

**Greater Lowell
COMPREHENSIVE ECONOMIC
DEVELOPMENT STRATEGY
(CEDS)
2009-2013**

**Prepared by:
Northern Middlesex Council of Governments
Lowell, MA 01852**

ACKNOWLEDGEMENTS

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NMCOG wishes to acknowledge the active participation of the Greater Lowell CEDS Committee members:

Francisco J. Carvalho	Theresa Park
Professor Victoria Fahlberg	Osvalda Rodrigues
Gerard Frechette	Steve Sadwick
Robert Halpin	Mark Scolnick
Stacie Hargis	Sophy Suon
William Lipchitz	Steve Themelis
Barbara O’Neill	Arthur Williams
Jeanne Osborn	

NMCOG wishes to thank Theresa Park of the City of Lowell’s Department of Planning & Development and Stacie Hargis of Congresswoman Niki Tsongas’ Office for their active support and participation. Additionally, the CEDS document would not have been possible without the active involvement of the region’s economic development stakeholders at our “grass-roots” meetings.

NMCOG thanks the Council for their ongoing support and leadership and acknowledges the contributions made by the following individuals:

James Silva, Chairman

Beverly Woods, Executive Director

Jay J. Donovan, Assistant Director

Courtney Knapp, Economic Development and Housing Planner

Shaun Logue, Chief Editor



Northern Middlesex Council of Governments

August 31, 2010

A Multi-Disciplinary
Regional Planning
Agency Serving:

Willie C. Taylor
Regional Director
Economic Development Administration
Philadelphia Regional Office
601 Walnut Street, Suite 1405
Philadelphia, Pennsylvania 19106-3821

Dear Mr. Taylor:

Billerica
Chelmsford
Dracut
Dunstable
Lowell
Pepperell
Tewksbury
Tyngsborough
Westford

The Northern Middlesex Council of Governments (NMCOG) is pleased to submit its 2009-2013 Comprehensive Economic Development Strategy (CEDS) for the Greater Lowell region. The submission of this “grass-roots” document reflects the strong partnership between NMCOG, the region’s economic development stakeholders, and the Economic Development Administration (EDA). Since the submission of the previous Five-Year CEDS in 2004, NMCOG has worked to ensure that the ten goals identified in the CEDS document were implemented in a manner that proactively responded to economic threats and opportunities.

The submission of this Five-Year CEDS reflects the continued commitment of NMCOG and the economic development stakeholders to follow the outlined Action Plan, to evaluate the performance of NMCOG and its economic development stakeholders in attaining the specified Goals and Objectives on an annual basis, and to develop and submit Annual CEDS Updates to reflect the economic and programmatic changes occurring in the Greater Lowell region between 2009 and 2013. The CEDS document has been developed through “grass-roots” meetings, the participation of the CEDS Committee and the oversight of the NMCOG Board. This document provides a blueprint for the next five years to address the economic problems currently affecting the Greater Lowell region, while striking a balance between economic development initiatives and maintaining the quality of life that residents, visitors and business people find so rewarding. This work is particularly important as the region and the nation move toward an economic recovery following this most recent recession.

NMCOG appreciates the participation of EDA in funding the CEDS planning grant for NMCOG, allowing this continuous, comprehensive economic development planning process to be maintained. NMCOG will be developing and submitting a future planning grant application in order to continue this partnership. In addition, the region is pleased with EDA’s award of a public works grant for the Hamilton Canal District redevelopment project in Lowell,

James G. Silva
Chair

Beverly A. Woods
Executive Director

40 Church Street, Suite 200
Lowell, MA
01852-2686

TEL: (978) 454.8021

FAX: (978) 454-8023

www.nmco.org

MA. The funding of this project has served to create badly needed jobs in an area where the unemployment rate remains consistently above the national average.

We appreciate the assistance of Matthew Suchodolski, Economic Development Specialist, during the CEDS development process. In particular, we appreciate the flexibility that EDA has shown as we dealt with some staffing issues and the increased workload resulting from the ARRA program. We are pleased to report that our efforts have successfully brought several million dollars in ARRA funding to the region, thereby resulting in many additional jobs for area workers.

We look forward to working with you and the entire EDA staff in Philadelphia as we continue our partnership. Please feel free to contact me directly at (978) 454-8021, x 20 or Jay Donovan, Assistant Director, at x 16, if you have any questions or require additional information.

Sincerely,

A handwritten signature in cursive script that reads "Beverly Woods".

Beverly Woods
Executive Director

cc: Stephen Grady, North Atlantic Area Director, EDA
Matthew Suchodolski, Economic Development Specialist, EDA
Jay J. Donovan, Assistant Director, NMCOG

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Greater Lowell CEDS Committee
Agenda and Minutes for CEDS Committee Meetings

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NMCOG Council List
Agenda and Minutes for September 16, 2009 Council Meeting

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Memorandum on CEDS Priority Projects
Priority Project Criteria
NMCOG CEDS Project Description

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Workforce Development Forum

Notice of Workforce Development Forum
Workforce Development Forum Program Summary
GLWIB Newsletter

SWOT Sessions

SWOT Session Public Notice
Agenda for Lowell SWOT Session
Meeting Notes for Lowell SWOT Session
Agenda for Tewksbury SWOT Session
Meeting Notes for Tewksbury SWOT Session

Public Meeting

Notice for Public Meeting to Present the Draft CEDS
Agenda for CEDS Public Meeting

Appendix VII: Newspaper Articles

Part I: Comprehensive Needs Analysis

The Comprehensive Analysis section of the *Greater Lowell Comprehensive Economic Development Strategy (CEDS) for 2009-2013* is comprised of three major sections: Background, The Regional Economy and The Region's Future. The Background section provides an overview of the Greater Lowell region in terms of its geography, population, land use and zoning, infrastructure and environment. The Regional Economy section provides an update from both the *Greater Lowell Comprehensive Economic Development Strategy (CEDS) for 2004-2008* and the *Greater Lowell annual CEDS Update for 2008*. Due to the national housing crisis and recession since December 2007, this region has been negatively impacted and the regional economy is quite different from that in 2004. These differences in the regional economy and housing market require new strategies as outlined in Part II (Vision Statement, Goals and Objectives) and Part III (Action Plan). The final section, entitled The Region's Future, incorporates the "grass-roots" input received from our economic development stakeholders at the two Strengths, Weaknesses, Opportunities and Threats (SWOT) sessions, as well as the ongoing input we've received from the Greater Lowell CEDS Committee and the NMCOG Council. This section reviews the land development potential in the region, which also includes redevelopment opportunities in our more fully developed communities, and identifies the partners and resources that will assist us in attaining our established CEDS Goals and Objectives. Finally, this section concludes with a component on Future Economic Strategies, which has been developed through the earlier sections and forms the framework for the CEDS Goals and Objectives and Action Plan.

A. Background

The Background section of the Comprehensive Analysis updates the information contained in the *Greater Lowell Comprehensive Economic Development Strategy (CEDS) for 2004-2008* and focuses upon six specific areas: Geographic Description, Regional Profile, Land Use and Zoning, Infrastructure (Transportation, Water and Sewer, Utilities), and the Environment, which addresses a number of quality of life issues in the Greater Lowell region. This information is intended to provide the reader with sufficient background information on the Greater Lowell region to appreciate the initiatives outlined in later sections.

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 approximately 195 square miles and an inland water area of 5.76 square miles. The City of Lowell serves as the central city and economic center of the Greater Lowell region. The Greater Lowell region had a population of 263,656 in 1990, 281,225 in 2000 and an estimated population of 281,617 in 2007, according to the U.S. Census. As illustrated by these figures, the population growth has leveled off substantially from 6.7% between 1990 and 2000 and .14% between 2000 and 2007. The 2010 U.S. Census will more accurately identify the growth that has occurred during this past decade. 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

Manchester, New Hampshire and an hour from the City of Worcester and Portsmouth, New Hampshire.

The City of Lowell had a population of 105,167 in 2000 and an estimated population of 100,659 in 2007. There has been significant housing development in the downtown area during the past five years that may not be reflected in these estimated population figures. Formerly part of the Lowell MA NH Primary Metropolitan Statistical Area (PMSA), the Greater Lowell region has been re-defined based upon changes made by the U.S. Office of Management and Budget (OMB). Within New England, OMB has established New England City and Town Areas (NECTAs) that use towns instead of counties to define various labor market areas. Those areas with an urban core with a population larger than 50,000 are defined as Metropolitan NECTAs, while those areas with urban cores less than 50,000 are described as Micropolitan NECTAs. The Greater Lowell region is principally part of the Boston-Cambridge-Quincy, MA-NH Micropolitan NECTA and the Lowell-Billerica-Chelmsford, MA-NH NECTA Division (also includes the town of Pelham, New Hampshire). The town of Pepperell falls within the Worcester, MA-CT Metropolitan NECTA. The suburban communities in the Greater Lowell region 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. Former residents of this area continue to move to New Hampshire and maintain their connections to this region through the Merrimack River and the highway network comprised largely of Routes 3, I-93 and I-495.

2. Regional Profile

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 tanning, blacksmithing, coppering, 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 1790s, 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 this 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 a labor force that worked along Route 128. The expansion of Route 3 during the past five years has increased the economic opportunities in the region and enhanced the connections to Route 128 and New Hampshire.

Development pressures in the region shifted from the City of Lowell to the other communities, particularly Billerica, Chelmsford and Tewksbury, in the 1970s and 1980s. Manufacturing continued to decline in the 1970s 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 1980s, 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 1980s and early 1990s, the region experienced a large number of layoffs in the computer and military equipment industries. It wasn't until the mid-1990s 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. During the mid-2000s the Greater Lowell region enjoyed a diversified economy that did not rely as heavily on the City of Lowell or Route 128, as it had in the past, but, rather, expanded economic opportunities in the suburban communities and in New Hampshire. As will be shown in the economic analysis, the overall economy has suffered as a result of the housing crisis and national recession. The Greater Lowell region has been experiencing unemployment rates that haven't been seen in this area for thirty years. The *Greater Lowell Comprehensive Economic Development Strategy (CEDS) for 2009-2013* will attempt to outline an economic development strategy to address these negative economic issues as the region has done for the last two hundred years.

3. Greater Lowell Population

This section is designed to provide an update on the population in the Greater Lowell region from what has been provided previously in the *Greater Lowell Comprehensive Economic Development Strategy (CEDS) for 2004-2008*. Since there has not been a decennial census since 2000, the population figures include estimated population estimates by the U.S. Census as of 2007 and recent MassHighway population projections through 2010, 2020 and 2030. In addition to the population figures, the specific social and economic characteristics of the population – race and Hispanic origin, foreign born, age groups, school enrollment and attainment, households, families, income (per capita and median income per household and family) and poverty status – are updated as well. This overview provides a better up-to-date appreciation for the special characteristics of the residents in the NMCOG region.

a. Population and Growth Rates

As discussed in the *Greater Lowell Comprehensive Economic Development Strategy (CEDS) for 2004-2008*, the population in the Greater Lowell region has increased substantially since 1960. Between 1960 and 2000, the population grew by 79.5% from 169,403 to 281,225, respectively. Over the past seven years, the region has continued to grow, albeit less dramatically than in past decades. Based upon population projections developed by the Massachusetts Highway Department with input from NMCOG, the region is expected to grow by an additional 21,000 residents (6.9%) between 2010 and 2020 and another 18,800 residents (5.8%) between 2020 and 2030. The region, as a whole, is projected to grow by 22.3% between 2000 and 2030, which represents a much greater growth rate than that experienced between 2000 and 2007 (1.3%).

The data summarized below in Table 1 reflects anticipated population trends over the next two decades. The region as a whole is expected to grow by 22.3% between 2000 and 2030. Both the Town of Dunstable and the Town of Pepperell are expected to dramatically increase in total population, with growth rates of 116.3% and 101.5%, respectively. Communities that are more developed, such as Billerica, Chelmsford, and the City of Lowell, are expected to see less dramatic population growth in the coming years, while the remaining towns in the region have anticipated growth rates falling between 15.3% (Tewksbury) and 51% (Westford).

Table 1: Greater Lowell Population: 2000-2030

Community	2000	2007	2010	2020	2030	Growth Rate, 2000-2030
Billerica	38,981	39,738	40,020	41,090	42,150	8.1%
Chelmsford	33,858	32,443	34,920	36,110	37,500	10.8%
Dracut	28,562	28,735	33,408	36,900	40,300	41.1%
Dunstable	2,829	3,231*	3,780	4,850	6,120	116.3%
Lowell	105,167	100,659	108,210	111,200	113,270	7.7%
Pepperell	11,142	11,586*	14,510	18,600	22,450	101.5%
Tewksbury	28,851	31,071	30,915	32,300	33,270	15.3%
Tyngsborough	11,081	11,359*	13,430	15,400	17,400	56.2%
Westford	20,754	22,795	24,807	28,490	31,340	51%
NMCOG Region	281,225	281,617	304,000	325,000	343,800	22.3%

Source: U. S. Census for 2000; 2005-2007 American Community Survey; Claritis, Inc. 2007 Estimates for Dunstable, Pepperell, and Tyngsborough developed by Claritis, Inc. Projections for 2010 through 2030 developed by the Massachusetts Highway Department

b. Population Composition by Race, Ethnicity, and Foreign Born Status

This section examines trends in the region’s population in terms of racial diversity and foreign born populations. First, a comparison of the racial composition of communities is made for the years 2000 and 2007. Second, an examination of trends in the number of foreign born residents living in the region for the same seven year time period is offered. This analysis is followed by a look at when different immigrant populations immigrated to the United States. Finally, the diverse foreign born population in the region is analyzed in terms of their respective countries of origin.

i. Racial Diversity

The City of Lowell is incredibly diverse in terms of its racial and ethnic composition. Considered to be one of Massachusetts’s several “Gateway Cities” because its social services, infrastructure, and relative affordability makes it accessible to many different types of people, especially new immigrants and their families, in many ways Lowell is a model for the 21st Century global urban center. The City boasts the second largest Cambodian refugee community in the United States¹, and the number of nonwhite residents has steadily increased since the middle of the 20th century. In 2007, approximately 54.7% of Lowell residents identified as “White alone,” down from 62% of the population in 2000. As illustrated in Table 2 below, the other three racial groups to experience population decline between 2000 and 2007 were American Indians/Native Americans (-37.6%), Native Hawaiian/ Pacific Islanders (-97.1%), and Multiracial residents (-42%). Groups experiencing population growth were the Black/African American community (45.8%), Hispanic/Latinos (23.7%), Asians (12.4%), and those who identify as “Other” (1,796%).

Table 2: Racial Composition of the City of Lowell: 2000 and 2007

	2000	Percent of Total	2007	Percent of Total	Percent Change, 2000 to 2007
Total Population	105,703	100%	115,534	100%	9.3%
White Alone	65,523	62%	63,235	54.7%	-3.5%
Black/African American Alone	3,696	3.5%	5,389	4.7%	45.8%
Hispanic/ Latino (All Races)	14,530	13.7%	14,875	12.9%	23.7%
American Indian Alone	335	0.3%	209	0.2%	-37.6%
Asian Alone	17,119	16.2%	19,250	16.7%	12.4%
Native Hawaiian/ Pacific Islander Alone	559	0.5%	16	0.01%	-97.1%
Other Race, Alone	559	0.5%	10,600	9.2%	1,796%
Multiracial	3,382	3.2%	1,960	1.7%	-42%

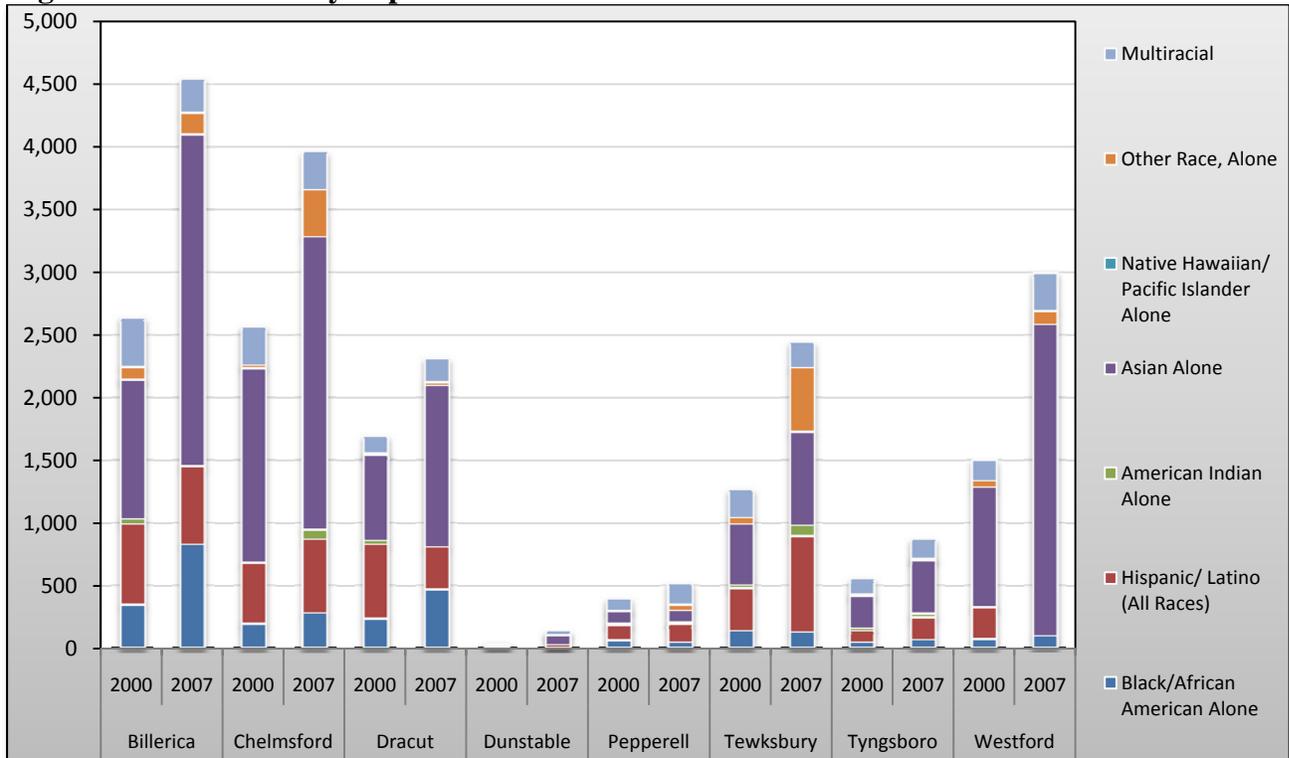
Source: US Census 2000; 2005-2007 American Community Survey

The eight NMCOG towns surrounding the City of Lowell have also seen increases in the number of non-white residents over the past several years, particularly among Asian, Hispanic/Latino, and Black/African American individuals and families. It is worth noting, however, that all eight of these towns continue to be predominantly white. In 2007, the “white alone” populations in these communities were: Billerica (88.7%), Chelmsford (88%), Dracut (92%), Dunstable (95.8%), Pepperell (95.6%), Tewksbury (92.3%), Tyngsborough (92.5%), and Westford (86.9%).

¹ Long Beach, CA

Figure 1 below illustrates changes in the composition of racial minority communities in the eight NMGOC towns between 2000 and 2007. Notably, the total nonwhite populations in Dunstable increased nearly four-fold, from 38 nonwhite residents in 2000 to 136 residents in 2007. Additionally, the nonwhite populations in Tyngsborough (92.7%) and Westford (99%) nearly doubled, while nonwhite populations increased in Billerica (72%), Chelmsford (54.2%), Dracut (36.6%), Pepperell (31%), and Tewksbury (56.5%).

Figure 1: Total Minority Populations in the NMGOC Suburban Communities: 2000 and 2007



Source: U.S. Census for 2000 and American Community Survey 2005-2007; Claritis, Inc.

ii. Foreign-Born Populations

The City of Lowell has long been a gateway for immigrants moving to the United States. In the late 19th and early 20th centuries, European immigrants settled in the City. Today, East and South Asian, South American, Caribbean, and African communities are predominant. Many of these immigrant communities are expanding into the region’s suburban towns, as well. Between 2000 and 2007, the foreign-born population in all of the communities for which data is available increased, as illustrated in Table 3 on the next page.

In 2000, the City of Lowell had by far the highest percentage of foreign-born residents with 22.1% of the population born outside of the United States. The other eight communities had more modest immigrant communities, with foreign born population rates ranging from 3.4% in Dunstable to 7.1% in Chelmsford. Seven years later, the immigrant communities had increased in at least six of the

nine communities² in the NMCOG region. Billerica’s immigrant population grew by 38.7%, from 2,426 individuals in 2000 to 3,425 in 2007, while Chelmsford, Dracut, and Lowell’s foreign-born populations increased by 53.5%, 31.5%, and 19.5%, respectively. Based on the available data, the Town of Tewksbury saw the smallest growth, with their immigrant population increasing from 5.8% in 2000 to 6.3% in 2007 (an 8.6% increase). Conversely, the Town of Westford experienced the greatest amount of growth in their foreign-born population between 2000 and 2007, jumping from 6.3% in the former year to 11.5% in the latter (an 82% increase).

Table 3: Foreign-Born Population in NMCOG Communities: 2000 to 2007

Community	2000		2007		Percent Increase, 2000 to 2007
	Number	Percent of Total Population	Number	Percent of Total Population	
Billerica	2,426	6.2%	3,435	8.6%	38.7%
Chelmsford	2,418	7.1%	3,546	10.9%	53.5%
Dracut	1,553	5.4%	2,040	7.1%	31.5%
Dunstable	97	3.4%	N/A	N/A	N/A
Lowell	22,267	22.1%	26,543	26.4%	19.5%
Pepperell	426	3.8%	N/A	N/A	N/A
Tewksbury	1,675	5.8%	1,969	6.3%	8.6%
Tyngsborough	536	4.8%	N/A	N/A	N/A
Westford	1,312	6.3%	2,632	11.5%	82%

Source: US Census Bureau 2000 and American Community Survey 2005-2007

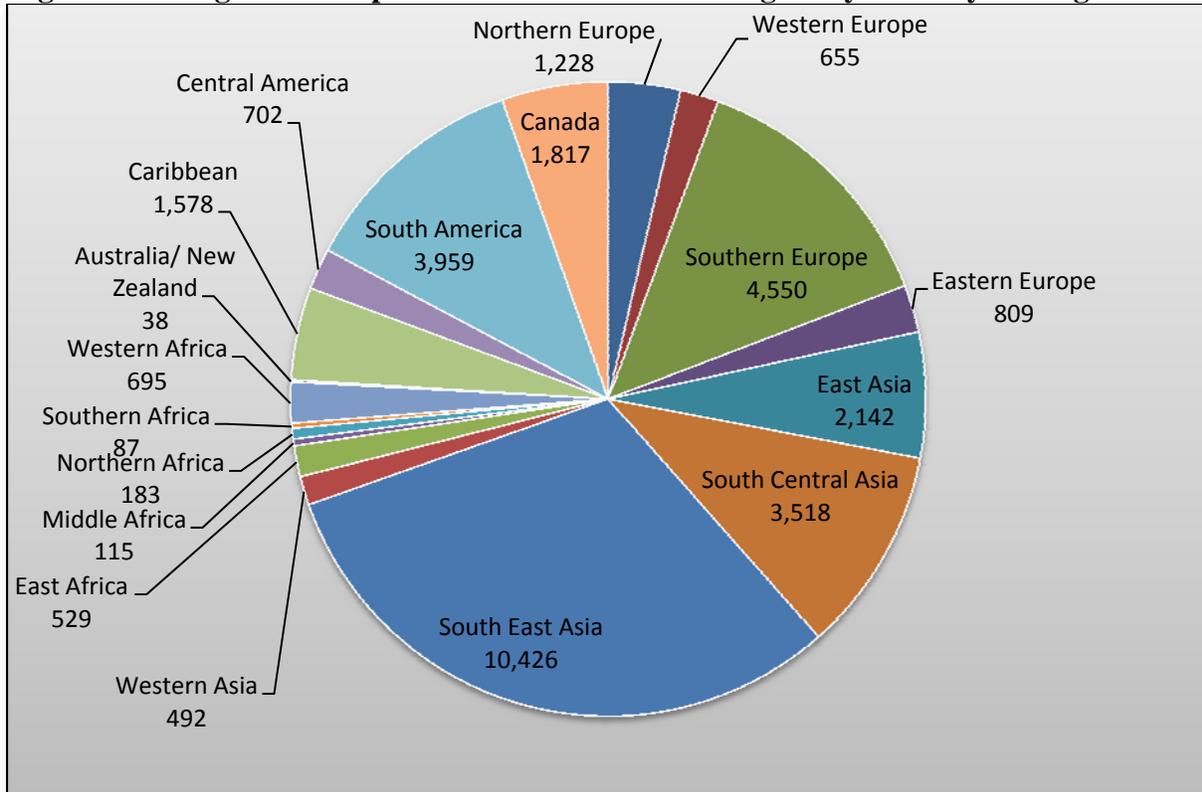
Data collected from the 2000 U.S. Census measures trends in the influx of non-native populations to the region by comparing the period in which individuals immigrated to the region to where they migrated from. In terms of some of the older immigrant communities, more than two-thirds (68.8%) of European immigrants living in the NMCOG region in 2000 moved to the United States prior to 1980, while 16.3% emigrated during the 1980s and 14.8% emigrated in the 1990s. Similarly, 76.4% of foreign-born individuals who migrated from Canada arrived in the United States prior to 1980.

Comparatively, there are a number of immigrant populations living in the region, which at the time of the 2000 U.S. Census had been in the United States for twenty years or less. Only 8.2% of Asian immigrants living in the region arrived in the United States prior to 1980, while the majority (55.4%) emigrated during the 1980s, and roughly a third (36.4%) emigrated between 1990 and March 2000. People emigrating from the Caribbean have arrived steadily throughout the decades, with 20.2% emigrating prior to 1980, 33.6% emigrating between 1980 and 1989, and another 46.2% arriving in the 1990s. Similarly, 19.9% of Central American and Mexican immigrants arrived prior to 1980, while 35.3% emigrated during the 1980s and 44.7% emigrated during the 1990’s. South American and African immigrants have similar migration patterns. Ten percent (10.4%) of South American immigrants arrived prior to 1980, while 21.2% arrived in the 1980s and more than two-thirds (68.5%) arrived in the 1990s. In comparison, 11.5% of African immigrants arrived prior to 1980, 23.6% arrived in the 1980s, and 64.9% arrived in the 1990s.

² Foreign-born population estimates were not calculated by Claritis, Inc. for Dunstable, Pepperell, or Tyngsborough—the three towns in the region where the 2005-2007 American Community Survey was not administered. However, given larger immigration trends across the region, one can assume that the foreign born populations in these three towns also increased between 2000 and 2007.

Figure 2 below offers a breakdown of the foreign-born population living in the region by their respective countries of origin. By far, the largest proportion of the region’s immigrant population, in 2000, was from Asia-- particularly South East Asia (10,426), South Central Asia (3,518), and East Asia (2,142). Southern Europeans (4,550) and South and Central Americans (3,959 and 702, respectively) were also prevalent, as were immigrants from Canada, the Caribbean and all regions of Africa. In sum, the Northern Middlesex region is an increasingly diverse area in terms of race, ethnicity, and the countries from which new residents arrive. Although most of this diversity is concentrated in the City of Lowell, the eight suburban towns surrounding the city are increasingly becoming multi-cultural communities.

Figure 2: Foreign-Born Populations in the NMCOG Region by Country of Origin in 2000



Source: US Census Bureau 2000

c. Population by Age Cohort

The composition of the NMCOG region’s population by age cohort offers insight into the region’s youth, workforce population, and retired communities. Age cohort analyses often form the basis of market studies, school enrollment projections and labor force participation analyses.

As outlined in Table 4 on the following page, the greatest portion of the region’s population was middle-aged in 2007. Twenty-five to thirty-four year olds comprised 12% of the region’s population, thirty-five to forty-nine year olds made up another 24.6%, and fifty to sixty-four year olds totaled 18.4% of the region’s 281,526 residents.

Youth and young adults made up the second largest age group in the region in 2007. Children under the age of ten comprised 13.3% of the region's total population, while ten to seventeen year olds and eighteen to twenty-four year olds totaled 11.9% and 8.5%, respectively. Seniors ages sixty-five to seventy-four comprised 6.2% of the region's population, while individuals over the age of seventy-five represented the smallest age cohort, at 5.3% of the region's total population. The towns of Dunstable (29.3%), Tyngsborough (28.9%), and Westford (29.7%) were the three communities with the highest percentage of their populations comprised of youth under the age of 18. Billerica (10.2%), Chelmsford (15%), Lowell (10.2%), and Tewksbury (16.6%) had the highest percentages of seniors (65 and over).

Table 4: Population by Age Cohort in 2007 for NMCOG Communities

		0 - 9 years	10 - 17 years	18 - 24 years	25 - 34 years	35 - 49 years	50 - 64 years	65 - 74 years	75 years or older
Billerica	Number	5,941	4,363	2,725	4,942	10,014	7,699	2,842	1,212
	Percent	15	11	6.9	12.4	25.2	19.4	7.2	3
Chelmsford	Number	3,881	3,722	2,083	2,868	8,696	6,315	2,793	2,085
	Percent	12	11.5	6.4	8.8	26.8	19.5	8.6	6.4
Dracut	Number	3,589	2,971	2,061	3,673	7,066	5,867	1,444	2,064
	Percent	12.5	10.3	7.2	12.8	25	20.4	5	7.2
Dunstable	Number	511	443	255	217	839	685	184	97
	Percent	15.8	13.7	8	6.7	26	21.2	6	3
Lowell	Number	13,051	11,795	11,261	15,440	22,215	16,613	5,067	5,217
	Percent	13	11.7	11.2	15.3	22	16.5	5	5.2
Pepperell	Number	1,743	1,491	1,038	1,074	3,003	2,213	522	411
	Percent	15.2	13	9	9.3	26.1	19.3	4.5	3.6
Tewksbury	Number	3,108	4,115	2,360	2,470	8,090	5,776	2,477	2,675
	Percent	10	13.2	7.6	7.9	26	18.6	8	8.6
Tyngsborough	Number	1,839	1,447	904	1,133	3,125	2,073	495	343
	Percent	16.2	12.7	8	10	27.5	18.2	4.4	3
Westford	Number	3,717	3,053	1,131	1,836	6,165	4,682	1,493	718
	Percent	16.3	13.4	5	8.1	27	20.5	6.5	3.1
NMCOG Region	Number	37,380	33,400	23,818	33,653	69,213	51,923	17,317	14,822
	Percent	13.3	11.9	8.5	12	24.6	18.4	6.2	5.3

Source: 2005-2007 American Community Survey; Claritis, Inc.

As previously mentioned, age cohort analyses and projections have significant policy implications: they inform school enrollment estimates, affordable housing plans, and workforce development strategies, among other things. In December 2003, The Massachusetts Institute for Social and Economic Research (MISER) released population projections broken down by age cohort for all the communities and counties in the Commonwealth of Massachusetts. These projections included low, medium, and high population estimates for the decades 2010 through 2020³.

³ For more information about MISER's population projection methodology, please visit: <http://www.umass.edu/miser/population/miserproj.html>

Table 5 below illustrates the projected levels of growth for all age cohorts across the region between the years 2010 and 2020. These numbers, which are based on MISER’s “Medium” population projections, anticipate that the region as a whole will gain an additional 17,685 people (5.9% growth rate) between 2010 and 2020. The most significant growth is expected to occur in the 25 to 39 year old, 60 to 74 year old, and 75+ age cohorts. Between 2010 and 2020 the 25-39 year old age cohort is expected to increase by 10,658 (18.8% growth) people. The 60-74 year old cohort is expected to increase by 40.1%, from 33,978 people in 2010 to 47,613 people in 2020. Finally, individuals 75 years of age and older are expected to grow by nearly a quarter (24.1%), from 15,058 individuals in 2010 to 18,689 in 2020.

Additionally, children under the age of ten are also expected to modestly increase in population (3.4% growth) over the next decade. The age cohorts expected to decline in population are 10-19 year olds (-6.3%), 20-24 year olds (-1.6%), and 40-59 year olds (-9.5%).

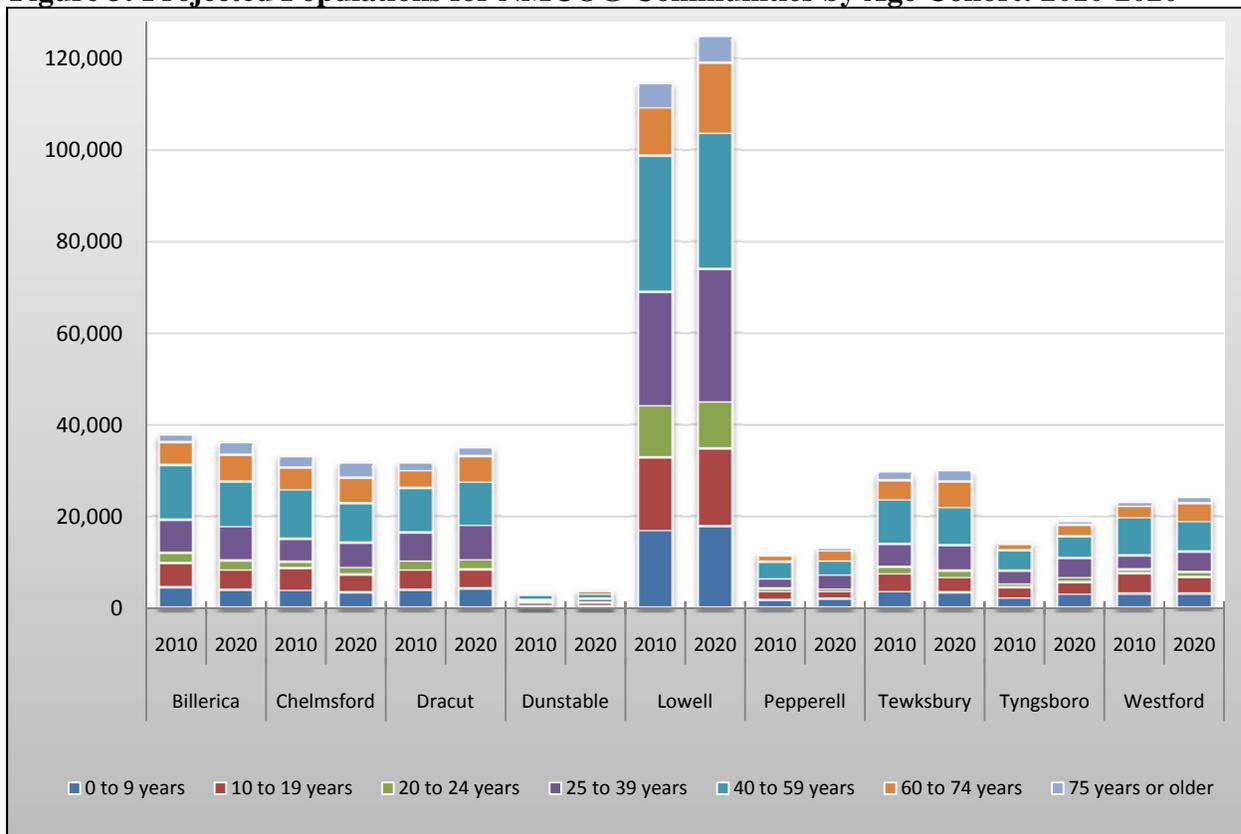
Table 5: Projected Population Growth in the NMCOG Region by Age Cohort: 2010 to 2020

Age Cohort	2010		2020		Percent Growth 2010-2020
	Number	Percent of Total	Number	Percent of Total	
Total Population	299,536	100%	317,221	100%	5.9%
0 to 9 years	39,854	13.3%	41,190	13.0%	3.4%
10 to 19 years	43,684	14.6%	40,919	12.9%	-6.3%
20 to 24 years	20,784	6.9%	20,445	6.4%	-1.6%
25 to 39 years	56,579	18.9%	67,237	21.2%	18.8%
40 to 59 years	89,599	29.9%	81,128	25.6%	-9.5%
60 to 74 years	33,978	11.3%	47,613	15.0%	40.1%
75 years or older	15,058	5.0%	18,689	5.9%	24.1%

Source: Massachusetts Institute of Social and Economic Research, 2003

Figure 3 on the next page breaks down the 2010-2020 “medium” population projections for the region by community. These projections anticipate that the towns of Billerica and Chelmsford will experience population decline over the next decade, with Billerica losing 1,826 people (-4.8%) and Chelmsford losing 1,549 people (-4.7%), respectively. In these two towns, the 65 to 74 year old age cohort is anticipated to grow by 17% and 15.6%, respectively, while individuals 75 years and older are expected to increase by 51.9% in Billerica and 41% in Chelmsford.

Figure 3: Projected Populations for NMCOC Communities by Age Cohort: 2010-2020



Source: Massachusetts Institute of Social and Economic Research, 2003

These population increases, however, will be offset by significant declines in several of the younger age cohorts. For example, MISER projects that the population of children under the age of ten will decline in Billerica and Chelmsford by 11.4% and 13%, respectively, while the 10-19 age cohort will decline by 19% and 18% during the same time period. In both towns, the most significant decline will occur among 50-59 year olds, with Billerica losing approximately 17.3% of its middle aged adult population and Chelmsford losing 19.6%. This significant decline in the number of middle-aged adults also corresponds to the anticipated growth in the number of seniors, assuming that many of these individuals will ‘age in place.’⁴

The projected growth rates by age cohort for all nine NMCOC communities are listed on the next page in Table 6. MISER projects that the seven other communities in the NMCOC region will experience population growth between 2010 and 2020. Total population growth within the individual communities is expected to range from 1.2% (or 361 people) in Tewksbury to 31.2% (4,472 people) in Tyngsborough. The aforementioned trend—declining youth and middle aged populations with corresponding increases in senior residents—is almost universal within the nine NMCOC communities. Table 6 reveals that the every community is expected to see a double-digit increase in the number of 60 to 74 year olds over the next decade, ranging from a 15.6% increase in Chelmsford to a 92.6% increase in Tyngsborough. Similarly, all nine communities

⁴ For more information about the concept of ‘aging in place,’ visit: <http://www.nw.org/network/comstrat/agingInPlace/default.asp>

are expected to see increases in the number of residents over the age of 75. The City of Lowell is expected to see the smallest percentage growth in this age cohort (4.4%), while Dunstable is expected to see the greatest growth rate (78.9%).

While only the communities of Billerica, Chelmsford, and Tewksbury are projected to experience population decline in the under-ten age cohort, every community except for the City of Lowell is expected to see decline in the 10-19 year old cohort between 2010 and 2020. Six of the nine communities have anticipated growth in their 20-24 year old populations, and all nine communities are expected to see growth in their adult (ages 25 to 39) populations. Conversely, older adult populations (ages 40 to 59) are expected to decline in every community except for Lowell (.4% increase) and Tyngsborough (3.6%), which, as previously mentioned, has a direct relationship to the increase in the number of seniors who will be living in the region in the coming years.

Table 6: Projected Growth Rates by Age Cohort for NMCOG Communities: 2010-2020

Community	0 - 9 years	10 - 19 years	20 - 24 years	25 - 39 years	40 - 59 years	60 - 74 years	75 + years
Billerica	-11.4%	-18.7%	-6.5%	1.8%	-17.3%	17.1%	51.9%
Chelmsford	-13%	-18%	8.6%	8.6%	-19.6%	15.6%	24.4%
Dracut	9.8%	-4.6%	6.6%	22%	-4.7%	50.7%	15.2%
Dunstable	9.5%	-11%	43%	64.6%	-14%	51.9%	78.9%
Lowell	6%	5%	-9%	16.7%	0.4%	48%	4.4%
Pepperell	17.5%	-13.7%	-8.6%	37.9%	-43.4%	58.8%	43.8%
Tewksbury	-5.2%	-16.2%	0.3%	10.9%	-14.4%	32.2%	34%
Tyngsboro	37%	12.7%	32.6%	52.8%	3.6%	92.6%	55%
Westford	0.2%	-19.5%	31.8%	50.3%	-20.3%	58%	58%

Source: Massachusetts Institute of Social and Economic Research, 2003

These age cohort projections point to a region where aging residents will increasingly outnumber youth, college-aged, and young adult individuals and families. These trends are important because they have an impact on the local and regional workforces, business climates, and housing stocks of the communities in the region. In order to ensure the future economic vitality of the Northern Middlesex region, strategies must be developed to attract and retain a diverse population of younger individuals, households, and families to live and work in the nine NMCOG communities. Such efforts can be achieved through education and workforce development programs, affordable housing initiatives, social and cultural programming, and other types of community revitalization efforts. A primary goal of the *Greater Lowell Comprehensive Economic Development Strategy* for 2009-2013 is to assess the economic conditions of the region and make recommendations for how best to improve the quality of life in the nine member communities. It is through these efforts that goals, such as retaining and attracting younger generations to the region, might be achieved.

d. School Enrollment

The School Enrollment figures outlined in Table 7 below provide information on the total population enrolled in public and charter schools in the region during the 2008-2009 academic school year (September 2008 through June 2009). The figures break the enrolled students down by six grade levels: nursery or pre-school, kindergarten, elementary school, middle school, high school, and special education beyond 12th grade. Based upon information from the fourteen school districts that serve students across the region, there were 53,029 students enrolled in district schools during the 2008-2009 school year. It is important to note that several of the districts operate on a regional basis, and, therefore, these numbers should not be taken as the total number of enrolled students living in the nine NMCOG communities. However, these numbers are valuable because they give us a sense of the size of the student-aged population living in the region and reinforce the notion of community interdependence and connectedness that is so important when planning on a regional scale.

Table 7: Student Enrollment by School District for the 2008-2009 Academic Year

District	Pre- K	Elementary School K – 5 th Grade	Middle School 6 th – 8 th Grade	High School 9 th – 12 th Grade	Special Education Beyond 12 th	Total
Billerica	121	2,921	1,548	1,506	4	6,100
Chelmsford	95	2,553	1,259	1,641	0	5,548
Dracut	46	1,865	1,086	1,193	0	4,190
Greater Lowell Regional Vocational Technical (Tyngsborough)	0	0	0	1,906	16	1,922
Groton-Dunstable	68	1,223	692	830	1	2,814
Lowell	447	6,286	3,246	3,396	25	13,400
Lowell Community Charter Public	0	695	220	0	0	915
Lowell Middlesex Academy Charter	0	0	0	111	0	111
Nashoba Valley Regional Vocational Technical (Westford)	0	0	0	642	0	692
North Middlesex (Pepperell)	195	1,872	1,040	1,155	5	4,267
Shawsheen Valley Regional Vocational Technical (Billerica)	0	0	0	1,268	0	1268
Tewksbury	131	2,057	1,158	1,065	0	4,411
Tyngsborough	86	954	516	527	0	2,083
Westford	86	2,347	1,280	1,595	0	5,308

Source: Massachusetts Department of Elementary and Secondary Education School District Reports

i. Projected Student-Aged Populations and Enrollments

MISER’s age cohort data offers some insight into future enrollment numbers for school districts across the region. The Institute’s population projection methodology allows them to give three population estimates per decade- low, medium, and high projections. Table 8 on the following page offers a breakdown of these school-aged population (0 to 19 years) projections by community and decade.

MISER’s projections postulate that between 2000 and 2010, the school-aged population living across the region will do one of three things. In the “low” estimate, the number of residents aged 0-19 will decline by 4,162 individuals, or 5.9%. In the “medium” projection, the population will increase slightly, from 70,252 to 70,986 individuals (1%). In the “high” projections, the population will grow by 8.2%, or 5,779 individuals. As previously discussed, much of the anticipated growth in this age cohort will occur in Dracut, Dunstable, Lowell, Tyngsborough, and Westford.

Table 8: Population and Projections for School Aged Children (0-19): 2000-2020

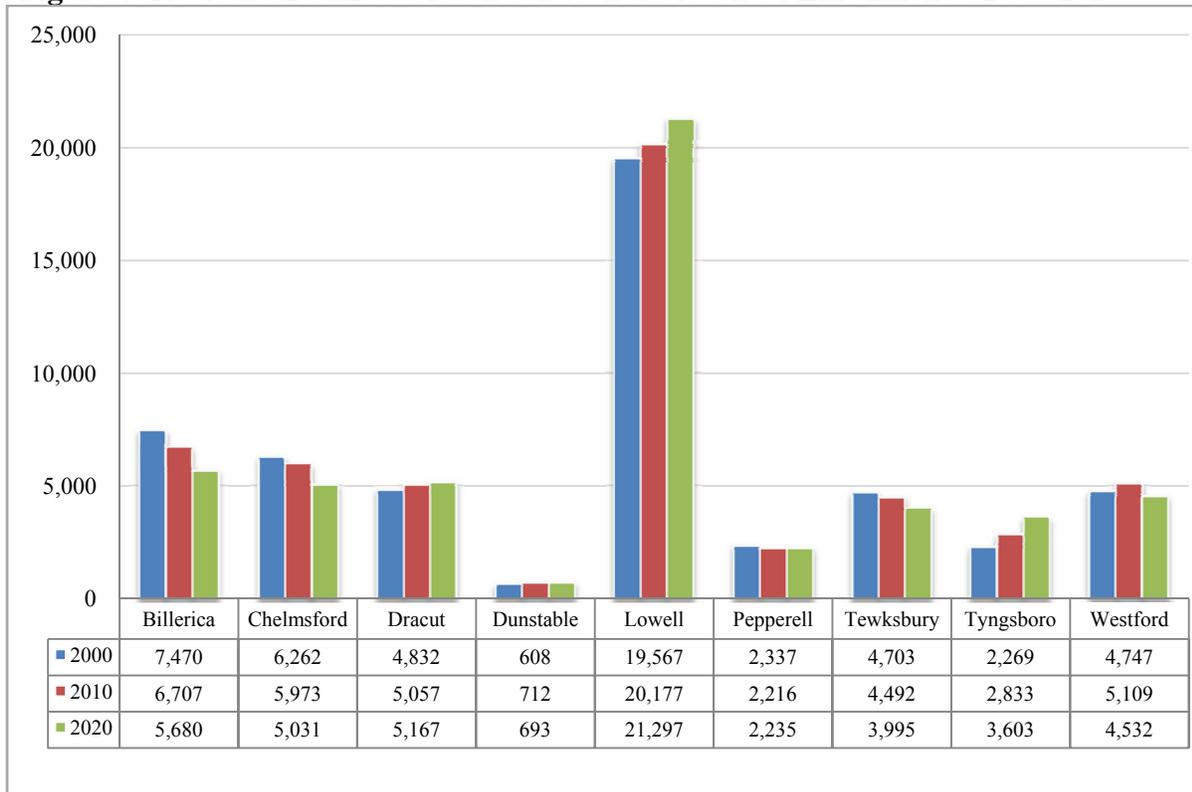
Community	2000 Actual	2010			2020		
		Low	Medium	High	Low	Medium	High
Billerica	9,200	7,731	8,260	8,798	6,017	6,995	8,017
Chelmsford	7,622	6,782	7,266	7,766	5,155	6,121	7,155
Dracut	6,711	6,558	7,024	7,501	6,152	7,177	8,251
Dunstable	790	854	925	1,000	730	900	1,088
Lowell	27,297	26,168	28,141	30,168	25,502	29,703	34,116
Pepperell	3,119	2,761	2,959	3,162	2,525	2,984	3,471
Tewksbury	6,583	5,874	6,291	6,720	4,766	5,595	6,472
Tyngsborough	2,959	3,393	3,693	4,008	3,809	4,697	5,531
Westford	5,971	5,969	6,427	6,908	4,646	5,700	6,875
NMCOG Region	70,252	66,090	70,986	76,031	59,302	69,872	80,976
Projected Growth Rate- NMCOG Region	N/A	-5.9%	1%	8.2%	-15.6%	-.5%	15.3%

Source: US Census Bureau 2000; Massachusetts Institute for Social and Economic Research, 2003

Looking ahead to 2020, MISER’s population projections show a net decline in both their “low” and “medium” figures for the region. Low projections anticipate that the region will lose approximately 10,950 school-aged residents (-15.6%) between 2000 and 2020. Medium projections expect a less dramatic decrease—380 individuals or -.5%. Conversely, the high projections estimate that as many as 10,724 new school-aged children would be living in the NMCOG region by 2020. It’s worth noting that even with the high 2020 projections, MISER expects that the communities of Billerica, Chelmsford, and Tewksbury will see their 0-19 year old populations shrink between 2000 and 2020.

Figure 4 on the next page applies the public school enrollment rates among school-aged children in 2000 to forthcoming decades in order to estimate future enrollment in public and charter schools across the region. These figures were produced by calculating the percentage of all school-aged children who were enrolled in public and charter schools, as reported in the 2000 U.S. Census, and then applying the rate to the ‘medium’ age cohort projections developed by MISER for the nine NMCOG communities.

Figure 4: Real and Estimated Public and Charter School Enrollments: 2000-2020



Source: US Census Bureau 2000; MISER, NMCOG

According to these calculations, the towns of Billerica, Chelmsford, Pepperell, and Tewksbury will experience steady declines in their enrolled student populations between 2000 and 2020, dropping by 24%, 19.7%, 4.4%, and 15%, respectively. The towns of Dunstable and Westford are expected to experience increased enrollment between 2000 and 2010 followed by decreased enrollment between 2010 and 2020. Finally, the communities of Dracut and Lowell will experience consistent increases in their enrolled student populations between 2000 and 2020.

ii. Student Aptitude and Achievement

This subsection examines several indicators of academic aptitude and achievement among students attending school in the region. These indicators include high school graduation and dropout rates, students' reported post-graduation plans, SAT Reasoning Test numbers and average scores, and MCAS proficiency rates. Through understanding how well students perform in the region's schools, as well as understanding students' intended future educational plans, a more sensitive and meaningful economic development strategy can be developed which reflects their specific needs and skills.

According to Table 1 in Appendix II of this report, graduation and dropout rates have not been consistent across the thirteen high schools operating in the region. Over the past three academic years (2006-2008), only Groton-Dunstable Regional High School and the Westford Academy have seen consistent increases in their senior graduation rates, rising from 92.9% and 95% in 2006 to 95.2% and 96.4% in 2008, respectively. Conversely, Chelmsford High School and the

Northern Middlesex Regional High School have seen consistent declines in their senior graduation rates, down from 97% and 93.3% in 2006 to 92.7% and 89.1% in 2008, respectively. The other nine schools serving high school students in the region have experienced ups and downs over the past three years. Billerica Memorial High School, Lowell Middlesex Academy Charter School, Nashoba Valley Regional High School, Shawsheen Valley Regional High School, and Tewksbury Memorial High School saw their high school graduation rates increase between 2006 and 2007, but subsequently decline the following year. Lowell, Tyngsborough, and Dracut Senior High Schools experienced a decline in their graduation rates between 2006 and 2007, but a subsequent improvement in 2008.

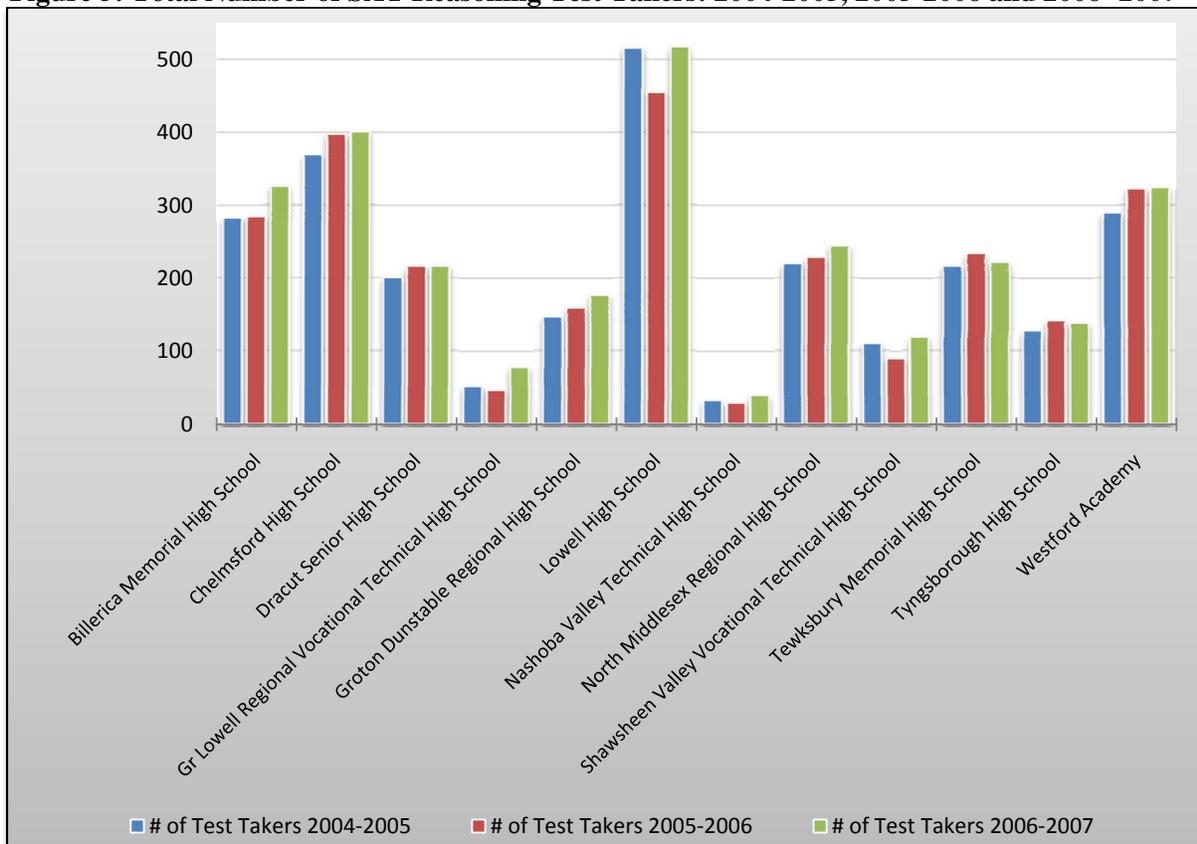
Somewhat consistent with the graduation rate trends are the high school dropout rates for these thirteen schools. In 2006, high school dropout rates ranged from .5% of the senior class population of Chelmsford High School to more than half (57.4%) of the senior population at the Lowell Middlesex Charter Academy. Lowell High School (15.8%) and Dracut Senior High School (9.7%) had the second and third highest dropout rates in the region in 2006. Between 2006 and 2008, dropout rates at Dracut Senior High School and Northern Middlesex Regional High School had consistently risen, while dropout rates steadily declined at Nashoba Valley Regional Vocational Technical School, Shawsheen Valley Regional Vocational Technical School, and Tyngsborough High School. Billerica Senior High School, Lowell Middlesex Academy Charter, Tewksbury Senior High School, and Westford Academy all saw their dropout rates increase between 2006 and 2007 and decrease between 2007 and 2008. Additionally, Table 1 in Appendix II reveals that obtaining a GED in lieu of a high school diploma continues to be a viable option for many students in the region, particularly for students attending the Lowell Middlesex Academy Charter School, where the GED rate increased from 4.3% in 2006 to 18.5% in 2008.

A second indicator of student achievement can be measured by assessing graduating seniors' exit interviews, which gauge post-graduation plans. Table 2, also included in Appendix II, compares seniors' reported plans, as reported during the 2003-2004 and 2007-2008 school years. According to these exit surveys, every school in the region, except for Billerica Senior High School and Groton-Dunstable Regional High School, saw an increase in the percent of students who said they planned on attending a four-year college after graduating high school. Additionally, during the 2007-2008 academic year, a higher percentage of students attending Dracut Senior High School, Groton-Dunstable Regional High School, Lowell High School, Lowell Middlesex Academy Charter School, and Shawsheen Valley Regional Vocational Technical High School said they intended on enrolling at a two-year college than was reported during the 2003-2004 school year.

Unsurprisingly, the vocational-technical high schools in the region had the highest percentages of students reporting that they intended to directly enter the workforce after graduation. In 2007-2008, 45.2% of graduating seniors attending Greater Lowell Regional Vocational Technical School expected to directly enter the workforce, while 44.9% of seniors at Nashoba Valley Vocational Tech and 37.3% of seniors at Shawsheen Valley Vocational Tech reported the same post-graduation plans. These surveys also show that enrolling in some other sort of postsecondary training program or the military are consistently options for a small number of seniors graduating each year across the NMCOG region.

