons per day, Dracut must provide Tyngsborough with 1.0 million gallons per day, based on a 1977 intermunicipal agreement. Currently, Dracut is utilizing about 1.4 million gallons per day of its allocation. The Town of Dracut has developed a comprehensive Wastewater Management Plan to sewer most of the Town over the next twenty years.

- **Dunstable**

The Town of Dunstable does not have a municipal sewer system. All wastewater is disposed of by private on-site septic systems.

- **Lowell**

Lowell's existing sewer system consists of approximately 210 miles of sewer line. Eighty percent of the system is a combined system designed to carry both sewage and stormwater. The Greater Lowell Wastewater Utility plant, located on Duck Island, has a design capacity of 32 million gallons per day (mgd) and serves the City of Lowell, and the Towns of Chelmsford, Dracut, Tyngsborough and Tewksbury. The plant has the design capacity to handle a peak flow of 64 mgd, and a peak primary flow of 110 mgd. In actual practice, a peak flow of only 50 mgd can be treated to secondary standards and 100 mgd to primary standards.

- **Pepperell**

The Pepperell Wastewater Treatment Plant, located at 47 Nashua Road, went on line in 1979. The Town is currently in the process of modifying the plant to increase its capacity from 705,000 gallons per day to 1,100,000 gallons per day. The system has about 1,500 connections, serving approximately 40% of the Town. The Town has an intermunicipal agreement in place with the Town of Groton. Groton purchased 120,000 gallons per day of capacity to connect the Groton Center area to Pepperell's plant. Approximately 60% of the town's population relies on on-site septic systems.

- **Tewksbury**

Presently, forty percent of the Town of Tewksbury is sewered. The sewage is treated at the Greater Lowell Wastewater Utility in the City of Lowell. The Town’s future plans call for sewerage of the remainder of the community by 2011, at a cost of \$80.6 million to be funded through an enterprise fund. The remaining system will be constructed in six phases.

- **Tyngsborough**

Public sewer services 25% of the Town. Treatment is provided at the Lowell Wastewater Utility.

- **Westford**

Public sewerage is not available in Westford. All waste treatment is handled on site.

d. Electric Services

Electric service is provided to all NMCOG communities by Massachusetts Electric. Massachusetts Electric is a subsidiary of U.K.-based National Grid. General Service rates apply for small commercial and industrial users with average usage less than 10,000 kWh per month or 200kW of demand, and are priced as outlined in *Chart 17* below:

Chart 17: G-1 Rates for Delivery Service

Customer Charge	\$8.32 /month
Distribution Charge	3.789¢/kWh
Transmission Charge	0.685¢/kWh
Transition Charge	0.595¢/kWh
Demand Side Management Charge	0.250¢/kWh
Renewables Charge	0.050¢/kWh

Source: Massachusetts Electric

Demand service is designed for commercial and industrial customers with average use exceeding 10,000 kWh per month and demand not exceeding 200 kW. This service is priced as outlined in *Chart 18* below:

Chart 18: G-2 Rates for Delivery Service

Customer Charge	\$15.23/month
Distribution Demand Charge	\$5.92/kW
Distribution Energy Charge	.0084¢/kWh
Transmission Charge	0.611¢/kWh
Transition Demand Charge	\$0.67/kWh
Transition Energy Charge	0.472¢/kWh
Demand Side Management Charge	0.250¢/kWh
Renewables Charge	0.050¢/kWh

Source: Massachusetts Electric

Time-of-Use rate structure is available for large commercial and industrial customers with demand greater than 200 kW. Peak hours are considered to be 8:00 a.m. through 9:00 p.m.,

Monday through Friday, excluding holidays. All hours not specified as peak hours, plus holidays and weekends are considered off-peak hours. This rate structure is further described in *Chart 19* below:

Chart 19: G-3 Rates for Delivery Service

Customer Charge	\$67.27/month
Distribution Demand Charge	\$3.63/kW
Distribution Energy Charge	
Peak hours	1.067¢/kWh
Off-peak hours	(0.002)¢/kWh
Transmission Charge	0.521¢/kWh
Transition Demand Charge	\$1.14/kW
Transition Energy Charge	0.320¢/kWh
Demand Side Management Charge	0.250¢/kWh
Renewables Charge	0.050¢/kWh

Source: Massachusetts Electric

MassElectric offers technical assistance and incentives to encourage energy efficiency. The Custom Project Program provides incentives of up to 45% of the cost of such improvements for existing facilities.

For small business customers with an average demand use of 100 kilowatts or less per month, MassElectric will provide a free energy audit and report of recommended energy efficiency improvements. The utility will pay 80% of the cost of installation of energy efficient equipment and the business can finance the remaining 20% interest free for 24 months. Upgrades available through the program include: lighting upgrades, energy efficient time clocks, photo cells for outdoor lighting, occupancy sensors, programmable thermostats, and walk-in coolers.

The MassElectric Design 2000plus program offers technical and financial incentives to large commercial and industrial customers who are building new facilities, adding capacity for manufacturing, replacing failed equipment or undergoing major renovations.

e. Natural Gas Delivery

KeySpan is the natural gas utility servicing the all of the NMCOG communities. KeySpan provides companies with natural gas delivery and assistance regarding incentives and energy services. The company offers an Architect/Engineer Program to assist companies in planning new construction or a rehabilitation project. It also offers the following programs for commercial customers:

- **Commercial High Efficiency Heating Program**- Provides cash rebates to customers for the installation of high-efficiency gas heating and water heating equipment. Rebates are available to multifamily and commercial-industrial customers to help reduce the incremental cost difference between standard and high-efficiency heating equipment.

- **Building Practices and Demonstration Program-** In order to showcase the energy savings that can be achieved with new or under utilized commercially available technologies, the company will help pay the cost to install such improvements. Eligible technologies include energy recovery devices, combustion controls, building energy management systems, desiccant units, infrared space heating equipment, and infrared process heating equipment. Approximately ten demonstration projects are selected in New England annually.
- **Commercial Energy Efficiency Program-** Designed to provide support services and financial incentives to help encourage multifamily, commercial, industrial, governmental and institutional customers to install energy efficient natural gas related features. Energy audit services are available for customers who need assistance in estimating energy savings. Participants are typically small to medium size commercial customers, or large customers with relatively simple energy efficiency projects. Engineering services are used to evaluate more complex projects that involve technologies associated with mechanical and/or process equipment, and where technical analysis and engineering support is needed. KeySpan will cost share these services with the customer. Prescriptive rebates are available for common energy efficiency measures installed after completion of an energy audit. Customer incentives are available for projects that demonstrate the use of natural gas more efficiently than industry practices, and/or more efficiently than the minimum building code requires. Incentives are available covering up to 50% of project costs, capped at \$150,000 per site and/or project.
- **Economic Redevelopment Program- ERP** is an energy efficiency program for commercial customers in state-designated economic target areas to help reduce costs and improve productivity and competitiveness. There must be a customer commitment to provide at least 50% matching funds. Only measures that exceed existing building energy code requirements are eligible. Maximum funding per project is \$100,000. Princeton Village Apartments in Lowell received \$82,990 under this program to install energy efficient windows, patio and storm doors, air infiltration sealing and underground heating system pipe insulation.

f. Telecommunications

Basic telephone service is provided by Verizon, as well as several other competing companies. Many of these companies also offer DSL lines, internet access and wireless service throughout much of the region.

The communities of Billerica, Chelmsford, Dracut, Lowell, Tewksbury, Tyngsborough and Westford are served by Comcast, which provides analog and digital cable TV, as well as high speed (broadband) internet access, web hosting and e-commerce for businesses. The Towns of Dunstable and Pepperell are served by Charter Communications, which provides businesses with cable TV WAN services, high-speed (broadband) internet access, VPN and video service.

6. Environmental Issues

a. Open Space/Conservation Land

NMCOG, working in cooperation with The Trustees of Reservations, completed the Greater Lowell Regional Open Space Strategy: Analysis and Recommendations in December 2002 with funding provided by the Theodore Edson Parker Foundation and NMCOG. The document summarizes the open space resources in the Northern Middlesex region by providing specific descriptions related to each community. The document recommended the establishment of the Greater Lowell Regional Open Space Collaborative and increased linkages between open space parcels throughout the region. Relevant maps related to Protected Open Space, Recreational and Cultural Landscapes (Map 6) and Environmental Resources (Map 7) can be found in Appendix I. The descriptions of each community, based upon their overall development, are as follows:

▪ Lowell

Based upon its location at the confluence of the Merrimack and Concord rivers, the City of Lowell has created a strong network of downtown historic open space sites that includes existing and planned river and canal walkways. Lowell has a number of large city and neighborhood parks, many of them designed by Frederick Law Olmsted and Charles Eliot, a farm and orchard, brownfield sites with open space potential and other new open space sites, such as East Pond and the UMass Lowell West Campus. Initial action to restore Tyler Park and Fort Hill Park has begun. The Lowell-Dracut-Tyngsborough State Forest is a major, underutilized conservation parcel in the City and, except for one neighborhood, there are no community gardens. Everything within the City revolves around its historic and cultural attributes and there is a strong determination to preserve and build upon the past. Numerous open space initiatives in the City include the Flowering City Initiative and Charrette, the Open Space and Recreation Plan Update, the Lowell Heritage Partnership and the Lowell Parks and Conservation Trust. These specific initiatives can be summarized as follows:

1. The Flowering City Initiative began in 1996 and was sponsored by the Human Services Corporation, which laid the visual framework for the entire Lowell revitalization effort in the 1960's and 1970's. The purpose of this initiative was to "reconnect Lowell and its people to the region's natural and manmade environment to improve the quality of life for Lowell residents, present and future", according to the brochure for the Project Antopolis Charrette. The charrette attracted one hundred participants and developed open space recommendations under five categories: Cultural Gardens, Greenways, Blueways, Environmental Ways, and Welcome Ways. These recommendations encompassed the following elements:
 - Community gardens and a community-based Lowell Garden Center and Greenhouse;
 - Restoration of existing parks;
 - Expansion of the National Historical Park system;
 - Creation of an urban park system that is linked to the region;
 - Filling gaps to complete the Lowell canal system;

- Creation of a River Meadow Brook Trail and a Concord River Trail to link with the region;
 - Linkage of Lowell resources to the Bay Circuit Trail and the Middlesex Canal;
 - Creation of pedestrian and public transit links between Cross Point and the Swamp Locks; and
 - Greening of Lowell's gateways, particularly the Connector entryway to the city.
2. Lowell is updating its 1994 Open Space and Recreation Plan. Elements of the next action plan include:
 - New uses for the Westford Street capped landfill, such as a nature study (the landfill functions as a locally rare grassland with ponds), a viewing station or a golf course;
 - Recreational use of the Tanner Street superfund site;
 - Restoration of River Meadow Brook;
 - Linkage of East Pond open space with downtown;
 - Open space uses at the West Campus of UMass Lowell after relocation of the School of Education to the Lawrence Mills;
 - Design and construction of new downtown canal walkways and the riverwalk;
 - A cemetery preservation plan;
 - A study of neighborhood walking distance access to open space and identification of gaps in open space access for neighborhood residents;
 - Open space development as part of the Lawrence Mills revitalization project;
 - A park system restoration plan to reverse degradation resulting from overuse and implementation of improved maintenance practices; and
 - Evaluation of the potential for access to the Christian Hill reservoir with its views of Boston.
 3. The Lowell Heritage Partnership (LHP) completed a survey to identify special places in each neighborhood and will create a multi-lingual brochure on neighborhood open space, cultural and historical attractions. The principal open space issues identified by this group were the need for more natural resources and open space information, increased access to these locations, support for the planned Concord River Greenway project and the need for more improvements, safety and maintenance related to the riverwalks.
 4. The Lowell Parks and Conservation Trust (LPCT) is focusing its regional efforts on the creation of the Concord River Greenway Park, which is part of a larger vision to create a walking path from Concord to Lowell reflecting the journey from "the American Revolution to the Industrial Revolution". Linking Rogers, Fort Hill and Shedd Parks and the Lowell Cemetery, this greenway will connect to the Bruce Freeman Trail at Cross Point, thus tying into the Bay Circuit Trail. LPCT conducts other activities on the Concord River, such as rafting trips, the Jollene Dubner Park, Alewife restoration, and ecological inventory work with the Massachusetts Audubon Society.

Billerica, Chelmsford and Tewksbury are less developed than the City of Lowell, but share more characteristics with Lowell than the rest of the region. In these three communities, there are more open space resources available than most people realize, but the major challenge is how to manage these open space resources well and how to make these areas more available to the general population. Dracut shares many of the characteristics of these communities in the western part of the town, but has considerable remaining agricultural lands in the eastern part of town.

- **Billerica**

The Warren Manning/Billerica State Forest, the Middlesex Canal and the Concord River, including the Mill Pond, are three of Billerica's most regionally significant cultural and open space resources. New parks, including athletic fields, and a forest stewardship program have been implemented. Billerica's Open Space and Recreation Plan was updated and approved in 2002 by the Commonwealth of Massachusetts. Among the goals cited in the plan that had regional implications were: improve access and day facilities at the staffed State Forest, identify recreational opportunities along the Concord River, and implement the long-term plan for the Middlesex Canal, including the park at the Mill Pond and a reconstructed towpath to connect with Lowell. Other projects, such as extending federal "Wild and Scenic River" designation from the Town of Concord to Billerica, the Concord River Greenway, and the Yankee Doodle rail trail, are supported by the Town of Billerica as efforts to improve their open space resources.

- **Chelmsford**

With only about 1,100 acres available for development, the Town of Chelmsford is anxious to maintain its open space, which includes three town forests, water district land adjacent to Hales Brook, and two open space areas shared with Carlisle, including the Great Brook Farm State Park and a 310-acre cranberry bog. The major problem with the open space areas in Chelmsford is the lack of connections between them. According to the 2000 Open Space and Recreation Plan, the highest priorities are to link open space, provide bike trails and develop community gardens. Chelmsford has the only public boat launch on the Merrimack River between Lowell and the New Hampshire border at Southwell Park. Among the remaining agricultural areas in Chelmsford, there are five properties that the town is interested in preserving: the Parlee-Waite Farm on Route 27 in south Chelmsford, the Walter Lewis property across the road from the Parlee-Waite Farm, Red Wing Farm abutting the Freeman trail, the Warren property south of Chelmsford Center and the Sheehan property on Pine Hill Road near the Westford line.

- **Tewksbury**

The town's principal open space goals are to preserve the Tewksbury State Hospital lands and to create a network of trails and river access points to link protected open space parcels. Tewksbury State Hospital includes approximately 662 acres of open space, consisting of considerable wetlands, 300 acres of active croplands and 162 acres with prime agricultural soils. There are also significant ponds without public access in Tewksbury, although a public parcel on Long Pond offers potential access. The community borders the Merrimack River and a river trail is being developed.

- **Dracut**

The town's Open Space and Recreation Plan was updated in 2002 and responds to the increasing development pressures on the community. Preservation of farmlands and natural areas is a principal concern of the community. The town or the State owns approximately 924 acres of protected land, while Agricultural Preservation Restrictions cover 185 acres and Conservation Restrictions protect 127 acres. More than 1,700 acres are in the Chapter 61, 61A or 61B forest, agricultural or recreational tax abatement programs. Access to this farmland is provided to Cambodian immigrants from Lowell as well. There is also interest in creating trails and greenways that connect to adjoining communities, such as through a floodplain greenway along Beaver Brook and a Merrimack River Trail along the river.

Westford and Tyngsborough both developed later than the aforementioned communities and have established themselves as suburban communities. Westford has taken aggressive steps to manage development and to acquire open space, including one of the last working farms. Tyngsborough, which was one of the fastest growing towns during the past decade, has also begun to focus on open space preservation. The Massachusetts Institute of Technology's (MIT) Haystack Radio Astronomy Observatory, which covers 500 acres in Westford and 339 acres in Tyngsborough (additional land is in Groton), represents a significant regional open space resource that needs to be preserved.

- **Westford**

Nearly 13% of the land in Westford, or 2,600 acres in nearly 240 parcels, is owned by the Town as open space. Examples of these parcels include parcels along Stony Brook to protect water supplies, an operating orchard and a working farm. Westford's local land trust owns an additional 120 acres in seventeen different parcels. Six private camps and clubs own approximately 635 acres of additional open space in northern Westford. More than fifty permanent trail easements have been created and trail connections are already established between Westford and Chelmsford, Acton and Carlisle. Design of an additional trail on the abandoned right of way of the Red Line trolley is underway and will connect with the Bruce Freeman trail and trails in Groton.

- **Tyngsborough**

Tyngsborough has nearly 1,150 acres of permanently protected land, including part of the Lowell-Dracut-Tyngsborough State Forest, town conservation lands, water district lands, land trust properties, and conservation and agricultural protection restrictions. The Massachusetts Land Conservation Trust, an affiliate of The Trustees, owns 68.7 acres. Recent town acquisitions of open space have focused on access to water or on border parcels that abut protected lands in neighboring communities. This approach is intended to maximize the value of the purchase by creating a larger habitat area through the combined parcels. Two institutional properties that have a similar impact on open space in Tyngsborough as the MIT property are Notre Dame Academy and Boston University's Corporate Training Center.

Due to the substantial development that has occurred in the western portion of Tyngsborough during the past decade, the town has become quite aggressive in

- **Tyngsborough (cont.)**

preserving its open space resources. The Town voted to implement the local option Community Preservation Act at a three-percent tax level, which is the highest tax rate permitted. The Sherburne House, which covers approximately 80 acres, was donated to the Town and The Trustees maintain a Conservation Restriction on the land. The property will be transformed into a Community History and Nature Center focusing on local history projects and research. The Town updated its Open Space and Recreation Plan in 2002 and residents expressed their desire for the protection of critical parcels to preserve the town's semi-rural visual character, scenic views and wildlife habitat. The Plan recommends more public access to the Merrimack River; walking and bicycle trails to connect open space parcels and the creation of a more defined town center.

Dunstable and Pepperell are the most rural of the NMCOC communities. Substantial portions of both towns have been included in the Petapawag and Squannassit Areas of Critical Environmental Concern (ACEC).

- **Dunstable**

Since the late 1970's, Dunstable has worked to retain its rural character through the active preservation of its farms and open spaces. From the completion of the Town's first Open Space Plan in 1976 until 1998, town-owned conservation and forestland increased from 341 acres to 1,597 acres. Almost 3,000 acres are temporarily preserved from development by agricultural or forestry tax abatements. The Dunstable Rural Land Trust owns approximately 500 acres, including two substantial parcels of 300 and 80 acres. The Nashua River Rail Trail follows the Nashua River from Ayer to Dunstable for 11.3 miles. The Red Line trolley right of way extends from Westford north to the west side of the Salmon Brook Valley in Dunstable.

The Merrimack River Watershed Council completed a detailed open space plan of the Salmon Brook Watershed in 2003. The Town is interested in completing a greenway along Salmon Brook and creating more linkages between conservation lands to create wildlife corridors. A bike trail has been constructed and another one is in the planning stages. The most important issue for the Town, though, is maintaining the scenic, rural character of the Route 113 gateway into town from Tyngsborough.

- **Pepperell**

Pepperell has approximately 3,000 acres of permanently protected open space, including conservation and agricultural preservation restrictions. More than 300 acres owned by the Massachusetts Department of Fisheries, Wildlife and Environmental Law Enforcement (DFWELE), the Pepperell Conservation Commission and the Nissitissit River Land Trust in the Nissitissit River Corridor are permanently protected open space. The majority of agricultural land is privately owned. The Town's Master Plan, which was completed in 2002, recommends the creation of an open space network through the purchase of land or easements along stream corridors.

b. River and Lake Systems

The NMCOG region possesses an abundance of water resources, including rivers, streams, brooks, lakes, ponds, reservoirs, marshes and swamps. The entire region falls within the drainage basin of the Merrimack River, the second largest in New England. The Concord, Nashua, Nissitissit and Shawsheen Rivers are the other rivers in the region and are tributaries of the Merrimack River. More than fifty streams and brooks, including Beaver Brook, Black Brook, River Meadow Brook, Stony Brook and Trull Brook, are tied into this river system and connect with the lakes, ponds and wetlands in an elaborate hydrologic system. *Map 8 in Appendix I* shows the water resources in the Greater Lowell region.

More than twenty-five major lakes and ponds are found in the region. Most of these lakes and ponds are natural water bodies over 10 acres in area and, therefore, are defined as “Great Ponds”, according to the Massachusetts Department of Environmental Protection (DEP). Each community has one or more Great Ponds within its boundaries. The larger bodies of water in the region include Forge Pond in Westford and Mascuppic Lake in Tyngsborough, which are greater than 200 acres in area. Long Pond in Tyngsborough and Dracut and Long Sought For and Nabnasset Ponds in Westford are greater than 100 acres in area. Pepperell Pond, which is located in Pepperell and Groton is also more than 100 acres in area. In general, the ponds with the clearest waters in the region have traditionally been Long Pond in Tyngsborough, Burgess Pond in Westford, and Massapoag Pond in Dunstable. Two swamps, the Great Swamp in Tewksbury and Tadmuck Swamp in Westford, are more than 100 acres in area as well.

The history of this region has been based upon the rivers and lakes in the region. The City of Lowell has depended upon the Merrimack River and the Concord River for its water supply and power for the textile mills. The extensive canal system was developed in order to build upon this natural strength and to grow the economy. The Middlesex Canal, running from Lowell through Billerica to Boston, was established as a transportation corridor dependent upon water to improve the area’s economy. In the 1920’s many people from the Boston area settled along many of the lakes in the region, including Nuttings Lake in Billerica, Forge Pond in Westford and Mascuppic Lake in Tyngsborough. For the most part, the communities began to grow around its rivers and lakes, road system and railroad/trolley tracks. Today, the combination of the Lowell National Urban Cultural Park and the Heritage State Park have re-focused attention on the historic benefits of the mills, canal system and rivers as an important ingredient to the economic future of the City. Other communities, such as Billerica, Dracut and Westford, have begun to re-utilize their mill properties along the region’s waterways to create jobs and provide affordable housing. The recreational opportunities available through these waterways are well documented in other portions of this CEDS document.

c. Water Quality

The water quality in the region has been deemed acceptable with improvements to the Merrimack and Concord Rivers over the years. Problems with the quality of water arise in drought situations during the summer when the bacteria levels in the rivers, lakes and ponds increase. No formal studies of the water quality in the region have been done since the federal 208 program was in effect nearly thirty years ago. However, ongoing efforts by environmental

groups, such as the Watershed Councils and Associations, have focused on the quality and quantity of water in the region through a watershed approach. Wetlands are protected from development by the state Wetlands Protection Act and, in some cases, by local wetlands protection bylaws. Water supply protection lands are owned by Water Districts in the region. Each community addresses water quality issues as they arise.

d. Solid Waste Disposal

All municipalities in the Region have provided for the proper disposal of solid waste. With the exception of the Towns of Pepperell and Dunstable, publicly funded/operated curb-site pick up is provided for residentially generated solid waste via contracted, collection/disposal services. Pepperell and Dunstable operate locally-owned transfer facilities wherein residents deliver their own waste for consolidation and removal by a contractor/hauler to an approved disposal site. Disposal options in the Commonwealth are limited to state approved landfills and/or incineration facilities. The majority of the residentially generated solid waste is delivered to incineration/co-generation sites located in North Andover and Haverhill.

Commercial and industrially generated waste is disposed pursuant to regulations promulgated by the Commonwealth and local by-laws (health and zoning). Business and industrial generators are, with minor exceptions, in the City of Lowell, individually responsible for the proper removal and disposal of solid waste. Ultimate disposal, as in the case of the municipally generated waste, must be in compliance with the Commonwealth's regulations; i.e., approved landfill or incineration facility.

Consistent with the Commonwealth's Solid Waste Master Plan, which sets a goal of recycling 50% of all solid waste, the Department of Environmental Protection (DEP) has mandated that every municipality conduct formal recycling programs. All municipalities in the region that offer curbside trash pick-up also require separation of paper, glass, metal and plastic from the waste stream. The recyclable material that does not become co-mingled with other waste products often has value and is removed from the general waste stream which is incinerated or land filled, thus lowering the overall cost to the community. Separate programs are in effect in all communities for the separation of other hazardous materials e.g. mercury, CFC's and heavy metals for proper disposal and/or recycling. For example, used hearing aid batteries (containing mercury) can be dropped off at any local Board of Health Office, used motor oil must be taken back by any retailer who sells new motor oil and, similarly, any retailer of auto batteries must require a deposit on new batteries in order to encourage their return and recycling.

Separate business and industrial associations have developed joint collection programs for waste paper/packaging materials, thinners used in industrial and automotive painting, metals used in plating processes and dry cleaning chemicals. The Commonwealth of Massachusetts, in cooperation with the Toxic Use Reduction Institute (TURI) at UMASS Lowell, has introduced many new processes, which have reduced or eliminated the use of toxic solvents, e.g. TCE in circuit and electrical component manufacturing, a dominant industry in the region.

The individual communities within the Greater Lowell region have addressed the solid waste issue in the following manner:

- **Billerica**

The Town has curbside trash collection and recycling. Total recycled waste collected in FY 99 was 1,956.51 tons; total trash collected was 4.69 million tons.

- **Chelmsford**

The Town has curbside trash collection and recycling. In FY 02, Chelmsford residents disposed of 15,661 tons of solid waste and recycled 3,362 tons of paper, cans, bottles and cardboard.

- **Dracut**

The Town has curbside trash collection and recycling. In 2003 total solid waste collected from Dracut and hauled to the NESWIC facility in North Andover was approximately 15,000 tons. The total recycling tonnage in 2003 was 1,704 tons.

- **Dunstable**

The Town has a trash transfer station and recycling drop-off facility.

- **Lowell**

The City has curbside trash collection and recycling. In FY 99, the City collected approximately 45,000 tons of trash and 6,000 tons of recyclables.

- **Pepperell**

The Town operates a transfer station on Boynton Street. In FY 99, the Town generated 950 tons in solid waste. Total recyclables received at the transfer station totaled 724 tons.

- **Tewksbury**

The Town has curbside trash collection and recycling. In FY 99, Tewksbury residents disposed of approximately 11,400 tons of solid waste and recycled 1,431 tons.

- **Tyngsborough**

Tyngsborough has curbside trash pickup and recycling. In FY 99, total solid waste collected in Town was 4,708 tons. Recyclables totaled another 1,100 tons.

- **Westford**

The Town has curbside trash collection and recycling. Recyclables collected including paper, glass, metal, plastics, white goods and textiles totaling 2,677.8 tons.

e. Hazardous Waste Management

The Commonwealth of Massachusetts, being consistent with United States Environmental Protection Agency (EPA) regulations, state and local regulations, requires the proper and safe disposal of all products classified as hazardous. Cradle-to-grave manifest and reporting is required by businesses and industrial generators.

EPA and the Commonwealth, in partnership with major industries in the state, participate in the Toxic Use Reduction Institute (TURI), which is headquartered at the University of Massachusetts at Lowell. TURI provides direct assistance and research into technology and methods aimed at reducing the use of toxic or hazardous materials in the manufacturing and packaging systems employed by industries in the production of manufactured or processed goods.

f. Air Quality

The 1990 Clean Air Act Amendments (CAAA) require Metropolitan Planning Organizations (MPO's) within nonattainment areas to perform air quality conformity determinations in order to ensure that the transportation improvements will not harm air quality in the region. Eastern Massachusetts, which includes all of Barnstable, Bristol, Dukes, Essex, Middlesex, Nantucket, Norfolk, Suffolk, and Worcester counties, has been classified as a "serious" ozone nonattainment area. With this nonattainment classification, the CAAA requires the Commonwealth to reduce its emissions of volatile organic compounds (VOCs) and nitrogen oxides (NOx), the two major precursors to ozone formation, to achieve attainment of the ozone standard by 1999 and beyond.

The CAAA and the Commonwealth acknowledge that mobile sources are among the major sources of emissions of VOCs, NOx and CO. Prior to the 1990 amendments, the majority of pollution control measures focused on stationary industrial sources. The Massachusetts 1993 Emissions Inventory indicated that on-road mobile sources emit approximately 28% of the total VOCs, 43% of the total NOx and 56% of the total CO emissions (summer day) in the state. Mobile source CO emissions on a winter day are approximately 78% of the total statewide CO emissions.

The Commonwealth revised its State Implementation Plan (SIP), which was submitted to the United States Environmental Protection Agency (EPA) on November 15, 1993. This SIP revision represents a strategy of programs to show Reasonable Further Progress of a 15% reduction of VOCs in 1996 toward attainment of the National Ambient Air Quality Standards (NAAQS) for ozone in 1999. A large number of the programs target mobile sources, including an enhanced inspection and maintenance program, reformulated gasoline, and California Low Emissions Vehicle Program. It also included a VOC mobile source emission budget for 1996.

A second major revision to the SIP was submitted to EPA in December 1994. This submission included programs to provide a further reduction of 9% in NOx emissions. NOx reduction credits will be taken from stationary sources through NOx Reasonably Available Control Technology (RACT), and from mobile sources through the Enhanced Inspection and Maintenance Program, the California Low Emission Vehicle Program, and the Tier I Federal Vehicle Standards. A NOx emission budget for 1999 and each year thereafter and a VOC emission budget for 1999 and each year thereafter were included in this submission. In addition, the 1996 VOC budget was revised.

In March of 1997, DEP submitted a 1996 Rate of Progress Report describing the progress to date on the SIP commitments that were submitted to EPA in 1993 and 1994. At that time they had the opportunity to make any revisions and corrections to programs that were submitted to ensure that the ozone air quality standards would be achieved by 1999. As part of the 1996 Progress Report, DEP revised the mobile source emission budget. Previously, the mobile source budget was developed

using the Highway Performance Monitoring System which uses traffic count data from spot locations along different functional classes of roadway to determine vehicle miles of travel in the region. The new mobile source emission budget was calculated using transportation demand models maintained by the regional planning agencies. In addition, some inputs to the emissions model were changed.

On October 1, 1998, DEP submitted to EPA a technical correction to the Massachusetts SIP for Ozone, which included a 2003 mobile source emission budget. This budget was found adequate for conformity purposes by EPA on February 19, 1999, and was used in conformity determinations that were approved by FHWA on January 12, 2001, and again on June 18, 2002 (in March 2002, the Boston MPO had completed another RTP update).

On September 6, 2002, DEP submitted to EPA a revision to the Massachusetts SIP that included a revised one-hour ozone attainment demonstration for Eastern Massachusetts. This SIP revision included a 2007 mobile source emission budget for the Eastern Massachusetts Non-Attainment Area. This budget was found adequate for conformity purposes by EPA on December 6, 2002.

The Northern Middlesex MPO must certify that all activities outlined in the 2003 Northern Middlesex Regional Transportation Plan:

- will not cause or contribute to any new violation of any standard in any area;
- will not increase the frequency or severity of any existing violation of any standard in any area; and
- will not delay the timely attainment of any standard or any required interim emission reductions or other milestones in any area.

Other development activities also fall under the air quality guidelines developed by EPA and must be addressed on an ongoing basis.