Figure 5 below illustrates the total number of students across the region who took the SAT Reasoning Test during the three academic years between Fall 2004 and Spring 2007. The SAT, which is a standardized test that most colleges and universities require applicants to complete, is another way to measure how many high school students intend to pursue higher education upon graduating high school. Between the 2004-2005 and 2007-2008 academic years, the number of SAT test takers consistently rose at the following schools: Billerica Memorial High School, Chelmsford High School, Dracut Senior High School, Groton-Dunstable Regional High School, North Middlesex Regional High School, and Westford Academy. The number of test takers at Greater Lowell Regional Vocational Tech, Lowell High School, Nashoba Valley Vocational Tech, and Shawsheen Valley Vocational Tech High School declined between 2004-2005 and 2005-2006, but then rebounded the following year. Tewksbury Memorial High School was the only institution to experience a decline in the number of test takers between 2005-2006 and 2006-2007.

Figure 5: Total Number of SAT Reasoning Test Takers: 2004-2005, 2005-2006 and 2006- 2007



Source: Massachusetts Department of Elementary and Secondary Education District Profile Reports

In addition to knowing how many students take the SAT exam, it's important to have a sense for how well students perform on the test. Table 9 on the next page shows the average verbal, reading, writing, and math scores for the SAT general exam, by high school, over three academic years. The average scores for each individual school are also compared to the regional average and Massachusetts averages.

The schools that have shown consistent improvement in the reading and writing sections of the SAT exam are Billerica Memorial High School, Chelmsford High School, and Shawsheen Valley Vocational Tech High School. Those that have shown consistent improvement in the math section are Groton-Dunstable Regional High School, Nashoba Valley Vocational Tech, and Northern Middlesex Regional High School. Schools showing consistent declines in reading and writing scores included Greater Lowell Regional Vocational Tech, Lowell High School, Tyngsborough High School, and Westford Academy. Chelmsford High School was the only institution to see a decline in math scores over the three academic years.

Several of the schools in the region have seen scores fluctuate over the three years. However, the majority of schools in the region surpass the state averages for SAT scores. During the 2006-2007 academic year, two-thirds of the high schools in the region scored higher than the Commonwealth's averages for both the reading and math components of the exam, while seven out of twelve schools exceeded the state-wide average writing score.

Table 9: Average SAT Scores for Schools in the NMCOG Region: 2004-2005 to 2006-2007

School	Verbal*	Reading		Writing		Math		
	2004-2005	2005-2006	2006-2007	2005-2006	2006-2007	2004-2005	2005-2006	2006-2007
Billerica Memorial High School	510	507	515	498	499	543	524	534
Chelmsford High	542	523	527	518	519	547	540	535
Dracut Senior High	521	495	495	488	479	509	494	501
Greater Lowell Regional Vocational Tech High School	452	448	438	434	418	439	485	451
Groton Dunstable Regional High	545	542	539	523	536	554	556	568
Lowell High School	454	449	463	445	434	469	472	452
Nashoba Valley Technical High (Westford)	444	462	461	417	456	455	467	478
North Middlesex Regional High School	523	513	528	517	513	525	526	531
Shawsheen Valley Vocational Tech (Billerica)	456	459	460	439	440	454	452	460
Tewksbury Memorial High	528	514	511	506	511	547	524	529
Tyngsborough High School	495	512	497	512	496	515	516	512
Westford Academy	562	574	569	569	563	585	592	583
NMCOG Average	503	500	500	489	489	512	512	511
Massachusetts Average	500	488	488	482	483	506	498	497

Source: Massachusetts Department of Elementary and Secondary Education District Profile Reports

Note: Between the 2004-2005 and 2005-2006 school years, the SAT exam was restructured. The "verbal" section was divided into two subsections: reading and writing. Thus, general verbal scores are not calculated for the two latter school years in Table 9.

A final measure of student aptitude across the region can be gleaned from Massachusetts Comprehensive Assessment System (MCAS) test scores. The MCAS is a standardized testing system that gauges students' aptitude in three core areas: language arts, math, and science. Tests are administered throughout elementary and middle school and students in the Commonwealth are required to pass the 10th grade exams in order to receive a high school diploma.

Tables 3, 4, and 5 in Appendix II provide a comparison of students' MCAS proficiency for the 2006 and 2008 academic school years. Table 3 offers proficiency levels for 6th Graders in the fields of language arts, math, and science, while Table 4 offers proficiency levels for 8th Graders in the same three subject areas. Table 5 provides 10th Graders proficiency levels for language arts and math.

Among 6th graders in the NMCOG region, the percentage of students who scored "above proficiency" in language arts increased in every school district between 2006 and 2008. Furthermore, the percentage of students achieving a "proficiency" score increased in every district, except for Lowell Charter Academy during this time period. Similarly, nine out of the ten districts saw increased percentages of their students earning both "advanced proficiency" and "proficient" scores in the math portion of the exam. Aptitude levels in the science exam were not as high as language arts and math, with only half of the districts experiencing increased levels of "advanced proficiency," and 60% of districts seeing an increase in "proficiency" designation.

Among 8th graders in the region, six out of ten districts boasted increased percentages of students earning "advanced proficiency" in language arts, while two districts saw increases in the percentage of students earning "proficient" scores between 2006 and 2008. All ten districts saw improvements in the math portion of the exam, with "advanced proficiency" rates increasing in every district and "proficient" scores increasing in four districts. Similar to the 6th graders, the math portion of the exam saw the smallest amount of overall improvement: only one district saw an increase in the percentage of students earning "advanced proficiency." However, nine out of ten communities saw increased levels of "proficiency" between 2006 and 2008, indicating improvement across the region as a whole.

Twelve out of thirteen school districts administering the 10th grade MCAS exams saw an increased percentage of students achieving "advanced proficiency" in the subject of language arts, while four saw increases in students earning a rank of "proficient" between these two school years. Five of the districts experienced at least a 100% increase in the percentage of students earning an "advanced proficiency" score: Chelmsford (16% in 2006 to 39% in 2008), Lowell Charter Academy (0% to 20%), Greater Lowell Regional Vocational Tech (1% to 2%), Nashoba Valley Vocational Tech (2% to 6%), and Shawsheen Valley Vocational Tech (4% to 13%). Only three districts saw an increase in the percentage of students "needing improvement" in language arts, and six saw increases in failure rates. For the math portion of the 10th grade exam, seven out of thirteen districts saw an increase in both "advanced proficiency" and "proficient" levels, while only two districts each saw an increase in their "needs improvement" and "warning/failure" levels.

e. Educational 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. In 2000, 83.2% of the NMCOG region's population 25 years and older had earned a high school diploma or higher. In 2007, this number had risen to 85.9% of the population, with 18.6% of the population earning a bachelor's degree and another 12.1% receiving an advanced professional or graduate degree. As in 2000, these numbers compare favorably to the national rate of 84.1% (earning a high school diploma or higher), but still trails the state (88%) and county (90.8%). Reflecting a measure of distress within the region, the NMCOG region almost matched the nation's figures for Less than 9th Grade (6% vs. 6.5%) and 9th-12th Grade – No Diploma (7.9% vs. 9.5%). Table 10 below summarizes this information.

Table 10: Educational Attainment in the NMCOG Region in 2007

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	26,709	861 (3.2%)	1,700 (6.4%)	9,341 (35%)	4,327 (16.2%)	2,975 (11.1%)	5,006 (18.7%)	2,499 (9.4%)
Chelmsford	22,757	543 (2.4%)	890 (3.9%)	4,648 (20.4%)	3,094 (13.6%)	2,060 (9.1%)	6,251 (27.5%)	5,271 (23.2%)
Dracut	20,114	754 (3.7%)	2,109 (10.5%)	6,706 (33.3%)	3,911 (19.4%)	1,741 (8.7%)	3,270 (16.3%)	1,623 (8.1%)
Dunstable	2,022	10 (.5%)	107 (5.3%)	496 (24.5%)	354 (17.5%)	158 (7.8%)	509 (25.2%)	388 (19.2%)
Lowell	64,552	7,687 (11.9%)	7,118 (11%)	21,095 (32.7%)	10,774 (16.7%)	4,273 (6.6%)	8,515 (13.2%)	5,090 (7.9%)
Pepperell	7,223	159 (2.2%)	337 (4.7%)	2,268 (31.4%)	1,413 (19.6%)	642 (8.9%)	1,624 (22.5%)	780 (10.8%)
Tewksbury	21,448	913 (4.3%)	1,698 (7.9%)	7,451 (34.7%)	3,973 (18.5%)	2,056 (9.6%)	3,373 (15.7%)	1,804 (8.4%)
Tyngsboro	7,169	186 (2.6%)	517 (7.2%)	2,234 (31.2%)	1,447 (20.1%)	554 (7.7%)	1,496 (20.9%)	735 (10.3%)
Westford	14,894	82 (0.6%)	336 (2.3%)	2,071 (13.9%)	2,015 (13.5%)	1,089 (7.3%)	4,791 (32.2%)	4,510 (30.3%)
NMCOG Region	186,888	11,195 (6%)	14,812 (7.9%)	56,310 (30.1%)	31,308 (16.8%)	15,548 (8.3%)	34,835 (18.6%)	22,700 (12.1%)
United States	195,646,383	12,691,550 (6.5%)	18,556,909 (9.5%)	58,762,191 (30%)	38,383,119 (19.6%)	14,392,617 (7.4%)	33,475,448 (17.1%)	19,384,549 (10%)

Source: American Community Survey 2005-2007; Claritis, Incorporated

These figures reveal that across the board, the region's adult populations are attaining higher levels of education. Although lower levels of educational attainment persist-- especially in the

City of Lowell, where 22.9% of the 25+ aged population had not received a high school diploma in 2007-- several towns in the region have populations that have earned higher proportions of college and graduate school educations than both the state or national rates. With the exception of Lowell, all of the NMCOC towns had higher-than-national average rates for adults earning Associates Degrees. The towns of Chelmsford, Dunstable, Pepperell, Tyngsborough, and Westford had higher-than-national average rates for college graduate and professionally educated adults. Westford, for example, had a rate three times higher (30.3%) than the national rate and nearly double the state rate for the same time period.

f. Households

The projected growth in households over the next two decades corresponds to the estimated changes in total population for the region, as reflected in Table 11 below. Anticipated changes in the total number of households are somewhat reflective of the extent to which communities in the region are already developed. Over the next twenty years, communities such as Billerica, Chelmsford, Lowell, and Tewksbury, which are more “built-out” relative to the other towns in the region, have anticipated household growth rates of 20.3%, 11.9%, 10.2%, and 24.1%. These growth rates are significantly less than those expected in the smaller, less dense communities of Dracut (49.7%), Dunstable (145.9%), Pepperell (116.5%), Tyngsborough (72.6%) and Westford (71.9%).

Table 11: Households in the NMCOC Region: 2000- 2030

Community	2000	2010	2015	2020	2025	2030	Percent Change 2000-2030
Billerica	12,961	13,885	14,402	14,838	15,215	15,540	20.3%
Chelmsford	12,826	13,377	13,630	13,929	14,232	14,340	11.9%
Dracut	10,450	12,586	13,266	14,265	14,783	15,640	49.7%
Dunstable	936	1,300	1,498	1,732	2,025	2,270	145.9%
Lowell	37,992	39,743	40,454	41,119	41,570	41,770	10.2%
Pepperell	3,845	5,167	6,159	6,807	7,514	8,330	116.5%
Tewksbury	9,955	11,051	11,542	11,845	12,048	12,370	24.1%
Tyngsborough	3,741	4,680	5,152	5,572	5,967	6,440	72.6%
Westford	6,836	8,511	9,197	10,193	10,848	11,700	71.9%
NMCOC Region	99,542	110,300	115,300	120,300	124,200	128,400	29.3%

*Source: 2000 U.S. Census; projections by MassHighway in consultation with NMCOC
Projections for 2020 developed by the Massachusetts Highway Department*

Another important trend to examine is the change in types of households in the region. As illustrated in Table 12 on the next page, every category of household type increased between 2000 and 2007. These trends correspond to the overall growth in the number of households across the region. The number of households with children, as well as those without children, increased by 10.7% and 7.9%, respectively, while married couples without children increased by 9.6% across the region. Finally, nonfamily households (both with and without children present) increased by 6.6% between 2000 and 2007. Although projections for the coming decades are not available for household type, one can anticipate, given the expected decline in families across the region, the number of nonfamily households living in the region will increase.

Table 12: Household Types in the NMCOG Region: 2000 and 2007

Household Type	2000	2007	Percent Change, 2000-2007
Total Households	99,342	108,327	9.0%
Households with one or more people under 18 years	39,518	43,758	10.7%
Family households:	39,208	43,430	10.8%
Married-couple family	29,061	32,644	12.3%
Male householder, no wife present	2,155	2,311	7.2%
Female householder, no husband present	7,992	8,475	6.0%
Nonfamily households	310	328	5.8%
Households with no people under 18 years	59,824	64,569	7.9%
Married-couple family	26,004	28,511	9.6%
Nonfamily households:	27,498	29,327	6.7%

Source: US Census Bureau 2000; American Community Survey 2005-2007; Claritis, Inc.

g. Families

Table 13 below illustrates changes in the number of families living in the NMCOG region between 2000 and 2007. According to these figures, the total number of families living in the NMCOG region decreased by 1.6%, or 1,183 families, during this time period. Communities that saw the greatest decline in the number of families living in town were Chelmsford (-4.2%), Dracut (-4.6%), and Lowell (-6.9%). Billerica's family population increased by less than 1% (53 families), while the family populations in Pepperell, Tewksbury, and Tyngsborough increased by less than 5% each. Only two towns—Dunstable and Westford—had increases greater than 5%, with family growth occurring at the rates of 8.4% and 15.7%, respectively.

Table 13: Families in the NMCOG Region: 2000 and 2007

Community	2000	2007	Percent Change, 2000- 2007
Billerica	10,306	10,359	0.5%
Chelmsford	9,361	8,967	-4.2%
Dracut	7,756	7,399	-4.6%
Dunstable	804	930	15.7%
Lowell	24,247	22,582	-6.9%
Pepperell	3,018	3,155	4.5%
Tewksbury	7,764	8,097	4.3%
Tyngsborough	2,961	3,053	3.1%
Westford	5,824	6,316	8.4%
NMCOG Region	72,041	70,858	-1.6%

Source: U.S. Census 2000, American Community Survey 2005-2007; Claritis, Inc.

h. Income

The basic income figures for the NMCOG region – Median Household Income (MHI), Median Family Income (MFI), and Per Capita Income (PCI)-- as well as poverty data-- have been

summarized in this section. These income figures show the changes between 1999 and 2007, compare the individual communities with the NMCOG region and compare the NMCOG region with Middlesex County, the State of Massachusetts and the United States.

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) with per capita incomes less than 80% of the national per capita income are eligible for funding from the Economic Development Administration. Within the NMCOG region, the majority of the City of Lowell is the only area to qualify for EDA funding based on the per capita income requirement. In 2007, Lowell’s per capita income (\$21,780) was 83.2% of the national per capita income (\$26,178).

Between 1999 and 2007, the median household, median family, and per capita incomes for all nine of the NMCOG communities have notably increased. While issues of poverty and affordability continue to impact individuals and families across the region, data reveals that across the board households and families are earning more, and there was more income per person in 2007 than in 1999, despite some increases in population in the towns. Table 14 below shows a breakdown of these three income indicators for each of the nine NMCOG communities in addition to the state and country rates. Additionally, Figure 6 on page 25 illustrates the percent change in median household, median family, and per capita incomes for the nine communities during this eight-year timeframe.

Table 14: Median Household, Median Family, and Per Capita Incomes: 1999-2007

Community	Median Household Income		Median Family Income		Per Capita Income	
	1999	2007	1999	2007	1999	2007
Billerica	\$67,799	\$83,531	\$72,102	\$89,461	\$24,953	\$31,018
Chelmsford	\$70,207	\$87,252	\$82,676	\$105,105	\$30,465	\$39,149
Dracut	\$57,676	\$72,348	\$65,633	\$84,170	\$23,750	\$30,958
Dunstable	\$86,633	\$100,161	\$92,270	\$111,645	\$30,608	\$37,943
Lowell	\$39,192	\$47,337	\$45,901	\$53,357	\$17,557	\$21,780
Pepperell	\$65,163	\$80,490	\$73,967	\$93,170	\$25,722	\$34,422
Tewksbury	\$68,800	\$85,115	\$76,443	\$93,957	\$27,031	\$32,293
Tyngsborough	\$69,818	\$85,785	\$78,680	\$101,361	\$27,249	\$34,681
Westford	\$98,272	\$113,160	\$104,029	\$120,410	\$37,979	\$43,304
Massachusetts	\$50,502	\$61,785	\$61,664	\$77,409	\$25,952	\$32,113
United States	\$41,994	\$50,007	\$50,046	\$60,374	\$21,587	\$26,178

Source: US Census Bureau 2000, American Community Survey, 2005-2007, Claritis, Inc.

i. Median Household Income (MHI)

In both 1999 and 2007, all of the communities, except for the City of Lowell, had median household incomes that exceeded the state and national figures. Although the City of Lowell saw its median household income increase by 20.8% between 2000 and 2007, the city’s MHI of \$47,337 in 2007 was approximately 76.6% of the state rate, and 94.7% of the national rate for the same period.

As was the case in 2000, the town of Westford had the highest MHI out of the nine communities (\$113,160), followed by Dunstable (\$100,161). Five communities had MHI's in the range of \$80,000- \$90,000 in 2007. These numbers can partially be attributed to the high levels of educational attainment among adults in the region, as well as the types of industries that people are working in, which will be discussed in a later chapter of this report. The changes can also partially be attributed to inflation over the past seven years.

ii. Median Family Income (MFI)

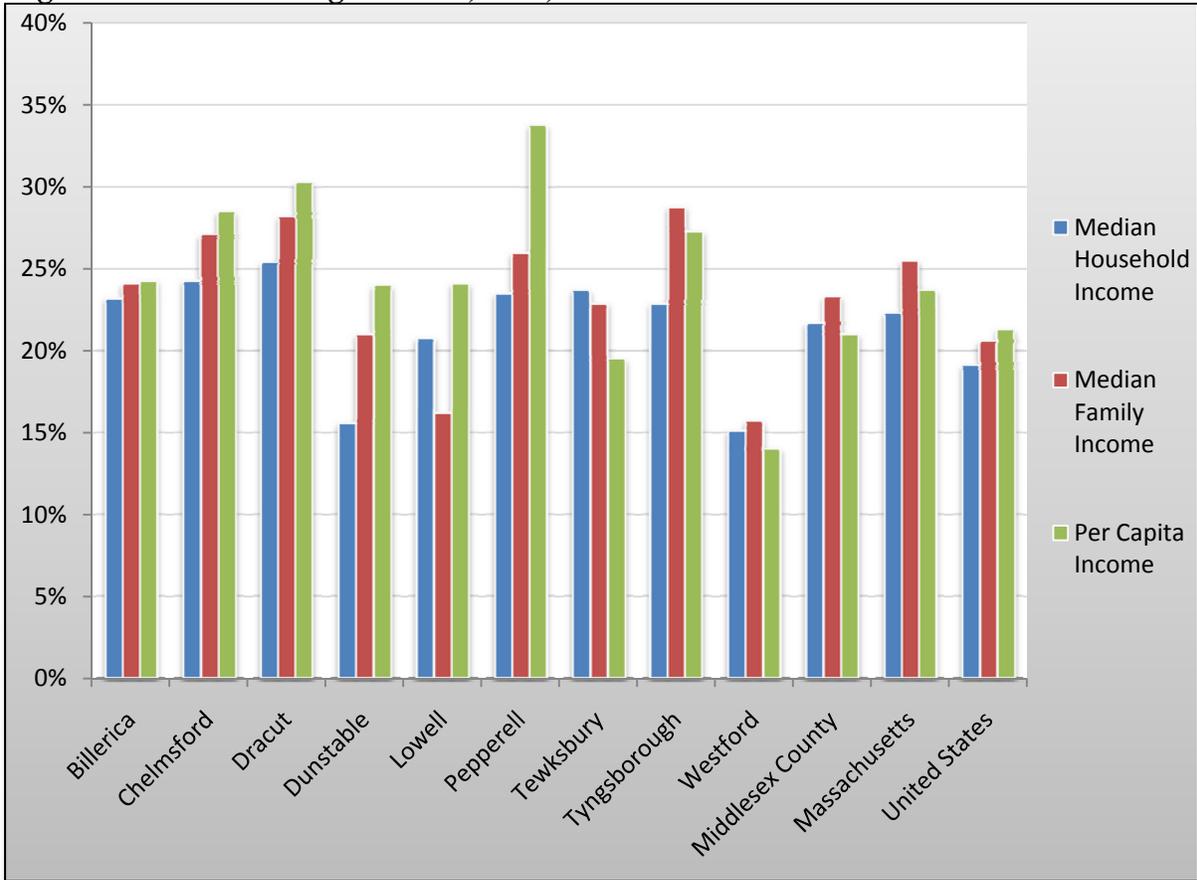
Similar to trends in the median household income in towns across the region, the median family income for NMOG towns increased—in some cases dramatically—between 2000 and 2007. An analysis of Table 14 and Figure 5 show that seven of the nine communities saw increases in MFI of 20-30% over the past several years. Tyngsborough, for example, rose from \$78,680 in 2000 to \$101,361 in 2007: an increase of 28.8%. Lowell and Westford experienced increases of 16.2% and 15.7%, respectively, bringing Lowell's MFI of \$53,357 and Westford's MFI of \$120,410 to 88.4% and 199.4% of the nation's median family income, respectively. The remaining six towns in the region had increases between 20.6% and 28.2%.

iii. Per Capita Income (PCI)

All nine of the NMCOG communities experienced increases in their per capita incomes between 1999 and 2007. In 1999, five communities—Chelmsford, Dunstable, Tewksbury, Tyngsborough, and Westford—exceeded the state's PCI of \$25,852. Only the City of Lowell (\$17,557) had a PCI lower than the national figure of \$21,587.

By 2007, two-thirds of the communities had PCI's that were higher than the state's (\$31,113), and the City of Lowell remained the only community with a PCI below the nation's-- \$21,780 versus \$26,178, respectively. The most dramatic increase in per capita income during this time occurred in Pepperell, a town which saw its figure rise 33.1% from \$25,722 in 2000 to \$34,422 in 2007. As previously mentioned, the percent change for these three income indicators are illustrated in Figure 6 on the next page.

Figure 6: Percent Change in MHI, MFI, and PCI: 2000 and 2007



Source: US Census Bureau 2000, American Community Survey, 2005-2007, Claritis, Inc.

i. Poverty Status

Data from the 2005-2007 American Community Survey reveals that poverty issues continue to be a concern for the region, particularly within the City of Lowell, which saw its poverty rate increase from 16.8% in 2000 to 18.5% in 2007. In 2000, poverty rates among the remaining eight towns ranged from 1.7% to 4.7%. By 2007, poverty levels had declined in Billerica, Dracut, and Westford, but had increased in Chelmsford and Tewksbury. As noted in Table 15 on the next page, 2007 data is not available for the communities of Dunstable, Pepperell, or Tyngsborough because the American Community Survey was not administered and Claritis, Incorporated did not calculate poverty estimates.

In all of the communities for which 2007 data was available, it is clear from Table 15 that poverty within the disabled community is a prevalent issue: between 22.9% and 38.2% of impoverished individuals had at least one disability. Poverty among senior citizens also persists, particularly in Billerica, Chelmsford, and Dracut, where 21.9%, 17.5%, and 18.6% of those individuals living below the poverty line were over the age of 65. Youth and child poverty also significantly impacts the region, as is reflected in Table 15 on the next page.

Table 15: Poverty Status for Selected Populations: 2000 and 2007

Community	Poverty Rate 2000	Number 2007	Poverty Rate 2007	Under 5 Years Old	5- 17 Years Old	65+ Years Old	Individuals with a Disability
Billerica	3.8%	839	2.1%	14	178	184	192
Chelmsford	2.8%	1,222	3.8%	49	203	214	353
Dracut	3.7%	785	2.7%	55	97	146	257
Dunstable*	1.9%	Data not available	N/A	N/A	N/A	N/A	N/A
Lowell	16.8%	17,946	18.5%	1,918	4,902	1,238	4,935
Pepperell**	3.7%	Data not available	N/A	N/A	N/A	N/A	N/A
Tewksbury	3.8%	1,516	5.1%	20	523	183	580
Tyngsborough*	4.7%	Data not available	N/A	N/A	N/A	N/A	N/A
Westford	1.7%	354	1.6%	21	98	28	99

Source: American Community Survey 2005-2007

*American Community Survey data is not available for Dunstable, Pepperell, or Tyngsborough. Refer to the 2004-2008 CEDS document for poverty data from the 2000 Census for these three towns.

4. Land Use Data and Trends

The Greater Lowell region has changed considerably since its early beginnings as an agrarian society which was later transformed by the Industrial Revolution. Over the years, the City of Lowell has lost its dominance as the economic center of the region as employment centers have emerged in its adjoining suburbs, particularly in Billerica, Chelmsford, Tewksbury and Westford. Table 16 on the following page provides an overview of the change in land use within the Greater Lowell region between 1971 and 2005, based on the McConnell land use maps provided by the University of Massachusetts. This data is broken out by developed and undeveloped land, as well as by land use category (commercial, industrial and residential). Although more recent land use data has been developed since 2005, the 2005 data was utilized as it provides an information base that is comparable across community boundaries.

In 1971, the region was 18.9% developed with 5.3% of its developed land devoted to commercial purposes, approximately 10% utilized for industrial purposes, and 84.8% devoted to residential uses. By 2005, the region's developed land increased by 148%, with commercially utilized land increasing by 97%, industrially used land by 52% and residentially used land by 119%. By 2005, the Greater Lowell region was 47.1% developed, with 4.2% of the developed land used for commercial uses, 6.1% devoted to industrial uses and nearly 74.9% dedicated to residential purposes. Although industrial uses increased from 1971 to 1990, between 1991 and 2005 the region lost 27% of its industrial uses. Between 1971 and 2005, the amount of undeveloped land in the region diminished by approximately 35%.

Table 16: Land Use in the NMCOG Region: 1971 through 2005

Community	Land Use	Acres				Percent Change	Percent of Region
		1971	1985	1991	2005	1971 - 2005	2005
Billerica	Commercial	216.6	283.80	397.00	419.81	93.82	16.99
	Industrial	324.6	692.28	1,083.57	1,071.70	230.16	29.67
	Residential	4,747.58	5,670.02	6,665.34	7,265.28	53.03	16.46
	Developed	5,288.78	6,646.10	8,145.91	9,831.96	85.90	16.67
	Undeveloped	11,608.93	10,251.61	8,751.80	6,983.72	-39.84	10.55
	Total	16,897.71	16,897.71	16,897.71	16,815.68	N/A	13.43
Chelmsford	Commercial	158.39	216.55	376.89	410.70	159.30	16.62
	Industrial	310.07	503.97	637.32	560.91	80.90	15.53
	Residential	3,249.10	3,914.34	6,866.71	7,162.52	120.44	16.22
	Developed	3,717.56	4,634.86	7,880.92	9,286.53	149.80	15.75
	Undeveloped	11,110.09	10,192.79	6,946.73	5,463.36	-50.83	8.25
	Total	14,827.65	14,827.65	14,827.65	14,749.89	N/A	11.78
Dracut	Commercial	115.88	176.87	215.36	256.82	121.63	10.39
	Industrial	228.49	277.73	425.91	125.47	-45.09	3.47
	Residential	2,159.37	3,024.00	4,502.61	4,837.59	124.03	10.96
	Developed	2,503.74	3,478.60	5,143.88	5,525.23	120.68	9.37
	Undeveloped	11,241.50	10,266.64	8,601.36	8,121.81	-27.75	12.27
	Total	13,745.24	13,745.24	13,745.24	13,647.04	N/A	10.90
Dunstable	Commercial	2.77	2.77	0.00	1.79	-35.38	0.07
	Industrial	26.8	62.75	189.11	0	0	0
	Residential	368.59	586.81	1,064.48	1,725.27	368.07	3.91
	Developed	398.16	652.33	1,253.59	1,850.79	364.84	3.14
	Undeveloped	10,346.39	10,092.22	9,490.96	8,866.62	-14.30	13.39
	Total	10,744.55	10,744.55	10,744.55	10,717.41	N/A	8.56
Lowell	Commercial	424.91	466.57	493.97	549.55	29.33	22.24
	Industrial	465.99	638.01	797.94	632.04	35.63	17.50
	Residential	2,455.18	2,645.16	4,453.35	3,548.46	44.53	8.04
	Developed	3,346.08	3,749.74	5,745.26	8,125.43	142.83	13.78
	Undeveloped	5,990.99	5,587.33	3,591.81	1,174.06	-80.40	1.77
	Total	9,337.07	9,337.07	9,337.07	9,299.48	N/A	7.43
Pepperell	Commercial	44.56	55.49	62.13	46.23	3.75	1.87
	Industrial	46.37	131.79	196.12	87.58	88.87	2.42
	Residential	1,041.51	1,801.37	2,595.19	4,013.63	285.37	9.09
	Developed	1,132.44	1,988.65	2,853.44	4,397.52	288.32	7.46
	Undeveloped	13,754.62	12,898.41	12,033.62	10,449.41	-24.03	15.78
	Total	14,887.06	14,887.06	14,887.06	14,846.93	N/A	11.862
Tewksbury	Commercial	194.63	284.85	274.18	342.64	76.05	13.87
	Industrial	338.63	442.83	656.03	586.22	73.12	16.23
	Residential	2,803.53	3,555.56	4,876.41	5,472.25	95.19	12.39
	Developed	3,336.79	4,283.24	5,806.62	7,264.22	207.61	12.32
	Undeveloped	10,234.58	9,288.13	7,764.75	6,247.17	-38.96	9.44
	Total	13,571.37	13,571.37	13,571.37	13,511.40	N/A	10.79
Tyngsborough	Commercial	24.83	82.13	178.98	225.79	809.34	9.14
	Industrial	149.43	256.78	309.28	132.08	-11.61	3.66
	Residential	819.27	1,459.02	2,245.08	3,561.95	334.77	8.07
	Developed	993.53	1,797.93	2,733.34	4,599.05	362.90	7.80
	Undeveloped	10,626.49	9,822.09	8,886.68	6,946.92	-34.63	10.49

Table 16: Land Use in the NMCOG Region: 1971 through 2005 (Cont.)

Community	Land Use	Acres				Percent Change	Percent of Region
		1971	1985	1991	2005	1971 - 2005	2005
	Total	11,620.02	11,620.02	11,620.02	11,545.96	N/A	9.225
Westford	Commercial	71.23	137.91	172.71	217.73	205.67	8.81
	Industrial	477.56	572.81	719.90	416.31	-12.83	11.52
	Residential	2,504.62	3,642.93	4,930.98	6,562.39	162.01	14.86
	Developed	3,053.41	4,353.65	5,823.59	8,086.59	164.84	13.71
	Undeveloped	17,013.72	15,713.48	14,243.54	11,949.75	-29.76	18.05
	Total	20,067.13	20,067.13	20,067.13	20,036.33	N/A	16.00
NMCOG Region	Commercial	1,253.80	1,706.94	2,171.22	2,471.06	97.09	100
	Industrial	2,367.94	3,578.95	5,015.18	3,612.31	52.55	100
	Residential	20,148.75	26,299.21	38,200.15	44,149.34	119.12	100
	Developed	23,770.49	31,585.10	45,386.55	58,967.31	148.07	100
	Undeveloped	101,927.31	94,112.70	80,311.25	66,202.82	-35.05	100
	Total	125,697.80	125,697.80	125,697.80	125,170.13	N/A	100

Source: McConnell Land Use Data, University of Massachusetts

Between 1971 and 2005, the following communities experienced an increase in developed land area that exceeded the regional average of 148%: Dunstable (365%), Tyngsborough (363%), Pepperell (288%), Tewksbury (208%), Westford (165%), and Chelmsford (150%). The Town of Billerica had the lowest increase (86%), while Lowell (143%) and Dracut (121%) were below the regional average increase. In terms of the loss of undeveloped land, Lowell (-80%), Chelmsford (-51%), Billerica (-40%) and Tewksbury (-39%) exceeded the region's average loss of undeveloped land (-35%). Images 1 and 2 below offer an example of the land use changes that have occurred over the past several years. Both images are of a site located at 62 Groton Street in Pepperell. In the late 19th century, the property was developed as a single family home (Image 1). During the 1990's, the home was demolished and a Brooks Drugs was built in its place (Image 2).



Image 1: Single Family Home Located at 62 Dutton Street in Pepperell, built circa 1890

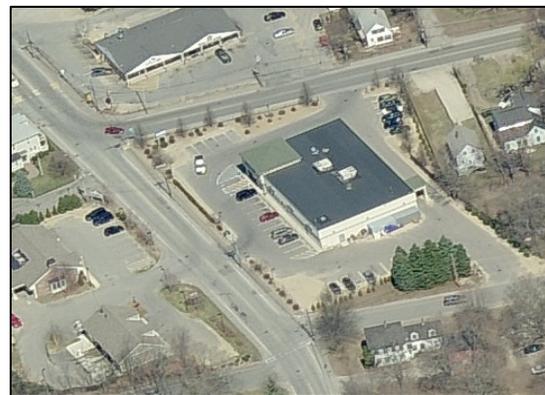


Image 2: Present Commercial Use of 62 Dutton Street

As shown in Table 17 on the following page, the communities of Lowell, Billerica, Chelmsford and Tewksbury have the greatest acreage currently in use for commercial development, followed by Dracut, Tyngsborough and Westford. Of the nine Greater Lowell communities, the Town of Billerica clearly has the largest land area devoted to industrial development (1,071 acres in

2005), followed by Lowell (632 acres), Tewksbury (586 acres), Chelmsford (561 acres) and Westford (416 acres). In 2005, the overall region had 2,470 acres of land being utilized for commercial development and 3,612 acres devoted to industrial development. Nearly one-quarter of the region's land area used for commercial and industrial development (1,491 acres) is located within the Town of Billerica. As shown previously in Table 16, this land use pattern is very different from the land uses seen in 1971 when the City of Lowell had the largest land area devoted to commercial and industrial uses, and reflects the continued trend in the suburbanization of employment centers.

Table 17: 2005 Commercial and Industrial Land Use by Community

Community	Commercial (Acres)	Industrial (Acres)	Total Commercial and Industrial (Acres)
Billerica	419.81	1,071.70	1,491.51
Chelmsford	410.70	560.91	971.61
Dracut	256.82	125.47	382.29
Dunstable	1.79	0	1.79
Lowell	549.55	632.04	1,181.59
Pepperell	46.23	87.58	133.81
Tewksbury	342.64	586.22	928.86
Tyngsborough	225.79	132.08	357.87
Westford	217.23	416.31	633.54
NMCOG Region	2,470.56	3,612.31	6,082.87

Source: 2005 McConnell Land Use Data, University of Massachusetts

5. Infrastructure

The state of a region's infrastructure plays a major role in its economic development potential. The Greater Lowell region has enjoyed a highly developed transportation infrastructure, which was enhanced during the past five years through the expansion of Route 3. This region has yet to see the direct economic benefits from the highway expansion, but is likely to experience these economic benefits during the next five years. Apart from the excellent highway network, access to public transit, multiple airports, freight transportation and bicycle and pedestrian facilities remain an enormous advantage for this region. The status of the region's water and sewer systems varies from community to community, yet there is a demonstrated need to address the regional sewer capacity in the future if private economic development investments are to continue. Utilities in the region have provided the Greater Lowell communities with the necessary electric and natural gas services, as well as telecommunications and internet support. Continued public investment in the region's infrastructure, particularly sewer and water systems, will be needed to maintain and expand economic growth over the next five years.

a. Transportation Systems

The ability to move people and goods is essential to the economic vitality and quality of life in the region. The transportation system supports economic growth by assuring efficient, safe, and reliable movement of employees and goods. The extensive and convenient transportation network provides an important economic advantage to businesses located in the Greater Lowell region. Highway access, public transit for workers, access to the major airports in Boston and Manchester, New Hampshire, and efficient freight delivery are provided through the region's

well-developed transportation infrastructure. The expansion of Route 3 and completion of the Central Artery project in Boston have served to further enhance mobility for the region’s residents and businesses.

i. Highways

The Greater Lowell region is served by an extensive highway network which includes U.S. Route 3, Interstate 495 and Interstate 93. The Lowell Connector provides direct access to the heart of the City of Lowell from Route 3 and I-495. These roadways provide convenient access to New Hampshire (Nashua, Manchester, Concord, Salem and Portsmouth), Maine, New York, Connecticut and Rhode Island, and other locations throughout New England, Canada, and the Mid-Atlantic states.

The Greater Lowell region contains approximately 2,696 lane miles of roadway, of which 97.95 lane miles are classified as interstate highway, comprising 3.63% of the region’s roadway network. Arterial roadways, which form the basic framework of the roadway system, comprise 679.1 lane miles (25.19%). Collector and local roads comprise 247.72 (9.12%) and 1671.63 (62%) lane miles respectively.

Historic traffic volume data is available for 178 locations throughout the region. From 1997 to 2008, traffic volumes across the region increased at an average annual rate of 0.8%. In 2007, the highest traffic volumes in the region were found on I-495 in Lowell (122,932 vehicles per day) and on Route 3 (118,600 vehicles per day).

Traffic congestion and safety concerns have been given high priority in transportation planning efforts at the regional and state levels. From 2004-2006, a total of 21,174 traffic accidents occurred in the nine communities comprising the Greater Lowell region. As part of its ongoing safety monitoring program, NMCOG identified the ten locations outlined in Table 18 as having the highest overall crash rates.

Table 18: Top Ten High Crash Locations within the Greater Lowell Area: 2004-2006

Intersection	Community	Total Crashes	Estimated Property Damage Only (EPDO) Score
Bridge St. and VFW Hwy.	Lowell	188	458
Wood St. and Middlesex St.	Lowell	138	266
Chelmsford St., Plain St. and Powell St.	Lowell	105	225
VFW Hwy, School St. and Mammoth Rd.	Lowell	112	208
Appleton St./Church St. and Central St.	Lowell	100	204
VFW Hwy. and Aiken St.	Lowell	84	188
Route 110, Carlisle Rd. and Boston Rd.	Westford	130	178
School St. and Branch St.	Lowell	66	154
Route 38 (Nesmith St.) and Route 133 (Andover St.)	Lowell	77	149
Route 110 (Chelmsford St.), Stevens St. and Industrial Ave.	Lowell	74	146

Source: Massachusetts Executive Office of Transportation- Registry of Motor Vehicles

Image 3 on the following page is an aerial photograph of the number one crash location in the Greater Lowell area, located at the intersection of Bridge Street and VFW Highway in the City

of Lowell. Between 2004 and 2006, 188 crashes were recorded at this intersection, resulting in the site receiving an Estimated Property Damage Only (EPDO) score of 458.



Image 3: Bridge Street and VFW Highway

Federal regulations require that each urbanized area over 200,000 in population develop a Congestion Management Program to systematically provide information on the performance of the transportation network, identify actions and measures to alleviate congestion, and enhance the mobility of goods and people. The Congestion Management Program is an important component of the transportation planning process and is used in the development of the Regional Transportation Plan and Transportation Improvement Program.

For the most part, data has shown that the majority of the region's arterial roadway segments operate at acceptable levels of service during the morning and evening peak travel periods. However, the data has also identified some congestion issues. During the morning peak period, 5.7% of the total monitored arterial roadways are congested, with 28% of the arterial roadway miles experiencing average speeds below 25 miles per hour. The Drum Hill Road/Westford Street/Wood Street corridor in Chelmsford and Lowell had the greatest number of roadway congested miles of the segments monitored throughout the region. Table 19 on the following page identifies the arterial roadway segments that experience significant delay during the A.M. peak period.

Table 19: Arterial Roadway Segments Experiencing Significant Delay During the A.M. Peak Period

Community	Roadway Segment	Direction	Segment Distance (miles)	Speed Limit (MPH)	Average Speed (MPH)
Billerica	Middlesex Turnpike from Manning Rd. to Lexington Rd.	SB	0.26	35	9.29
Chelmsford	Route 4 from Summer St. to Route 110/129	NB	0.25	25	7.03
Lowell	Pawtucket St. from Fletcher St. to School St.	WB	0.29	35	8.24
	Route 3A from SB Thorndike St. Ramp to Terminal Dr.	SB	0.04	30	8.38
	Route 38 from Hunts Falls Bridge to Merrimack St.	SB	0.16	35	7.46
	Route 38 from Sixth St. to VFW Hwy.	SB	0.24	30	9.39
	VFW Hwy. from Aiken St. to Route 38	EB	0.69	45	14.59
	VFW Hwy. from Varnum Ave. to Mammoth Rd.	EB	0.35	35	8.6
	Wood St. from Middlesex St. to Pawtucket Blvd.	NB	0.33	25	7.22
	Wood St. from Pawtucket Blvd. to Middlesex St.	SB	0.33	25	7.37
	Westford	Carlisle Rd. from Liberty Way to Route 110	NB	0.24	30
Route 110 from Westford Valley Marketplace to Boston Rd.		WB	0.25	30	9.76

Source: Northern Middlesex Council of Governments' Congestion Management Program

During the evening peak period, 10.7% of the total monitored arterial roadway miles are congested, with 2% of the arterial network operating at an average speed of 14 miles per hour. Thirty-three percent (33%) of the arterial roadway network experienced average speeds below 25 miles per hour. Drum Hill Road/Westford Street in Chelmsford and Lowell and Route 3A in Lowell had the greatest number of roadway miles experiencing congestion. Table 20 on the following page identifies the arterial roadway segments that experience significant delay during the P.M. peak period.

Table 20: Arterial Roadway Segments Experiencing Significant Delay During the P.M. Peak Period

Community	Roadway Segment	Direction	Segment Distance (miles)	Speed Limit (MPH)	Average Speed (MPH)
Chelmsford	Route 4 from Summer St. to Route 110/129	NB	0.25	25	4.13
Chelmsford/ Lowell	Drum Hill Rd./Westford St./Wood St. from Drum Hill Square to Pawtucket Blvd.	NB	1.45	30	4.01
Dracut	Route 38 from Dracut T.L. to Route 113	NB	0.24	30	9.29
Lowell	Middlesex St. from Baldwin St. to Wood St.	WB	0.27	35	7.21
	Pawtucket St. from Fletcher St. to School St.	WB	0.29	35	11.13
	Pawtucket St. from Wilder St. to School St.	EB	0.37	35	9.92
	Route 38 from Rogers St. to Boylston St.	NB	0.48	35	12.75
	Route 38 from Rogers St. to Andover St.	NB	0.49	35	6.16
	Route 38 from Sixth St. to VFW Hwy.	SB	0.24	30	9.64
	VFW Hwy. from Hunts Falls Rotary to Route 38	WB	0.28	35	7.37
	VFW Hwy. from University Ave. to Mammoth Rd.	WB	0.38	35	12.72
	VFW Hwy. from Aiken St. to Route 38	EB	0.69	45	15.95
	VFW Hwy. from Mammoth Rd. to University Ave.	EB	0.38	35	13.54
	Wood St. from Middlesex St. to Princeton St.	SB	0.1	30	8.92
Westford	Boston Rd. from Crown St. to Main St.	NB	0.43	30	13.4
	Carlisle Rd. from Liberty Way to Route 110	NB	0.24	30	6.41
	Route 110 from Westford Valley Marketplace to Boston Rd.	WB	0.25	30	8.04

Source: Northern Middlesex Council of Governments' Congestion Management Program

The Massachusetts Highway Department has compiled an inventory of bridges within the region. Each of these bridges is inspected (typically every two years) and rated using a national rating system (AASHTO). This system uses a scale of 0 to 100 with 100 indicating the highest score, and considers a number of standards including structural adequacy, safety, serviceability, traffic and use. Table 21 on the next page provides an inventory of the region's structurally deficient bridges, based on MassHighway's inspection, and the corresponding ratings. A structurally deficient bridge is one that has experienced deterioration that potentially reduces its load carrying capacity.

Table 21: Structurally Deficient Bridges in the Northern Middlesex Region

Community	Bridge Location	AASHTO Rating
Billerica	Nashua Rd. over the Concord River	57.9
	Boston Rd. over the Concord River	49.5
Chelmsford	Princeton St. over B&M Railroad	24.7
	North Rd. over I495	56.0
Dunstable	Main St. over Salmon Brook	21.7
Lowell	Morton St. over the B&M Railroad	15.0
	University Ave. over the Merrimack River	38.2
	Lawrence St. over Concord River	50.6
	Bridge St. over the Eastern Canal	49.2
	Market St. over the Western Canal	31.2
	Beaver St. over Beaver Brook	50.3
	VFW Hwy. over Beaver Brook	21.0
	Route 38 over Merrimack River	68.3
	Northbound Lowell Connector over Plain St.	62.4
	Southbound Lowell Connector over Plain St.	59.2
	I-495 south over Concord River	53.7
	I-495 south over MBTA/B&M Railroad	54.0
	I-495 north over B&M Railroad	54.0
	Wood St. extension. over B&M Railroad and the Merrimack River	31.9
Pepperell	Mill St. over the Naissitsit River	16.7
	Groton St. over the Nashua River	2.0
Tewksbury	I-495 north over Main St.	51.0
	I-495 south over Main St.	49.6
Tyngsborough	Kendall Rd. over the Merrimack River	7.2
	Kendall Rd. over B7M Railroad	3.0
Westford	Broadway St. over Stony Brook	74.6

Source: MassHighway

Table 22 below provides a listing of functionally obsolete bridges, according to MassHighway. Functionally obsolete bridges are structurally sound but do not meet current design and engineering standards.

Table 22: Functionally Obsolete Bridges in the Northern Middlesex Region

Community	Bridge Location	AASHTO Rating
Billerica	Faulkner Street over the Concord River	54.1
	Salem Road over the Shawsheen River	75.7
	Boston Road (Route 3A) over the Shawsheen River	51.0
	Gray Street	74.3
Chelmsford	School Street over Stony Brook	66.4
	Turnpike Road over River Meadow Brook	77.3
	Meadowbrook Road over Canal	56.2
	I-495 Northbound over Route 110	52.0
	I-495 Southbound over Route 110	52.0
	Westford Street over I-495	73.7
	Gorham Street (Route 3A) over I-495	75.6

Table 22: Functionally Obsolete Bridges in the Northern Middlesex Region (Cont.)

Community	Bridge Location	AASHTO Rating
Dracut	Pleasant Street (Route 113) East over Beaver Brook	60.6
	Pleasant Street (Route 113) West over Beaver Brook	72.7
	Parker Ave over Beaver Brook	69.4
	Phineas Street over Beaver Brook	76.3
Lowell	Lundburg Street over MBTA/B&M Railroad	76.2
	YMCA Drive over MBTA/B&M Railroad	74.8
	Route 3A over B&M Railroad	65.6
	Walker Street over B&M Railroad	56.7
	Wilder Street over B&M Railroad	72.5
	Bridge Street over the Merrimack River	57.1
	Cabot Street over Northern Canal	71.4
	Dutton Street over Western Canal	73.6
	Appleton Street (Route 110) over Thorndike Street	38.9
Westford	Stony Brook Road over Stony Brook	69.4
	Depot Road over Stony Brook	71.8
	Bridge Street over Stony Brook	73.5
	Town Farm Road over Stony Brook	74.1
	River Street over B&M Railroad	77.4
	Beaver Brook Road over Beaver Brook	53.2
	I-495 Southbound over Tadmuck Road	66.0
	I-495 Northbound over Tadmuck Road	64.0

Source: *MassHighway*

a) Merrimack River Crossing Capacity Issues

There is a lack of capacity on the many Merrimack River crossings within the City of Lowell and the Town of Tyngsborough. Such deficiencies were identified and noted in the region’s Congestion Management Program report. Six bridges span the Merrimack River within the City of Lowell. A temporary bridge has been constructed over the river in the Town of Tyngsborough to handle traffic while the permanent Tyngsborough Bridge is closed for repairs. The distance between the Tyngsborough Bridge and those in Lowell is approximately six miles.

In the morning, nearly half of the traffic originating north of the river is bound for Chelmsford or other points south of Lowell, while more than half of the northbound traffic in the evening peak period is destined for areas beyond Lowell. Since these vehicles largely represent commuters, the through movement consists mainly of people who live north of Lowell travelling to and from their jobs south of Lowell. The Lowell Connector and U.S. Route 3 serve as the primary collector-distributor south of Lowell, and Mammoth Road performs this function north of the river.

These regional traffic patterns, with heavy southbound flow in the mornings and northbound flow in the evenings, coupled with internal traffic movements in Lowell, a limited number of river crossings, and Lowell’s essentially 19th century street network, have resulted in severe peak hour congestion at the bridge approaches.

The river crossing in Tyngsborough is also severely congested during both the A.M. and P.M. peak travel periods. This congestion is again the result of regional traffic flows, with heavy southbound flow in the mornings and the northbound flow in the evenings. Furthermore, capacity on the bridge itself is very limited with only one travel lane in each direction.

b) Lowell River Crossing Issues

In developing the 2007 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 identified the river crossing deficiencies as being of high 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. Former Congressman Marty Meehan earmarked \$500,000 in High Priority Project through SAFETEA-LU for this purpose.

The University Avenue Bridge is structurally deficient and needs to be replaced with a new structure. In 2004 and in 2008, the City of Lowell spent approximately one million dollars to make temporary repairs to the one hundred year old structure, with hopes of keeping the bridge open for another few years. MassHighway has retained a consultant to design a replacement bridge on a new alignment extending from the intersection of Merrimack Street and Pawtucket Street, across the Merrimack River to the intersection of University Avenue and the VFW Highway. That project is at the 25% design stage and is expected to cost approximately \$20 million dollars to construct.

c) 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. The bridge is the only river crossing located within Tyngsborough, and for approximately five miles to the north and six miles to the south. Increased traffic congestion on and around the bridge, resulting from local and regional growth, has resulted in significant congestion and delays. In 1999, the bridge carried 23,500 vehicles per day. The high volume of traffic not only creates delays for commuters and residents, but also presents safety concerns for emergency and public safety personnel. As development continues in the area, vehicular demand will increase and additional river crossing capacity will be desired.

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. 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 (EIR) 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.

MassHighway constructed a temporary bridge immediately to the south of the existing bridge, which opened in Fall 2005 to allow for the closure of the Tyngsborough Bridge for repairs. Rehabilitation of the original structure commenced this summer and will take three years to complete. A photograph of the bridge, including the temporary bridge, is offered below in Image 4.



Image 4: Tyngsborough Bridge Replacement Project

d) Route 3 North Transportation Improvement Project

The Route 3 North Transportation Improvement project was undertaken to address traffic congestion on State Highway Route 3 between I-95/Route 128 and the New Hampshire state line. The project involved the addition of a third travel lane in each direction for the entire 21-mile long corridor. The project also included 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 new northbound ramps at the Concord Road interchange in Billerica, construction of a park and ride lot, and the installation of Intelligent Transportation Systems (“ITS”) components consistent with both national ITS Architecture and the IVHS Strategic Deployment Plan for Metropolitan Boston. All bridges have been widened to accommodate the potential installation of additional fourth north/south travel lanes in the future. Improvements have also been made adjacent to Route 3 North, such as new signal timings and lane restriping to facilitate movement through the corridor. The Route 3 project was completed in the fall of 2006 and has been critical to continued economic development initiatives within the region.

e) Recommended improvements from the I-495 Corridor Transportation Study

The I-495 Corridor Transportation Study was initiated by the Massachusetts Executive Office of Transportation and Public Works to identify existing and future transportation problems within the study area and outline an improvement strategy for addressing any deficiencies. The project study area extended from Westford north to Salisbury, a distance of 40 miles. The study was completed in 2008 and involved the development and evaluation of a full range of transportation improvement alternatives, including interchange, highway and non-highway improvements, as well as multi-modal options.

I-495 processes inter-regional traffic throughout the region and provides intra-regional connections from the main line to abutting roadways and land uses at interchanges. The corridor study found that travel on the mainline is congested at times, and that the majority of congestion is directly related to traffic operations at the interchanges. Interchanges operations, both at junction of interchange ramps with the mainline and with local intersection streets, are critical to the overall functioning of the network.

The study concluded that additional public transit service and the development of park and ride lots would not be sufficient measures to negate the need for additional capacity to the corridor in the future. It is assumed that the short-term recommendations outlined in the study would be implemented by MassHighway as part of its ongoing maintenance program or under a district-wide contract. The mid-term and long-term improvements will need to be programmed in the region's Transportation Improvement Program and in the State Transportation Improvement Program, through the MPO process. The improvements outlined in the study will be critical to providing the transportation infrastructure necessary for the future economic growth and prosperity of the region.

ii. Public Transportation

The public transportation network in the Greater Lowell region is fairly extensive. 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 initiatives, such as Boston-Montreal High Speed Rail, Lowell-Nashua-Manchester Commuter Rail extension and the Lowell Trolley Extension Project to bring additional services to the region's residents. The level of service to the Greater Lowell communities depends largely upon the federal, state and local financial resources available.

a) 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, Maynard and Townsend, and serves 321,187 residents. A chief elected official or designee from each member community serves on the LRTA Advisory Board. The LRTA, through a contractual agreement with Lowell Transit Management Inc., provides fixed route bus service to 267,254 residents in the City of Lowell and the Towns of Billerica, Chelmsford, Dracut, Tewksbury, Tyngsborough and Westford. All fixed routes have Lowell as either their origin or destination; nine routes operate only within the city, two routes service the Town of Chelmsford, one route

serves both Chelmsford and Westford, and single routes cover the towns of Billerica, Dracut/Tyngsborough (combined) Tewksbury, Andover and Burlington. Additionally, Billerica is covered by the Burlington Mall/Lahey Clinic route.

In June 2009, the LRTA increased fixed route service to the Town of Tewksbury by extending the # 12 bus to the Wilmington Commuter Rail Station and adding Saturday service. The #15 bus was also extended along Route 110 through Westford and into the IBM facility in Littleton. Additionally, the LRTA operates the Downtown Shuttle, which provides 15 minute bus service between the Gallagher Intermodal Transportation Center and downtown Lowell.

The City of Lowell is served by nine local routes and eight suburban routes, five days a week, from 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 service on Sundays or the following holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day. In 2008, the LRTA was awarded a Job Access Reverse Commute (JARC) grant for the operation of Saturday level service on the five holidays of Martin Luther King Day, Presidents' Day, Patriots' Day, Columbus Day and Veterans Day. Currently, the LRTA is awaiting the award of the next round of JARC funding, which will increase the hours of operation and expand routes on the five holidays to better meet the needs of commuters. The cost to ride an LRTA bus is \$1.00 within one community and \$1.50 between two or more communities. Monthly passes valid for unlimited travel on all City and suburban routes are also available.

The LRTA contracts with Lowell Transit Management, Inc. for the operation and maintenance of a forty-six bus fleet, forty of which are operated in peak hour service. Over the past four years, the LRTA has undertaken an aggressive bus replacement program, resulting in a modern fleet with the oldest vehicles being of a 2001 model year. Additionally, the LRTA currently operates two hybrid 35-foot buses and is awaiting the delivery of two more. The LRTA fixed route fleet is 100% handicapped accessible.

b) LRTA Paratransit Service

The LRTA currently provides paratransit services for the elderly and handicapped in twelve 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, Groton, Lowell, and Pepperell, under a contract with Paratransit Management of Lowell, Inc. This contract also includes special transportation service for area nursing homes and the Boston medical bus, which departs the LRTA region on Wednesday mornings delivering passengers to the hospitals in Bedford, Burlington and Boston and returning to Lowell in the afternoon. Additionally, the LRTA intends to expand paratransit service as part of its Americans with Disabilities Act (ADA) compliance program.

- The LRTA has entered into agreements with the Councils on Aging (CoA) in Acton, Chelmsford, Dracut, Groton, Maynard, Townsend, Tyngsborough and Westford to provide service for elderly and handicapped residents within these towns.

Currently, service is provided for trips not within each town and in 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, Maynard, and Townsend) are located in the western section of the LRTA district and gravitate, economically and socially, more to Fitchburg than Lowell.

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 residents. Within the urbanized area, nearly 7,400 of those 65 or older reported a mobility or self-care limitation to the U.S. Census Bureau. Additionally, nearly 11,000 individuals aged 16-64 years reported a mobility and/or self-care limitation. All trip purposes, including medical, nutritional, shopping, recreational, and social, are accommodated. 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 forty-three demand response vehicles with Paratransit Management of Lowell, Inc. and the Councils on Aging in Acton, Chelmsford, Dracut, Groton, Maynard, Townsend, Tyngsborough and Westford. Ten (10) of these vehicles serve the ADA service area: Billerica, Chelmsford, Dracut, Lowell, Tewksbury, Tyngsborough and Westford. All of the paratransit vehicles are wheelchair lift equipped and range in capacity from eight to fourteen passengers. In FY'09, the total paratransit passenger trip count was 95,919, with 61,361 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+F Bus Company, Inc., 16 Wyman Road, Billerica
2. Bedford Charter Service, 11 Railroad Avenue, Bedford
3. Bruce Transportation Group, 1 Ward Way, Chelmsford
4. Buckingham Bus Company, 40 Station Avenue, Groton
5. Dee Bus Service, 30 Progress Ave, Tyngsborough
6. Dunbar Bus Company, 33 Middlesex Road, Tyngsborough
7. R. C. Herrmann Bus Company, 290 Littleton Road, Westford
8. Tewksbury Transit Inc., 555 Whipple Road, Tewksbury
9. 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 Limousine, 15 Vinal Square, Chelmsford
4. Diamond Yellow Taxi Cabs, 50 Payne Street, Lowell
5. Lowell Cab Company, Lowell
6. Greater Lowell Town Taxi, 14 Perry Street, Lowell
7. Wilmington Taxi
8. Lowell Transportation

Ambulance Service and Wheelchair Transport:

1. American Medical Response, Lowell
2. Trinity EMS, 170 Perry Street, Lowell
3. Patriot Ambulance Service, 249 Mill Road, Chelmsford

c) Commuter Rail

Commuter rail transportation has long provided 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 description of the existing rail service offered in the Greater Lowell area, including the current fare structure, ridership and discussion of the possible future extension to Nashua and Manchester, New Hampshire.

• **Existing Service**

Present commuter rail service between Gallagher Terminal in Lowell and North Station in Boston consists of twenty-two 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-two daily outbound trains between the hours of 5:45 a.m. and 12:10 a.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 one-way, round trips and multiple ride tickets, as well as calendar monthly rail passes. Weekend and holiday rail service consists of eight 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 \$6.75. The calendar monthly pass costs \$223.00 for unlimited monthly service. The price of a one-way ticket between North Billerica is \$6.25, and the monthly pass is \$210.00.

- **Ridership**

Commuter rail ridership from Lowell has increased from 655 inbound passengers in March 1975 to 1,437 inbound passengers in December 2008. 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 North Billerica station increased from 185 inbound passengers in March 1975 to 938 inbound passengers in December 2008. Passenger ridership reached a high of 1,256 inbound passengers in December 2006 and a low of 184 inbound passengers in March 1976.

The LRTA has been promoting the use of commuter rail by increasing parking at the Lowell and North Billerica stations. In 1992 the LRTA completed construction of a 231-parking space addition to the Gallagher Terminal, thereby 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 was 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. A flyover image of the industrial complex on Wotton Street identified as a potential commuter rail stop is offered in Image 5 below.



Image 5: The industrial complex at the end of Wotton Street was identified as one potential site for a commuter rail stop in North Chelmsford.

The New Hampshire Rail Transit Authority was formed in 2008 through state legislation to serve as the operating entity for commuter rail service within the State of New Hampshire. The Nashua Regional Planning Commission and the New Hampshire DOT continue to address the design and permitting issues needed to move the project forward.

- **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 facilities at North Station and South Station in Boston. The connections to these locations are made as follows:

- The region is served by Peter Pan and Greyhound bus lines, which provide connections to locations nationwide. Buses depart and arrive at Gallagher Intermodal Center several 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 nation.

- 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 to 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 Boston Regional Airport in Manchester, New Hampshire is provided through private shuttle service.
- Access to Amtrak at North Station enables connection to New Hampshire and Maine via the Downeaster train. Access to Amtrak at South Station in Boston is provided by commuter rail whereby passengers get off at North Station and take the Green and Red lines to South Station allowing connections nationwide.

A photograph of the Gallagher Intermodal Transportation Center is provided in Image 6 below.

- **Park and Ride Facilities**

Currently there is one designated park and ride facility in the Northern Middlesex region. Located in Tyngsborough along Route 3 at Exit 35, the park and ride lot on Route 113 (Kendall Road) has a capacity of 250 vehicles. The lot has shown a steady increase in usage since opening in November 2006, and is currently at approximately 30% of its capacity. Parking is free at this location.

- **Commuter Rail Parking Facilities**



Image 6: Gallagher Intermodal Transportation Center

As part of the Massachusetts Bay Transit Authority (MBTA) commuter rail system, the Northern Middlesex region is served by the Lowell Line. There are two commuter rail stations in the region located in North Billerica and Lowell. The North Billerica station includes two open parking lots, while the Lowell station includes a large 858-space parking garage that is currently at 75% utilization. The Lowell station is located at the Charles Gallagher Intermodal Center on Thorndike Street, near the Lowell Connector, and serves as the fixed route bus hub for the Lowell Regional Transit Authority (LRTA). The cost of parking is \$5.00 per day, \$10.00 overnight, and \$45.00 for a monthly pass.

The two surface parking lots at the North Billerica commuter rail station total 541 parking spaces. In the past, these lots ran at capacity. However recent surveys have shown the usage to

be at around 75% full. The cost of parking is \$4.00 per day, with Billerica residents receiving a discount of \$2.00 per day.

- **Other Parking Facilities**

In addition to the park and ride and commuter rail parking areas, the City of Lowell operates five public parking garages that are open 24 hours per day:

- George Ayotte Parking Facility, 11 Post Office Square, 1,250 spaces
- Leo Roy Parking Facility, 100 Market Street, 1,143 spaces
- Lower Locks Parking Facility, 90 Warren Street, 643 spaces
- Joseph Downes Parking Facility, 75 John Street, 1,141 spaces
- Edward J. Early Jr. Parking Facility, 135 Middlesex Street, 940 spaces

Each of these facilities is located in downtown Lowell with easy access to the LRTA fixed route bus system. Parking rates start at \$1.00 per half hour, with a maximum charge of \$8.00 per day.

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.

iii. Airports

In terms of the availability of regional airport facilities, residents and businesses within the NMCOG region have several options:

- **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 Boston Regional 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 Regional Airport**
Travel distance from Lowell is approximately 40 miles. Worcester currently has one commercial airline, Direct Air, providing non-stop service to Myrtle Beach, South Carolina and Orlando and Punta Gorda, Florida. Worcester also offers private charter services.
- **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.

iv. Freight Transportation

The Executive Office of Transportation and Public Works is currently developing a statewide Freight and Rail Plan for Massachusetts. The final document is anticipated for release later this year. 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.

Table 23 on the next page summarizes 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 Table 23, trucks move more than half of freight shipments by tonnage and value and the principal trade is within the domestic market.

Table 23: 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 Table 24 below, 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:

Table 24: 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:

a) 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.

b) 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.

c) 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 Boston Regional Airport and Pease in Portsmouth, New Hampshire.

d) 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.

v. 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 Massachusetts Highway Department is designated as the lead agency to encourage the development of these facilities as part of larger infrastructure improvement projects and as stand-alone facilities.

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.

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/construction process and are listed below by community:

- **Billerica**

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 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. The easements for the Concord River Mill Pond/ Canal Park Project have been approved and the design drawings have been submitted to the Massachusetts Highway Department for preliminary review. Phase II has been started and has produced a study of the approximate 12 miles of existing canal segments.

- **Chelmsford**

Phase I of the Bruce Freeman Rail Trail has been completed and is open for use. This section of the trail extends from the Lowell/Chelmsford line near Cross Point, through Chelmsford Center, to the intersection of Route 27 and Route 225 in Westford. The trail has a 10-foot wide paved surface with a 2-foot wide packed shoulder on each side. Authorized parking for the trail is available at the following locations:

- Old Town Hall, 4 North Rd, Chelmsford
- Municipal lot behind Sovereign Bank, 5 Billerica Rd, Chelmsford
- Byam School (off school hours), 25 Maple Rd, Chelmsford
- Town Land, 2 Pond St, Chelmsford

A photograph of the trail is offered in Image 7 below.



Image 7: A Section of Phase I of the Bruce Freeman Rail Trail in Chelmsford

- **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 in Nashua, New Hampshire.

- **Lowell**

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. The canalway and river walk network provide access for tourists and workers to various parts of downtown Lowell. The network allows for pleasant travel for individuals moving from one downtown location to another. The Riverwalk provides access to many of the historic mill buildings in Lowell and developments such as the Tsongas Arena. Overlooks, a pedestrian bridge and seating areas enhance the recreational use of the walkway. The Boott Mill Courtyard was restored as part of this project to connect the Eastern Canal walkway with the Riverwalk. Western Canal Park is a component of the larger pedestrian walkway system of Lowell. The park development, which featured incorporation of historic remnants into the park design, has increased the accessibility along Western Canal, the Merrimack River and Lowell downtown areas.

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.

Concord River Walkway

The project is proposed along the eastern bank of the Concord River. The City of Lowell is overseeing construction of two sections of the Greenway, including the northern-most end at the Davidson Street parking lot and at the southern-most end near Lawrence Street and the Lowell Cemetery.

- **Tewksbury**

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 made great strides in developing a town-wide trail network. Within the Town of Westford, the trail system concept will include the entire town rather than just one or two major open space areas. With the completion of Phase I of the Bruce Freeman Rail Trail near Route 27, a valuable connection has been made incorporating the Westford trail network into a regional trail network. This is now being incorporated into the Bay Circuit Trail, which is a long distance trail, extending from Ipswich on the North Shore to Duxbury on the South Shore.

Phase II of the Bruce Freeman Rail Trail will begin at the Phase I terminus and continue for 4.88 miles through the communities of Westford, Carlisle and Acton. The construction will include a new variable-width paved asphalt multi-use trail with a 2-foot stabilized shoulders and an adjacent 6-foot stone dust trail. The project is currently at 25% Design.

b. Water and Sewer Systems

The Water and Sewer Systems in the region play an important role in supporting economic growth. The greatest challenge for the region's economic future is being able to expand the sewer capacity in the region so that additional economic growth can occur. This section provides a current overview of the water and sewer systems in each community within the region.

i. Water Systems

The sources and development status of the water systems in the region vary from community to community. Outlined below are brief summaries on the water systems in each community:

- **Billerica**

Due to problems with the existing water treatment plant, the Town broke ground in 2003 on a new \$25 million treatment plant located off Treble Cove Road, with a capacity of 14 million gallons per day. The Concord River is the sole source of all drinking water for the Town of Billerica, with public water available to the entire Town. The Town has MassDEP approval to withdraw 5.26 million gallons per day on an annual average. In 2008, the annual water consumption was approximately 1 billion gallons, with an average of 4.95 million gallons of water per day.

The new water treatment plant responded to numerous problems with the existing plant, including not being able to meet current water quality standards. The new plant did not increase the amount of water withdrawn from the Concord River; but, rather, to improve the quality of the drinking water.

- **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.

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 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 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 supplies approximately 9,000 households, including about 1,000 Tyngsborough residents.

The Kenwood Water District distributes water to approximately 1,500 households in East Dracut. The Kenwood District has no water supply of its own, and provides only the water distribution service. The Kenwood Water District purchases water from the City of Lowell and the Town of Methuen, and supplies it to many of the residential and businesses in the eastern portion of the town. The source of water for Lowell and Methuen is the Merrimack River. Dracut's current average demand is approximately 1.5 million gallons of water per day.

- **Dunstable**

Dunstable has a very limited public water supply system, with most of the homes and businesses relying on private wells as their water source. Only 5% of Dunstable's population living near the Town Center is served by municipal water supply. Currently, Dunstable operates from the Salmon Brook Well #1 and #2, which are located off Main Street, and pump approximately 25,000 gallons per day. 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.

Only one well operates at a given time, with the other well used as a backup. The wells are approximately 90 feet deep, with a current capacity of 250 gallons per minute. In 2008, the system included over 1 mile of water main, 101 services and less than 1,000 users. In 2008, the well produced and delivered over 10,925,100 gallons of water, an average of over 29,931 gallons per day. In 2008, the Dunstable Water Department was awarded the Small System Security Award by the MassDEP.

- **Lowell**

The only drinking water supply for Lowell's Water Treatment Plant is the surface water from the Merrimack River, which has its source in the White Mountains of New Hampshire. The Greater Lowell Regional Water Utility (LRWU) is responsible for the treatment and distribution of the water supply. LRWU also provides water to parts of Dracut, Tyngsborough and Chelmsford on a daily basis, and to parts of Tewksbury as needed.

In 2008, the LRWU produced more than 4.8 billion gallons of drinking water to over 135,000 people and businesses in Lowell, Dracut, Tyngsborough, and Chelmsford. Approximately 15 million gallons per day are pumped with a maximum capacity of 30 million gallons per day. 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.

In 2007 and 2008 the LRWU was granted State Revolving Fund (SRF) loans to continue water system improvements. These SRF loans will fund further upgrades to the LRWU's treatment facility, as well as water main replacements, water meter replacement, construction of a new water storage tank and several other minor system improvements.

- **Pepperell**

In 2008, the Pepperell Water Division was in full compliance with all state and federal drinking water standards and operating requirements. In 2008, the Pepperell Water Division supplied approximately 259,925 million gallons of water through approximately 2,984 service connections, with an average of .710 million gallons per day.

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 the drinking water for the Town of Tewksbury. The Massachusetts Surface Water Quality Standards classify the River as a Class B waterway, which means that the water withdrawn for drinking purposes must be treated. 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. Total water consumption in 2008 was approximately 3.5 million gallons per day, with residential water users accounting for approximately 65% of the demand. Municipal water is available to 98% of the town.

The location of the town's first storage tank, located at Catamount Street (aka Ames Hill), which is still in use, is home to the two (2) underground storage tanks which were built circa 1951 and 1958. Each tank can hold up to 500,000 gallons of water. In 1971 an elevated storage tank was constructed at Astle Street, which was just recently refurbished and can store up to 1,000,000 gallons of water. In August 2007, the Town completed the construction of a wire wound pre-stressed concrete tank that can hold 5 million gallons of water, which is located on Colonial Drive. This tank is the largest pumped tank in New England and provides a low profile.

- **Tyngsborough**

Public water service currently serves approximately thirty percent (30%) of the town. The remaining seventy percent (70%) of the town is served by on-site private wells. There are three water districts that operate a total of five water distributions systems that access various supply sources in neighboring communities, including Dracut, Chelmsford, Lowell and Nashua, New Hampshire. The 2003 Comprehensive Water Resources Management Plan (CWRMP) concluded that between inter-municipal agreements with Dracut and Lowell, and the agreement with the Pennichuck Water Works Corp., that the Town has sufficient capacity for future growth in the water system through 2020.

- **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. For the Fiscal Year 2008, 1.37 million gallons of water was used per day on average. The MassDEP is currently working with the Westford Board of Commissioners in acquiring a 31-acre parcel located on River Street for public water supply protection purposes. The land in question contains most of the Zone I protective radius for the town of Westford's proposed Stepinski Well. In 2008, the Westford Water Department was awarded the Conservation Award and Community Systems Award (Medium and Large Community Systems) by the MassDEP.

ii. Sewer Systems

The scope of completion for the Sewer Systems in the region is consistent with each community's overall development pattern. The City of Lowell, which is the most developed community in the region, has approximately 95% of its community supported by the municipal sewer system. Since the completion of the *Greater Lowell CEDS for 2004-200*, several communities within the Greater Lowell region, such as Billerica, Chelmsford and Tewksbury have participated in intensive sewer expansion projects. Dunstable and Westford do not have municipal sewer systems and rely on on-site septic systems. The summary of the sewer systems by community is as follows.

- **Billerica**

The Town is still in the process of completing an aggressive \$15 million dollar sewer expansion program. The Town's public sewer system currently covers 76% of the community, an increase from 70% in 2004. The Town operates a Wastewater Treatment Plant with design capacity of 5.5 million gallons per day (MGD). Billerica is currently in the process of making

approximately \$2 million in upgrades to the Shawsheen River Pump Station (aka George Brown Street Pump Station). In addition, the Letchworth Avenue Wastewater Treatment Facility completed a CoMag process in an effort to reduce phosphorous from the wastewater that enters the Concord River. Average daily flow for 2008 at the plant was 4.14 MGD, a significant increase (>2 MGD) from 2002 levels. During Fiscal Year 2008, 368 sewer permits were issued for new connections into the system.

- **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, 90% of the Town of Chelmsford is sewered, up from 70% in 2004, with plans to sewer the remainder of the Town by 2011. During Fiscal Year 2008, 337 sewer permits were issued for new connections into the system.

- **Dracut**

The municipal sewer system services about 65% of the Town's population. Existing sewered areas include most of Dracut Center, Collinsville, and the Navy Yard area. The remainder of the town is supported by on-site septic systems. Discharge from the sewer system is sent to the Greater Lowell Wastewater Utility. Dracut uses approximately 11% of the facility, or 3.6 million gallons per day of capacity. Of these 3.6 million gallons per day, Dracut must provide Tyngsborough with 1.0 million gallons per day, based on a 1977 inter-municipal 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 (CWMP) to sewer most of the Town over the next twenty years, which received final MEPA approval in May 2007. Construction will involve approximately 30 miles of new sewer lines to Wheeler Road, Colburn Avenue, Marsh Hill, Methuen Street, and Peter's Pond. Loon Hill, Mammoth Road and Gumpus Road and will also add nine new pump stations to the system. An additional 73,000 gpd will be added to the system, all of which will go to the City of Lowell's Treatment Facility and approximately 600,000 gpd of inflow and infiltration (I&I) will be removed from the system. The I&I removal will help the Town to stay within its Inter-municipal agreement with the City of Lowell.

- **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. Sixty percent of the system is a combined system designed to carry both sewage and stormwater. There are eight direct discharge points for this system that come into play during significant storm events. The City is under a federal court order to begin to eliminate these discharges. During 2008 and 2009, construction was started and/or completed on this sewer separation project in the Gorham

Street, Chelmsford Street and Boston Road areas of the City to begin to eliminate the combined sewer systems and the direct discharges into the river systems. 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 75 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. An aerial image of the plant is offered in Image 8.



Image 8: Greater Lowell Wastewater Treatment Facility

- **Pepperell**

The Pepperell Wastewater Treatment Plant, located at 47 Nashua Road, went on line in 1979. In 2008- 2009, the Town expanded the sewer system, installing almost 2,600 feet of new main line sewer on Nashua Road and Mill Street. The Town is currently processing approximately 178 million gallons per day and in both 2007 and 2008 received Operation and Excellence Awards from USEPA for a mid-size facility. The system has over 1,500 connections, serving approximately 40 % of the Town. The Town has an inter-municipal 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 is supported by on-site septic systems.

- **Tewksbury**

The Town of Tewksbury was 40% sewerred in 2004 and currently 98% of the Town is supported by the municipal sewer system. The Town is continuing with its on-going construction for sewerred the remainder of the community by 2010-2011. The cost of the sewer expansion project cost approximately \$80.6 million, which was funded through an enterprise fund. The Town of Tewksbury’s sewer collection systems consists of over 90 miles of pipe and 31 pump stations. The sewage is treated at the Greater Lowell Wastewater Utility in the City of Lowell. In the fall of 2008, construction involving the upgrading of seven of the oldest pump stations was initiated. Some of these stations have been in continuous operation for 23 years and these upgrades are critically needed.

- **Tyngsborough**

The Town of Tyngsborough’s public sewer services cover only 25% of the Town, while the remainder of the town is supported by on-site septic systems. Treatment is provided at the Greater Lowell Wastewater Utility. In fiscal year 2008, the pump station on Willowdale Avenue was replaced with a new pump station. The final design phases of the CWMP were completed in 2008, and the Final Environmental Report was approved by MEPA in early 2009. The Town is

continuing with its in place systematic study of the current sewer system to identify and correct infiltration/inflow (I&I) issues that are a significant contributor to overall flows. Currently, the town is attempting to find additional capacity for wastewater in order to effectively expand its tax base, provide residents with safe and sanitary wastewater disposal and prevent potential environmental problems.

- **Westford**

Public sewer still remains unavailable in the Town of Westford. All wastewater is disposed of by private on-site septic systems.

c. Utilities

This section focuses upon the utilities in the region, particularly related to electric services, natural gas delivery and telecommunications. In general, the Greater Lowell region is well served by the private utility companies, although there are some areas in the region that require additional telecommunications services. The utility companies generally work well with the local communities and the private development community to maintain and expand utility service throughout the region.

i. 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 (G-1) 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 Table 25 below.

Table 25: (G-1) Rates for Delivery Service

Customer Charge	\$9.03/month
Distribution Charge	\$4.094¢/kWh
Transmission Charge	\$1.453¢/kWh
Transition Charge	0.116¢/kWh
Demand Side Management Charge	0.250¢/kWh
Renewables Charge	0.050¢/kWh

Source: National Grid and Massachusetts Electric

Demand service (G-2) 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 Table 26 below.

Table 26: (G-2) Rates for Delivery Service

Customer Charge	\$16.56/month
Distribution Demand Charge	\$6.41/kW
Distribution Energy Charge	.0089¢/kWh
Transmission Charge	\$1.408¢/kWh
Transition Demand Charge	0.11¢/kWh
Transition Energy Charge	0.123¢/kWh
Demand Side Management Charge	0.250¢/kWh
Renewables Charge	0.050¢/kWh

Source: National Grid and Massachusetts Electric

Time-of-Use (G-3) rate structure is available for large commercial and industrial customers with demand greater than 200 kW. Peak hours are considered the following:

- Jan. 1 – Mar. 7: 8:00 a.m. through 9:00 p.m.
- Mar. 8 – Apr. 4: 9:00 a.m. through 10:00 p.m.
- Apr. 5 – Oct. 24: 8:00 a.m. through 9:00 p.m.
- Oct. 25 – Oct. 31: 7:00 a.m. through 8:00 p.m.
- Nov. 1 – Dec. 31: 8:00 a.m. through 9:00 p.m.

All hours not specified as peak hours, plus holidays and weekends are considered off peak hours. Customers on Rate G-2 and G-3 are eligible to receive discounts for high voltage metering and transformer ownership (high voltage delivery) if the customer meets the criteria of the discount. This rate structure is further described in Table 27 below.

Table 27: (G-3) Rates for Delivery Service

Customer Charge	\$73.16/month
Distribution Demand Charge	\$3.92/kW
Distribution Energy Charge	
Peak hours	\$1.229¢/kWh
Off-peak hours	0.045¢/kWh
Transmission Charge	\$1.192¢/kWh
Transition Demand Charge	0.19/kW
Transition Energy Charge	0.061¢/kWh
Demand Side Management Charge	0.250¢/kWh
Renewables Charge	0.050¢/kWh

Source: National Grid and Massachusetts Electric

MassElectric offers exceptional customer service, technical assistance and incentives to encourage energy efficiency. MassElectric has partnered with renewable energy companies and works closely with the Massachusetts Alliance for Economic Development (MAED) to ensure the most innovative services are available to their small and large business customers. The MAED offers a free and confidential site-finding service and is the best source of commercial property listings in the Commonwealth.

For small business customers with an average demand use of 200 kilowatts or less (or 40,300 kilowatt-hours or less) per month, MassElectric will provide a free energy audit and report of recommended energy efficiency improvements. The utility will pay 70% of the cost of installation of energy efficient equipment and the business can finance the remaining 30% interest free for up to 24 months. Upgrades available through the program include: lighting, 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. Also, MassElectric *Energy Initiative* 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.

MassElectric *GreenUp* renewable energy program is offered to G-1 customers to support the development of renewable energy. *GreenUp* allows customers to choose to have all or part of their electricity generated from renewable resources (wind, solar, biomass or hydro). Remaining a customer of MassElectric; your service will be outsourced to a participating *GreenUp* renewable energy company. Energy Profiler Online™ is an additional service provided that allows customers with interval data meters to access their interval load data via the internet, which helps customers better understand their electricity usage over time.

ii. Natural Gas Delivery

National Grid, in addition to providing electricity to all the NMCOG communities also provides natural gas services. As of May 1, 2008, KeySpan Energy Delivery changed its name to National Grid. National Grid 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 rehabilitation projects. National Grid also offers the following energy efficiency programs and advising services for commercial customers that will help identify opportunities to save money and operating costs:

- **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 multi-family and commercial-industrial customers to help reduce the incremental cost difference between standard and high-efficiency heating equipment. These rebates are summarized in Table 28 below.

Table 28: Energy Efficiency Customer Rebates

Product	Rating	Rebate
Furnaces (up to 150 MBH)	90% AFUE* or greater	\$100
Furnaces with electronic commutated motor (ECM)	92% AFUE* or greater	\$400
Condensing unit heaters (151 to 400 MBH)	90% Thermal Efficiency**	\$500
Direct fired heaters/direct fired makeup air (up to 1500 MBH)		\$1,000
Direct fired heaters/direct fired makeup air (1501 to 3000 MBH)		\$1,500
Direct fired heaters/direct fired makeup air (over 3000 MBH)		\$2,000
Infrared heaters (all sizes)	Low Intensity	\$500
Steam boilers (up to 300 MBH)	82% AFUE* or greater	\$200
Hydronic boilers (up to 300 MBH)	85% AFUE* or greater	\$500
Hydronic boilers (301 to 499 MBH)	85% Thermal Efficiency**	\$1,000
Hydronic boilers (500 to 999 MMBH)	85% Thermal Efficiency**	\$2,000
Hydronic boilers (1000 to 1700 MBTU)	85% Thermal Efficiency**	\$3,000
Hydronic boilers (1701 MBTU and up)	85% Thermal Efficiency**	\$4,000
Condensing boilers (up to 300 Mbtuh)	90% AFUE* or greater	\$1,000
Condensing boilers (301 to 499 Mbtuh)	90% Thermal Efficiency**	\$1,500
Condensing boilers (500 to 999 Mbtuh)	88% Thermal Efficiency**	\$3,000
Condensing boilers (1000 to 1700 Mbtuh)	88% Thermal Efficiency**	\$4,500
Condensing boilers (1701 Mbtuh and larger)	90% Thermal Efficiency**	\$6,000
Indirect fired water heaters (up to 50 gallon storage)		\$100
Indirect fired water heaters (over 50 gallon storage)		\$300
On-demand tankless water heaters (with electronic ignition)	Efficiency factor of .82 or higher	\$300

* AFUE = Annual Fuel Utilization Efficiency

** Thermal Efficiency = Efficiency of heat transfer in a boiler minus boiler radiation and convection losses

- **Building Practices and Demonstration Program-** In order to showcase the energy savings that can be achieved with new or underutilized 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-** This program is 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. National Grid 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 \$100,000 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.

iii. Telecommunications

Verizon provides the NMCOCG region with basic telephone service, in addition to providing homes and businesses with Verizon Fios, voice, data and video services. Verizon is the first company in the region and in the telecom industry to begin fiber optics on a widespread basis to connect homes and businesses directly to the network. Although Verizon is the largest service provider in the region, several other smaller competitors provide basic telephone, internet access and wireless services.

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, Ethernet, web hosting and e-commerce for businesses. Comcast also provides business solutions for small (less than 20 employees), medium (20 to 100 employees) and large (more than 100 employees) businesses. The Towns of Dunstable and Pepperell are served by Charter Communications, Inc., which provides businesses with cable TV

WAN services, high-speed (broadband) internet access, fiber services, telephone and video service.

6. The Environment

In balancing economic growth with the quality of life in the region, it is important to identify the natural and cultural resources available to residents, businessmen and visitors that make this area unique. This section identifies the open space/conservation land, the region's natural resources and the cultural and regional amenities in the area. Furthermore, this section addresses those areas that need to be maintained and improved in order to enhance the quality of life. These areas include water resources and quality, solid waste disposal, hazardous waste management, air quality and brownfields. Addressing each of these components in a positive manner provides the basis for increased private investment in the region's economy.

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. The descriptions of each community, based upon their overall development, are as follows.

- **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 2007 by the Commonwealth of Massachusetts.

Among the goals cited in the plan that had regional implications were: promotion of environmentally healthy water and wetlands resources, preservation of key open space, cultural and historic resources, improved public awareness and access to open space; establishment of greenways for recreational trails and habitat networks, focusing on local and regional links; balanced use of open space to include conservation, passive recreation and active recreation, development of land management and facilities maintenance plans; increased quantity and quality of athletic fields, parks and playgrounds, public education relative to the values of conservation and recreation



Image 9: Chuck Lampson Park in Billerica provides a variety of both active and passive recreational opportunities.

resources and the need for stewardship; establishment of land use and permitting practices that promote Smart Growth principles and protect resources areas; and creation of partnerships between the public sector, private sector, non-profit organizations and civic organizations in order to advance the above goals and objectives. A photograph of Chuck Lampson Park is offered in Image 9.

- **Chelmsford**

Since 1970, according to U.S. Census figures, the pace of residential development in Chelmsford has been relatively slow, growing by 2,426 people from 1970 to 2000. (By way of comparison, the population increased by almost 108% from 1960 -1970, when the Town grew by 16,302 people.) The growth rate is indicative of a well developed suburban community with little land left for development. (According to a 2008 Build-out Analysis conducted by NMCOG, there are only 681± acres remaining in Town that are considered “developable”.) Approximately 16 percent of the Town's total land area of 14,750 acres is classified as open space. Approximately 1,610.27 acres of the 2,378.06± acres classified as open space are considered permanently protected. Thus, 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 2003 Open Space and Recreation Plan Update, the highest priorities are to protect water resources, expand access to and awareness of conservation areas, and improve existing conservation and recreation areas. 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 Parlee-Waite, 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.

- **Dracut**

The town's Open Space and Recreation Plan was updated in 2002, and 2008, and continues to respond to the increasing development pressures on the community. Despite the strong pace of residential development in Dracut over the last quarter century, the town is fortunate to retain substantial open space, particularly the farm lands of East Dracut. Approximately 26 percent of the Town's total area of 13,697.8 acres is classified as open space. However, the semi-rural character of the town, valued by its residents, is by no means permanently protected. Only 1,390.63 acres of the 3,507.66 acres classified as open space is considered permanently protected. Preservation of farmlands and natural areas remains the principal concern of the community and is the primary goal of the 2008 Plan. The town or the state owns approximately 555± acres of protected land, while Agricultural Preservation Restrictions cover 223± acres and Conservation Restrictions protect 127 acres. Approximately 1700± acres are in the Chapter 61, 61A or 61B forest, agricultural or recreational tax abatement programs.

- **Dunstable**

Since the late 1970's, Dunstable has worked to retain its rural character through the active preservation of its farms and open spaces. Between the completion of the Town's first Open Space Plan in 1976 and the most recent update completed in 2005, publically and non-profit owned permanently protected lands increased to over 1,292 acres. All together there are over 2,100 acres of permanently preserved land. The Dunstable Rural Land Trust owns approximately 507 acres, in eleven parcels. Included in these figures are newly acquired lands via an appropriation of Community Preservation Act funds at the February 2009 town meeting. 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 for 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 issues for the Town, as outlined in the 2005 Open Space and Recreation Plan Update are the protection of water resources, maintaining the scenic, rural character of the Route 113 gateway into town from Tyngsborough, and protecting farmlands and wildlife habitat.

- **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 1,140 acre 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:

- 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 1960s and 1970s. 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; such as the current proposal to convert an unused trolley bridge to a pedestrian bridge along the Middlesex Canal;
 - 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.
- Lowell updated its 1994 Open Space and Recreation Plan in 2005. The stated goals of the 2005 Plan are:
- Develop an active public policy toward open space preservation;
 - Develop and maintain existing parks and recreational spaces;
 - Create links between open spaces within the City and to regional open space systems;
 - Protect and enhance Lowell’s historical and ecological heritage, including historic resources, rivers, wetlands and wildlife habitats;
 - Encourage an overall “greening” of the City; and
 - Build community pride and unity through an increased use and appreciation of Lowell’s open spaces, recreational services and natural environments.
- 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.
- 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 “American Revolution to 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, maintaining the Jollene Dubner Park, Alewife restoration, and ecological inventory work with the Massachusetts Audubon Society. In addition, the Trust has constructed a new quarter acre park on the Concord River.

The Friends of the Forest, a local land trust organization, has purchased almost seven acres of land adjacent to the Lowell-Tyngsborough-Dracut State Forest.

- **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 Open Space and Recreation Plan, which was completed in 2005, outlines the following goals: Preserve Pepperell's public and private water supplies, protect sensitive natural resources and the rural character of the Town; provide for long-term sustainability of open space and recreation efforts; increase access for people of all demographic groups to Pepperell's Open Space and recreation Land and programs; and promote a cooperative and regional approach to open space and recreation planning.

- **Tewksbury**

According to the 2009 Open Space and Recreation Plan, a substantial amount of land has been set aside for open space and recreation. Approximately 9.5% of Town's total land area or 1,387.29 acres is permanently protected. There are another 704.74 acres that are undeveloped and under public ownership but have limited protection or no protection. Another 956.38 acres of privately held lands are undeveloped and have limited or no protection. Approximately 3,048.41 acres of open space are either permanently protected, have limited protection or no protection. The town's principal open space goals as reflected in the 2009 Plan, are to Preserve and protect the rivers, brooks, ponds, wetlands, and floodplain in Tewksbury; preserve and protect the Town's natural resources and outstanding natural features for future generations; provide accessible, well-balanced recreation opportunities for all Town residents; ensure adequate maintenance of conservation areas, open spaces and recreation facilities in the interest of protecting the Town's investment and reducing long-term costs; educate the town's residents regarding the importance of open space and recreation areas to the town's quality of life - encourage enjoyment, use, and stewardship; preserve important historical and archaeological sites; enhance and protect the scenic and aesthetic character of the Town; work with regional, federal and state agencies, and non-profit organizations to develop a trail network linking open spaces within Tewksbury, as well as establishing linkages to other trail facilities located in adjoining communities; protect the Merrimack River as the Town's water supply; and promote efforts to preserve and protect open space for conservation, agriculture, and active and passive recreational needs.

- **Tyngsborough**

Despite the strong pace of residential development in Tyngsborough over the last quarter century, the town is fortunate to retain substantial open space. Approximately 31 percent of the Town's total land area of 10,816 acres is classified as open space. However, the semi-rural character of the town, valued by its residents, is by no means permanently protected. Approximately 1,242.72 acres of the 3,311.93 acres classified as open space are considered permanently protected. Included in this figure are 223 acres in the Town, which is part of the Lowell-Dracut-Tyngsborough State Forest. Recent town acquisitions of open space have focused on access to water or town 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 an impact on open space in Tyngsborough are Notre Dame Academy and the former Boston University's Corporate Training Center, now known as the Innovation Academy Charter School.

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 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 2009 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 the following goals:

- Increase the quantity and quality of recreation space and facilities;
- Develop maintenance and management plans for existing recreation and conservation areas;
- Revitalize the Town Center;
- Educate the residents on the value of open space in the Town and region;
- Increase accessibility of all recreational resources, facilities and programs;
- Promote land use and permitting practices that foster Smart Growth and protect historic assets, open space, cultural assets and resource areas;
- Improve the overall water quality of the Town's surface water bodies and wetland resources; and
- Establish greenways for recreation and habitat networks, with a focus on creating local and regional links.

- **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 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 north Westford. More than fifty permanent trail easements have been created and trail connections are already established between Westford and Chelmsford, Acton and Carlisle. An additional trail on the abandoned right-of-way of the Red Line trolley is under way and will connect with the Bruce Freeman trail and trails in Groton. A photograph of the town-owned Hills Orchard is offered in Image 10.



Image 10: Hill's Orchard in Westford

b. Water Resources and Quality

The Greater Lowell region has an exceptional river and lake system, which provides an abundance of water resources. The quality of the water is generally good, although there is some bacteria that impairs the water quality, particularly during drought situations. Partnership projects, such as those with the Merrimack River Watershed Association, are designed to improve the quality of the water through the identification of the level of bacteria impairment and the recommendation of ways to improve the overall water quality in the region.

River and Lake Systems

The NMCOG region possesses an abundance of water resources, including rivers, streams, brooks, lakes, ponds, reservoirs, marshes and wetlands, as shown on Map 8 in Appendix I. 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.

More than twenty-five major lakes and ponds are found in the region. Most of these lakes and ponds are natural water bodies over ten acres in area and, therefore, are defined as “Great Ponds”, according to the Massachusetts Department of Environmental Protection. 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, and Pepperell Pond in Pepperell and Groton are greater 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 greatly influenced by the region’s waterways. The City of Lowell has depended upon the Merrimack River and the Concord River for its water supply and to power 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 route to transport raw materials from Boston and ship finished products to market. In the 1920s 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 region grew around its rivers and lakes, road system and railroad/trolley tracks. Today, the Lowell National Historical Park and the Heritage State Park have focused attention on the historic benefits of the mills, canal system and rivers, as an important ingredient to the economic future of the City and the region. 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 have been well documented in other portions of this document.

Water Quality

The Merrimack River suffers from a number of impairments including pathogens (bacteria), metals, nutrients, priority organics and unionized ammonia, according to the *Massachusetts 2006 Integrated List of Impairments* [MA 303(d) List]. In addition to pathogens, nutrients are listed as impairments in the MA 303(d) list from the Pawtucket Dam to the confluence of the Merrimack River with Creek Brook in Haverhill. The Massachusetts Department of Environmental Protection (MassDEP) Massachusetts Watershed-Based Plans also list nutrient impairments in the Merrimack from Nashua, New Hampshire to the confluence of the Concord River in Lowell.

Problems with the quality of water are worse 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 thirty years ago. However, ongoing efforts by environmental groups, such as the Merrimack River Watershed Council and the Nashua River Watershed Association, have focused on the quality and quantity of water in the region through a watershed approach.

In 2009, NMCOG, in partnership with the Merrimack River Watershed Association applied for funds under the Massachusetts 604b program to determine the extent of nutrient and pathogen contamination in the upper Merrimack River in Massachusetts. This project will collect and report on the water quality impairment data necessary to assess (1) the level of bacteria impairment in the upper Merrimack River and trace pollution to river sources; (2) the extent of nutrient contamination and whether levels have increased, decreased or remained constant in the river since it was first listed; and (3) conduct at least two public outreach sessions regarding measures to improve the river's water quality. Data will be used to evaluate pollution abatement practices and recommend best management practices for the region.

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 and various municipal water departments throughout the region. Each community addresses water quality issues as they arise, in cooperation with MassDEP.

c. Hazardous Waste Management

The Commonwealth of Massachusetts, in compliance with U.S. Environmental Protection Agency (EPA) regulations, requires the proper and safe disposal of all products classified as hazardous products and wastes. The 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 (UMass 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.

The individual communities within the Greater Lowell region have collected the following amounts of hazardous products and wastes in 2007:

Table 29: Hazardous Waste Generation (2007)

Municipality	Hazardous Products and Difficult to Manage Wastes (Tons)	Hazardous Products Collected at One-Day Events (Tons)	Total (Tons)
Billerica	0.2	2.1	2.3
Chelmsford	52.2	0.1	52.3
Dracut	36.9	1.5	38.4
Dunstable	1.0	1.3	2.3
Lowell	157.6	0.0	157.6
Pepperell	52.0	0.0	52.0
Tewksbury	35.9	0.8	36.7
Tyngsborough	1.0	3.8	4.8
Westford	32.4	0.0	32.4
Total (Tons)	369.2	9.6	378.8

Source: Massachusetts Department of Environmental Protection, 2007 Municipal Solid Waste Recycling Tonnages and Rate Summary

d. Solid Waste Disposal

All municipalities in the NMCOG region provide for the proper disposal of solid waste. With the exception of the Towns of Pepperell and Dunstable, publicly funded/operated curbside pick-up is provided for residentially generated solid waste via contracted, collection/disposal services. Pepperell and Dunstable operate locally-owned transfer facilities where 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. Currently, there are no active landfills or combustion facilities identified by the Massachusetts Department of Environmental Protection (MassDEP) in any of the nine (9) NMCOG communities.

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 (e.g. approved landfill or incineration facility).

All municipalities in the region offering curbside trash pick-up also require separation of recyclables from the waste stream. Separate programs are in effect in all communities for the separation of other hazardous materials, such as mercury, CFCs and heavy metals for proper disposal and/or recycling. Since the *2000 Solid Waste Master Plan (Beyond 2000 Plan)* was published in December 2000 by MassDEP, municipalities, citizens, businesses, and solid waste service providers have achieved significant accomplishments in reducing waste and furthering sustainable solid waste management.

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 TURI, has introduced many new processes, which have reduced or eliminated

the use of toxic solvents (e.g. TCE in circuit and electrical component manufacturing, which is a dominant industry in the Region).

Table 30 below provides the solid waste and recycled disposal rates for each municipality in the Greater Lowell region for 2003 and 2007.

Table 30: Solid Waste/Recycled Material Disposal Rates: 2003 -2007

Municipality	2003 Solid Waste Disposal Rates (Tons)	2007 Solid Waste Disposal Rates (Tons)	Solid Waste % Change 2003-2007	2003 Recycled Materials* (Tons)	2007 Recycled Materials* (Tons)	Recycled Materials % Change 2003-2007
Billerica	20,225	20,181	-0.22%	2,694	2,662	-1.19%
Chelmsford	15,733	13,822	-12.15%	3,622	4,234	16.89%
Dracut	13,798	13,390	-2.96%	2,167	2,050	-5.40%
Dunstable	1,310	1,018	-22.30%	247	248	0.40%
Lowell	65,039	51,163	-21.34%	4,148	8,613	107.64%
Pepperell	3,502	5,251	49.94%	732	990	35.24%
Tewksbury	12,943	15,047	16.25%	1,433	1,328	-7.33%
Tyngsborough	5,516	4,336	-21.40%	1,016	1,277	25.68%
Westford	9,794	10,038	2.49%	2,747	2,559	-6.85%

Note: MassDEP calculates disposal rates and recycling rates based on data submitted annually by municipalities. The accuracy of rates depends on the completeness and accuracy of data reported to MassDEP.

**Recycled materials include the following: paper, glass, plastic, metal, textiles and swap shop.*

The following section describes the municipal solid waste program within each community:

- **Billerica**

Billerica provides curbside trash collection and recycling services. There are no municipal transfer stations, however, the Andrejois Hygiene transfer station is privately operated and located at 13 Linnell Street. Total recycled waste (glass, metal, paper, plastic and textiles) in 2007 was 2,662 tons. Total solid waste disposed in 2007 was 20,181 tons. Composted material (leaf and yard waste, Christmas trees and home compost) totaled 1,265 tons.

- **Chelmsford**

Chelmsford provides curbside trash collection and recycling services. There are no municipal or private transfer stations in town. Chelmsford residents disposed of 13,822 tons of solid and recycled 4,234 tons of glass, metal, paper, plastic and textiles in 2007. Composted material (leaf and yard waste, Christmas trees and home compost) totaled 563 tons.

- **Dracut**

Dracut provides curbside trash collection and recycling services. Solid waste generated in 2007 was 13,390 tons, while 2,050 tons were recycled, which includes glass, metal, paper, plastic and textiles. Composted material (leaf and yard waste, Christmas trees and home compost) totaled 670 tons.

- **Dunstable**

The Town has a municipal trash transfer station and recycling drop-off facility located on Depot Street and operates from 8:00 a.m. to 4:00 p.m. on Saturdays. Transfer Station stickers are required for all vehicles accessing the Transfer station and all bags must contain a tag. Stickers for vehicles and tags may be purchased at Town Hall. Total recycled waste in 2007 was 248 tons and total solid waste was 1,018 tons. Composted material (leaf and yard waste, Christmas trees and home compost) totaled 217 tons.

- **Lowell**

The City of Lowell provides curbside trash collection and recycling. In 2007, the City collected approximately 51,163 tons of trash and 8,613 tons of recyclables. Composted material (leaf and yard waste, Christmas trees and home compost) totaled 2,934 tons.

- **Pepperell**

The Town of Pepperell operates a municipal transfer station on Boynton Street. In 2007, Pepperell generated 5,251 tons in solid waste. Total recyclables received at the transfer station totaled 990 tons. Composted material (leaf and yard waste, Christmas trees and home compost) totaled 875 tons.

- **Tewksbury**

Tewksbury provides curbside trash collection and recycling services. In 2007, Tewksbury disposed approximately 15,047 tons of solid waste and recycled 1,328 tons. Composted material (leaf and yard waste, Christmas trees and home compost) totaled 671 tons.

- **Tyngsborough**

Tyngsborough provides curbside trash pickup and recycling services. In 2007, total solid waste collected in Town was 4,336 tons. Recyclables totaled another 1,277 tons. Composted material (leaf and yard waste, Christmas trees and home compost) totaled 809 tons.

- **Westford**

Westford provides curbside trash collection and recycling services. Recyclables accounted for 2,559 tons, while solid waste accounted for 10,038. Composted material (leaf and yard waste, Christmas trees and home compost) totaled 149 tons.

e. Air Quality

The Commonwealth of Massachusetts is classified as serious nonattainment for ozone, and is divided into two nonattainment areas. The Eastern Massachusetts ozone nonattainment area includes Barnstable, Bristol, Dukes, Essex, Middlesex, Nantucket, Norfolk, Suffolk, and Worcester counties. Berkshire, Franklin, Hampden, and Hampshire counties comprise the

Western Massachusetts ozone nonattainment area. With these classifications, the 1990 Clean Air Act Amendments (CAAA) required 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.

In April 2002, the cities of Lowell, Waltham, Worcester and Springfield were re-designated to attainment for carbon monoxide with EPA-approved limited maintenance plans. In April 1996, the communities of Boston, Cambridge, Chelsea, Everett, Malden, Medford, Quincy, Revere, and Somerville were classified as attainment for carbon monoxide (CO). Air quality conformity analysis must still be completed in these communities, as they have a carbon monoxide maintenance plan approved into the state implementation plan (SIP). The year 2010 carbon monoxide motor vehicle emission budget established for the Boston CO attainment area with a maintenance plan is 228.33 tons of carbon monoxide per winter day.

The CAAA also required Metropolitan Planning Organizations (MPOs) within nonattainment areas to perform conformity determinations prior to the approval of their Regional Transportation Plans (RTPs) and Transportation Improvement Programs (TIPs). The most recent prior conformity determination occurred in the summer of 2007, when the Federal Highway Administration (FHWA) – in consultation with the Environmental Protection Agency (EPA New England) and the Massachusetts Department of Environmental Protection (DEP) – confirmed that all the RTPs for the year 2007 in Massachusetts were in conformity with the Massachusetts State Implementation Plan (SIP). A brief summary of major conformity milestones in recent years is as follows (more details are provided in the 2007 RTPs and related documents).

Between 2003 and 2006, several new conformity determinations were made that were triggered by various events, including: The 2003 regional transportation plans, a change in designation from the one-hour ozone standard to an eight-hour ozone standard, and various changes to regional TIPs that involved reprogramming transportation projects across analysis years.

In 2007, air quality analyses were conducted on behalf of all the 2007 Regional Transportation Plans (RTPs), the purposes of which were to evaluate the RTPs air quality impacts on the SIP. Conformity determinations were performed to ensure that all regionally significant projects were included in the RTPs. The Massachusetts Executive Office of Transportation found the emission levels from the 2007 Regional Transportation Plans to be in conformance with the SIP. Each MPO had certified (and continues to certify) that all activities outlined in its Plan and its TIP:

- 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.

On April 2, 2008 EPA found that the 2008 and 2009 motor vehicle emissions budgets in the January 31, 2008 Massachusetts 8-hour ozone State Implementation Plan revision were adequate for transportation conformity purposes. The submittal included 2008 and 2009 motor vehicle emission budgets for the Boston-Lawrence-Worcester (Eastern Massachusetts) and Springfield

(Western Massachusetts) 8-hour ozone nonattainment areas. Massachusetts submitted these budgets as part of the 8-hour ozone attainment demonstration and reasonable further progress plan for both nonattainment areas, and as a result of EPA's adequacy finding, these budgets are required to be used for this and future conformity determinations.

Conformity Test

The conformity test is to show consistency with the emissions budgets set forth in the SIP, and to contribute to reductions in CO nonattainment areas. In addition, the format of the conformity test is determined by evolving regulations. These regulations set specific requirements for different time periods depending on the timeframe of the Commonwealth's SIP submittals to EPA. These periods are defined as follows:

- **Control Strategy Period:** Once a control strategy SIP has been submitted to EPA, EPA has to make a positive adequacy determination of the mobile source emission budget before such budget can be used for conformity purposes. The conformity test in this period is consistent with the mobile source emission budget.
- **Maintenance Period** is the period of time beginning when the Commonwealth submits and EPA approves a request for redesignation to an attainment area, and lasting for 20 years. The conformity test in this period is consistency with the mobile source emission budget. Horizon years for regional and state model analyses have been established following 40 CFR 93.106(a) of the Federal Conformity Regulations. The years for which the regional and state transportation models were run for emission estimates are shown below:
 - 2000: Milestone Year – This year is currently being used by the statewide travel demand model as the new base year for calculation of emission reductions of VOCs and NOx.
 - 2010: Analysis Year – first year of TIP
 - 2020: Analysis Year
 - 2030: Horizon Year – last forecast year of regional transportation plans

Changes in Project Design since the Last Conformity Determination Analysis

The milestone and analysis year transportation model networks are composed of projects proposed in this 2010-2013 TIP. Projects in these networks consist of all in-place “regionally significant” projects that can reasonably be expected to be completed by a given analysis/horizon year with consideration of available funding commitments. This project group would include, but not be limited to, regionally significant projects where at least one of the following steps has occurred within the past three years:

- Comes from the first year of a previously conforming TIP,
- Completed the NEPA process, or
- Currently under construction or are undergoing right-of-way acquisition

The Commonwealth requires that any changes in project design from the previous conformity determination for the region be identified. The last conformity determination was performed on the 2007 Regional Transportation Plan.

Air Quality Conformity Analysis

Specific information regarding the analysis and modeling methods, latest planning assumptions, and consultation procedures are all detailed in the 2007 RTP (and appendices). The emissions from the following MPOs have been combined to show conformity with the SIP for the Eastern Massachusetts Nonattainment Area:

- Cape Cod MPO
- Central Massachusetts MPO
- Merrimack Valley MPO
- Boston MPO
- Montachusett Region MPO
- Northern Middlesex MPO
- Old Colony MPO
- Southeastern Region MPO
- Martha's Vineyard Commission
- Nantucket Planning and Economic Development Commission

Using the latest planning assumptions, the Executive Office of Transportation, Office of Transportation Planning, estimated the emissions for VOC and NOx for all areas and all MPOs through a combination of the statewide and selected regional travel demand models (and with assistance from MPO staff). The VOC mobile source emission budget for 2009 and beyond for the Eastern Massachusetts Nonattainment Area has been set at 63.50 tons per summer day and the 2009 (and beyond) mobile source budget for NOx is 174.96 tons per summer day. As shown in Tables 31 and 32, 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:

Table 31: VOC Emissions Estimates for the Eastern Massachusetts Ozone Nonattainment Area
(all emissions in tons per summer day)

Year	Northern Middlesex MPO Action Emissions	Eastern MA Action Emissions	Budget	Difference (Action – Budget)
2000	n/a	166.545	n/a	n/a
2010	3.7741	59.155	63.50	-4.345
2020	2.0294	32.415	63.50	-31.085
2030	1.8864	30.412	63.50	-33.088

**Table 32: NO_x Emissions Estimates for the Eastern Massachusetts Ozone Nonattainment Area
(all emissions in tons per summer day)**

Year	Northern Middlesex MPO Action Emissions	Eastern MA Action Emissions	Budget	Difference (Action – Budget)
2000	n/a	287.877	n/a	n/a
2010	9.9184	162.637	174.96	-12.323
2020	2.6485	48.148	174.96	-126.812
2030	1.7002	32.743	174.96	-142.217

This conformity determination analysis has been prepared in accordance with EPA’s final conformity regulations. The air quality analyses outlined in this document demonstrate that the implementation of the TIP satisfies the conformity criteria where applicable and is consistent with the air quality goals in the Massachusetts SIP. In conclusion, the NMCOG region is addressing the Air Quality standards established by federal law and implemented by EPA.

f. Brownfields

Communities within the Greater Lowell region are committed to revitalizing existing brownfield sites, 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”. Although the majority of these brownfield redevelopment efforts have occurred in the City of Lowell, the suburban communities are increasingly targeting brownfield sites for revitalization as a way to promote economic development and curb suburban sprawl.

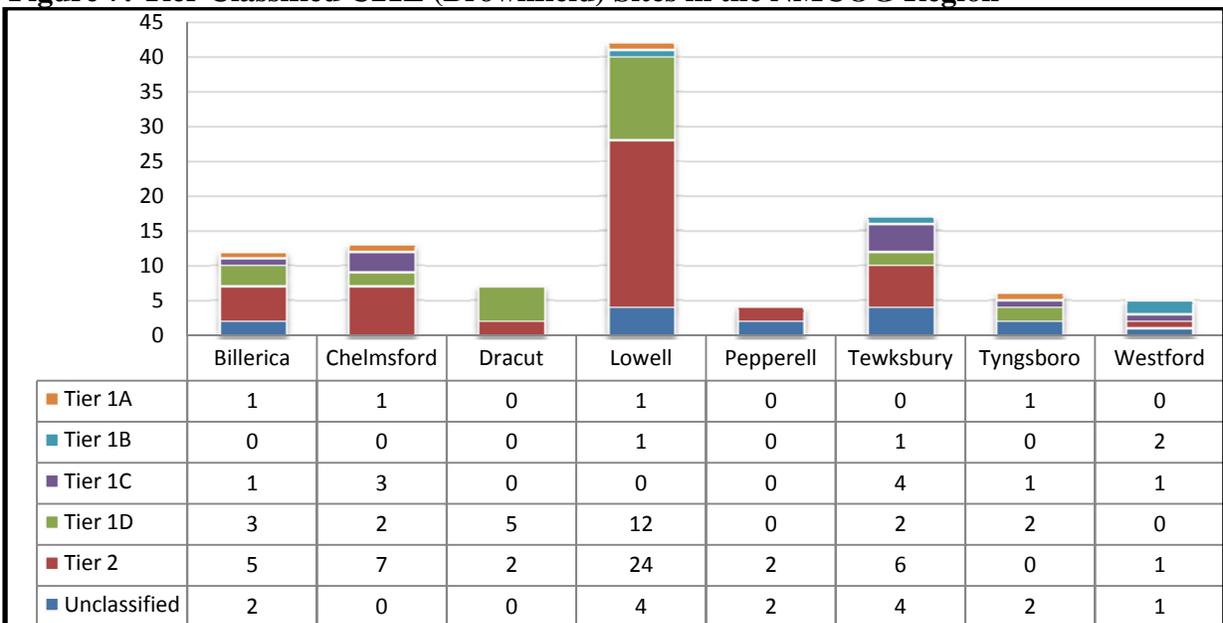
The Commonwealth of Massachusetts has developed a numerical Tier Classified System for these so-called Chapter 21E sites as a means of assessing sites where contamination has occurred. Properties are classified according to several variables, including site complexity, the type of contamination, and the potential for human or environmental exposure to the contamination. These 21E sites are designated within one of six categories:

- *Tier 1A* sites have received a Numerical Ranking Score (NRS) equal to or greater than 550. These sites require a permit and the person undertaking response actions must do so under direct supervision from the Massachusetts Department of Environmental Protection (DEP). Additionally, some sites are automatically classified as Tier 1A if they pose an imminent hazard, affect public water supplies, or miss regulatory deadlines.
- *Tier 1B* sites (NRS $450 \leq 550$) require a permit but response actions may be performed under the supervision of a Licensed Site Professional (LSP) without DEP approval.
- *Tier 1C* sites (NRS $350 \leq 450$) require a permit, but response actions may be performed under the supervision of an LSP without prior DEP approval.
- *Tier 2* sites (<350) do not require a permit and response actions may be performed under the supervision of an LSP without prior DEP approval. All pre-1993 transition sites that have accepted waivers are categorized as Tier 2 sites.
- *Tier 1D* sites are sites where the responsible party has failed to provide a required submittal to DEP by a specified deadline.

- *Unclassified* sites are sites that haven't reached their Tier Classification deadline and Response Action Outcome (RAO) statements, Downgradient Property Status (DPS) submittals, or Tier Classification forms have not been received by DEP.