The Northern Middlesex MPO has conducted an air quality analysis of the 2003 Northern Middlesex Regional Transportation Plan. The purpose of the analysis is to evaluate the plan's air quality impacts on the SIP. The analysis evaluates the change in ozone precursor (VOCs and NO_x) emissions and carbon monoxide emissions due to implementation of the 2003 Northern Middlesex Regional Transportation Plan. The modeling procedures and assumptions used in this air quality analysis follow the EPA's final conformity regulations issued on August 15, 1997. They are also consistent with procedures used by the Massachusetts Department of Environmental Protection to develop Massachusetts' 1990 Base Year Emission Inventory, 1996 Reasonable Further Progress Plan, the Post-1996 Reasonable Further Progress Plan, 1996 Rate of Progress Report, and the Ozone Attainment Demonstration for the SIP. All consultation procedures were followed to ensure that a complete analysis of the 2003 Northern Middlesex Regional Transportation Plan was performed with consistency with the SIP.

The primary test to show conformity with the SIP is to show that the Air Quality Conformity of the 2003 Northern Middlesex Regional Transportation Plan is consistent with the emission budgets set forth in the SIP. The Massachusetts Reasonable Further Progress Plan (RFP) was deemed complete by EPA on June 5, 1997. EPA determined that the 15% RFP SIP submittal contained an adequate

mobile source emissions budget to conduct conformity determinations using the conformity criteria. In addition, the 2007 mobile source emission budget for Eastern Massachusetts was found adequate for conformity purposes by EPA on December 6, 2002.

On behalf of the Executive Office of Transportation and Construction (EOTC), the Bureau of Transportation Planning and Development (BTPD) estimated the emissions for VOC and NOx for all areas and all MPOs (emissions for the Boston Region were also estimated by MPO staff and were included in the final totals). The VOC mobile source emission budget for 2007 for the Eastern Massachusetts Nonattainment Area has been set at 86.700 tons per summer day and the 2007 mobile source budget for NOx is 226.363 tons per summer day. As shown in *charts 20 and 21*, the results of the air quality analysis demonstrate that the VOC and NOx emissions from all Action scenarios are less than the VOC and NOx emissions budgets for the Eastern Massachusetts Nonattainment Area:

Chart 20: VOC Emissions Estimates for the Eastern Massachusetts Ozone Nonattainment Area
(all emissions in tons per summer day)

Year	Northern Middlesex Action Emissions	Eastern MA Action Emissions	Budget	Difference (Action – Budget)
2000	n/a	166.545	n/a	n/a
2007	4.697	80.516	86.700	-6.184
2015	2.4269	41.403	86.700	-45.297
2025	1.5832	31.647	86.700	-55.53

Source: Massachusetts Highway Department

Chart 21: NOx Emissions Estimates for the Eastern Massachusetts Ozone Nonattainment Area
(all emissions in tons per summer day)

Year	Northern Middlesex Action Emissions	Eastern MA Action Emissions	Budget	Difference (Action – Budget)
2000	n/a	287.877	n/a	n/a
2007	11.892	207.567	226.363	-18.796
2015	4.3808	81.380	226.363	-144.983
2025	1.5373	38.974	226.363	-187.389

Source: Massachusetts Highway Department

EOTC has found the emission levels from all areas and all MPOs in Eastern Massachusetts – including from the 2003 Northern Middlesex Regional Transportation Plan – to be in conformance with the SIP according to conformity criteria. Specifically, the following conditions are met:

- The VOC emissions for the Action (build) scenarios are less than the 2007 VOC mobile source emission budget for analysis years 2007 through 2025.
- The NOx emissions for the Action (build) scenario are less than the 2007 NOx mobile source emission budget for analysis years 2007 through 2025.

In conclusion, the NMCOG region is addressing the Air Quality standards established by federal law and implemented by EPA.

g. Brownfields

The Greater Lowell region is committed to the cleanup and redevelopment of brownfields, which is defined by the U.S. Environmental Protection Agency (EPA) as “real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. In 1997 NMCOG worked closely with the City of Lowell to identify potential brownfield sites that could be redeveloped and reused as contributors to the economy.

Since that time, the City of Lowell has taken a lead role in this field and has been designated as a Brownfields Showcase Community. As part of this designation, the City of Lowell has received EPA Brownfields funding for site assessment activities and a Brownfields Cleanup Revolving Loan Fund (BCRLF). Working with representatives from the federal and state governments, the City of Lowell was able to redevelop two brownfield sites and convert them into the 7,800 seat Paul Tsongas Arena and the 4,700 seat Edward LeLacheur Park. The City has also worked with the LRTA to convert a site at 100 Hale Street into the LRTA Maintenance Facility. The City received Brownfields funding in 2000 and 2001 to focus on three Davidson Street properties and also received an Economic Development Initiative (EDI) grant from the U.S. Department of Housing and Urban Development (HUD) in 2000 to develop a state court house, private office space and a performing arts center. Currently, the City is focusing on additional sites at the JAM Plan parking garage, the parcel next to the Tsongas Arena, and Tanner Street properties.

Other entities within the City of Lowell have received Brownfield funds. The National Park Service received EPA Brownfield funds in order to complete a Phase I Targeted Brownfield Assessment in 2001 for the Assets Building on Market Street. The Coalition for a Better Acre (CBA), which advocates for low and moderate income residents in the inner city, received \$200,000 in EPA Brownfields funding for a Brownfields job training program in 2003. For the most part, work on brownfield sites in the rest of the region has focused on the Charles George Landfill site in Tyngsborough and Rocco’s Dump in Tewksbury. NMCOG has applied for funds from EPA in the past to develop a brownfield project list for those communities outside the City of Lowell, but has not received any funds to date.

The federal and state governments, through EPA and the Commonwealth's Division of Environmental Protection (DEP), encourage private investors and local communities to apply for public funds to convert brownfield sites into productive uses. These brownfield sites are generally abandoned properties that have been used in the past for commercial and industrial purposes that either have been reported as contaminated properties or have been suspected of unknown contamination conditions. At the federal level, brownfield initiatives are generally covered by the Small Business Liability Relief and Brownfields Revitalization Act, while the state's brownfield program is covered by the Brownfields Act of 1998. Under the Massachusetts legislation, \$50 million was appropriated to administer brownfields programs targeted toward the clean up and reuse of contaminated property.

The DEP Bureau of Waste Site Cleanup promotes brownfield projects by providing technical assistance through single points of contact, certifying eligibility for the Brownfields Federal Tax Deduction Program, being flexible on cleanup timelines, supporting the Environmental Justice Initiative and providing technical assistance to communities and organizations that have received funding under the EPA Brownfields Cleanup Revolving Loan Fund Program.

There are extensive federal and state grants available to undertake Brownfields projects. Working with EPA, the Economic Development Administration and HUD at the federal level, communities and organizations can identify funding sources that address their specific problems. Similarly, at the state level, DEP, MassDevelopment, the Department of Housing and Community Development (DHCD) and the Governor's Office provide access to state funding sources for this project. The communities that are designated as Economic Target Areas (ETA), Lowell, Billerica and Dracut, are eligible for brownfield funds through MassDevelopment

h. Natural Resources

The Greater Lowell region has extensive natural resources, as described in many of the sections within the Environmental Issues section. The region's natural location within the Merrimack River valley affords residents and visitors with a wide range of natural resource opportunities. Whether it is fishing, swimming or boating, the numerous rivers, lakes and ponds offer extensive recreational advantages. Also, this region's location in relation to the rest of New England, enables residents and workers to travel to the ocean, mountains or lakes of New Hampshire and Maine within easy travel distance. The quality of life in this region is largely attributable to the natural resources of the area and several industries in this area, particularly tourism, rely upon the natural setting of the mills and canals, as well as the farmlands still operating in the suburban communities. During the winter, many people travel north to take advantage of the excellent skiing, tobogganing or ice skating available in the region, as well as Nashoba Ski Area in Westford.

During the past thirty years, the amount of agricultural land in the region has steadily declined. According to the 2020 Vision: Planning for Growth in the Northern Middlesex Region developed by the Northern Middlesex Council of Governments in June 1999, the total amount of agricultural land in the region decreased by 65% between 1950 and 1991. The decline in agricultural land was a result of the suburbanization of the region, the changing agricultural markets in New England, the increasing land values and the change in financial viability of the family farm. Due to changing economic conditions and development pressures, many of these farms have been turned into housing subdivisions. Based upon figures developed through

interpretation of the MacConnell aerial maps, *Chart 22* below summarizes the decline of agricultural land use in the NMCOG region by community between 1971 and 1991:

Chart 22: Agricultural Land Use in the NMCOG Region

	Acres				Percent Change		
	1971	1985	1991	% of region	'71-85	'85-'91	'71-'91
Billerica	537.34	518.57	486.21	5.7%	-3%	-6%	-10%
Chelmsford	827.97	643.00	562.30	6.6%	-22%	-13%	-32%
Dracut	2,420.13	2,146.73	1,917.23	22.5%	-11%	-11%	-21%
Dunstable	1,405.41	1,416.47	1,318.47	15.5%	1%	-7%	-6%
Lowell	129.34	120.39	98.85	1.2%	-7%	-18%	-24%
Pepperell	2,411.05	2,266.45	2,156.23	25.4%	-6%	-5%	-11%
Tewksbury	822.91	746.71	674.59	7.9%	-9%	-10%	-18%
Tyngsborough	669.26	559.36	502.50	5.9%	-16%	-10%	-25%
Westford	1,339.25	1,313.07	789.41	9.3%	-2%	-40%	-41%
Region	10,562.66	9,730.75	8,505.79	100.0%	-8%	-13%	-19%

Source: 2020 Vision: Planning for Growth in the Northern Middlesex Region, Northern Middlesex Council of Governments, June 1999.

Chart 22 reflects the decline of agricultural land by 19% in the region between 1971 and 1991. The largest declines were experienced in Westford (-41%), Chelmsford (-32%), Tyngsborough (-25%), Lowell (-24%) and Dracut (-21%). In 1971 the principal agricultural communities, as reflected by their percentage of the region’s total agricultural land, were Dracut (22.9%), Pepperell (22.8%), Dunstable (13.3%) and Westford (12.7%), while in 1991, the largest remaining agricultural lands were in Pepperell (25.4%), Dracut (22.5%) and Dunstable (15.5%). Based upon more recent development trends during the 1990’s and early 2000’s, the trend of declining agricultural land continues to this day.

i. Cultural and Recreational Amenities

The Greater Lowell region has extensive cultural and recreational amenities. During the 1990’s, the City of Lowell decided that in order to improve its economy and to solidify its standing as the central focus of this region, it needed to be a “destination” city. This meant that a middle-sized community needed to develop the wherewithal to develop major projects and attract minor league baseball and hockey franchises to the community. In the past the City had utilized its Center to host theatrical productions and Golden Glove boxing events; however, there needed to be more extensive athletic events to encourage visitors from Greater Lowell and outside the region to come into the city. The development of the Paul E. Tsongas Arena and the Edward LeLacheur Stadium have provided minor league hockey and baseball attractions that did not exist ten years ago. The rest of the region enjoys extensive cultural and recreational activities as well and the Town of Billerica was actually designated by *Sports Illustrated* as one of the top sports communities in America. Listed below are the various cultural and recreational amenities for each of the communities in the Greater Lowell region:

▪ **Billerica**

1. *Great Meadows National Wildlife Refuge (55 acres)*
Hiking, nature observation, cross-country skiing, canoeing.
2. *Vietnam Veteran's Memorial Park (200 acres)*
Located off Treble Cove Rd., this park was deeded to the Town from Middlesex County in 1995 via a legislative act. Features include Concord River frontage, walking trails, show horse rink, soccer fields, radio control airport, fishing, canoeing, cross country running trail, cross country skiing, community gardens, special events, nature observation and the first in the nation Vietnam Veterans Memorial.
3. *Lampson Recreation Complex*
Basketball courts, tennis courts, football field, softball fields, multi-use field, ice-skating, recreation office.
4. *Akeson Park*
Soccer fields, canoe launch site for Shawsheen River.
5. *Pollard Park*
Kids Konnection (children's playground), picnicking, baseball field.
6. *Micozzi Beach*
Swimming, picnic area, playground, sand volleyball court, basketball, handicapped accessible fishing pier, canoe launch, nature observation.
7. *Billerica Public Schools*
Many of the Town's athletic fields are located on school property. The Marshall Middle School facilities include an outdoor hockey rink. All elementary schools have a children's playground.
8. *Country Club of Billerica*
Eighteen hole public golf course, driving range, Barrie Bruce Golf School.
9. *Rangeway Golf*
Driving range, miniature golf course.
10. *Minuteman Sportsman Club*
Rifle target range, archery.
11. *Boys and Girls Club of Greater Billerica*
Gymnasium, pool, ropes course, game rooms, before/after school program, special events.
12. *Nuttings Lake, Winning Pond, Concord River, Shawsheen River.*
Fishing or Canoeing
13. *Warren H. Manning State Forest and Park*
Located off Route 129 in North Billerica and is comprised of 207 acres. The park consists of hiking trails through the forest, a small pond, a picnic area and a children's wading pool.
14. *Gilson Hill State Forest*
Consists of 168 acres with hiking trails located off Treble Cove Road.
15. *Town Conservation Land owned by Conservation Commission.*
Sixteen parcels totaling over 200 acres located throughout the Town.

▪ **Chelmsford**

1. *Cranberry Bog Reservation (164 acres)*
Hiking, wildlife observation, fishing.

▪ **Chelmsford (cont.)**

2. *George B.B. Wright Reservation* (110 acres)
Hiking, nature observation.
3. *Lime Quarry Reservation* (64 acres)
Hiking, nature observation.
4. *Lowell Sportsman Club* (64 acres) private
Fresh water fishing, target archery, shooting.
5. *Chelmsford Country Club* (31.5 acres) (municipal)
Golf, sledding.
6. *Chelmsford High School* (52 acres)
Baseball/softball, cross country skiing, football/soccer, general play, hiking, nature observation, organized events, tennis.
7. *Russell Mill Pond and Forest* (132 acres)
Hiking, horseback riding, nature observation, fishing, boating, soccer.
8. *Thanksgiving Ground Forest* (48 acres)
Fresh water fishing, swimming, hiking, nature observation, boating.
9. *McCarthy Jr. High School* (42 acres)
Baseball/softball, football/soccer, general play, nature observation, tennis, walking/jogging.
10. *Freeman Lake* (77 acres)
Swimming, boating (non-motorized), skating.

▪ **Dracut**

1. *Lowell Dracut Tyngsborough State Forest* (1,040 Acres)
ATV motoring, bicycling, non-motorized boating, camping, cross country skiing, fresh water fishing, hiking, horseback riding, hunting, ice skating, nature observation, organized events, snowmobiling, walking/jogging.
2. *Dracut High Complex* (89 Acres)
Baseball/softball, football/soccer, freshwater fishing, organized events, team activities, and walking/jogging
3. *Municipal Landfill* (70 Acres)
Baseball/softball, football/soccer
4. *Centerville Sport Club* (35 Acres)
Fresh water fishing, hunting, nature observation, target archery
5. *Polubinski Land* (23 Acres)
Baseball/softball
6. *Colburn Land* (19 Acres)
Nature observation, picnicking
7. *Parker Avenue School* (7 Acres)
Baseball/softball
8. *Dracut Tennis Center* (6 Acres)
Tennis

▪ **Dunstable**

1. *Town Forest* (119 Acres)
Cross-country skiing, hiking, horseback riding, hunting, nature observation, and snowmobiling
2. *Cambridge YMCA* (106 Acres)
Non-motorized boating, cross country skiing, fresh water fishing, swimming, hiking, nature observation, target archery.
3. *Spaulding Proctor* (91 Acres)
Non-motorized boating, cross country skiing, fresh water fishing, swimming, hiking, nature observation.
4. *Salmon Brook Area* (35 Acres)
Fresh water fishing, hiking, hunting, nature observation.
5. *Spectal Hill Lot* (23 Acres)
Cross country skiing, hiking, hunting, nature observation
6. *Swallow/Union School Area* 913 Acres)
Fresh water fishing, hiking, nature observation, tennis

▪ **Lowell**

1. *Lowell Dracut Tyngsborough State Forest* (1,040 Acres)
ATV motoring, non-motorized boating, cross country skiing, fresh water fishing, hiking, hunting, ice skating, nature observation, organized events, sightseeing, snowmobiling, walking/jogging.
2. *Lowell Heritage State Park* (118 Acres)
Bicycling, non-motorized boating, cross country skiing, fresh water fishing, fresh water swimming, hiking, horseback riding, ice skating, nature observation, organized events, picnicking, walking/jogging.
3. *University of Massachusetts at Lowell* (103 Acres)
Assorted facilities
4. *Longmeadow Golf Club* (62 Acres)
Golf
5. *Leblanc Park* (60 Acres)
Camping, general play, hiking, organized events, picnicking, and pool swimming.
6. *Shedd Park* (52 Acres)
Baseball/softball, basketball, bicycling, cross-country skiing, football/soccer, general play, hiking, organized events, other team related activities, pool swimming, tennis, walking/jogging.
7. *Fort Hill Park* (34 Acres)
Bicycling, cross country skiing, downhill skiing, hiking, picnicking, and walking/jogging
8. *Boulevard Park* (24 Acres)
Bicycling, non-motorized boating, camping, fresh water fishing, general play, hiking, ice-skating, organized events, picnicking, walking/jogging.

▪ **Pepperell**

1. *Nissitissit River W.M.A (294 Acres)*
Cross-country skiing, fresh water fishing, hiking, hunting, nature observation, and snowmobiling
2. *Hays and Swett Lots (125 Acres)*
Non-motorized boating, cross country skiing, fresh water fishing, hiking, hunting, nature observation, snowmobiling, target archery.
3. *Conservation Commission Land Trust (100 Acres)*
Cross-country skiing, fresh water fishing, hiking, horseback riding, and nature observation.
4. *Town Forest (83 Acres)*
Cross country skiing, hiking, horseback riding, hunting, nature observation, picnicking
5. *Orchard Lot (80 Acres)*
ATV motoring, cross-country skiing, hiking, nature observation, picnicking, sight seeing, snowmobiling

▪ **Tewksbury**

1. *Trull Brook Golf Course (126 Acres)*
Golf, tennis, nature observation
2. *Open Space Site (48 Acres)*
Nature observation
3. *Memorial High School (55 Acres)*
Baseball/softball, football/soccer, general play.
4. *Livingston Street Park (31 Acres)*
Basketball, general play, tennis.
5. *Rogers Park (27 Acres)*
Nature observation
6. *Center School (25 Acres)*
General play, tennis.

▪ **Tyngsborough**

1. *Lowell, Dracut, Tyngsborough State Forest (1,040 Acres)*
ATV motoring, bicycling, non-motorized boating, cross-country skiing, fresh water fishing, hiking, horseback riding, hunting, ice skating, nature observation, organized events, picnicking, sightseeing, snowmobiling, walking/jogging.
2. *MIT Property (251 Acres, Private)*
Nature observation, hiking
3. *Notre Dame Academy (199 Acres, Private)*
Hiking, nature observation, pool swimming, tennis.
4. *Vesper Country Club (170 Acres, Private)*
Golf, hiking, nature observation, pool swimming, tennis
5. *Elbow Meadow (132 Acres)*
Hiking, nature observation
6. *Tyngsborough Country Club (87 Acres)*
Golf, hiking, hunting, nature observation, picnicking

- **Tyngsborough (cont.)**

7. *Greater Lowell Regional Vocational Technical High School* (85 Acres)
Baseball/softball, basketball, football/soccer, general play, organized events

- **Westford**

1. *Nashoba Brook Area* (350 Acres)
Cross-country skiing, hiking, hunting, nature observation, and snowmobiling
2. *East Boston Camps* (241 Acres, Private)
Camping, swimming, picnicking, fishing, boating
3. *Nonset Brook – Vine Brook* (174 Acres)
Hunting, nature observation
4. *Tadmuck Swamp Area* (142 Acres)
Fresh water fishing, hunting, nature observation
5. *Wyman’s Beach* (140 Acres – private fee charged)
Non-motorized boating, camping, nature observation, picnicking, pool swimming
6. *New Westford Academy* (111 Acres)
Baseball/softball, other team sports.
7. *Mystery Spring* (106 Acres)
Cross country skiing, hiking, hunting, nature observation, and snowmobiling
8. *Nashoba Valley Ski Area* (50 Acres)
Downhill skiing, four chair lifts, three rope tows, nine trails, snow tubing, swimming

j. Bicycle and Pedestrian Facilities

In order to improve the quality of life for area residents and to foster a more livable environment in each community, bicycle and pedestrian facilities are encouraged in the Greater Lowell region. The MassHighway Department is designated as the lead agency to encourage the development of these facilities within infrastructure improvements and as part of stand-alone facilities. Although there are presently no designated bicycle facilities along functionally classified roadways in the region, bicyclists often utilize these roadways at their own risk. Commuter bicyclists often use the arterials notwithstanding the discomfort of narrow lanes, parked cars and heavy traffic. A balanced program to accommodate the needs of motor vehicles, bicyclists and pedestrians is needed.

The Off-Road Bicycling Facilities within the region are at various stages of the planning/design process and are listed below by community:

- **Billerica**

At this time, the only trail system in Billerica is comprised of two trails blazed by the Boy Scouts in the Warren Manning State Park. Plans were developed several years ago to blaze trails on the county property around the Middlesex County corrections facility. A handful of trails have been developed around the facility through this effort. Other trails exist along transmission and gas pipeline easements.

The Yankee Doodle Bikeway is currently in the planning process. The proposed bikeway is located along an abandoned railroad right-of-way extending from Iron Horse Park to

- **Billerica (cont.)**

the Bedford town line. Design and construction funds for the project were included in a previous state transportation bond bill. Local officials are currently negotiating with property owners to acquire control of the right-of-way, which was sold by the railroad over the years.

A trail network is also being planned along the towpath of the Middlesex Canal. Design has commenced on the section of the canal adjacent to the Concord River/Mill Pond area of North Billerica. The Middlesex Canal Commission has also been awarded statewide enhancement monies to design subsequent phases of the project from Chelmsford to Winchester.

- **Chelmsford**

Phase I of the Bruce N. Freeman Memorial Bike Path, a proposed rails-to-trails project extending from Lowell to Sudbury, was advertised for construction in September 2002. The Phase I project will extend from Cross Point in Lowell to the Westford/Acton town line. It is anticipated that construction will begin in Spring 2004.

- **Dracut**

Dracut does not currently have an active Trail Committee. However, preliminary efforts are underway by the Merrimack River Watershed Council to develop a section of the Merrimack River Trail. This trail, if developed, would run between the Merrimack River and Route 110.

- **Dunstable**

The Nashua River Trail project was completed and opened in 2002. This rails-to-trails project extends for more than eleven miles from the MBTA Commuter Rail Station in Ayer, through Groton, Pepperell and Dunstable, ending at the New Hampshire border.

NMCOG is currently conducting a feasibility study for an additional bike path along Route 113 in Dunstable. This proposed facility would connect with the Nashua River trail and provide a link to Dunstable Center and the Town of Tyngsborough.

- **Lowell**

- **Merrimack River Trail**

Sections of the Merrimack River Trail are complete in the City of Lowell providing paved surfaces for walkers and cyclists. One section is incorporated into the Lowell Esplanade Park and managed by the Department of Environmental Management (DEM). The other section runs between Beaver Brook and the Lowell Sewage Treatment Plant to the east. However, these two sections are not connected at this point. The City of Lowell and the National Park Service recently constructed an additional section of the trail as part of a Public Lands Highway project called the Merrimack River Walk. The Northern Canal/Great River Wall Walkway is currently under construction. This walkway will be completed in late Summer 2004.

- **National and State Park Facilities**

The City of Lowell currently has the National Historical Park and Heritage State Park located along the Merrimack River and intertwined among the mill complexes and the downtown area. Numerous walking trails have been incorporated into the urban landscape with several other similar facilities in the planning stages. There are also trail facilities in the Lowell/ Dracut/Tyngsborough State Forest.

As part of the Lowell National Historical Park and Heritage State Park systems, numerous walking trail networks exist that provide passive and interpretive recreation. These trail networks, found on both sidewalks and paved trails, provide access for tourists and workers to various parts of downtown Lowell. The networks allow for pleasant travel for individuals moving from one downtown location to another. The Northern Canal Walkway, within the Lowell Heritage State Park area, provides an excellent pedestrian and possible bicycle link between the downtown core and other recreational and commuting sites along the northern banks of the Merrimack River. The Canalway Plan, currently under development by the National Park Service, will provide pedestrian walkways along the extensive canal network in the City.

Walking trails line both sides of the Merrimack River in Lowell and comprise sections of the Merrimack River Trail. A crude trail, the Interceptor, runs from the mouth of the Concord River to the Tewksbury town line. This two-mile segment, which runs along a sewer easement, is not paved but provides recreation opportunities for residents in this area. Once Tewksbury develops its section, the Interceptor Trail will connect all the way to Lawrence.

- **Concord River Walkway**

The Concord River Walkway is in the planning stages. The project is proposed along the eastern bank of the Concord River. Conceptual design work on the project has been completed. The City of Lowell has also expressed an interest in extending the Bruce Freeman Bike Path to the Concord River Trail.

- **Pepperell**

The Nashua River Watershed Association is presently working on the planning and design of a trail system along the banks of the Nashua River in Pepperell and other adjacent communities outside of the Northern Middlesex region. The trail would be primarily for pedestrian and passive recreational use.

- **Tewksbury**

The Town of Tewksbury recently acquired an abandoned rail right-of-way paralleling a section of Main Street near the Town Center. Plans are underway to utilize the right-of-way as a trail. The Bay Circuit Alliance is working on plans for a South Bay Circuit spur from Andover into Tewksbury along an abandoned railroad right-of-way which will connect into Billerica and points beyond. The project is known as the Strong Meadow Trail.

- **Tyngsborough**

There are several marked trails located in the Lowell/Dracut/Tyngsborough State Park. There are no current connections to other facilities in the immediate area. The Town has, however, proposed constructing a multi-use path along the east side of the Merrimack River. This project is in the early planning stage. The Town has deferred future work on the plans until the location of the second river crossing is selected.

- **Westford**

As part of its Master Plan Implementation effort, Westford has proposed to develop a town-wide trail network. Most recently, public input was solicited for a proposed multi-use trail extending along the abandoned Red Line trolley right-of-way. The Town has received regional transportation enhancement funds to design portions of the townwide trail. That design effort is now underway.

Pedestrian Facilities need to be developed in order to encourage walking as an alternative to automobile use. The Massachusetts Pedestrian Plan provides detailed guidance on how to ensure that the needs of pedestrians are integrated within the future planning, design, construction and maintenance of the regional transportation infrastructure. The Pedestrian Plan recommends constructing pedestrian walkways or sidewalks where land uses generate seasonal or year-round pedestrian traffic such as commercial areas, employment centers and areas of residential concentration such as village centers.

B. The Regional Economy

This section on the Regional Economy focuses on the basic elements of the Greater Lowell region's economy---its labor force, businesses, job creation and tax policies, workforce development system and housing. Each of these elements can improve or hold back economic expansion in the region and it is important for the economic development stakeholders in the region to understand the consequences of their actions or inaction. In the past, the City of Lowell has largely driven the regional economy; today, the suburban communities are an equal partner in the business and job creation efforts in the region. The City of Lowell offers an extensive skilled and semi-skilled workforce and reusable space downtown or in the mill complexes surrounding the downtown. The suburban communities have access to more educated and mobile workers and have developed office parks along the major highways to take advantage of these resources.

1. The Lowell MA-NH PMSA

The Greater Lowell region is a fairly cohesive area that utilizes the City of Lowell as its central city, but also reaches out to other economic areas, such as Greater Boston and southern New Hampshire for employment opportunities. The U.S. Census Bureau has recognized this growing phenomenon and has established an urbanized area that includes portions of Southern New Hampshire, Southern Maine, Eastern Massachusetts and most of Rhode Island as one urbanized area. These areas are replacing the traditional Standard Metropolitan Statistical Areas (SMSAs), Primary Metropolitan Statistical Areas (PMSAs) and Labor Market Areas (LMAs) in showing

how labor markets operate in this country. Unfortunately, by grouping many of the smaller SMSAs, PMSAs and LMAs together, the unique characteristics of these areas are lost.

Travel to work data from the U. S. Census indicates that residents of the Greater Lowell region travel great distances in order to access jobs. According to the 2000 U.S. Census, the number of workers in the region who didn't work at home increased by 5.7% from 129,063 in 1990 to 136,451 in 2000. Their mean travel time to work increased by 18% and those who traveled more than 45 minutes to work (12% in 1990 and 18% in 2000) increased by 58.6% from 15,449 in 1990 to 24,502 in 2000. The increase in travel time can be attributed to increased traffic congestion, the development of new businesses farther from the traditional urban centers, the higher cost of housing forcing people to locate further from their jobs and the moving to jobs further away. For those in the workforce dependent upon public transportation, the bus system administered by the Lowell Regional Transit Authority (LRTA) and the M.B.T.A commuter rail network provide more options than most regions. The number of non-home working residents utilizing public transportation in the Greater Lowell region increased from 2,681 (2.1%) in 1990 to 3,384 (2.5%) in 2000 for a total increase of 26.2% within the region.

Within the Massachusetts portion of the Lowell MA-NH PMSA, there are ten communities – Billerica, Chelmsford, Dracut, Dunstable, Groton, Lowell, Pepperell, Tewksbury, Tyngsborough and Westford. However, within the Northern Middlesex Service Delivery Area, where the Greater Lowell Workforce Investment Board (WIB) operates, there are eight communities – Billerica, Chelmsford, Dracut, Dunstable, Lowell, Tewksbury, Tyngsborough and Westford. Given the relatively small difference in the labor force figures (approximately 20,000 workers) for the Lowell MA-NH PMSA and the Northern Middlesex Service Delivery Area, there is not an appreciable difference in the unemployment figures. However, to the extent possible, employment and unemployment figures will be provided for the NMCOG region (nine communities) and sometimes interchanged with these other figures.

Overall the employment situation in the Lowell MA-NH PMSA has declined since 2000 due principally to the national recession and the major layoffs locally in the information technology and computer manufacturing sectors. The New England economy between 2001 and 2002, according to the Greater Lowell Workforce Investment Board's "Workforce Development Blueprint", was hardest hit in "manufacturing (9.2%), information (8.5%), professional and business services (5.2%) and transportation, warehousing, and utilities (3.4%)". With Massachusetts accounting for roughly four out of five jobs lost in New England, nearly half of these job losses were in the manufacturing sector, most notably in communications equipment (36.0%), semiconductor and other electronic components (21.5%) and computer and electronic products (16.6%). Additionally, the information sector, which included software publishing (14.0%) and telecommunications (10.8%), lost 10.9% of jobs in Massachusetts. According to an analysis conducted by Northeastern University's Center for Labor Market Studies, the actual job losses were much more severe than those reported with Massachusetts undercounting its job losses by 38,600.

In March 2003 the Boston Globe reported that the Greater Boston area experienced the third biggest loss in jobs (35,200) from January 2002 to January 2003 of all metropolitan areas in the country, while the Greater Lowell area lost 4.1% of its jobs, which was the fourth highest

percentage loss of employment in the country during the same period. The Greater Lowell area lost 5,200 jobs, principally in the high-tech manufacturing sectors, such as fabricated metals, machinery and computers and electronics. The Greater Lowell unemployment rate in January 2003 was 6.8%, as compared to the state unemployment rate of 5.8% and the national unemployment rate of 6.5%. Since 2000 the Lowell MA-NH PMSA has been harder hit than the state as a whole due to its over-dependence on the information technology and computer manufacturing sectors. While the unemployment rate for the Lowell MA-NH PMSA was at 2.5% in 2000, it steadily increased to 4.2% in 2001, 6.5% in 2002, 6.8% in 2003 and 6.5% in January 2004.