Figure 7 below breaks out the one hundred six (106) identified 21E sites in the region by community and tier classification. Every community in the Greater Lowell region has at least one 21E site, except for Dunstable. Four of these sites have been classified as Tier 1A sites - Iron Horse Park in Billerica, the Silicon Transistor Corporation site in Chelmsford, the former Costas Dump in Lowell, and the Charles George landfill in Tyngsborough. The remediation strategy for Iron Horse Park has been implemented and the environmental clean-up is presently underway. The Silicon Transistor Corporation site is in Phase IV of the remediation process and the cleanup plan is being implemented. The former Costas Dump has reached Phase V, which means the long-term treatment processes have been implemented and the focus has shifted to the monitoring and tracking of the cleanup process. The Charles George Landfill was completed in 1998 through the construction of a full synthetic landfill cap, but the collection and treatment of leachate and flaring methane continues.

Figure 7: Tier Classified C21E (Brownfield) Sites in the NMCOG Region



Source: Massachusetts Department of Environmental Protection

Four Tier 1B sites have also been identified - the School Street right of way in Lowell, Tewksbury Auto Parts in Tewksbury, and Rustlick, Inc. and the Westford Highway Garage in Westford. The School Street right of way site has been worked on by two LSPs and there are some businesses on the site. The Tewksbury Auto Parts site is in Phase IV of the remediation process, while the Rustlick, Inc. and Westford Highway Garage sites are in Phase II, during which a comprehensive site analysis is conducted and risks to public health, welfare, and the environment are determined. In addition to the Tier 1A and 1B sites, there are ten sites classified as 1C sites, twenty-six sites classified as 1D, forty-seven sites classified as Tier 2 sites, and fifteen unclassified sites. Nearly 40% of the 21E sites in the region are located in Lowell, while

16% are located in Tewksbury, 12.3% in Chelmsford, 11.3% in Billerica, 6.7% in Dracut, 5.7% in Tyngsborough, 4.7% in Westford and 3.8% in Pepperell.

In addition to the sites identified by DEP, EPA maintains a National Priorities List (NPL), which is the list of national priorities among the known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States and its territories. The NPL is intended primarily to guide the EPA in determining which sites warrant further investigation. Presently, there are twenty-one NPL sites in the NMCOG region. Three of these sites – the former Silresim Chemical Corporation in Lowell, the Sutton Brook Disposal Area in Tewksbury and the Charles George Reclamation Trust Landfill in Tyngsborough - have completed the NPL designation process and are listed as Superfund sites. Additionally, there are eleven sites on the NPL List awaiting designation, three sites have been identified as Short Term/Removal sites, two sites have been identified as “Brownfield” sites, and one site has been identified as a Resource Conservation and Recovery Act (RCRA) Corrective Action site.⁵

In 1996, the City of Lowell was designated by EPA as a “Brownfields Showcase Community” and during the past thirteen years the city has received \$3.2 million dollars in funding. Several of these awards have been used to remediate contamination discovered within the Jackson-Appleton-Middlesex (JAM) Plan area and within the Hamilton Canal District. In 2005, the City received \$255,040 in clean-up funds to remediate a Middlesex Street site that was redeveloped into the Early Parking Facility within the Hamilton Canal District. Two years later, the City received an additional \$200,000 to assess and clean up two sites within the Hamilton Canal District. The City also received \$400,000 per year in 2008 and 2009 to complete Phase I or Phase II site investigations on nearly thirty sites across the city.

More recently, the Architectural Heritage Foundation (AHF) received a \$70,000 site assessment grant from MassDevelopment to utilize for the Hamilton Crossing Project. MassDevelopment also makes Brownfield Redevelopment Funds available to communities with Economic Target Areas (ETAs), such as Lowell, Billerica, Chelmsford and Dracut. In 2005, MassDevelopment awarded a \$400,000 loan to Dracut developer for the redevelopment of a former wool mill complex into the mixed-use Beaver Brook Village in Dracut.

In June 2009, the Silresim Superfund site located at 86 Tanner Street in Lowell was selected for up to \$25 million in additional remediation funds through the American Recovery and Reinvestment Act (ARRA). Presently, the EPA is conducting groundwater remediation and monitoring at the site, and the City is in the process of developing a Master Plan for the property. (This project is listed as a Short Term Priority Project for the Greater Lowell region in the Action Plan section of this report.) A flyover image of 86 Tanner Street is provided in Image 11.



Image 11: Silresim Superfund site at 86 Tanner Street in Lowell

⁵ For information about how the EPA defines NPL status, visit: <http://www.epa.gov/superfund/sites/npl/status.htm>.

The redevelopment of the former Silicon Transistor Corporation site at 25 Katrina Road in Chelmsford was advanced through the Chapter 43D designation of the site by the Interagency Permitting Board in December 2008. Additionally, the site has received up to \$ 2 million in low cost loans under the Brownfields Priority Project Program from MassDevelopment, as well as an \$85,000 EPA targeted brownfield assessment grant. Upon completion of the environmental assessment, the Town plans to issue a Request For Proposal (RFP) for the disposition and redevelopment of the site. The redevelopment of 25 Katrina Road is included as a Short-Term Priority Project in the Action Plan section of this report.

Other Priority Projects identified in this CEDS Document, which are likely to have a brownfield component are the Navy Yard Mill Redevelopment initiative and 970 Broadway Industrial Redevelopment project in Dracut, and the Pepperell Paper Mill Redevelopment Initiative—one of the “Major Development Projects” identified and discussed in this report.

g. 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, Table 33 on the following page summarizes the decline of agricultural land use in the NMCOG region by community between 1971 and 2005.

Table 33: Agricultural Land Use in the NMCOG Region

Community	Acres		Percent of Region in 1971*	Percent of Region in 2005*	Acreage Change 1971-2005 (Percent)*
	1971	2005			
Billerica	537.34	262.11	5.1%	4%	51.2%
Chelmsford	827.97	415.81	7.8%	6.4%	49.8%
Dracut	2,420.13	1,690.21	23%	26%	30.2%
Dunstable	1,405.41	1,089.58	13.3%	16.7%	22.5%
Lowell	129.34	21.80	1.2%	0.3%	83.1%
Pepperell	2,411.05	1,664.42	23%	25.6%	31%
Tewksbury	822.91	399.98	7.8%	6.1%	51.4%
Tyngsborough	669.26	418.79	6.3%	6.4%	37.4%
Westford	1,339.25	545.05	12.7%	8.3%	59.3%
Region	10,562.66	6,507.75	100%	100%	38.3%

Sources: *2020 Vision: Planning for Growth in the Northern Middlesex Region, MassGIS*
Northern Middlesex Council of Governments,

* Figures have been rounded

Table 33 reflects the decline of agricultural land by 38% in the region between 1971 and 2005. The largest declines were experienced in Westford (-59.3%), Chelmsford (-49.7%), Tyngsborough (-37%), and Lowell (-83%). 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 2005, the largest remaining agricultural lands were in Pepperell (25.6%), Dracut (26%) and Dunstable (16.7%). Based upon more recent development trends during the 1990s and early 2000s, the trend of declining agricultural land continues to this day. A number of communities, including Dracut, Dunstable, Pepperell and Tewksbury, reacting to this trend, have made the preservation of natural resources and agricultural enterprises a priority in their Open Space and Recreational Plan Updates. Image 12 below is a photograph of Brox Farm in Dracut, a working farm that has utilized land conservation restrictions in order to ensure its continued use for agricultural purposes.



Image 12: Brox Farm in Dracut

h. Cultural and Recreational Amenities

The Greater Lowell region has extensive cultural and recreational amenities. Over the past few years, the region has increasingly recognized the importance of its cultural economy. The Creative Economy project was initiated by the Merrimack Valley Economic Development Council (MVEDC) through a small grant it received from the Massachusetts Cultural Council. The focus of this project was to define the creative economy in the Merrimack Valley, quantify its contributions to the overall economy, and promote the growth of the creative economy as a means to diversify the economy and provide a destination location for travelers and shoppers. The communities involved in this project included the nine communities of the Northern Middlesex Council of Governments (NMCOG) and the fifteen communities of the Merrimack Valley Planning Commission (MVPC).

The initial study of the creative economy in this area was undertaken by Mt. Auburn Associates in 2000, when it worked with the New England Council to produce the report entitled “The New England Creative Economy Initiative: The Role of Arts and Culture in New England’s Economic Competitiveness”. Based upon the results of this study, three specific components were quantified:

- 1) The Creative Cluster businesses employed 245,000 employees, which represented 3.5% of the New England business workforce; this cluster was growing faster than the rest of the economy; the cluster bringing in significant external revenues;
- 2) The Creative Community focused upon quality of life, was a key to downtown revitalization and could be a component of suburban and rural development as well, and
- 3) The Creative Workforce represented 2% of the New England total workforce, many worked outside the cluster and the workforce was highly entrepreneurial.

In 2007, Mt. Auburn Associates worked with the Lowell Plan to produce “On the Cultural Road...CITY OF WORLD CULTURE – Strategies for the Creative Economy in Lowell, Massachusetts”. The purpose of this project was to “Utilize and strengthen Lowell’s cultural assets in order to enhance community revitalization and pride, develop leadership and build human capital and create new economic opportunities”. This strategy document outlined implementation steps in five specific areas: 1) Strengthen Lowell’s Cultural Organizations and Artists, 2) Enhance the Cultural Product, 3) Promote Creative Business Development, 4) Build New Leadership and Civic Engagement and 5) Shape the Image and Improve Marketing. In essence, the Lowell report provided a blueprint for growing the creative economy in the city.

Beginning in July 2007, MVEDC formed an initial steering committee consisting of the Cultural Organization of Lowell (COOL), UMass Lowell and representatives of MVEDC. This steering committee was broadened to include representatives from the Northern Middlesex Council of Governments (NMCOG), Team Haverhill, the Merrimack Valley Planning Commission (MVPC), the Light of Cambodian Children & Southeast Asian Water Festival, Live Lawrence and the artist community. MVEDC hired Deborah Carey as project manager and Mt. Auburn Associates to provide an overview of the creative economy as part of their outreach efforts. MVEDC conducted two creative economy forums with more than 300 attendees at the

Revolving Museum in Lowell (November 2007) and Northern Essex Community College in Haverhill (January 2008). As a result of these forums, four working groups were established: Workforce/Business Development, Marketing and Communications, Festivals, Celebrations and Cultural Products, and New Regional Activities and Events. There was also an active effort to tie together businesses with the arts and cultural organizations to focus upon the economic component of this initiative. MVEDC identified more than 70 annual festivals in the Merrimack Valley and compiled an inventory of “creative economy assets” in the region.

There was an extensive marketing effort and outreach by MVEDC to the Chambers of Commerce in Lowell, Lawrence, Haverhill and Newburyport, as well as the Visitor Centers at the Greater Merrimack Valley and the North of Boston Convention & Visitors Bureau. MVEDC implemented an extensive outreach to the press, cable television and travel bureaus to “brand” the region as a creative economy and destination location. MVEDC and the Steering Committee began planning for two Valley-wide events scheduled for the fall of 2008. The first event was the *ArtsFest Merrimack Valley*, which was the first-ever Merrimack Valley-wide arts and cultural event. Through an active partnership with the Essex National Heritage Commission’s annual “Trails and Sails” weekend, Lowell’s annual “Lowell Open Studios” and Newburyport’s ArtWalk, MVEDC used this framework of activities to schedule the event from September 26th through 28th. The second event was the first Massachusetts Poetry Festival scheduled for October 10th to 12th in downtown Lowell. Based upon a collaborative effort with the Massachusetts Poetry Outreach Project, the Massachusetts Cultural Council and the Massachusetts Foundation for the Humanities, MVEDC modeled this event after the successful Lowell Folk Festival.

Due to limited funding, MVEDC concluded this project after the two major events were held. The resources developed as a result of this grant from the Massachusetts Cultural Council are available for future efforts to expand the Creative Economy in the Merrimack Valley. This project served to unify, organize and strengthen the cultural community which continues to work with the local communities to promote their role in the economy and in the region’s quality of life. The following is a partial listing of established cultural organizations and entities located within the Greater Lowell area:

- 119 Gallery
- American Textile Museum
- Arts League of Lowell
- Audio Park Productions
- Ayer Lofts and Gallery
- CounterpART Gallery
- Cultural Organization of Lowell
- Friends of Photography
- Garrison House
- Image Theater
- Illuminations Opera Company
- Loading Dock Gallery
- Lowell Film Collaborative
- Lowell National Historical Park
- Lowell Rocks
- Lowell Philharmonic
- Lowell Poetry Network
- Merrimack Repertory Theatre
- Merrimack Valley Bridge Review
- National Streetcar Museum
- New England Quilt Museum
- Parish Center for the Arts
- Parker Lecture Series
- Patrick J. Mogan Cultural Center
- Revolving Museum
- Western Avenue Studios
- Whistler House Museum of Art

As discussed in prior sections of the CEDS document, the region’s natural resources and open spaces provide a broad array of recreational opportunities. Table 34 of the following pages lists and summarizes the recreational areas and opportunities within each community:

Table 34: Recreational Areas and Opportunities

Recreational Area	Recreational Opportunities
Billerica	
Great Meadows National Wildlife Refuge (55 acres)	Hiking, nature observation, cross-country skiing, canoeing
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.
Lampson Recreation Complex	Basketball courts, tennis courts, football field, softball fields, multi-use field, ice-skating, recreation office.
Akeson Park	Soccer fields, canoe put-in/take-out site for Shawsheen River.
Pollard Park	Kids Konnection (children’s playground), picnicking, baseball field.
Micozzi Beach	Swimming, picnic area, playground, sand volleyball court, basketball, handicapped accessible fishing pier, canoe launch, nature observation.
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.
Country Club of Billerica	Eighteen hole public golf course, driving range, Barrie Bruce Golf School.
Rangeway Golf	Driving range, miniature golf course.
Minute Man Sportsman’s Club	Rifle target range, archery, skeet shooting, trap shooting
Billerica Rod and Gun Club (North Billerica)	Rifle target range, archery, skeet shooting, trap shooting
Boys and Girls Club of Greater Billerica	Gymnasium, pool, ropes course, game rooms, before/after school program, special events.
Nuttings Lake, Winning Pond, Concord River, Shawsheen River.	Fishing or canoeing
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.
Gilson Hill State Forest	Consists of 168 acres with hiking trails located off Treble Cove Road.
Town Conservation Land owned by Conservation Commission.	Sixteen parcels totaling over 200 acres located throughout the Town.
Chelmsford	
Cranberry Bog Reservation (164 acres)	Hiking, wildlife observation, fishing
George B.B. Wright Reservation (110 acres)	Hiking, nature observation
Lime Quarry Reservation (64 acres)	Hiking, nature observation
Lowell Sportsman Club (64 acres, private)	Fresh water fishing, target archery, shooting
Chelmsford Country Club (31.5 acres, municipal)	Golf, sledding
Chelmsford High School (52 acres)	Baseball/softball, cross-country skiing, football/soccer, general play, hiking, nature observation, organized events, tennis.
Russell Mill Pond and Forest (132 acres)	Hiking, horseback riding, nature observation, fishing, boating, soccer
Thanksgiving Ground Forest (48 acres)	Fresh water fishing, swimming, hiking, nature observation, boating
McCarthy Jr. High School (42 acres)	Baseball/softball, football/soccer, general play, nature observation, tennis, walking/jogging
Freeman Lake (77 acres)	Swimming, boating (non-motorized), skating
Warren Wildlife Sanctuary (24 acres)	Wildlife observation
Bruce Freeman Rail Trail	Bicycling, walking, rollerblading, jogging, cross-country skiing

Table 34: Recreational Areas and Opportunities (Cont.)

Recreational Area	Recreational Opportunities
Dracut	
Lowell Dracut Tyngsborough State Forest (1,140 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.
Dracut High Complex (89 Acres)	Baseball/softball, football/soccer, freshwater fishing, organized events, team activities, and walking/jogging
Municipal Landfill (70 Acres)	Baseball/softball, football/soccer
Centerville Sport Club (35 Acres)	Fresh water fishing, hunting, nature observation, target archery
Polubinski Land (23 Acres)	Baseball/softball
Colburn Land (19 Acres)	Nature observation, picnicking
Parker Avenue School (7 Acres)	Baseball/softball
Dracut Tennis Center (6 Acres)	Tennis
Town Conservation Land owned by Conservation Commission.	Sixteen parcels totaling over 325 acres located throughout the Town
Veteran’s Memorial Park	Sports fields, water park
Centralville Sportsman’s Club	Target shooting, trap shooting
Methuen Road and Gun Club	Archery, fishing
Dunstable	
Town Forest (119 Acres)	Cross-country skiing, hiking, horseback riding, hunting, nature observation, and snowmobiling
Camp Massapoag (106 Acres)	Non-motorized boating, cross-country skiing, fresh water fishing, swimming, hiking, nature observation, target archery.
Spaulding Proctor (91 Acres)	Non-motorized boating, non-motorized boating, cross-country skiing, fresh water fishing, swimming, hiking, nature observation.
Salmon Brook Area (35 Acres)	Fresh water fishing, hiking, hunting, nature observation.
Spectal Hill Lot (23 Acres)	Cross-country skiing, hiking, hunting, nature observation
Swallow/Union School Area (913 Acres)	Fresh water fishing, hiking, nature observation, tennis
Nashua River Trail	Bicycling, walking, rollerblading, jogging, cross-country skiing, horseback riding
Lowell	
Lowell Dracut Tyngsborough State Forest (1,140 Acres)	ATV motoring, non-motorized boating, cross-country skiing, fresh water fishing, hiking, hunting, ice skating, nature observation, organized events, sightseeing, snowmobiling, walking/jogging.
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.
University of Massachusetts Lowell (103 Acres)	Assorted facilities
Longmeadow Golf Club (62 Acres)	Golf
Leblanc Park (60 Acres)	Camping, general play, hiking, organized events, picnicking, and pool swimming.
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.
Fort Hill Park (34 Acres)	Bicycling, cross-country skiing, downhill skiing, hiking, picnicking, and walking/jogging
Boulevard Park (24 Acres)	Bicycling, non-motorized boating, camping, fresh water fishing, general play, hiking, ice skating, organized events, picnicking, walking/jogging.
Pepperell	
Nissitissit River W.M.A (294 Acres)	Cross-country skiing, fresh water fishing, hiking, hunting, nature observation, and snowmobiling
Hays and Swett Lots (125 Acres)	Non-motorized boating, cross-country skiing, fresh water fishing, hiking, hunting, nature observation, snowmobiling, target archery.
Conservation Commission Land Trust (100 Acres)	Cross-country skiing, fresh water fishing, hiking, horseback riding, and nature observation.
Town Forest (83 Acres)	Cross-country skiing, hiking, horseback riding, hunting, nature observation, picnicking
Orchard Lot (80 Acres)	ATV motoring, cross-country skiing, hiking, nature observation, picnicking, sightseeing, snowmobiling
Nashua River Trail	Bicycling, walking, rollerblading, jogging, cross-country skiing, and horseback riding

Table 34: Recreational Areas and Opportunities (Cont.)

Recreational Area	Recreational Opportunities
Tewksbury	
Trull Brook Golf Course (126 Acres)	Golf, tennis, nature observation
Memorial High School (55 Acres)	Baseball/softball, football/soccer, general play.
Livingston Street Park (31 Acres)	Basketball, general play, tennis.
Rogers Park (27 Acres)	Nature observation
Center School (25 Acres)	General play, tennis.
Longmeadow Golf Course (52 acres)	Golf
Tewksbury Country Club (31 acres)	Golf
Camp Pohelo	Summer youth programs
Frasca Field (40 acres)	Athletic fields
Tyngsborough	
Lowell, Dracut, Tyngsborough State Forest (1,140 Acres)	ATV motoring, bicycling, non-motorized boating, cross-country skiing, fresh water fishing, hiking, horseback riding, hunting, ice skating, nature observation, organized events, picnicking, sight-seeing, snowmobiling, walking/jogging.
MIT Property (251 Acres, Private)	Nature observation
Notre Dame Academy (199 Acres, Private)	Hiking, nature observation, swimming, tennis.
Vesper Country Club (170 Acres, Private)	Golf, hiking, nature observation, swimming, tennis
Elbow Meadow (132 Acres)	Hiking, nature observation
Tyngsborough Country Club (87 Acres)	Golf, hiking, hunting, nature observation, picnicking
Greater Lowell Regional Vocational Technical High School (85 Acres)	Baseball/softball, basketball, football/soccer, general play, organized events
Lake Mascuppick	Town Beach, swimming, boating
Tyngsborough Elementary School (70 acres)	Athletic fields
Tyngsborough High/Middle School complex (45 acres)	Athletic fields, basketball courts
Community Center Fields	Athletic fields
Wicasse Field (9 acres)	Athletic fields
Bridge Meadow (37 acres)	Athletic fields, hiking, nature observation
Sherburn Property (79 acres)	Hiking, nature observation
Lakeview School (11 acres)	Athletic fields
Tyngsborough Sportsman's Club (43 acres)	Target shooting, fishing derbies
Clover Hill Road School (26 acres)	Athletic Fields
Innovation Academy (177 acres)	Athletic fields
Westford	
Nashoba Brook Area (350 Acres)	Cross-country skiing, hiking, hunting, nature observation, and snowmobiling
Bruce Freeman Bike Path	Bicycling, walking, rollerblading, jogging, cross-country skiing
Nabnasset Lake Golf Course	Golf, sledding
East Boston Camps (241 Acres)	Camping, swimming, picnicking, fishing, boating (non- motorized), snowshoeing, cross-country skiing, hiking, jogging
Slifer Conservation Land	Hiking, bird watching, cross-country skiing
Nonset Brook-Vine Brook (174 Acres)	Hunting, nature observation
Graniteville Ball Fields	Baseball, softball, basketball, playground
Tadmuck Swamp Area (142 Acres)	Fresh water fishing, hunting, nature observation
New Westford Academy (111 Acres)	Baseball/softball, football, track, other team sports.
Stony Brook School	Tennis, lacrosse, basketball, soccer
Jack Walsh Field	Soccer, tennis, basketball
Mystery Spring (106 Acres)	Cross-country skiing, hiking, hunting, nature observation, and snowmobiling
Nashoba Valley Ski Area (50 Acres)	Downhill skiing, 4 chair lifts, 3 rope tows, 9 trails
Butter Brook Golf Course	Golf
Edwards Beach	Swimming, boating (non-motorized), fishing, nature observation
Forge Pond Beach	Swimming, boating (non-motorized), nature observation

B. The Regional Economy

This section provides an overview of the current economic conditions in the Greater Lowell region by updating the statistical data provided previously in the *Greater Lowell Comprehensive Economic Development Strategy (CEDS) 2004-2008*. This economic data has also been updated in the previous Annual CEDS Updates. By offering this “snapshot” of the regional economy, one can assess the current economic conditions and adjust our policies to reflect them, effectively building upon available economic opportunities and providing direction for the regional economic development goal-setting process.

Regional economic development is becoming a priority for planners and policymakers through the recognition that the communities are dependent upon neighboring communities. Whether the focus is on regional employment, plant layoffs, workforce development initiatives, transportation and transit planning, disaster preparedness, or funding for regional school districts, public administrators increasingly understand that the success of one town depends on the overall economic strength and vitality of the region in which it’s situated.

The current economic recession has repeatedly demonstrated that the weakening economic conditions in individual communities in the Northern Middlesex region are not mutually exclusive. A large plant layoff in Billerica will inevitably impact residents in the City of Lowell and neighboring suburban towns. Land use decisions made to revitalize the industrial tax base in one community may generate opposition from residents in an abutting municipality. Debates around the equitable distribution of scarce state and Federal resources often surface during public meetings and planning sessions. These are some examples of the ways in which the impacts of regionalization are being felt in the Greater Lowell area.

The Regional Economy chapter is divided into nine sections. In the first and second sections, the Greater Lowell labor market and regional employment are described. These sections are followed by an examination of factors related to pockets of distress in the region. Business creation is the focus of the fourth section. Next, we explore some of the current and emerging industry clusters within the region. Regional innovation and competitiveness is the subject of the sixth section. This is followed by an overview of the tax policies and bonding capacities for the nine communities in the NMCOG region. The eighth section examines the existing workforce development system in the region. The Regional Economy section concludes with an examination of trends in the regional housing market over the past four years.

1. The Greater Lowell Labor Market

The Greater Lowell region’s labor market cuts across the New Hampshire state line and is dependent upon New Hampshire residents to fill many positions. To a large extent, many residents of southern New Hampshire formerly lived in the Merrimack Valley and are accustomed to working in Lowell and the surrounding communities. Similarly, some residents of the Greater Lowell region commute on Route 3, I-495 and I-93 to work in southern New Hampshire businesses located in Rockingham or Hillsborough Counties. The commuting patterns in this region rely upon a dependable highway infrastructure and, to a more limited extent, on public transit.

In 2005 the Office of Management and Budget (OMB) revised or created new statistical labor market areas based upon the commuting patterns and economic dependence upon communities in Massachusetts. Within New England, a special category called New England Cities and Town Areas (NECTAs) was created to reflect existing labor markets as determined by the commuting patterns identified in the 2000 U.S. Census. Instead of dealing with the previous Metropolitan Statistical Areas (MSAs) or Primary Metropolitan Statistical Areas (PMSAs), the new labor market areas are defined as Metropolitan or Micropolitan NECTAs, as well as NECTA Divisions.

In Massachusetts, OMB created seven Metropolitan NECTAs, nine NECTA Divisions of the Boston-Cambridge-Quincy, MA-NH Metropolitan NECTA, three Labor Market Areas and one Adjacent Labor Market Area. So instead of referring to this region as the Lowell MA-NH PMSA, it is now referred to as the Lowell-Billerica-Chelmsford, MA-NH and Nashua, NH-MA NECTA Divisions of the Boston-Cambridge-Quincy, MA-NH Metropolitan NECTA. Within the Lowell-Billerica-Chelmsford, MA-NH NECTA Division are eight of the Greater Lowell communities – Billerica, Chelmsford, Dracut, Dunstable, Lowell, Tewksbury, Tyngsborough and Westford – and Pelham, New Hampshire. The Town of Pepperell is included in the Nashua, NH-MA NECTA Division, along with Townsend and nineteen New Hampshire communities.

With regard to the workforce development work undertaken by the Greater Lowell Workforce Investment Board (GLWIB) headquartered in Lowell, their service area is designated as the Greater Lowell Workforce Investment Area and consists of eight of the Greater Lowell communities – Billerica, Chelmsford, Dracut, Dunstable, Lowell, Tewksbury, Tyngsborough, and Westford. The Town of Pepperell falls within the North Central Workforce Investment Area, although we work closely with the town to tie together their economic and workforce development initiatives.

2. Regional Employment

In the early 2000s, the Greater Lowell region was significantly impacted by the downturn in the economy and suffered extensive layoffs in the information technology and computer manufacturing sectors. Today, the economic recession that has beset the nation, state, and region has had a very real impact on Lowell and its surrounding suburbs. In 2007 and 2008, two thirds of the NMCOG communities suffered plant layoffs, primarily in the high tech manufacturing, information technology, and retail sectors.

Prior to the current economic recession, the region had largely recovered from the recession of the early 2000s. Despite this stabilization, the growth rate in the civilian labor force in Massachusetts ranked last among all states at -1.7% between 2002 and 2005, according to Professor Andrew Sum at the Center for Labor Market Studies at Northeastern University. Between 2002 and 2006, the statewide labor force growth rate was 0.2%, which ranked last in New England behind Vermont (8.3%), Maine (6.7%), New Hampshire (6.6%), Rhode Island (6.3%) and Connecticut (6.1%). Moreover, during the six year period from July 2000 to July 2006, Massachusetts ranked 47th of all states in terms of population growth (1.2%), as compared to the U.S. population growth rate of 6%. Between August 2007 and August 2008, the state's labor force increased by .22%, increasing its growth rank to 37th out of the 50 states.

This limited growth in population was attributed to high levels of domestic out-migration (304,000 people between 2000 and mid-2008), being only partially offset by the high level of international migration (206,000 people between 2000 and mid-2008). Between 2000 and 2005 only two other states – Louisiana (due to Hurricane Katrina) and New York – had higher net levels of domestic out-migration during this time period. The states benefiting from this mass out-migration from Massachusetts between 2003 and 2005 included Florida, New Hampshire, Texas, North Carolina, Maine, Connecticut, Rhode Island, Virginia, Washington and Illinois. As a result of these factors, the educational attainment levels of the current labor force have shifted considerably and offer new challenges for private industry and the workforce development and educational systems in the Greater Lowell region and across the Commonwealth.

The national recession, which economists believe began as of December 2007, has impacted every part of the country, including the Greater Lowell region and Massachusetts. This recession has been described as the worst economic downturn since World War II. In this part of the country, the housing “bubble” burst prior to the national recession being felt in this area. In fact, the full impacts of the national recession were not felt in the Greater Lowell region until the end of 2008. Economic indicators, such as the number of establishments, unemployment rates and average monthly employment, have all been negatively impacted by the national recession, while the number of foreclosure, housing sales and median housing prices have been significantly altered by the housing crisis. Throughout the remainder of this section, the specific differences between what the region was experiencing in 2004 and what was occurring in 2009 will be summarized.

a. Regional Industry Profile

Table 35 on the following page shows changes, by community, in the number of establishments, total wages, average monthly employment, and average weekly wages during the five-year period between 2004 (Q2) and 2009 (Q2). Although several of these indicators will be investigated further in later sections of this chapter, Table 35 on the following page provides a snapshot of the overall changes that have occurred in the region over this five-year period.

According to the Executive Office of Labor and Workforce Development, five of the nine communities in the region experienced a decline in their total number of establishments between the first quarters of 2004 and 2009. These communities were Billerica (-2.2%), Chelmsford (-4.3%), Dracut (-7.8%), Tyngsborough (-3.3%), and Westford (-8.5%). While Dunstable and Pepperell experienced no net change in their total number of establishments between these two years, the City of Lowell experienced a 3.9% (74) increase in establishments, while Tewksbury’s local business pool grew by one establishment, or 0.1%. Overall, the number of establishments located in the NMCOG region decreased by 154 establishments, or -2.2%.

Table 35: Establishments, Employment and Wages: 2004 (Q2) and 2009 (Q2)

Community	Number of Establishments			Average Monthly Employment			Average Weekly Wages		
	2004 (Q2)	2009 (Q2)	Percent Change	2004 (Q2)	2009 (Q2)	Percent Change	2004 (Q2)	2009 (Q2)	Percent Change
Billerica	1,192	1,166	-2.2	22,772	20,915	-8.2	\$1,090	\$1,216	11.6
Chelmsford	1,170	1,120	-4.3	20,441	20,735	1.4	\$981	\$1,103	12.4
Dracut	615	567	-7.8	5,204	4,912	-5.6	\$644	\$750	16.5
Dunstable	61	61	0.0	306	260	-15.0	\$662	\$666	0.6
Lowell	1,892	1,966	3.9	33,130	33,222	0.3	\$798	\$955	19.7
Pepperell	223	223	0.0	1,565	1,394	-10.9	\$612	\$725	18.5
Tewksbury	838	839	0.1	15,803	15,252	-3.5	\$1,006	\$1,184	17.7
Tyngsborough	365	353	-3.3	4,750	4,200	-11.6	\$657	\$841	28.0
Westford	705	645	-8.5	11,698	11,700	0.02	\$1,285	\$1,449	12.8
NMCOG Region	7,061	6,907	-2.2	115,669	111,965	-3.2	\$859	\$988	15.0
Massachusetts	209,277	212,688	1.6	3,167,338	3,159,546	-0.2	\$898	\$1,028	14.5

Source: Executive Office of Labor and Workforce Development, ES-202 Reports

In terms of average monthly employment, only three communities experienced marginal growth - Chelmsford (41.4%), Lowell (0.3%), and Westford (0.02%). The remaining six communities experienced overall declines in average monthly employment ranging from -3.5% in Tewksbury to -15% in Dunstable. The decline in average monthly employment among the remaining six towns was in large part due to increased unemployment across the region since the onset of the national recession. Average weekly wages (for all industries), on the other hand, increased in every community in the region, ranging from a 0.6% (\$4) increase in Dunstable to a 28% (\$184) increase in Tyngsborough. Across the region as a whole, average weekly wages increased by \$129 or 15%.

Historically, the City of Lowell—and to a lesser extent, its suburban neighbors—has been a hub for manufacturing and industrial activity. Over the past twenty years, however, the NMCOG region, similar to many areas across the United States, has undergone a transformation in the composition of its industries and businesses. Although a significant proportion of the Commonwealth’s remaining manufacturing businesses are located in the Greater Lowell region, the area is rapidly transforming towards a service-providing economy.

Table 36 below compares the industry composition (by NAICS code) in the region during the second quarters of 2004 and 2009. In 2004, establishments in the service-providing domain outnumbered those in the goods-producing domain by 3.5 to 1. Five years later, that ratio had increased to 3.9 to 1, despite a slight decrease (-2.2%) in the total number of establishments across the region.

Table 36: Industry Composition of the NMCOG Region: 2004 and 2009

	2004 (Q2)	2009 (Q2)	% Change 2004 to 2009
Total, All Industries	7,061	6,907	-2.2
Goods-Producing Domain	1,518	1,375	-9.4
Agriculture, Forestry, Fishing & Hunting	4	4	0
Construction	1,085	1,023	-5.7
Durable Goods Manufacturing	314	268	-14.6
Non-Durable Goods Manufacturing	115	80	-30.4
Service-Providing Domain	5,384	5,377	-0.1

Table 36: Industry Composition of the NMCOG Region: 2004 and 2009 (Cont.)

	2004 (Q2)	2009 (Q2)	% Change 2004 to 2009
Utilities	11	15	36.4
Wholesale Trade	468	408	-12.8
Retail Trade	724	663	-8.4
Transportation and Warehousing	173	146	-15.6
Information	134	108	-19.4
Finance and Insurance	236	241	2.1
Real Estate and Rental and Leasing	219	192	-12.3
Professional and Technical Services	882	786	-10.9
Management of Companies and Enterprises	21	28	33.3
Administrative and Waste Services	411	382	-7.1
Educational Services	60	55	-8.3
Health Care and Social Assistance	569	565	-0.7
Arts, Entertainment, and Recreation	83	102	22.9
Accommodation and Food Services	507	531	4.7
Other Services, Ex. Public Admin	840	1,099	30.8
Public Administration	46	56	21.7

Source: Executive Office of Labor and Workforce Development, ES-202 Reports

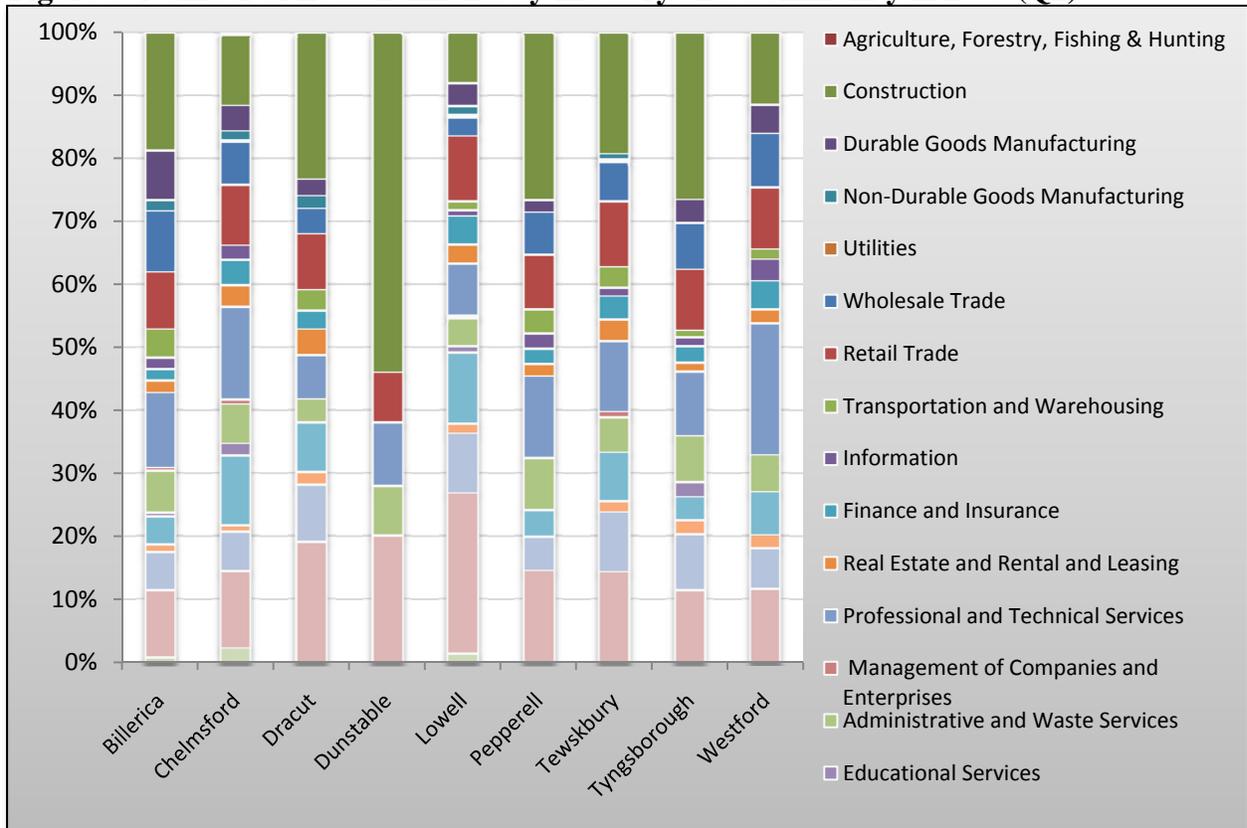
The number of goods-producing establishments in the region decreased by 143 businesses, or 9.4%, during this time period. Every industry sector in the goods-producing domain, with the exception of Agriculture and Fishing, declined between 2004 (Q2) and 2009 (Q2). The sectors impacted by this decline included Non-Durable Goods Manufacturing (-30.4%), Durable Goods Manufacturing (-14.6%), and Construction (-5.7%).

Many service-providing industries also experienced a decrease in the number of establishments across the region between the first quarters of 2004 and 2009. The Information Services sector was hit the hardest with the number of establishments decreasing by 19.4%. Other sectors that have been impacted include Wholesale Trade (-12.8%), Retail Trade (-8.4%), Transportation and Warehousing (-15.6%), Real Estate, Rental and Leasing (-12.3%), Professional and Technical Services (-10.9%), Administrative and Waste Services (-7.1%), Educational Services (-8.3%), and Health Care and Social Assistance (-0.7%). This decline is due to the negative impacts of the national recession on small businesses across the region.

Despite the recent economic downturn, there has been some business growth within several service-providing sectors. These industries include Utilities (36.4%), Finance and Insurance (2.1%), Management of Companies and Enterprises (33.3%), Arts, Entertainment, and Recreation (22.9%), Accommodation and Food Services (4.7%), ‘Other’ Services (30.8%)—including Membership Organizations & Associations (9.0%), Personal Care Services (7.5%), and Private Households (89.6%) -- and Public Administration (41.3%).

Figure 8 on following page shows the breakdown of establishments by industry and community during the second quarter of 2009. Most economists agree that the greater the diversity of industry in the region, the more resistant that economy will be to economic downturns. Figure 8 reflects the relative diversity of industry in the Greater Lowell region.

Figure 8: Number of Establishments by Industry and Community in 2009 (Q2)

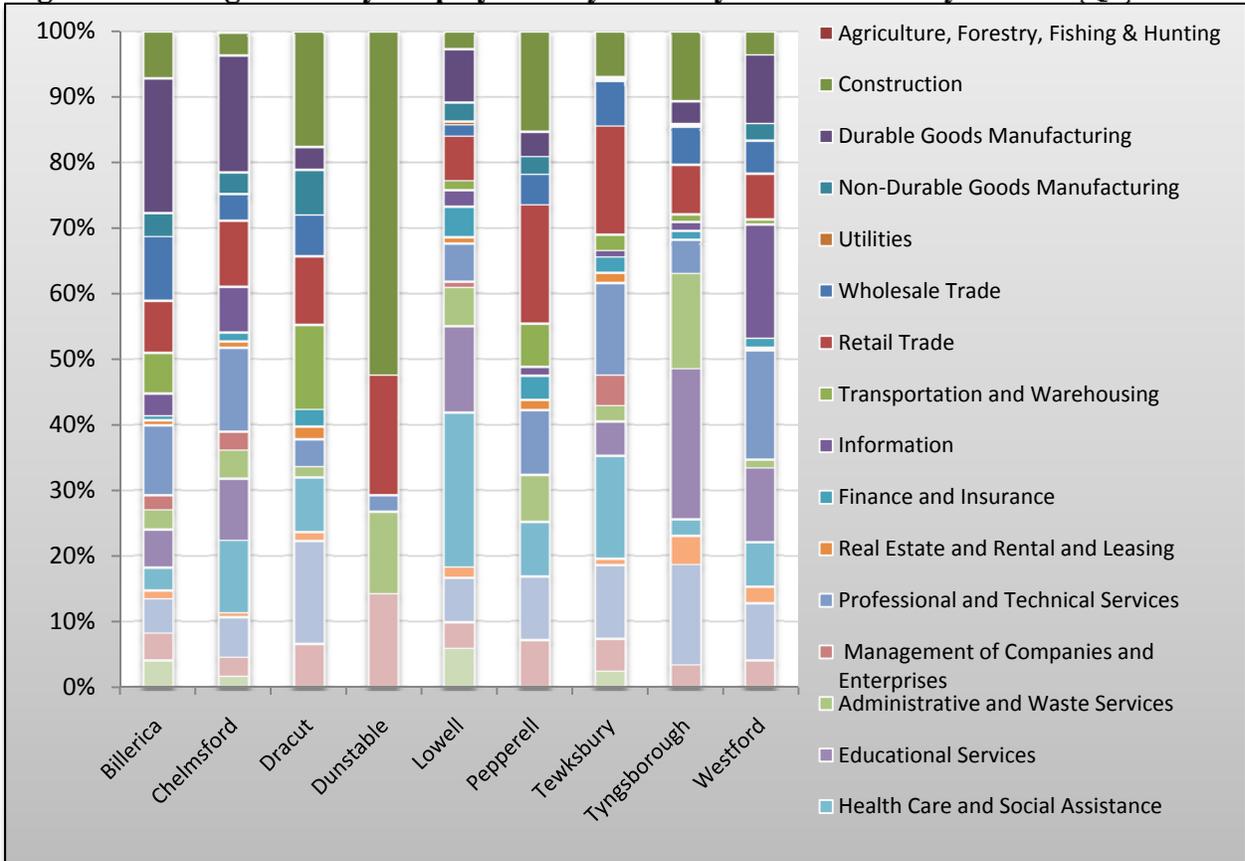


Source: Executive Office of Labor and Workforce Development, ES-202 Reports

Although sector diversity varies across communities, the data reveals that each of the nine communities in the region has an economy that is predominantly service-providing. Dunstable and Tyngsborough have the highest percentages of goods-producing industries, accounting for 44.3% and 30% of their respective local economies. Conversely, the City of Lowell has the highest percentage of service-providing businesses, accounting for 86.9% of all establishments in the city, followed by Chelmsford (83.2%) and Tewksbury (81%).

Related to the composition of establishments in the region is the composition of jobs across the Greater Lowell area. Figure 9 on the following page illustrates average monthly employment, by community and industry, during the second quarter of 2009.

Figure 9: Average Monthly Employment by Industry and Community in 2009 (Q2)



Source: Executive Office of Labor and Workforce Development, ES-202 Reports

While average monthly employment by industry is related to the number of establishments in a community in that it speaks to the relative diversity of a local economy, it is not synonymous. For example, as previously discussed, construction establishments in Dunstable comprise 44.2% of all local businesses. In terms of average monthly employment, however, construction jobs accounted for 52.5% of all local jobs in town. With more than half of the jobs in the community concentrated within one industry, one can conclude that Dunstable would be one of the more vulnerable communities should there be downturns in construction-related business.

The eight other communities in the region have much more diversity in terms of the industries where workers are employed, making the overall health of their local economies less susceptible to downturns in a lone industry. These employment figures speak to the overall strength of the regional economy and its ability to adapt to dynamic and emerging industry trends. More detailed analyses of several sectors of the economy—high tech industries, the knowledge-based economy, the creative economy, and the green economy—are offered in subsequent sections of this chapter.

b. Labor Force

As evidenced in Table 37 on the following page, the Greater Lowell labor force increased by 1.6% between June 2004 and June 2009, which is slightly higher than the 1.2% increase on the

state level for the same period. Eight out of nine communities in the NMCOC region experienced an increase in their labor force during this time period, ranging from 0.005% in Chelmsford to 4.4% in Billerica.

Table 37: Local, Regional, and State Labor Force Levels: June 2004 through June 2009

Community	June 2004	June 2005	June 2006	June 2007	June 2008	June 2009	Percent Change, 2004-2009
Billerica	22,557	22,521	23,167	23,455	23,471	23,553	4.4
Chelmsford	19,087	19,060	18,981	19,112	19,175	19,086	0.005
Dracut	16,365	16,400	16,589	16,628	16,625	16,812	2.7
Dunstable	1,809	1,825	1,856	1,884	1,899	1,884	4.1
Lowell	50,895	50,476	50,128	50,082	50,385	51,273	0.74
Pepperell	6,511	6,508	6,479	6,442	6,440	6,453	-0.89
Tewksbury	16,668	16,654	16,788	16,783	16,810	16,893	1.3
Tyngsborough	6,402	6,393	6,482	6,647	6,664	6,660	4
Westford	11,793	11,825	11,800	11,889	11,918	11,881	0.74
Greater Lowell	152,087	151,662	152,270	152,922	153,387	154,495	1.6
Massachusetts	3,425,800	3,414,600	3,450,700	3,461,000	3,473,400	3,468,100	1.2

Source: Massachusetts Department of Employment Security Labor Force and Unemployment Data

c. Employment Levels and Projections

Based upon the employment figures shown in Table 38 below, employment levels in the region decreased by 2.2% from 143,156 in 2004 to 139,992 in 2009. Within this period of time, the employment levels for each community varied, with three of the nine communities experiencing an increase in their overall employment levels and six communities experiencing declines. The employment level trends are somewhat consistent with the labor force trends discussed above for Table 37.

Table 38: Local, Regional, and State Employment Levels: June 2004- June 2009

Community	June 2004	June 2005	June 2006	June 2007	June 2008	June 2009	Percent Change, 2004-2009
Billerica	21,300	21,447	22,117	22,431	22,366	21,542	1.1
Chelmsford	18,164	18,278	18,170	18,372	18,319	17,643	-2.9
Dracut	15,385	15,601	15,797	15,836	15,791	15,209	-1.1
Dunstable	1,724	1,764	1,794	1,830	1,825	1,757	1.9
Lowell	47,165	47,227	47,074	47,137	47,001	45,269	-4
Pepperell	6,216	6,262	6,233	6,233	6,203	6,009	-3.3
Tewksbury	15,801	15,858	15,992	16,072	16,026	15,435	-2.3
Tyngsborough	6,110	6,125	6,208	6,370	6,351	6,117	0.11
Westford	11,291	11,358	11,333	11,465	11,432	11,011	-2.5
NMCOG Region	143,156	143,920	144,718	145,746	145,314	139,992	-2.2
Massachusetts	3,237,400	3,247,300	3,281,200	3,301,300	3,292,900	3,165,700	-2.2

Source: Massachusetts Department of Employment Security Labor Force and Unemployment Data

Another important indicator published in the State's *ES-202 Reports* is average monthly employment. Table 39 on following page compares the average monthly employment during the second quarters of 2004 and 2009 respectively. As this data illustrates, average monthly employment levels dropped in six of the nine communities between these two time periods, in

large part because of the current recession's impact on employment opportunities across the region, state, and nation. The town of Dunstable had the greatest rate of decrease (-15%), followed by Tyngsborough (-11.6%), Pepperell (-10.9%), Billerica (-8.2%), Dracut (-5.6%), and Tewksbury (-3.5%). In contrast, average monthly employment levels increased in Chelmsford (1.4%), Lowell (0.3%), and Westford (0.02%). Across the region, average monthly employment decreased by 0.2% between the second quarters of 2004 and 2009.

Table 39: Average Monthly Employment in the NMCOG Region: 2004 (Q2) and 2009 (Q2)

Community	2004 (Q2)	2009 (Q2)	Percent Change
Billerica	22,772	20,915	-8.2
Chelmsford	20,441	20,735	1.4
Dracut	5,204	4,912	-5.6
Dunstable	306	260	-15.0
Lowell	33,130	33,222	0.3
Pepperell	1,565	1,394	-10.9
Tewksbury	15,803	15,252	-3.5
Tyngsborough	4,750	4,200	-11.6
Westford	11,698	11,700	0.02
NMCOG Region	115,669	111,965	-0.2

Source: Executive Office of Labor and Workforce Development, ES-202 Reports

Similar to the population projections presented in the Demographics section of this report, MassHighway developed employment projections for the Greater Lowell region through 2030. These projections, which are represented in Table 40 below are developed using a “top-down” approach that takes employment projections for the state as a whole and then assigns shares of these figures to the MPO regions and individual communities within those regions. Based upon this approach, the employment projections for the state are more accurate than those for the regions or individual communities. Nevertheless, there is some value to seeing the projected employment numbers that were calculated for the nine communities in the NMCOG region.

According to these figures, every community in the region will experience significant increases in their local employment levels over the next two decades. The region as a whole is projected to see a 17.3% increase in employment during this thirty year time period, while employment in individual communities is anticipated to increase between 10.7% in Tewksbury and 102% in Dunstable. These projections correspond to the population projections that were developed for the region by MassHighway for the same time period.

Table 40: Employment Projections for the Greater Lowell Region: 2000-2030

Community	2000	2010	2015	2020	2025	2030	% Change 2000-2030
Billerica	20,862	28,796	28,965	29,080	29,111	28,930	38.7
Chelmsford	15,711	24,670	24,910	25,105	25,200	25,100	60.0
Dracut	4,927	5,460	5,619	5,725	5,810	5,920	20.2
Dunstable	258	354	401	455	475	520	102.0
Lowell	36,185	39,990	41,541	43,314	44,065	45,170	24.8
Pepperell	1,685	1,770	1,804	1,893	1,952	2,000	18.7
Tewksbury	18,003	19,370	19,601	19,800	19,837	19,930	10.7
Tyngsborough	4,476	5,203	5,679	5,882	5,950	6,200	38.5
Westford	11,997	14,987	15,780	16,546	16,700	17,530	46.1
NMCOG Region	129,000	140,600	144,300	147,800	149,100	151,300	17.3

Source: 2000 U.S. Census; projections by MassHighway in consultation with NMCOG

As previously described, the top-down approach to developing employment projections has accuracy limitations. Table 41 below compares the real employment numbers during the second quarter of 2009 with the 2010 Projections developed by MassHighway in consultation with NMCOG. With every community, the actual employment numbers have fallen short of projections—ranging from 73.4% accuracy in Dunstable to 84% accuracy in Chelmsford. While these shortfalls may be due in part to rising unemployment across the region since the onset of the national recession, in general, this comparison highlights the differences between the actual and projected employment figures.

Table 41: Comparison of Actual and Projected Employment Numbers

Community	2009 (Q2)	2010 Projection	Actual Employment as a % of 2010 Projection
Billerica	20,915	28,796	72.6
Chelmsford	20,735	24,670	84.0
Dracut	4,912	5,460	90.0
Dunstable	260	354	73.4
Lowell	33,222	39,990	83.1
Pepperell	1,394	1,770	78.8
Tewksbury	15,252	19,370	78.7
Tyngsborough	4,200	5,203	80.7
Westford	11,700	14,987	78.1
NMCOG Region	111,965	140,600	79.6

Sources: Massachusetts Department of Employment Security Labor Force and Unemployment Data; Projections by MassHighway in consultation with NMCOG

3. Pockets of Distress in the Region

By the mid-2000s, the NMCOG region had largely rebounded from the economic recession which occurred earlier in the decade. During this time, employment levels were fairly high, foreclosure rates were low, and many jobs were considered secure. Since November 2007, however, the economic recession that has impacted the United States and much of the world has taken its toll on the Greater Lowell region. This section examines specific economic indicators, including unemployment rates, plant layoffs, and housing foreclosure rates, in order to identify pockets of distress in the region where resources might be targeted to help secure the economic well being of the Greater Lowell area as a whole.

a. Unemployment Rates

Table 42 on the following page shows the June unemployment rates for the nine NMCOG communities, the Commonwealth of Massachusetts, and the United States between 2004 and 2009. This data indicates that unemployment rates in every community across the region dropped between June 2004 and June 2005, and again between June 2006 and 2007. By June 2008, however, unemployment rates had increased in every community, ranging from 3.7% in Pepperell to 6.7% in Lowell. In June 2009—by then well into the current recession—unemployment rates were nearly double those in June 2007. The town of Dunstable had the lowest rate in the region (6.7%), and the City of Lowell had the highest (11.7%), with the remaining towns possessing rates ranging from 6.9% in Pepperell to 9.5% in Dracut.

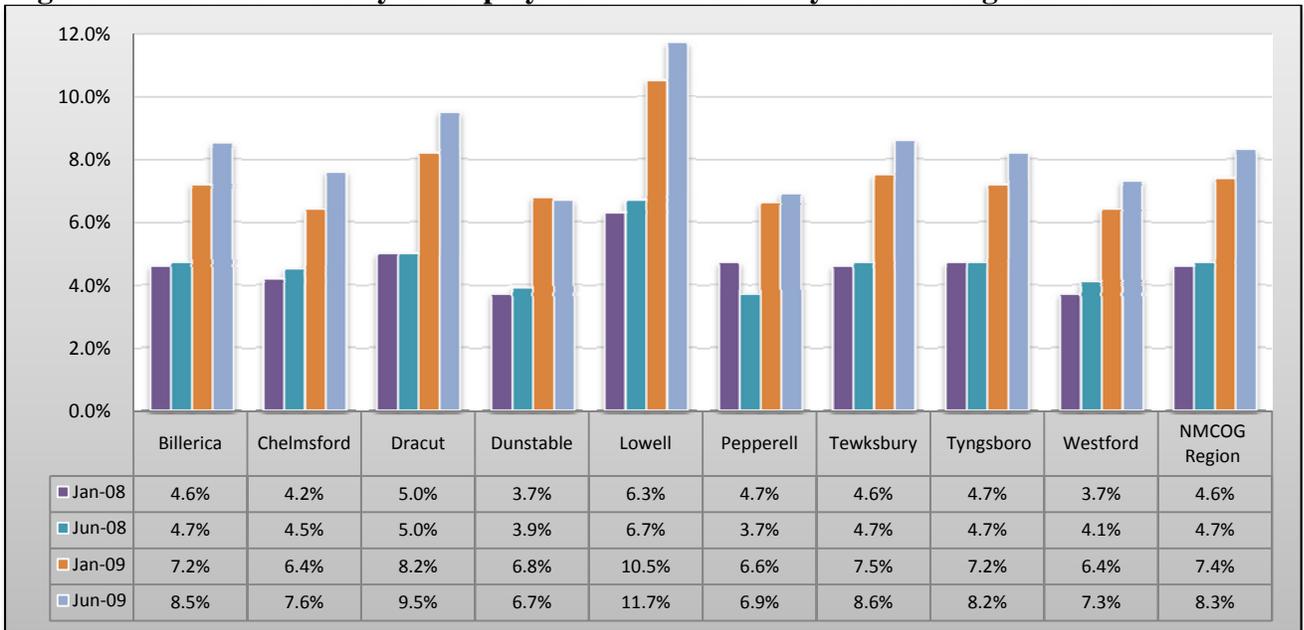
Table 42: June Unemployment Rates: 2004 through 2009

Community	June 2004	June 2005	June 2006	June 2007	June 2008	June 2009
Billerica	5.6	4.8	4.5	4.4	4.7	8.5
Chelmsford	4.8	4.1	4.3	3.9	4.5	7.6
Dracut	6.0	4.9	4.8	4.8	5.0	9.5
Dunstable	4.7	3.3	3.3	2.9	3.9	6.7
Lowell	7.3	6.4	6.1	5.9	6.7	11.7
Pepperell	4.5	3.8	3.8	3.2	3.7	6.9
Tewksbury	5.2	4.8	4.7	4.2	4.7	8.6
Tyngsborough	4.6	4.2	4.2	4.2	4.7	8.2
Westford	5.5	3.9	4.0	3.6	4.1	7.3
NMCOG Region	5.2	4.5	4.4	4.1	4.7	8.3
Massachusetts	5.5	4.9	4.9	4.6	5.2	8.7
United States	5.8	5.2	4.8	4.7	5.7	9.7

Source: Massachusetts Department of Employment Security Labor Force and Unemployment Data

During the past eighteen months, unemployment rates have significantly increased in every community in the Greater Lowell region. Figure 10 below provides unadjusted monthly unemployment rates for the nine NMCOG communities and the Greater Lowell region between January 2008 and June 2009.