According to a recent Boston Globe article, Massachusetts suffered a 6.2% decline in jobs between January 2001 and January 2004, which was the highest rate in the nation and more than three times the national average decline of 1.7% for the period. Employment fell by 20% in manufacturing, 25% in information and 15% in the professional and business sector. Once again, the impact within the Greater Lowell region has been even higher and has resulted in unemployment rates higher than those for the state or nation. It is generally assumed that the economic recovery in New England will take longer than in the rest of the country and there will need to be an adopted economic development strategy to address these problems on a subregional basis.

2. Regional Employment

In 1992, the Weld Administration published a document entitled “Choosing to Compete”, which became the guiding economic development document for the Commonwealth of Massachusetts. The document was a collaborative project between the Executive Office of Economic Affairs (EOEA) and the University of Massachusetts and divided the Commonwealth into seven regions: Berkshire, Pioneer Valley, Central, Northeast, Greater Boston, Southeast and Cape & Islands. The Greater Lowell area was included in the Northeast region and had approximately 32% of the region’s population and 34% of the region’s total employment. (Note: The Northeast region is comprised principally of the NMCOG and Merrimack Valley Planning Commission (MVPC) regional planning areas.) In general, this region had done poorly during the recession in the late 1980’s and early 1990’s and took longer than the rest of the state or nation to recover. Summarized below is an overview of the economic development components of the region and specific recommendations designed to improve the regional economy:

- According to the regional profile, the Northeast region has had a high concentration of manufacturing with 32% of employment in the manufacturing sector in 1991, as compared to the state’s figure of 17.3%. During the recession of the late 1980’s and early 1990’s, the region lost a number of manufacturing jobs in the computer and defense-related industries. More than 40% of the manufacturing employment in the Greater Lowell area was in the computer industry, which represented seven times its presence as the state as a whole. The regional profile indicated that this over dependence upon these industries made the region’s economy dependent upon a few core businesses; i.e., the computer, military transportation equipment and communications industries. The region’s search and navigational instrument,

electronic component and semiconductor industries were highly dependent upon the computer and guided missile industry.

- The Northeast region was judged to have a lower than average concentration of high wage business, engineering and management services, but a higher concentration of lower paid services, such as health education and repair. Average service sector wages in the Northeast were \$23,816 in 1991, as compared to the statewide figure of \$27,913.
- Only 16.1% of the region's employment was in the retail sector, as compared to 18.4% statewide. Construction, finance and real estate comprised less than 5% of all employment in the region.
- The region's educational attainment levels were somewhat below the state's levels, however, these levels did improve between 1980 and 1990.
- The labor force in Northern Middlesex County grew by more than 25% between 1980 and 1989 and exceeded the overall population growth.
- Due to the extensive focus upon the computer industry in the Northern Middlesex portion of the Northeast region, manufacturing jobs paid 4% more in this area in 1989 than at the state level. However, with the large number of jobs lost in the computer industry, this wage difference virtually disappeared.
- The bankruptcy of Wang Laboratories in 1992 resulted in the laying off of 5,000 employees. Regional employment in the computer industry fell by more than 35% from the fourth quarter of 1988 through the fourth quarter of 1991. It was expected that Digital Equipment Company would be laying off an additional 20,000 employees. The electronic components and accessory firms, which supplied the computer industry, laid off 14.7% of their employees between 1988 and 1991, greatly exceeding the national decline.
- The telecommunications industry employed more than 9,900 employees in the Northeast region. Firms like AT & T in North Andover, Loral Microwave FSI in Chelmsford and CPS Inc. and Davox Corporation in Billerica contributed largely to these employment levels.
- The transportation equipment and guidance instrumentation cluster employed approximately 14,500 people in the Northeast region in 1991. Raytheon Corporation, which received \$3.03 billion in prime contract awards in 1990, was the largest contractor in the state. As of late 1992, Raytheon employed 11,600 people in the region (5,000 in Andover, 2,700 in Lowell and 3,900 in Tewksbury). Other contractors in the region included Whistler Corporation (500 employees) in Westford and Inframetrics Inc. (170 employees) in Billerica.

- The competitive advantages of the Northeast region include its proximity to the financial and technological markets of Greater Boston, an excellent transportation network, a favorable credit and capital position relative to other Massachusetts regions, a well developed local banking system, excellent educational and workforce development resources and a well trained labor force in Massachusetts and New Hampshire.
- The challenges to future growth are well documented. These challenges include accessing private investment, overcoming the below average educational attainment figures for the population as a whole, holding on to laid off, highly-skilled workers and addressing distressed areas in the region.
- The regional policy priorities, as identified for the Northeast region, are to facilitate loans for new businesses and the financing of knowledge assets, to enhance communication between schools and businesses, to coordinate the activities of the region’s community colleges and vocational schools, to retrain dislocated workers and anticipate the needs of industry in the future and to stay aware of new manufacturing techniques and processes. Apart from these recommendations, the report argues that few capital projects have been targeted for the region and that a “comprehensive strategy should be drawn up and a process established for coordinating the efforts of local, regional and state bodies”. In particular, the study recommends “widening the arterial spokes for I-93 to four lanes, constructing four-way interchanges along Route 495,93 and 128, and widening Route 3”. Due to its proximity to New Hampshire, businesses in the Northeast region are particularly sensitive to state regulations. Small business growth, which has not been a priority in this region, needs to be encouraged, while foreign export markets need to be explored. The utilization of Economic Opportunity Areas (EOAs) and microenterprise loans were recommended as a means to address the specific problems of economically distressed areas within the region.

In August 2002 the Commonwealth of Massachusetts, once again through EOEA and the University of Massachusetts, published a follow-up document entitled “Toward a New Prosperity: Building Regional Competitiveness Across the Commonwealth”. This report was designed to improve the business climate in Massachusetts by highlighting the accomplishments during the previous decade and by recommending updated economic development strategies. The document utilized the same seven regions as established under “Choosing to Compete” and developed the following information on the Northeast region:

- This region, which played a prominent role in the Industrial Revolution and post-World War II economy, has been impacted by three major economic developments since 1950 – “the sharp decline of the textile industry, the Cold War buildup and post-Cold War reduction of defense spending and the meteoric emergence and eventual flame-out of the minicomputer industry”.

- Employment in the Northeast region grew by 16% from 1990 to 2001 (compared to 12.4% for the State); the workforce expanded by 12.6% (compared to 6% for the State); and population expanded by 8.6% (compared to 5% for the State).
- Although manufacturing employment grew during this period, its share of employment decreased from 25% in 1990 to 20.8% in 2001, while the services sector increased its share from 33.2% to 37.9%. Retail trade comprised 18.2% of total employment in the region in 2001.
- The Northeast region retained its dominance in manufacturing, as compared to the State, with 20.8% of total employment versus 13.4% in 2000. Due to the relatively high wages, the manufacturing sector generated 29.5% of total payroll, as compared to 16.7% statewide. In fact, real average wages in the Northeast region have exceeded the State since 1985, and this gap widened in 1998.
- In previous state studies, such as “Choosing to Compete” and “Knowledge Sector Powerhouse”, the concept of the Massachusetts Export Sector was defined and analyzed to illustrate how the state economy can grow by increasing employment in the predominantly knowledge-based clusters – Information Technology, Health Care, Financial Services and Knowledge Creation – and two less knowledge-intensive clusters – Traditional Manufacturing and Travel and Tourism. This concept was applied to the regional profiles and the analysis of job growth within the seven regions was conducted based upon this concept.
- Based upon this analysis, the Northeast region’s job growth between 1993 and 2000 in the Information Technology, Health Care, Financial Services, Knowledge Creation and Traditional Manufacturing clusters exceeded that at the state level.
- Within the Information Technology cluster, the Communications Hardware Manufacturing sector increased by 1,585% within the Northeast region, far outstripping the statewide increase of 100%. The region’s computer and communications services industries added nearly 7,500 jobs between 1993 and 2000.
- In the Health Care cluster, health services added more than 5,000 jobs between 1993 and 2000, nearly doubling the state’s growth rate. Although the drugs and pharmaceuticals sector grew by 28% in the Northeast region, the statewide rate was more than 115%.
- Within the Financial Services cluster, the securities and exchange services sector added more than 2,200 jobs or 1,063% in the Northeast region between 1993 and 2000. The Insurance sector declined by 12%, while the Banking sector’s employment level remained the same.
- The Knowledge Creation cluster in the Northeast region outpaced the State by 20%. The combination of growth in the Higher Education sector by 3,411 jobs, the addition of 1,082 jobs (76% increase) in the engineering and architectural services sector and

other gains in the research and test services and printing and publishing sectors contributed to this overall increase.

- In the Traditional Manufacturing cluster, the Northeast region experienced a significant increase in jobs in the fabricated metal, industrial machinery and instruments sectors. While the Northeast region had a 35% increase in this cluster, the State barely increased its level of jobs.
- The Northeast region increased its jobs in the Travel and Tourism cluster by 36%, but this increase lagged behind the State as a whole. Even though the average real wages in this cluster increased by 25% to \$20,044 in 2000, the pay for jobs in this cluster is relatively low and the work is often part-time.
- The principal strengths identified for the Northeast region were its skilled workforce, immigrant contributions (there were more than 300 immigrant-owned businesses in Lowell) and the extensive collaborative efforts.
- The regional policy priorities recommended for the Northeast region were better training for low-skilled workers, redevelopment of brownfields and diversifying the region's economic base.

The previous information related to the major economic development documents prepared by the Commonwealth, "Choosing to Compete" and "Toward a New Prosperity: Building Regional Competitiveness Across the Commonwealth", was provided in order to have an overview regarding the State's perspective on the economic strengths and weaknesses of the Northeast region. In many respects, the economic strengths of the region during the good times often become the area's weakness during the bad times. The region has moved from an over dependence upon the textile industry to an over dependence upon the computer industry to an over dependence upon the information technology industry. Fortunately, there appears to be a greater diversification of industries developing that can take advantage of the skilled workforce, immigrant population, proximity to Boston and transportation infrastructure.

The conversion of economic data from the Standard Industrial Classification (SIC) system established in 1939 to the North American Industry Classification System in 2003 has provided a major challenge in attempting to compare industry data pre-2003 and post-2003. Therefore, absent the ability to directly compare data, it is important to offer a snapshot of the regional economy. Data from the Employment, Wages and Contributions program (ES-202) was compared between the third quarter of 2001 and the third quarter of 2003, the most recent data available. This time period also coincided with reports by leading economists that the recession had ended. *Chart 23* provides information on all industries in the NMCOG region broken down by community and includes information on the number of establishments, average monthly employment and average weekly wage. The information, as outlined in *Chart 23* on the next page is as follows:

Chart 23: Establishments, Employment and Wages for the NMCOG Region

	<u>Establishments</u>		<u>Average Monthly Employment</u>		<u>Average Weekly Wage</u>	
	<u>2001 (Q3)</u>	<u>2003 (Q3)</u>	<u>2001 (Q3)</u>	<u>2003 (Q3)</u>	<u>2001 (Q3)</u>	<u>2003 (Q3)</u>
Billerica	1,118	1,181	24,900	22,679	\$1,015	\$1,000
Chelmsford	1,070	1,130	23,204	20,788	1,106	916
Dracut	518	581	4,670	4,822	604	608
Dunstable	53	55	282	284	535	545
Lowell	1,764	1,876	34,225	32,059	714	787
Pepperell	211	213	1,553	1,472	585	604
Tewksbury	769	819	16,343	15,766	871	1,046
Tyngsborough	310	355	3,722	4,609	555	557
Westford	623	665	12,297	10,866	1,157	1,275
NMCOG Region	6,436	6,845	121,286	113,345	\$ 767*	\$857*
State	192,502	205,211	3,256,610	3,131,033	\$ 823	\$ 860

* Estimate

Source: ES-202 Reports

While the number of establishments in the NMCOG region increased by 409 or 6.4%, the number employed decreased by 7,941 workers or 6.5%. These employment losses were being felt during a period of time when the economy was supposedly coming out of the recession. The statewide figures show a 6.6% increase in the number of establishments and a similar 6.5% decrease in employment. These figures also illustrate that the average weekly wage gap is being addressed by moving from 93.2% of the statewide average weekly wage in the third quarter of 2001 to 99.7% of the statewide average weekly wage in the third quarter of 2003.

Another analysis of the figures in *Chart 23* reflects the overall composition of the NMCOG regional economy by individual community. As expected, the City of Lowell has the highest share of establishments (27.4%) and the highest share of average monthly employment (28.2%) in the region. However, due to the higher high-tech manufacturing mix in the suburban communities, the town of Westford maintained the highest average weekly wage outperforming the average for the NMCOG region by 1.5 times. Other communities, such as Billerica, Chelmsford, Tewksbury and Westford, ranked high in terms of their share of establishments and average monthly employment. These communities, along with the City of Lowell, lost the greatest number of jobs between 2001 and 2003 – Billerica (2,311), Chelmsford (2,416), Tewksbury (577) and Westford (1,431). In the case of Billerica and Chelmsford, the loss of specific jobs within the community lowered the average weekly wage between 2001 and 2003.

According to an analysis of the NMCOG employment figures between 2001 (Q3) and 2003 (Q3) based upon the NAICS Code (see *Chart 24* on the next page), jobs decreased by 7,941 or 6.5%. Jobs within the Goods-Producing Domain, which comprised 27.2% of total employment in 1991 and 23.9% of total employment in 1993, decreased by 5,816 or 17.7%, with major losses of 6,489 jobs (24.7% decrease from 1991) in the Manufacturing area. The Natural Resources and Mining and Construction sectors increased employment between 1991 and 1993. Within the Service-Providing Domain, the number of jobs decreased by 2,125 or 2.4% with the bulk of the decreases in the Trade Transportation and Utilities (2.4% decrease from 1991), Information (8.0% decrease from 1991), Financial Activities (1.8% decrease from 1991) and Professional and Business Services (9.2% decrease from 1991) sectors. Employment actually increased in the

Education and Health Services, Leisure and Hospitality, Other Services and Public Administration sectors. The actual figures are listed below in *Chart 24*:

Chart 24: Establishments, Employment and Wages by NAICS Code for the NMCOG Region

Description	Total Establishments		Avg. Monthly Employment		Avg. Weekly Wages	
	2001 (Q3)	2003 (Q3)	2001 (Q3)	2003 (Q3)	2001 (Q3)	2003 (Q3)
Total, All Industries	6,436	6,845	121,288	113,347	\$ 767*	857*
Goods-Producing Domain	1,366	1,528	32,940	27,124	\$1,111	\$1,139
Natural Resources and Mining	15	17	216	225	\$604	\$522
Construction	869	1,031	6,451	7,115	\$871	\$895
Manufacturing	482	480	26,274	19,785	\$1,185	\$1,263
Service-Providing Domain	5,070	5,347	88,348	86,223	\$677	\$808
Trade Transportation and Utilities	1,381	1,359	23,071	22,520	\$759	\$740
Information	148	142	6,763	6,225	\$1,197	\$1,447
Financial Activities	418	433	4,258	4,183	\$765	\$896
Professional and Business Services	1,188	1,309	17,311	15,715	\$1,092	\$1,063
Education and Health Services	603	654	19,452	19,766	\$651	\$695
Leisure and Hospitality	572	582	10,057	\$10,075	\$279	\$280
Other Services	686	794	3,709	3,748	\$506	\$474
Public Administration	74	74	3,727	3,992	\$894	\$1,025

Note: Estimate. Due to rounding the numbers may not add.

Source: ES-202 Data according to the NAICS Code

The changes in the regional economy since 2000 have been fairly dramatic with the decline in goods-producing jobs and the increase in the share of service-providing jobs. The changes within the NMCOG region are fairly consistent with what has happened at the state level. Outlined on the next page in *Chart 25* are the figures for the period from 2001 (Q3) and 2003 (Q3) for Massachusetts as a whole:

Chart 25: Establishments, Employment and Wages by NAICS Code for Massachusetts

Description	Total Establishments		Avg. Monthly Employment		Avg. Weekly Wages	
	2001 (Q3)	2003 (Q3)	2001 (Q3)	2003 (Q3)	2001 (Q3)	2003 (Q3)
Total, All Industries	192,502	205,211	3,256,610	3,131,033	\$823	\$860
Goods-Producing Domain	28,442	30,471	550,400	488,453	\$980	\$1,042
Natural Resources and Mining	1,047	1,110	8,904	9,579	\$612	\$695
Construction	17,739	20,214	159,805	157,087	\$935	\$938
Manufacturing	9,656	9,147	381,692	321,786	\$1,007	\$1,102
Service-Providing Domain	164,060	174,740	2,706,210	2,642,580	\$791	\$827
Trade Transportation and Utilities	43,645	44,973	624,731	606,308	\$692	\$722
Information	4,952	4,662	116,441	96,709	\$1,176	\$1,216
Financial Activities	15,351	16,361	231,133	222,771	\$1,227	\$1,361
Professional and Business Services	37,413	39,611	488,469	447,320	\$1,053	\$1,069
Education and Health Services	18,265	19,119	677,558	696,544	\$723	\$788
Leisure and Hospitality	16,964	18,268	308,303	318,170	\$347	\$359
Other Services	24,489	28,714	115,516	118,221	\$471	\$485
Public Administration	2,981	3,032	144,058	136,538	\$839	\$928

Note: Due to rounding, the numbers may not add.

Source: ES-202 Data according to the NAICS Code

As outlined in the previous reports from the Commonwealth, the share of goods-producing or manufacturing jobs within the NMCOG Region are higher than at the state level. Furthermore, it appears that the decline in jobs has been steeper in the NMCOG region than at the state level.

3. Pockets of Distress in the Region

Although the Greater Lowell region experienced exceptional economic growth during the 1990's, which is readily apparent in the 2000 U.S. Census data, the decline in the economy since 2000 has taken its toll on the region. As outlined previously, the unemployment rates have steadily risen and this unemployment has not been confined to the City of Lowell, but, rather, has impacted many of the suburban communities in the Greater Lowell region. Large layoffs in the computer manufacturing and information technology industries have significantly impacted many of the high tech parks along Routes 3, 495 and 93. Furthermore, the State of Massachusetts, according to an article in the *Boston Globe* on March 11, 2004, experienced the largest decrease in jobs of any state between January 2001 and January 2004 when it suffered a 6.2% decline in jobs. According to the Bureau of Labor Statistics, employment in Massachusetts during this three-year period fell by 20% in manufacturing, 25% in information and telecommunication and 15% in the professional and business sector. Additionally, more Americans have been out of work longer than at any period since the early 1980's with 40% of the unemployed out of work for more than 15 weeks. With this factor in mind, economists estimate that if those who quit the labor market were added in, the national unemployment rate in January 2004 would have been greater than 7% instead of the 5.6% official figure.

Notwithstanding the economic difficulties in the Commonwealth of Massachusetts, the unemployment figures for the NMCOG region and the City of Lowell were even higher. During the past twelve months (March 2003 – February 2004), the unemployment rates for the NMCOG region and the City of Lowell have averaged 6.7% and 8.4% respectively, as compared to the national (6%) and state (5.8%) averages for the same period. In fact, the unemployment rate in the City of Lowell (8.2%) for the past twenty-four months has been 2.3% higher than the national unemployment rate (5.9%) for the same period. The unemployment rate figures for the past twelve-month period were as follows:

**Chart 26: Unemployment Rate Comparisons:
March 2003 – February 2004**

<u>Month</u>	<u>U.S.</u>	<u>Mass.</u>	<u>NMCOG Region</u>	<u>City of Lowell</u>
March 2003	5.8	6.4	7.5	9.1
April 2003	6.0	5.7	6.9	8.5
May 2003	6.1	5.6	6.9	8.8
June 2003	6.3	5.9	7.3	9.4
July 2003	6.2	6.0	7.4	9.4
August 2003	6.1	5.8	7.1	8.9
September 2003	6.1	5.9	6.9	8.6
October 2003	6.0	5.4	6.3	7.9
November 2003	5.9	5.3	6.0	7.6
December 2003	5.7	5.4	5.9	7.3
January 2004	5.6	6.2	6.6	8.0
February 2004	5.6	5.8	6.1	7.3

Source: Massachusetts Division of Unemployment Assistance.

In terms of per capita income, the City of Lowell, as a whole, is barely above 80% of the national per capita income figure for 2000. However, the majority of Census Tracts in the City of Lowell are below the 80% national per capita income figure and, in many cases, well below this figure. The following Census Tracts are eligible for EDA funding based upon their 2000 Per Capita Income figures: 3101, 3103 – 3105, 3107 – 3113, 3117 – 3121, and 3124. No other Census Tracts or communities are eligible for EDA funding under the per capital income criteria.

While the City of Lowell has been impacted by a high unemployment rate and low per capita income figures, the suburban communities have been largely impacted by the number of layoffs at their facilities since 2000. As outlined in the pre-application for EDA funding, the figures from the federal WARN System provide an indication of the communities impacted by these layoffs. Listed in *Chart 27* on the next page are the layoffs that have been reported to the Rapid Response Team as part of the WARN System for communities in the Greater Lowell region:

Chart 27: Layoffs in the NMCOG Region

<u>Community</u>	<u>Company</u>	<u>Effective Date</u>	<u>Employees Affected</u>	
Billerica	American Science & Engineering	4/1/04	14	
	K Mart Distribution Center	2/28/04	265	
	Bull Honeywell Information	2/20/04	5	
	Kokusai Semiconductor	10/31/03	15	
	Kawneer Company, Inc.	10/10/03	12	
	Sipex	9/30/03	45	
	Circuit City Service	3/14/03	40	
	Jabil Circuits	2/28/03	20	
	RADIONICS	1/31/03	80	
	Iris Graphics	1/31/03	140	
	Bull Honeywell Information	1/17/03	13	
	Kokusui Semiconductor	11/29/02	25	
	Avici Systems	8/19/02	75	
	Kokusui Semiconductor	3/31/02	50	
	Silver Stream Software	2/28/02	35	
	Nortel Networks	9/28/01	200	
	Chelmsford	Intercept Group	5/21/04	34
		Total Filtration Technology	11/29/03	15
Thermo Detection		8/30/03	63	
3M		6/28/03	9	
Brooks-PRI Automation		10/4/02	300	
Integral Access Inc.		9/17/02	35	
Sycamore Networks, Inc.		7/31/02	200	
Tektronix, Inc.		6/30/02	40	
Dracut	United Circuits, Inc.	7/31/02	28	
	APA No. America	2/22/02	50	
Lowell	First Essex Bank	2/06/04	132	
	Freudenberg Nonwoven	12/31/03	60	
	Lowell School Department	8/31/03	22	
	Collins & Aikman Products	2/15/03	80	
	Ames	10/15/02	64	
	Joan Fabrics Corp.	8/31/02	107	
	Celestica Corporation	5/24/02	70	
	Microsemi Microwave	5/03/02	8	
	Celestica Corporation	2/01/02	186	
	Tewksbury	Muro Pharmaceuticals	6/30/03	80
Motorola		6/30/03	17	
DigitalNet Government		2/10/03	2	
Muro Pharmaceuticals		7/31/02	44	
Tewksbury State Hospital		7/1/02	25	
Tyngsborough	Hussey Plastics Company	1/31/04	48	
Westford	Teradyne	4/30/03	12	
	Lucent Technologies	3/30/03	1	
	Lucent Technologies	1/30/03	16	
	Lucent Technologies	1/5/03	490	
	Lucent Technologies	12/11/02	13	
	Agilent Technologies	8/30/02	30	
	Acutest	2/28/02	2	
	Flextronics Internal	1/18/02	19	
Lucent Technologies	10/11/01	100		

Source: Massachusetts Rapid Response Team

Additional layoffs have been announced in the local press, which have not been reflected in these figures. These layoffs reflect the economic distress felt in the suburban communities and would, depending upon the magnitude of the layoffs, make these communities eligible for EDA funding. As stated previously, the unemployment rates in the suburban communities have been much higher than usual given the nature of these layoffs.

Another issue that may have an impact upon the region is the potential closing of Hanscom Air Force Base, which may be a target under the Base Realignment And Closure (BRAC) deliberations. Hanscom has always provided a major impetus for this region in terms of contracting opportunities and access to defense contracts. In 1998 NMCOG and the Metropolitan Area Planning Council (MAPC) collaborated on a study entitled “Defense and the Regional Economy: Local Impacts and Local Strategies in Eastern Massachusetts” which focused upon the impact of defense spending reductions on the regional economy and individual communities. This study used Billerica as one of the focus communities and determined the overall impact of these defense reductions, which were significant, on the community. Similar impacts are likely to occur with the potential closing of Hanscom Air Force Base.

4. Business Creation

The number of businesses in the Greater Lowell region increased from 4,248 in 1985 to 6,227 in 2000 for an overall increase of 46.6%. While overall employment declined between 2000 and the third quarter of 2003, the number of businesses actually increased by 10.4%. The number of business establishment increased in every community between 1985 and 2000, while there was a decline in business in some communities (Dracut, Dunstable, Lowell, Pepperell) between 1900 and 1995. It appears that in good and bad economic times, new businesses are being created in the Greater Lowell region. Chart 25 below summarizes the growth in establishments in the NMCOG region between 1985 and the third quarter of 2003.

Chart 28: Establishments in the NMCOG Region: 1985 – 2003 (Q3).

<u>Community</u>	<u>1985</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>	<u>2003 (Q3)</u>
Billerica	609	920	982	1,078	1,181
Chelmsford	688	916	974	1,032	1,130
Dracut	372	478	449	492	581
Dunstable	31	42	38	46	55
Lowell	1,592	1,766	1,607	1,711	1,876
Pepperell	126	193	188	192	213
Tewksbury	406	595	673	758	819
Tyngsborough	136	218	241	300	355
Westford	288	447	507	618	665
NMCOG Region	4,248	5,575	5,659	6,227	6,875

Source: ES-202 reports

The major employers (1,000 or more employees) in the Greater Lowell region have changed during the past five years. Based upon information developed by the Lowell Sun every March, the top twenty-four employers in the region in 2004 have changed from those in 1999 and their overall employment levels have been reduced. *Table 3 in Appendix II* provides a listing of all the

major employers in the NMCOG Region, while Chart 26 below summarizes information on the top 24 employers in the region:

Chart 29: Top Twenty-Four Employers in the NMCOG Region – 1999 and 2004

Rank	Employer (1999)	Number of Employees	Employer (2004)	Number of Employees
1	Raytheon	9,500	Raytheon	6,976
2	Compaq Computer	7-8,000	DeMoulas Supermarkets	5,500
3	DeMoulas Supermarkets	6,629	BAE Systems	5,500
4	Lucent Technologies	6,425	Lahey Clinic	5,500
5	Sanders	5,205	Hewlett-Packard	3,500
6	Lahey Clinic	3,912	United Parcel Service	2,300
7	Hewlett-Packard	2,830	Cisco Systems	2,100
8	Northern Telecom Ltd.	2,370	Sun Microsystems	2,000
9	Bell Atlantic Corp.	2,300	Mitre Corp.	1,900
10	Teradyne Inc.	2,250	Wyeth Biopharma	1,800
11	Fidelity Investments	2,156	Verizon Communications	1,600
12	Mitre Corp.	1,875	Analog Devices, Inc.	1,500
13	M/A Com Inc.	1,866	M/A Com Inc.	1,500
14	United Parcel Service	1,835	Lowell General Hospital	1,400
15	Putnam Investments	1,800	Saints Memorial Med. Ctr.	1,400
16	Hadco Corp.	1,723	Wal-Mart Stores, Inc.	1,350
17	Analog Devices, Inc.	1,600	The Home Depot, Inc.	1,300
18	Malden Mills	1,600	N.E. Business Service	1,200
19	Lowell General Hospital	1,450	Malden Mills	1,200
20	South. NH Health System	1,420	Lucent Technologies	1,200
21	MediaOne Group	1,398	Kronos Inc.	1,119
22	Sun Microsystems	1,260	Emerson Hospital	1,100
23	Wang Global Inc.	1,220	Hannaford Bros.	1,050
24	Textron Corp.	1,217	Vicor Corp.	1,000

Source: *The Lowell Sun, March 1999 and March 2004*

In analyzing the composition of business establishments in the Greater Lowell region, it was estimated in March 2003 that 84.8% of the businesses located within the Northern Middlesex Workforce Investment Area (WIA) had less than 20 employees that accounted for 22.5% of the workforce. The growth of business establishments in this region largely occurred within this group of businesses. This region had a slightly lower percentage of under 20 employee businesses as compared to the statewide figures, which were 86.8% of the businesses and 22.8% of statewide employment. The breakout of businesses by size within the Northern Middlesex WIA in March 2003 is summarized in *Chart 30* on the next page:

Chart 30: Establishments in the NMCOG Region by Number of Employees

Number of employees	Number of establishments	% of all establishments	Total number of employees	% of all employees
0	878	13.5%	0	0
1-4	2,628	40.3%	5,799	5.2%
5-9	1,188	18.2%	7,888	7.1%
10-19	833	12.8%	11,349	10.2%
20-49	573	8.8%	17,501	15.7%
50-99	227	3.5%	15,682	14.1%
100-249	129	2.0%	20,301	18.2%
250-499	38	0.6%	12,468	11.2%
500-999	15	0.2%	10,607	9.5%
1000 +	5	0.1%	9,716	8.7%
Total	6,514	100.0%	111,311	100.0%

Source: ES-202 Data

5. Job Creation

The number of jobs in the region increased by 24,870 or 25.2% between 1985 and 2000. The greatest increase in jobs during this period occurred in Billerica, which gained 10,032 jobs or 60.5%, while the steepest decline was in the City of Lowell, which lost 10,697 jobs or 23.6% of its 1985 employment levels. During the recession of the late 1980's and early 1990's, the number of jobs decreased, as reflected in the 0.6% decline between 1985 and 1990. Also, the number of jobs actually declined by 10,418 jobs or 8.4% between 2000 and the third quarter of 2003.

The share of jobs within the region has shifted from the City of Lowell to the three major suburban employment centers – Billerica, Chelmsford and Tewksbury. In 1985 the City of Lowell enjoyed a 46.0% share of the region's employment, while Billerica (16.8%), Chelmsford (15.5%) and Tewksbury (10.4%) combine for 42.7% of the Region's total employment. By 2000 the City of Lowell's share of the regional employment base had been reduced to 28.1 %, while Billerica (21.5%), Chelmsford (18.4%) and Tewksbury (14.0%) had increased their shares significantly, combining for 53.9% of total employment in the region. Even Westford, which moved from a 4.7% share in 1985 to a 9.3% share in 2000, has demonstrated significant employment growth. Between 2000 and the third quarter of 2003, the shares of employment had shifted slightly with the City of Lowell moving from 28.1% to 28.3% and the suburban communities decreasing their shares of employment due to the larger job losses in the suburban communities. However, the combined total for Billerica, Chelmsford and Tewksbury was still 52.2% in the third quarter of 2003. Summarized on the next page in *Chart 31* are the Average Annual Employment Figures for the region and individual communities between 1985 and the third quarter of 2003:

**Chart 31: Average Annual Employment in the NMCOC Region
Between 1985 and 2003 (Q3)**

Community	1985	1990	1995	2000	2003 (Q3)
Billerica	16,594	20,009	21,615	26,626	22,679
Chelmsford	15,300	15,065	16,529	22,801	20,708
Dracut	3,352	4,113	3,837	4,720	4,822
Dunstable	180	161	142	234	284
Lowell	45,391	40,116	31,534	34,694	32,059
Pepperell	1,148	1,358	1,442	1,569	1,472
Tewksbury	10,239	9,489	14,846	17,262	15,766
Tyngsborough	1,950	2,320	3,004	4,293	4,609
Westford	4,659	5,565	6,445	11,484	10,866
NMCOG Region	98,813	98,196	99,394	123,683	113,265

Source: ES-202 reports

Annual wages have increased steadily in this region. The region increased its estimated average annual wage by 166.4% between 1985 and 2000. Even when there was a decline in jobs, such as between 1985 and 1990, the estimated average annual wage still increased by 34.9%. Between 2000 and the third quarter of 2003, however, the estimated average annual wage decreased by 10.5% from \$53,343 in 2000 to \$47,728 in the third quarter of 2003.