Figure 10: Selected Monthly Unemployment Rates: January 2008 through June 2009



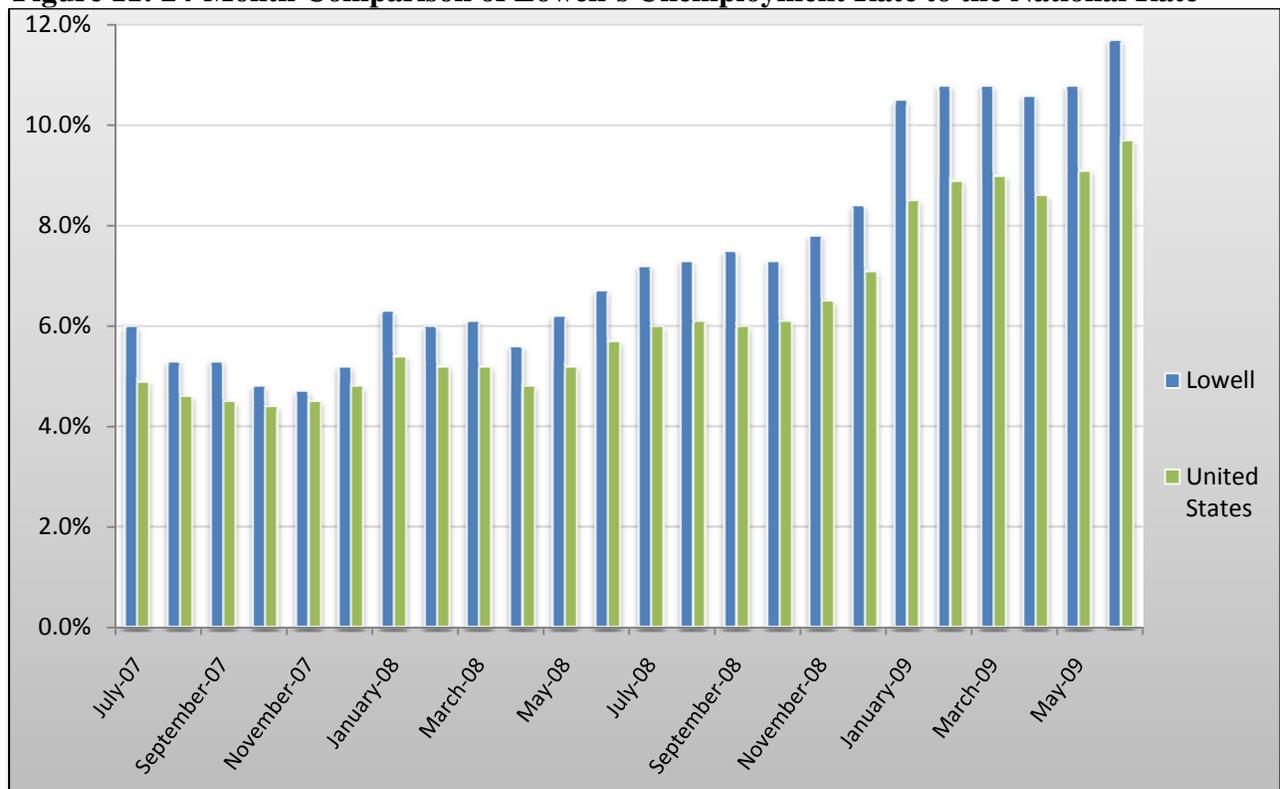
Source: Massachusetts Department of Employment Security; US Bureau of Labor Statistics

This graph illustrates the impact that the current recession has had on employment levels in the region. Over the past year and a half, high unemployment rates, which were traditionally confined to the City of Lowell, have become commonplace in the eight suburban towns. The town of Westford experienced a 116% increase in its unemployment rate between January 2008 and June 2009, while unemployment rates in the other communities increased as follows: Billerica (89%), Chelmsford (88%), Dracut (94%), Dunstable (81%), Lowell (92%), Pepperell (68%), Tewksbury (89%), and Tyngsborough (89%). It is important to note, however, that the

unemployment rates for every community, except for the City of Lowell, have been lower than the national unemployment rates.

Another important indicator of economic distress in the region is reflected by a comparison of the City of Lowell’s unemployment rate to the national unemployment rate during the past twenty-four months. The Economic Development Administration uses this criterion to designate a community as an Economically Distressed Area (EDA). According to Figure 11 below, between July 2007 and June 2009, the City of Lowell’s 24-month average was approximately 1.0% higher than the national rate. The minimum threshold for qualification according to this criterion is 1.0% above the national unemployment rate. It is expected that this gap will grow as employment levels continue to be impacted by the current recession.

Figure 11: 24-Month Comparison of Lowell’s Unemployment Rate to the National Rate



Source: Massachusetts Department of Employment Security; US Bureau of Labor Statistics

b. Plant Layoffs

Every community in the region has been impacted by the number of layoffs experienced by private firms located across the region. These layoffs impact not only the community where the private firm is located, but also the communities in the region where the employees reside.

Companies have a responsibility to notify the Commonwealth’s Rapid Response Team of impending layoffs and this information is provided to the public as part of the federal WARN System. The *Greater Lowell Annual CEDS Update for 2008* reported a total of 812 layoffs in the Greater Lowell region between July 1, 2007 and June 30, 2008. During the past year, the

total number of layoffs increased by 48.1% to 1,203 layoffs in the region. Table 43 below lists the layoffs cited by the Rapid Response Team between July 1, 2008 and June 30, 2009.

The Rapid Response Team reported that there were 1,203 employees in the Greater Lowell region affected by layoffs between July 1, 2008 and June 30, 2009. The communities directly impacted by plant layoffs were Billerica (423), Chelmsford (388), Lowell (63), and Tewksbury (129). Additionally, 200 employees from across the Greater Lowell region were affected by layoffs within the Andover campus of the Internal Revenue Service. Brooks Automation in Chelmsford (Image 13) was one company in the region affected by layoffs.



Image 13: Brooks Automation in Chelmsford

As previously mentioned, a plant layoff in one community has repercussions across the region. For example, Jabil Circuits, based in Billerica, was forced to cut 405 jobs in three separate layoffs between July 2008 and June 2009. The Greater Lowell Workforce Investment Board (GLWIB) estimates that as many as one-third of the employees affected by these layoffs were residents of the City of Lowell.

Table 43: Layoffs in the NMCOCG Region: July 1, 2008 – June 30, 2009

Community	Company	Effective Date	Number of Employees Affected
Greater Lowell	Internal Revenue Service	6/1/2009	200
Billerica	Tel Epion, Inc.	4/18/2009	18
	Jabil Circuit	10/31/2008	70
	Jabil Circuit	11/25/2008	20
	Jabil Circuit	6/01/2009	315
Chelmsford	Kronos Inc.	9/30/2008	87
	Potpourri Group, Inc.	12/24/2008	60
	Brooks Automation, Inc.	3/1/2009	190
	Brooks Automation, Inc.	In Progress	51
Lowell	Adden Furniture	9/3/2008	15
	Cass Information Services	4/17/2009	48
Tewksbury	DJ Reardon Company	7/14/2008	56
	Avid Technology, Inc.	12/23/2008	73
Total Layoffs			1,203

Source: Massachusetts Rapid Response Team

c. Foreclosures in the Region

Beginning in early 2007, a combination of market and regulatory forces activated a nationwide “foreclosure crisis” not witnessed in the United States since the Great Depression of the 1930s. Although the factors contributing to this crisis are complex and multifaceted, economists and

policy analysts generally point to several root causes. In its March 2009 *Interim Report to Congress on the Root Causes of the Foreclosure Crisis*, the U.S. Department of Housing and Urban Development summarized these factors accordingly:

- In pursuit of higher profits, lenders and investors poured resources into ever riskier loans, particularly after 2003. These “risk-based pricing” investments, which include subprime and Alt-A mortgages, were enabled by a series of legislative changes, including removed interest rate ceilings, which allowed lenders to offer loans with variable interest rates, balloon terms, and negative amortization;
- The emergence of an international asset-backed securities market shifted the primary source of mortgage finance from federally-regulated institutions to mortgage banking institutions that acquired funds through broader capital markets. These lenders are subject to far less regulatory oversight than institutions such as Fannie Mae and Freddie Mac;
- A lack of federal oversight of the lending rating agencies led to “excessive optimism” with respect to the risk inherent to the subprime mortgage market, resulting in an explosion of the financially risky loans described above;
- A substantial increase in home values across the United States through 2006 created a false sense of financial security within the housing market and encouraged lenders to approve ever increasing numbers of loans, including refinances. These efforts to keep loan origination volumes high despite increasing unaffordability led to loosened underwriting standards;
- Following the onset of the more general economic recession, housing prices slowed down, stagnated, and in many cases, declined. This led to many homeowners falling “under water”—a term used to describe a phenomenon where the borrower owes more money on the mortgage than the home is worth; and,
- Since 2008, other “trigger” impacts of the economic recession, such as job losses and rising health care costs, have exacerbated the foreclosure crisis and forced borrowers to default on the home mortgages that they could previously afford.

The Greater Lowell region has experienced the foreclosure crisis first hand, with the number of petitions filed increasing substantially since the housing crisis began in 2007. Table 44 on the following page shows the total number of foreclosure petitions filed across the region between January 2007 and June 2009, as well as year-to-date petitions filed for the first half (January through June) of 2007, 2008, and 2009.

In 2007 there were 319 foreclosure notices filed in the NMCOC region. At that time, the majority of notices occurred in the City of Lowell (38.9%), followed by Billerica, (15.4%), Tewksbury (13.5%), Dracut (12.5%), Chelmsford (9.1%), Pepperell (3.8%), Westford (3.4%), Tyngsborough (3.1%), and Dunstable (.3%).

One year later, the total number of foreclosure notices across the region had increased by roughly a third (33.2%) to 425 notices. Notices filed in the City of Lowell still made up the majority of

those filed in the region. However, notices in seven of the eight suburban communities had increased significantly during this twelve month period. The rates of change during this time period, by community, were: Billerica (24.5%), Chelmsford (17.2%), Dracut (25%), Dunstable (500%), Lowell (51.6%), Pepperell (25%), Tewksbury (-2.3%), Tyngsborough (40%), and Westford (36.4%).

Table 44: Foreclosure Records in the NMCOG Region: Jan. 1, 2007 through June 30, 2009

Community	2007		2008		2009	% Change Jan.-June 2007-2009
	Total Number	January- June	Total Number	January- June	January- June	
Billerica	49	23	61	41	48	108.7
Chelmsford	29	17	34	11	29	70.6
Dracut	40	17	50	31	47	176.5
Dunstable	1	0	6	3	1	100.0
Lowell	124	49	188	94	150	206.1
Pepperell	12	5	15	9	11	120.0
Tewksbury	43	12	42	23	31	158.3
Tyngsborough	10	4	14	9	18	350.0
Westford	11	6	15	12	10	66.7
NMCOG Total	319	133	425	233	345	159.4

Source: The Warren Group

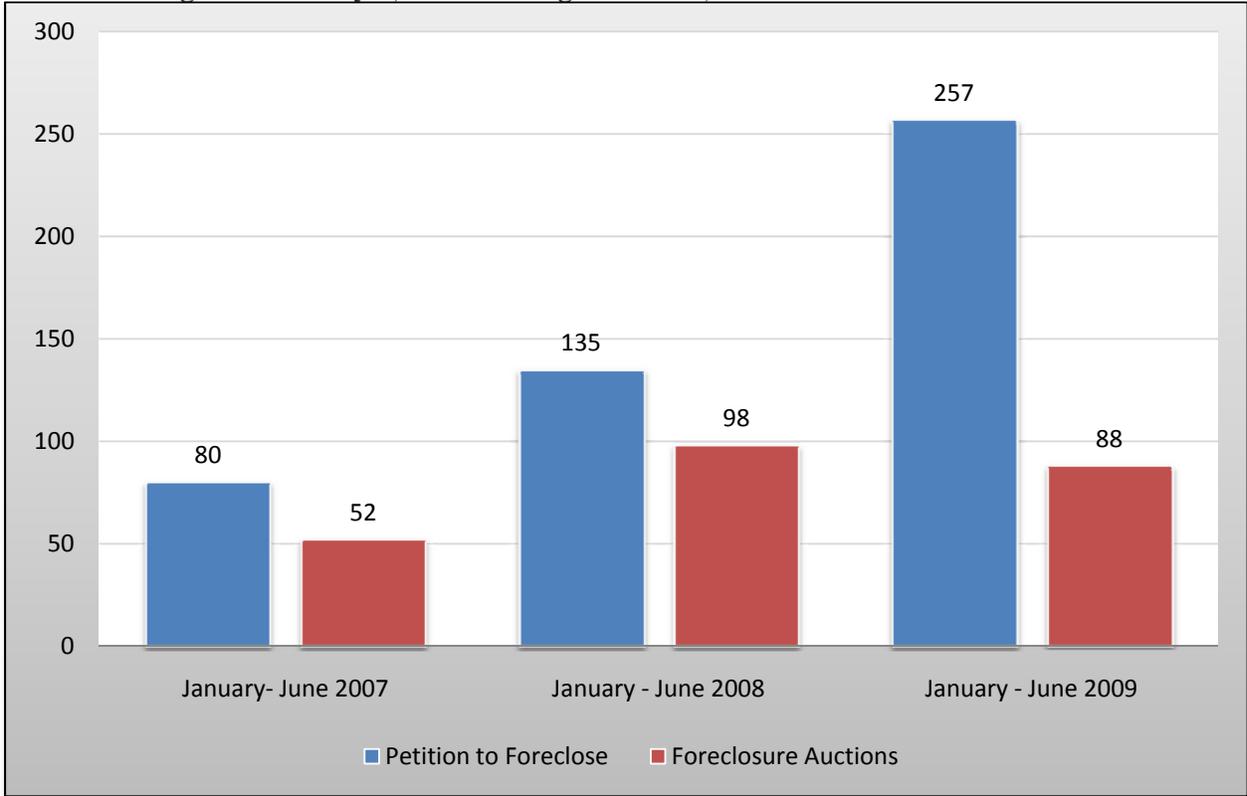
Note: Total numbers include foreclosure petitions, foreclosure auctions, lis pendings, and sheriff sales.

The first six months of 2009 experienced an even greater rate of increase, with the total number of petitions filed across the NMCOG region (345) reaching 81.1% of the 12-month total in 2008. Another important indicator of distress within the housing market is the year-to-date foreclosure petitions filed in local communities and across the region. During the first six months of 2007, 133 petitions were filed across the region, accounting for 41.7% of the annual total. In 2008, 233 petitions had been filed by the end of June, marking a 75.2% increase in petitions from the previous year.

As of June 2009, year-to-date petitions across the region were up an additional 48.1% from the previous year. This marks a 159.4% increase across the region when compared to 2007. Seven of the nine communities in the NMCOG region saw their June 2009 figures increase by more than 100% when compared to the first six months of 2007. Lowell and Tyngsborough saw their petitions increase by 206.1% and 350% respectively.

It is important to note that not every foreclosure petition filed ends in a foreclosure. Figure 12 on the following page compares the year-to-date notices filed across the NMCOG region to number of foreclosure auctions completed during the same time.

Figure 12: Year-to-Date Number of Petitions to Foreclose and Foreclosure Auctions in the NMCOG Region: January 1, 2007 through June 30, 2009

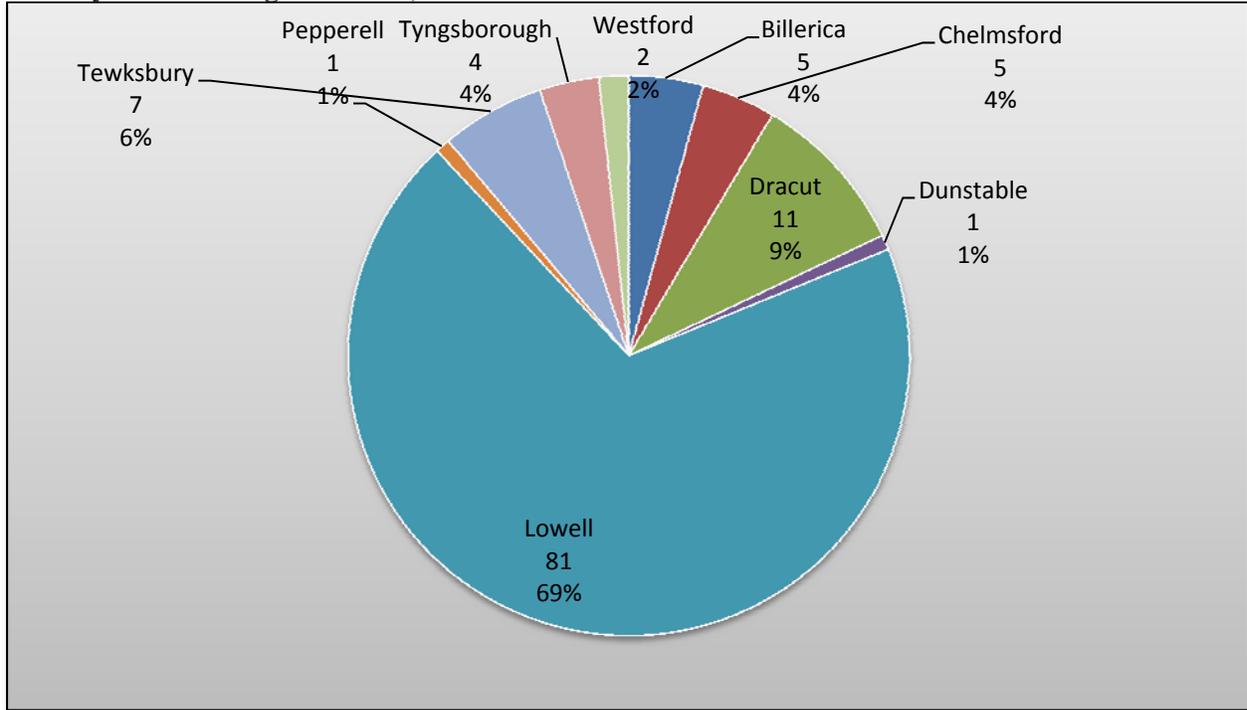


Source: The Warren Group

One can see from this figure that the number of notices filed far exceeds the number of auctions completed. While the year-to-date auctions increased by 88.5% between 2007 and 2008, this figure number decreased by 10.2% in 2009. While part of the difference in petition and auction rates is due to the lengthy timeframe of foreclosure proceedings, one can also assume that some of the households where initial petitions were filed were able to restructure their financing in a way that prevented their home from being seized by their lender.

A final foreclosure indicator worth analyzing is the number of bank-owned/REO properties across the region. Figure 13 on the next page illustrates the total number of properties, by community, that were seized by banks between January 2007 and June 2009. This graph reveals that more than two-thirds (69%) of all bank owned/REO properties were in the City of Lowell. Dracut (9%) had the second highest percentage of bank-owned/REO properties, followed by Tewksbury (6%), Billerica (4%), Chelmsford (4%), and Tyngsborough (4%), Westford (2%), Pepperell (1%) and Dunstable (1%).

Figure 13: Bank-Owned/Real Estate Owned (REO) Properties in the NMCOG Region: January 2007 through June 30, 2009



Source: The Warren Group

4. Business Creation

This section builds upon the ES-202 data to assess trends in new business creation throughout the NMCOG region for the five year period between 2004 and 2009. The Business Creation section focuses on the total number of establishments, the size of these establishments in terms of number of employees, the average weekly wages by industry category and the major employers in the region.

a. Total Number of Establishments

Between the second quarters of 2004 and 2009, the total number of business establishments in the NMCOG region decreased by 154 establishments or 2.2%. Table 45 on the next page reveals that much of the business growth in the region over the past five years has occurred within the City of Lowell (3.9%). Five communities in the region experienced decreases in the number of local establishments. These communities included Westford, which lost 60 establishments or 8.5% of its businesses, Chelmsford, which lost 4.3% of its establishments or 50 businesses, Dracut, which lost 48 businesses or 7.8% of its establishments, Billerica, which lost 26 establishments or 2.2% of its establishments since 2004 and Tyngsborough, which lost 12 businesses or 3.3% of its establishments.

Table 45: Total Number of Establishments by Community: 2004 (Q2) and 2009 (Q2)

Community	2004 (Q2)	2009 (Q2)	Percent Change
Billerica	1,192	1,166	-2.2
Chelmsford	1,170	1,120	-4.3
Dracut	615	567	-7.8
Dunstable	61	61	0
Lowell	1,892	1,966	3.9
Pepperell	223	223	0
Tewksbury	838	839	0.1
Tyngsborough	365	353	-3.3
Westford	705	645	-8.5
NMCOG Region	7,061	6,907	-2.2

Source: Executive Office of Labor and Workforce Development, ES-202 Reports

b. Establishments by Number of Employees

The Executive Office of Labor and Workforce Development provides information about the number of individuals employed in businesses across the region. Table 46 below shows the total establishments by number of employees and their total employment within the Greater Lowell Workforce Investment Area (GLWIA), which doesn't include information on the town of Pepperell due to its inclusion in another workforce investment area.

Table 46 reveals that more than half (56%) of the establishments located within this area employ fewer than five people, yet as a percentage of total regional employment, these businesses only employ 5% of the 110,169 workers employed in the workforce investment area. An additional 20% of establishments employ between five and twenty workers and these businesses employ approximately 16% of the regional workforce. Establishments employing more than twenty workers comprise just 15% of businesses in the region, but account for 79% of the workforce within the Greater Lowell Workforce Investment Area.

Table 46: Establishments in Greater Lowell WIA by Number of Employees: March 2009

Number of Employees	Units	Percent	Employment	Percent
0/ Self Employed	973	14	0	0
1-4	2,848	42	5,868	5
5-9	1,178	17	7,785	7
10-19	775	11	10,438	9
20 - 49	591	9	17,773	16
50 - 99	209	3	14,318	13
100 - 249	105	2	16,077	15
250 - 499	47	1	15,410	14
500 - 999	15	0	9,696	9
1000 +	8	0	12,804	12
Total	6,749	100	110,169	100

Source: Executive Office of Labor and Workforce Development, ES-202 Reports

Note: Greater Lowell Workforce Investment Area

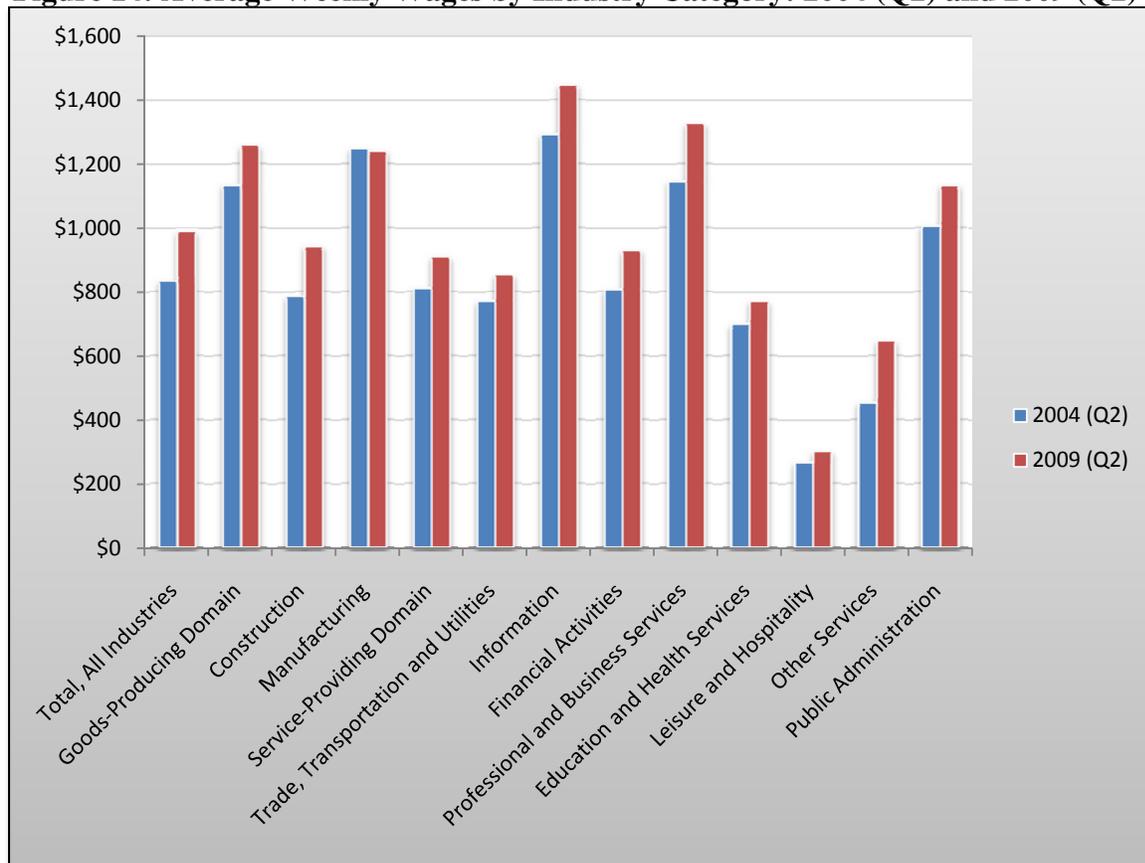
c. Average Weekly Wages

The average weekly wages for workers varies across industries. Figure 14 on the next page shows average weekly wages, by industry, for the NMCOG region, during the second quarters of

2004 and 2009. This chart reveals that average weekly wages increased in every industry except for manufacturing (-0.6%) between these two time periods, and wages across all industries grew by 18.5%. Among goods-producing sectors, average weekly wages increased by 10.9%, while average weekly wages increased by 12.1% within service-providing industries.

Individual sectors operating in the region increased their average weekly wages between 2004 and 2009 accordingly: Construction (20.2%), Trade, Transportation, and Utilities (10.5%), Information (12.0%), Financial Services (15.1%), Professional and Business Services (15.8%), Education and Health Services (10.3%), Leisure and Hospitality (13.2%), ‘Other’ Services (42.8%), and Public Administration (12.7%).

Figure 14: Average Weekly Wages by Industry Category: 2004 (Q2) and 2009 (Q2)



Source: Executive Office of Labor and Workforce Development, ES-202 Reports

d. Major Employers

Every year the *Lowell Sun* publishes a list of major regional employers. Major employers are those companies with at least 1,000 workers employed across the region. Table 47 on the next page compares the Major Regional Employers identified by the *Sun* in 2004 to those identified in 2009.

This analysis reveals that Raytheon Corporation and DeMoulas Supermarkets maintained their status as the first and second largest employers in the Greater Lowell region between 2004 and

2009, employing 8,000 and 5,500 workers, respectively. Several other companies remained on the list of the top twenty regional employers in 2009, including, but not limited to, BAE Systems, United Parcel Service, and Lowell General Hospital. Teradyne, Inc., and Verizon Communications, which appear on the 2009 list, were not even on the list of major employers in 2004.

Table 47: Major Employers in the NMCOG Region: 2004 and 2009

Rank	Employer (2004)	Employees	Employer (2009)	Employees
1	Raytheon	6,976	Raytheon	8,000
2	DeMoulas Supermarkets	5,500	DeMoulas Supermarkets	5,500
3	BAE Systems	5,500	Lahey Clinic	5,202
4	Lahey Clinic	5,500	BAE Systems	5,000
5	Hewlett-Packard	3,500	IBM, Inc.	3,400
6	United Parcel Service	2,300	Mitre Corp.	2,080
7	Cisco Systems	2,100	Lowell General Hospital	2,017
8	Sun Microsystems	2,000	United Parcel Service, Inc	2,000
9	Mitre Corporation	1,900	Teradyne, Inc.	1,500
10	Wyeth Biopharma	1,800	Verizon Communications	1,500
11	Verizon Communications	1,600	Analog Devices, Inc.	1,400
12	Analog Devices, Inc.	1,500	Hannaford Bros.	1,400
13	M/A Com Inc.	1,500	Walmart Stores, Inc.	1,350
14	Lowell General Hospital	1,400	The Home Depot, Inc.	1,350
15	Saints Memorial Medical Center	1,400	Cisco Systems	1,300
16	Wal-Mart Stores, Inc.	1,350	Sun Micro Systems	1,300
17	The Home Depot, Inc.	1,300	Emerson Hospital	1,171
18	N.E. Business Service	1,200	Saints Medical Center	1,000
19	Malden Mills	1,200	Kronos, Inc.	1,000
20	Lucent Technologies	1,200	Millipore Corporation	1,000

Source: *The Lowell Sun*, March 2004 and March 2009

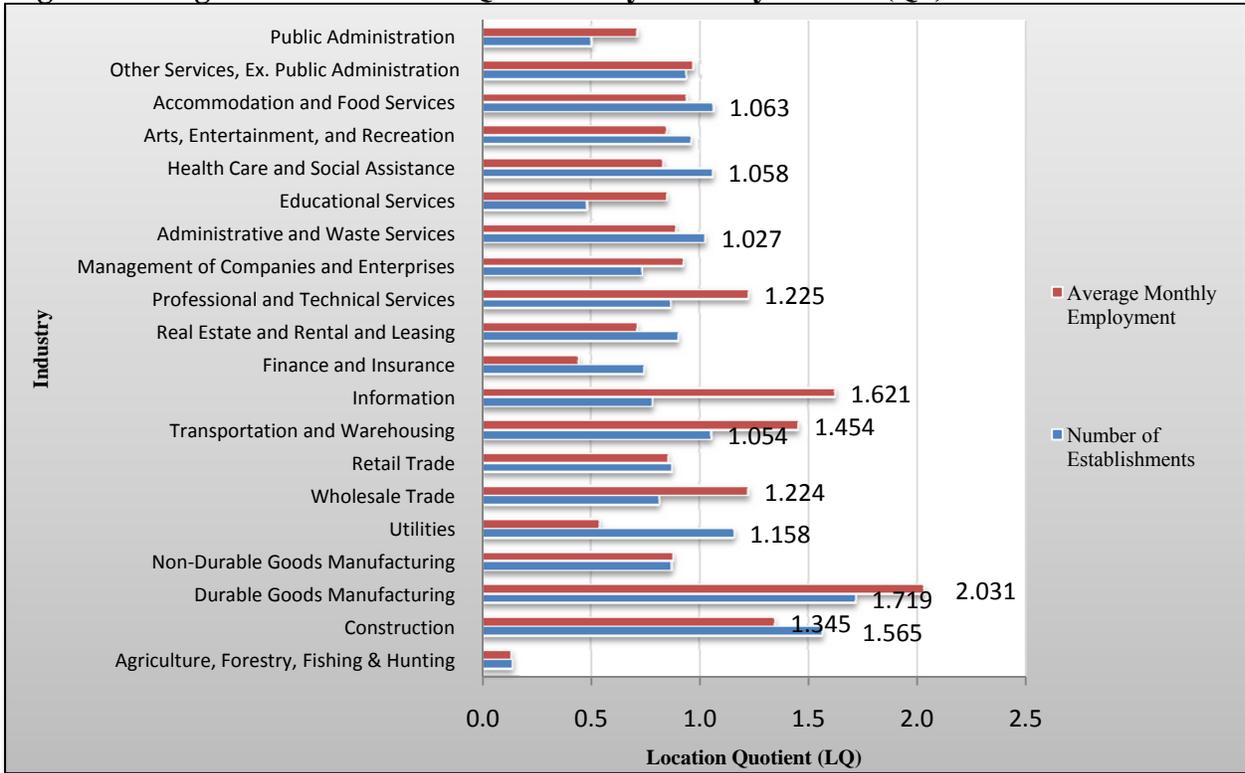
5. Industry Clusters

This section provides a more detailed analysis of industry clusters in the Greater Lowell region. It includes a discussion of location quotients associated with industries located here, as well as an analysis of the Knowledge Economy, high tech industries, and the Creative Economy.

Location quotients (LQ) are a useful tool for assessing existing and emerging industry clusters located in a particular region. Location quotient analyses help us better understand the strengths of a regional economy by assessing which industries are concentrated within its member communities, relative to the state or a nation as a whole. Location quotients, which are essentially a ratio of the concentration of a particular industry in one area (in this case, NMCOG's nine member communities) to the concentration of the same industry in a larger geographic area (Massachusetts), are understood to be significant when they are higher than 1.0.

Using the Commonwealth of Massachusetts as its basis of comparison, location quotients were developed with second quarter 2009 data for each of the industries with a presence in the Greater Lowell region. Quotients were calculated for both the total number of establishments and average monthly employment among each industry sector. These figures are illustrated on the next page in Figure 15.

Figure 15: Region-State Location Quotients by Industry in 2009 (Q2)



Source: Executive Office of Labor and Workforce Development, ES-202 Reports

This figure illustrates that industries within the goods-producing domain—especially durable goods production and construction-- are fairly concentrated within the Greater Lowell region when compared to the state as a whole. Even though the average monthly employment within these sectors have decreased across the region since 2004, durable goods manufacturing and construction still had LQ’s of 2.031 and 1.345; in terms of the total number of establishments, their LQ’s were 1.719 and 1.565 respectively.

Transportation and Warehousing represents another industry cluster within the region, with average monthly employment and number of establishment LQ’s totaling 1.454 and 1.054 respectively. Several other industries have notable LQ’s in terms of average monthly employment, but not total number of establishments, suggesting fewer-- but larger-- businesses. Industries where this is the case include Professional and Technical Services (1.225) and Wholesale Trade (1.224). Conversely, there are several industries with significant total establishment LQ’s but relatively low average monthly LQ’s. This trend is indicative of the presence of many smaller businesses operating within a particular industry. Sectors where this is the case include Accommodation and Food Services (1.063), Health Care and Social Assistance (1.058), Administrative and Waste Services (1.027), and Utilities (1.158).

a. The Knowledge Economy

The Greater Lowell region, like most other regions across the United States, is increasingly transforming from a goods producing-based economy to a service-providing economy. Although

the NMCOG region maintains a relatively high number of manufacturing and construction jobs and establishments, most of the higher paying jobs in the region now fall into one of many “knowledge economy” sectors. In 1999, Charles Leadbeater published a report titled *New Measures for a New Economy*. In this report, Leadbeater defined the emerging knowledge economy accordingly:

“The idea of the knowledge driven economy is not just a description of high tech industries. It describes a set of new sources of competitive advantage which can apply to all sectors, all companies and all regions, from agriculture and retailing to software and biotechnology” (Leadbeater, 1999).

Five years later, the Economic and Social Research Council expanded this definition, arguing that “economic success is increasingly based on upon the effective utilization of intangible assets such as knowledge, skills and innovative potential as the key resource for competitive advantage.” Given the NMCOG region’s relatively well-educated workforce and its proximity to major research centers in Boston and Cambridge, it is understandable that many of the people living and working in the region are part of this knowledge-based economy.

Table 48 on the next page shows the number of establishments, average monthly employment (AME), average weekly wages, and AME location quotient (LQ) for forty-six (46) different knowledge-based sectors of the Greater Lowell economy. These highly-specialized sectors represent the more general fields of publishing; finance, lending, and real estate; health care, education, and social assistance; business, accounting, and employment, and legal services; administrative; and corporate services. Another critical component of the knowledge economy is emerging technologies and high-tech industries, including high-tech manufacturing. An analysis of the high-tech sectors of the economy present in the Greater Lowell area is offered in the next part of this section.

According to Table 48, during the second quarter of 2009, there were approximately 29,265 workers employed in knowledge-economy based sectors at approximately 3,248 establishments across the Greater Lowell region. These numbers represent 26.1% of all workers employed in the region and 47% of all establishments, but do not include the high tech jobs that will be analyzed separately in the next section. Health care-related businesses comprised the largest section of the knowledge economy in the region, representing 25.7% (834) of establishments and 56.8% (16,614) of the jobs. The average weekly wage paid to health care workers during this time period was \$755, with wages ranging from \$444 (Residential Mental Health Facilities) to \$1,217 (Offices of Physicians).

The second largest sector of the knowledge economy in the Greater Lowell region is Educational Services, employing 10,357 workers at 191 establishments across the region. Weekly wages among this sector averaged \$543 per week, ranging from \$233 per week (Other Schools and Instruction) to \$1088 per week (General Educational Services).

Table 48: Knowledge Economy Sectors in the NMCOG Region in 2009 (Q2)

Sub-Industry	Number of Establishments	Monthly Employment	Weekly Wages	LQ (AME)
Information Services				
Publishing Industries	28	767	\$1,914	0.539
Newspaper, Book, & Directory Publishers	5	71	\$2,098	0.352
Financial Activities				
Activities Related to Credit Intermediation	5	9	\$1,672	0.086
Activities Related to Real Estate	47	257	\$825	0.544
Credit Intermediation & Related Activity	126	1,552	\$1,039	0.715
Depository Credit Intermediation	91	1,231	\$785	0.668
Financial Investment & Related Activity	9	52	\$1,223	0.033
Insurance Agencies, Brokerages & Support	80	427	\$882	0.544
Insurance Carriers & Related Activities	86	779	\$939	0.334
Non-depository Credit Intermediation	8	24	\$3,197	0.108
Offices of Real Estate Agents & Brokers	53	109	\$687	0.442
Other Financial Investment Activities	3	12	\$875	0.013
Real Estate and Rental and Leasing	192	986	\$735	0.686
Health Care, Education, and Social Assistance				
Ambulatory Health Care Services	361	4,197	\$940	0.791
Child Day Care Services	68	1,071	\$400	1.279
Community Care Facility for the Elderly	12	525	\$376	0.969
Educational Services	55	8,291	\$1,088	0.697
Emergency and Other Relief Services	11	146	\$544	0.751
Home Health Care Services	7	285	\$567	0.298
Hospitals	4	3,052	\$869	0.452
Individual and Family Services	23	606	\$459	0.537
Nursing and Residential Care Facilities	65	3,449	\$545	0.971
Nursing Care Facilities	11	1,669	\$547	0.787
Offices of Dentists	81	865	\$1,059	1.127
Offices of Other Health Practitioners	76	377	\$744	0.779
Offices of Physicians	124	1,626	\$1,217	0.874
Other Residential Care Facilities	12	167	\$624	0.816
Other Schools and Instruction	46	382	\$233	1.005
Outpatient Care Centers	19	596	\$962	0.750
Residential Mental Health Facilities	17	185	\$444	0.270
Social Assistance	123	1,988	\$416	0.802
Technical and Trade Schools	7	50	\$576	0.586
Vocational Rehabilitation Services	3	38	\$587	0.119
Professional, Technical, Administrative and Waste Services				
Accounting and Bookkeeping Services	83	493	\$887	0.649
Administrative and Support Services	355	4343	\$622	0.862
Advertising and Related Services	376	4622	\$644	11.958
Business Support Services	103	1360	\$1,547	4.128
Employment Services	196	4981	\$1,883	3.061
Investigation and Security Services	49	892	\$559	1.487
Legal Services	11	988	\$485	0.951
Management of Companies and Enterprises	28	1874	\$1,321	0.890
Office Administrative Services	11	92	\$1,079	0.356
Other Professional & Technical Services	31	300	\$606	0.707
Other Support Services	7	15	\$1,043	0.104
Remediation and Other Waste Services	128	1847	\$2,180	16.141
Waste Management and Remediation Service	12	57	\$825	0.163

Source: Executive Office of Labor and Workforce Development, ES-202 Reports

Financial Activities, including lending/banking, finance, insurance, and real estate-related business is another sizable portion of the Greater Lowell's Knowledge Economy. These sectors employed approximately 5,438 workers at 700 different establishments during the second quarter of 2009.

b. High-Tech Industries

The Greater Lowell region is home to many innovative, high-tech industries and businesses, including those in manufacturing, research and development, and information services. This section summarizes some of the trends related to high-tech industries located in the region.

i. Employment Information

Table 49 below shows the number of establishments, average monthly employment, average weekly wages, and average monthly employment location quotient for the various high-tech sectors with a presence in the NMCOG region. The sectors represented fall within one of three primary categories: manufacturing, information services, and professional, business, and technical services.

Table 49: High-Tech Sectors in the NMCOG Region in 2009 (Q2)

Sub-Industry	Number of Establishments	Average Monthly Employment	Average Weekly Wages	LQ (AME)
Manufacturing				
Chemical Manufacturing	10	779	\$1,760	1.241
Computer and Electronic Product Mfg	88	4,800	\$1,653	2.131
Computers and Peripheral Equipment	3	95	\$1,736	0.206
Electrical Equipment and Appliances	7	413	\$1,118	1.146
Electrical Equipment Manufacturing	3	76	\$1,178	0.56
Electronic Instrument Manufacturing	14	1,581	\$1,406	1.682
Industrial Machinery Manufacturing	6	166	\$1,874	1.104
Machinery Manufacturing	26	743	\$1,377	1.226
Nonmetallic Mineral Product Mfg	7	54	\$1,468	0.285
Other Electrical Equipment & Components	3	276	\$1,193	2.317
Other General Purpose Machinery Mfg	7	254	\$1,397	1.826
Printing and Related Support Activities	18	367	\$1,043	0.793
Semiconductor and Electronic Components	36	2,829	\$1,580	4.484
Information Services				
Software Publishers	22	696	\$1,884	1.075
Motion Picture & Sound Recording	3	10	\$954	0.024
Other Information Services	5	64	\$833	0.083
Telecommunications	22	658	\$1,647	0.871
Wired Telecommunications Carriers	9	173	\$1,703	0.286
Professional, Business, and Technical Services				
Architectural and Engineering Services	13	27	\$535	0.019
Computer Systems Design and Related Services	15	249	\$619	0.127
Scientific Research and Development Services	51	1,462	\$2,183	0.875
Specialized Design Services	7	14	\$862	0.137

Source: Executive Office of Labor and Workforce Development, ES-202 Reports

During the second quarter of 2009 (April-June), there were 228 establishments engaged in high-tech manufacturing sectors, employing 12,443 workers in an average month. Jobs in these manufacturing sectors were well-paying, with every one paying average weekly wages that significantly exceed the average across all industries for this time period (\$988). The region is also home to several dozen high-tech information services industry sectors, as reflected in Table 49. Businesses in the information category include software publishing (22), motion picture and sound recording (3), telecommunications (22), wired telecommunications carriers (9), and ‘other’ services (5). In sum, the average monthly employment within the high-tech information services area stood at 1,601 workers during the second quarter of 2009. Similar to high tech manufacturing, these sectors tend to pay significantly higher average weekly wages than the all-industry average.

The sectors included within Professional and Technical Services are architectural and engineering services (13), computer systems design and related services (15), scientific research and development (51), and specialized design services (7). On average, these sectors combined employed 1,752 workers during the second quarter of 2009. While the average weekly wages paid to workers fell below the average for all industries for all but one sector, weekly wages paid to workers employed in the scientific research and development industries was more than twice the all-industry average for the same time period.

ii. City of Lowell’s Emerging Technologies Ordinance

Beginning in early 2009, NMCOG staff began working with City of Lowell Department of Planning and Development staff to develop an Emerging Technologies/Nanotechnology Ordinance. Nanotechnology is a relatively new, but burgeoning, sector of the economy. Industries dealing with these technologies range from research and development to product manufacturing and environmental remediation. The diverse range of nanotechnology applications speaks to its potential from an economic development standpoint. However, because of its novelty, little research has been conducted to assess the long-term or cumulative impacts of these particles on human health or the environment. While few would deny the great economic potential of encouraging these industries in their community, many are skeptical about whether the long-term economic benefits outweigh the unknown health and environmental costs.

The intention of Lowell’s Emerging Technologies ordinance was twofold. First, the ordinance was meant to promote the City as a place where emerging technology businesses--and nanotechnology businesses in particular--would want to locate. Second, the ordinance was intended to help mitigate public health concerns raised by residents who may be neighbors to these businesses and worry about the environmental risks associated with nano-sized particles and materials. In assisting the city, NMCOG staff convened meetings with the private sector, university researchers, and municipal staff to better understand the promises-and challenges-in developing an Emerging Technologies Ordinance in Lowell.

Given the ever-evolving and complex nature of the nanotechnology issue, a Working Group has been set up to provide ongoing support and feedback for the Emerging Technologies Ordinance in Lowell. This group is comprised of the Assistant City Manager and the Economic Development Director for the City of Lowell, two local business representatives that use and/or manufacture nanomaterials; the Director of Research and Technology Development in

Nanomanufacturing and Biomanufacturing and the Director of the Center for High Rate Nanomanufacturing at UMass-Lowell; and the Executive Director and Economic Development/Housing Planner at NMCOG.

c. Creative Economy

The Creative Economy project was initiated by the Merrimack Valley Economic Development Council (MVEDC) through a small grant it received from the Massachusetts Cultural Council. The focus of this project was to define the creative economy in the Merrimack Valley, quantify its contributions to the overall economy, and promote the growth of the creative economy as a means to diversify the economy and provide a destination location for travelers and shoppers. The communities involved in this project included the nine communities of the Northern Middlesex Council of Governments (NMCOG) and the fifteen communities of the Merrimack Valley Planning Commission (MVPC). The description of the MVEDC project was provided previously under the Cultural and Recreational Amenities on page 81.

This initiative to brand the region as a center for the Creative Economy is occurring within the City of Lowell. The City has established an arts district within its historic nineteenth century era downtown as a place to encourage artists to set up their studios and living space. A host of housing opportunities are available for individual artists and cooperative groups who wish to relocate to the Arts District. A map of the current Arts District Overlay area is offered in Image 14 below.

It is important to note that the entire Hamilton Canal and Hamilton Crossing sites are located within this district. The current plan for the Hamilton Canal District includes a significant supply of affordable artist live/work space, additional galleries, and performance venues. These new amenities will complement the many artist lofts, studios, museums, and galleries already located downtown.



Image 14: Arts District Overlay in Downtown Lowell

As previously discussed, the total number of arts, entertainment, and recreation establishments in the Greater Lowell region grew by 22.9% between 2004 and 2009. The number of workers employed in sectors related to the arts, entertainment, and recreation, also increased substantially, with average monthly employment growing by 468% from 1,449 in 2004 to 8,232 in 2009. This growth can be attributed to the Creative Economy initiatives described above.

6. Regional Innovation and Competitiveness

The region's capacity for innovation and economic competitiveness can be determined by a number of factors. In this case, we will provide current data related to patents and exports in the Greater Lowell region. Given the renewed emphasis placed upon innovation and international trade by the Obama Administration, these data sets will be useful for future CEDS activities.

a. Patents

The Greater Lowell region is known for its economic innovation and competitiveness, especially within the high-tech manufacturing and computer information services areas. The presence of the various research communities at UMass Lowell—particularly those in engineering and life sciences-- coupled with the availability of a highly skilled and educated professional workforce—has contributed greatly to the overall capacity for innovation and economic competitiveness in the Greater Lowell region. One useful indicator for assessing industry dynamism and innovation is the number of patents that are issued to private companies located in the area. Table 50 below tracks the total number of patents issued to businesses in the NMCOG region between January 2004 and June 30, 2009.

Table 50: Patents Issued to Individuals and Businesses in the NMCOG Region: January 2004-June 2009

Community	Year						Total	Percent of Region
	2004	2005	2006	2007	2008	2009 (Jan- June)		
Billerica	114	80	116	83	102	52	547	49.0
Chelmsford	45	34	45	48	25	12	209	18.7
Dracut	0	1	4	0	4	0	9	0.8
Dunstable	0	0	0	0	0	0	0	0.0
Lowell	29	32	32	45	40	20	198	17.7
Pepperell	0	0	0	0	0	0	0	0.0
Tewksbury	28	14	17	13	13	11	96	8.6
Tyngsborough	0	0	0	0	0	0	0	0.0
Westford	17	10	20	5	4	1	57	5.1
NMCOG Region	233	171	234	194	188	96	1,116	100.0

Data Source: U.S. Patent and Trademark Office

In total, 1,116 patents were issued to businesses in the region over the five and a half year period. Nearly half of these patents (49%) were issued to companies in Billerica, primarily in the industries of medical device manufacturing and technologies, semiconductors, telecommunications, gas and electromagnetism, filter and environmental remediation technologies, and optics/ photonics systems. The Biotechnology and Life Science Research company Millipore Corporation, Inc. -- which has its corporate headquarters in Billerica—was awarded ninety-five (95) patents between January 2004 and June 2009, signaling the strength in innovation of companies located in Billerica.

An additional 18.7% of the patents issued during the five and a half year time period were assigned to companies located in Chelmsford. The types of industries awarded patents during this time included, but were not limited to, medical device technologies, transportation

engineering, laser and photonics technologies, semiconductor components, software engineering, life and biological sciences, and data transmission.

Patents issued in the City of Lowell accounted for 17.7% of all patents awarded across the NMCOCG region. Similar to Billerica and Chelmsford, many of these patents were awarded to companies engaged in electromagnetic processing, telecommunications, and electrical components. However, the City stood out in terms of its patents for products related to photovoltaic/solar technologies, chemical engineering, sustainable wastewater treatment processes, plastics and polymer components, and nanotechnology. Konarka Technologies, the “leader in polymer-based, organic photovoltaic technologies” (<http://www.konarka.com>) which is headquartered in Lowell, was awarded twenty-three (23) patents between January 2004 and June 2009.

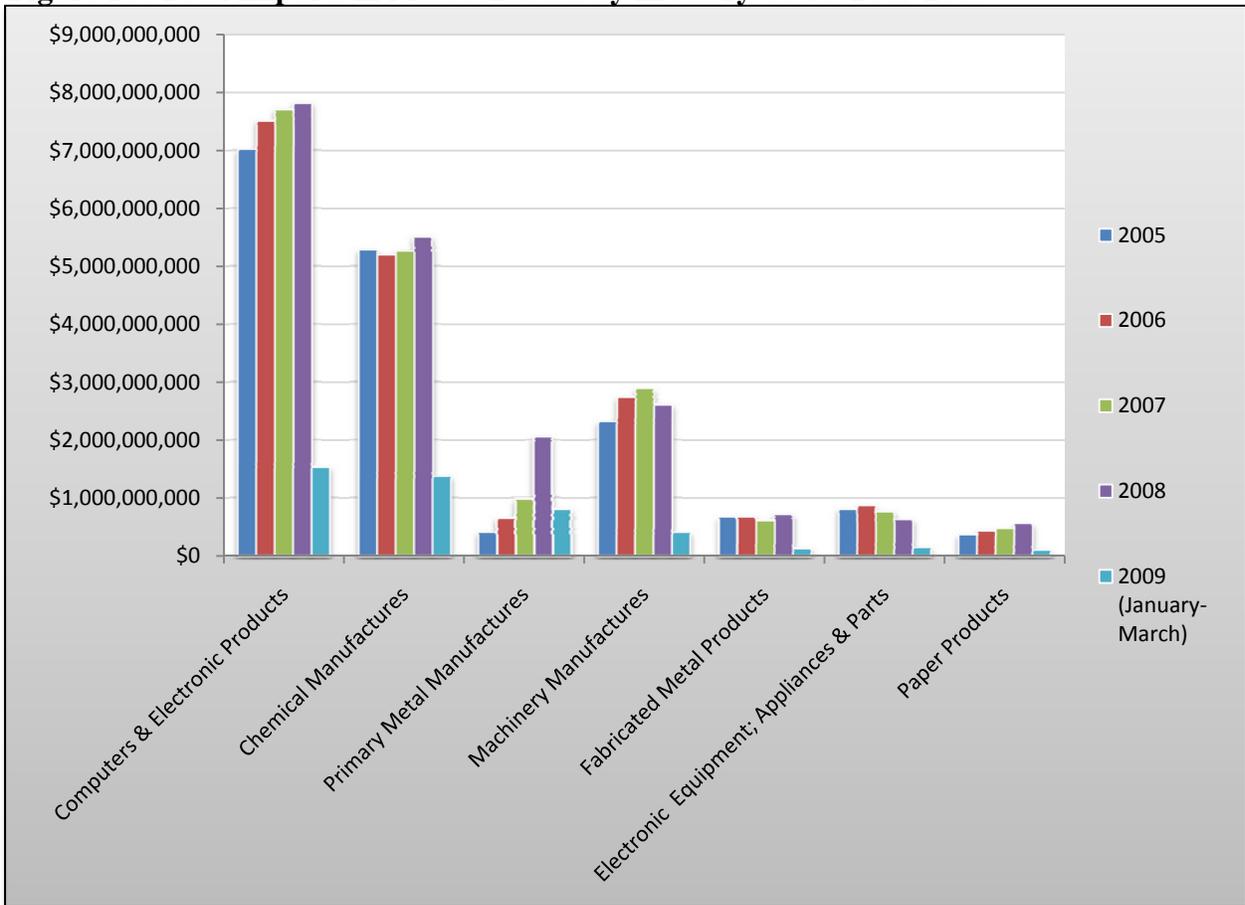
Companies located in Tewksbury (8.6%), Westford (5.1%), and Dracut (0.8%) were awarded patents during the past five and half years. In Tewksbury, the vast majority of patents were issued for products related to telecommunications, audio/video (A/V) technology, and data processing. Two-thirds (66.6%, or 64 patents) of the patents issued in Tewksbury were awarded to Avid Technologies, Inc., a leader in the field of audio software and devices. In Westford, industries awarded patents included, but were not limited to, computer networks and software packages, photonics/imaging, and medical technology. The nine patents awarded to companies in Dracut involved environmental control units, electronic accessories, industrial machine components, and personal accessories.

b. Exports

Another indicator of economic competitiveness is the level of goods being exported from a region. The U.S. Census Bureau’s Foreign Trade Division compiles export data on a quarterly basis for each of the fifty states. Figure 16 on the next page illustrates total monies generated through trade exports for several manufacturing industries in Massachusetts between 2005 and 2009. Although the U.S. Census Bureau’s Foreign Trade Division does not compile data on the sub-state level, these figures are useful in getting a sense for the level of export trade among industries with a presence in the Greater Lowell region. The eight industries represented below are offered because all of them had an average monthly employment (AME) location quotient of at least one (1.0), when the region was compared to the state as a whole. For this reason, one can assume that a significant portion of these total exports would have come from businesses operating in the Great Lowell region.

By far, the most lucrative export industry represented below is computer and electronic goods. According to ES-202 data compiled for the second quarter of 2009, the location quotient for this sector is 2.131, indicating a notable concentration of computer and electronics manufacturing jobs in the Greater Lowell region. In 2005, approximately \$7,011,554,864 in computer and electronic goods were exported statewide. Three years later, that number had increased by 11.6% to \$7,821,471,150. Although first quarter 2009 data suggests that total computer and electronics exports will be much less than during the previous four years, the data identifies this sector as still being the primary export industry in the Commonwealth.

Figure 16: Total Exports in Massachusetts by Industry Code: 2005-2009



Source: Foreign Trade Division, U.S. Census Bureau.

Chemical manufacturing is another industry with a significant presence in the NMCOG region. Second quarter average monthly employment data for this industry revealed a location quotient of 1.241. In terms of product exports, chemical goods exports increased by 4.3%, or \$229,331,142, between 2005 and 2008. As of March 2009, \$1,368,982,726 in chemical goods had been exported from the Commonwealth. To a lesser extent, the paper goods manufacturing industry, with a location quotient of 1.036, increased its exports between 2005 and 2008 by 52% or \$188,566,562.

Machinery, electronics/appliances, and metal manufacturing are also prevalent industries in the region. The average monthly employment location quotients for these industries during the second quarter of 2009 were as follows: architectural and structural metals (1.285), electrical equipment and appliances (1.146), electronic instruments (1.682), industrial machinery (1.104), machinery (1.226), other electrical equipment and components (2.317), and semiconductors and electronics (4.484). According to the trade export data for these types of products, every sector except for “electronic equipment, appliances and parts” experienced an increase in total exports between 2005 and 2008. The most significant growth in export revenue was in primary metal manufacturing, which grew by 408.6% between 2005 and 2008 (primary growth between 2007 and 2008).

7. Tax Policies and Bonding Capacity

The setting of the tax rates can provide a balance between the property tax generated by homeowners and the taxes provided by the business community. Outlined in Table 51 below are the Fiscal Year 2009 tax rates for the nine communities in the NMCOG region.