The Town of Chelmsford demonstrated the greatest growth in average annual wage from \$18,953 in 1985 to \$ 76,159 in 2000 or 301.8%. However, between 2000 and the third quarter of 2003, the average annual wage decreased by 37.5% while the other communities were experiencing slight declines or increases in their average annual wage. Chart 32 below summarizes the changes in Average Annual Wages between 1985 and the third quarter of 2003:

Chart 32: Average Annual Wage in the NMCOC Region between 1985 and 2003 (Q3)

Community	1985	1990	1995	2000	2003*
Billerica	\$22,462	\$30,800	\$40,792	\$58,868	\$52,000
Chelmsford	18,953	25,103	34,580	76,159	47,632
Dracut	14,880	18,347	23,535	29,408	33,696
Dunstable	17,197	25,478	24,726	30,713	28,340
Lowell	20,425	27,649	29,911	39,268	40,924
Pepperell	17,042	20,860	25,361	29,934	31,408
Tewksbury	18,809	24,837	36,343	46,754	54,392
Tyngsborough	15,204	21,120	26,056	30,403	28,964
Westford	20,156	27,911	35,456	69,732	66,300
NMCOG Region	\$20,023**	\$27,002**	\$33,938**	\$53,343**	\$47,728**

* Third Quarter of 2003. ** Estimate

Source: ES-202 reports

6. Tax Policies and Bonding Capacity

The budget situation in the Commonwealth of Massachusetts has been critical since 2001. The growing unemployment figures and the declining tax revenue figures have impacted government services at the state and local levels. According to the Massachusetts Taxpayers Foundation (MTF), an independent, nonprofit organization that conducts research on state and local taxes, government spending and the economy, “deep cuts in state aid to cities and town have produced

significant increases in property taxes across the Commonwealth”. According to the MTF study entitled “Municipal Financial Data”, “total property taxes climbed 13% from 2001 to 2003, a 6.3% average rate on annual growth that is almost 40% higher than the average for the previous eight years”. These rising tax burdens are a particular problem for the poorer communities, such as Lowell, where property taxes more than doubled in 2003 as compared to 2001. Local municipalities are being forced to increase their property taxes by more than the established standard of 2.5% instituted by Proposition 2 ½ through overrides of the Proposition 2 and a half limit and raising the taxes to the maximum amount permitted. The current tax rates for local communities in the NMCOC region are listed in *Chart 33* as follows:

Chart 33: Current Tax Rates By Community

Community	Year	Residential	Commercial
Billerica	FY 2003	\$ 11.06/ \$ 1,000	\$ 25.13/ \$ 1,000
Chelmsford	FY 2002	\$ 15.84/ \$ 1,000	\$ 15.84/ \$ 1,000
Dracut	FY 2002	\$ 12.08/ \$ 1,000	\$ 12.08/ \$ 1,000
Dunstable	FY 2002	\$ 11.91/ \$ 1,000	\$ 11.91/ \$ 1,000
Lowell	FY 2002	\$ 13.67/ \$ 1,000	\$ 28.42/ \$ 1,000
Pepperell	FY 2003	\$ 13.01/ \$ 1,000	\$ 13.01/ \$ 1,000
Tewksbury	FY 2003	\$ 13.60/ \$ 1,000	\$ 22.47/ \$ 1,000
Tyngsborough	FY 2002	\$ 17.20/ \$ 1,000	\$ 17.20/ \$ 1,000
Westford	FY 2002	\$ 15.58/ \$ 1,000	\$ 15.58/ \$ 1,000

Source: Annual Town reports and City of Lowell Data

7. Education and Training

The Northern Middlesex region enjoys a unique strength in terms of its education and training facilities. Notwithstanding the fact that Greater Lowell residents live within an hour of the greatest collection of colleges and universities in the world in Boston, the availability of education and training facilities in the Greater Lowell region is quite remarkable for an area this size. The area is well represented by the University of Massachusetts at Lowell and Middlesex Community College in terms of higher educational facilities, as well as nearby Merrimack College in North Andover and Northern Essex Community College in Lawrence and Haverhill. The Corporate Education Center operated by Boston University in Tyngsborough provides corporate training opportunities. Additional higher educational facilities, such as Northeastern University’s campus in Burlington, Rivier College and Southern New Hampshire University in Nashua, New Hampshire, and numerous Worcester colleges, such as Worcester State, Clark University, Holy Cross and Worcester Polytechnic Institute, offer additional educational choices to area residents and employees.

The principal higher education facilities serving this area are UMass Lowell and Middlesex Community College. Both institutions provide employment, education opportunities and research and development initiatives that help the region grow economically. While UMass Lowell was created out of a merger between Lowell Technological Institute and Lowell State, Middlesex Community College expanded into downtown Lowell from its Bedford campus. These institutions provide cost-effective quality education for students of all ages and play a vital role in the lifelong learning goals of the region. The Greater Lowell Workforce Investment

Board (GLWIB), which is the region's principal workforce development entity, contracts with both institutions, as well as Northern Essex Community College, to provide quality skill training for area employers. The role each institution plays in the region is as follows:

- **UMass Lowell:** Originally founded in 1894, UMass Lowell has traditionally specialized in applied science, technology and education. UMass Lowell is the second largest campus within the University of Massachusetts system and offers more than a hundred different degree programs leading to associate, bachelor's and graduate level degrees, as well as certificate programs in specialized technical and professional areas. Doctorates are offered in the sciences, education, physical therapy and engineering, while Masters Degrees are offered in science, education, business administration and Arts and Sciences. The Division of Continuing Studies and Corporate Education trained more than 1,600 employees at nearly twenty-four companies in 2003 and offers numerous continuing education programs on site and online.

UMass Lowell plays a major role as one of Lowell's largest employers and economic development stakeholders in the region. The UMass Lowell campuses in Centerville, South Lowell and Chelmsford have a major impact upon the commercial and residential markets and the university's support for the development of mill space and vacant land has resulted in major tourism magnets, such as the Paul E. Tsongas Arena, where the Lowell Lockmonsters hockey team plays, and LeLacheur Field, where the Lowell Spinners Single A baseball team plays, and business and residential initiatives in the form of Lawrence Mills and incubator space at Boott Mills. The University's research and development efforts have spurred start-up firms and recently forged a partnership with Northeastern University and the University of New Hampshire in the Nanotechnology field, which hopefully will result in the establishment of a regional nanomanufacturing center funded by the National Science Foundation.

- **Middlesex Community College:** This institution, which was established in 1970, has a campus in the heart of downtown Lowell and has played a major role in the renovation and reuse of the former Wang Training Center and the Old Post Office on Merrimack Street. Middlesex Community College offers associate degree programs and has partnered with local secondary schools to prepare their students for college. The College's Business and Industry Program responds to the training needs of employers in the region by developing customized training programs. The College also offers Career Development Certificate programs, Distance Learning courses online and Software Technical Writing programs.

Middlesex Community College employs 890 people and plays an active role in the economic development and cultural activities in the region. The College plays a valuable role in developing training programs that address the current training needs of local employers in a cost-effective and efficient manner. The College also addresses the needs of students who can't go to higher-priced schools, but wish to access courses of higher learning to improve their skill levels for the marketplace.

The Greater Lowell Workforce Investment Board (GLWIB), which is a private non-profit organization, plays a critical role in matching the needs of employers with the available workforce in the region. The GLWIB provides policy guidance for workforce development issues in the Northern Middlesex Service Delivery area, which is the same as the NMCOG region, except for the Town of Pepperell. The service area of the GLWIB is the same as the NMCOG region, except for the Town of Pepperell. (Note: the Massachusetts portion of the Lowell, MA-NH PMSA is the same as the NMCOG region, except for the addition of the Town of Groton.) The GLWIB was established to meet the requirements of the Workforce Investment Act of 1998 (Public Law 105-220) and provides the following services:

- Evaluation of the local One-Stop system, youth activities and other employment and training activities as described under WIA in partnership with the Chief Elected Official including determination of resource allocations, priorities for service and eligibility for Individual Training Account vendors;
- Development and/or modification with the WIA partners, the Five-Year WIA plan for the region;
- Provision of information regarding workforce development initiatives and resources to employers within the region;
- Convene and manage grant-writing activities as appropriate;
- Negotiation of Memoranda of Understanding with One-Stop partners;
- Liaison with local, state and federal agencies regarding workforce development policy;
- Select eligible service providers for youth and adults in the region;
- Negotiation of performance standards with the State and other local performance indicators as appropriate;
- Generate Labor Market Information and reports as needed and or requested by the City of Lowell; and
- Other Workforce Development activities deemed appropriate.

The GLWIB contracts with the One-Stop Center and its partners to provide comprehensive workforce development training. The One-Stop Center utilizes Individual Training Account (ITA) contractors, Private Career Schools, Community Colleges and Universities and social service providers to address the training needs of their clientele. The Lowell Adult Education Program is the largest of two hundred similar programs across the State. Adult Basic Education (ABE), General Education Development (GED) and English for Speakers of Other Languages (ESOL) programs are offered at more than ten different locations, including the Cambodian Mutual Assistance Association, Community Teamwork, Inc., the Middlesex County House of

Correction in Billerica and various homeless shelters. The ethnic and racial populations taught include Southeast Asian, Brazilian, African and Hispanic immigrants.

At the regional and local levels, there are three regional vocational schools: the Greater Lowell Technical School, which serves residents from Lowell, Dracut, Dunstable and Tyngsborough, the Nashoba Valley Technical School, which serves residents of Chelmsford, Pepperell, and Westford and the Shawsheen Valley Technical School, which serves Billerica and Tewksbury residents. Each community has their own public school system and library designed to educate their residents as follows:

- **Billerica**

The Billerica public school system is made up of six K-5 elementary schools, two middle schools and one high school. The school enrollment for 2001-2002 totaled 6,629. The new Billerica Public Library, now two years old, has been quite successful. In FY2002 the library had a circulation of 290,000 items and nearly 250,000 people visited the facility. The circulation has increased by 14.5% over FY'01 and more than 41% since opening the new facility.

- **Chelmsford**

The Chelmsford School System is made up of five elementary schools (K-4), two middle schools and one high school. During the 2002 school year, 5,647 pupils attended the Chelmsford Public Schools. The town is also one of seven member communities of the Nashoba Valley Technical High School, which had 87 Chelmsford students enrolled as of October 1, 2003. The Chelmsford Public Library underwent renovations and expanded its size and holdings in 1999. The Town also has a satellite library – the Anna C. MacKay Memorial Library on Newfield St. in North Chelmsford.

- **Dracut**

The Dracut School System operates four elementary schools (K-6), one middle school and one high school. During the 2002-2003 school year, 4,273 students attended Dracut schools. The Town is also a member community of the Greater Lowell Vocational Technical High School. The Moses Greeley Parker Memorial Library holds 73,000 volumes and in FY'00 had a circulation of 157,535 volumes. Construction on a new library facility began at the end of 2002.

- **Dunstable**

Dunstable is a member of the Groton – Dunstable Regional School District, which is comprised of four elementary schools, a middle school and a high school. The Regional School District had a total enrollment of 2,781 students during the 2002-2003 school year. Dunstable is also a member community for the Greater Lowell Vocational Technical High School. The Dunstable Free Public Library became a member of the Merrimack Valley Library Consortium in 2002 and increased its access to three million items in the system.

- **Lowell**

The Lowell School System operates twenty elementary schools, seven middle schools and Lowell High School, which is the second largest public high school in the

- **Lowell (cont.)**

Commonwealth. The total enrollment for the Lowell school system in 1999-2000 was 16,374 pupils. Lowell is also member community with the Greater Lowell Vocational Technical High School. Lowell's Pollard Memorial Library was recently renovated, and has an annual circulation of 194,000 items.

- **Pepperell**

Pepperell, along with the towns of Townsend and Ashby, is a member of the North Middlesex Regional School District. The district provides four schools for Pepperell children – the Peter Fitzpatrick Elementary School (Pre-K-2), the Varnum Brook Elementary School (3-5), the Nissitissit Middle School (6-8) and the Northern Middlesex Regional High School. The school district had an enrollment of 4,743 pupils in 2002. Pepperell is also member community of the Nashoba Valley Technical High School, which provided an education for 108 Pepperell students as of October 1, 2003. In 2003 Pepperell's Lawrence Library increased its circulation by 6% and the total items borrowed totaled 160,372.

- **Tewksbury**

The Tewksbury School System is made up of six elementary schools (1) pre-K, (1) pre-K-4, (3) K-4 and (1) 5-6, one middle school (7-8) and Tewksbury Memorial High School. As of October 1, 2002, there were 4,554 pupils enrolled in the Tewksbury School System. Tewksbury is a member community of the Shawsheen Valley Technical High School, which had a total student enrollment of 1,192 in October 2002. The new Tewksbury Public Library opened at its new location at the corner of Main and Chandler streets in 1999. Total circulation in 2002 was 191,000 items.

- **Tyngsborough**

The Tyngsborough School System is comprised of a new elementary school, a new middle school and a high school. Tyngsborough is also a member community of the Greater Lowell Technical High School, which had 550 students in 2002. Tyngsborough Public Library had a total circulation of 81,800 items in 2002.

- **Westford**

The Westford School System is made up of six elementary schools, two middle schools and Westford Academy. During the 2001-2002 school year, 4,935 students were enrolled in the Westford School System. The Town is also one of seven member communities of the Nashoba Valley Technical School, which had thirty-five Westford students as of October 1, 2003. The J.V. Fletcher Public Library in 2002 had a total circulation of 286,071.

8. Housing

The cost and availability of housing in the Greater Lowell region has become a major issue, not only in terms of housing the region's population, but in being a constraint on economic growth in the region. Without a housing stock that is affordable to its workforce, the prospects for economic growth are limited. Within the last few years, there has been an effort at the state level to encourage

the development of low- and moderate-income housing under a thirty-year old Governor’s Executive Order that requires local communities to develop 10% of its housing for low- and moderate-income residents. To a large extent, the communities that have fulfilled this requirement are the larger urban communities in Massachusetts, including the City of Lowell. Notwithstanding the provisions of Executive Order 418, the demand for housing in Eastern Massachusetts and the Greater Lowell region far outstrips the supply. The cost of housing has become a major deterrent to the location of new workers in the area and has encouraged many workers to locate farther from their jobs in order to afford their housing.

Households

Defined by the U.S. Census as being equivalent to “occupied housing units”, households in the NMCOG region grew by 20.4% between 1980 and 1990 and 10.1% between 1990 and 2000 as shown in Chart ? below. According to projections developed by the Massachusetts Highway Department (MassHighway), it is expected that households in the NMCOG region will increase by 6.2% between 2000 and 2005, 4.5% between 2005 and 2010, 4.5% between 2010 and 2015, 4.3% between 2015 and 2020 and 3.2% between 2020 and 2025. *Chart 34* below summarizes the U.S. Census data and MassHighway projections on households in the region:

Chart 34: Households (1980, 1990, 2000, Projections) in the NMCOG Region

	1980	1990	2000	2005	2010	2015	2020	2025
Households	74,923	90,191	99,342	105,500	110,300	115,300	120,300	124,200
% Growth	NA	20.4	10.1	6.2	4.5	4.5	4.3	3.2

NA- Not Available

Source: 1980, 1990 and 2000: U.S. Census

2005-2025: Massachusetts Highway Department with review by NMCOG.

According to the projections developed by the Massachusetts Highway Department, this trend is expected to continue through 2020 until they become relatively similar in 2025. According to the U.S. Census, the average household size in the Greater Lowell region decreased from 2.85 persons per household in 1990 to 2.77 persons per household in 2000.

Housing Units

The NMCOG region had 101,973 housing units in 2000 according to the U.S. Census. *Chart 35* below shows the growth in housing units from 1980 to 2000 in the NMCOG region. Housing units grew by 21.6% between 1980 and 1990, as compared to the 20.4% growth in households during the same period, and by 7.2% between 1990 and 2000, as compared to the 10.1% growth in households. This difference may be attributed to the lower vacancy rates in 2000 as compared to those in 1990. *Chart 35* summarizes this information below:

Chart 35: Housing Units (1980, 1990, 2000) in the NMCOG Region

	1980	1990	2000
Total Housing Units	78,249	95,156	101,973
Percentage Growth	21.0	21.6	7.2

Source: U.S. Census for 1980, 1990 and 2000

Housing Unit Characteristics

Chart 36 below summarizes the changes in Housing Unit Characteristics in the NMCOG region between 1990 and 2000. As mentioned previously, the number of occupied housing units in the region increased from 94.6% in 1990 to 97.4% in 2000. The principal reason for this was the increase in the share of owner-occupied housing units from 65.9% in 1990 to 68.8% in 2000. Conversely, the vacancy rate fell from 5.3% in 1990 to 2.6% in 2000 with the owner vacancy rate decreasing from 1.1% to 0.5% and the rental vacancy rate decreasing from 8.6% to 3.0%. These numbers reflect a very tight housing market within an improving economy. The City of Lowell accounted for nearly 70% of all rental units in the region in 1990 and 2000. *Chart 36* below provides additional information:

Chart 36: Housing Unit Characteristics (1990, 2000) in the NMCOG Region

	<u>1990</u>	<u>2000</u>
Total Units	95,156	101,973
Total Occupied	90,049 (94.6)	99,342 (97.4)
Owner Occupied	59,312 (65.9)	68,347 (68.8)
Renter Occupied	30,807 (34.2)	30,995 (31.2)
Total Vacant	5,037 (5.3)	2,631 (2.6)
For Sale	644 (12.8)	344 (13.1)
For Rent	2,914 (57.9)	962 (36.6%)
Other Vacant	1,479 (29.4)	1,325 (50.4)
Owner Vacancy Rate	1.1%	0.5%
Rental Vacancy Rate	8.6%	3.0%

Source: 1990 and 2000 U.S. Census

Income Distribution by Household

The median household income in the NMCOG region increased by 36% between 1990 and 2000. The percentage of households within each income category, as outlined in *Chart 37* below, decreases between 1990 and 2000 in the \$50,000 - \$74,999 and below categories and increases for the \$75,000 - \$99,999 and above categories. Approximately 19.3% of the households in the NMCOG region earned more than \$100,000 in 1999, while 2,280 of these households earned \$200,000 or more. *Chart 37* below summarizes this data:

Chart 37: Income Distribution by Household (1990, 2000) in the NMCOG Region

	<u>1990</u>	<u>2000</u>
	<u>Households (%)</u>	<u>Households (%)</u>
Less than \$ 10,000	10,570 (11.7)	6,844 (6.9)
\$ 10,000-\$ 14,999	4,709 (5.2)	4,756 (4.8)
\$ 15,000-\$ 24,999	9,780 (10.9)	8,441 (8.5)
\$ 25,000-\$ 34,999	11,323 (12.6)	9,052 (9.1)
\$ 35,000-\$ 49,999	17,794 (19.7)	14,660 (14.7)
\$ 50,000-\$ 74,999	21,526 (23.9)	21,472 (21.6)
\$ 75,000-\$ 99,999	9,150 (10.2)	15,100 (15.2)
\$ 100,000-\$ 149,999	4,199 (4.7)	13,342 (13.4)
\$ 150,000 or more	1,067 (1.2)	5,875 (5.9)
TOTAL	90,118 (100.1)	99,542 (100.1)
Median Income	\$ 43,008	\$ 58,472

Source: 1990 and 2000 U.S. Census

According to the 2000 U.S. Census, the 1999 Lowell, MA-NH PMSA median income was \$67,841. In 2003 the median income for the PMSA had increased by 17.5% to \$79,700.

Home Ownership Data

In analyzing an area’s housing ownership patterns, it is important to review housing values, the amount of monthly mortgage payments and the percentage of household income spent on housing. The following sections summarize this important information for the NMCOG region in 1990 and 2000 and *Charts 38-40* provide the data for each of these areas of concern.

The NMCOG region experienced a 31.3% increase in housing values between 1990 (\$146,545) and 2000 (\$192,419). As outlined in *Chart 38* below, the number of houses in the region with values below \$ 200,000 decreased from 78.8% of the homes in 1990 to 55.7% in 2000. Conversely, the number of houses above \$ 200,000 increased with sixty (60) houses in the region valued at \$1 million or more in 2000. See *Chart 38* below for additional information:

Chart 38: Housing Values (1990, 2000) in the NMCOG Region

	1990		2000	
	#	%	#	%
Less than \$ 50,000	408	0.8	327	0.6
\$ 50,000 – 99,999	3,488	7.2	3,232	5.6
\$ 100,000 – 149,999	15,781	32.6	11,678	20.2
\$ 150,000 – 199,999	18,486	38.2	16,958	29.3
\$ 200,000 – 299,999	8,631	17.9	18,693	32.3
\$ 300,000 – 499,999	1,417	2.9	6,308	18.9
\$ 500,000 or more*	128	0.3	608	1.0
TOTAL	48,339	99.9	57,814	100
Median Value	\$146,545		\$192,419	

Source: 1990 and 2000 U.S. Census

The ability to own a home is dependent upon a family’s ability to pay the mortgage. In the case of the NMCOG region, the ability to pay the mortgage, based upon rising housing values, is becoming more difficult. According to the U.S. Census, the median mortgage for the NMCOG region increased by nearly 34.4% between 1990 and 2000. While the less than \$ 300 per month mortgaged has disappeared, the median payment for non-mortgaged properties increased by 42.2% in the NMCOG region between 1990 and 2000. *Chart 39* on the next page reflects the information on monthly homeowners payments for the NMCOG region in 1990 and 2000:

Chart 39: Mortgage – Monthly Payments (1990, 2000) in the NMCOG Region

<u>Monthly Payments</u>	1990		2000	
	#	%	#	%
Less than \$ 300	280	0.6	0	0
\$ 300 – 499	4,138	8.6	424	0.7
\$ 500 – 699	4,946	10.2	1,969	3.4
\$ 700 – 999	8,186	16.9	6,437	11.1
\$ 1,000 – 1,499	12,775	26.4	17,203	29.8
\$ 1,500 – 1,999	4,709	9.7	11,860	20.5
\$ 2,000 or more	1,628	3.4	6,330	10.9
Total Mortgages	36,662	75.8	44,223	76.5
Median Mortgage	\$ 1,036		\$ 1,392	
Not Mortgaged	11,677	24.2	13,591	23.5
Median payment	\$ 296		\$ 421	

Source: 1990 and 2000 U.S. Census

In general, the rule-of-thumb in the housing industry is that homeowners should not spend more than 30% of their household income on housing costs. *Chart 40* below reflects the Owner Costs as a Percentage of Household Income in the NMCOG region for 1990 and 2000. Due to the improvement in the economy between 1990 and 2000, 1,601 fewer households (- 14.6%) in the region paid 30% or more on housing costs. As an overall percentage, though, those households paying more than 30% of their income on housing in the NMCOG region decreased from 22.7% to 21.7%. At least one-fifth of the homeowners pay more than 30% of their household income for the opportunity to own their own home, as reflected in *Chart 40* below:

Chart 40: Owner Costs as a Percentage of Household Income (1990, 2000) in the NMCOG Region

<u>Owner Costs as a % of Household Income</u>	1990		2000	
	#	%	#	%
0 - 19.9	24,339	50.4	29,251	50.6
20 - 24.9	6,890	14.3	9,575	16.6
25 – 29.9	5,950	12.3	6,169	10.7
30 – 34.9	3,715	7.7	3,782	6.5
35 or more	7,255	15.0	8,789	15.2
Not Computed	190	0.4	248	0.4
TOTAL	48,339	100.1	57,814	100

Source: 1990 and 2000 U.S. Census

Rental Housing Data

The rental housing market plays a major role in providing affordable housing opportunities for residents at all income levels. As mentioned previously, the dominance of the City of Lowell (70% of the units) in the region's rental market skews the overall rent figures. Between 1990 and 2000 the percentage of renter occupied units in the NMCOG region declined by 3%, from 34.2% in 1990 to 31.2% in 2000, even though the number of renter occupied units actually increased by 188 units or 0.6%. As with the homeownership information, it is important to review the affordability of rents in the NMCOG region based upon Gross Rent and Gross Rent as a Percentage of household income. *Charts 41 and 42* provide data on both these areas.

As outlined in *Chart 41*, the median gross rent in the NMCOG region increased by \$79 per month, or 13.2%, between 1990 and 2000. Rent levels in the \$750 or more categories have been increasing and there were actually 506 units, or 1.6% of all units in the NMCOG region, that had gross rents at \$1,500 or more in 2000. *Chart 41* below provides more detailed information about gross rents in the NMCOG region:

Chart 41: Gross Rent (1990, 2000) in the NMCOG Region

Gross Rent	1990		2000	
	#	%	#	%
Less than \$ 200	3,426	11.2	2,067	6.7
\$ 200 – 299	1,669	5.5	1,741	5.6
\$ 300 – 499	5,298	17.3	3,760	12.2
\$ 500 – 749	12,556	41.0	11,756	38.0
\$ 750 – 999	5,317	17.4	7,312	23.7
\$ 1,000 or more	1,612	5.3	3,454	11.1
No cash rent	719	2.3	826	2.7
TOTAL	30,597	100	30,916	100
Median Gross Rent	\$ 598		\$ 677	

Source: 1990 and 2000 U.S. Census

Chart 42 examines the Gross Rent as a Percentage of Household Income in the NMCOG region for 1990 and 2000. The percentage of renters in the region paying more than 30% of their income for rent actually decreased from 40.1% in 1990 to 34.4% in 2000. It would appear that the growth in income levels in the NMCOG region between 1990 and 2000 outstripped the rent increases for the same period. Due to the tight rental market, landlords can keep the rents at a higher level today. However, the data summarized in *Chart 42* illustrates that renters paying less than 20% of their income for rent actually increased by 33.1% in the NMCOG region from 8,134 renters in 1990 to 10,826 renters in 2000. Additional information is summarized in *Chart 42* below:

Chart 42: Gross Rent as a Percentage of Household Income (1990, 2000) in the NMCOG Region

Gross Rent as a % of Household Income	1990		2000	
	#	%	#	%
Less than 20%	8,134	26.6	10,826	35.0
20 – 24.9%	4,623	15.1	4,088	13.2
25 – 29.9%	4,401	14.4	3,826	12.4
30 – 34.9%	2,556	8.4	2,212	7.2
35 or more	9,695	31.7	8,418	27.2
Not Computed	1,188	3.9	1,546	5.0
TOTAL	30,597	100.1	30,916	100

Source: 1990 and 2000 U.S. Census

Current Greater Lowell Housing Market

Since the 2000 U.S. Census, additional information has been made available related to the Greater Lowell housing market. This additional information has focused upon the sales and prices of homes in the region between 2000 and 2002, the inventory of subsidized housing in the region as developed by the Massachusetts Department of Housing and Community Development (DHCD) and the housing sales and median sales prices for homes between 2001 and 2003.

While the U.S. Census data is quite valuable and provides a means to compare data from decade to decade, this supplemental information provides a more updated snapshot of the Greater Lowell housing market.

Last year the Boston Globe published an article and chart utilizing data through October 2002 from the Warren Group illustrating sales and median housing prices by community and ranking in Eastern Massachusetts. The information from the Boston Globe has been broken out to show the communities in the NMCOG region and, therefore, the region itself. As outlined in *Chart 43* below, the 2000 and 2002 median income figures for the region are 11.2% and 42.9% higher respectively than the region’s 1999 Housing Value of \$192,419 provided in the 2000 U.S. Census (previously summarized in *Chart 38*). Between 2000 and 2002, median sales prices increased approximately 28.5% in the NMCOG region as illustrated in *Chart 43* below:

Chart 43: Massachusetts Single-Family Home Sales Price Increases, 2000-2002

<u>Community</u>	<u>2002 Sales</u>	<u>2002 Median Price</u>	<u>2000 Median Price</u>	<u>Percent. Increase 2000-2002</u>	<u>Rank</u>
Billerica	351	\$ 289,900	\$ 215,539	34.5	91
Chelmsford	300	\$ 300,000	\$ 240,000	25.0	186
Dracut	240	\$ 235,000	\$ 182,453	28.8	156
Dunstable	30	\$ 389,950	\$ 329,907	18.2	247
Lowell	483	\$ 193,000	\$ 142,016	35.9	80
Pepperell	140	\$ 282,500	\$ 231,938	21.8	219
Tewksbury	259	\$ 289,900	\$ 230,079	26.0	178
Tyngsborough	81	\$ 296,910	\$ 239,830	23.8	198
Westford	215	\$ 397,000	\$ 315,330	25.9	179

NMCOG Region 2009 \$ 274,946 \$ 214,015 28.5 (approx.)

Note: Data for 2000 median prices was based upon percent increase numbers.

Source: The Warren Group (all data through October 2002)

As mentioned previously, Governor’s Executive Order 418 signed thirty years ago established 10% as the goal for every community in the Commonwealth to meet in addressing their low- and moderate-income housing needs. DHCD has maintained an inventory of housing units by community that have some form of public subsidy and affordability restriction. According to DHCD, the NMCOG region had 7,063 subsidized units, or 6.95% of its year-round housing units, as of April 24, 2002. More than 75.2% of these subsidized units were in the City of Lowell. This inventory is referred to as the Chapter 40B Inventory because there is a provision under Massachusetts General Laws Chapter 40B that permits the State Housing Advisory Committee to overturn local zoning decisions in those communities with less than the required 10% goal in order to allow for the production of low- and moderate-income housing. *Chart 44* on the next page summarizes the DHCD information on subsidized units by community in the NMCOG Region as of April 24, 2002:

Chart 44: Chapter 40B Inventory, NMCOG Region

Community	2000 Census Year-Round Units	Chapter 40B Units	Chapter 40B %
Billerica	13,055	216	1.65%
Chelmsford	12,981	481	3.71%
Dracut	10,597	279	2.63%
Dunstable	933	0	0
Lowell	39,381	5,312	13.49%
Pepperell	3,905	117	3.00%
Tewksbury	10,125	410	4.05%
Tyngsborough	3,784	116	3.07%
Westford	6,877	132	1.92%
NMCOG Region	101,638	7,063	6.95%

Note: Chapter 40B Subsidized Housing Inventory Through October 1, 2001 (Revised as of 4/24/02)

Source: Massachusetts Department of Housing and Community Development

More recent data on the sale of houses and their median sales prices in the region for the period from 2001 to 2003 has been made available by the Warren Group. *Table 4 on Housing Sales (2001-2003) and Table 5 (2001-2003) on Median Sales Prices* have been included in *Appendix II* for your information. The data shows that 14,815 housing units were sold in the NMCOG region in the period from 2001 to 2003 and that 49.6% of these units were single-family homes and 27.3% were condominiums. The City of Lowell (4,793), Billerica (1,931), Chelmsford (1,915), Dracut (1,884) and Tewksbury (1,713) had the largest number of housing sales during this period. Median Sales Prices increased from 9.4% in Pepperell to 42.0% in Lowell on all housing sales during this period. The data also shows that there was a downturn in the sale of housing units between 2001 and 2002, whereby the NMCOG region experienced a 21.1% decline in housing sales from 5,223 units in 2001 to 4,120 units in 2002. Housing sales in the region then increased from 4,120 units in 2002 to 5,472 units in 2003 for an increase of 32.8%.

Chart 45 on the next page breaks out the information from the Housing Sales and Median Sales Prices Tables for 2003. This information shows that the total housing sales in the region totaled 5,472 units at a total estimated median sales price of \$266,398. Single-family homes comprised 51.0% of the total housing sales in the region and condominiums represented 26.8% of total housing sales in 2003. The estimated median sales prices in the region for single-family homes were 11.7% higher than the estimated median sales prices for all housing units, while the estimated median sales prices for condominiums were 72.1% of the estimated median sales prices for all housing units. The median sales prices for all housing units ranged from \$213,000 in Lowell to \$417,450 in Dunstable, which had no condominium sales. The median sales prices for condominium sales ranged from \$144,450 in the City of Lowell to \$354,900 in Westford. Single-family homes ranged from \$218,000 in Lowell to \$415,000 in Dunstable. These figures continue to reflect the growing cost of housing in the NMCOG region.

Chart 45: 2003 Housing Sales and Median Sales Prices in the NMCOG Region

Community	2003 Single Family Sales	2003 Single Family Median Sales Prices	2003 Condo Sales	2003 Condo Median Sales Prices	All Housing Sales in 2003	All Housing Median Sales Prices in 2003
Billerica	489	\$ 311,000	134	\$ 164,675	757	\$ 302,000
Chelmsford	376	329,900	226	231,000	658	294,750
Dracut	309	264,000	256	164,900	680	224,950
Dunstable	47	415,000	0	0	66	417,450
Lowell	693	218,000	488	144,450	1,841	213,000
Pepperell	138	308,950	12	167,000	210	292,000
Tewksbury	345	320,000	219	252,000	620	286,500
Tyngsborough	134	315,000	51	177,900	241	282,000
Westford	261	412,250	79	354,900	399	390,000
NMCOG Region	2,792	\$ 297,679 (estimate)	1,465	\$ 192,000 (estimate)	5,472	\$ 266,398 (estimate)

Source: Warren Group

D. The Region's Economic Potential

Even though this region has experienced a downturn in the economy recently, it is expected that the regional economy will bounce back once again. This has been the experience with the previous recessions in the 1970's, late 1980's and early 1990's. The challenge facing the region, though, is whether the computer manufacturing and information technology sectors can recover from their recent decline or if new sectors, such as homeland security, biotechnology or nanotechnology, can emerge as the foundation for the future regional economy. Due to the decline in the high technology sectors, many laid-off workers have re-located to other regions of the country or started their own businesses out of their homes. Recovery from the recent recession offers an opportunity to explore new areas, such as biotechnology and nanotechnology, and to determine whether this region has a competitive advantage for these industries. Another challenge will be to see how the local communities deal with the development pressures for new industry, commercial ventures and housing, while meeting their fiscal obligations at a time when the budget situation at the state and local levels remain strained.

This section of the CEDS document builds upon the Background and Regional Economy sections of Part I and attempts to outline a course of action for the region to follow in reaching its full economic potential. Information for this section has been derived from the three Needs Analysis "grass-roots" meetings, regional and local studies on the region's economy and development potential, federal and state economic reports and extensive experience in surviving the recessions of the past. The Economic Strengths and Weaknesses, which have been highlighted in the first two sections, will be summarized here. The component on Future Economic Growth will utilize the recent "Workforce Development Blueprint" developed by the Greater Lowell Workforce Investment Board, some basic information on industry clusters in the region and recent announcements by the University of Massachusetts at Lowell regarding its nanotechnology initiative in order to summarize the expectations for future economic growth. The section on Land Development Potential will highlight the results of NMCOG's Build-out

Study of the region completed for the Massachusetts Executive Office of Environmental Affairs (EOEA) and also take a look at some of the initiatives the City of Lowell is focusing upon as outlined within the Urban Land Institute's recent report.

This section on the Region's Economic Potential will conclude with a focus on External Threats and Forces and Partners and Resources for Economic Development. The component on External Threats and Forces will attempt to identify those factors in the future that could have either a positive or negative impact upon this region's future economic growth. Specific issues, such as the potential closing of Hanscom Air Force Base under the Base Realignment and Closure (BRAC) program, the evolution of Lowell and its surrounding communities as "suburbs" of Boston, the focus upon the knowledge-based economy and the development of the arts and performing sector as a significant contributor to the regional economy and demand for affordable housing, and the growth of the minority populations in the region, will be addressed. Finally, the Partners and Resources for Economic Development section will identify the economic development stakeholders in the region, as well as their partners at the federal and state levels. This region, and, in particular, the City of Lowell, has developed the public/private partnership model to the point whereby it has become a standard for other similar-sized cities to follow in planning, developing and implementing projects that improve the region's economy and maintain the quality of life that is so important to the residents, workers, businessmen and visitors in the Greater Lowell region. As part of this partnership effort, the City of Lowell has explored almost every public, private and non-profit funding opportunity available to a city of its size and has demonstrated its ability to implement these important projects successfully.

1. Economic Strengths

The economic strengths in the Greater Lowell region are extensive and provide a firm basis for the creation, growth and expansion of economic activity. From its inception, the City of Lowell, as the first planned industrial city in the nation, focused upon the strengths that made its development and expansion possible. First and foremost, is its location at the confluence of the Merrimack and Concord Rivers, which provided a beautiful natural setting, as well as the necessary components – water power, labor and space – for industrial development. The proximity to Boston, via the Middlesex Canal and the road system, was a major factor in the growth of the region and remains a significant strength today. Proximity to the mountains and the seashore makes this area an ideal location for businesses that stress quality of life issues for their employees. Access to all parts of New England and Canada is a particular strength of this region's location.

The highway system that has developed in the region, with the combination of Routes 3, 93 and 495 and the Lowell Connector, provides direct access to every community. The established public transportation system through public buses and vans operated by the Lowell Regional Transit Authority (LRTA) and trains administered by the Massachusetts Bay Transit Authority (MBTA) provide extensive public transit options within the region and to other areas. Access to airports in Boston, Manchester and Worcester is a regional strength, as is access to the Port of Boston. The freight rail system also serves this area well. Overall, the highway network, public transit system and freight systems provide a high level of mobility for passengers of every economic class, as well as goods moving through the region.

Additionally, the region has a diverse population and workforce by race, ethnic background and economic class. The City of Lowell has served as the entry point to the region for many immigrant groups, including the Irish, French Canadians, Greeks, Polish, Latinos, Cambodians, Portuguese and African. These immigrants have earned a living, raised a family and, in many cases, moved to the surrounding communities to help build a future for their descendants. The City of Lowell has the second highest number of Cambodians in the country and has a growing Latino and African population as well. The diversity of the workforce has provided strength for the regional economy and the involvement of the residents has improved the quality of life in the region.

The region's workforce is well educated and adaptable to changing economic conditions, as outlined in the section regarding Educational Attainment. The education system with the combination of public, private, community college and university facilities within the region provide a competitive advantage to the children and adults in the region. Access to other educational facilities, such as those in Boston, the rest of the Merrimack Valley and Massachusetts or New England, provide even greater opportunities for the residents of the Greater Lowell region. The University of Massachusetts at Lowell and Middlesex Community College work closely with the Greater Lowell Workforce Investment Board and private industry to prepare students of all ages for emerging employment opportunities. Education in this region is a life-long activity and provides a means to improve the skill levels of the workforce as economic demands in the private marketplace change.

The industrial and commercial base for this region has changed from its dependence upon the textile industries of the past to a renewed focus upon high technology. Access to defense contracts by firms in the area, such as Raytheon, is important to the area's economy and the Massachusetts Congressional Delegation has worked cooperatively to ensure that the Greater Lowell region, and Massachusetts as a whole, receives its fair share of defense contracts. The availability of various types of industrial and commercial space in each of the Greater Lowell communities provides a choice for industry re-locating to the area. The incubator programs offered by the University of Massachusetts at Lowell (UMass Lowell) in mill space provide an opportunity to move from a Research and Development component to a new business establishment. These firms are then spun off into the region once they have become self-supporting.

The business community, including the region's financial institutions and the Greater Lowell Chamber of Commerce, provides strong regional and community leadership, in conjunction with the elected officials at the federal, state, regional and local levels. Area institutions, such as the Lowell Plan, the Lowell Development and Financial Corporation, the Billerica Plan, the Billerica Chamber of Commerce and the Chelmsford Business Association, encourage public/private partnerships to address the problems in the region and to take advantage of opportunities that benefit the region. The Merrimack Valley Economic Development Council (MVEDC), which serves the entire Merrimack Valley region, is another institution interested in pulling together public and private representatives to encourage economic growth and to maintain the quality of life in the region. The Romney Administration has also established the Northeast Regional Competitiveness Council to develop economic development goals for this region.

The quality of life in the region is a major strength that attracts progressive businesses and encourages new and different ways of addressing obstacles to economic growth. The natural facilities created by the lake, river and pond network in the region, as well as the man-made recreational facilities, provide an improved quality of life for area residents and visitors alike. The focus upon the history of Lowell and its surrounding communities has opened up economic development opportunities through the National Park Service and attracted visitors from across the country to the annual Folk Festival and other ethnic and historic celebrations.

2. Economic Weaknesses

The economic weaknesses in the Greater Lowell region are fewer than the economic strengths, however, given that the region is still emerging from the most recent recession, these weaknesses continue to cause fundamental problems for the regional economy. The main issue facing the Greater Lowell region is its lack of diversity in terms of business composition, which makes the regional economy vulnerable to downturns in one or two industries. As with the overdependence upon the textile industry in the 1960's and upon the defense industry in the 1970's and 1980's, this region's overdependence upon the computer manufacturing and information technology sectors resulted in a much deeper and longer recession in this area than in other parts of the country. The layoffs also significantly impacted the suburban communities and have contributed to a longer than normal recession in this region. Although it appears the recession is being addressed finally, the effects of the recession are still hurting this region with many former employees of computer manufacturing and information technology firms going through career changes in order to attain employment. The emerging dependence upon outsourcing to foreign countries, particularly in these two areas, is having an impact upon the ability of workers in this area to be employed once again.

The lack of a regional focus in this area was raised as a weakness at the "grass-roots" Needs Analysis sessions. Whether it was in the area of regional planning, infrastructure, resources, finances, communication, or thinking, participants at the "grass-roots" sessions felt that the local communities and their residents needed to focus more on regional solutions to their problems. By having each community solely responsible for its own planning and development agenda, the benefits from a regional comprehensive development were not being realized. NMCOG mentioned that a regional Open Space Plan and 2020 Vision Plan had been completed with the active participation of the local communities, their policymakers and residents and that transportation decisions and the allocation of federal and state funds are made on a regional basis through the Metropolitan Planning Organization. It was also stressed that the CEDS initiative was a regional "grass-roots" process designed to focus on where the region is, where the region wants to be in twenty years and how the region intends to get there.

Another weakness is the limited sewer infrastructure in some of the towns, which limits the industrial, commercial and residential development in their communities. The cost of developing infrastructure for the suburban communities is often prohibitive and the towns do not have access to the federal and state funds available to central cities. Therefore, the towns need to rely upon the taxpayers and private developers to pay for these improvements.

Another economic weakness identified as part of the Needs Analysis “grass-roots” meeting was the high cost of energy, labor and housing. The New England region has always had higher energy costs than the rest of the nation, based principally on the limited energy resources in the area and where it is located in the nation. Labor costs in the Greater Lowell region are generally higher than other sections of New England and the nation. The explosion in housing costs is well documented in the Housing section and this issue has become as much an economic development issue as it is a housing issue. These high costs generally result in higher taxes for area residents, which the voters partially addressed in the 1980’s through the passage of Proposition 2 ½. Concerns about higher taxes are particularly prevalent in this region, which abuts the State of New Hampshire. An analysis of retail industry clusters for each area could demonstrate how the tax issue affects this area.

Sprawl was identified as a significant weakness in the region. This issue has been addressed by the 2020 Vision Plan and there are initiatives at the state level designed to encourage local communities and developers to target their developments in areas where infrastructure is already available. This weakness is an issue that has been addressed by NMCOG from a planning perspective, but will not be fully addressed from an implementation perspective until there is a level playing field for all communities that will encourage them to work regionally to address this issue. Other issues, such as the lack of a regional retail center, the need to preserve open space and to provide more frequent evening transit service and the problems of the state bureaucracy, were identified as weaknesses in this region.

3. Future Economic Growth

As the region emerges from the economic recession, the question asked of participants in the “grass-roots” Needs Analysis sessions was: Where will the economy be in a year, five years, ten years? The responses to this question varied from participant to participant. When the initial Needs Analysis sessions were held in July 2002, it was generally thought that the recession would continue and that the unemployment rate in the City of Lowell could reach 10%. Additional problems with the economy were cited: the state budget problems were likely to curtail or reduce public investments utilized to leverage private investments, the emerging overseas markets that were being used more and more by multinational corporations due to their comparative cost savings and the negative impact of the corporate accounting scandal on the public’s reaction to business in general. However, it was also felt that the Biotech industry could pick up some of the slack created by the downturn in the Computer Manufacturing and Information Technology industries and that the entrepreneurial spirit and research and development focus in the region would work in favor of the region rebounding from the recession.

In general, it was expected that the recovery from the recession would take longer in Massachusetts than in other parts of the country. Therefore, until we began to see positive results at the national level, it was premature to expect the economy to turn around in this region. Some positive signs are appearing, though, with the leasing of office space in the region. During the trough of the recession, office vacancy rates increased to more than 30% of all office space in the region. As of February 2004, these office vacancy rates had declined to the high 20% figure in the Billerica-Chelmsford portion of the NMCOG region, according to an article in the Boston Globe. Even with the decline in the office vacancy rates, Cushman & Wakefield of

Massachusetts, Inc., a commercial real estate services firm in Boston, estimates that there is still 2.2 million square feet of office space available along Route 495 between Littleton and Lowell. Monthly rental figures have been reduced to \$20 per square foot, as compared to the \$33-35 per square foot rates in the late 1990's. Billerica was severely impacted by the loss of Nortel and is only now seeing some interest in leasing their former buildings, while Chelmsford, which experienced the loss of Sun Microsystems to Burlington and Cisco to Boxborough, has had two new firms, Zoll Medical Corporation and Siemens, move into town.

This region has steadily evolved from the labor-intensive days of the textile mills to the knowledge-based economy of today. The availability of a skilled workforce, quality educational facilities and entrepreneurial initiatives has made this region a natural growth area for high technology firms. This area of expertise has been referred to as the Massachusetts Innovation Economy by the Massachusetts Technology Collaborative (MTC). MTC is the state's development agency for renewable energy and the innovation economy, which is responsible for 25% of all non-government jobs in the state. MTC brings together representatives from the public, private and academic sectors of the economy in order to develop "technology-based solutions that lead to economic growth and a cleaner environment in Massachusetts". MTC has identified nine key industry clusters, including their 2002 total employment, in Massachusetts that fit within its definition of the innovation economy: Computer & Communications Hardware (64,820), Defense Manufacturing & Instrumentation (44,350), Diversified Industrial Support (95,800), Financial Services (135,020), Healthcare Technology (26,420), Innovation Services (162,660), Postsecondary Education (123,550), Software & Communication Services (139,360), and Textiles and Apparel (19,540).

Each year MTC issues its Index of the Massachusetts Economy, which focuses on the progress within fifteen (15) statistical indicators that have an impact upon the key industry clusters within the Innovative Economy. These statistical indicators are broken out into three major components—Employment, the Innovation Process and Resources. Under the Employment component, the principal indicator utilized is Industry Clusters Employment. Under the Innovation Process component, the seven (7) statistical indicators were Number & Types of Patents Issued, Invention Disclosures and Patent Applications; Technology Licenses and Royalties; FDA Approval of Medical Devices and Biotech Drugs; New Business Incorporations; Small Business Innovation (SBIR) Awards, Initial Public Offerings (IPOs) and Mergers & Acquisitions (M&As); and Corporate Headquarters and Number of "Tech Fast 500" Firms. The Resources component had seven (7) statistical indicators as well—Population Growth Rate, Unemployment Rate, and University Enrollments; Migration; High School and College Education; Scientists and Engineers as a Percent of Total Labor Force-Engineering & Computer Science Degrees; Federal R&D Spending and Health R&D Spending; Venture Capital; and Median Price of Single-Family Homes and Home Ownership Rates. MTC then compares progress in these statistical indicators with the progress made in the other Leading Technology States (LTS)—California, Colorado, Connecticut, Minnesota, New Jersey and New York. In terms of Industry Clusters Employment, the only cluster in Massachusetts that experienced growth between 2001 and 2002 was the Postsecondary Education cluster, which still lagged behind the growth in the LTS. Within the LTS, the only other industry cluster that gained jobs between 2001 and 2002 was the Financial Services cluster. The findings on the other statistical

indicators for the State of Massachusetts, in comparison to the LTS, are summarized in the Executive Index of the Massachusetts Innovation Economy 2003.

Unfortunately, these findings have not been broken down on a subregional basis within the State to illustrate how well a region has done over a specific period of time in relation to the State. However, seven (7) out of the nine industry clusters within the Innovation Economy had a significant presence in the Northern Middlesex Workforce Investment Area, according to an analysis done by NMCOG. These seven industry clusters were also broken down by subcategories that reflected significant “clusters” in the NMCOG region. *Chart 46* below summarizes these industry clusters by Industry Code and Title, Average Annual Employment for 2001, Annual Total Wages for 2001 and the Location Quotient (LQ) for each industry, which compares its relative size within the NMCOG region to its relative size at the national level. In general, any LQ greater than 1.00 reflects a relatively larger industry within the NMCOG region than at the national level. The specific industries identified are as follows:

Chart 46: Industry Clusters in the NMCOG Region.

<u>Industry Code and Title</u>	<u>Annual Average Employment</u>	<u>Annual Total Wages</u>	<u>LQ 2001 4 Digit</u>
Computers & Communications Hardware			
3341 Computers and Peripheral Equipment	4,175	\$ 412.6m	14.85
3341 Communications Equipment Manufac.	2,671	252.1m	11.48
3344 Semiconductor and Elect. Components	3,071	169.3m	4.86
3345 Electronic Instrument Manufacturing	2,887	225.0m	6.23
3353 Electrical Equipment Manufacturing	190	11.1m	0.99
Diversified Industrial Support			
3222 Converted Paper Product Manufacturing	448	\$ 18.1m	1.14
3231 Printing and Related Support Activity	1,016	43.2m	1.35
3327 Machine Shops and Threaded Products	674	29.1m	1.99
3328 Coating, Engraving & Heat Treating Metal	245	8.9m	1.52
3332 Industrial Machinery Manufacturing	852	65.3m	5.80
3334 HVAC and Commercial Refrigeration Equip.	1,090	71.5m	6.06
3339 Other General Purpose Machinery Mfg.	845	46.3m	2.69
3359 Other Electrical Equipment & Components	334	18.9m	1.91
Healthcare Technology			
3254 Pharmaceutical & Medicine Manufacturing	732	\$ 55.9m	2.65
Innovation Services			
5416 Management & Technical Consulting Services	1,097	\$ 75.7m	1.49
5417 Scientific Research and Development Services	832	75.5m	1.60
Textiles & Apparel			
3132 Fabric Mills	501	\$ 19.3m	3.05
3133 Textile and Fabric Finishing and Fabric	450	17.0m	4.92
Software & Communications Services			
5415 Computer Systems Design and Related Services	4,830	\$ 567.7m	3.84
5112 Software Publishers	2,086	216.2m	7.83
5181 ISPs and Web Search Portals	646	41.4m	3.84
5182 Data Processing and Related Services	1,007	69.8m	3.25
8112 Electronic Equipment Repair/Maintenance	577	34.2m	5.49

Source: ES-202 Data

Additional possibilities for future economic growth include the biotechnology and nanotechnology fields. Although the Pharmaceutical & Medicine Manufacturing industry enjoys a Location Quotient of 2.65 in this region, the level of infrastructure support that exists in Cambridge or Worcester for the biotechnology industry does not exist in this region. However, UMass Lowell recently announced that it was building a \$23 million nanotech center in Lawrence Mills along the Merrimack River by partnering with Northeastern University and the University of New Hampshire in requesting funds from the National Science Foundation. UMass Lowell had previous experience creating a nanotechnology start-up company, Konarka Technologies, which makes flexible photovoltaic solar panels. Another company in the region, Triton Systems, Inc. of Chelmsford, has worked with Converse to perfect a helium cushioning system for its sneakers, as well as developing a cancer treatment utilizing cancer-fighting beads through its subsidiary, Triton BioSystems. If U Mass Lowell is successful in receiving NSF funding, the school will invest \$2 million of its own funds to ensure that this region establishes the first nanotechnology center, which would lead to making this area a nanotechnology manufacturing center. This industry is so new that there has been little data available to classify it as a cluster industry. However, in terms of venture capital investments in the industry, Massachusetts ranks second, just behind California, of the LTS in total venture capital investments in nanotechnology-related companies. As one of the leading states in attracting private funding for the nanotechnology field, the potential for future employment opportunities and establishment growth appear to be limitless. More data on this industry needs to be developed, though, before it can be identified as one of the cluster industries to be fully embraced in the NMCOG region.

Another way to predict future economic growth within the region is to review occupational forecasts for the region and to incorporate workforce development studies into the discussion. The Greater Lowell Workforce Investment Board (GLWIB) published its “Workforce Development Blueprint” in October 2003. This 2003 Blueprint was designed “to identify occupations and training needs of industries important to the future competitiveness of the Greater Lowell area”. This document utilized state and regional data to predict future job growth in the Greater Lowell area. In general, the document summarizes the future for specific industries in the region as follows:

- the expansion will continue in the Services Industry;
- the Manufacturing industry will continue to decline;
- the Construction industry will grow moderately;
- Financial Activities will remain stable;
- the Telecommunication sector has bottomed out; and
- the Transportation, Communication and Utilities sector will continue to show moderate growth.

In terms of actual job growth between 2003 and 2008 in the Northern Middlesex Service Delivery Area (SDA), the twenty fastest growing occupations and their growth rate through 2008, according to the Massachusetts Division of Employment and Training, will be as outlined in *Chart 47* one the next page:

Chart 47: Fastest Growing Occupations (2003-2008) in the Northern Middlesex SDA

<u>Occupation</u>	<u>Growth Rate</u>
▪ Systems Analysts	133%
▪ Computer Engineers	125%
▪ Computer Support Specialists	125%
▪ Social/Human Service Assistants	55%
▪ Engr/Science & Computer Information Systems	54%
▪ Home Health Aides	53%
▪ Computer Programmers	51%
▪ Sales Agents, Business Services	51%
▪ Bill and Account Collectors	41%
▪ Teachers, Special Education	37%
▪ Child Care Workers	35%
▪ Technical Writers	34%
▪ Security Guards	34%
▪ Sales Representatives, Scientific Products	33%
▪ Teacher Aides	33%
▪ Social Workers	31%
▪ Teachers, Preschool	30%
▪ Management Analysts	30%
▪ Police Patrol Officers	27%
▪ Advertising/Marketing/Promotional/ Public Relations/Sales Managers	25%

Source: Massachusetts Division of Employment and Training

The Massachusetts Division of Employment and Training also identified the occupations in the Northern Middlesex SDA that generated 60% of new jobs by 2008, including the number of new jobs through 2008. These occupations are listed in *Chart 48* below:

Chart 45: Occupations with Highest Number of Jobs (2003-2008) in the Northern Middlesex SDA

<u>Occupations</u>	<u>Total New Jobs</u>
▪ Computer Engineers	3,230
▪ Systems Analysts	1,150
▪ Computer Support Specialists	790
▪ Engineering/Science/Computer Information System Managers	510
▪ Sales Representatives, Scientific Products/Scientists	370
▪ Teacher Aides	370
▪ Computer Programmers	360
▪ General Managers and Top Executives	350
▪ Security Guards	320
▪ Teachers, Secondary School	280
▪ Hand Packers and Packagers	280
▪ Truck Drivers, Light	270

Chart 45 (cont.):

<u>Occupations</u>	<u>Total New Jobs</u>
▪ Teachers, Elementary School	220
▪ Nursing Aides/Orderlies/Attendants	210
▪ Electric and Electronic Technicians	210
▪ Waiters and Waitresses	200
▪ Advertising/Marketing/Promotional Public Relations/Sales Managers	200
▪ Management Analysts	190
▪ Office Clerks, General	180
▪ Cashiers	180
▪ Home Health Aides	170

Source: Massachusetts Division of Employment and Training

4. Land Development Potential

In assessing the region's land development potential, NMCOG had worked under a contract with the Executive Office of Environmental Affairs (EOEA) between 2000 and 2001 to determine the complete build-out based upon current zoning for communities within the region. EOEA promoted this effort as a means to encourage balanced growth, or sustainable development, that preserves a community's character and natural resources, while also providing jobs, taxes and homes for its residents. In order to complete these build-out studies, a Geographic Information System (GIS) model was utilized. The focus of this study was to have the local residents understand the potential for residential, commercial and industrial development within their community based upon their current zoning and to encourage them to make changes to achieve greater balance for the community. Once the build-out studies were completed for each community, representatives from NMCOG and EOEA would make their presentations to the local communities. The action then, taken by the local communities, depended upon how seriously the findings were received.

The accuracy of these build-out studies depended upon the information being provided by the Massachusetts GIS Office (MassGIS) and the supplemental data provided by each community. For the most part, the build-out studies were viewed as estimates of the potential development within the community. Factors for development within each community varied and it was virtually impossible to establish standard factors for the region as a whole. An estimate of "developable land" was initially established, which represented the community's total land area minus existing developed land minus permanently protected open space minus areas with absolute development constraints. From these estimates of developable land, it was then determined how many new homes and businesses could be developed within each zoning area. Within *Appendix II* there is a comparison of the results from the build-out studies for each community in the region. Based upon a compilation of the data from the nine build-out studies conducted by NMCOG in the Greater Lowell region, the impact upon the region would be significant. If there were no zoning changes, it is estimated that additional 66,636 residents, 11,785 students and 21,041 residential lots would be added to the region. The future development potential for the region as a whole is summarized on the next page in *Chart 49*:

Chart 49: Future Development Potential for the Region

Components	NMCOG Region
Developable Land (sq. ft.)	1,564,739, 333 sq. ft.
Developable Land (acres)	35,921.5 acres
Residential Lots (total)	21,041 lots
Commercial/Industrial Buildable Floor Area (sq. ft.)	113,798,994 sq. ft.
Residential Water Use (gallons per day)	4,883,417 gallons per day
Commercial/Industrial Water Use (gallons per day)	8,532,837 gallons per day
Municipal Solid Waste (tons)	34,651 tons
Non-Recycled Solid Waste (tons)	22,455 tons
New Residents	66,636 residents
New Students	11,785 students
New Residential Subdivision Roads (miles)	413 miles

Source: EOE/NMCOG Build-Out Studies for the NMCOG Region

The build-out studies provided a strong rationale for greater control over development so as to manage municipal costs related to education, roads, sewerage and water. Additional assistance from developers will be needed in order to assist the communities in managing these infrastructure costs.

EOEA had also been working with the Department of Housing and Community Development (DHCD), the Department of Economic Development (DED) and the Executive Office of Transportation and Construction (EOTC) to implement Governor’s Executive Order 418 (EO 418), which encourages local communities to develop Community Development Plans through a \$30,000 grant from the Commonwealth. The State designated the regional planning agencies (including NMCOG) to be the administrative entities responsible as the liaison between the State agencies and the local communities. In some cases, such as Tyngsborough and Tewksbury, the local communities developed their Community Development Plans in conjunction with an updating of their Master Plan. In other cases, such as Lowell and Billerica, the communities have recently updated their Master Plans without benefit of the EO 418 resources. The other communities – Chelmsford, Dracut, Dunstable, Pepperell and Westford – have Master Plans that have been updated within the past two years or are within the five year period established by the Commonwealth. These Community Development and Master Plans are designed to provide a blueprint for future development in the community and their effectiveness is dependent upon the manner that local Boards – Planning Board, Board of Appeals, Conservation Commission – adhere to them. As outlined previously, NMCOG also worked with the local communities to develop its 2020 Vision: Planning for Growth in the Northern Middlesex Region in 1999, which was funded by EOE and the Massachusetts Highway Department.

5. External Trends and Forces

The major external trend and force impacting the NMCOG region’s economy is the U.S. economy. With the recent positive news about job growth, the NMCOG region can look forward to new jobs being created in this area as well. However, the issue will be the types of jobs being created and the rates of pay for these jobs. With the ongoing decline in manufacturing jobs, this region’s advantage in terms of pay rates is declining. The City of Lowell and the NMCOG region will continue to have unemployment rates higher than the nation as a whole for the immediate future.

Another issue that will impact the region will be the high cost of energy, particularly gasoline and home heating oil. These costs have been unusually high recently and further place companies at a disadvantage in this region. The ongoing activities in Iraq are likely to have an impact upon the future price of oil.

The high cost of housing places this region at a competitive disadvantage with the rest of the country and contributes to the increased migration of workers out of Massachusetts. The reduction in the labor force, as a result of migration, raises the cost of skilled labor and limits companies in their efforts to expand. High housing costs increase the travel-to-work times for employees and force them to pay more for gasoline. If the region begins to address the high housing costs, it will help address other related problems.

The potential closure of Hanscom Air Base under the Base Realignment and Closure (BRAC) procedure will not only have an impact upon those at the base, it will send shock waves through the electrical and information technology firms throughout the region. There has been a traditional tie between the Greater Lowell area, Hanscom Air Base and the Route 128 firms that continues to this day. The potential elimination of the Hanscom Air Base piece will adversely impact the relationship between Greater Lowell and the Route 128 firms at a time when the Route 3 improvements should benefit the relationship.

The state budget crisis has had a detrimental impact upon state programs and local budgets. Although the situation should be improved this year, the question of whether to reinvest the new tax revenues in stabilizing and expanding the economy or returning the funds to state taxpayers will be debated. Unfortunately, those least able to afford the cuts – immigrants, low-income workers, and the disadvantaged—have been asked to assume these cuts.

Other external trends and forces will have an impact upon this region. The business and political communities in this region have learned to weather the economic storms and to develop public-private partnerships to move important projects, such as the JAM and Acre Plans, from planning to implementation. The establishment of the Greater Lowell CEDS Committee will provide a forum to address these problems as they arise and to develop comprehensive solutions to these problems.

6. Partners and Resources for Economic Development

The implementation of the CEDS will depend to a large extent on the partnerships developed by the economic development stakeholders in the region and the willingness of federal and state partners to come to the table to supplement the limited resources available at the regional and local levels. This region has an extensive history in making public/private partnerships work. The City of Lowell has led the way in making the community a “destination place”, whereby people from the surrounding communities and outside the region are attracted to downtown Lowell to visit the museums and National Park, attend a Lock Monster hockey game at Tsongas Arena or a Lowell Spinners Single A baseball game at LeLacheur Park along the banks of the Merrimack River, or dine at a Greek or Cambodian restaurant in the Acre. Federal and state dollars have been combined with private, non-profit and local funds to make much of this

happen. While the levels of public/private partnerships are not as extensive in the suburban communities, there are a number of projects that wouldn't have gone forward without this spirit of cooperation and ability to leverage funds. All in all, for a region of its size, the Greater Lowell region has done well and will continue to succeed at what it attempts to accomplish.