According to this table, the town of Chelmsford had the highest residential tax rate in FY2009 (\$14.07 per \$1,000 evaluation), followed by Westford (\$13.97), Lowell (\$12.97), Pepperell (\$11.68), Billerica (\$11.55), Tyngsborough (\$11.35), Tewksbury (\$10.87), Dunstable (\$10.86), and Dracut (\$10.00). Commercial and industrial rates varied across the region, ranging from \$26.22 in Billerica to \$10.86 in Dracut. The town of Chelmsford was the only community in the region to have a single-rate classification system, and Tewksbury was the only community to levy taxes on Open Space.

Table 51: Fiscal Year 2009 Tax Rates by Class for the NMCOG Region

Community	Residential	Open Space	Commercial	Industrial	Personal Property
Billerica	\$11.55	-	\$26.22	\$26.22	\$26.22
Chelmsford	\$14.07	-	\$14.07	\$14.07	\$14.07
Dracut	\$10.00	-	\$10.86	\$10.86	\$10.86
Dunstable	\$10.86	-	\$12.97	\$12.97	\$12.97
Lowell	\$12.97	-	\$23.76	\$23.76	\$23.76
Pepperell	\$11.68	-	\$10.87	\$10.87	\$10.87
Tewksbury	\$10.87	\$11.35	\$19.77	\$19.77	\$19.77
Tyngsborough	\$11.35	-	\$12.55	\$12.55	\$12.55
Westford	\$13.97	-	\$14.15	\$14.15	\$13.97

Source: Mass. Department of Revenue, Division of Local Services

Note: Rate per \$ 1,000 evaluation

Furthermore, an analysis of total land valuation and taxes levied during Fiscal Year 2009 (See Table 6 in Appendix II) reveals that the City of Lowell has the largest municipal tax base in the region, valued at \$95,420,809. While residential taxes make up the majority of this tax base, the City also secures significant revenues from commercial, industrial, and personal properties.

Conversely, the community with the smallest municipal tax base is the Town of Dunstable. In Fiscal Year 2009, the town levied \$6,625,952 in property taxes. A predominantly residential community, approximately 96% of Dunstable's tax base came from residential properties. The other seven communities in the region had a healthy mix of taxable residential, commercial, industrial, and personal properties. Billerica had the second highest commercial tax base, followed by Tewksbury, Chelmsford, Westford, Dracut, Tyngsborough, Pepperell, and Dunstable. Billerica also had the highest industrial tax base in the region valued at \$22,964,728. The other eight communities in the region had industrial tax bases that ranged from \$9,205,523 in Lowell to \$55,224 in Dunstable. Personal property made up a significantly smaller portion of the local tax bases in each of the nine communities, ranging from \$135,215 in Dunstable to \$4,335,965 in Billerica.

8. Workforce Development System

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 and Cambridge, 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 (UMass Lowell) and Middlesex Community College (MCC) 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 MCC. 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, MCC 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 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.

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 the partnership with Northeastern University and the University of New Hampshire in the

Nanotechnology field. The University has already begun construction on their Emerging Technologies Center and will be investing in downtown Lowell at the former Doubletree Inn as a potential Inn and Conference Center.

Middlesex Community College (MCC)

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. MCC 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.

MCC 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. A photograph of MCC's downtown Lowell campus is offered below in Image 15.



Image 15: Middlesex Community College Campus in Downtown Lowell

The Greater Lowell Workforce Investment Board (GLWIB)

GLWIB 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 NMCOC region, except for the Town of Pepperell. 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 2008-2009 academic year totaled 6,100.

- **Chelmsford**

The Chelmsford School System is made up of five elementary schools (K-4), two middle schools and one high school. During the 2008-2009 school year, 5,548 pupils attended the Chelmsford Public Schools. The town is also one of seven member communities of the Nashoba Valley Technical High School.

- **Dracut**

The Dracut School System operates four elementary schools (K-6), one middle school and one high school. During the 2008-2009 school year, 4,190 students attended Dracut schools.

- **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 1,922 students during the 2008-2009 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 Commonwealth. The total enrollment for the Lowell school system in 2008-2009 was 13,400 pupils. Lowell is also member community with the Greater Lowell Vocational Technical High School and the Lowell Middlesex Academy Charter School.

- **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 4,267 during the 2008-2009. Pepperell is also member community of the Nashoba Valley Technical High School.

- **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. During the 2008-2009 school year, 4,411 pupils were enrolled in the Tewksbury School System. Tewksbury is a member community of the Shawsheen Valley Technical High School.

- **Tyngsborough**

The Tyngsborough School System is comprised of an elementary school, a middle school and a high school. Total enrollment for the 2008-2009 year was 2,083 pupils. Tyngsborough is also a member community of the Greater Lowell Technical High School.

- **Westford**

The Westford School System is made up of six elementary schools, two middle schools and Westford Academy. During the 2008-2009 school year, 5,308 students were enrolled in the Westford School System. The Town is also one of seven member communities of the Nashoba Valley Technical School.

9. Housing Market

The cost and availability of housing in the Greater Lowell region remains a major barrier to economic growth in the region. Although housing prices have declined over the past twenty-four months, homes are still too costly for many families and households who wish to live in the region. Without the availability of affordable housing for its workforce, private firms have difficulty expanding their businesses or locating in the region. Since the publication of the *Greater Lowell Comprehensive Economic Development Strategy (CEDS) for 2004-2008* and the *Annual CEDS Update for 2005-2007* and the *Annual CEDS Update for 2008*, the housing sector has been the most impacted sector within the region's economy. The number of housing units built and sold has been reduced and the cost of housing has begun to show the impacts of this slowdown. While the number of housing units built for low- and moderate-income families under Chapter 40B have increased in the region, the sale of market-rate housing units have slowed due to increased mortgage costs and declining and aging populations. These collective issues make the state of housing in the region the most challenging area for the expansion of the regional economy.

a. Homeownership Data

In analyzing the region's home 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 compare this important information for the NMCOG region in 2000 and 2008.

i. Home Values

Table 52 below compares median home values across the region between 2000 and 2008. This table reveals that home values among owner-occupied units substantially increased between 2000 and 2008. Both the town of Dracut and the City of Lowell saw values increase by at least 100% during this time period. The remaining seven communities experienced rates of increase ranging from 63.8% in Westford to 88.9% in Tewksbury. Across the NMCOG region, home values among owner-occupied units increased by 85.3%. Although this rate is lower than the state-wide increase of 96% during the same time period, median home values themselves are higher than the state figures in seven of the nine communities, pointing to the region's relatively strong housing market.

Table 52: Median Home Values for Owner-Occupied Units in 2000 and 2008

Community	2000	2008	Percentage Change
Billerica	\$201,400	\$374,800	86.1
Chelmsford	\$205,500	\$371,000	80.5
Dracut	\$158,400	\$317,600	100.5
Dunstable	\$271,500	\$508,655*	87.4
Lowell	\$130,500	\$266,600	104.3
Pepperell	\$189,300	\$354,748*	87.4
Tewksbury	\$197,600	\$373,200	88.9
Tyngsborough	\$204,900	\$383,983*	87.4
Westford	\$276,200	\$452,300	63.8
NMCOG Region	\$201,400	\$373,200	85.3
Massachusetts	\$185,700	\$363,900	96.0

Sources: US Census 2000; 2006-2008 American Community Survey

*Note: Estimates were developed for Dunstable, Pepperell, and Tyngsborough by applying the average rate of increase for the other six communities to the median home value in 2000.

ii. Owner Costs

Table 53 below provides selected monthly housing costs for homeowners living in the NMCOG region in 2000 and 2007. In 2000, 7,733 owner occupied households (12.2%) paid less than \$500 per month on housing-related expenses, while 24.7% of households spent between \$500 and \$999 per month. More than half (52.2%) of the owner-occupied households in the region spent between \$1,000 and \$1,999 per month. The remaining 10.9% of homeowners spent \$2,000 or more per month on their housing costs. By 2007, only 4,563 (7.02%) homeowners spent less than \$500 per month, while 46,470 homeowners or 71.5% paid more than \$1,000 per month.

Table 53: Selected Monthly Owners Costs for Owner Occupied Units: 2000 and 2007

Cost Range	2000		2007*	
	Number	Percent	Number	Percent
Less than \$ 300	1,762	2.8	340	.52
\$ 300 – 499	5,971	9.4	4,223	6.5
\$ 500 – 699	6,257	9.8	6,553	10.1
\$ 700 – 999	9,479	14.9	7,436	11.4
\$ 1,000 – 1,499	20,268	31.8	10,205	15.7
\$ 1,500 – 1,999	12,996	20.4	12,815	19.7
\$ 2,000 or more	6,908	10.9	23,450	36.1

Source: US Census 2000; 2005-2007 American Community Survey

*Note: 2007 Counts do not include households in Dunstable, Pepperell, or Tyngsborough

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. Table 54 below reflects the Owner Costs as a Percentage of Household Income in the NMCOG region for 2000 and 2008.

Table 54: Owner Costs as a Percentage of Household Income: 2000 and 2008

Owner Costs as a Percent of Household Income	2000		2008*	
	Number	Percent	Number	Percent
Less than 10%	8,260	14.3	7,187	10.8
10% - 19.99%	20,991	36.3	16,864	25.4
20% - 29.99%	15,744	27.2	18,380	27.7
30% – 49.99%	8,550	14.8	14,749	22.2
50% or more	4,021	7	8,739	13.2
Not Computed	248	.43	375	.6
Total	57,814	100	66,294	100

Source: US Census 2000; 2006-2008 American Community Survey

*Note: 2008 Counts do not include households in Dunstable, Pepperell, or Tyngsborough

In 2000 more than three-quarters (77.8%) of homeowners had ‘affordable’ housing relative to their incomes, meaning that their total housing and housing-related costs did not exceed 30% of their household income. Another 14.8% of homeowner households were ‘moderately’ burdened, spending between 30% and 50% of their incomes on housing-related costs. However, 7% of households were ‘severely’ burdened, spending more than half of their incomes on housing. Eight years later, the percentage of homeowner households whose housing was affordable relative to their incomes had decreased to 63.9%. As a result, the percentage of ‘moderately’ and ‘severely’ burdened households increased to 22.2% and 13.8% respectively.

b. Rental Housing Data

The rental housing market plays a major role in providing affordable housing opportunities for residents at all income levels. As outlined below in Table 55, the median gross rent in the NMCOG region increased by \$322 per month, or 44.4%, between 2000 and 2008. The percentage change within individual communities ranged from \$111, or 11.9%, in Tewksbury, to \$359, or 49.5%, in Dracut.

Table 55: Median Gross Rent: 2000 and 2008

Gross Rent	2000	2008*	Percent Change 1999-2008
Billerica	\$897	\$1,197	33.4
Chelmsford	\$777	\$1,154	45.8
Dracut	\$725	\$1,084	49.5
Dunstable	\$908	\$1,265*	39.3
Lowell	\$627	\$917	46.3
Pepperell	\$697	\$971*	39.3
Tewksbury	\$936	\$1,047	11.9
Tyngsborough	\$701	\$976 *	39.3
Westford	\$690	\$995	44.2
NMCOG Region	\$725	\$1,047	44.4
Massachusetts	\$684	\$987	44.3

Source: US Census 2000 and 2005-2007 American Community Survey

*Note: 2008 estimates were developed for Dunstable, Pepperell, and Tyngsborough by applying the average rate of increase for the other six communities to their median gross rent in 1999.

Table 56 below examines the Gross Rent as a Percentage of Household Income in the NMCOG region for 2000 and 2008. Similar to the affordability of housing for homeowners, in 2000 the majority (60.8%) of rental households spent less than 30% of their incomes on housing related costs. However, in general, housing burdens were greater among renters than homeowners: 17.9% of rental households were ‘moderately’ burdened, while 16.4% were ‘severely’ burdened.

Table 56: Gross Rent as a Percentage of Household Income in the NMCOG Region: 2000 and 2008

Gross Rent as a Percent of Household Income	2000		2008	
	Number	Percent	Number	Percent
Less than 10%	1,920	6.2	729	3.0
10% -19.99%	8,906	28.8	5,278	21.4
20% -29.99%	7,914	25.6	6,413	26.0
30% -49.99%	5,546	17.9	5,393	21.9
50% or more	5,084	16.4	5,796	23.5
Not Computed	1,546	5.0	1,023	4.2
Total	30,916	100.0	24,632	100.0

Source: US Census 2000; 2006-2008 America Community Survey

*2008 Counts do not include households in Dunstable, Pepperell, Tyngsborough, or Westford

In 2008 slightly more than half (50.4%) of rental households lived in housing that was affordable relative to their incomes. ‘Moderately’ burdened renters accounted for 21.0% of all rental households, and those ‘severely’ burdened grew to 23.5%. These figures give us a sense of the housing burden among renters across the region. However, these estimates understate the total household costs since the Census Bureau does not collect data about additional housing-related costs for renters, such as utilities and rental insurance.

c. Households and Household Projections

As with the population and employment projections completed by the Massachusetts Highway Department, the household projections were developed to show the growth of households in the Greater Lowell region. Households are defined by the U.S. Census as being equivalent to “occupied housing units”. According to the projections developed by MassHighway, the number of households in the Greater Lowell region was expected to increase from 99,542 in 2000 to 128,400 in 2030. Based upon these projections, Lowell’s share of households would be reduced from 38.2% in 2000 to 32.5% in 2030. Other communities with decreasing shares of the households in the region were Billerica, Chelmsford and Tewksbury. Summarized below in Table 57 are the household projections for the Greater Lowell region.

Table 57: Household Projections for the Greater Lowell Region: 2000 - 2030

Community	2000	2010	2015	2020	2025	2030	Percent Change 2000-2030
Billerica	12,961	13,885	14,402	14,838	15,215	15,540	20.3%
Chelmsford	12,826	13,377	13,630	13,929	14,232	14,340	11.9%
Dracut	10,450	12,586	13,266	14,265	14,783	15,640	49.7%
Dunstable	936	1,300	1,498	1,732	2,025	2,270	145.9%
Lowell	37,992	39,743	40,454	41,119	41,570	41,770	10.2%
Pepperell	3,845	5,167	6,159	6,807	7,514	8,330	116.5%
Tewksbury	9,955	11,051	11,542	11,845	12,048	12,370	24.1%
Tyngsborough	3,741	4,680	5,152	5,572	5,967	6,440	72.6%
Westford	6,836	8,511	9,197	10,193	10,848	11,700	71.9%
Greater Lowell	99,542	110,300	115,300	120,300	124,200	128,400	29.3%

Source: 2000 U.S. Census; projections by MassHighway in consultation with NMCOG

According to the household projections, the number of households in the Greater Lowell region will increase by 20.9% between 2000 and 2020 and 29.3% between 2000 and 2030. In analyzing the household projection figures, the largest household growth areas are anticipated to be in Dracut, Dunstable, Pepperell, Tyngsborough and Westford.

d. Affordable Housing in the NMCOG Region

The Greater Lowell region has shown some progress in addressing the affordable housing goals established by former Governor Michael Dukakis through Executive Order 418. As of June 2009, the Greater Lowell region had 9,401 subsidized housing units, or 9.25% of the year-round housing units documented in the 2000 U.S. Census. Approximately 55.7% of these subsidized units were located in the City of Lowell. Between April 2002 and June 2009, the subsidized housing inventory for the region grew by 2,338 units, or 33.1%. Lowell’s subsidized housing inventory, however, dropped from a 75.2% share of the region to approximately 55.7% during this time, which reflected the increase in the subsidized units being developed in the towns. Outlined below in Table 58 are the subsidized housing unit comparisons for each community in the Greater Lowell region.

Table 58: Subsidized Housing Units in the NMCOG Region: June 2009

	Year Round Housing Units 2000	Subsidized Housing Units	
		June 2009	Percent of Total
Billerica	13,055	1,186	9.08%
Chelmsford	12,981	919	7.08%
Dracut	10,597	588	5.55%
Dunstable	933	0	0.0%
Lowell	39,381	5,237	13.3%
Pepperell	3,905	122	3.12%
Tewksbury	10,125	519	5.13%
Tyngsborough	3,784	194	5.13%
Westford	6,877	636	9.25%
Greater Lowell Region	101,638	9,401	9.25%

Source: Executive Office of Housing and Economic Development

e. Trends in the Regional Housing Market

The Massachusetts housing market has changed significantly during the past four years. Sales in single-family homes in Massachusetts declined by 29.8% between 2004 and 2007, and dropped even more, according to the Warren Report, when the “credit crisis” hit in July 2007. This contributed to a total sales decline statewide of more than 20% in the first part of 2008 and a decline in sales in the Merrimack Valley of 19.1% during the same period of time. Over the course of the year, the total number of sales across the state declined by 5,216, or 11.5%. Condominium sales have also been severely impacted. The Warren Group reported that in February 2009, there were 866 condo sales across the state, marking a 30% drop from the 1,236 condos that were sold in February 2008.

Median prices of single-family homes have been declining for thirty-five months in Massachusetts, while the Merrimack Valley lost 10% in median prices during the first four

months of 2008. The Warren Group reported that the median selling price for a single-family home in Massachusetts dropped 18.3% from February 2008 to February 2009. Furthermore, February 2009 marked the sixth consecutive month that the median sales price was below \$300,000 and that prices had declined by double digit percentages.

These numbers surpass estimates calculated by Professor Ross Gittell of the University of New Hampshire, who projected a 14% decline in housing prices for Massachusetts between 2005 and mid-May 2008, which represented the largest decline in New England. Professor Gittell predicted that housing prices wouldn't return to their peak until 2010. Another study conducted by Professor Adam Clayton-Matthews of the University of Massachusetts argued that these price declines were good for the Massachusetts economy. Professor Matthews predicted that Massachusetts would not recover its lost jobs from the early 2000s until 2011. Given the sharp declines in home sales and values and sharp rise in unemployment that have occurred in recent months, these projections may ultimately prove to have been too optimistic.

i. Number of Sales

Table 59 below shows the number of single family home and condominium sales by community between July 2008 and June 2009. This data reveals that over the course of the year, 900 single-family homes and 464 condos were sold in the NMCOG Region. Sales in Lowell accounted for the greatest percentage of both single-family (26.2%) and condo (35.3%) sales during this time. Billerica had the second highest percentage of single-family home sales (18.9%), while Chelmsford and Westford tied for the second-highest percentage of condos sold, with 61 units sold in each community during the course of the year.

Table 59: Single-Family and Condominium Sales: July 1, 2008 – June 30, 2009

Community	Single-Family		Condos	
	Number	Percent of Region	Number	Percent of Region
Billerica	170	18.9	39	8.4
Chelmsford	141	15.7	61	13.1
Dracut	93	10.3	52	11.2
Dunstable	11	1.2	0	0
Lowell	236	26.2	164	35.3
Pepperell	41	4.6	8	1.7
Tewksbury	86	9.6	56	12.1
Tyngsborough	40	4.4	23	5.0
Westford	82	9.1	61	13.1
Greater Lowell Region	900	100	464	100

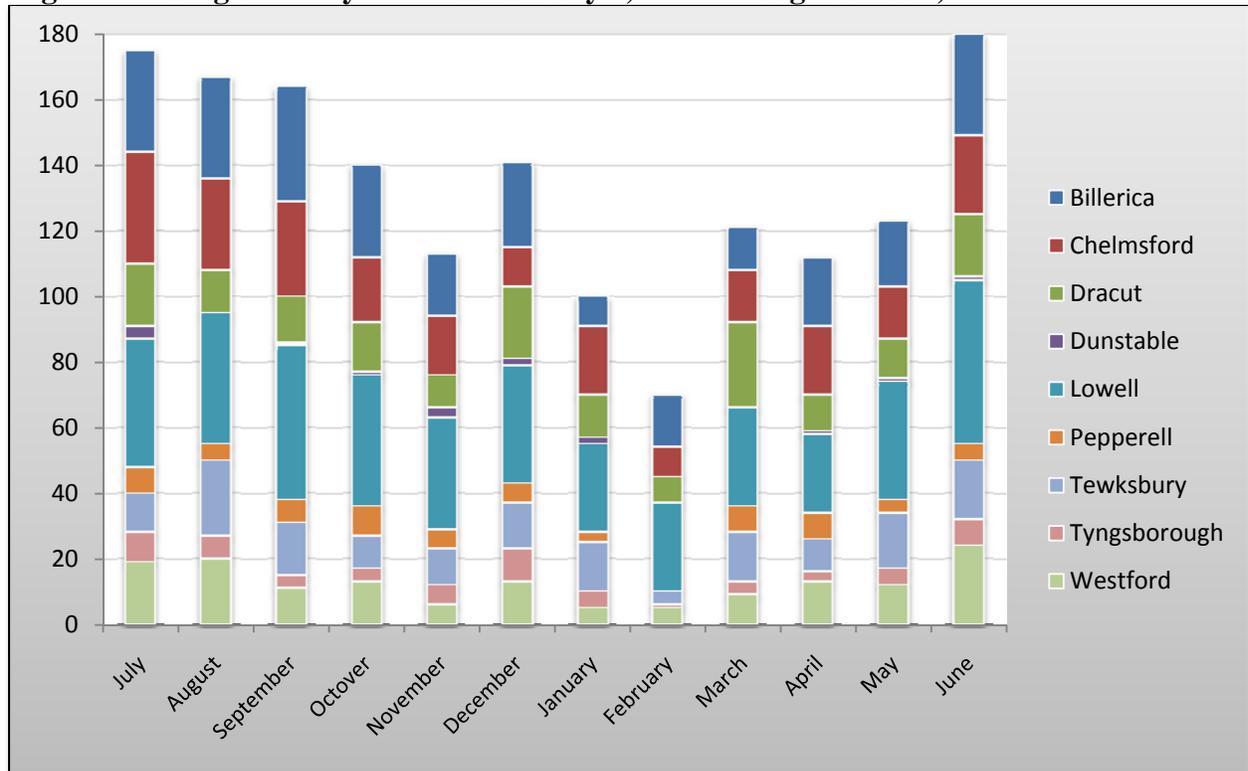
Source: The Warren Group

Figure 17 on the next page breaks down total single-family home sales by month and community. This figure reveals that total sales decreased monthly from 175 sales in July 2008 to 113 sales in November 2008. Between November 2008 and December 2008, however, total sales increased by nearly a quarter (24.8%) to 141 single-family home sales.

Between December 2008 and January 2009, single-family home sales across the region dropped by 29.1% and then decreased an additional 30% between January 2009 and February 2009. In March 2009, single-family home sales increased by 72.9% from the previous month. Even

though the total number of sales across the region decreased slightly in April 2009, single-family home sales increased over May and June so that there were 180 single-family home sales in the region in June 2009, the highest number of monthly sales in the past year.

Figure 17: Single-Family Home Sales: July 1, 2008 through June 30, 2009

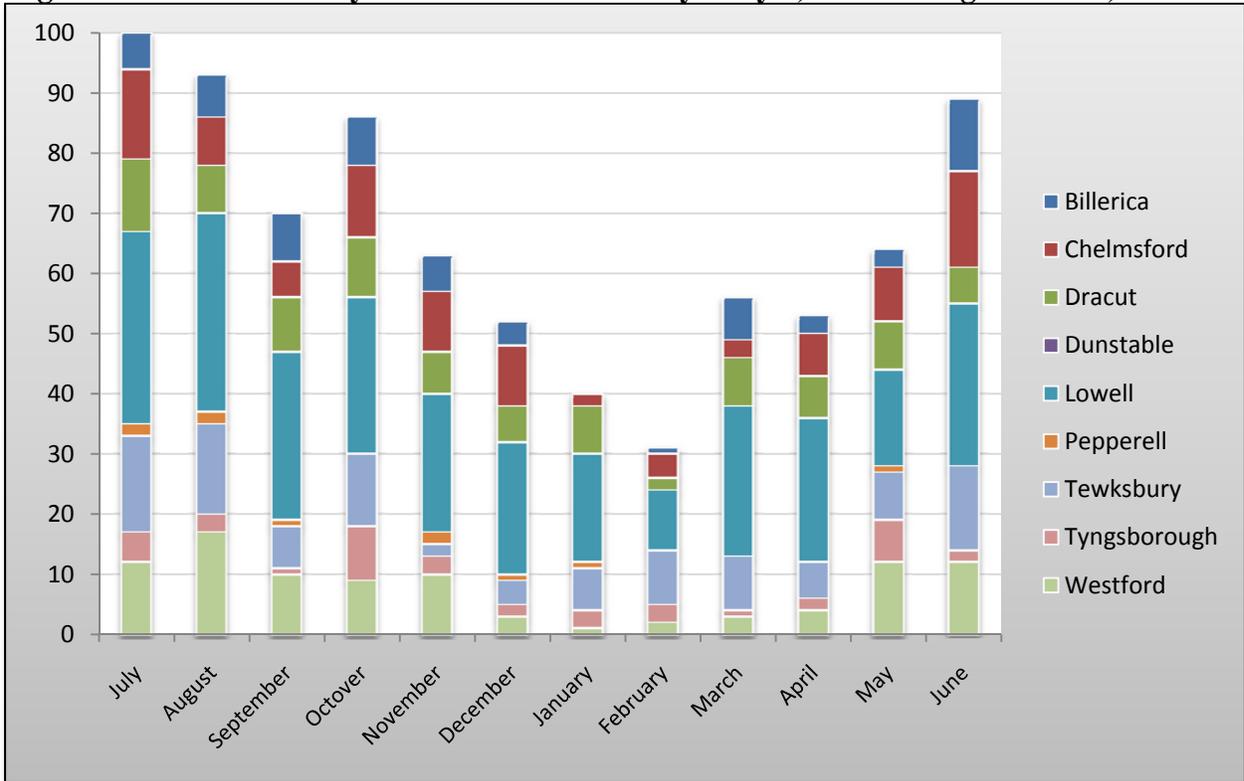


Source: The Warren Group

Condominium sales have been more severely impacted across the Greater Lowell region, as reflected in Figure 18 on the following page. According to the Warren Group, there were 464 condo sales between July 1, 2008 and June 30, 2009. Approximately 21.6% of those sales occurred in July 2008 when 100 units were sold. Over the next two months, sales declined rapidly. In September 2008, only 70 units were sold, which represented a decrease of 30% from the July 2008 sales. Although condominium sales recovered somewhat in October 2008, beginning in November 2008 the number of sales declined steadily until it reached a low of only 31 condo sales across the region in February 2009.

Since February 2009, however, condo sales began to rebound with a nearly twofold increase in sales by March 2009. Although the sales of condos decreased between March 2009 and April 2009, similar to single-family home sales, sales of condominium units increased by 20.8% between April 2009 and May 2009 and an additional 39.1% between May 2009 and June 2009 to the third highest monthly sales figure during this eighteen month period.

Figure 18: Condo Sales by Month and Community: July 1, 2008 through June 30, 2009



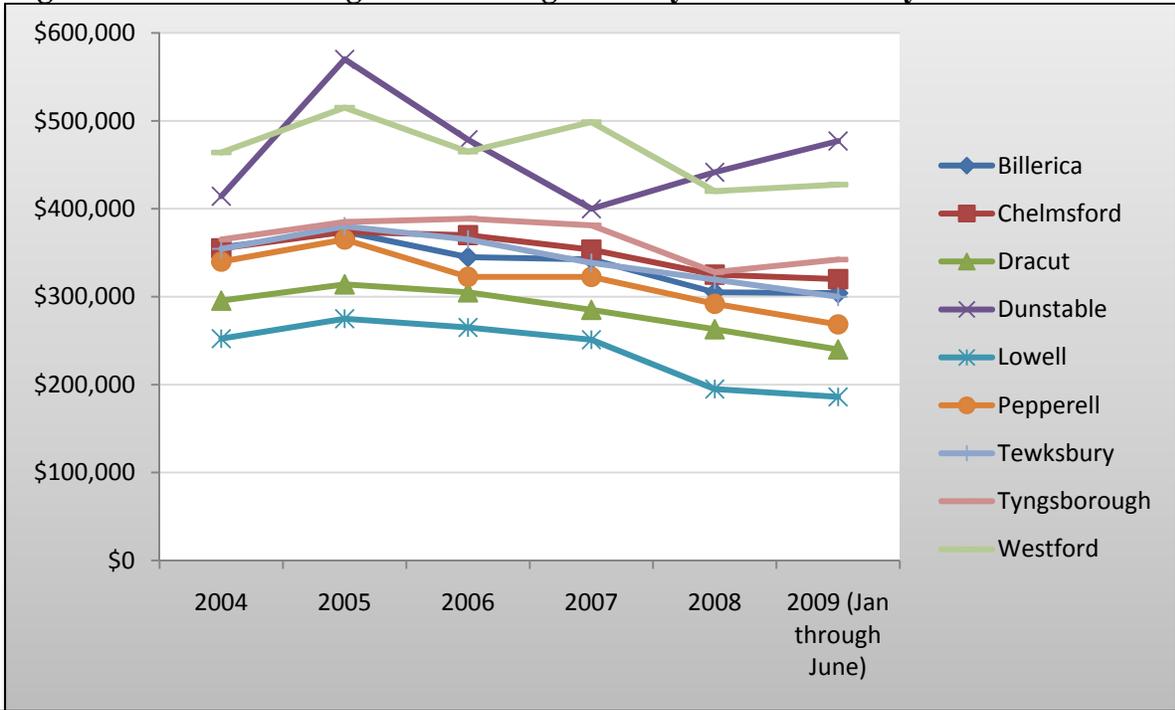
Source: The Warren Group

ii. Median Selling Prices

Another important indicator of the health of a housing market is the median selling price for homes. Figure 19 on the next page illustrates the median selling price for single-family homes in the NMCOG Region between January 2004 and June 2009. According to this data, median sales prices for single-family homes for every community in the region peaked in 2005, the same year that housing sales peaked. This data reflected a robust real estate market in the Greater Lowell region during the middle of the decade, when people wanted to move here and were willing to pay more to do so. The Town of Dunstable saw the most significant increase in median selling price between 2004 and 2005, up \$155,700, or 37.6%. Other communities experienced more modest gains during this period, ranging from a 4.9% increase in Billerica to an 11% increase in Westford between 2004 and 2005.

With the exception of Dunstable, which experienced a 10.4% increase in median selling price between 2007 and 2008, every community in the NMCOG region has seen the median selling price for single-family homes in their community consistently decline between 2005 and 2008. Data for the first half of 2009 has revealed mixed trends among the nine communities in the region. Chelmsford, Dunstable, and Tyngsborough have seen increases in the median selling price for single-family homes during this time period, while Billerica, Dracut, Lowell, Pepperell, and Tewksbury have seen their prices drop further. The median selling price for a single-family home in Westford was \$ 420,000 in 2008 and the first six months of 2009.

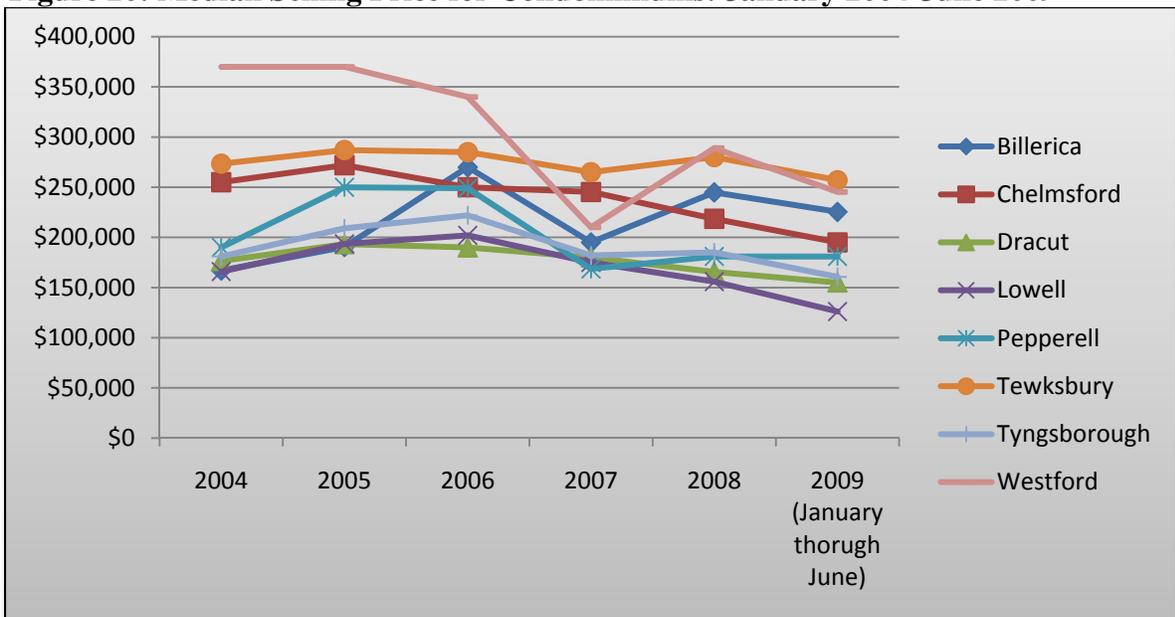
Figure 19: Median Selling Price for Single-Family Homes: January 2004-June 2009



Source: The Warren Group

Figure 20 below shows the median selling price for condominiums in the region between 2004 and the first half of 2009. These trends are different from the median selling price for single-family homes and show wide variations, such as in the case of Westford and Billerica.

Figure 20: Median Selling Price for Condominiums: January 2004-June 2009



Source: The Warren Group

The median selling price for condominiums increased in every community between 2000 and 2004. In 2005 Chelmsford, Dracut, and Tewksbury experienced their highest median selling price for condominiums, while Westford matched their 2004 median selling price. In 2006 Billerica, Lowell and Tyngsborough had their highest median selling price for condominiums, while Pepperell matched their highest median selling price set in 2005. Between 2006 and 2007, the median selling price for condos declined sharply in all nine communities from 2% in Chelmsford to 38.2% in Westford. The median selling price for condominiums increased between 2007 and 2008 in every community, except for Chelmsford and Dracut. Over the next year, prices climbed again in every community, except for Chelmsford, Dracut and Lowell. Through the first six months of 2009, the median selling prices declined, which is reflective of the overall decline in sales and increased number of foreclosures. As of the first six months of 2009, the median selling price for condominiums had not yet returned to the 2004 levels in any community in the region.

C. The Region's Future Economy

In developing the Five-Year CEDS for the Greater Lowell region, NMCOG staff and the Greater Lowell CEDS Committee developed a “grass-roots” strategy to encourage input from the economic development stakeholders and residents in the region. In order to bring the stakeholders together and to present the Annual CEDS planning process to them, NMCOG scheduled two Strengths, Weaknesses, Opportunities and Threats (SWOT) sessions at Lowell City Hall on August 11, 2009 and at the Tewksbury Public Safety Building on August 13, 2009. In addition to these SWOT sessions and the regular Greater Lowell CEDS Committee meetings, a CEDS Public Meeting was held at the NMCOG Conference Room on September 14, 2009 to receive comments on the CEDS Vision Statement, Goals and priority projects. More than 40 people attended at least one of these sessions and offered their input on the development of the Vision for the Five-Year CEDS and the priority projects to be implemented. Additional information on these sessions, including the promotional flyer, agenda, meeting notes and attendance sheet, can be found in Appendix VI.

The first part of this section focuses principally on the results of these SWOT sessions. Through a discussion of the Region's Strength and Weaknesses, Future Economic Growth Opportunities, and External Trends and Forces, the input from the SWOT sessions will be summarized and become the foundation for the development of the Vision Statement and the Five-Year Goals and Objectives to be established. As mentioned previously, the more detailed input from the SWOT sessions can be found in the meeting notes in Appendix VI.

Two other parts of this section – Land Development Potential and Partners and Resources for Economic Development – identify the commercial and industrial development potential in the region and the economic development stakeholders and resources at the local, non-profit, state and federal levels that will be depended upon in order to implement the Action Plan developed through the Five-Year CEDS. The Future Economic Strategies portion of this section will briefly outline the steps that need to be taken over the next five years in order to improve the regional economy and create well-paying, high skilled jobs.

1. The Region's Strengths and Weaknesses

In assessing the Strengths and Weaknesses of a region through the SWOT process, there are often disagreements on the part of the participants as to whether a specific topic is a strength or a weakness, and, sometimes, they can be both. For the purposes of this document, we've identified the Strengths and Weaknesses as separate and distinct items that may be contradictory. The overall purpose of this effort is to develop a consensus from the SWOT participants in order to develop a Vision Statement and specific Goals and Objectives that are consistent with their statements.

There were more than twelve (12) separate Strengths identified through the SWOT sessions and many of the strengths identified were overlapping at the two sessions. These Strengths can be categorized into seven general themes: **business community**, **workforce**, **infrastructure**, **diversity**, **affordability**, **location** and **quality of life**. Each one of these themes combines several different statements that reflect the general consensus of the group.

Business community and related issues focused on the economic and industry diversity in the region. It was stated that there were a number of growing companies in the region, as well as growing retail activity related to the new Target and Lowes facilities in Lowell. The region's ability to reinvent itself after every economic downturn was cited as a major strength. The cluster of "growth industries", including "green" jobs, cultural and creative economy, solar, nanotech, high tech and health care, was emphasized as a positive for the future. The local financial institutions were identified as major contributors to the strength of the region. This region was identified as having a strong core manufacturing base as compared to other parts of Massachusetts.

The quality of the **workforce** was seen as a major strength in attracting businesses and encouraging local businesses to expand. Participants cited both the educational levels of the workforce and the quality of the educational institutions in the region. The exceptional skills and strong work ethic of the workforce are an attraction to high technology and biotech firms, which already represent a cluster industry in the region. The active participation of UMass Lowell and Middlesex Community College in training the current and future workforces for these firms is a comparative advantage for the region.

The region's **infrastructure** was cited as a significant advantage and strength as compared to other parts of the country. The extensive highway network provided by I-495, I-93 and Route 3 offered an opportunity for residents, workers and visitors to travel anywhere in New England effectively and efficiently. The highway network provides access to freight facilities throughout New England and creates options for shipping by air, rail, sea or highway. The public transit system, both in terms of the Lowell Regional Transit Authority and the Massachusetts Bay Transit Authority, was identified as an advantage for the Greater Lowell region. The availability of other infrastructure – water, sewer, and electric – was seen as a strength in the region.

The **diversity** in the region, both in terms of the cultures and ethnic groups, was identified as a strength. Immigrants – Irish, French Canadian, Greeks, Latino, Cambodian- coming to Lowell began in the Acre and then moved to other parts of the city and region as each generation became

part of American society. Diversity has always been cited as an important element for the economic growth in the Greater Lowell region.

Affordability, particularly in relation to Boston and other parts of Massachusetts, was identified as a strength in attracting homeowners and businesses that would otherwise locate elsewhere. Residential and commercial real estate is thought to be competitively priced and affordable relative to the Greater Boston area.

Location, in terms of proximity to Boston, New Hampshire, the ocean and mountains, represented a significant strength. Residents, workers and visitors have access to international airports in Boston and Manchester, as well as to the tourist areas on the North Shore, in Boston and throughout the rest of New England. Most participants felt that this region was ideally located.

Quality of life and related issues were cited as strengths for this area. The region's livability, in terms of historical and cultural resources, and access to the natural resources in the area make this an enjoyable place to live, work and visit. Economic, social and educational opportunities were cited as other quality of life issues.

More than sixteen (16) separate Weaknesses were identified for the Greater Lowell region. These Weaknesses can be categorized into six different groupings – **high cost of living, quality of life, infrastructure, business costs, budget and financing and housing**.

The **high cost of living** covered many different areas – housing, health care, energy, taxes and the cost of living overall. The cost of housing and energy relative to other parts of the country, were significant weaknesses according to the participants. Health care costs were identified as a weakness for families and small businesses. The relatively high tax rates, particularly the sales and property taxes, were identified as disadvantages in competing with New Hampshire. In general, the participants felt that it cost more to live in the Greater Lowell region.

The **quality of life** was felt to be a weakness in some respects. The high unemployment rates in both the City and suburban communities were cited as a weakness, as were the high poverty rates in pockets of the City. The perception of a high crime rate in the City of Lowell was identified as a weakness. Empty store fronts and closed businesses added to the negative feelings about the quality of life in the region.

The aging **Infrastructure** in the City and the lack of infrastructure in some towns was seen as a serious weakness. Insufficient telecommunications and high tech infrastructure to support the business community was identified as another weakness. The lack of additional sewer capacity in the region was seen as an impediment to future economic growth. Outdated sewer and water infrastructure were thought to only add to these capacity issues. The road network was described as both “distressed” and “cowpaths” in some locations. The limited scheduling for public transit was seen as a barrier to the workforce. The lack of responsiveness by electric and utility companies was thought to be unfriendly toward the business community. The lack of sidewalks offered significant challenges to pedestrians.

Business costs were cited as a weakness in the Greater Lowell region. These business costs included the cost of development and doing business. Due to the built out nature of the region, there is less undeveloped land available compared to other regions. Brownfield sites that are available are more costly to develop as well. The cost of development, relative to other regions, creates an imbalance between project cost and viability. Many of the commercial and industrial buildings are outdated and not conducive to high tech industries. According to one participant, “the costs associated with starting up or expanding businesses in the region are prohibitive”.

Budget and financing represented another weakness. Due to the current national recession, state and local budgets have been cut significantly. These cuts have had an impact upon the local school systems and, therefore, on the quality of education for the region’s students. There are limited funds for nonprofits and the state funding for economic development groups has been cut. In terms of financing, small and medium-sized businesses can’t access loans through their financial institutions due to the global and national economy. The development of stricter underwriting standards, due to the economic crisis, creates gap financing problems.

Housing was identified as another major weakness. The lack of rental housing in the towns makes it difficult for workers to find housing. The increase in foreclosures and higher vacancy rates causes problems for adjacent properties. The relatively high cost of housing makes it difficult for families to own their own homes.

2. Future Economic Opportunities

In identifying the future economic opportunities in the Greater Lowell region, the participants at the SWOT sessions offered more than fourteen (14) separate groupings of positive Opportunities for the future. These Opportunities can be categorized into seven (7) different themes: **economic development tools, businesses, regional services, education, partnerships, demographic groups and quality of life.**

Economic development tools received the most responses related to future economic opportunities. The utilization of federal designations, such as the Renewal Community designation from the U.S. Department of Housing and Urban Development (HUD) and the Economic Development Designation from the Economic Development Administration (EDA), would increase private investment in the region. The available federal stimulus funding under the ARRA legislation was identified as an opportunity for funding the Hamilton Crossing project and other economic development initiatives in the region. An increased focus on “green” industries in the region was a distinct possibility given the Green Communities Act at the state level and the availability of ARRA funding for these initiatives. The utilization of brownfield funds was cited as an opportunity to return idle property to productive use. Marketing initiatives were seen as an opportunity to identify and promote the Greater Lowell region, as well as to promote incentives and vacancies. The development of more public/private partnerships modeled after the City’s Lowell Plan and Lowell Development and Financial Corporation was encouraged. Groups, such as the Tewksbury Economic Development Committee, have moved forward with this concept to promote active dialogue between the public and private sectors.

Economic opportunities for **businesses** included taking advantage of commercial vacancies and lower rents due to the decline in the real estate market. Participants expressed the opinion that emerging industries should be targeted for the region and that entrepreneurship opportunities should be encouraged. The health care industry, which plays a significant role in the regional economy, should be supported to create higher-skill, higher-wage employment opportunities. Opportunities in the biotechnology and nanotechnology fields should be pursued and the relationship with the Biotechnology Council should be strengthened.

Regional services should be encouraged in order to share resources on a regional basis. The utilization of NMCOG to establish these regional agreements should be pursued. The regionalization of the 911 service should be studied to see if there are any cost savings and opportunities for shared services. Inter-municipal collaboration, such as the Woburn Street Corridor project, should be expanded in an attempt to attract businesses to vacant facilities and to provide employment opportunities for the regional workforce.

Opportunities in **education** focused principally on the roles of UMass Lowell and Middlesex Community College. The university research center at UMass Lowell should be utilized as a means to attract emerging industries (energy, “green” jobs, high tech, etc.) to the region. Partnerships with both UMass Lowell and Middlesex Community College should be developed to generate higher-skill, higher-wage jobs. It was even suggested that the community college system expand in the Greater Boston area.

Partnerships were encouraged as a means to create new opportunities for economic growth. Collaboration with nonprofits was cited as an opportunity to expand service areas and build inter-organizational partnerships. Opportunities were identified in terms of tapping into volunteerism and promoting civic engagement. Within the workforce development system, there were opportunities identified in working with youth leadership. On the educational side, increased collaboration among public, technical and Catholic high schools was seen as an opportunity to improve the quality of students to be prepared for the work world.

The changing **demographic groups** in the Greater Lowell region will have an impact upon the future workforce. Among the unemployed in the manufacturing sector, the hardest group to re-employ was white, older males. There is a need to increase opportunities for youth so that they stay in this area. Baby boomers, immigrant communities and nontraditional households are moving out of Lowell into the suburban communities. This movement will increase the demand for new livability initiatives in the suburbs. The current workforce is growing older and there will be a need to retain the college and high school graduates in the region in order to meet the manpower needs of growing businesses.

Quality of life was cited as an opportunity for economic growth as well. Through the encouragement of sustainable infrastructure improvements, the region’s quality of life will be improved. The linking of community assets, such as sports, across town lines was felt by one participant to be an opportunity to improve the quality of life. The utilization and expansion of natural resources, such as walking trails or canoe launches, was seen as another means to improve the sense of well being in the region.

3. External Trends and Forces

The participants at the SWOT sessions identified nine (9) separate external trends or forces that would be a threat to the economic future of the Greater Lowell region. These Trends and Forces can be combined into five different categories: **state of the economy, budgets and financing, workforce, environment and lack of regional cooperation.**

The **state of the economy** represents the greatest threat to the economic future of the Greater Lowell region. The increasing unemployment rates and number of foreclosures continue to take their toll on the regional economy. With the nation mired in the worst recession since World War II, it has been difficult for Massachusetts and the Greater Lowell region to recover. Unlike the recession in the early 2000s, this recession affected Massachusetts later than other parts of the country. Associated with the state of the economy is the current housing crisis. Even though housing prices have not returned to their 2004 levels, it is still difficult for a family to afford housing in this region. Older homeowners are leaving the State and not maintaining their properties. The persistent global threats drain funds from addressing local and regional needs.

With the state of the economy, **budgets** at the state and municipal levels continue to be cut. There has been a deterioration of state and municipal services as a result of these budget cuts. The lack of investment in infrastructure improvements will have a negative impact upon economic growth. Unfunded federal and state mandates exasperate the financial situation at the local level, while unfunded obligations at the state level, such as health insurance and state pensions, are likely to have a negative impact in the future. One participant noted that the re-appropriating of defense spending under the Obama Administration will negatively impact defense-related manufacturing activity in the region. Another casualty of the state of the economy is **financing** for businesses and housing. The lack of credit and seed funding for real estate and equipment is limiting the business growth in the region.

Another threat to the region relates to the **workforce**. With an aging workforce and the inability to keep young workers in the region, growing businesses will be forced to relocate to those areas that have a ready supply of workers. With the outsourcing of jobs by some of these companies, employment opportunities for the workforce are reduced. The lack of workforce development and training in schools due to budget cuts was identified as a serious threat to the regional economy.

The **environment** was cited by several participants as a threat to the regional economy. The impact of changing weather and the need for emergency preparedness was identified as a factor. The 2009 ice storm and the spring floods were used as examples of changing weather patterns. Another environmental issue identified were the proposed development projects, such as asphalt and power plants, that threatened the health of residents in these communities. The lack of public information about the environmental impacts of the proposed projects increased the concern about these projects. Toxic waste sites, which have not been remediated due to their extensive redevelopment costs, represent a threat to the economic future of the region.

The **lack of regional cooperation** in the future will strain federal, state and local budgets beyond their breaking point. The lack of available resources creates competition between communities

and threatens regional cooperation. The expansion of the Lowell Development and Financial Corporation (LDFC) to serve the suburban communities or the utilization of the nonprofit arm of NMCOG, the Northern Middlesex Economic Development District (NMEDD), would increase the regional focus that will be needed in the future.

4. Land Development Potential

The *Greater Lowell CEDS for 2004-2008* provided a summary of the buildout analyses completed by NMCOG in 2000 and 2001, under contract to the Executive Office of Environmental Affairs (EOEA). The buildout analyses have not been updated since, with the exception of an analysis recently completed for the Town of Chelmsford as part of the Master Plan process. Much of the data and assumptions upon which the 2000/2001 buildout analyses were based are now outdated. Alternatively, the *Greater Lowell CEDS for 2009-2013* includes a brief summary of current zoning and land development issues within each NMCOG community. While the character of the nine communities comprising the Greater Lowell area varies considerably through zoning, each municipality has designated specific areas of their community for business development. Table 60 below outlines the percentage of land area zoned for commercial and industrial use within each municipality.

Table 60: Land Area Zoned for Commercial and Industrial Uses by Community

Community	Land Zoned for Commercial Use		Land Zoned for Industrial Use	
	Acres	% of Land Area	Acres	% of Land Area
Billerica	402.53	2.39	3,240.62	19.24
Chelmsford	527.56	3.13	1,595.61	9.47
Dracut	760.32	4.51	689.95	4.10
Dunstable	356.09	2.11	0	0
Lowell	730.77	4.34	637.34	3.78
Pepperell	80.05	.048	428.89	2.55
Tewksbury	1,087.82	6.46	1,552.64	9.22
Tyngsborough	775.41	4.60	1,393.17	8.27
Westford	456.66	2.71	1,526.37	9.06

Source: NMCOG GIS Analysis

- **Billerica**

Billerica’s Zoning Bylaw contains four zoning districts which accommodate commercial and industrial development: General Business (GB), Neighborhood Business (NB), Commercial (CM) and Industrial (IND). The General Business and Commercial districts are principally found along the Route 3A corridor and allow for a mix of office and retail uses. The Neighborhood Business district is intended to accommodate small retail and service establishments and can be found in small pockets throughout town. The Industrial District is the largest business zoning district and is found along the Route 3 corridor, and along the southern portion of the Middlesex Turnpike, adjacent to the town’s border with Bedford and Burlington. The Town of Billerica has been designated as an Economic Target Area (ETA) under the state’s Economic Development Incentive Program (EDIP) and there are nine approved Economic Opportunity Areas (EOAs). The EDIP program allows the Town to offer real estate tax incentives on additional tax base growth in exchange for business investment and local employment. The nine EOAs include:

- North Billerica Park/former Raytheon missile plant;
- Concord Road Industrial Area;
- Middlesex Turnpike North;
- Middlesex Turnpike South;
- Treble Cove Road EOA including Republic, Sterling, and Esquire Roads, along with a portion of Treble Cove and Rangeway Roads;
- The North Billerica Mills EOA including the Talbot and Faulkner Mills;
- The Salem Road EOA including the former Purity/Kmart distribution warehouse; and
- Three single-user EOAs: Parexel International Corporation, EMD Serono and Nuvera Fuel Cells.

In addition, the Town has established a Priority Development Site (PDS) along the Middlesex Turnpike under the Chapter 43D. The PDS was created in conjunction with the expansion of EMD Serono and establishes procedures whereby local permit applications for any project proposed for the PDS site will be acted on within 180 days. The Town has been studying infrastructure barriers to new development along Route 3 and Middlesex Turnpike through a state-funded study. Additional development opportunities at the Route 3 exits and along Route 3A are also being reviewed.

There are several undeveloped parcels of land available within the town suitable for industrial and commercial development, including the 62-acre Sullivan Road parcel. In addition, there are several redevelopment opportunities, including the 500,000 square foot former Raytheon Plant located near the Lowell line.

- **Chelmsford**

With 3.1 % of the town's land area zoned for commercial uses, Chelmsford has a diverse commercial base comprised of retail, hotels, restaurants, financial services establishments, and service type businesses. Shopping center and strip mall development is prevalent along Route 110 between the Center Village and Route 3, and within the Drum Hill area. Office/R&D development occupies much of the land along Route 129 in the area of the Route 3 interchange. Smaller village style businesses are found in the Center Village and Vinal Square in North Chelmsford, while pockets of neighborhood-style retail are interspersed throughout the community.

Nearly 9.5 % of the town's land area is zoned for industrial uses. In 2008, approximately 546 acres, or 4.72% of the town's tax parcels contained industrial uses, which included utilities, manufacturing, research facilities, warehousing and wholesale establishments.

A buildout analysis was performed in 2008 by NMCOG staff as part of the town's master plan process. The analysis showed that the town is nearly built out with only 680.58 acres of developable land remaining, as shown in Table 61 on the following page.

Table 61: Undeveloped/Developable Parcels by Zoning Classification

Zoning Classification	Number of Parcels	Total Acreage
Limited Industrial (IA)	13	96.54
Special Industrial (IS)	3	83.07
Residential A (RA)	10	79.75
Residential B (RB)	46	397.74
Adult Entertainment (CX)	3	23.48
Total	75	680.58

Source: 2008 Chelmsford Build-out Analysis Update prepared by the Northern Middlesex Council of Governments

As shown above, there is no remaining developable land located in the commercial zoning districts. Therefore, any new commercial development will likely occur as a result of a redevelopment or infill projects. There is approximately 179 acres of undeveloped industrial land remaining. As part of the Master Plan process, NMCOG staff has worked with the Town to identify future industrial and commercial redevelopment opportunities and found that there are nearly 352 acres of land on 66 parcels that may hold potential as redevelopment sites for future commercial, industrial and mixed-use developments. Furthermore, under Chapter 43D, the town has moved forward in designating a town-owned brownfield property (the former site of the Silicon Transistor Corporation located at 77 Katrina Road) as a PDS. Town officials envision this area becoming a “premiere local retail district”. The Town has also benefited from the Lowell ETA and has established three single-user EOAs to date.

- **Dracut**

The Town of Dracut contains 766 acres of land zoned specifically for industrial and commercial uses. This represents approximately 8.6% of the town’s total land area. According to the McConnell Land Use data compiled in 2008, 262 acres of land are now used for commercial purposes, while 119 acres are industrial. Much of the town’s commercial and industrial development is located along Lakeview Avenue, Route 38, Route 110 and Route 113. The Town has established an ETA and EOAs have been designated at the Beaver Brook Mills and in the Navy Yard business area. Dracut has a significant amount of agricultural land remaining in active use, particularly in the eastern portion of town. Approximately, 1,247 acres of land are used as cropland and 182 acres are used as pasture. Agriculture is viewed as an important component of the local economy and the town has actively pursued preservation of these lands through the state’s Agricultural Preservation Restriction program.

- **Dunstable**

The Town of Dunstable is predominantly rural with very little commercial activity. Existing retail establishments principally serve the town’s residents or the neighborhood in which they are located. There are two areas zoned for business use: the B-1 district located in a small area off Main Street near the Town Center and the B-3 district on the town’s eastern border with Tyngsborough. The Town’s Master Plan recommends that the area along the Tyngsborough border be developed for future office or high technology-oriented businesses. The Master Plan also encourages additional retail and service development for economic development purposes and to meet the needs of local entrepreneurs.

The lack of municipal sewer and water service limits the types of development that could potentially locate within the community. Agriculture has historically been a vital part of the town's economy and agricultural preservation remains an important quality of life issue for the town's residents.

- **Lowell**

Approximately 18% of the City's land area is used for industrial and commercial purposes, according to a land use survey presented in the 2002 Master Plan for the City of Lowell. This land use pattern was largely established during the city's development as a major manufacturing center. The city's major waterways are lined with mill buildings, some of which remain in industrial use, but many have been converted to residential, institutional or commercial uses, and some remain vacant or underutilized. Lowell's commercial downtown is centered on Merrimack and Central Streets.

With more than 2.5 million square feet of first-class commercial, institutional and retail space, the City is a regional destination for business development. The City is focusing on remediating brownfields sites and has been designated as an EPA Brownfields Showcase Community. The City is also encouraging small-scale business ventures, and incubator space, and is working toward developing an emerging technologies ordinance to capitalize on business opportunities which spin off from research being conducted at UMass Lowell. The City was one of the first to establish an ETA and currently has eighteen (18) EOAs in operation.

Given the built-out, urban nature of Lowell, much of the City's future economic growth will depend on the redevelopment of blighted or underutilized properties. As discussed in other sections of this document, the Hamilton Canal District is a state-designated Priority Development site, while the adjacent Hamilton Crossings project has been designated as a PDS and a Chapter 40R Growth District. The Prince Spaghetti site has also been designated as a PDS. Construction was recently initiated on Phase I of the Hamilton Canal project and it is estimated that the project buildout will take ten years. This project will transform a blighted area of the City that has not seen any reinvestment in decades.