Who are the economic development stakeholders in the region that will implement the CEDS? What federal or state agencies will these economic development stakeholders be appealing to? To a large extent the implementation of the CEDS will build upon the long-established relationships in the region between the regional economic development stakeholders and their financial and programmatic partners at the federal and state levels. The following material identifies the major players at the regional and local, federal and state levels that will be involved in the implementation of the CEDS. Ideally, we will be striving to encourage other economic development stakeholders to participate in the process and to play a role in helping the region attain its goals through funding provided by federal and state agencies new to the region. This listing of partners and resources for economic development is not a complete list, but, rather, a summary of the various partners at all levels of government. Obviously, the private sector will play a major role in creating jobs and non-profit entities at the local and neighborhood levels will work to ensure these initiatives address quality of live concerns they have. With that brief introduction, here are the economic development stakeholders at the regional and local levels in Greater Lowell with the federal and state agencies that will play a significant role in implementing the CEDS:

Regional and Local Economic Development Stakeholders

- **Northern Middlesex Council of Governments**

The Northern Middlesex Council of Governments (NMCOG) is one of thirteen regional planning agencies established under Chapter 40B of the Massachusetts General Laws in and represents the City of Lowell and the towns of Billerica, Chelmsford, Dracut, Dunstable, Pepperell, Tewksbury, Tyngsborough and Westford. The NMCOG Board is comprised of elected representatives from the Lowell City Council, Boards of Selectmen and Planning Boards. NMCOG provides professional planning services in the areas of economic development, housing, transportation and transit, community development and environmental protection. NMCOG interacts with federal, state and non-profit agencies, while representing its local communities in accessing funding. NMCOG has worked with EDA since the late 1960's and is currently overseeing the CEDS planning process through its CEDS Committee.

- **Lowell Regional Transit Authority**

The Lowell Regional Transit Authority (LRTA) is one of fifteen regional transit authorities in the Commonwealth with statutory responsibility for providing mass transportation services to the Greater Lowell communities. The LRTA provides fixed route bus service to 312,218 residents in the City of Lowell and the Towns of Billerica, Chelmsford, Dracut, Tewksbury and Tyngsborough. The LRTA also provides bus service to Acton, Groton and Townsend and has routes that connect with Andover, Bedford and Burlington. The LRTA provides paratransit services for the

elderly and handicapped and has entered into contracts with the Councils on Aging in the area to provide transportation service.

- **Community Teamwork, Inc.**

Community Teamwork, Inc. (CTI) serves as the Community Action Agency for the Greater Lowell communities and targets its programs to low-income residents in the region. CTI addresses poverty in the region and encourages low-income people to become self-sufficient. CTI administers an annual budget of \$ 45 million and provides the following programs: Adult Basic Education, Training and Employment programs, housing management services, emergency food and shelter program, emergency shelter grant, family self-sufficiency, fuel assistance, home modification for the disabled, the Housing Assistance Program, the Housing Consumer Education Center, Section 8 certificates and Welfare to Work Housing Assistance vouchers.

- **Greater Lowell Workforce Investment Board**

The Greater Lowell Workforce Investment Board (GLWIB) provides policy guidance for workforce development issues in the Northern Middlesex Service Delivery area, which is the same as the NMCOG region with the exception of the Town of Pepperell. The GLWIB oversees the One-Stop system and addresses the responsibilities outlined in the Workforce Investment Act of 1998.

- **Greater Lowell Chamber of Commerce**

The Greater Lowell Chamber of Commerce was founded in 1994 by a group of local businessmen who were looking for an opportunity to promote businesses throughout the Lowell area. With initial funding and space provided by Lowell businesses, the Chamber of Commerce became a reality. Today, the Chamber of Commerce is a regional organization serving the communities of Chelmsford, Dracut, Lowell, Tewksbury, Tyngsborough, and Westford. As a viable organization with more than seven hundred (700) members, the Chamber continues to promote, network and advocate for businesses in the Greater Lowell area.

- **Merrimack Valley Housing Partnership**

The Merrimack Valley Housing Partnership (MVHP) is a private, 501 (C) (3) non-profit organization located in the City of Lowell. The mission of the organization is “to promote home ownership opportunities for low and moderate income earners”. MVHP offers its Project Genesis, which is a comprehensive series of training seminars for first-time home buyers, to residents of Greater Lowell communities. MVHP also works with the City of Lowell and the Lowell Development and Financial Corporation to make down payment assistance available to first-time home buyers.

- **Lowell City Council and Lowell Planning Board**

The Lowell City Council serves as the lead elective body in the City of Lowell. The City of Lowell operates under a City Manager Charter and the City Manager is appointed by and reports to the nine-member City Council. The Lowell Planning

Board has five appointed members and oversees development issues in the City of Lowell. Representatives from both bodies serve on the NMCOG Board.

- **Local Boards of Selectmen and Planning Boards**

The eight towns in the region have Boards of Selectmen and Planning Boards that operate in a similar fashion to the Lowell City Council and Lowell Planning Board. The Boards of Selectmen have five elected members with the exception of Pepperell and Dunstable, which have three elected members. The Boards of Selectmen appoint and oversee the work of their respective Town Manager, Town Administrator or Secretary. The Planning Boards oversee development issues in each community and the members are either appointed (Dracut) or elected (other towns). The number of members varies by community. Representatives from each Board of Selectmen and Planning Board serve on the NMCOG Board.

- **Lowell National Historical Park**

The Lowell National Historical Park, which is one of 389 units of the National Park Service, preserves and interprets the history of the American Industrial Revolution in Lowell. The Lowell National Historical Park is comprised of historic cotton textile mills, 5.6 miles of power canals, operating gate houses, worker housing and a 1900 trolley system. The Visitor Center, Boott Cotton Mills Museum, the Mill Girls and Immigrants Exhibit, the Tsongas Industrial History Center and the Patrick J. Mogan Cultural Center offer extensive opportunities for residents and visitors alike to learn more about the American Industrial Revolution in Lowell.

- **Lowell Division of Planning and Development**

The Lowell Division of Planning and Development (DPD) serves as the planning agency and chief development organization for the City of Lowell. Comprised of the Economic Development, Enterprise Community, Housing and Planning Departments, DPD has responsibility for the implementation of the Acre and JAM Urban Renewal Plans, the Enterprise and Renewal Community designations, the Community Development Block Grant (CDBG), HOME and Emergency Shelter Grant (ESG) programs and the City's recently completed Master Plan. DPD is also heavily involved in housing developments and reviews any development issue that comes before the City of Lowell for approval.

- **Coalition for a Better Acre**

The Coalition for a Better Acre (CBA) was established as a non-profit community development corporation as a result of the City's Acre Urban Renewal Plan in 1982. The mission of CBA is to improve the quality of life in the Acre by creating housing and employment opportunities for neighborhood residents. CBA currently has eleven (11) employees and an annual operating budget of nearly \$1 million. CBA also serves as a Community Housing Development Organization (CHDO) and a Community Development Financial Institution (CDFI). To date, the CBA has created more than 370 affordable homeownership and rental units with an additional 35 units in the pipeline. CBA's economic development efforts include the creation of the Acre Family Day Care Corporation, the Enterprise Development Center and Acre

Food for Acre Residents, as well as the provision of job training programs in the environmental remediation area. CBA engages in community organizing in order to address social and economic justice issues.

- **Lowell Small Business Assistance Center**

The Lowell Small Business Assistance Center (LSBAC) was created as part of the Lowell Enterprise Community through the joint efforts of Middlesex Community College and Community Teamwork, Inc. This LSBAC initiative was jointly supported by the City of Lowell and the U.S. Small Business Administration (SBA). The LSBAC serves as a one-stop center for anyone who wants to start or expand a business, develop a business plan, take business courses, workshops or seminars, conduct market research or find out about business management, financing and technology issues. The LSBAC's partners include the African Assistance Center, the Asian American Business Association, the Cambodian American League of Lowell, the Cambodian Mutual Assistance Association, the Center for Women and Enterprise, NMCOG, local and regional banks and state and federal agencies.

- **Cambodian American League of Lowell**

The Cambodian American League of Lowell (CALL) was founded in 1993 as a community development corporation designed to assist the Southeast Asian community. CALL promotes homeownership through the development of affordable housing and the provision of homeownership training and technical assistance. CALL also assists the Southeast Asian business community through small business training and technical assistance and micro loan programs.

- **Cambodian Mutual Assistance Association**

The Cambodian Mutual Assistance Association (CMAA) was formed in 1984 to principally serve the Cambodian population re-locating to Lowell. Initially, CMAA provided transitional services, such as English language training, housing assistance and employment support. Today, CMAA offers a comprehensive social service program that enables Cambodians and other Southeast Asian communities to improve their language, job and social skills, while maintaining their homeland traditions.

- **Lowell Plan, Inc. and Lowell Development & Finance Corporation**

The Lowell Plan, Inc., which was established in 1979, is a nonprofit economic development corporation designed to implement public-private partnerships that benefit the City of Lowell. The Lowell Plan provides a regular forum for the exchange of ideas and promotes projects that create jobs and improve the quality of life. The Lowell Plan has raised and invested more than \$7 million since 1979 in economic development and housing projects, historic preservation and education and culture. Currently, the Lowell Plan is actively marketing the City of Lowell as a place to live, conduct business and raise a family.

The Lowell Development & Finance Corporation (LDFC), which is a 501(c) (3) nonprofit corporation, was established in 1975 to promote Lowell's economic revitalization. The LDFC and the Lowell Plan work closely together with the LDFC's

Executive Director also serving as the Lowell Plan’s chief executive. Originally started with \$350,000 from nine local banks, the Center City Committee, Inc., and the State, the LDFC provides secondary financing loans for businesses and residents and also administers loans for the City of Lowell. Among the programs administered by the LDFC are the UDAG and HoDAG “repayment proceeds” loan programs, the Homebuyer Incentive Program, and the Downtown Lowell Venture Fund. The LDFC has also worked with local banks to establish a \$20 million loan pool for the reinvention of the Julian Steele housing development.

- **Chelmsford Business Association**

The Chelmsford Business Association was established in 1990 to address the concerns of local businesses. Currently, there are almost 300 members of the Chelmsford Business Association. The Chelmsford Business Association supports fair taxes for local businesses, civic events and the revitalization of Chelmsford Center.

- **Billerica Plan**

The Billerica Plan was established in 1987 as a working, non-profit partnership for education, business and the Town of Billerica. The principal purpose of the organization is to improve the quality of life in the community by improving education, attracting new businesses and promoting public and private cooperation.

- **Billerica Chamber of Commerce**

The Billerica Chamber of Commerce is an incorporated organization established “to advance the general welfare and prosperity of the Town of Billerica so that its citizens and all areas of its business and professional community shall prosper”. The Chamber has established the Business Alliance and the Business Assistance Task Force to promote cooperation between local non-profit groups and to encourage the growth of businesses in Billerica.

- **University of Massachusetts – Lowell**

Originally founded in 1894, UMass Lowell has traditionally specialized in applied science, technology and education. UMass Lowell is the second largest campus within the University of Massachusetts system and offers more than a hundred degree programs leading to associate, bachelor’s and graduate level degrees, as well as certificate programs in specialized technical and professional areas. UMass Lowell also plays a major role as one of Lowell’s largest employers and economic development stakeholders in the region.

- **Middlesex Community College**

Established in 1970, Middlesex Community College has a campus in the heart of downtown Lowell, as well as a suburban campus in Bedford, and employs 890 people. Middlesex Community College has played a major role in the renovation and reuse of the former Wang Training Center and the Old Post Office on Merrimack Street. This institution offers associate degree programs and has partnered with local secondary schools to prepare their students for college. The College’s Business and

Industry Program responds to the training needs of employers in the region by developing customized training programs.

Federal Partners and Resources

- **Economic Development Administration**

Established in 1965, the Economic Development Administration (EDA) works in partnership with States, regional organizations and local communities to address economic needs identified through the Comprehensive Economic Development Strategy (CEDSS) “grass-roots” process. EDA is focused on creating the environment whereby well-paying jobs may be created, particularly in economically-distressed areas. Through the utilization of planning, technical assistance and economic adjustment grants, EDA helps identify the possibilities for public works grants and trade adjustment assistance to make a difference in a regional economy. The Region I EDA Office is located in Philadelphia and the Economic Development Representative (EDR) for Massachusetts is Ms. Rita Potter, who may be contacted at (603) 225-1624. Additional information on EDA may be found by going to www.eda.gov.

- **U.S. Department of Commerce**

Established in 1903, the U.S. Department of Commerce (DOC) oversees EDA, the U.S. Census Bureau, the Foreign-Trade Zones Board, the National Oceanic & Atmospheric Administration, the Bureau of Industry and Security, the Bureau of Economic Analysis, the International Trade Administration, the Minority Business Development Agency, the National Telecommunications & Information Administration and the Patent and Trademark Office. Additional information on DOC may be found by going to www.doc.gov.

- **U.S. Department of Transportation**

The U.S. Department of Transportation (DOT) was established in 1966 and currently employs 60,000 people. The Secretary of Transportation oversees the development of national transportation policy and promotes intermodal transportation. DOT is comprised of many agencies, including the Federal Highway Administration, the Federal Transit Administration, the Federal Aviation Administration, the Maritime Administration and the Federal Railroad Administration. Additional information on DOT may be found by going to www.dot.gov.

- **U.S. Department of Housing and Urban Development**

The U.S. Department of Housing and Urban Development (HUD) was established in 1965 to create “a decent, safe, and sanitary home and suitable living environment for every American”. Today, HUD’s mission is “to increase homeownership, support community development and increase access to affordable housing free from discrimination”. Major programs administered by HUD include the Community Development Block Grant (CDBG) program, the HOME Investment Partnership Act program, the Emergency Shelter Grant (ESG), Section 8, public housing, Enterprise Community/Empowerment Zone/Renewal Community initiatives and “brownfields”

programs. HUD awards CDBG, HOME and ESG funds to States and entitlement communities on an annual basis. The City of Lowell, as an entitlement community, received \$2.8 million in CDBG funds, \$1.2 million in HOME funds and \$103,556 in ESG funds for the FY 2004-2005 period. The other communities in the region have to apply for HUD funds through the Massachusetts Department of Housing and Community Development. Additional information on HUD may be found by going to www.hud.gov.

- **U.S. Department of the Interior**

The U.S. Department of the Interior (DOI) currently employs 70,000 workers whose mission is “to protect and provide access to our Nation’s natural and cultural heritage and honor our trust responsibilities to Indian tribes and our commitment to island communities”. The major agencies within DOI include the National Park Service, the U.S. Fish and Wildlife Service, the Bureau of Land Management, the Bureau of Reclamation, the U.S. Geological Survey and the Bureau of Indian Affairs. For this particular region, the National Park Service plays a prominent role in attracting visitors to the Lowell National Historical Park. Additional information on DOI may be found by going to www.doi.gov.

- **U.S. Department of Labor**

In 1913 the U.S. Congress created the U.S. Department of Labor (DOL) to protect working people. Today, the focus of DOL is to get people back to work and to prepare people for the future. The Employment and Training Administration (ETA) within DOL provides “high quality job training, employment, labor market information, and income maintenance services primarily through state and local workforce development systems”. Principally through the use of the Workforce Investment Boards (WIBs) and One-Stop Centers, ETA funds workforce development programs that address regional and local labor market needs. Other agencies within DOL, such as the Occupational Safety & Health Administration, the Employee Benefits Security Administration and the Employment Standards Administration, address the safety, health and welfare of working people. Additional information on DOL may be found by going to www.dol.gov.

- **U.S. Department of Agriculture Rural Development**

The U.S. Department of Agriculture Rural Development (USDA Rural Development) was created in 1994 when the Farmers Home Administration was combined with the Rural Electrification Administration, Agricultural Cooperative Service and the Alternative Agricultural Research and Commercialization Center. USDA Rural Development provides financing for public facilities and services, economic development assistance for businesses and technical assistance and information for communities and cooperatives in rural areas. USDA Rural Development focuses on business assistance, infrastructure improvements, housing development and community development initiatives. Additional information on USDA Rural Development may be found by going to www.rurdev.usda.gov.

- **U.S. Small Business Administration**

The mission of the U.S. Small Business Administration (SBA) is to “maintain and strengthen the nation’s economy by aiding, counseling, assisting and protecting the interests of small businesses and by helping families and businesses recover from national disasters”. SBA was created in 1953 and serves as an advocate for small business. SBA provides hands-on training and financial services, such as the 7a Loan Guarantee Program, Y2K Action Loans, SBA Low Doc Loans and Microloans. SBA provides information on procurement and subcontracting opportunities and works with the Small Business Development Centers. Additional information on SBA may be found by going to www.sba.gov.

- **U.S. Export-Import Bank**

The U.S. Export-Import Bank (Ex-Im Bank) is the official export credit agency for the United States and its mission is “to assist in financing the export of U.S. goods and services to international markets”. The Ex-Im Bank was created in 1934 and has been utilized to facilitate U.S. exports since 1945. The Ex-Im Bank works closely with other federal agencies, such as the U.S. Department of Commerce and the U.S. Small Business Administration, in assisting large and small American businesses to sell their products overseas. Ex-Im Bank provides export financing products that assume greater risk than those financed in the private marketplace. Additional information on the Ex-Im Bank can be found by going to www.exim.gov.

State Partners and Resources

- **Massachusetts Office of Commonwealth Development**

The Office for Commonwealth Development (OCD) was created by Governor Mitt Romney as one of two new development agencies. The agency’s mission is “to care for the built and natural environment by promoting sustainable development through the integration of energy, environment, housing, and transportation agencies’ policies, programs and regulations”. OCD coordinates the activities of four major state agencies and encourages public investment in smart growth and equitable development, while prioritizing investments according to a project’s ability to provide living wage jobs, transit access, housing, open space and community-serving enterprises in conformance with the established sustainable development principles.

- **Massachusetts Department of Business & Technology**

The Massachusetts Department of Business & Technology (DBT) serves as the principal Economic Development Office in the Commonwealth. DBT is committed to helping businesses locate and expand in Massachusetts and oversees four specific agencies and works with many quasi-public agencies:

- The **Massachusetts Office of Business Development** (MOBD) has five regional offices and “connects companies, individuals and communities with the human, financial and technological resources” needed to prosper. MOBD provides staff support to the seven Regional Competitiveness Councils established by Governor Mitt Romney.

- The **State Office of Minority and Women Business Assistance (SOMWBA)** certifies minority and women-owned businesses and provides business assistance and advocacy programs.
 - The **Massachusetts Office of Travel and Tourism (MOTT)** oversees the State's travel business and tourism markets and encourages visitors to come to the Commonwealth.
 - The **Massachusetts Office of International Trade and Investment (MOITI)** works with businesses in the international field to identify foreign market opportunities and to encourage foreign investment in the State so as to create jobs in the Commonwealth.
 - DBT works with a wealth of quasi-public agencies, such as the **Commonwealth Corporation**, the **Community Development Finance Corporation (CDFC)**, the **Community Economic Development Assistance Corporation (CEDAC)**, the **Massachusetts Business Development Corporation (MBDC)**, the **Massachusetts Capital Resource Company (MCRC)**, the **Massachusetts Housing Finance Agency (MHFA)**, the **Massachusetts Small Business Development Center (MSBDC)**, the **Massachusetts Technology Collaborative (MTC)**, and the **Massachusetts Technology Development Corporation (MTDC)**.
- **Massachusetts Development Financing Agency**
 The Massachusetts Development Financing Agency (MassDevelopment) was created to provide public financing options for larger scale public and private developments. During 2003 alone, MassDevelopment financed \$860 million in projects across the Commonwealth. MassDevelopment provides development funds, tax-exempt bonds and loan and guarantee programs to businesses, developers and non-profit entities. MassDevelopment also partners with municipalities to plan, implement and manage major real estate projects. MassDevelopment played a major role in the redevelopment of the former Devens Army Base and continues to work with the local communities in building out the Devens complex. MassDevelopment makes available brownfield funds to communities that have established Economic Target Areas (ETAs) through a \$30 million Brownfields Redevelopment Fund. MassDevelopment recently completed work on the Saltonstall Building (100 Cambridge Street) in downtown Boston transforming it from a government office building to office and retail space, condominiums and affordable residential units. MassDevelopment will lease other property in Adams, Devens, Fall River and Gloucester, while selling property in the Barnum Business Park, Devens Industrial Park and Jackson Technology Park in Devens.
 - **Massachusetts Executive Office of Transportation and Construction**
 The Massachusetts Executive Office of Transportation and Construction (EOTC) is the umbrella Secretariat for the major transportation agencies in state government. EOTC oversees programs and services for highways, mass transit systems, railroads, airports and water vehicles. As the administrator for many federal grants from the Federal Highway Administration (FHA) and the Federal Transit Administration (FTA), EOTC works with the thirteen Metropolitan Planning Organizations (MPO's)

and fifteen Regional Transit Authorities (RTA's) across the state to develop transportation policy, to allocate transportation funds and to provide transportation services to residents of Massachusetts.

- **Massachusetts Highway Department**

The Massachusetts Highway Department (MassHighway) oversees the planning, construction and maintenance of state highway, road and bridge projects throughout the Commonwealth and falls under the EOTC umbrella. MassHighway has five District Offices that work with the regional planning agencies and local communities to move transportation projects forward.

- **Massachusetts Executive Office of Environmental Affairs**

The Massachusetts Executive Office of Environmental Affairs (EOEA) is the Secretariat responsible for environmental programs in the Commonwealth. The major agencies within EOEA are the **Department of Agricultural Resources**, the **Department of Conservation and Recreation**, the **Department of Environmental Protection** and the **Department of Fish and Game**. Other offices falling under this administrative umbrella are the **Coastal Zone Management Office**, the **Massachusetts Environmental Policy Act Office**, the **Mass Wetlands Restoration Program** and the **Water Resources Commission**.

- **Massachusetts Department of Housing and Community Development**

The Massachusetts Department of Housing and Community Development (DHCD) is responsible for overseeing the housing and community development programs of the Commonwealth. Aside from state funding, DHCD receives annual allocations from HUD and distributes these funds to non-entitlement communities. DHCD has been actively involved in downtown revitalization, housing production and the Executive Order 418 program established to encourage community development planning in local communities. In essence, DHCD provides many of the same services on the state level that HUD does at the federal level. Additional information on DHCD may be found by going to www.state.ma.us/dhcd.

Part II – Vision Statement and Goals and Objectives

The Greater Lowell region has demonstrated its ability to balance its economic development needs with the quality of life issues important to residents and visitors to this area. The emphasis upon the area's history is reflected in the region's re-use of older properties, the focus on the Merrimack and Concord Rivers and Lowell's canal system and the utilization of the extensive mill space in the City. Similar mill projects in the surrounding communities have resulted in affordable and market-rate housing, commercial and industrial businesses and a tourism industry that supports the regional economy. Therefore, it is expected that any Vision for the future will build upon the area's past, particularly in the case of the Greater Lowell region.

A. Vision Statement

The Vision for the Greater Lowell region is to build upon the region's historic past and character to develop a regional economic development framework that supports:

- the creation of high skill, well paying jobs;
- affordable and market-rate housing to house the regional employment base;
- an integrated economic development and workforce development system that prepares students and workers for future jobs; and
- a racially, ethnically and economically diverse workforce.

B. Priority Areas to be Addressed

The "grass-roots" CEDS planning process in the NMCOC region included two Vision sessions that identified the following initiatives as being important in attaining the Vision for the Greater Lowell region. These initiatives provide the foundation for the development of the Goals and Objectives summarized in the next section (Section C) of this CEDS document. These Priority Areas, according to the "grass-roots" participants, need to be addressed over the next 5-10 years in order to attain the Vision outlined previously:

1) Economic Development

- Strong economic base, including diverse small business base;
- Improvements in service industry, increased R & D;
- Marketing of Lowell venues to minorities and suburbs;
- High-tech incubator space for start-up businesses; and
- Address sales tax issue in order to assist service businesses located in communities on the state border.

2) Workforce Development

- Opportunity to train the unskilled and semi-skilled workers; and
- Improved, more accessible child care system.

3) Education

- Strong (healthy) education system;
- Affordable post high-school education;
- Partnerships between higher education and public education will develop as survival tactic for colleges;
- School choice;
- Elementary & High School level education will continue to improve;
- Higher education facilities will continue to supply skilled workers; and
- Learning must be a lifelong process with skills continually being upgraded.

4) Affordable Housing

- Adequate amount of affordable housing--diverse type and pricing; and
- Better zoning regulations to encourage affordable housing.

5) Racial and Ethnic Diversity

- Skills of immigrants not fully utilized;
- Development of multi-ethnic industries on a broad scale;
- Established markets for minority/ethnic populations;
- Greater diversity in political structure/government representation; and
- Good health care system (language accessible).

6) Pockets of Distress

- CMAA and CAL projects are likely to go forward as part of JAM Plan; and
- More vibrant, mixed-use centers/villages would eliminate need for some travel.

7) Regional Transportation System

- Improved transportation access to region's assets;
- Transportation costs to be addressed;
- Alternative technologies to improve transportation;
- LRTA Transit hub improvements in place and need for regional evening transit service; and
- Expand transportation network with more efficient vehicles.

8) Quality of Life

- Linked green space in the region;
- Improved regional cultural activities as an attraction;
- Project impacts to be considered on a regional basis;

Quality of Life (cont.)

- Increased environmental police on lakes/waterways to protect natural resources;
- National Park Serve to be more active regionally;
- Increase in volunteerism as part of the community fabric;
- More bike paths; and
- Increasing public awareness of the human element in Historic Preservation.

9) Technology

- Attract creative, leading-edge industry in addition to traditional industries;
- Alternative technologies to improve transportation system;
- Increased energy efficiency and water use;
- Sufficient power and energy resources;
- Dependable energy/power sources; and
- Use of alternative technology to transform trash into energy through recycling, composting and reduction/trash.

10) Financial Investments

- Resources are needed to implement the other goals;
- EDA funding can leverage other federal, private, state, local and non-profit financial resources;
- Resource pool at the regional level is needed;
- Tax incentives needed to encourage private investment; and
- Capital needed for private enterprise.

C. Goals and Objectives

The Comprehensive Economic Development Strategy (CEDS) for the Greater Lowell region attains this Vision by establishing ten goals and related objectives that reflect the input of the meeting participants and previous regional and community studies. The Goals and Objectives, as outlined in the CEDS, is as follows:

GOALS	OBJECTIVES
<p>1. Economic Development</p> <p>Develop a regional economic development framework that supports the efforts of private industry, local communities and agencies, educational institutions, federal and state agencies and private foundations to create jobs and to improve the quality of life in the region.</p>	<ul style="list-style-type: none"> ▪ Establish a permanent CEDS Committee meet four times annually and to update the CEDS on an annual basis. ▪ Apply for EDA Planning and Public Works funds to establish an annual CEDS process and to implement priority projects in the Greater Lowell region. ▪ Apply for Economic Development District (EDD) designation to formalize the CEDS process. ▪ Identify infrastructure needs of the local communities and work with community leaders to identify funding for these projects. ▪ Build upon the Renewal Community status of the City of Lowell and the Economic Target Area designation of Lowell, Dracut, Billerica and Chelmsford to expand and attract business.
<p>2. Workforce Development</p> <p>Increase the supply of skilled workers for industry in the region through the integration of the economic development and workforce development systems.</p>	<ul style="list-style-type: none"> ▪ Integrate the economic development and workforce development systems to support the expansion of business in the region. ▪ Support regional industry needs today and plan for industry needs five years in the future. ▪ Incorporate minority and low income residents into the workforce development system and provide jobs for them upon successful completion of their training.

GOALS	OBJECTIVES
<p>3. Education</p> <p>Improve the educational and workforce skills of primary, secondary and college students to meet the needs of industry in the future.</p>	<ul style="list-style-type: none"> ▪ Encourage stronger ties between the primary and secondary school systems and the colleges in the region. ▪ Identify specific initiatives that need to be implemented in order to prepare high school and college students for the working world. ▪ Support the development of curricula at UMass Lowell and Middlesex Community College that supports regional industry needs.
<p>4. Affordable Housing</p> <p>Create more affordable housing throughout the region to ensure that businesses can expand and relocate to the region with the assurance that their workforce will be able to afford the housing.</p>	<ul style="list-style-type: none"> ▪ Create more affordable housing in the region in accordance with Affordable Housing Productivity Plans for each community. ▪ Develop Regional Cooperative Housing Initiative(s) that access federal, state and non-profit funds to create new housing through regional participation. ▪ Target housing for the artist and knowledge industry communities in downtown Lowell.
<p>5. Racial and Ethnic Diversity</p> <p>Increase the opportunities available to minority and low-income communities in the region to participate in the expansion of the regional economy.</p>	<ul style="list-style-type: none"> ▪ Implement the Environmental Justice principles related to transportation and infrastructure projects in the region. ▪ Develop stronger ties with the Latino, Asian and Black communities and identify specific initiatives that the CEDS Committee can implement in order to improve their economic condition. ▪ Support the efforts of minority CDC's to implement economic development and housing programs.

GOALS	OBJECTIVES
<p>6. Pockets of Distress</p> <p>Target assistance to those neighborhoods and communities in the region that have not shared the economic benefits of the regional economy.</p>	<ul style="list-style-type: none"> ▪ Target resources to Lowell and the surrounding communities that have unemployment rates one percent higher than the national average and per capita income figures less than or equal to 80% the national figure. ▪ Identify areas with major vacancy rates as a result of recent layoffs and develop an inventory of available properties. ▪ Work with the minority and low-income communities in the region to identify specific initiatives that should be incorporated within the CEDS annual program.
<p>7. Regional Transportation System</p> <p>Develop the infrastructure needed to build upon the strengths of the regional highway system and the public transportation network to enhance access to the economic centers of the region.</p>	<ul style="list-style-type: none"> ▪ Complete the Route 3 North Transportation Improvement Project as a means to improve access in the region. ▪ Implement the bridge improvements in Lowell and Tyngsborough to enhance access in the region. ▪ Complete the LRTA's "Transit Initiative for the Twenty-First Century".
<p>8. Quality of Life</p> <p>Maintain the community character in the region by preserving and protecting the region's natural, cultural and historic resources and encouraging concentrated development.</p>	<ul style="list-style-type: none"> ▪ Implement the Regional Open Space Plan developed by NMCOG. ▪ Support initiatives by the National Park Service and other organizations to maintain and improve access to open spaces along the Merrimack and Concord Rivers. ▪ Build upon the cultural and historic heritage of the region by supporting the cultural facilities in the region and the professionals working in the industry. ▪ Encourage local communities to develop and update Master Plans that provide a balance between development and quality of life issues.

GOALS	OBJECTIVES
<p>9. Technology</p> <p>Enhance the region’s strengths within its “cluster industries” by promoting technological advancements and expanding the technological infrastructure in the region.</p>	<ul style="list-style-type: none"> ▪ Work the Chambers of Commerce in the region and the Lowell and Billerica Plans to develop support mechanisms for the identified “cluster industries”. ▪ Target assistance from UMass Lowell and Middlesex Community College to improve the technology of local businesses. ▪ Provide digital access to downtown Lowell and within the minority and low-income communities to address the digital divide issue in the region.
<p>10. Financial Investments</p> <p>Target federal, state, local, non-profit and private funds to those projects that create jobs and improve the quality of life in the neighborhoods.</p>	<ul style="list-style-type: none"> ▪ Access funding from the regional banking community and private investment firms to expand local businesses. ▪ Establish regional lending program under NMCOG’s planned 501 (c) non-profit entity. ▪ Apply for federal and state funding, such as brownfields and New Market Tax Credits which can be targeted to priority projects

Part III – Action Plan

The Action Plan has been developed as a result of the Needs Analysis and Vision sections. The Action Plan covers a period of five years and is broken down into Short-Term, Intermediate and Long-Term projects. NMCOG solicited projects from economic development stakeholders on two occasions and reviewed the submitted projects based upon the criteria sent with the applications. These projects were determined to contribute to the economic growth of the region and to meet at least one of the goals identified in the Vision Section. Currently, the City of Lowell is the only community eligible for EDA funding based upon its unemployment rate. Other communities may be eligible in the future depending upon potential layoffs and their economic impact upon the community. Most of the projects listed are not eligible for EDA funding, but are included to demonstrate how other federal, state, local, non-profit and private resources are being accessed in order to move this region toward the Vision outlined.

This Action Plan section initially focuses upon the status of economic development projects in the Greater Lowell region listed in the 1994 Overall Economic Development Program (OEDP) completed by NMCOG and then identifies the projects recommended at the Action Plan sessions on July 31, 2002 and August 1, 2002 and discussed at the Action Plan session on January 22, 2004. These identified projects are listed by the specific goal in the Vision section. The next part of the Action Plan section describes the Project Selection Criteria and summarizes the process whereby these criteria were made available to the economic development stakeholders in the region. Subsection C summarizes the CEDS Priority Projects for the NMCOG region based upon their short-term, intermediate or long-term status, as well as identifying the major projects in the region. The final portion of this section documents the extensive “grass-roots” process utilized in developing this region’s first CEDS document.

A. Implementing the CEDS Goals

In developing the Action Plan “grass-roots” sessions, attention was paid to the development history in the region and the ability of economic development stakeholders to be successful in implementing their projects. As the evaluation component will demonstrate, qualitative and quantitative results are important to any CEDS Action Plan. In the case of the Greater Lowell region, specific projects were identified in the last document submitted to EDA, specifically the 1994 OEDP. As a result of the submission of this document, the City of Lowell received \$25,000 in EDA Planning funds to develop a feasibility study for the Lowell Arena Project, now known as the Paul E. Tsongas Arena. Through this initial investment by EDA, more than \$62.7 million in federal, state, local, private and non-profit funds were invested in order to make the Lowell Arena Project and its related improvements a reality. The Tsongas Arena, along with LeLacheur Stadium, have helped make the City of Lowell a “destination city” and enabled it to broaden its economic base and to encourage visitors to see what else the City of Lowell has to offer in terms of historical sites, shopping and entertainment.

When NMCOG completed the 1994 OEDP, it also addressed economic issues for the Massachusetts Department of Housing and Community Development (DHCD). As part of the document that addressed the needs of EDA and DHCD, NMCOG identified Private Sector, Retail, Public Sector and Other Transportation Projects in the region that would have a major economic impact upon the

region. In compiling the information on the status of the specific identified projects, it was reassuring to see that most of these projects had either been completed or are being implemented today. The summary of the projects in the 1994 OEDP and their status is provided in *Chart 50* below:

Chart 50: Summary of Projects identified in the 1994 OEDP

		<u>Status</u>
A. Private Sector Projects		
•	ESA, Inc. to locate in Chelmsford	Uncertain
•	Sun Microsystems, Inc. in Chelmsford	Moved
•	Mercury Computer Systems, Inc. in Chelmsford	Completed
•	Saints Memorial Hospital Plan in Lowell	Completed
•	Boott Mill Redevelopment in Lowell	Ongoing
•	M/A Com in Lowell	Completed
•	Cadence Design Systems in Chelmsford	Uncertain
•	TRC Environmental in Lowell	Completed
•	Terra Logistics, Inc. of Lowell	Out of Business
•	Lowell Brewing Company/ Family Entertainment Facility	Partially Completed
•	Bio-Development Tri-Generation Facility ---2 nd priority	No Action
•	EPA, Inc. in Lowell	Out of Business
•	Wang Towers Redevelopment ---3 rd priority	Completed
•	Merrimack Valley Gerontology Center	No Action
•	Sentry Insurance in Westford	Moved
B. Retail Projects		
•	Bon March Building/University Bookstore	Completed
•	Proposed Wal-Mart store in Tewksbury	Completed
•	Home Depot retail store in Tewksbury	Completed
•	Market Basket and TJ Maxx Store in Chelmsford	Completed
•	Towne Farm Shopping Plaza renovation and expansion in Billerica.	Completed
•	Proposed supermarket in Lowell's Acre neighborhood---4 th priority	Completed
C. Public Sector Projects		
•	Re-use of the old town hall facility in Billerica	Completed
•	Re-use of former North Chelmsford town hall	No Action
•	Expansion of the current Senior Center in Dracut	Completed
•	Completion of Lowell Arena Project	Completed
•	University of Massachusetts Lowell Master Plan	Ongoing
•	Museum of American Textile History relocation	Completed
•	Coalition for a Better Acre/UMass Lowell Toxic Use	No Action
•	Reduction Institution Industrial Development	

C. Public Sector Projects (cont.)	
• Middlesex Dam Hydroelectric Plant/Recreational White Water Park Development	No Action
• St. Peter's Church in Lowell	Demolished
• Senior Center in Pepperell	Completed
• New transfer station/recycling facility in Pepperell	Uncertain
• New town hall in Tyngsborough	Completed
• Thirteen buses for the LRTA	Completed
• Route 3 widening	Ongoing
D. Other Transportation Projects	
• Permanent Merrimack River crossing in Lowell	Under Study
• Completion of the I-495 interchange	Study
• Railroad improvements to facilitate doublestacking of rail container cars	No action
• Lowell/Sudbury Bicycle Trail	Construction Phase
• Roadway improvements to Route 38 in Lowell	Completed

Source: 1994 Overall Economic Development Program for Greater Lowell

Building upon this information from the 1994 OEDP, two “grass-roots” Action Plan sessions were held on July 31, 2002 and August 1, 2002 to receive input on economic development initiatives that addressed the problems and opportunities identified in the Needs Analysis “grass-roots” sessions and strived to attain the Vision for the region by addressing the specific Goals and Objectives. The following listing of economic development initiatives are arranged according to the ten specific goals identified earlier and were discussed, along with the Priority Project listing, at our Action Plan session on January 22, 2004. These Action Plan initiatives identified specifically by the public, and arranged by specific goal, were as follows:

Goal One: Economic Development: Develop a regional economic development framework that supports the efforts of private industry, local communities and agencies, educational institutions, federal and state agencies and private foundations to create jobs and improve the quality of life in the region.

- Encourage better coordination on the part of the City in matching up with available state resources through MassDevelopment and the Massachusetts Office of Business Development (MOBD) and federal resources. The City should not be the entity dealing with financing or providing loans for small businesses because this function is already being handled at the state level.
- Utilize the NMCOG web site to assist the Towns in marketing their vacant commercial and industrial space, such as the available space on Route 129. Filling vacant space on Route 129.
- The Pepperell Paper Mill, which recently closed down, needs

Goal One (cont.):

\$ 1 million worth of work to repair the penstock for the hydroplant. There are potential 21E issues, as well as the need to repair or replace the river retaining wall.

Goal Two: Workforce Development: Increase the supply of skilled workers for industry in the region through the integration of the economic development and workforce development systems.

- Encourage private sector investment in training opportunities through a public/private partnership that also reduces the tax burden for private companies.
- Implement apprenticeship training programs, especially for dropouts and troubled youth.
- Address the unemployed in the building trades and construction industry through retraining programs co-sponsored by the Workforce Investment Board and local unions.
- Be prepared to implement workforce training programs when the high tech industry rebounds.
- Reassess the Service industry and retrain employees as the need for hotel industry grows.

Goal Three: Education: Improve the educational and workforce skills of primary, secondary and college students to meet the needs of industry in the future.

- Develop partnership between UMass Lowell and suburban communities.
- Utilize schools as a community facility, not just for children.

Goal Four: Affordable Housing: Create more affordable housing throughout the region to ensure that businesses can expand and relocate to the region with assurance that their workforce will be able to afford their housing.

- Establish non-profit alliances as a means to address housing costs and to create affordable housing.
- Investigate the possibilities of utilizing pre-fabricated, modular and new technology housing as a means to produce more affordable housing in the neighborhoods
- Build upon the success of the Artist's Lofts in downtown Lowell, redevelop the Boott Mills as housing, implement the Acre Urban Renewal Plan and expand the First Time Homebuyers Program
- Establish partnership with the vocational schools and non-profit housing entities, such as Habitat for Humanity, to create more affordable housing.

- Goal Five: Racial and Ethnic Diversity: Increase the opportunities available to minority and low-income communities in the region to participate in the expansion of the regional economy.**
- Identify funding sources for Cambodian small businesses through the involvement of the Greater Lowell Chamber of Commerce.
 - Expand English-as-a-Second Language (ESL) opportunities for immigrants, including on-the-job training. Middlesex Community College could expand its current ESL programs or UMass Lowell could implement a new ESL program to address these needs.
 - Strengthen the Small Business Assistance Center’s Microenterprise Program and the Cambodian Mutual Assistance Association’s (CMAA) employment and training programs through increased funding.
 - Regionalize the ESL programs and utilize contractors such as CMAA to provide the training. .
- Goal Six: Pockets of Distress: Target assistance to those neighborhoods and communities in the region that have not shared the economic benefits of the regional economy.**
- Establish job preference for area residents for those companies locating in the region that are receiving government financial assistance.
- Goal Seven: Regional Transportation System: Develop the infrastructure needed to build upon the strengths of the regional highway system and the public transportation network to enhance access to the economic centers of the region.**
- Establish Commuter Rail Station in North Chelmsford.
 - Develop the necessary infrastructure- Route3/I-495/I-93 Corridors, highway access, sewer and water- in order to expand the regional economy.
 - Expand public transportation to serve Pepperell.
 - Increase transportation opportunities in the form of bus service or commuter rail to communities within ten miles of the region.
 - Invest public transportation dollars as a catalyst for additional private and non-profit investments.
- Goal Eight: Quality of Life: Maintain the community character in the region by preserving and protecting the region’s natural, cultural and historic resources and encouraging concentrated development.**
- Develop Regional Master Plan.

Goal Nine: Technology: Enhance the region’s strengths within its “cluster industries” by promoting technological advancements and expanding the technological infrastructure in the region.

- Support the work of UMass Lowell Centers of Excellence that provide “spin-off” businesses from incubator space.
- Integrate the high tech home occupations or telecommuters into the regional economy and urban centers.

Goal Ten: Financial Investments: Target federal, state, local, non-profit and private funds to those projects that create jobs and improve the quality of life in the neighborhoods.

- Provide tax incentives for private industry to locate in the region, such as the Economic Target Area designation and Tax Incentive Financing tools utilized by Billerica.
- Utilize the Billerica Plan.
- Provide capital for private enterprise.
- Develop a regional non-profit investment corporation modeled after the Billerica Plan to provide venture capital and revolving loans to businesses in the region.
- Create resource pool for small business at the regional level.

B. Project Selection Criteria

NMCOG worked with its CEDS Committee in the development of the project criteria to be included for the review of projects for inclusion on the CEDS Priority Project List. The criteria were established based upon the EDA Investment Policy Guidelines and additional criteria important to development in this region. Due to the fact that we wanted to develop as comprehensive a list as possible to address the ten goals, which included projects funded through sources other than EDA, we needed to develop these additional criteria, which were based upon the results of the CEDS “grass-roots” meetings held throughout the NMCOG region between July 11, 2002 and August 1, 2002, as well as previous regional studies completed by NMCOG.

These criteria were made available to project proponents through two mailings in August 2002 and November 2003. Project proponents had an opportunity to update their initial submissions due to the delay in finalizing the EDA grant. Project proponents were provided information on these criteria at the initial Action Plan Sessions on July 31, 2002 and August 1, 2002, as well as the Action Plan Session on January 22, 2004. Furthermore, at the Final CEDS Public Meeting on February 25, 2004, we reviewed the criteria once again and encouraged additional projects to be submitted for review by the CEDS Committee and final approval by the NMCOG Board.

The EDA Investment Policy Guidelines form the larger framework for evaluating CEDS projects, particularly those seeking EDA funding. These criteria have been reviewed at our public meetings and have been discussed at the CEDS Committee meetings as well. The 2003 EDA Investment Guidelines are as follows:

2003 EDA Investment Guidelines, (Cont.)

1. The proposed investments are market-based.
2. The proposed investments are proactive in nature and scope.
3. The proposed investments look beyond the immediate economic horizon, anticipate economic changes, and diversify the local and regional economy.
4. The proposed investments maximize the attraction of private sector investment and would not otherwise come to fruition absent EDA's investment.
5. The proposed investments have a high probability of success.
 - Level of local, state, and private matching funds.
 - High degree of commitment of local political "capital" by elected officials.
 - Commitment of human resources talent to project outcomes.
6. The proposed investments result in an environment where high skill, high wage jobs are created.
7. The proposed investments maximize Return on Taxpayer Investment.

Project proponents were provided the following information and criteria (regional, community, job creation/workforce development, and project readiness) for short-term, intermediate and long-term projects regarding the submission of their one-page project summary for their inclusion on the Priority Project list:

All projects will meet the Priority Project Criteria and will be categorized based upon the expected timeframe to complete the specific project (Short-Term: 12-18 months, Intermediate: 2-4 years and Long-Term: 5+ years). Projects funded by EDA must either be located in an area that has an unemployment rate of at least 1% higher than the national average for the preceding 24 months or have a per capita income level equal to or less than 80% of the U.S. average. EDA-funded projects will be consistent with the specific program requirements and the EDA Investment Policy Guidelines.

For the purposes of the NMCOG Region CEDS for 2004-2008, the criteria for priority projects are outlined below. All projects will be required to be consistent with community objectives and have local support. The priority project criteria are as follows:

Short-Term (Up to 18 months)

Regional Criteria

- Project exhibits intermunicipal cooperation and coordination on development.
- Project addresses regional issues, such as affordable housing, trained workforce, small business assistance and financial tools for economic development.
- Project addresses problems with the current highway and/or mass transit system.

Regional Criteria, (Cont.)

- Project provides improvements to the region's infrastructure that have a positive impact on the regional economy.
- Project supports quality of life issues related to open space, "greenfields", and recreational and cultural facilities.

Community Criteria

- Project is consistent with community goals and has evidence of support within the community (required).
- Project addresses the need for affordable housing.
- Project promotes local economic development projects or improves economic development capacity at the local level.
- Project reutilizes former industrial or commercial sites and converts them into positive, job-creating uses (example: brownfields).
- Project provides a positive environmental impact.
- Project addresses emergency need, such as the closure of military bases, layoff situations, the closure or consolidation of businesses or natural disasters.

Job Creation /Workforce Development Criteria

- Project supports job creation/retention that benefits the unemployed and underemployed.
- Project provides workforce development assistance, including skill training and supportive services, i.e. child care, transportation, English-as-a-second language, etc.
- Project broadens skills for incumbent workers and provides new skills or entrepreneurial training for laid off workers.
- Project targets assistance to those areas in the region most in need.
- Project creates jobs at living wage salaries.

Project Readiness Criteria

- Project is ready for construction or implementation within 12-18 months.
- Project proponents have site control for the project.
- Financing for the project has been identified and is in the process of being secured.

Intermediate (2-4 years)

Intermediate projects are those economic development projects that are expected to take 2-4 years to begin construction or implementation and that meet the previous criteria. Under this priority, site control and financing do not have to be under control.

Long-Term (5+ years)

Long-Term projects are those economic development projects that are expected to take 5 years to begin construction or implementation. These projects may be in the formation stages today and, due to limited resources or the amount of time until the project can be implemented, are not expected to begin for five years.

C. CEDS Projects for the NMCOG Region

The listing of CEDS Projects for the NMCOG Region has been done based upon their short-term (up to 18 months), intermediate (2-4 years) or long-term (5+ years) status. The listing of the CEDS projects in this manner will help separate out those projects that are ready to go and to be able to show movement within the Priority Projects in the intermediate and long-term categories. To a large extent, apart from the projects that were submitted by project proponents, NMCOG has relied to a great extent on the region's Transportation Improvement Program (TIP), which is completed each year by the Metropolitan Planning Organization (MPO) for the region, which is staffed by NMCOG. It is anticipated that the Annual CEDS Updates submitted each year will summarize the changes in projects that take place from year to year.

The short-term, intermediate and long-term projects are summarized according to Project Name, Project Description, Project Proponent, Total Cost, Funding Sources (if known), Start Date, Environmental Impact, and the CEDS Goals Addressed by the specific project. The projects are not prioritized, however, in the case of EDA-eligible projects, the general consensus of the CEDS Committee was that the projects from Lowell should be funded according to the following priority-JAM Plan, Tanner Street Initiative and Acre Plan. It was generally agreed that the nature of these projects in addressing multiple CEDS goals was beneficial to the region and that the community goals and minority goals were being met simultaneously. Furthermore, in terms of job creation, the City of Lowell estimates that the JAM Plan will create 533 jobs, the Tanner Street Initiative will create more than 200 jobs and the Acre Plan will create 541 jobs. Part 1 provides a brief summary of the Short-Term Projects, Part 2 provides a brief summary of the Intermediate Projects and Part 3 provides a brief summary of the Long-Term Projects. The actual project listings are included after Part 3.

Part 4 covers major development projects in the region and focuses upon three major projects - the Route 3 expansion, the Acre Urban Renewal Area and the Jackson-Appleton-Middlesex (JAM) Urban Renewal Area. A brief description of each of these projects is included in order to provide greater detail on how these projects have a major impact upon the region. It is anticipated that this section will be developed in the Annual CEDS Updates as well in order to identify major projects that currently have or are expected to have a major impact upon the region. In some cases, these projects are also listed in the Priority Project listing.

1. Short-Term Projects (up to 18 months)

Within this initial CEDS document, we have identified thirty-nine (39) projects that contribute to maintaining a balance between the economic development needs of the region and quality of life issues that attract people to this area. As mentioned previously, three specific projects – JAM Plan, Tanner Street Initiative and the Acre Plan – are designated as EDA projects and are currently eligible for public works funding. Other infrastructure projects in the surrounding communities may be eligible for EDA funding in the future depending upon the economic conditions at the time of application. Eligibility in these cases will be most likely related to the closing of businesses, not based upon the unemployment or per capita income rates. Also listed within the short-term projects are the EDA Planning Grant and Economic Development District (EDD) designation initiatives of NMCOG, which will add immeasurably to the economic

development capacity of the region. *Chart 51* following Part 3 summarizes the short-term projects for the NMCOG region.

2. Intermediate Projects (2-4 years)

Twenty-five (25) Intermediate Projects have been identified for the NMCOG region as part of this initial CEDS. The Downtown Phase II project sponsored by the City of Lowell is the only currently eligible EDA project, however, the limited job creation numbers would make it difficult to qualify as a public works projects. Other projects, such as the Navy Yard Mill Reuse Study, could be eligible for EDA assistance in the future if there are major layoffs in the community. *Chart 52* following Part 3 summarizes the intermediate projects for the NMCOG region.

3. Long-Term Projects (5+ years)

Only three (3) projects have been identified as long-term projects for the NMCOG region. Each of these projects will require a combination of federal, state and local assistance, but it is unlikely that EDA will be the federal source of funding. *Chart 53* following this section summarizes the long-term projects for the NMCOG region.

Over the next eight pages, *Charts 51, 52 and 53* summarize the Short-Term, Intermediate and Long-Term projects for the NMCOG region for 2004-2008.

CEDS Projects for the NMCOG Region

Chart 51: Short-Term Projects (up to 18 months)

Project Name	Project Description	Project Proponent	Total Cost	Funding Source(s)	Start Date	Environmental Impact	Goals Addressed
JAM Plan	Neighborhood Revitalization	City of Lowell	\$ 48 m	EDA, HUD, state, local	2004	Yes	1, 2, 4, 5, 6, 7, 8, 9 and 10
Tanner Street Initiative	Area Improvements	City of Lowell	\$ 1.5 m	EDA, state, local bonding	2004	Yes-Positive	1, 6, 8
Acre Plan	Neighborhood Revitalization	City of Lowell	\$ 55 m	EDA, EPA, state, local	2004	Yes	1,2,4,5,6,8,9 and 10
Combined Sewer Overflow (CSO)	Reduce discharges into Merrimack River	City of Lowell	\$ 65 m	Local bonding	2004	Yes	1,8
Western Canal Acre Reach	Canal Walk	Lowell National Historical Park	\$ 1.1 m	Fed- \$ 839 k Local- \$ 260 k	2004	Yes	8
Business Assistance Task Force	Small Business Support	Town of Billerica	Unknown	Unknown	2004	No	1
Republic-Esquire Sterling Sewer	Sewer Project	Town of Billerica	\$ 3.7 m	State- \$ 1.7 m Private- \$ 2 m	2004	Yes	1,8
Town wide Sewer	Sewer Expansion	Town of Billerica	\$ 68 m	Town	2004	Yes	1,8
Water Treatment Plant	Water Treatment	Town of Billerica	\$ 36 m	State loan Town	2004	Yes	1
Concord Rd. (Phase I)	Road Reconstruction	Town of Billerica	\$ 2.0 m	Fed and state funds	2004	Yes	7

Project Name	Project Description	Project Proponent	Total Cost	Funding Source(s)	Start Date	Environmental Impact	Goals Addressed
Habitat for Humanity	Affordable Housing	Town of Billerica	Land donation	In-kind	2004	Yes	4
Housing Productivity Plan	Housing Plan for Affordable Housing	Town of Billerica	\$ 15 k	Local	2004	No	4
Open Space and Recreation Fund	Land Acquisition	Town of Billerica	Varies	Town	2004	No	8
Rangeway Road	Road Reconstruction	Town of Billerica	\$ 1.5 m	Town-\$ 1.25 m Private- \$ 250 k	2004	Yes	7
Middlesex Turnpike	Road Improvements	Town of Billerica	\$ 3.42 m	Fed.- \$ 2.736 m State – \$ 684 k	2004	Yes	7
Project Vision	Business Incubator & Resource Center	Billerica Chamber of Commerce	\$ 100 k	Unknown	2004	No	1
Town Sewer	Sewer expansion	Town of Chelmsford	\$ 31 m	State and local	2004	Yes	1
11 Cushing Place	Building Reuse	Town of Chelmsford	Unknown	Private	2004	No	1,4
Trout Brook Sanitary Sewer Extension	Sewer Extension	Town of Dracut	\$ 5 m	Federal and town	2004	Yes	1
Phase VII Sewer	Sewer expansion	Town of Tewksbury	\$ 5.2 m	Unknown	2004	Yes	1
Water Meter Replacement	Water Meter	Town of Tewksbury	\$ 1 m	Town	2004	No	1
Stony Brook	Affordable housing	Town of Westford	\$ 2.8 m	MHP & HOME; CPA	2004	Yes	4

Project Name	Project Description	Project Proponent	Total Cost	Funding Source(s)	Start Date	Environmental Impact	Goals Addressed
EDA Planning Grant	CEDS Planning Grant	NMCOG	\$ 100 k	EDA- \$ 50 k Match- \$50 k	2004	No	1
Economic Development District Designation	EDD Designation by EDA	NMCOG	\$ 10 k	NMCOG Private	2004	No	All
495 Corridor Study	Study	NMCOG	\$ 500 k	FHA	2004	No	1,7
Route 3	Widening	MPO	\$ 891.5 m	FHA	Ongoing	Yes	1,7
Main St. and Shawsheen	Reconstruct and upgrade	Town of Tewksbury	\$ 1.2 m	Fed. – \$ 960 k State- \$ 240 k	2004	Yes	7
Route 225 Bridge	Bridge Replacement	Town of Westford	\$ 913 k	Fed.- \$ 730.4 k State- \$182.6 k	2004	Yes	7
Lowell Loam Commercial Compacting	Organic waste recycling enterprise	UMass Lowell	\$ 150 k	Unknown	2004	Yes-Positive	1,3,8
Lakeview Ave. Bridge	Bridge Replacement	Town of Dracut	\$ 300 k	State Highway	2004	Yes	7
Route 225 Relocation	Relocate Road	Town of Westford	\$ 1.2 m	State Highway	2004	Yes	7
Groton Street Bridge	Reconstruct Bridge	Town of Pepperell	\$ 2.5 m	Fed. – \$ 2 m State- \$ 500 k	2004	Yes	7
Operating/ Preventive Maintenance Assistance	Fixed Route Service	Lowell Reg. Transit Authority	\$ 5.4 m	Fed.- \$ 1.7 m State- \$ 2.3 m Local-\$ 1.4 m	2004	No	7
Planning Assistance	Contract with NMCOG	Lowell Reg. Transit Authority	\$ 75 k	Fed. – \$ 60 k Local – \$ 15 k	2004	No	7

Project Name	Project Description	Project Proponent	Total Cost	Funding Source(s)	Start Date	Environmental Impact	Goals Addressed
Capital Assistance	Computer software for paratransit	Lowell Reg. Transit Authority	\$ 50 k	Fed. – \$ 40 k State or local	2004	No	7
Capital Assistance	Bus and bus facilities	Lowell Reg. Transit Authority	\$ 2.5 m	Fed. – \$ 2 m State – \$ 247 k Local – \$ 247 k	2004	No	7
Capital Assistance	Bus and facilities/spare parts	Lowell Reg. Transit Authority	\$ 80 k	Fed. – \$ 64 k State – \$ 8 k Local – \$ 8 k	2004	No	7
Operating Assistance	Section 18 rural assistance	Lowell Reg. Transit Authority	\$ 9.7 k	Fed. – \$ 7.7 k State – \$ 1 k Local – \$ 1 k	2004	No	7
Capital Assistance	Ten lift and radio equipped vehicles	Lowell Reg. Transit Authority	\$ 500 k	Fed. – \$ 100 k State – \$ 400 k	2004	No	7

Chart 52: Intermediate Projects (2-4 years)

Project Name	Project Description	Project Proponent	Total Cost	Funding Source(s)	Start Date	Environmental Impact	Goals Addressed
Downtown Phase II	Downtown Improvements	City of Lowell	\$ 2.7 m	Fed, state and local funds	2005	Yes	1, 4
Alexander Road/Cook Street	Road Reconstruction	Town of Billerica	\$ 3 m	Federal and state funds	2005	Yes	1,7
Middlesex Turnpike	Road Improvements	Town of Billerica	\$ 5.385 m	Fed.- \$ 4.3m State – \$ 1 m	2005	Yes	1,7
Route 4 Bridge	Bridge Replacement	Town of Billerica	\$ 1.4 m	Federal and state funds	2005	Yes	7
Town Center/ Common Improvements	Town Common Improvements	Town of Billerica	\$ 1.5 m	Town and other sources	2005	Yes	8
Drum Hill Corridor Study	Improvements	Town of Chelmsford	Unknown	Unknown	2005	Yes	7
East Dracut Water Storage Tank	Water Storage Tank	Town of Dracut	\$ 3.2 m	Unknown	2005	Yes	1,8
Navy Yard Mill Reuse Study	Reuse Study	Town of Dracut	\$ 50 k	Unknown	2005	Yes	1
Water Storage	Water Project	Town of Tewksbury	\$ 5 m	Unknown	2005	Yes	1,8
Water Distribution	Water Project	Town of Tewksbury	\$ 4.01 m	Unknown	2005	Yes	1,8
Groton Street Bridge	Bridge Reconstruction	Town of Pepperell	\$ 2.5 m	Federal and State Highway	2005	Yes	7
Operating/ Preventive Maintenance Assistance	Fixed Route Service	Lowell Reg. Transit Authority	\$ 5.4 m	Fed.- \$ 1.7 m State- \$ 2.3 m Local-\$ 1.4 m	2005	No	7

Project Name	Project Description	Project Proponent	Total Cost	Funding Source(s)	Start Date	Environmental Impact	Goals Addressed
Planning Assistance	Contract with NMCOG	Lowell Reg. Transit Authority	\$ 75 k	Fed. – \$ 60 k Local – \$ 15 k	2005	No	7
Capital Assistance	Bus and facilities/spare parts	Lowell Reg. Transit Authority	\$ 80 k	Fed. – \$ 64 k State – \$ 8 k Local – \$ 8 k	2005	No	7
Operating Assistance	Section 18 rural assistance	Lowell Reg. Transit Authority	\$ 9.7 k	Fed. – \$ 7.7 k State – \$ 1 k Local – \$ 1 k	2005	No	7
Capital Assistance	Ten lift and radio equipped vehicles	Lowell Reg. Transit Authority	\$ 500 k	Fed. – \$ 100 k State – \$ 400 k	2005	No	7
Princeton Street Bridge	Rehab/replace	Town of Chelmsford	\$ 1.25 m	To be determined	2005	Yes	7
University Avenue Bridge	Replacement	City of Lowell	\$ 5.342 m	State Highway funds	2005	Yes	1,7
Hamilton Canalway	Walkway	Lowell National Historical Park	\$ 1.6 m	Federal and local funds	2006	Yes	8
Riverwalk Extension	Extension of Riverwalk	Lowell National Historical Park	\$ 5-6 m	Federal and local funds	2006	Yes	8

Project Name	Project Description	Project Proponent	Total Cost	Funding Source(s)	Start Date	Environmental Impact	Goals Addressed
Middlesex Street Mill	Redevelop Mill Space	Town of Chelmsford	Unknown	Unknown	2006	Yes	1,4
Middlesex Turnpike	Road Improvements	Town of Billerica	\$ 7.2 m	Fed.- \$ 5.8 m State -\$ 1.4 m	2006	Yes	1,7
Water Treatment Plant	Water Treatment	Town of Tewksbury	\$ 4.4 m	Unknown	2006	Yes	1,8
Western Canal Park Reach	Park	Lowell National Historical Park	\$ 1.3 m	Federal and local	2007	Yes	8
Middlesex Turnpike	Road Improvements	Town of Billerica	\$ 3.8m	Fed.- \$ 3 m State - \$ 760 k	2007	Yes	1,7

Chart 53: Long-Term Projects (5+ years)

Project Name	Project Description	Project Proponent	Total Cost	Funding Source(s)	Start Date	Environmental Impact	Goals Addressed
Upper Pawtucket Canalway	Walkway	Lowell National Historical Park	\$ 2.6 m	Federal and local	2009	Yes	8
Pawtucket Falls Overlook	Walkway	Lowell National Historical Park	\$ 2.1 m	Federal and local	2009	Yes	8
Route 113 Bypass/ Connector Road	Connector Road	Town of Dracut	Unknown	Federal or state funds	2010+	Yes	1,7

4. Major Development Projects

The region's major development projects as this time consist of the Route 3 expansion project, the Acre Urban Renewal Project and the Jackson-Appleton-Middlesex (JAM) Urban Renewal Project. There are other projects outside the region that have an economic impact upon this area, such as the potential closing of Hanscom Field under BRAC and the expansion of Route I-93 in New Hampshire. Additional developments are underway in the area, such as the implementation of the recommendations of the Urban Land Institute for the City of Lowell, infrastructure projects in the suburban communities and the evolving exploration of the Nanotechnology sector at UMass-Lowell, which will be addressed more fully in next year's Annual CEDS Update.

a. Route 3 North Transportation Improvement Project

The Route 3 North Transportation Improvement Project is being undertaken to address traffic congestion on State Highway Route 3 between I-95/Route 128 and the New Hampshire state line. The project involves the addition of a third travel lane in each direction for the entire 21-mile long corridor. The project also includes the addition of a median shoulder and a 30 foot clear recovery zone, inclusion of shoulders, improvements to thirteen interchanges, replacement of 30 bridges consisting of 41 separate structures, creation of an additional pair of travel lanes in each direction in certain areas to function as a collector/distributor system to aid in handling the high volume of traffic that moves between Route 3 and I-495, reconstruction of the Drum Hill Rotary, construction of a new northbound ramp at Concord Road interchange in Billerica, construction of two park and ride lots, and installation of Intelligent Transportation System ("ITS") components consistent with both the National ITS Architecture and the IVHS Strategic Deployment Plan for Metropolitan Boston. The ITS components being deployed in the project include variable message signs, blank out signs, roadside cameras for traffic surveillance, Remote Traffic Microwave Sensors, automated weather observation systems, and a link to the Regional Traffic Operations Center.