- **Pepperell**

Approximately, 508 acres, or 3% of Pepperell's land area, is zoned for commercial and industrial use. Pepperell's commercial area has largely developed along Main Street (Route 113), with some smaller areas of commercial activity located along Route 119 and Route 111. Lomar Industrial Park, an industrial subdivision comprised of industrial, service and office uses, is the major business complex within the community.

The town has created a Mixed Use Overlay District within the area surrounding Railroad Square in order to provide developer incentives for revitalization projects. In addition, the Town recently became part of the Ayer ETA and designated Lomar Industrial Park as its first EOA. Through the use of financial incentives under the EDIP program and the designation of the former Pepperell Paper Mill site as a PDS, the potential redevelopment of the site has been enhanced. A marketing study regarding the mill site and surrounding area was recently

completed. In addition, the town has hired a consultant to prepare a detailed Master Plan for the mill site, which is expected to be completed within the next few months.

- **Tewksbury**

Approximately 2,640 acres of land in the Town of Tewksbury are zoned for commercial and industrial uses. This represents over 15% of the town's land area. Except for a small, 8-acre area at the junction of River Road and Andover Streets, all of Tewksbury's commercially-zoned land lies in a classic strip formation along Main Street (Route 38). Industrial uses are located in the north and western sections of town where land zoned for heavy industry is accessible from I-495, and along East Street, not far from the Andover town line.

The Town of Tewksbury has established a Priority Development Site under Chapter 43D within the Lowell Junction development area. The redevelopment of this area is being planned in cooperation with the communities of Andover and Wilmington, and is focused on the construction of a new I-93 interchange, which will open up access to 700 acres of land that is currently landlocked. In addition, the town is working to create an Economic Target Area to help encourage the redevelopment of the former Raytheon site on Woburn Street.

- **Tyngsborough**

Most of the land zoned for business within Tyngsborough is located along the Westford Road and Middlesex Road corridors, west of the Merrimack River. There are four such zoning districts incorporated into the town's Zoning Bylaw. The B-1 zone (Neighborhood) provides for small neighborhood-oriented businesses and is found along the north side of Lakeview Avenue, at the east end of the Tyngsborough Bridge, and on the west side of Middlesex Road. The B-2 zone, which covers the Town Center, is intended for office and professional uses, but also allows retail uses of less than 5,000 square feet. The B-3 zone (General Shopping), provides for larger business areas along arterial roadways, and is principally located along Middlesex Road, north of the Town Center. The B-4 zone has been created to accommodate adult entertainment and is located along a remote area on Cummings Road.

In June 2006, the Northern Middlesex Council of Governments assisted the Town of Tyngsborough in completing the *Tyngsborough Economic Development Plan* which focused on five areas of the community: (1) the Middlesex Road corridor; (2) the Westford Road corridor (3) Pawtucket Boulevard; (4) Kendall Road; and (5) the Boston University/Sycamore Networks parcels. The total acreage of these areas (2,245 acres) represents about 20% of the town's land area. Over twenty-two percent (22%) of the land within these five areas is vacant (511 acres), according to the Tax Assessor data base. The Town's Economic Development Committee works to promote the community and to attract additional businesses. The Committee is working to address the town's need for additional sewer infrastructure, in order to accommodate the development of large parcels, such as the so-called Sycamore Networks parcel located between Middlesex Road and Westford Road.

As discussed in Part III, Section C (5)(d) of this document, the Town recently completed a Master Plan for the Town Center which envisions the creation of a mixed-use overlay zoning

district focused on the adaptive reuse of vacant municipal properties. The Town will issue an RFP for the redevelopment of these properties within the next two months, and hopes that the reuse of these buildings will serve as a catalyst for additional investment in the Town Center area and along other sections of the Middlesex Road corridor.

- **Westford**

The Town of Westford has zoned approximately 1,983 acres of land for commercial and industrial use, representing 11.7% of the town's land area. Commercial development is located along the Route 110 corridor and within the town's villages. The two largest industrial districts are located along Route 110 and Route 40 near Route 3. The town has created a mill reuse overlay district to encourage the redevelopment of four mill complexes located along Stony Brook.

As a matter of policy, Westford has designated the Route 110 corridor as the town's business corridor. The town is currently working with the Executive Office of Housing and Economic Development (EOHED) and the Town of Littleton to brand Route 110 as an "Information Technology Corridor". There are two large development projects along Route 110 that have been permitted by the Town, but are not yet constructed: Westford Technology Park West (725,000 square feet office/R&D) and Cornerstone Square (226,000 square feet high-end retail). Federal stimulus funds were recently utilized to construct traffic improvements along a section of Route 110 adjacent to the Westford Technology Park West in order to stimulate further economic investment.

5. Partners and Resources for Economic Development

The implementation of the CEDS will depend to a large extent on the partnerships developed by economic development stakeholders and willingness of federal and state partners to come to the table. The Greater Lowell region has an extensive history in building successful public/private partnerships. Over the past twenty years, the City of Lowell and the state and federal governments have led the way in making the city and its suburban neighbors, a destination for visitors and tourists interested in exploring and appreciating the area's rich past and present.

In many cases, Federal and state dollars have been combined with private, non-profit and local funds to yield very positive results for the region. Residents from surrounding communities and from outside the region come to Lowell to visit its museums and the Lowell National Historical Park, to attend a concert at the Tsongas Arena, participate in the national Folk Festival, attend a Lowell Spinners Single A baseball game at LeLacheur Park, or dine at a Greek or Cambodian restaurant in the Acre. Federal and State funds have been combined with private, non-profit and local funds to finance many of these activities, events and facilities.

While public/private partnerships are not as extensive in the suburban communities as in the City, there have been and continue to be a number of significant initiatives and accomplishments. The Town of Chelmsford, for example, was ranked 21st in *Money Magazine's* Top 100 Best Places to Live (2007), and ranked 20th in the Commonwealth by the Massachusetts High Technology Council's (MHTC) Fast Track program. In 2009, five of the region's nine

communities were awarded “BioReady” status by MHTC: Platinum status in Lowell; Gold status in Billerica and Tewksbury; Silver status in Chelmsford, and Bronze status in Dracut. These communities were assessed according to several criteria, including the presence of Biotech-zoned science parks, having a streamlined permitting process in place, having sufficient infrastructure capacity available, and the presence of pre-permitted biotech sites.

The following identifies the major economic development stakeholders at the regional, and local, federal and state levels that will play a role in implementing the *2009-2014 Greater Lowell Comprehensive Economic Development Strategy*. To a large extent, the implementation of the CEDS will build upon long established relationships between regional economic development stakeholders and their financial and programmatic partners at the federal and state levels. The private sector will also play a major role in creating jobs and bringing economic investment to the region. Additional economic development stakeholders will be encouraged to participate in the process as new groups and initiatives are formed.

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 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 1960s and is currently overseeing the CEDS planning process through the Greater Lowell CEDS Committee.

Billerica Community Alliance

The Billerica Community Alliance was formed through the merger of the Billerica Plan and the Billerica Chamber of Commerce. The Alliance is a 501(C)(3) non-profit organization, and is the only business organization that focuses solely on Billerica. The core objectives of the Alliance are to: promote conditions to assist growth and development of local businesses; enhance quality of life for all Billerica citizens; be a catalyst for community involvement; fund activities to foster education and improve the community; promote public and private cooperation; and enhance the image of Billerica.

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, technical assistance and micro-loan programs.

Cambodian Mutual Assistance Association

The Cambodian Mutual Assistance Association (CMAA) was formed in 1984 to serve the Cambodian community that had recently immigrated to the City of 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 Asians to improve their language, job and social skills, while maintaining their homeland traditions. One of the most notable programs, from an economic development perspective, is the *Building Community, Building Career* program. This initiative trains high school or GED graduates for the construction or construction-related fields. Several current large construction projects underway in the City of Lowell have created a demand for skilled construction tradesmen, including laborers, painters, carpenters and bricklayers. CMMA's union apprentice training results in a 2-4 year training cycle, depending on the craft. This initiative will assure a steady supply of skilled workers as demand for skilled tradesmen increases with the economic recovery.

Chelmsford Business Association

The Chelmsford Business Association (CBA) was established in 1990 to address the concerns of local businesses located within Chelmsford, and today there are approximately 300 members of the CBA. The CBA advocates for fair taxes for local businesses, supports civic events, and promotes the revitalization of the Village Center. CBA is guided by three primary goals: 1) promotion of the services, skills and contributions that the Association provides to the residents, and other businesses and professionals within the Town of Chelmsford; 2) mediation between the local business community and public officials; and 3) regulatory monitoring, including town government regulations, rules and actions.

Community Teamwork, Inc.

Community Teamwork, Inc. (CTI) serves as the Community Action Agency for the Greater Lowell area and targets its programs to low-income residents of the region. Through a broad array of services, CTI's mission is to reduce and eliminate poverty in the region by encouraging low-income people to become self-sufficient. Table 62 on the following page summarizes the programs offered by CTI. The agency is organized within five (5) general program categories: Child & Family Services, Housing & Homelessness Services, Energy & Property Management, Community Resources, and Workforce Development.

Table 62: Services Offered by Community Teamwork, Incorporated (CTI)

Division	Programs
Child & Family Services	Head Start, Early Head Start, Family Child Care, Center-Based Child Care, After School Care, Spindle City Corps, Citizen Schools, WIC
Housing & Homelessness Services	Section 8 Housing Assistance, Family Shelters, Housing Consumer Education Center, Scattered Site Transitional Housing, Housing Assistance Program, SHIFT Coalition
Energy & Property Management	Fuel Assistance, Heating System Repair and Replacement, Weatherization, Housing for the Elderly and Disabled, Property Management
Community Resources	Child Care Search, Family Foundation Network Community Partnerships for Children, Senior Volunteer Programs, New Entry Sustainable Farming Program, Lowell Farmers' Market
Workforce Development	YouthBuild, Service Integration, Pathways to Advancement to Training in Healthcare Initiative

Source: CTI Strategic Plan, 2009-2011

Coalition for a Better Acre

The Coalition for a Better Acre (CBA) was established as a non-profit community development corporation through 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 also serves as a Community Housing Development Organization (CHDO) and a Community Development Financial Institution (CDFI). Over a quarter century after CBA's first acquisition of a derelict tenement, CBA is now a professionally-staffed and has a portfolio of nearly four hundred (400) rental apartments and thirty-three (33) retail and light industrial spaces. In addition to CBA's real estate development activities, the organization's Home Ownership program has helped two hundred-twenty (220) low-income families purchase homes since 1999. CBA, in partnership with Community Teamwork, Inc., also created the Home Preservation Center, which has provided support to over four hundred-fifty (450) homeowners facing foreclosure over the past two years.

Greater Lowell Chamber of Commerce

The Greater Lowell Chamber of Commerce is a regional organization of over eight hundred-fifty (850) members and serves the communities of Billerica, Dracut, Lowell, Chelmsford, Tewksbury, Tyngsborough, and Westford. The mission of the Chamber is to provide a unified voice in shaping the future of the region's business community and to provide a vehicle through which individuals can work to improve the area's business climate and quality of life. The Chamber works to create a healthy and competitive environment where businesses can grow and prosper. One of the most important roles of the Chamber is to serve as a vehicle for bringing members of the business community together in a collaborative fashion, which allows individual businesses to be sustained and to grow. In addition to advocating for regional business members, the Chamber also hosts and sponsors a variety of social networking and community service events.

Greater Lowell Workforce Investment Board

The Greater Lowell Workforce Investment Board (GLWIB) is a collaborative involving employers, educational institutions, labor groups, municipal and state officials, and community-based organizations, and provides leadership, policy direction, and accountability for the local workforce development system. By securing and allocating public and private funds for high quality, innovative, and collaborative workforce development programs, the GLWIB promotes a skilled and educated workforce, meets the workforce needs of employers, and supports and sustains economic development, business competitiveness, and job creation in Greater Lowell.

GLWIB provides policy guidance for workforce development issues in the Northern Middlesex Service Delivery area, which includes the communities of Billerica, Chelmsford, Dracut, Dunstable, Lowell, Tewksbury, Tyngsborough, and Westford. The GLWIB oversees the One-Stop system and addresses the responsibilities outlined in the Workforce Investment Act of 1998.

In its *2009-2014 Strategic Plan*, the GLWIB articulated three strategic goals and objectives for the next five years: 1) promote a highly skilled and trained workforce capable of earning a sustaining wage, while ensuring access for all individuals and families to opportunities for ongoing employment services and workforce development; 2) meet the workforce needs of current and future employers, thereby increasing the region's economic competitiveness; and 3) enhance the organizational effectiveness and capacity of the GLWIB to provide leadership in the region, engage key stakeholders, and sustain an effective workforce development system.

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, as well as the City's Master Plan. DPD is also heavily involved in housing issues, and reviews any development proposal that comes before the City of Lowell for approval.

Lowell National Historical Park

The Lowell National Historical Park is a unit of the National Park Service charged with preserving and interpreting the history of the 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 about the Industrial Revolution in Lowell. The tourists visiting the Park also contribute to the region's economy.

Lowell Plan, Inc. and Lowell Development & Finance Corporation

The Lowell Plan, Inc., which was established in 1979, is a non-profit 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. Since 1979, the Lowell Plan has raised and invested more than \$7 million 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) non-profit 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. Additionally, the LDFC provides several low-interest, community-centered loan options, including:

- **Economic Development Assistance Fund** (Section 108 Loan Program), which provides up to \$1,000,000 (or up to 25% of total project cost, whichever is less) to assist for-profit businesses seeking to locate, expand, or remain in business in Lowell;
- **Industrial Improvement Loans**, which provide up to \$250,000 (or 25% of total project costs) for the acquisition, construction, or renovation of commercial, industrial, and office facilities containing at least 10,000 square feet;
- **Neighborhood Improvement Loans**, which provides up to \$50,000 (or 30% of the appraised value of the project upon completion, whichever is less) for the acquisition, construction, restoration, and/or renovation of commercial property that may also have a residential component;
- **Homebuyer Incentive Program (HIP)**, which provides eligible employees of Lowell General Hospital, UMass Lowell, Middlesex Community College, Saints Medical Center, and Community Teamwork, Inc, who are first time home buyers and whose household incomes do not exceed \$125,000 per year, three funding options:
 - **Down Payment Loan:** A no interest, deferred loan for up to 2.5% of the purchase price, or ½ of the required down payment. The loan is capped at \$5,000 and the start of repayment is deferred for three years.
 - **Closing Cost Grant:** A grant for \$500 toward closing costs.
 - **Rehab Grant:** A matching grant (up to \$5,000) for approved exterior home improvements of a newly purchased home.
- **Down Payment Assistance Program**, which provides up to \$5,000 in down payment assistance to participants of the Merrimack Valley Housing Partnership's Project

Genesis program. There are income eligibility criteria which must be met to qualify for this program;

- **Downtown Venture Fund**, which provides up to \$200,000 to qualified retail and restaurant establishments located or wishing to locate in the Downtown Lowell area, to be used for design work, construction, equipment purchases, inventory, and working capital;
- **Foreclosure Prevention Assistance Program**, which provides up to \$10,000 toward closing costs, pre-payment penalties, and equity to assist borrowers who have received housing mortgages from predatory lenders and encourage the use of local LDFC member banks to provide refinancing support. There are income eligibility criteria which must be met to qualify for this program; and,
- **Lowell National Historical Park Preservation Loan Program**, which provides up to \$200,000 (but no more than 50% of total rehabilitation costs) for preservation, restoration, and redevelopment activities on properties located within the downtown National Historical Park district. The Preservation Loan must be at least matched by an equal amount of private funding for other qualifying historic or non-historic rehabilitation work.

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's fixed route bus service offers eighteen (18) routes to 321,187 residents in the City of Lowell and the Towns of Billerica, Chelmsford, Dracut, Tewksbury, Tyngsborough, and Westford. The LRTA also provides bus service to Acton, Groton, Maynard, and Townsend and has routes that connect with Andover, Bedford, Burlington and Wilmington. The LRTA provides paratransit services for the elderly and handicapped and has entered into contracts with the region's Councils on Aging to provide door-to-door transportation services.

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.

Merrimack Valley Economic Development Council

The Merrimack Valley Economic Development Council (MVEDC) is a private, non-profit, tax-exempt charitable organization, created in August 1999 to promote the interests of the entire Merrimack Valley region. The mission of the Council is to encourage greater communication between the public and private sectors and foster collaborative efforts between and among communities, leading to sustainable economic growth and prosperity for all. By bringing together leaders in the public and private sectors from communities across the region, the Council provides a valuable forum for sharing information, developing joint strategies to address specific challenges, and ensuring that the interests of the entire Merrimack Valley are advanced.

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 Project Genesis, which is a comprehensive series of training seminars for first-time home buyers within the Greater Lowell area. Between 2005 and 2009, 2,238 first-time home buyers completed the Project Genesis Program, with approximately 78.1% of participants purchasing homes in the City of Lowell. MVHP also works with the City of Lowell and the Lowell Development and Financial Corporation to provide up to \$5,000 in down payment assistance for first-time home buyers.

Middlesex Community College

Established in 1970, Middlesex Community College (MCC) has a campus in the heart of downtown Lowell, as well as a suburban campus in Bedford. MCC has played a major role in the revitalization of the downtown district by attracting students to retail establishments and restaurants in the area. MCC offers forty seven (47) associate degree and twenty (20) certificate 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. Highly engaged in community activities, Middlesex Community College was selected by Campus Compact as one of only thirteen (13) colleges in the nation to be studied as a model of exemplary practices of civic engagement. The commitment of the college community to community service has resulted in hundreds of Middlesex students volunteering thousands of hours to community projects, carefully designed to help bridge the gap between classroom learning and real-world applications. An article in the New England Board of Higher Education’s Connections magazine named MCC one of 25 academic institutions that are “exemplary examples of community revitalization and cultural renewal, economic drivers of the local economy, and advocates of community service”.

Tewksbury Economic Development Committee

The Tewksbury Economic Development Committee was formed in 2007 and is comprised of eleven (11) members. The Committee is charged with promoting Tewksbury’s identity in the

Merrimack Valley and Greater Boston area, serving as a liaison between businesses and government to facilitate streamlined review processes and assistance programs, while implementing the recommendations and goals established in the Town's Master Plan.

Tyngsborough Economic Development Committee

The Tyngsborough Economic Development Committee is dedicated to retaining businesses currently operating within Tyngsborough, and to actively pursuing suitable new business opportunities which are consistent with the town's Master Plan and Economic Development Plan. The Committee is comprised of a five member Board, including a member of the Board of Selectmen, and actively markets the town to interested companies and business enterprises. The Committee also works with town boards and committees to address land use, permitting and infrastructure issues that may be an impediment to future economic development initiatives.

University of Massachusetts Lowell

Originally founded in 1894, the University of Massachusetts at Lowell (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's, bachelor's and graduate level degrees, as well as certificate programs in specialized technical and professional areas. UMass Lowell is a leader in emerging technology sectors, including plastics/polymer engineering, environmental remediation and safety engineering, and nanotechnology. During the summer of 2009, UMass Lowell purchased the DoubleTree Hotel, located in downtown Lowell, in order to turn it into student housing and event/conference space. This redevelopment is expected to increase commercial and retail activity in the downtown. In addition, the University recently broke ground on a new Emerging Technologies Center located on its North Campus.

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 (CEDS) "grass-roots" planning process. EDA is focused on creating an 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 possible projects for public works grants and trade adjustment assistance in order to make a difference in a regional economy. The Region I EDA Office is located in Philadelphia. Additional information on EDA may be found by going to www.eda.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. 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 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. 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, 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 Transportation

The U.S. Department of Transportation (DOT) was established in 1966. 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. Environmental Protection Agency

The U.S. Environmental Protection Agency (EPA) began operation on December 3, 1970. The mission of EPA is “to protect human health and to safeguard the natural environment--- air, water and land--- upon which life depends”. To accomplish this mission, EPA develops and enforces regulations, provides grants, studies environmental issues, sponsors partnerships, teaches people about the environment and publishes information on its activities. Specific grant programs administered by EPA include the brownfields, environmental justice, community action for a renewed environment (CARE), pollution prevention, Science to Achieve Results (STAR), Small Business Innovation Research (SBIR) and water grant programs. Additional information on EPA may be found by going to www.epa.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 1980 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 in selling their products and services 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.

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.

State Partners and Resources

Massachusetts Executive Office of Housing and Economic Development

The mission of the Executive Office of Housing and Economic Development (EOHED) is to create homes and jobs in the Commonwealth by aligning the state's housing and economic development agencies to better coordinate policies and programs and ensure that Massachusetts will maintain its global competitive edge. EOHED works to enhance the state's economic position by attracting new businesses, retaining existing businesses and increasing housing stock so that Massachusetts remains an affordable place to live.

When Governor Patrick took office in 2007, he announced the creation of the Development Cabinet – an executive level entity that coordinates the administration's work in housing, economic development, labor, workforce development, transportation, construction, environment affairs, energy, and finance. By ensuring that inter-secretariat collaboration occurs on economic development projects, the state is better able to identify and promote business development, job growth and infrastructure projects. The Department of Housing and Community Development, the Department of Business Development, and the Office of Consumer Affairs and Business Regulations fall under the EOHED Secretariat.

Massachusetts Department of Business Development

As one of the three under-secretariats within the Executive Office of Housing and Economic Development, the Massachusetts Department of Business Development (DBD) assists companies to create and retain jobs, and promotes private investment in the Commonwealth. DBD facilitates simplified, timely access to a host of governmental and non-governmental resources and incentive programs that help businesses grow faster and stronger in Massachusetts. The provides services through nine regional offices across the Commonwealth, helping companies navigate and access the technical, human, financial, training, educational, and site finding resources necessary to expand or locate in Massachusetts.

DBD collaborates with the Business Resource Team (BRT), a partnership of public and private agencies and organizations committed to supporting businesses in Massachusetts. The BRT provides the necessary resources and information to help businesses grow and thrive within the Commonwealth. DBD also helps companies obtain training grants. This often includes getting the Applicant Assistance Group from Commonwealth Corporation. The state matches the in-kind private investment made by the company to train employees. In addition, DBD works with MassEcon and the state's municipalities to find sites for companies that want to locate, relocate or expand a facility.

Massachusetts Permit Regulatory Office

The Massachusetts Permit Regulatory Office (MPRO) was established in 2006 to work with new and existing businesses to help foster job creation efforts by assisting with permitting, licensing, and regulatory processes. The Director of the Office serves as the state permitting ombudsman to municipalities and businesses, and Chair of the Interagency Permitting Board (IPB), which administers the Chapter 43D Expedited Permitting Program. The Office works in partnership with MassDevelopment, the Regional Planning Agencies, and MassEcon to accomplish its core mission, which is:

1. To provide direct assistance to proponents of development projects with respect to state and local permitting, licensing and regulatory matters;
2. To work with municipalities on efforts to streamline local permitting processes through the Chapter 43D Expedited Permitting Program and other means; and
3. To work with state regulatory agencies on efforts to streamline state permitting processes.

Interagency Permitting Board

The Interagency Permitting Board (IPB) was created by *Chapter 205 of the Acts of 2006*. The State Permit Ombudsman serves as Chair of the Board, which is charged with administering the Chapter 43D Expedited Permitting Program and expedited projects on those sites, working with the Massachusetts Office of Business Development (MOBD) and regional planning agencies to better serve local businesses, evaluating state permit processes and recommending changes for improved efficiency; and working with municipalities to facilitate communication with state agencies.

Massachusetts Department of Labor

The Massachusetts Department of Labor (DOL), the first such office of its kind in the United States, assists workers through an array of programs and services. These include workers' compensation, public employee collective bargaining and minimum wage laws, labor relations assistance through state mediation and arbitration, occupational injury and illness statistics, providing a vehicle for the public to report suspected cases of workplace fraud and more. Staffed by professional arbitrators, mediators, judges, hearing officers, safety experts, investigators and administrators, the DOL resolves hundreds of cases and disputes each year.

The Department of Labor consists of the following agencies:

- Department of Industrial Accidents (DIA) administers the Commonwealth's workers' compensation system, providing compensation to workers who are injured on the job.
- Division of Occupational Safety (DOS) administers several workplace safety and health programs, interprets minimum and prevailing wage regulations, and licenses employment agencies. Through its 7c-1 consultation program, DOS also works with employers at no cost to them to help them comply with federal health and safety standards.

- The Division of Labor Relations (DLR), formed in 2007, is the result of legislation to increase efficiency and accountability among the labor relations agencies. DLR encompasses the former Labor Relations Commission, Board of Conciliation and Arbitration as well as the Joint Labor-Management Committee. The DLR enforces the Commonwealth's labor laws, administers the collective bargaining law for public and private employees in Massachusetts and ensures the swift and fair resolution of labor disputes, in part by offering dispute resolution services to parties to bring about settlement.
- The Joint Labor-Management Committee (JLMC), while falling organizationally within the DLR, retains its unique structure as a forum to resolve disputes between municipal managers and police officers and firefighters and address common concerns. Led by police and fire organization officials, municipal managers and neutral representatives of the public, the JLMC encourages amicable labor-management relations.

Massachusetts Department of Transitional Assistance

The Massachusetts Department of Transitional Assistance (DTA) provides individuals and families with food assistance, job assistance, and cash assistance. DTA administers benefits such as the Supplemental Nutrition Assistance Program/SNAP (formerly the Food Stamp Program), Transitional Aid to Families with Dependent Children (TAFDC), and Emergency Aid to the Elderly, Disabled and Children (EAEDC). Because DTA emphasizes transitional assistance, recipients are encouraged to participate in education, training and job search activities to assist in obtaining employment.

Massachusetts Office of International Trade & Investment

The Massachusetts Office of International Trade & Investment (MOITI) works to expand the Massachusetts economy by marketing the state's business internationally, through focused export promotion, attracting foreign companies to invest in Massachusetts and handling protocol as it relates to trade and investment. The two agencies primarily responsible for international trade development in the state are MOITI and its sister agency, the Massachusetts Export Center.

Since 1983, the functions and operations of MOITI have been performed under contract by the Massachusetts International Trade Council, Inc. (MITCI). Incorporated in 1979, MITCI is a not-for-profit corporation organized to enhance the global competitiveness of Massachusetts. Its mission is: "to assist the Commonwealth of Massachusetts to create new employment opportunities within the Commonwealth by conducting research and disseminating and providing information to foreign business, interested observers and the general public".

State Office of Minority and Women Business Assistance

The State Office of Minority and Women Business Assistance (SOMWBA) is an agency within the Executive Office of Housing and Economic Development which promotes the development of certified minority business enterprises (MBE), women-owned (WBE) business enterprises, and minority non-profit (M/NPO) and women (W/NPO) non-profit organizations. It does this by

facilitating their participation in Massachusetts business and economic development opportunities. Specifically, SOMWBA offers services in certification, enforcement, business assistance and advocacy.

SOMWBA promotes the participation of certified businesses in public and private purchasing and contracting programs. SOMWBA also assists with new legislative and policy proposals that facilitate the involvement of minorities and women in the mainstream of the economy. SOMWBA provides a resource and referral service for certified firms with information about federal, state, municipal and private sector procurement opportunities, bidding and contracting, financial resources, business assistance agencies and organizations, business membership and networking organizations. The agency also posts directories of its certified firms.

Massachusetts Office of Small Business & Entrepreneurship

Small businesses represent 85% of all Massachusetts companies and employ over a quarter of the workforce. A “small” business generally means a privately held enterprise with up to 19 employees, or a sole proprietorship. Massachusetts entrepreneurs are the creators, risk takers, inventors, and leaders of the economy. The Massachusetts Office of Small Business & Entrepreneurship (MOSBE) works with the Commonwealth's many providers of technical assistance and financing, and work directly with small businesses to foster a positive business environment in which small businesses can grow and prosper.

MassDevelopment

Both a lender and developer, MassDevelopment was created in 1998 when the Massachusetts State Legislature enacted M.G.L. Chapter 23G and merged the Massachusetts Government Land Bank with the Massachusetts Industrial Finance Agency. MassDevelopment is the state's finance and development authority and works with businesses, nonprofits, and local, state, and federal officials and agencies to strengthen the Massachusetts economy by creating jobs, increasing the number of housing units, eliminating blight, and addressing the overarching challenges that limit economic growth, such as transportation, energy, and other infrastructure deficiencies.

Offering a wide range of finance programs and real estate development services, MassDevelopment supports economic growth, development, and investment across all sectors of the Massachusetts economy: public and private; commercial, industrial, and residential; and nonprofit, including educational, cultural, and human service providers. From FY2004 through FY2008, MassDevelopment financed or managed more than 900 projects in 190 communities statewide, representing an investment of more than \$9.4 billion in Massachusetts. These projects supported the creation of 10,045 housing units and more than 45,000 permanent and construction-related jobs.

Community Economic Development Assistance Corporation

In 1978, the Commonwealth of Massachusetts created the Community Economic Development Assistance Corporation (CEDAC) to serve as a vital resource for organizations engaged in

community economic development. CEDAC is a public-private, community development finance institution that provides technical assistance, pre-development lending, and consulting services to non-profit organizations involved in housing development, workforce development, neighborhood economic development, and capital improvements to child care facilities. These organizations may include community or neighborhood development corporations, non-profit developers, and tenants' associations.

CEDAC has worked with its partner agencies at the state level - the Department of Housing and Community Development, MassHousing, the Massachusetts Housing Partnership, and MassDevelopment - to focus resources in support of the non-profit development agenda as an important element of Massachusetts' system for the production of affordable housing. CEDAC is also active in national housing preservation policy research and development and is widely recognized as a leader in the non-profit community development industry.

Commonwealth Corporation

The mission of the Commonwealth Corporation is to build upward mobility pathways for Massachusetts youth and adults to prepare for high demand careers, in concert with state and regional partners. Commonwealth Corporation's approach to education and workforce development is strategically focused, outcome based, and results driven. The Corporation strives to accomplish its mission by understanding and addressing employer needs for a twenty-first century workforce, and individual needs for stronger skills and better jobs. The Commonwealth Corporation fosters a workplace culture that values each employee's unique contribution to the analysis of problems and crafting unique solutions. Commonwealth Corporation assists its partners by:

- identifying critical needs through research and evaluation;
- delivering effective solutions through demonstration projects; and
- sharing promising practices through documentation.

The Commonwealth Corporation team is comprised of educators, facilitators, researchers, youth development experts, career counselors, and industry specialists who work together to solve workforce challenges.

Massachusetts Department of Transportation

The Massachusetts Department of Transportation (MassDOT) represents a recent merger of the Executive Office of Transportation and Public Works (EOT) and its divisions with the Massachusetts Turnpike Authority (MTA), the Massachusetts Highway Department (MHD), the Registry of Motor Vehicles (RMV), the Massachusetts Aeronautics Commission (MAC), and the Tobin Bridge, currently owned and operated by the Massachusetts Port Authority (MPA). In addition, the Massachusetts Bay Transportation Authority (MBTA) and Regional Transit Authorities (RTA) are subject to oversight by the new organization. The new organization has also assumed responsibility for many of the bridges and parkways currently operated by the Department of Conservation and Recreation (DCR).

MassDOT includes four Divisions: Highway, Transit, Aeronautics, and Registry of Motor Vehicles. The Highway Division includes the roadways, bridges, and tunnels of the former Massachusetts Highway Department. The Division's responsibilities also include many bridges and parkways previously under the authority of the Department of Conservation and Recreation. The Highway Division is responsible for the design, construction and maintenance of the Commonwealth's state highways and bridges. The Division is responsible for overseeing traffic safety and engineering activities including the Highway Operations Control Center to ensure safe road and travel conditions. The Transit Division is responsible for all transit initiatives and oversees the Massachusetts Bay Transportation Authority (MBTA) and all Regional Transit Authorities of the Commonwealth.

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. DHCD's mission is to strengthen cities, towns and neighborhoods to enhance the quality of life of Massachusetts residents. DHCD provides leadership, professional assistance and financial resources to promote safe, decent affordable housing opportunities, economic vitality of communities and sound municipal management. 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 Commonwealth Capital program established to encourage sustainability and smart growth in the local communities.

Massachusetts Executive Office of Energy and Environmental Affairs

The Massachusetts Executive Office of Energy and Environmental Affairs (EOEEA) is the Secretariat responsible for environmental and energy programs in the Commonwealth. The major agencies within EOEEA 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, and the Department of Energy Resources.

MassEcon

In 1993, recognizing the need for a private-public partnership to promote Massachusetts as a place to do business, a consortium of the state's utility and telecommunications companies, real estate associations, public sector partners, and the Massachusetts Office of Business Development, founded the Massachusetts Alliance for Economic Development (MassEcon). MassEcon's statewide Site Finder Service is an economic development resource for companies seeking a Massachusetts location within which to expand or relocate. MassEcon works cooperatively with real estate brokers, site location consultants, and state, regional, and local economic development officials to enable companies and their exclusive agents to access property information that matches their real estate needs. The service covers all regions of the state and serves a broad range of industry sectors.

The organization's Research and Information Service assists companies in conducting research about Massachusetts during the site selection process. Companies can use the service to answer questions about demographics, incentives, workforce, education, industry sectors, or related matters that are relevant to the location or expansion of their business. The service is particularly useful when companies are comparing Massachusetts to other states. Not only data-based, the service also helps link companies with the people and resources on the state, regional, and local levels. MassEcon also holds many events throughout the year to increase the economic development knowledge of its staff, members, public officials, and the business community at large.

6. Future Economic Strategies

The participants at the SWOT sessions offered their suggestions on future economic strategies by identifying more than ten (10) areas for consideration. These Economic Strategies can be categorized into six (6) different groups: **workforce, marketing, infrastructure, housing, quality of life and capacity building.**

Workforce was recognized as a critical component to the future economic growth in the Greater Lowell region. One suggestion was to focus on creating ladders, especially in emerging technologies. The need to increase opportunities for entry level positions for youth and young adults was also recognized. Certificate programs for entry and mid-level employees, perhaps through Middlesex Community College, were recommended. The impact of new technologies on work and education through online courses and working remotely should be understood.

Marketing and “branding” the Merrimack Valley was considered to be an important component in attracting industry. The region should be highlighted through mechanisms, such as the Biotech Awards, that ranked communities on their preparedness in meeting the needs of expanding businesses. The Greater Lowell region could learn from other growing areas of the country on the “best practices” to attract private investment. There is a need for enhanced visibility and communication of businesses and services in the region.

Infrastructure investment is necessary to retain and attract new businesses. The CEDS Committee should promote economic development at highway interchanges, such as at Commerce Way, Lowell Junction and Route 3. Funding for bridge repairs and replacement need to be a priority so that they improve connectivity in the region instead of creating a physical barrier. Inter-state collaborations need to be pursued, such as in the case of expanding the rail line to Nashua, New Hampshire. This bi-state effort will result in increased access from Route 3 in Tyngsborough, the establishment of the Vinal Square commuter station adjacent to the mill reuse overlay district in Chelmsford and connection with the UMass south campus to increase student accessibility. The gateways to communities need to be focused upon and strengthened as principal economic and transportation corridors.

Housing options are a critical element to expanding or re-locating businesses. Without available housing options for supervisory personnel and workers, companies have difficulty attracting the quality workforce they need. Affordable housing is a key to economic growth and an enhancement to the quality of life in the region. The combination of market-rate housing and

affordable units is required to address the housing needs of the current and future workforce. Each community in the region needs to address their own housing needs, while addressing the 10% affordable housing goal established by Chapter 40B. There needs to be an aggressive financing component in order to facilitate the construction of affordable housing and the mortgage components for the eligible homeowners.

Quality of life issues were part of the focus of Future Economic Strategies in order to maintain an appropriate balance with economic growth initiatives. The preservation of open and recreational space to maintain the “suburban feel” of towns was considered to be quite important. The effective and efficient use of the Community Preservation Act was cited as a means to address affordable housing, open space and historic preservation issues that preserve the quality of life in the region. The utilization of design guidelines in Tewksbury Center, for instance, provides a means to maintain the character of the community, while encouraging mixed-use development. Various rezoning tools that promote growth while maintaining a high quality of life can be employed by local communities.

Capacity building was considered to be one of the more critical elements of Future Economic Strategies. The region has to address the lack of technical expertise in some communities so that they have the necessary information and can be organized. Instead of being reactive, the region needs to be proactive in addressing its economic needs. There needs to be a process for economic development consensus building within each community so there is an understanding of what should be encouraged and discouraged in terms of what fits with the character of the community. The utilization of the CEDS planning process can be an appropriate means to develop an effective strategy for job creation. The Greater Lowell region should be eligible for EDA funding through its designation as an Economic Development District (EDD).

Part II: Vision Statement, Goals and Objectives

In building upon the *Greater Lowell Comprehensive Economic Development Strategy (CEDS) for 2004-2008*, the updated Vision Statement and Goals reflect the advances that have been made during the past five years, as well as the changing economic conditions facing the Greater Lowell region, the Commonwealth of Massachusetts and the nation as a whole. These Goals are attained largely through the implementation of the CEDS Priority Projects, as well as the ongoing work of the economic development stakeholders in the Greater Lowell region. It is important to balance economic growth with the maintenance of the quality of life that's important to our residents, businesses and visitors. The emphasis upon the area's history is reflected in the region's re-use of former mill buildings, such as the Hamilton Canal and Hamilton Crossing projects, as well as its attention to the Merrimack and Concord Rivers and the extensive canal system in Lowell. 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. Building upon the Greater Lowell region's past will ensure a successful future.

A. Vision Statement

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

- the creation of high skill, well-paying jobs for a racially, ethnically and economically diverse workforce;
- an integrated economic development, workforce development and education system that prepares students and workers for current and future jobs;
- affordable and market-rate housing to shelter the regional employment base;
- an effective and efficient transportation system and an upgraded infrastructure to support the expansion needs of businesses and homeowners;
- private investment matched by public and non-profit funding sources designed to grow the economy; and
- the maintenance of the quality of life in the region.

B. Priority Areas to be Addressed

Based upon the input from the two SWOT sessions and the experience gained from working with EDA for the past five years, the priority areas to be addressed fell within eight distinct areas: economic development, workforce development, education, affordable and market-rate housing, regional transportation system, infrastructure, financial investments and quality of life. These eight areas vary slightly from the ten areas focused upon in 2004. For instance, instead of focusing exclusively upon affordable housing as in 2004, the SWOT participants felt there needed to be a balance between affordable and market-rate housing to provide housing options for the current and future workforce. These priority areas provide the foundation for the development of the Goals and Objectives in Section C of this CEDS document. Listed below are the eight priority areas and the specific ideas outlined:

Economic Development

- Utilize economic development tools, such as the Renewal Community and Economic Development District designations, to attract businesses to the region;
- Focus on opportunities in the “green”, biotechnology and nanotechnology industries.
- Build upon the region’s competitive advantage in the high technology and health care sectors;
- Support entrepreneurship opportunities;
- Increase economic development initiatives related to the cultural and creative economy;
- Redevelop idle property in city and town centers for commercial and mixed-uses;
- Focus on the manufacturing base as a means to maintain high paying jobs;
- Address the cost of doing business in the Greater Lowell region;
- Attract businesses that will provide higher-skill, higher wage jobs; and
- Market the Greater Lowell region to attract greater private investment.

Workforce Development

- Focus on creating career ladders, especially in emerging industries;
- Understand the impact of new technologies, such as online courses and working remotely, on work and education;
- Build upon the competitive advantage of the Greater Lowell workforce by attracting high technology industries;
- Utilize the resources of the Greater Lowell Workforce Investment Board, UMass Lowell and Middlesex Community College to educate the region’s workforce to meet the skill needs of industry; and
- Identify funding sources at the federal and state levels that will support the workforce development initiatives in the Greater Lowell region.

Education

- Improve the quality of schools in the region;
- Establish partnerships between higher education and the primary and secondary school systems;
- Attract emerging industries by linking them to university research centers;
- Build upon the strengths of UMass Lowell and Middlesex Community College to educate students and workers in the region; and
- Establish learning as a lifelong process.

Affordable and Market-Rate Housing

- Increase the supply of rental housing in the suburban communities;
- Address the housing needs of expanding businesses by developing a balance of affordable and market-rate housing;
- Meet the housing needs of individual communities and address the requirements of Chapter 40B;
- Encourage mixed-use developments in the town centers; and
- Collaborate on the foreclosure and housing vacancy issues to ensure that neighborhoods are not impacted.

Regional Transportation System

- Improve the distressed roadway system and invest in bridge improvements throughout the region;
- Support the extension of the commuter rail system to Nashua, New Hampshire, develop the Vinal Square commuter station, and increase access through Route 3 in Tyngsborough;
- Build upon the competitive advantage of the region's highway network and attract businesses to the areas opened up by the Route 3 expansion project;
- Improve the transit options available to the public and workers through evening and weekend service where appropriate; and
- Tie together transportation improvements and economic development projects in order to create jobs and increase private investment in the region.

Infrastructure

- Address the aging infrastructure in the City and the lack of infrastructure in some towns;
- Increase water and sewer capacity to support the types of industries being targeted;
- Improve the telecommunications and high tech infrastructure to support higher technology industries;
- Promote economic development in those areas that already have existing infrastructure, such as at highway interchanges; and
- Improve the responsiveness of electric and utility companies to the needs of business.

Financial Investments

- Identify federal, state, local and non-profit funding sources to address the issues identified;
- Expand funding opportunities for highway, road, bridge and transit projects to improve overall circulation within the region;
- Encourage private investment through the availability of federal, state and local funds;
- Target investments to those areas with federal and/or state designations; and
- Assist local and new businesses in addressing their cost issues related to their business operations and development initiatives.

Quality of Life

- Preserve open and recreational space in the region;
- Utilize the Community Preservation Act to implement affordable housing, open space and historic preservation projects;
- Develop walking and bike trails throughout the region;
- Support sustainable development initiatives; and
- Maintain the historic character of the region.

C. Goals and Objectives

The Comprehensive Economic Development Strategy (CEDS) for the Greater Lowell region attains this Vision by establishing eight goals that reflect the input of the meeting participants and previous regional and community studies. Based upon the Vision Statement and the Priority Areas to be addressed, the Goals and Objectives for the 2009-2013 Greater Lowell CEDS are 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"> ➤ Create higher-skill, higher-wage jobs within industry clusters to diversify the regional economy. ➤ Target biotech, nanotech, high technology and “green” jobs and focus on the global economy. ➤ Work with state, regional and local economic development entities to improve the region’s economy. ➤ Redevelop properties for industrial and commercial uses. ➤ Apply for EDA Planning and Public Works funds and Economic Development District (EDD) designation and maintain an annual CEDS planning process.
<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"> ➤ Collaborate with the Greater Lowell WIB, UMass Lowell and Middlesex Community College to address the workforce needs of industry. ➤ Leverage available resources at the federal and state levels to address unemployment and business closure issues in the region. ➤ Expand the use of new technologies, such as online courses and working remotely, to access businesses.
<p>3. Education</p> <p>Improve the educational and workforce skills of primary, secondary and college students to meet the current and future needs of industry.</p>	<ul style="list-style-type: none"> ➤ Establish partnerships between the primary and secondary school systems and the colleges in the region. ➤ Attract emerging industries by linking them to the university research centers. ➤ Support the development of certificate programs at UMass Lowell and Middlesex Community College that supports regional industry needs.
<p>4. Affordable and Market-Rate Housing</p> <p>Create more affordable and market-rate 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 own, lease or rent quality housing.</p>	<ul style="list-style-type: none"> ➤ Increase the supply of rental housing in the suburban communities. ➤ Work with local communities to develop their Housing Plans. ➤ Target housing for the artist community in downtown Lowell. ➤ Encourage mixed-use development throughout the region. ➤ Address the housing needs of new businesses.

GOALS	OBJECTIVES
<p>5. Regional Transportation System</p> <p>Develop the infrastructure needed to build upon the strengths of the regional highway system and the public transit networks to enhance access to the economic centers of the region.</p>	<ul style="list-style-type: none"> ➤ Attract businesses to the areas opened up by the Route 3 expansion project. ➤ Implement road, bridge and transit improvements in the region to enhance access. ➤ Support the extension of the commuter rail system to Nashua, New Hampshire.
<p>6. Infrastructure</p> <p>Build upon the existing sewer, water, telecommunication and public utility infrastructure to increase capacity so that private businesses and homeowners can grow in the future.</p>	<ul style="list-style-type: none"> ➤ Support projects that increase the sewer and water capacity in the region. ➤ Improve the telecommunications and high tech infrastructure. ➤ Target infrastructure improvements in those areas that support economic expansion.
<p>7. 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, particularly in those areas that have not shared in the economic benefits of the regional economy.</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 the Northern Middlesex Economic Development District, Inc. the non-profit arm of NMCOG. ➤ Apply for federal and state funding, such as brownfields and New Market Tax Credits, which can be targeted to priority projects.
<p>8. Quality of Life</p> <p>Maintain the quality of life 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"> ➤ Preserve open and recreational space through the implementation of regional and local Open Space Plans. ➤ 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 creative economy and the Community Preservation Act. ➤ Support the development of Master Plans at the local level to balance economic growth with quality of life initiatives.

Part III: Action Plan

The CEDS Action Plan outlines the economic development and initiatives of the Greater Lowell region for the next five years. Building upon our past five-year experience in promoting regional economic development projects, supporting local economic development initiatives and encouraging “grass-roots” input from the economic development stakeholders in the region, the Action Plan provides a “blueprint” for where the region needs to move in order to address the impacts of the national recession and housing crisis. The Action Plan has been developed as a result of the Needs Analysis and Vision sections and identifies those specific projects that assist the region in meeting its Goals and Objectives. Through input provided at the SWOT sessions and Greater Lowell CEDS Committee meetings, the Priority Project Criteria were developed and made available to project proponents. These Priority Project Criteria are consistent with EDA’s Investment Policy Guidelines and address the specific needs in the Greater Lowell region.

The Action Plan consists of several parts – Implementing the CEDS Goals, Project Selection Criteria, CEDS Projects for the Greater Lowell Region (short-term, intermediate, long-term), the CEDS Priority Project Status Report and Major Development Projects. The section on Implementing the CEDS Goals provides an overview of how the CEDS Goals identified in Part II are reflected in the priority projects. This process has been utilized for the previous Five-Year CEDS document and with the Annual CEDS Updates. The Project Selection Criteria section summarizes the steps taken in developing the criteria, issuing the request for proposals and selecting the projects for inclusion on the CEDS Priority Project list. The complete CEDS Priority Project RFP Package has been included in Appendix V. The CEDS Projects for the Greater Lowell Region lists the short-term, intermediate and long-term projects for the Greater Lowell region. The CEDS Priority Project Status Report summarizes the progress made on the priority projects since the submission of the *Annual CEDS Update for 2008*. Within the Evaluation Section, there is a more extensive listing of the priority project movement and completion for the entire five year period. The Major Development Projects section provides a brief narrative on eight significant projects in the region – Hamilton Canal, Lowell Junction, District Local Technical Assistance, Tyngsborough Town Center Revitalization, Downtown Lowell Renaissance Plan, Pepperell Paper Mill Site Redevelopment Project, Middlesex Turnpike Corridor Development and the Woburn Street Corridor. These major development projects have been included due to their significant impact upon the region’s economy and their importance to each of our communities.

A. Implementing the CEDS Goals

The development of the CEDS Goals and Objectives was largely accomplished through the input provided through the two SWOT sessions, the meetings of the Greater Lowell CEDS Committee and the experience of the NMCOG staff in administering the CEDS program for the past five years. In the development of the *Greater Lowell CEDS for 2004-2008*, NMCOG staff needed to depend almost totally on the Action Plan sessions and the previous experience with the 1994 Overall Economic Development Program (OEDP). During the goals and objectives development process this year, we were fortunate to have the 2004 experience behind us, as well as our Annual CEDS planning processes since the last Five-Year CEDS was developed. Based upon that experience, we reduced the number of goals and made them more specific to the needs in the

Greater Lowell region. For instance, we had focused solely on transportation projects in the past, although sewer and water projects are important to economic growth in the region. It was also necessary to have goals that could be evaluated on a qualitative and quantitative basis.

The implementation of the CEDS Goals will depend to a large extent on federal, state, local, non-profit and private funding. Due to the current national recession, additional federal stimulus funds were made available to jump start the economy. However, due to the cutback in state and municipal budgets, program funds that were previously available were reduced or eliminated. For instance, under the State's Chapter 43D program, planning funds were available to the municipalities to implement their Priority Development Site projects in partnership with the private owners. Due to budget cuts, though, those planning funds are no longer available. The role of NMCOG in overseeing the implementation of the CEDS Goals is dependent upon the availability of EDA planning funds. NMCOG was not able to apply for a short-term planning grant this past year and had to utilize other funding sources. Hopefully, upon submission of a new grant application for short-term planning assistance and the development of an Economic Development District (EDD) application, NMCOG will have the necessary resources to oversee the implementation of the CEDS Goals.

B. Project Selection Criteria

The Project Selection Criteria for 2009 were developed in a similar manner as the project selection criteria for the *Greater Lowell Comprehensive Economic Development Strategy (CEDS) for 2004-2008*. NMCOG has utilized these project selection criteria since 2004 and has made determinations as to the acceptance of the projects in the CEDS Priority Project list based upon those criteria. Minor modifications were made to the Project Selection Criteria to reflect policy changes for EDA and the Greater Lowell region. This year NMCOG issued the CEDS Priority Project RFP Package (attached in Appendix V) to its member communities and to other public and nonprofit entities that requested a copy of the RFP package. This RFP package was sent by mail and by e-mail and the solicitation was followed up with a phone call from NMCOG staff. For those projects that were included in the CEDS Priority Project list, we simply requested that a status update be provided. For any new projects, we requested that the complete one-page form be submitted.

Any projects that were requesting EDA funding had to meet the EDA Investment Policy Guidelines as follows:

- **Be market-based and results driven.** An investment will capitalize on a region's comparative strengths and will positively move a regional economic indicator measured on EDA's Balanced Scorecard, such as: an increased number of higher-skill, higher wage jobs, increased tax revenue, or increased private sector investment.
- **Have strong organizational leadership.** An investment will have strong leadership, relevant project management experience, and a significant commitment of human resources talent to ensure a project's successful execution.

- **Advance productivity, innovation and entrepreneurship.** An investment will embrace the principles of entrepreneurship, enhance regional clusters, and leverage and link technology innovators and local universities to the private sector to create conditions for greater productivity, innovation and job creation.
- **Look beyond the immediate economic horizon, anticipate economic changes, and diversify the local and regional economy.** An investment will be part of an overarching, long-term comprehensive economic development strategy that enhances a region's success in achieving a rising standard of living by supporting existing industry clusters, developing emerging clusters, or attracting new regional economic drivers.
- **Demonstrate a high degree of commitment by exhibiting:**
 - High levels of local government or nonprofit matching funds and private sector leverage.
 - Clear and unified leadership and support by local elected officials.
 - Strong cooperation between the business sector, relevant regional partners and local, state and federal governments.

In addition, project proponents were notified that projects funded by EDA must be located in an area that has an unemployment rate of at least 1% higher than the national average for the preceding 24 months, have a per capita income level equal to or less than 80% of the U.S. average or have experienced extensive layoffs during the past year.

C. CEDS Projects for the Greater Lowell Region

The listing of CEDS Projects for the NMCOG Region has been organized according to their short-term (up to 18 months), intermediate (2-4 years), or long-term (5+ years) implementation schedule. Organizing the CEDS projects in this way helps distinguish those projects that are shovel ready from those that are more long-term in nature. The CEDS Priority Project lists are comprised of projects identified principally by the nine municipalities in the Greater Lowell region, as well as projects that are by included in the region's Transportation Improvement Program (TIP). The TIP Program is completed annually by the Northern Middlesex Metropolitan Planning Organization (NMMPO), which is staffed by NMCOG. As a means to show movement within the CEDS Priority Projects, a summary of the project changes is included in this document. The short-term, intermediate, and long-term projects are summarized in Tables 63-65 on the preceding pages. These tables include the following information: Project Name, Project Description, Project Proponent, Total Cost, Funding Sources, Start Date, Environmental Impact, Number of Jobs Created, and CEDS Goals Addressed.

1. Short-Term Projects (Up to 18 Months)

Table 63 on pages 168-170 lists the fifty Short-Term Priority Projects for this year. There are four projects included in the list that presently qualify for EDA funds: Hamilton Canal, the Hamilton Crossing Infrastructure component, Economic Adjustment grant for NMCOG and the Hamilton Crossing Community Health Center Expansion. This \$50,000 economic adjustment grant would provide funding to support NMCOG staff in maintaining the annual CEDS planning

process. Three of the short-term projects listed will be funded through the American Recovery and Reinvestment Act (ARRA), including two projects for the Lowell Regional Transit Authority (LRTA) and improvements to Routes 110 and 255 in the Town of Westford.

2. Intermediate Projects (2-4 Years)

Twenty-two (22) intermediate projects have been identified for this year and the specific details are listed in Table 64 beginning on page 171. There are no EDA-eligible projects identified on the intermediate project list.

3. Long-Term Projects (5+ Years)

Fourteen (14) long-term priority projects are identified for this year. The long-term projects are listed in Table 65 beginning on page 173. NMCOG expects that each of these projects will be funded through a combination of local, state, and federal funds.

Table 63: Short-Term Projects (up to 18 months)

Project Name	Project Description	Project Proponent	Total Cost	Funding Source(s)	Start Date	Jobs Created	Environmental Impact	Goals Addressed
JAM Plan*	Neighborhood Revitalization	City of Lowell	\$850 M	Federal, state, private and local funds.	2009	TBD	Yes: positive	1,4, 8
Hamilton Canal*	Development of residential, commercial and institutional uses.	City of Lowell	\$800 M	Federal, state, private and local funds.	2009	1,000 full-time and temporary jobs	Yes: positive	1,4, 8
Hamilton Crossing Infrastructure *	Development of housing, R & D, commercial offices, and light mfg. facilities.	Arch. Heritage Foundation/ Banc of America CDC	\$80 M	Federal: \$25 M State: \$1.3 M Private: \$54 M	2009	120 const. jobs; 33 perm. jobs	Yes: positive	1,4, 8
Community Health Center Expansion*	Community Health Center Expansion	Lowell Community Health Center	\$31.5 M	Federal: \$11.8 M State: \$1 M Private: \$7.95 M Nonprofit: \$1 M	2009	198 const. jobs; 100 perm. jobs	Yes: positive	1, 8
Tanner Street Initiative	Remediation work for Silresim Superfund site.	City of Lowell	Up to \$25 M	Federal: \$10-25M	2009	10-12 const. jobs	Yes: positive	1, 8
Lowell Junction Interchange	PDS planning; EIR, EIS, ramp construction.	Town of Tewksbury	\$150 M	Federal: \$120 M State: \$30 M	2009	1,630 const. jobs (est.) Unknown permanent jobs.	Yes	1, 4, 5, 8
Updated Housing Plan	Housing Production Plan	Town of Tyngsborough	\$8.5 k	Local	2009	NA	No	4
EDA Economic Adjustment Grant*	CEDS Planning activities	NMCOG	\$100 k	Federal: \$50 k Match :\$50 k	2009	N/A	No	1
Sewer Line Extension	Extension of sewer lines	Town of Billerica	\$3M per contract	Local	2009	TBD	Yes: positive	1, 6
Navy Yard Mill Redevelopment	Redevelopment of vacant space.	Town of Dracut	\$3.8 M	State: \$200 k Private : ?	2009	41const. jobs (est.)	No	1
Neighborhood Business Center Improvements	Business assistance, traffic calming, sidewalk and street improvements, etc.	City of Lowell	Unknown	Federal and local	2009	TBD	No	5
Downtown Improvements	New crosswalks that meet ADA requirements.	City of Lowell	Unknown	Unknown	2009	TBD	Unknown	5
Wood St./Rourke Bridge RFP	Feasibility analysis	Mass Highway	\$500 k	Federal:\$400 k State:\$100 k	2009	NA	No	1, 5
Pepperell Paper Mill Redevelopment	ETA and 43D Designation granted; Master Plan site study underway	Town of Pepperell	Unknown	Federal, state, local, and private funds	2009	TBD	Yes: positive	1, 4, 8
Combined Sewer Overflow (CSO) (Phase I)	Reduce discharges into Merrimack and Concord Rivers	City of Lowell	\$65 M	Federal, state and local	Ongoing (to be complete by 2011)	707 const. jobs (est.)	Yes	8

Table 63: Short-Term Projects (up to 18 months) (cont.)