All bridges are being widened to accommodate the potential installation of additional fourth north/south travel lanes in the future. Improvements are also being made adjacent to Route 3 North, such as new signal timing and lane re-striping to facilitate movement through the corridor.

Governor Cellucci signed the legislation authorizing the design/build/finance process for Route 3 on August 12, 1999. The Request for Proposals (RFP) was issued on December 17, 1999 and three bidders submitted proposals on March 16, 2000. Modern Continental Construction was selected in April 2000, and the Notice to Proceed was issued on August 17, 2000. The Development Agreement requires that substantial completion occur within 42 months of the issuance of the Notice to Proceed. The project has remained on schedule with an estimated completion of October 2004.

This project has major economic implications for the region and its importance was noted in the Commonwealth's "Choosing to Compete" document. Once the improvements are completed

later this year, additional economic development opportunities will become available as a result of this project.

b. Acre Urban Development and Revitalization Plan

The Acre Urban Renewal Area is located in the southeast part of the Acre Neighborhood, west of downtown Lowell, in the area between the Pawtucket Canal and the Merrimack River. The Acre includes the North Common public housing development, North Common and the Western Canal.

The Acre has been the home to many immigrant groups in Lowell. Beginning in 1822 with the settlement of the Irish in the St. Patrick's Church area, the immigration continued with the Greeks, French Canadians and Latino immigrants and, more recently, the southeast Asians. The neighborhood has traditionally been one of the poorest neighborhoods in Lowell and has experienced blight, economic decay and high unemployment rates.

In 1999 the City of Lowell submitted an Urban Renewal Plan entitled "The Acre Urban Revitalization and Development Plan" to the Massachusetts Department of Housing and Community Development (DHCD) for its approval. According to the Development Plan, the City proposed "(I) direct intervention in the Area through the use of eminent domain for construction of public improvements and to assist private economic development, (ii) adoption of economic indicators throughout the Area, (iii) completion of public infrastructure improvements for traffic and public safety reasons, (iv) rezoning of the Area to facilitate removal of incompatible land uses, (v) commitment of housing incentive programs presently utilized by the City to this specific area, and (vi) a disposition mechanism to dispose of publicly held properties within this area for private redevelopment".

The City's proposed plan to redevelop the Acre was to:

1. Acquire 18.28 acres of the Area consisting of 9.19 acres of Clearance Area and 9.88 acres at fifteen Spot Clearance or Rehabilitation Areas. These acquisitions were designed to provide a site for a new 600-student middle school, twenty-eight units of privately developed housing, stabilize the existing housing stock, provide significant economic development opportunities and remove deficient, underutilized or obsolete buildings.
2. Adopt new zoning for the Area to increase residential and commercial uses and to resolve incompatible land uses.
3. Undertake infrastructure improvements in the Area as a means to improve traffic conditions and overall safety in the Area.
4. Adopt economic incentive programs for the Area, particularly in reference to the state's Economic Development Incentive Program (EDIP). The three major EDIP

incentives – abandoned tax credit for abandoned properties, investment tax credit for redevelopment and property tax relief between a property’s existing taxes and its redeveloped property taxes – provided extensive benefits for the Area.

5. Implement a comprehensive housing revitalization program through two parallel initiatives – the construction of 103 new housing units – 47 homeownership and 56 rental – and the rehabilitation of the existing housing stock.
6. Adopt design review procedure and design guidelines for the area.

DHCD approved the Urban Renewal Plan for the Acre in January 2000. In February 2000, new zoning was instituted and the Acre Neighborhood District was established. Public improvements have already begun on several streets with roadway repaving, brick sidewalks, historic curb setting, Victorian lighting and underground utility work underway. The environmental remediation of the \$24 million school project site is complete and construction began in early 2004. It is estimated that the total project cost would be \$55 million with a minimum of \$2 million from federal sources (EPA, HUD, and EDA), \$34 million from state sources (Urban Renewal and school funds) and \$1.5 million from local sources. The project will create more than 500 jobs and it is expected that EDA funding would be targeted to the Cushing Street development phase, which will create productive commercial and industrial uses with infrastructure improvements from vacant land. The Acre Urban Renewal Project supports the creation of new jobs for low- and moderate-income residents by transforming underutilized brownfield properties into productive uses.

c. Jackson/Appleton/Middlesex (JAM) Urban Renewal Area

The City of Lowell has established the Jackson/Appleton/Middlesex (JAM) Urban Renewal Area, which, according to the City of Lowell, contains more than fifty (50) acres of land in the southwest corner of the Central City area. This Project Area is bounded by Dutton Street on the north, by Central and Gorham Streets on the east, by Appleton and Summer Streets on the south and by Thorndike Street and the Lord Overpass on the west. This area has been largely underutilized, but has tremendous potential for new industrial, commercial and residential uses. According to an Advisory Services Panel Report on Lowell, Massachusetts completed by the Urban Land Institute in 2004, “the JAM area represents Lowell’s most significant opportunity for future growth and economic development”.

The JAM Project Area is comprised of a number of industrial, commercial and residential buildings which have deteriorated and, in many cases, been abandoned. This neighborhood is among the poorest in the City and has been an area where Southeast Asians, particularly Cambodians, have located their homes and businesses. The City of Lowell has focused on this area since 1985 when it began to work with neighborhood residents and business owners on the development of the initial Appleton/Middlesex Urban Renew Plan, which was completed in June 1987. Since that time, the City of Lowell has applied for and received designation of the area as the Lowell Central

Business District – South Economic Opportunity Area (EOA) from the State. The JAM Plan was completed in March of 2000 and subsequently approved by DHCD as an urban renewal area later in the year. The essential components are in place to encourage private investment and to revitalize this neighborhood.

The City's proposed plan to redevelop the Area, as outlined in the Urban Renewal area, is to:

- 1. Acquire more than eighteen (18) acres within the Project Area.** There will be one Clearance Area, eighteen (18) Spot Clearance sites and nine (9) Rehabilitation Areas. Six buildings within the Clearance Area and twenty-seven buildings in the Spot Clearance sites and Rehabilitation Areas have been targeted.
- 2. Adopt new zoning for the Area to increase residential and commercial uses and to resolve incompatible land use issues.**
A new zoning district for mixed commercial and residential development, industrial zoning between the Hamilton and Pawtucket Canals and amended current zoning to encourage street level commercial development will be instituted.
- 3. Undertake infrastructure improvements in the Area.**
These new improvements will include new reconstructed streets, pedestrian paths, sanitary and storm drains and open space opportunities.
- 4. Adopt economic incentive programs for the Area.**
With the designation of this area as an Economic Opportunity Area, three major incentives are available to businesses: an abandoned tax credit for abandoned properties, an investment tax credit for redevelopment and property tax relief on the increment between a property's existing taxes and its redeveloped property taxes. Businesses that need to be relocated from this area would be eligible for these tax incentives as well.

The JAM Plan currently proposes to develop or redevelop 100,000 square feet of industrial space, 75,000 square feet of retail space and 100,000 square feet of office space. In addition, vacant mill space will be redeveloped into Canal Place III, which will house eighty (80) market-rate housing units. Nineteen (19) deteriorated buildings will be removed and funding for new infrastructure – a widened street with dedicated turning lanes, two-way traffic on the current one-way Middlesex Street, streetscape improvements, two new city parks and additional parking facilities. The Lowell City Council has already approved a \$ 22 million bond for the construction of a parking facility with retail space (also includes infrastructure improvements to the street). At this time, the total project cost is estimated to be \$ 48 million with \$ 5 million from the federal government, \$ 500,000+ from the State and \$ 22 million + from the City of Lowell. It is expected that 533 jobs will be created as a result of this project. This project will

turn underutilized brownfields properties and other abandoned buildings into productive industrial, commercial and residential uses that will create jobs and affordable housing opportunities, revitalize a predominantly low income minority neighborhood and expand the City's tax base through increased private investment.

D. Documentation of CEDS Process

The CEDS Process outlined and implemented by NMCOG was designed to encourage as much “grass-roots” participation from economic development stakeholders in the City of Lowell and the surrounding communities as possible. NMCOG actually began the “grass-roots” CEDS process in June 2002 when it developed its mailing list of two hundred fifty (250) economic development stakeholders in the region. NMCOG then began to work on four different levels of activities – (1) developing, marketing, hosting and documenting ten (10) “grass-roots” meetings that represented the “heart” of the CEDS process, (2) hosting and documenting six (6) CEDS Committee meetings and incorporating the CEDS agenda on three (3) different NMCOG Board meetings, (3) developing project criteria and requesting projects on two different occasions and (4) developing, updating and writing the material that comprised the CEDS document.

During the initial phase of the “grass-roots” CEDS process, NMCOG utilized its own funds and matching funds from the City of Lowell to begin the process. This CEDS Process was placed on hold until NMCOG received a \$ 15,000 contract from EDA for the period from April 1, 2003 to March 31, 2004 that was also matched with NMCOG funds. The second phase of the CEDS process began on April 1st and helped complete the CEDS process and document.

The CEDS Process began with the CEDS Training Session on June 27, 2002 when the NMCOG staff provided a CEDS Power Point presentation for members of the CEDS Committee and NMCOG Board at NMCOG's Office in Lowell. The Kick-Off Meeting for the CEDS was held at Lowell City Hall on the evening of July 11th where an overview of the CEDS process and requirements and the proposed schedule for the “grass-roots” CEDS meetings was provided. As part of the process, it was determined that the CEDS “grass-roots” meetings should be scheduled throughout the region and not just in the City of Lowell. In keeping with this sentiment, the two Needs Analysis meetings were held at the Tewksbury Public Library on July 17th and the George P. Rogers Fire Station in Westford on July 18th. The two Vision meetings were held on July 24th at Billerica Town Hall and on July 25th at the Training Room of the Westford Police Department. The Action Plan I session was held at Chelmsford Town Hall on July 31st and the Action Plan II session was held at Pepperell Town Hall on August 1st.

The CEDS Committee met on August 8, 2002 to discuss the “grass-roots” meetings, the pre-application for EDA funding and the CEDS Project Criteria and Request for Proposals. Subsequently, the letter and project criteria from NMCOG requesting projects was sent to the local communities and other economic development stakeholders on August 12th and requested that project proposals be submitted to NMCOG no later

than August 26th. It was anticipated that this project information would be compiled in time for a scheduled Public Meeting on September 19th in Lowell. At this point, NMCOG learned that EDA funding would not be available until a later date and a decision was made to place the CEDS process on hold until additional information was received on EDA funding.

NMCOG worked with EDA to complete the pre-application and application for funding, as well as with the local entities to identify the required matching funds. EDA notified NMCOG that \$ 15,000 would be available beginning April 1, 2003 to complete the second phase of the CEDS process and document. Rita Potter, the EDA Representative for Massachusetts, Maine and New Hampshire, graciously appeared at the NMCOG Board meeting on April 16, 2003 to provide an overview of EDA's programs and to respond to specific questions from the NMCOG Board. The CEDS Committee met on June 12, 2003 at the NMCOG Office to review the EDA contract, the revised CEDS Workplan, and information on EDA Reauthorization.

The CEDS Committee next met on November 20, 2003 to review the Request for Proposals and draft portions of the CEDS document. The second Request for Proposals was issued on November 28, 2003 and the economic development stakeholders were requested to submit the information on their specific projects to NMCOG by January 9, 2004. A combined Needs Analysis and Vision "grass-roots" session was held in conjunction with the NMCOG Board meeting on December 17, 2003 at the LRTA Maintenance Facility in Lowell to review the information from the original Needs Analysis and Vision sessions, to provide updated information on the revised CEDS schedule and to outline additional information from the draft CEDS document. The Action Plan session at NMCOG's Office on January 22, 2004 provided an opportunity to share information on the projects that had been submitted by the economic development stakeholders and to encourage the submission of additional projects. The CEDS Committee met on January 29, 2004 to review the listing of the submitted projects and to endorse the NMCOG region's CEDS Priority Projects based upon their short-term, intermediate and long-term status. A Final CEDS Public Meeting was held on February 25, 2004 at the Community Room of the LRTA Maintenance Facility to receive comments on the summary CEDS document. Based upon the input from this meeting, the CEDS Committee endorsed the Greater Lowell CEDS for 2004-2008 on March 11, 2004 and recommended approval to the NMCOG Board. At their March 17th meeting the NMCOG Board approved the Greater Lowell CEDS for 2004-2008.

Copies of the agenda and participants for the "grass-roots" meetings have been included in Appendix III. Also included in Appendix III is the CEDS Committee meeting agenda and membership. The final minutes for the approval of the CEDS by the NMCOG Board on March 17, 2003 are also included.

Part IV – Evaluation

The most critical aspect of any plan is the evaluation component. Without an annual evaluation of the programmatic efforts being undertaken to achieve the stated Goals and Objectives, it is difficult for any organization to determine how successful they've been and what, if any, changes need to be made. NMCOG recognizes that the CEDS Committee, as overseer of the CEDS document, needs to assume this evaluative responsibility with staff support from NMCOG. It is also clear that the CEDS Committee and NMCOG do not have the sole responsibility for achieving the CEDS Goals and Objectives, but that it is also the responsibility of the other economic development stakeholders in the region. Obviously, NMCOG, as the lead economic development agency for the region needs to collect the necessary information during the year and report on it as part of the Annual CEDS Update. As part of this process, we will attempt to separate out what specific responsibilities are the responsibility of NMCOG and what activities fall under the purview of the other economic development stakeholders.

This section provides a description of the Evaluation Methodology to be utilized in order to evaluate the Greater Lowell CEDS program on a quantitative and qualitative basis. This initial Evaluation Methodology will be followed until it is revised by the CEDS Committee. Another issue to be addressed within this section is the State of the Regional Economy relative to Goal Attainment. The evaluation components have been broken out into three separate areas: the CEDS Implementation Process, the CEDS Goals and the CEDS Priority Projects. Each area is important to the overall success of the CEDS program in the Greater Lowell region.

A. The Evaluation Methodology

During the course of the next year, NMCOG will be scheduling two to four public meetings, as well as the four CEDS Committee meetings. These meetings will be scheduled in conjunction with another CEDS economic development stakeholder in the region, such as the Greater Lowell Chamber of Commerce or the Greater Lowell Workforce Investment Board. As part of these meetings, NMCOG will utilize a meeting evaluation form to determine how well the participants judged the session. To a large extent, the number of meetings scheduled will depend upon the amount of funding secured to support the CEDS process.

The Evaluation Methodology will be comprised of both quantitative and qualitative measures. Different quantitative measures will be assigned to the three separate areas under examination. These quantitative measures will reflect numbers of participants, number of approved projects, the number of requests for information and other measurable results. As a first step, we have developed evaluation criteria that are relevant to the specific activity, while also being within the control of NMCOG or another economic development stakeholder in the region. As the year proceeds, NMCOG will be able to fine-tune these quantitative measures and evaluation criteria to better reflect what success under the Greater Lowell CEDS program is and what appropriate and available measures to use.

Qualitative measures are more descriptive and not as “black and white” as quantitative measures. These measures answer the question: To what degree has the CEDS product or service been excellent, good, satisfactory or unsatisfactory? While quantitative measures will assign numbers to each of these descriptions, qualitative measures simply state the opinion of the evaluator, in

this case, the CEDS Committee or NMCOG staff. However, it is important to utilize both measures because numbers do not also tell the whole story in evaluating programmatic efforts.

B. State of the Regional Economy Relative to Goal Attainment under CEDS

The regional economy in the Greater Lowell area is slowly improving, although it is lagging behind other regions of the country. The population has been increasing over the years and the workforce has increased as well. These increases have been more predominant in some of the suburban communities than in the City of Lowell. The housing market has been quite active and at an all time high for housing prices, while the number of unemployed computer and information technology workers remains high as well. Obviously, there are mixed messages about the state of the regional economy and the prospects for improvement over the next five years.

At the time of the completion of the CEDS, the economic prospects for the region were optimistic, however, not yet realized. The Goals developed as a result of the CEDS “grass-roots” process takes into account the improving economy and the lack of affordable housing for the projected workforce. Also recognized is the importance of a skilled workforce and the educational institutions to provide the necessary training. The infrastructure needs of the region, particularly in terms of highway, road, water and sewer improvements, are a critical component of the future economy in the region. Targeting the limited available resources to pockets of distress within the region and utilizing the skills and abilities of the minority and low-income populations are essential elements to improving the quality of life in the region. The combined importance of Technology and Financial Investments to this region’s future economy, and the preservation of the quality of life in the region, have been recognized in this CEDS document.

The ability to attain the goals outlined in the CEDS will be dependent upon the availability of financial resources and the willingness of the economic development stakeholders to work in partnership for the region. While each community is developing their own Master Plans and Action Plans, the CEDS can provide the regional umbrella over these community efforts to create good-paying jobs and to maintain the quality of life in the region. The State of the Regional Economy has been taken into consideration in the development of the CEDS Goals for 2004-2008.

C. Evaluation of CEDS Implementation Process

The CEDS Implementation Process is an important component for the success of the CEDS program in Greater Lowell. NMCOG developed a mailing list of more than two hundred fifty economic development stakeholders within the region for the CEDS “grass-roots” process. This mailing list will be updated to include new contacts made through the concerted CEDS Marketing & Outreach effort. It will also be important to encourage more private sector and minority representatives to attend the public meetings and actively participate in next year’s CEDS process.

The critical components of the CEDS Implementation Process are the Levels of Participation, Data Development and Dissemination and CEDS Marketing & Outreach. These components are

consistent with the current roles and responsibilities of NMCOG, particularly the data development and dissemination component. Now that the CEDS document has been completed, NMCOG can market the document and reach out to economic development stakeholders throughout the region. Furthermore, in implementing what has been outlined in the CEDS document, NMCOG can schedule two to four public meetings and four CEDS Committee meetings and encourage greater participation than occurred during the CEDS development phase. NMCOG will be asking the CEDS Committee members if they wish to continue serving and will be adding some new members as well. The three components and their quantitative and qualitative measures and evaluation criteria are as follows:

A. Component One: Levels of Participation

The levels of participation at the public and CEDS Committee meetings are critical to the continuing success of the CEDS program. NMCOG needs to improve its recruitment effort in attracting people from various backgrounds to participate in the public meetings and to serve on the CEDS Committee. This effort is necessary in order to maintain the “grass-roots” nature of the CEDS process.

Quantitative Measures: Attendance at public and CEDS Committee meetings; affiliation of participants; number of evaluation forms submitted; updated mailing list.

Qualitative Measures: Opinions from evaluation forms on meetings; subject matter; follow-up comments on meetings; survey of CEDS Committee members.

Evaluation Criteria: 15-20 attendees (excellent)

10-15 attendees (good)

5-10 attendees (needs improvement)

75%+ evaluations completed (excellent)

50%+ evaluations completed (good)

< 50% evaluations completed (needs improvement)

B. Component Two: Data Development & Dissemination

NMCOG provides data to the general public and local communities on an ongoing basis. The additional role related to the CEDS complements the efforts NMCOG already makes to keep the public and member communities apprised of new data that impacts the area. Among the data provided are the U.S. Census, local and regional traffic counts, labor market information, housing affordability information, GIS maps and recent newspaper articles. NMCOG provides this information by telephone, mail and on its web site, www.nmcog.org. The private sector also contacts this office for data on the individual communities within the region. At some point, NMCOG will work with local communities to assemble information on a regional basis on available commercial and industrial space.

Quantitative Measures: Requests for data and information; number of hits on the NMCOG web site per month; types of information being requested; copies of the CEDS requested; and requests for presentations.

Qualitative Measures: Level of data available; information on the web page; mailings to local communities; and quality of data available.

Evaluation Criteria: 25-30 annual requests and referrals (excellent)
15+ annual requests and referrals (good)
< 15 annual requests and referrals (needs improvement)

C. Component Three: CEDS Marketing & Outreach

Now that the CEDS document has been completed, NMCOG can begin its marketing and outreach efforts to promote the CEDS. Presentations will be made before the Lowell City Council and the Boards of Selectmen in the towns, as well as before various businesses, social and community groups upon request. The effort under this component will provide increased level of participation under Component One summarized earlier. The CEDS document will also be on the NMCOG web site and, hopefully, will be linked with other web sites in the region. Increased marketing via the Lowell Sun and the community newspapers will be implemented once the CEDS document is approved by EDA

Quantitative Measures: Number of presentations before government, business, social and community groups; number of articles in the local newspapers or on the cable access channels; number of hits on the NMCOG web site; number of mailings sent to economic development stakeholders in the region related to the distribution of the CEDS or public meetings; and number of referrals to other agencies.

Qualitative Measures: Level of success in making presentations; additional contacts made as a result of marketing and outreach; and feedback from CEDS Committee members and NMCOG Councilors on response to CEDS document and presentations.

Evaluation Criteria: 10-15 presentations, articles or events (excellent)
5-9 presentations, articles or events (good)
< 5 presentations, articles or events (needs improvement)

D. Evaluation of Goals and Objectives

The establishment of quantitative and qualitative measures for the CEDS Goals is often more difficult to accomplish than dealing with the previous activities. Until there is sufficient programmatic experience, it is difficult to determine what the evaluation criteria should be in terms of total dollars or jobs created. There also needs to be additional capacity built to support this effort and a more established working relationship between NMCOG and the other economic development stakeholders in the region. Communities within the Greater Lowell region are more accustomed to working on their own economic development agendas than in

working together on a regional economic development agenda. However, previous experience working together on the Metropolitan Planning Organization in identifying transportation priorities for the region and addressing housing issues across the board have provided the necessary experience to build upon. Outlined below are our initial quantitative and qualitative measures and evaluation criteria for each Goal within this year's CEDS:

1. Goal One: Economic Development: Develop a regional economic development framework that supports the efforts of private industry, local communities and agencies, educational institutions, federal and state agencies and private foundations to create jobs and improve the quality of life in the region.

Quantitative Measures: Number of new jobs created; applications submitted to EDA for planning and public works funds and EDD designation; and completion of Annual CEDS Update for 2005.

Qualitative Measures: Development of regional economic development capacity; establishment of annual RFP process for CEDS projects; identification of additional economic development needs; establishment of permanent CEDS Committee and increased financial support for economic development projects in the region.

Evaluation Criteria: Two EDA grant applications submitted (excellent)
One EDA grant application submitted (good)
No EDA grant applications submitted (needs improvement)

2. Goal Two: Workforce Development: Increase the supply of skilled workers for industry in the region through the integration of the economic development and workforce development systems.

Quantitative Measures: Reduction of unemployment rate through successful training programs; number of new programs funded; increase in number of trainees; number of additional companies serviced; and number of minority and low-income workers trained and employed.

Qualitative Measures: Integration of economic development and workforce development systems; new workforce development programs to address unemployed and underemployed; information sharing with the Greater Lowell Workforce Investment Board; responsiveness to layoffs in the region and new training programs designed to address future labor market needs.

Evaluation Criteria: New training programs, companies serviced and number of graduates.
6-10 (excellent)
2-5 (good)
1 (needs improvement)

3. Goal Three: Education: Improve the educational and workforce skills of primary, secondary and college students to meet the needs of industry in the future.

Quantitative Measures: Number of graduates from area colleges and high schools; MCAS Scores; SAT scores; placements of new graduates; new programs tying together school and work; and number of GED certificates awarded.

Qualitative Measures: School rankings based upon MCAS scores and college ratings; number of students who graduate from local colleges and stay in the area and reputation of educational institutions.

Evaluation Criteria: Educational initiatives
3 (excellent)
2 (good)
1 (needs improvement)

4. Goal Four: Affordable Housing: Create more affordable housing throughout the region to ensure that businesses can expand and relocate to the region with assurance that their workforce will be able to afford their housing.

Quantitative Measures: Number of new 40B housing units; housing productivity plans completed; new housing units; new residential building permits; increased housing subsidies from federal and state sources; and housing values.

Qualitative Measures: Response from business community on housing needs; general newspaper articles; housing values; and non-profit housing activities in the region.

Evaluation Criteria: Number of efforts addressing affordable housing.
5 (excellent)
3-4 (good)
2 (needs improvement)

5. Goal Five: Racial and Ethnic Diversity: Increase the opportunities available to minority and low-income communities in the region to participate in the expansion of the regional economy.

Quantitative Measures: Number of contacts with minority and low-income agencies; additional participants at CEDS public meetings; additional representation on the CEDS Committee; presentations to social, civic and cultural organizations; and outreach to the minority and low-income community.

Qualitative Measures: Environmental Justice status in region; involvement of minority and low-income communities; increased participation in CEDS meetings; increased representation in local government; and multi-lingual signage to address cultural and language barriers.

Evaluation Criteria: Contacts with minority and low-income agencies.
20 (excellent)
15-19 (good)
< 15 (needs improvement)

6. Goal Six: Pockets of Distress: Target assistance to those neighborhoods and communities in the region that have not shared the economic benefits of the regional economy.

Quantitative Measures: Funds invested in the City of Lowell; EDA funding received; number of layoffs within the region; number of unemployed in the region; number of residents below 80% of the national per capita income rate; and number of minority and low-income residents.

Qualitative Measures: Status of urban neighborhoods; blight, crime, and unemployment statistics; newspaper articles on improvements to the Acre and JAM Plan areas; CDBG investments; and funding shortages.

Evaluation Criteria: EDA Public Works Grant for the City
1 (excellent)
0 (needs improvement)

7. Goal Seven: Regional Transportation System: Develop the infrastructure needed to build upon the strengths of the regional highway system and the public transportation network to enhance access to the economic centers of the region.

Quantitative Measures: Number of transportation projects implemented; funding received for the LRTA, improvement in bridge ratings and safety measurements for roads; and completion of Route 3 project.

Qualitative Measures: TIP projects moved forward; bids advertised; travel time along the highways and roadways; quality of travel; travel to work information; and technological improvements.

Evaluation Criteria: Projects implemented.
3 (excellent)
2 (good)
1 (needs improvement)

8. Goal Eight: Quality of Life: Maintain the community character in the region by preserving and protecting the region’s natural, cultural and historic resources and encouraging concentrated development.

Quantitative Measures: Number of environmental reviews conducted annually; number of historic preservation projects funded; amount of open space preserved; number of walking and bicycle trails funded; and number of tourists.

Qualitative Measures: “Smart Growth” initiatives; air quality; increase in tourism opportunities; growth of artist community; quality of water; and walking and bicycle trails completed.

Evaluation Criteria: Environmental reviews conducted annually.
15 (excellent)
10-14 (good)
< 14 (needs improvement)

9. Goal Nine: Technology: Enhance the region’s strengths within its “cluster industries” by promoting technological advancements and expanding the technological infrastructure in the region.

Quantitative Measures: Growth in employment in “cluster industries”; number of biotechnology or nanotechnology firms; number of new start-ups from incubator space at UMass Lowell; number of new companies in renovated mill space; and number of graduates in the technical sciences from UMass Lowell.

Qualitative Measures: Reputation of the region as a technological center; newspaper articles on new businesses; technological improvements initiated by UMass Lowell; and information on digital access in the region.

Evaluation Criteria: New technological advancements.
5 (excellent)
3-4 (good)
< 3 (needs improvement)

10. Goal Ten: Financial Investments: Target federal, state, local, non-profit and private funds to those projects that create jobs and improve the quality of life in the neighborhoods.

Quantitative Measures: New regional lending program; amount of New Market Tax Credits accessed; amount of private investment targeted to the region; number of federal and state grants that create jobs; amount of EDA investment; and number of banking institutions serving the region.

Qualitative Measures: Reputation of area as a place to invest private funds; ability to complete projects; public-private partnerships; collaboration among public agencies; leveraging private investments and eligibility for funding.

Evaluation Criteria: New federal/state grants to create jobs.

5 (excellent)

3-4 good

< 3 (needs improvement)

E. Evaluation of CEDS Priority Projects

The CEDS Priority Projects represent a major component of the overall CEDS effort. These projects are funded by multiple funding sources and each one addresses a specific goal or goals within the CEDS. These projects are important to the local communities and non-profit agencies that sponsored them and have been included because they help move the Greater Lowell region closer to its Vision. A limited number of projects are eligible for EDA funding and will be reported on separate from the other projects. Many of the transportation projects included on the regional Transportation Improvement Program are dependent upon passage of federal legislation, as well as changing state priorities. In essence, this component will be deemed to be successful if projects are implemented, there is movement from the Short-Term, Intermediate and Long-Term project priority lists and new projects are submitted each year.

Quantitative Measures: Number of projects implemented; number of EDA projects funded; number of projects moving from the Long-Term and Intermediate lists to the Intermediate and Short-Term lists; number of new projects submitted; number of jobs created; and funding of EDA Planning grant and designation of the Greater Lowell region as an Economic Development District (EDD).

Qualitative Measures: Quality of projects moving forward; movement from the Long-Term and Intermediate lists to the Intermediate and Short-term lists; types of new projects submitted; goals addressed in new projects; and number of EDA projects submitted.

Evaluation Criteria: 5+ projects moving forward (excellent)
2-4 projects moving forward (good)
1 project moving forward (needs improvement)

APPENDICES

Appendix I: SEE APPENDIX I FOLDER

- Map 1 – Site Location Map
- Map 2 – Transportation Infrastructure
- Map 3 – Land Use and Development Pressure
- Map 4 – Water Infrastructure
- Map 5 – Sewer Infrastructure
- Map 6 – Protected Open Space, Recreational & Cultural Landscapes
- Map 7 – Environmental Resources
- Map 8 – Water Resources

Appendix II: SEE APPENDIX II FOLDER

- Table 1 – Population Figures: 1990 and 2000
- Table 2 – Economic Data: 1990 and 2000
- Table 3 – Major Employers in the NMCOG Region – 1999 and 2004
- Table 4 – Housing Sales (2001-2003) in the NMCOG Region
- Table 5 – Median Sales Prices (2001-2003) in the NMCOG Region
- Table 6 – Build-Out Study Comparisons

Appendix III: AVAILABLE UPON REQUEST

- Initial Schedule of Meetings
- Kick-Off Meeting Agenda
- Needs Analysis I Agenda
- Needs Analysis II Agenda
- Needs Analysis I and II Notes
- Vision I Agenda
- Vision II Agenda
- Vision I and II Notes
- Action I Agenda
- Action II Agenda
- Action I and II Notes
- Needs Analysis and Vision Agenda
- Action Plan Agenda
- Final CEDS Meeting Agenda
- CEDS Committee Members
- CEDS Training Session Agenda
- 8/8/02 CEDS Committee Agenda
- 6/12/03 CEDS Committee Agenda
- 11/20/03 CEDS Committee Agenda
- 1/29/04 CEDS Committee Agenda
- 3/11/04 CEDS Committee Agenda
- NMCOG Board Members**
- 3/17/04 NMCOG Board Minutes

Appendix IV: AVAILABLE UPON REQUEST

- Newspaper Articles