Project Name	Project Description	Project Proponent	Total Cost	Funding Source(s)	Start Date	Jobs Created	Environmental Impact	Goals Addressed
Routes 110/225 Improvements	Intersection and signal improvements at Routes 110 and 225	Town of Westford	\$3 M	ARRA Funding	2009	33 const. jobs (est.); Unknown permanent jobs	No	5
Capital Spare Parts	Purchase capital spare parts.	LRTA	\$100 k	Federal: \$80 k State: \$20 k	2009	N/A	No	5
Technology and Bus Stop Upgrades	Upgrade technology and bus stops	LRTA	\$100 k	Federal: \$80 k State: \$20 k	2009	N/A	No	5
Hale Street	Upgrade maintenance	LRTA	\$43,750 k	Federal: \$35 k State: \$8,750 k	2009	NA	No	5
Mobility Assistance Vehicles	Purchase mobility assistance vehicles and equipment.	LRTA	\$300 k	Fed.: \$240k State: \$60 k	2009	NA	No	5
Hybrid Buses	Purchase two hybrid replacement buses.	LRTA	\$1.173 M	Fed.: \$938 k State: \$235 k	2009	NA	Yes: positive	5
Gallagher Terminal	Upgrade Gallagher Terminal and adjacent parking garage.	LRTA	\$529 k	Fed: \$529 k	2009	NA	No	5
Planning Assistance	Contract with NMCOG	LRTA	\$75 k	Federal: \$60k Local: \$15 k	2009	NA	No	5
Surveillance Cameras	Purchase onboard surveillance cameras	LRTA	\$250 k	ARRA Funding	2009	NA	No	5
Preventative Maintenance	Preventative maintenance	LRTA	\$485 k	ARRA Funding	2009	NA	No	5
Town Center Project	Signal upgrading, new crosswalks, resurfacing and pedestrian walkways.	Town of Billerica	\$2.5 M	State	2010	27 const. jobs (est.)	No	5
43 Katrina Road	Redevelopment of town-owned brownfield property; 43D designation	Town of Chelmsford	\$2.085 M for remediation	Federal: \$85 k State: \$2 M	2010	28 const. jobs (est.)	Yes: positive	1, 8
Affordable Housing Plan	Develop Housing Productivity Plan	Town of Chelmsford	Unknown	Local	2010	NA	No	4
Regional Housing Rehabilitation Application	Regional CDBG application for housing rehabilitation	Town of Chelmsford	\$1 M	State: \$1 M	2010	11 const. jobs (est.)	No	4, 8
Regional Economic Target Area (ETA) Application	Joint application to create and expand existing ETA	Town of Chelmsford	Unknown	Federal	2010	NA	No	1
Riverside Senior Affordable Housing	Develop town-owned parcel for affordable housing.	Town of Dracut	\$4.5 M	Federal: \$3.15M Private: \$1.13 M Nonprofit: \$220 k	2010	49 const. jobs (est.)	Yes	4
Water Line Upgrade	Upgrade of existing water lines	Town of Dunstable	\$500 k	Federal and state funds	2010	TBD	Yes	6

Table 63: Short-Term Projects (up to 18 months) (cont.)

Project Name	Project Description	Project Proponent	Total Cost	Funding Source(s)	Start Date	Jobs Created	Environmental Impact	Goals Addressed
Cornerstone Square	Construction of commercial center	Town of Westford	Unknown	Federal, state, and private funds?	2010	TBD	Unknown	1
University Ave. (Textile) Bridge	Bridge replacement	Mass Highway	\$20 M	Federal: \$16 M State: \$4 M	2010	217 const. jobs (est.)	No	5
Upper Merrimack Traffic Calming & Street Improvements	Redevelop commercial core	City of Lowell	Unknown	Federal, state, and local	2010	TBD	Unknown	1, 4, 5
Economic Development District Designation (EDD)*	Designation of NMCOG as EDD	NMCOG	Annual planning grants	Federal:\$60k Match :\$60k	2010	NA	No	1
Pawtucket Blvd. Relocation	Road relocation. (two years)	Town of Tyngsborough	\$7 M	Federal:\$5.6 M State: \$1.4 M	2010	76 const. jobs (est.)	No	5
Route 113 Resurfacing	Resurface Route 113	Town of Tyngsborough	\$1.08 M	Federal: \$865 k State: \$216 k	2010	12 const. jobs (est.)	No	5
Nanomanufacturing Center	Develop Emerging Technology Center	UMass Lowell	\$85 M	Federal, state, private and local funds.	2010	TBD	Unknown	1, 2, 3
Boston Road Affordable Housing Development	20 single family homes at 100% affordability and conservation of land.	Town of Westford	\$2.83 M	Public and Private funds	2010	31 const. jobs (est.)	Yes: positive	4, 8
Minibuses	Purchase two minibuses.	LRTA	\$164 k	Federal: \$131 k	2010	N/A	No	5
Hale Street	Upgrade maintenance facility.	LRTA	\$150 k	Federal: \$120 k State: \$30 k	2010	N/A	No	5
Capital Spare Parts	Purchase capital spare parts.	LRTA	\$100 k	Federal: \$80 k State: \$20 k	2010	N/A	No	5
Mobility Assistance Vehicles	Purchase mobility assistance vehicles and equipment.	LRTA	\$410 k	Federal: \$328 k State: \$82 k	2010	N/A	No	5
Gallagher Terminal	Upgrade Gallagher Terminal and the parking garage.	LRTA	\$340 k	Federal: \$340 k	2010	N/A	No	5
Planning Assistance	Contract with NMCOG.	LRTA	\$75 k	Federal: \$60 k	2010	N/A	No	5
Hybrid Vehicles	Purchase two hybrid electric/diesel vehicles.	LRTA	\$1.1 M	ARRA Funding	2010	N/A	Yes: positive	5
Fare Boxes	Replace 50 fare boxes and equipment.	LRTA	\$1 M	ARRA Funding	2010	N/A	No	5
ITS Planning Services	Procurement of ITS planning services and equipment.	LRTA	\$587 k	ARRA Funding	2010	N/A	No	5
Cut-a-way buses	Purchase three cutaway buses.	LRTA	\$165 k	ARRA Funding	2010	N/A	No	5

Table 64: Intermediate Projects (2-4 years)

Project Name	Project Description	Project Proponent	Total Cost	Funding Source(s)	Start Date	Jobs Created	Environmental Impact	Goals Addressed
Sewer Plant Upgrade & Evaluation	Upgraded sewer network	Town of Billerica	\$9 M	Local	2011	98 const. jobs (est.)	Yes: positive	6
Safety Improvements At Bridge Street and VFW Highway	Design safety improvements.	Mass Highway	\$391 k	Federal: \$ 313 k State: \$78 k	2011	4 const. jobs (est.)	No	5
East/Shawsheen Streets	Intersection and signalization project.	Town of Tewksbury	\$1 M	Federal: \$550 k State \$450 k	2011	11const. jobs (est.)	No	5
East/Livingston Streets	Intersection and signalization improvements.	Town of Tewksbury	\$650 k	Federal: \$520 k State: \$130 k	2011	8 const. jobs (est.)	No	5
Tewksbury Memorial High School	Reconstruction of local high school	Town of Tewksbury	\$80 M	State: \$50 M Local: \$30 M	2011	TBD	Yes	2, 3, 8
Town Center Development/ Preservation	Implementation of Master Plan for Town Center	Town of Tyngsborough	Unknown	Federal, state, local, private and nonprofit	2011	TBD	No	1, 4, 8
Sewer Expansion	Expansion of sewer capacity to accommodate economic growth	Town of Tyngsborough	Unknown	Federal and state funds	2011	TBD	Yes	1, 6
Minots Corner Route 110	Roadway reconstruction and intersection improvements.	Town of Westford	\$4 M	Federal: \$3.2 M State: \$800 k	2011	43 const. jobs (est.)	No	5
Bus stops/ Communication	Upgrade bus stops and radio/communication	LRTA	\$1 M	Federal: \$800 k State: \$200 k	2011	NA	No	5
ITS Security	ITS Security	LRTA	\$80 k	Federal: \$64 k State: \$16 k	2011	NA	No	5
Capital Spare Parts	Purchase capital spare parts	LRTA	\$100 k	Federal: \$80 k State: \$20 k	2011	NA	No	5
Mobility Assistance Vehicles	Purchase mobility assistance vehicles and equipment	LRTA	\$318.3 k	Federal: \$254.6 k State: \$63.7 k	2011	NA	No	5
Planning Assistance	Contract with NMCOG	LRTA	\$75 k	Federal: \$60 k Local: \$15 k	2011	NA	No	5
970 Broadway Industrial Redevelopment	Redevelop brownfield site for industrial use.	Town of Dracut	Unknown	Federal and state	2012	TBD	Yes	1, 8
Holden Center	Building renovation	City of Lowell	Unknown	Federal, state, local and private	2012	TBD	Unknown	1, 2
Central Fire Station	Construction of new fire station	Town of Tewksbury	\$9 M	Local: \$9 M	2012	98 const. jobs (est.)	Yes	8
Transit Buses	Purchase three replacement transit buses	LRTA	\$1 M	Federal: \$ 800 k State: \$ 200 k	2012	NA	No	5

Table 64: Intermediate Projects (2-4 years) (cont.)

Project Name	Project Description	Project Proponent	Total Cost	Funding Source(s)	Start Date	Jobs Created	Environmental Impact	Goals Addressed
Cut-a-way Buses	Purchase two cutaway buses	LRTA	\$ 160 k	Federal: \$ 128 k State: \$ 32 k	2012	NA	No	5
Capital Spare Parts	Purchase capital spare parts.	LRTA	\$ 100 k	Federal: \$ 80 k State: \$ 20 k	2012	NA	No	5
ITS/ Security	ITS/ Security	LRTA	\$ 120 k	Federal: \$ 96 k State: \$ 24 k	2012	NA	No	5
Mobility Assistance Vehicles	Purchase mobility assistance vehicles and equipment.	LRTA	\$ 328 k	Federal: \$ 262 k State: \$ 66 k	2012	NA	No	5
Planning Assistance	Contract with NMCOG	LRTA	\$ 75 k	Federal: \$ 60 k Local: \$ 15 k	2012	NA	No	5

Table 65: Long Term Projects (5+ years)

Project Name	Project Description	Project Proponent	Total Cost	Funding Source(s)	Start Date	Jobs Created	Environmental Impact	Goals Addressed
Allen Road	Reconstruction of Allen Road from Route 3A to Webb Brook Road.	Town of Billerica	\$4.5 M	Federal, state, and local	2013	49 const. jobs (est.)	Yes	5
Boston Road Improvements	Resurfacing of town-owned property and construction of new sidewalks and a new drainage system.	Town of Billerica	\$2.5 M	State	2013	27 const. jobs (est.)	Yes	1, 5
Middlesex Turnpike (Phase III)	Reconstruction of Middlesex Turnpike from Bedford line.	Town of Billerica	\$7.3 M	Federal, state, and local funds	2013	80 const. jobs (est.) ; Unknown permanent jobs	Yes	5
Lowell Connector	Reconstruction of Lowell Connector from Thorndike Street to Gorham Street.	City of Lowell	\$750 k	Federal, state, and local funds	2013	67 const. jobs (est.)	No	5
UMass Lowell – West Campus	Re-use of property for mixed-income housing.	Town of Chelmsford	Unknown	Federal, state and non-profit funds	2013	TBD	Unknown	4
Transit Buses	Purchase three replacement transit buses.	LRTA	\$1 M	Federal: \$800 k State: \$200 k	2013	NA	No	5
ITS/ Security	ITS/ Security	LRTA	\$120 k	Federal: \$96 k State: \$24 k	2013	NA	No	5
Capital Spare Parts	Purchase capital spare parts.	LRTA	\$100 k	Federal: \$80 k State: \$20 k	2013	NA	No	5
Capital Maintenance Equipment	Purchase capital maintenance equipment.	LRTA	\$100 k	Federal: \$80 k State: \$20 k	2013	NA	No	5
Cut-a-way Buses	Purchase two replacement cutaway buses.	LRTA	\$160 k	Federal: \$128 k State: \$32 k	2013	NA	No	7
Mobility Assistance Vehicles	Purchase mobility assistance vehicles and equipment.	LRTA	\$338 k	Federal: \$270 k State: \$68 k	2013	NA	No	7, 8
Planning Assistance	Contract with NMCOG	LRTA	\$75 k	Federal: \$60 k State: \$15 k	2013	NA	No	7
River Road	Reconstruction of River Road from Trull Brook to the Andover line.	Town of Tewksbury	\$6.2 M	Federal, state, and local funds.	2014	67 const. jobs (est.)	No	7
Bruce Freeman Rail Trail (Phase II-A)	Southward extension of Rail Trail 4.88 miles	Town of Westford, Town of Acton, and Town of Carlisle	TBD	Funds have not been programmed	2014	TBD	Yes: positive	5, 8

4. CEDS Priority Project Status Report (As of June 30, 2009)

Completed Projects:

EDA Planning Grant (2007)
Concord Road (Phase II)
Route 4 Bridge
Andover Road Bridge
Princeton Street Bridge
Route 113 Industrial Zone Sewer Development
Navy Yard EOA and TIF agreement
Chelmsford St., Plain St., & Powell St.
Sewer construction- Phases 8,9,10 and 11
Route 113 temporary bridge

Proponent

NMCOG
Town of Billerica
Town of Billerica
Town of Billerica
Town of Chelmsford
Town of Dracut
Town of Dracut
City of Lowell
Town of Tewksbury
Town of Tyngsborough

Projects Underway:

EDA Planning Grant (2008)
Alexander Road/Cook Street
Route 3A Signals
Town-wide sewer
Town Sewer
Bruce N. Freeman Mem. Bike Path
Combined Sewer Overflow
Tanner Street Initiative
Gallagher Square
Morton Street Bridge
Hunts Falls & Rotary Bridges
Rourke Memorial Bridge (rehab)
Groton Street Bridge
Manley Brook Restoration
Water Distribution System
Sewer expansion (final phase)
Tyngsborough Bridge (rehab)
Route 110 and Powers Road
Service Maintenance Vehicles (ARRA funding)
Bus maintenance equipment, etc. (ARRA funding)
Office upgrades (ARRA funding)
Gallagher Terminal upgrades (ARRA funding)
Operating assistance (ARRA funding)

Proponent

NMCOG
Town of Billerica
Town of Billerica
Town of Billerica
Town of Chelmsford
Town of Chelmsford
City of Lowell
Town of Pepperell
Town of Tewksbury
Town of Tewksbury
Town of Tewksbury
Town of Tyngsborough
Town of Westford
LRTA
LRTA
LRTA
LRTA
LRTA

Dropped Projects:

Middlesex Street Mill
Glenview Sand & Gravel
Thorndike St. Pedestrian Bridge

Proponent

Town of Chelmsford
Town of Chelmsford
National Park Service/City of Lowell

5. Major Development Projects

In addition to the CEDS Priority Projects, there are major development projects in the region that have a significant impact upon the economic growth of the region. The Route 3 North Transportation Improvement Project, which was identified as a major development project in the *Greater Lowell CEDS for 2004-2008*, has had a significant economic impact on the region. Within the *Greater Lowell CEDS for 2009-2013*, we've identified eight major development projects that will have an appreciable impact on the future economy in the Greater Lowell region. These projects include Hamilton Canal, Lowell Junction, District Local Technical Assistance (DLTA), Tyngsborough Town Center Revitalization, Downtown Lowell Renaissance Plan, Pepperell Paper Mill Site Redevelopment Project, Middlesex Turnpike Corridor Development and the Woburn Street Corridor. Within this section of the CEDS document, there are brief descriptions of each of these major development projects.

a. Hamilton Canal

In June 2006, the City of Lowell issued a solicitation for a master developer to design, entitle, market and develop the Hamilton Canal District (HCD), a 15-acre underutilized and vacant site bordered by Jackson Street, Revere Street, Middlesex Street and Dutton Street. The site is located at the confluence of three canals: the Hamilton, Merrimack and Pawtucket Canals, and has been designated by the Commonwealth of Massachusetts as a Priority Development Site under Chapter 43D. The HCD development district is part of the Jackson/Appleton/Middlesex Urban Renewal Plan district, as amended in 2008.

Following a two-phase qualification process, the Trinity Hamilton Canal Limited Partnership team was selected to become the master developer for the site. Through an extensive master planning process, a transit-oriented, mixed-use development plan has been created that will enhance the tax base, strengthen and diversify the downtown economy, and create additional employment and housing opportunities for area residents. The City has chosen to entitle the project through the creation of a form-based zoning code.

The total project build out will be approximately 1.8 million square feet, and will include 425,000 square feet of commercial space, up to 55,000 square feet of retail space, a 450-seat theater, up to 700 mixed-income housing units, additional parkland, and a parking garage. In addition, the Commonwealth of Massachusetts will be developing an adjacent parcel as a comprehensive justice center comprised of sixteen court rooms, although this project is not considered part of the Hamilton Canal project. The City of Lowell will be retaining ownership of the streets, bridges and rights-of-way connecting the development parcels.

The City of Lowell and the Northern Middlesex region will realize the following significant benefits from the project:

- Revitalization of a 13-acre underutilized and neglected site, located directly adjacent to Downtown Lowell, into a mixed-use development featuring housing, office space, retail uses, restaurants and other commercial development;
- The project will bring an estimated \$800 million in new investment to an area that has not seen any significant reinvestment in decades;

- Creation of up to 1,000 jobs (full-time and temporary) and an increase in state and local tax revenues;
- The creation of up to 700 units of affordable and market rate housing;
- The project's proximity to the Gallagher Transportation Terminal will support and enhance use of public transportation;
- The proposed extension of the trolley system will augment transportation within the development district and the downtown area;
- New canal crossings, and roadway improvements will enhance pedestrian and vehicular access; and
- The project design includes adaptive reuse and the historic preservation of a large mill complex; and
- The project will incorporate many element of green building design in compliance with the Leadership in Energy and Environmental Design Neighborhood Development (LEED ND) criteria.

The City of Lowell is considered an Environmental Justice community by the Massachusetts Executive Office of Energy and Environmental Affairs. The City of Lowell and the master developer have established an extensive public outreach process, which has included outreach to the city's minority and disadvantaged communities. Multiple meetings and public visioning sessions have been conducted to discuss the planning and development processes, as well as the potential project impacts and mitigation. This process has allowed for meaningful input relative to the design of the project, and has positively and successfully shaped the final design plans for the project. Documents related to the project have been translated into three languages and are posted on the project's website.

The City of Lowell recently submitted an application to EDA seeking \$2 million in Public Works Investment Assistance for the construction of Revere Street, the redevelopment of Jackson Street, and the construction of a new permanent Revere Street Bridge. The new Revere Street Bridge is necessary in order to allow construction equipment to access the site. The reconstruction of Revere Street and Jackson Street will ensure that the approaches to the new bridge are properly designed. Presently, there are no public streets or utility infrastructure connecting to or located within the Hamilton Canal District.

The improvements outlined in the EDA Public Works Investment Assistance application will support Phase I of the Hamilton Canal District, which consists of the rehabilitation of three existing historic mill buildings contained within the Appleton Mills complex and the Freudenberg Building. The Appleton Mills will contain 135 units of artist live/work style housing. The Freudenberg Building will be redeveloped as 50,000 square feet of commercial office space with below grade parking, accommodating 200 new well-paying jobs for office workers and professionals. Trinity Financial is currently negotiating a purchase and sale agreement for the Freudenberg Building with a local engineering and construction management firm.

The City of Lowell has secured state funding to complete additional infrastructure improvements along Jackson Street that will connect directly to the proposed EDA funded portion of infrastructure improvements. These improvements include the complete reconstruction of the

north side of Jackson Street, from Central Street to Revere Street. Groundbreaking for Phase I of the Hamilton Canal District project is anticipated in October 2009, and it is expected that the entire project will be built out over a ten-year period.

b. Lowell Junction

The proposed project consists of the construction of a new highway interchange on I-93 in the towns of Andover, Tewksbury and Wilmington. The new interchange would be located between the I-93/Route 125 Interchange in Wilmington and the I-93/Dascomb Road Interchange in Andover, an area referred to as Lowell Junction. The purpose of the project is to relieve traffic congestion on I-93 and adjacent local roadways, and to improve access to existing industrial and commercial developments, and to undeveloped land suitable for industrial and commercial development. Currently, access from the south to businesses in the Lowell Junction area (east of I-93) is via the I-93/Route 125 Interchange (Interchange 41) to Ballardvale Street (a local, partially residential roadway north of Route 125). From the north, access to the Lowell Junction area is via the I-93/Dascomb Road Interchange (Interchange 42) to Dascomb Road, Clark Road, Andover Street, River Street, and Ballardvale Street. These narrow, winding residential roads are inadequate for the volume of commuter traffic they currently handle.

Given the amount of available undeveloped and underutilized land, the Lowell Junction/ I-93 Development Area has the potential to become one of the largest concentrations of employment in northeastern Massachusetts. The area's strategic location north of the research and development centers of Boston, Cambridge and Route 128, and immediately south of the longstanding technology manufacturing centers of the Merrimack Valley, place it at the nexus of the Commonwealth's initiatives to retain and develop employment opportunities in the communications, technology, instrumentation and life sciences sectors. With its strategic location between Exit 41 (Route 125) and Exit 42 (Dascomb Road), the proposed new interchange would open up 700 acres of currently landlocked land for development.

In 2006, the communities of Andover, Wilmington and Tewksbury formed the Tri Town Development Task Force in order to create a Unified Development Vision for the area. The task force retained the services of The Cecil Group to assist with formulating four alternative visions for the Junction Area. As a result of the public planning process, a mixed-use vision emerged which will allow for science and technology based development, around sustainable mixed-use "villages" which offer a compact setting for office and retail uses. Residential uses will be included in specific locations within the site.

The Tri-Town Unified Development Vision seeks to provide area businesses, residents, municipalities, and the region with significant new job and tax benefits, while alleviating existing traffic congestion, limiting the impact of vehicular trips generated by new development, and improving environmental conditions. The three towns are committed to reaching unanimous agreement on a final development area master plan that respects each community's "Priorities" as outlined in the vision. Further refinement and consensus will be required to move the Development Vision forward into a plan that can be used as the basis for creating a form-based zoning code.

In the spring 2008, Town Meeting voters in the three communities voted to designate three separate portions of the development area as Priority Development Sites under the Commonwealth of Massachusetts' Chapter 43D expedited permitting regulation. This process required the communities to commit to permitting development projects on the priority development sites within 180 days. In exchange, the Executive Office of Housing and Economic Development provided planning funds and economic development assistance to the communities.

The communities are now working toward advancing the planning that would allow the mixed-use vision for the development area to be implemented. The Towns have collectively decided to pursue a form-based zoning code as the mechanism for implementing the development vision. The form-based code will be consistent across municipal boundaries, and will be voted by each community's town meeting in Spring 2010. The master planning process signals to businesses that the communities are serious about economic growth and encourage private investment in the area.

MassHighway is presently engaged in designing and permitting the new interchange project. It is anticipated that it will take three years to complete the design and permitting processes, with construction commencing in 2011. While several design alternatives are being evaluated, it is estimated that construction of the interchange and related improvements will cost approximately \$150 million.

c. District Local Technical Assistance

Chapter 205 of the Acts of 2006, *An Act Relative to Streamlining and Expediting the Permitting Process in the Commonwealth*, created the District Local Technical Assistance Fund (DLTA), providing \$1.8 million to the state's regional planning agencies. This funding was used to provide support to local communities relative to streamlining the local permitting process, promoting regional collaboration, fostering economic development and addressing smart growth issues. In December 2006, the Northern Middlesex Council of Governments (NMCOG) received \$130,000 in DLTA funds, through a contract with the Massachusetts Department of Housing and Community Development (DHCD). NMCOG initiated the DLTA program by conducting a public forum and soliciting proposals from its member communities. Letters of Agreement were established with all nine member communities outlining the scope of work and schedule for each DLTA project.

The regional planning agencies have been fortunate to receive annual funding appropriations under the DLTA program since its inception in 2006. Below is a summary of the technical assistance projects that has been undertaken for our local communities over the past three years. It should be noted that the work completed under this program produces significant economic development and quality of life benefits for our communities and the region overall.

Billerica

NMCOG staff developed a Chapter 43D application relative to the EMD Serono Priority Development Site recently approved by Billerica Town Meeting. EMD Serono, a pharmaceutical

company located on the Middlesex Turnpike, plans to expand its facility and create one hundred additional research jobs by 2012. NMCOG staff also assisted the town by preparing a job description for an Economic Development Coordinator.

In December 2007, the Town's 43D application was approved by the Interagency Permitting Board for \$100,000. An additional \$50,000 was awarded to identify infrastructure issues impeding development along the Route 3 corridor from Burlington to Chelmsford. Following approval of the 43D application, NMCOG staff reviewed the town's permitting process for compliance with Chapter 43D, worked with town boards and commissions to streamline the permitting process so that all local permits related to the Priority Development site are granted within 180 days, and prepared a Permit Streamlining Guide. A Development Guide was also created for those businesses and individuals seeking permits from the town's various boards and commissions.

In 2008, NMCOG assisted the town in developing zoning bylaws to address alternative energy. A bylaw regulating the location of wind turbines was developed to allow and encourage the construction of these energy systems where feasible and appropriate. In addition, a solar energy bylaw was also drafted. Both of the bylaws will be presented for adoption at Town Meeting. In addition, NMCOG worked with the town, as well as the communities of Tewksbury and Lowell, to study economic development opportunities along the Woburn Street corridor, including the reuse of the former Raytheon/Jabil Circuits facility which is currently vacant.

Chelmsford

NMCOG staff updated the 2000 Build-out Study for the Town of Chelmsford. The build-out report is a tool that allows the community to understand the impacts of developing available land to the capacity allowed under current zoning. This analysis helps the community identify changes that may be needed to its Master Plan, Zoning Bylaw and development regulations. NMCOG also used some DLTA resources to assist the Town with their Master Plan Update.

Under the DLTA program, NMCOG staff updated the *Drum Hill Master Plan*, which was initially completed in 2000 by NMCOG. Drum Hill is a major business and commercial district located at Exit 31 on U.S. Route 3, adjacent to the Lowell line. The updated document focused on the following elements:

- Providing an inventory and map of existing sidewalks, crosswalks, pedestrian amenities, parking fields and parking spaces;
- Outlining recommendations for improving pedestrian safety and circulation, vehicular traffic flow, and parking within the Drum Hill area; and
- Creating an overlay zoning district and design guidelines, to encourage mixed-use development, improve the visual and aesthetic character of the area, and enhance the quality of future development and redevelopment projects within the district.

The study also focused on the redevelopment of key vacant and underutilized parcels, such as the former car wash, Glenview Sand and Gravel, and other vacant properties that were acquired by MassHighway for the reconstruction of the Drum Hill Rotary.

Dracut

NMCOG staff assisted the Town of Dracut in streamlining its permitting process by reviewing existing permitting practices, policies and procedures, preparing an assessment report, and outlining recommendations for streamlining the processes and procedures, based on the MARPA document entitled *A Best Practices Model for Streamlined Local Permitting*. A Permitting Guide was created as part of this project.

Dunstable

NMCOG provided GIS services to the Town of Dunstable. A map of the proposed Source Water Protection Overlay Zoning District was created and used for public presentations, board meetings, and town meeting. The purpose of the bylaw is to protect the town's wellfield and recharge area from potential sources of contamination.

Lowell

NMCOG staff reviewed and supported the City's 43D application for the Hamilton Canal District Priority Development site. The project will bring approximately 1.8 million square feet of new development and \$800 million in additional investment to the City. Current development plans include 425,000 square feet of commercial space, up to 55,000 square feet of retail space, a 450-seat theater, up to 700 mixed-income housing units, additional parkland, and a parking garage. Staff participated in the project Visioning Sessions and provided input and feedback to the City and master developer, and assisted the City in preparing and submitting a Public Works application to EDA.

Pepperell

Under the Letter of Agreement established with the Town of Pepperell, NMCOG staff provided technical support relative to the proposed redevelopment of the former Pepperell Paper Mill site. NMCOG staff facilitated discussions between the town and state economic development agencies, and assisted the town in designating a Priority Development Site for the mill property and in establishing an Economic Target Area (ETA). NMCOG worked with state partners to examine options for addressing brownfield issues related to the mill site, and assisted the Town by providing guidance on the scope for a proposed site master plan relative to the mill property and surrounding area.

Tewksbury

NMCOG assisted the Town of Tewksbury with the development of a Town Center Overlay Zoning District Bylaw and corresponding design guidelines. The Town Center Overlay Zoning Bylaw goals are as follows:

- Encourage a mix of business, residential, cultural, educational and civic uses;
- Promote compact development that is pedestrian-oriented and preserves the historic value and character of the area;

- Minimize impacts on public services and maximize the efficient use of public infrastructure;
- Increase the town's tax base by creating a thriving small business environment, attracting new investment and promoting economic development;
- Provide diverse housing opportunities; and
- Encourage the reuse of existing underutilized or vacant properties.

The town center bylaw and design guidelines are complete and were approved by town meeting voters at the Annual Town Meeting.

NMCOG staff also assisted the town with the formation of the Tewksbury Economic Development Committee and provides technical assistance to the committee on an ongoing basis. In addition, NMCOG staff assisted the Town of Tewksbury with streamlining its permitting process by reviewing existing permitting practices, policies and procedures, preparing an assessment report, and outlining recommendations for streamlining the permitting processes and procedures.

Tyngsborough

NMCOG staff assisted the Town of Tyngsborough in streamlining its permitting process by reviewing existing permitting practices, policies and procedures, preparing an assessment report, and outlining recommendations for streamlining the permitting processes and procedures. Staff also continued to meet with the town's Economic Development Committee to discuss Chapter 43D, provide technical assistance regarding the Town Center Master Plan, and on issues related to development along Middlesex Road.

Westford

NMCOG prepared the Economic Development Component of the Westford Comprehensive Master Plan. This work included conducting two forums for the business community focused on the business experience in the Town of Westford. A Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis was performed at each of these events which were both sponsored by local companies. In addition, NMCOG staff participated in town-wide and neighborhood forums where residents expressed their opinions and concerns regarding economic development issues.

d. Tyngsborough Town Center Revitalization

The 2004 Tyngsborough Master Plan identified the need to strengthen the commercial base in the Town Center, while preserving and enhancing its historic character. NMCOG staff has provided technical assistance to the Tyngsborough Economic Development Committee regarding the redevelopment of the Town Center over the past three years.

In late 2007, NMCOG staff worked with the Economic Development Committee to draft a Town Center Overlay Zoning Bylaw that would encourage mixed-use development. In addition, Design Guidelines were created that focused on the use of traditional town center design concepts in order to minimize impacts on public services, maximize the use of public

infrastructure, and allow for a mix of residential, commercial and civic uses. In creating the new zoning overlay district, the Town has focused on providing additional employment opportunities, sparking new investment and fostering economic growth.

As a result of these efforts, and based on recommendations outlined in the *Tyngsborough Economic Development Plan* prepared by NMCOG in 2006, Town Meeting voters allocated Community Preservation funds to develop a Town Center Master Plan. In 2008, a consultant was retained and the Town commenced work on the detailed Master Plan for the Town Center area. The Town Center Master Plan was subsequently prepared under the direction of the Economic Development Committee and addressed the following:

- Re-use of vacant town-owned properties;
- Opportunities for new development;
- Infrastructure needs; and
- Open space enhancements.

The Town's ownership of four properties within the Town Center provides a unique opportunity to shape future development plans for the area. The Master Plan identified and recommended potential reuse options for the Winslow School, Littlefield Library, Old Town Hall, and the former Shur-Fine Market site. The restoration and reuse of these properties has the potential to transform the Town Center into a more vibrant and economically viable area. The Master Plan has also focused on potential sites for new development to create the density and building mass that will provide a distinctive entrance to the Town Center from Middlesex Road, the bridge and Kendall Road.

Added economic value will attract the additional private investment capital needed to implement the Master Plan in its entirety. However, this new development will not be possible without bringing public sewer to the area. The Economic Development Committee is actively working with the Sewer Commission to address this issue.

Throughout the development of the Town Center Master Plan there were multiple walking tours of the study area. Meetings and conversations were held with local property owners, merchants, and municipal officials. Three public meetings were conducted to gather ideas from Tyngsborough residents, businesses and property owners. The level of interest in this project was clearly evident in the strong attendance at each public input event.

The Economic Development Committee approved the final Town Center Master Plan Master Plan in September 2008. Since that time, the town has retained the services of a marketing consultant to further analyze the potential of this area from a business perspective. It is expected that the Market analysis will be completed in December 2009. By November 2009, the Town expects to solicit bids for the demolition of the former Shur-Fine Market which is in poor condition and inconsistent with the character of the Town Center area. This demolition work was identified as essential to the implementation of the Town Center Master Plan.

e. Downtown Lowell Renaissance Plan

During the summer and fall of 2007, the City of Lowell prepared the Downtown Lowell Renaissance Plan, which focused on traffic and parking, infrastructure, retail recruitment and retention and marketing. Summits were held to receive input from residents, local officials, businesses, non-profits and other stakeholders. NMCOG staff participated in these events and provided input.

Based on the results of the planning and public input process, a plan was developed that included immediate and long-term actions for improving conditions within the downtown. The following is a list of immediate actions that have been identified:

- Improve directional signage by redesigning the signs to include larger print and updated logos;
- Assess traffic and infrastructure improvement options to address one-way street patterns, improved signal operations, condition of cobblestone streets, pedestrian accommodations, lighting, street furniture, and sidewalk vaults;
- Address short-term parking needs of businesses and residents by increasing the supply of parking and distributing the parking more evenly throughout downtown;
- Improve landscaping along the Central Street traffic island;
- Add additional planters and street furniture throughout downtown;
- Construct Mack Plaza Children's Playground;
- Improve streetscapes by replacing broken light post components, repainting kiosk signs, and providing additional trash receptacles;
- Develop and implement a Best Retail Practices Program offering workshops on best practices, providing in-store consultation for business owners, and offering a grant program to help finance implementation of forthcoming recommendations;
- Hire a retail site selection consultant to assess the downtown's retail potential, prepare a marketing plan for targeted retailers, and work with the City to recruit retailers;
- Establish an arts competition to enliven Lowell's vacant storefronts as a collaboration of the City of Lowell, the Downtown Lowell Business Association, Arts League of Lowell, and the Cultural Organization of Lowell;
- Implement the cultural plan: *On the Cultural Road-City World of Culture*;
- Bring back the "There's a lot to like about Lowell" slogan;
- Use image advertising to promote downtown strengths; and
- Improve public safety image by continuing to build partnerships between the Police Department and community stakeholders and expanding the public surveillance system.

The following long-term actions have been recommended for implementation as a means of improving the economic viability of the downtown and improving the quality of life for its residents:

- Implement the traffic and intersection improvements identified as part of the immediate action program outlined above;

- Upgrade the cobblestone roadway and implement streetscape improvements along Middle Street;
- Improve sidewalks, streetscape and street furniture at the intersection of Prescott, Central and Market Streets;
- Improve crosswalks and pedestrian amenities throughout the downtown
- Upgrade Mack Plaza;
- Install new historic street lights along French, John, Bridge, East Merrimack, Market, and Jackson Streets, as well as in Kearney Square;
- Implement the development for the Hamilton Canal District;
- Implement the recommendations of the retail site selection consultant as discussed in the immediate actions above;
- Explore public-private partnerships with financial institutions, commercial property owners and brokers to promote and attract businesses to the downtown;
- Create a Downtown Wi-Fi hotspot; and
- Improve the Thorndike Street gateway to downtown.

Implementation of a number of actions outlined in the Renaissance Plan was initiated in the Summer of 2009. The following construction projects are underway:

- Cobblestone repairs on Middle and Palmer Streets;
- Installation of new crosswalks that are ADA compliant;
- Installation of new handicap ramps that are ADA compliant;
- Removal of granite rosette at Market/Central and Prescott Streets and installation of new pavement and crosswalks; and
- New crosswalks that will be outlined with reused 16-inch granite slab with an 8-foot interior of poured concrete with a scoring pattern to match sidewalks.

f. Pepperell Paper Mill Site Redevelopment Project

In July 2007, the Town of Pepperell requested assistance from the Commonwealth of Massachusetts in redeveloping the former site of the Pepperell Paper Mill, a 12-acre property located at 128 Main Street. The facility has been inactive since the late 1990s and has been owned by several property owners. Currently, the property is owned by Pepperell Realty LLC, which is in turn owned by Perry Videx.

In August 2007, the Massachusetts Permit Regulatory Office (MPRO) of the Executive Office of Housing and Economic Development (EOHED), responded by meeting with town officials, and representatives from the Massachusetts Office of Business Development (MOBD), NMCOG and MassDevelopment. The state officials provided information to the community on the Expedited Permitting Program, the Economic Development Incentive Program (EDIP) and “brownfield” programs at the state and federal levels. The state officials encouraged the town to apply for Priority Development Site (PDS) and Economic Target Area (ETA) designation and to develop a site master plan to identify the next steps that needed to be addressed in redeveloping the site.

In January 2008, NMCOG staff submitted a memorandum to the Town outlining the steps that needed to be taken to move the redevelopment project forward. Based upon a review of other site

master plans that had been developed for similar projects, the consensus was that the master plan should be comprehensive in scope by incorporating recommendations for the former mill site, Railroad Square, and the Nashua River, in order to maximize the economic impact of the mill site revitalization. NMCOG offered to provide technical assistance using the District Local Technical Assistance (DLTA) funds provided under Chapter 43D, in order to move the Site Master Plan forward. NMCOG also recommended that the town establish an oversight committee consisting of six to nine representatives to provide advice to the Board of Selectmen on the steps to be taken to redevelop the site in partnership with the property owner. Furthermore, it was recommended that there be a public outreach component to inform the overall process. An outline for the Site Master Plan was then developed that detailed the elements that needed to be incorporated into the plan.

The Town and NMCOG established a Letter of Agreement for DLTA assistance in April 2008 related to the former mill site. NMCOG pledged \$15,000 in technical assistance to the community through this agreement. Annual Town Meeting, held on May 5, 2008, unanimously voted to adopt the provisions of Chapter 43D related to the designation of the former mill property as a PDS and also voted to designate the community as an ETA. The Town subsequently established the Mill Site Study Committee in June 2008, as suggested by NMCOG.

At the Annual Town Meeting in May 2008, the citizens of Pepperell approved two articles designed to encourage development at the Mill Site. The first article created a Chapter 43D Priority Development Site at the Mill Site, ensuring a prospective developer that all local permitting decisions regarding the development of the site will be made within 180 days. The second article authorized the Board of Selectmen to petition the General Court for special legislation to add the Town of Pepperell as a member of the Fort Owens ETA. In addition, during May 2008, the Pepperell Downtown Business District and Mill Site market study was completed by FinePoint Associates through DHCD's Massachusetts Downtown Initiative.

NMCOG led a Visioning Session related to the reuse of the mill site on October 25, 2008 at the Pepperell Senior Center. The Visioning Session provided an opportunity for the public to learn about the activities of the Mill Site Study Committee, as well as to provide input into the redevelopment process associated with the former Pepperell Paper Mill site. NMCOG facilitated the Strengths, Weaknesses, Opportunities and Threats (SWOT) Analysis portion of the program, which provided an opportunity for the thirty-five (35) attendees to voice their opinions on the strengths, weaknesses, opportunities and threats associated with the Town of Pepperell, the mill site, Railroad Square and the Nashua and Nissitissit Rivers. In November 2008 the Town of Pepperell submitted a PDS application that was approved by the Permit Regulatory Board and provided funding for the town to have NMCOG complete the required permit streamlining guide and to enter into a contract with a consultant to complete the site master plan. The consultant selected to complete the site master plan was Vanasse Hangen Brustlin, Inc. and it was expected that the plan would be completed by early 2010.

In April 2009, the firm of Wright Pierce completed a site analysis for the mill complex that focused on the following issues:

- Road and Pedestrian Access;
- Access to the River;
- Available and Potential Parking;
- Environmental Clean-up Issues;
- Building Demolition Considerations;
- Zoning Considerations;
- Infrastructure;
- Land Use Considerations; and
- Interrelationship with businesses and residents.

This analysis was followed by a marketing study in June 2009 that was paid for by the property owner. Prepared by the firm of Bartram and Cochran, the marketing study concluded that the site should be developed as a mixed-use lifestyle center.

The activities of the Town and the property owner demonstrate the partnership that has been forged in order to successfully bring economic investment to this blighted parcel. The Town continues to work with the property owner to reuse this site in a fashion that benefits the community and the regional economy.

g. Middlesex Turnpike Corridor Development

The Middlesex Turnpike connects the communities of Billerica, Bedford and Burlington and is a significant regional economic center and home to several major international and national companies. Transportation improvements along the corridor will improve access to these firms, and are vital to attracting and maintaining employees, accommodating the needs of commuters, and facilitating the transport of goods along the corridor. The Middlesex Turnpike provides direct access to I-95 and to U.S. Route 3, and many of the firms along the corridor rely on just-in-time delivery of goods.

The Massachusetts Executive Office of Housing and Economic Development (EOHED) has targeted this area for future economic growth and expansion, approving Priority Development Sites along the corridor within the Towns of Billerica and Burlington. This area has seen the relocation and expansion of several high tech and life sciences firms, such as Anika Therapeutics, Inc. and EMD Serono. Even more significant is the established working relationship among the towns of Billerica, Bedford and Burlington. Each of these communities has been approved as Economic Target Areas (ETAs) and work closely together on economic development projects of regional significance. The communities meet frequently to address municipal service and infrastructure needs that enable private companies to grow and to locate along the Middlesex Turnpike.

The Middlesex Turnpike project is divided into three phases as follows:

- Phase I: Crosby Drive and Middlesex Turnpike improvements, including roadway widening and intersection improvements from 375 feet north of Route 62 to the Crosby Drive/Middlesex Turnpike intersection in Bedford. The Phase I project was completed in 2007 at a total cost of \$9,500,000.

- Phase II includes full depth reconstruction and intersection improvements along the Middlesex Turnpike and the Mitre Extension, from the intersection of the Mitre Extension and Route 62 to 800 feet north of the intersection of Plank Street/Middlesex Turnpike/Crosby Drive, a distance of 2.08 miles. This project was advertised for construction in September 2009, at an estimated cost of \$13,500,000. Construction is expected to commence in Spring 2010.
- Phase III includes improvements to 1.6 miles of the Middlesex Turnpike from the northern terminus of Phase II to 1000 feet north of Manning Road in Billerica. Left-turn lanes and signals will be constructed at high volume intersections and driveways. The twin pipe arch culverts at the Shawsheen River will be reconstructed and retaining walls will be installed to minimize impacts to the adjacent resource areas. Full depth pavement, new drainage and a stormwater management system will be installed, along with new waterline and new state-of-the-art traffic signal hardware. The total estimated project cost is \$16,500,000. Currently, the project design is 75% complete.

The Phase III project has tremendous economic development benefits. The Town of Billerica has designated a priority development site at 45A Middlesex Turnpike. This site is within the targeted economic development Tri-Town area of Billerica, Bedford and Burlington. With the investment to date of more than \$ 23 million in earlier phases of the Middlesex Turnpike and \$ 350 million in the expansion of Route 3, the state and federal governments have recognized the importance of this area in attracting high tech and biotech companies, and in generating well-paying jobs for the regional workforce. It is anticipated that the Middlesex Turnpike Phase III project will create 150 construction jobs. The improvements will also support an additional 1.7 million square feet of new commercial, industrial and residential space along the corridor, which equates to 2,500 new office, R&D and industrial jobs.

h. Woburn Street Corridor

The Northern Middlesex Council of Governments (NMCOG) has entered into a Letter of Agreement with the communities of Billerica, Lowell and Tewksbury to study the Woburn Street Corridor and outline recommendations involving transportation, land use and economic development. With the closure of Jabil Circuits at the former Raytheon building, the corridor study takes on new importance and will focus on strategies that create employment opportunities, improve the quality of life for residents, and expand the local tax base.

The Woburn Street Corridor begins at the intersection of Woburn Street and Easton Street in Lowell and extends southeasterly, terminating at the intersection with Mt. Pleasant Street in Billerica. Zoning along the corridor varies within the three communities. Within the City of Lowell, the majority of the parcels are zoned for single-family homes, while in Tewksbury all of the parcels abutting the roadway are zoned for heavy industry. Parcels located along the Billerica section of the corridor are zoned for residential, commercial or industrial use. The transportation component of the study will evaluate existing and future traffic conditions along the corridor, including pavement condition, bicycle and pedestrian accommodations, signage and pavement markings, and safety. Transit service will also be assessed, with a focus on connections to the North Billerica Commuter Rail Station. The Woburn Street and I-495

interchange area will be examined in relationship to the recommendations outlined in the *I-495 Corridor Transportation Study (2008)*, prepared by the Executive Office of Transportation and Public Works in cooperation with the Northern Middlesex Council of Governments and the Merrimack Valley Planning Commission. Improvement strategies will be outlined for addressing any operational or safety deficiencies identified through the study process.

Attracting and retaining businesses and creating well-paying jobs are high priorities for Lowell, Billerica and Tewksbury. The land use component will identify present land uses and examine future opportunities for development and redevelopment. A zoning analysis is being conducted for the parcels along the corridor, examining permitted uses and dimensional requirements within different zoning districts across municipal boundaries. The land use component will focus on the re-use of the former Raytheon site, in addition to examining other suitable locations (open space/vacant land and buildings) for future development and redevelopment opportunities. The economic development component will assess the economic potential of redeveloping or developing available and underutilized properties along the corridor. The existing economic conditions for the corridor and adjacent properties will be assessed by examining the following:

- Commercial, industrial and residential zoning and land use characteristics;
- Vacant land, underutilized parcel and open space parcels;
- Business characteristics and trends;
- Available infrastructure to accommodate economic development (water, wastewater, transportation, utilities and telecommunications);
- Assessment of commercial and industrial vacancies, and other indicators of distress;
- Community assets and liabilities; and
- Balance between economic development and quality of life.

The future economic development outlook for the corridor and adjacent properties will be evaluated by analyzing and documenting the following:

- Availability of commercial, industrial and residential zoned land for development;
- Re-use of the existing Raytheon site;
- Workforce development opportunities;
- Trends in the local and regional economy;
- Identification of potential development and redevelopment opportunities for existing sites in the corridor area;
- Identification of permitting and regulatory issues that may serve as an impediment to economic development; and
- Available economic development incentives, such as the EDIP program, will be considered in order to revitalize this corridor.

Part IV: Evaluation Section

As outlined in the *Greater Lowell Comprehensive Economic Development Strategy (CEDS) for 2004-2008*, the most critical aspect of any plan is the evaluation component. Without an evaluation of the programmatic efforts undertaken to achieve the stated Goals and Objectives in the Five-Year CEDS document, it is difficult for NMCOG and its economic development partners to determine the success of the program and to identify what changes, if any, need to be made. NMCOG recognizes that the Greater Lowell CEDS Committee and the NMCOG Council have a role to play in the overall evaluation process. It is also clear that NMCOG and the Greater Lowell CEDS Committee do not have sole responsibility for achieving the CEDS Goals and Objectives, but that implementation responsibility also rests with other economic development stakeholders in the region.

As the lead economic development agency for the region, NMCOG collects certain information during the year and reports on it as part of the CEDS Update process. However, given the ongoing funding and time constraints, it is often difficult to fully document the accomplishments of the other economic development stakeholders in the region. Although the CEDS process is designed to build consensus and collaboration among economic development partners at the federal, state, regional and local levels, each of these entities responds to its own needs, mission, and priorities. We will strive to do a better job of reporting on the accomplishments of our partners in the future by strengthening of our relationships with these economic development organizations.

This section provides an evaluation of the past five years in relation to the Evaluation Methodology that was outlined in the *Greater Lowell Comprehensive Economic Development Strategy (CEDS) for 2004-2008*. The Evaluation Methodology utilized in the 2004-2008 CEDS has been modified as part of the Five-Year CEDS for 2009-2013. The Evaluation Methodology focuses upon both quantitative and qualitative measures, and attempts to provide an overall assessment of the program activities, in accordance with the established goals and priority projects outlined in the CEDS document. Over the next five years, the annual assessment process will help identify areas that need to be improved, as well as those areas that have been addressed fully. NMCOG and its economic development partners will continue to improve upon the evaluation methodology in order to address those issues that are most important in growing the regional economy and in maintaining the quality of life in the region.

Within this section of the document, the evaluation components are 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. CEDS Implementation Process

The CEDS Implementation Process outlined how the “grass-roots” CEDS process was to be implemented over the five-year implementation period, the level of participation at the Greater Lowell CEDS Committee meetings and other forums, the availability and dissemination of data that was developed through the completion of the Annual CEDS Updates, and the CEDS Marketing and Outreach process. Each of these components is essential to the overall

functioning of the “grass-roots” CEDS process and ensures greater participation by businesses, community organizations, municipalities, minority groups, nonprofit groups, public agencies and the general public in the CEDS process. The evaluation results for the Levels of Participation, Data Development and Dissemination and CEDS Marketing and Outreach components are outlined in the following section.

1. 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 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.

The Greater Lowell CEDS Committee has met regularly during the five-period covered by the *Greater Lowell CEDS for 2004-2008*. Attendance at these meetings has been fairly high, as evidenced in the meeting minutes included within the Appendix of this document. The membership of the Greater Lowell CEDS Committee has been expanded, since the inception of the Committee back in 2004, to include more representatives of the minority community to ensure that all voices were being heard. Some of these new Committee members have left recently due to changing jobs and increased professional and personal commitments. NMCOG needs to work with ONE Lowell and other CEDS Committee members to recruit new members to the Greater Lowell CEDS Committee. It is anticipated that additional members that will need to be replaced over the implementation period of the *Greater Lowell CEDS for 2009-2013*. NMCOG has updated its mailing list every year since the Five-Year CEDS was developed.

NMCOG has worked with its economic development partners to co-sponsor different events related to economic development. NMCOG held its first public forum in Tyngsborough on October 31, 2006. The Economic Growth Forum focused on economic development activities occurring throughout the Greater Lowell region, but principally focused on the City of Lowell and the Towns of Tyngsborough, Westford and Billerica. This forum was co-sponsored by Enterprise Bank and the Greater Lowell Chamber of Commerce (GLCC) and promotions were provided by the Lowell Sun and WUML, the radio station for the University of Massachusetts Lowell (UMass Lowell). As a result of this public forum, NMCOG received a \$5,000 donation from Digital Credit Union, as well as additional private commitments for future public forums.

In October 2006, NMCOG participated in a session sponsored by the Lowell Plan, which focused on the proposed Nanotechnology Center at UMass Lowell. NMCOG staff also supervised the economic development visioning session for the Westford Comprehensive Master Plan in November 2006. In December 2006, NMCOG staff participated in the Merrimack Valley Development Showcase hosted by the Merrimack Valley Economic Development Council (MVEDC), which focused on marketing in the Merrimack Valley. Staff also attended the staff review session on the power plant proposal in the Town of Billerica.

In January 2007, NMCOG attended the first of three Downtown Summits designed to focus on the current and future role of Downtown Lowell within the region’s economy. Staff also

attended the Building Jobs Pipeline session hosted by Mass Inc., which focused on the skill training supply and needs of the Commonwealth.

On May 11, 2007, the City of Lowell, Division of Planning & Development (DPD), hosted a Renewal Community (RC) Workshop to educate local business owners on the valuable RC tax incentives. The Renewal Community is a federal designation of certain census tracts in Lowell to encourage economic growth and job creation through the use of special tax incentives. Operations Specialist Ernest Zupancic from the U.S. Department of Housing and Urban Development (HUD), Richard Sweeney of the Internal Revenue Service (IRS), consultants from Abt Associates, and local officials were present to discuss the programs. The workshop focused on local, state and federal incentives that can help facilitate local development and the presenters explained in detail the RC incentives available to businesses in the community.

On May 21, 2007, NMCOG hosted its “Public/Private Partnership Forum” at the UMass Wannalancit Mills complex in Lowell. The forum focused on successful partnership arrangements between government and private industry, which create jobs, expand the tax base and utilize the region’s educated workforce to grow the region’s economy. Speakers and panelists from the Lowell Plan, and Lowell Development and Financial Corporation (LDFC), the Billerica Plan, MVEDC, Merrimack Valley Venture Forum (MVVF), and the Massachusetts Office of Business Development (MOBD) participated in the event.

NMCOG hosted a Citizens Planning Training Collaborative program on the Chapter 43D initiative designed to expedite the permitting process with the Massachusetts Permit Regulatory Office (MPRO), MOBD, and the Massachusetts Alliance for Economic Development (MAED) on October 22, 2007, which had ten participants. NMCOG co-hosted the Zoning Reform Task Force meeting on November 9, 2007 at which there were 30 attendees. NMCOG also participated in a regional marketing session with MAED, the state’s selected marketing consultant, and MVEDC in order to provide feedback on the state’s marketing program for the Merrimack Valley. The Lowell Center for Sustainable Production at UMass Lowell and MVEDC co-sponsored “A Roundtable Discussion to Advance Clean Technologies in the Merrimack Valley” on November 13, 2007 at the Osgood Landing Commerce Center in North Andover. NMCOG staff attended the Smart Growth Conference in Worcester on December 7, 2007, and actively promoted the Priority Development Site (PDS) in Billerica. In supporting the Town of Billerica’s economic development initiatives, NMCOG assisted the Town and Representative Bill Greene’s Office on their “Growing Your Business in Billerica” forum on December 11, 2007 at which there were 60 people in attendance. This forum attracted private industry from Billerica and state development agencies, including the Executive Office of Housing and Economic Development (EOHED), MPRO, MOBD, MassDevelopment and MAED.

NMCOG hosted the Chapter 40B Regulations session with the Department of Housing and Community Development (DHCD) on May 15, 2008 at which there were 15 participants. NMCOG co-sponsored the BioReady Community Forums with the Massachusetts Biotechnology Council, MVEDC and the Merrimack Valley Planning Commission (MVPC) at Wyeth in Andover (34 attendees) on April 2, 2008 and at Millipore in Billerica (33 attendees) on April 30, 2008. NMCOG played a major role in working with Congresswoman Tsongas’ Office

to plan the Regional Housing Summit held on June 2, 2008, which attracted 120 participants, and provided an extensive overview of the housing situation in the Merrimack Valley. NMCOG also attended the workforce development session sponsored by the Greater Lowell Workforce Investment Board (GLWIB). NMCOG participated in a forum on the Creative Economy, in partnership with MVEDC and MVPC, on July 16, 2008. Willie Taylor, Regional Director of the EDA Philadelphia office, addressed the Annual Meeting of NMCOG and discussed the importance of regional partnerships and collaboration in advancing economic development goals. On October 25, 2008, NMCOG facilitated a Visioning Session on the redevelopment of the former Pepperell Paper Mill site. NMCOG, along with the MVPC and DHCD, co-hosted a workshop on “Organizing for Economic Development” on October 7, 2008. On October 21, 2008, EDA Regional Director Willie Taylor made a grant award presentation to NMCOG at Lowell City Hall. NMCOG participated in an event sponsored by the Associated Industries of Massachusetts (AIM) regarding Education and Workforce Development on October 31, 2008.

On February 5, 2009, NMCOG began participating in the “Partners for Progress” initiative, which is a strategic alliance for Workforce Development in the Merrimack Valley. The primary partners in this initiative include NMCOG, MVPC, the Merrimack Valley Workforce Investment Board (MVWIB), the GLWIB, MVEDC, and the Metro North Regional Employment Board, along with Middlesex Community College, Northern Essex Community College, and the Greater Lowell and Merrimack Valley Chambers of Commerce. On May 5, 2009, NMCOG and MVPC co-hosted a session on Land Use Reform in Massachusetts with Secretary Greg Bialecki of EOHEd. On May 6, 2009, NMCOG facilitated a Business Forum as part of the public input process for the economic development section of the Chelmsford Master Plan.

The Youth Job Fair 2009 was sponsored by GLWIB, the Career Center and Middlesex Community College and held at Lowell High School on May 7, 2009. Over 38 employers were on hand for the Job Fair and they were very impressed with the turnout of students and the abundance of applications received. Over 600 students attended the job fair talking with prospective employers and completing applications on site.

On May 20, 2009, NMCOG staff led a meeting with UMass Lowell, the City of Lowell, and nanotechnology companies regarding possible zoning ordinance changes related to nanotechnology and emerging industries. On June 22, 2009, NMCOG participated in a groundbreaking ceremony for the Route 110 ARRA project in the town of Westford. Staff also attended a forum with representatives of technology companies along the corridor and Lt. Governor Murray to discuss the needs and concerns of area businesses.

Based upon the quantitative and qualitative measures established for this component, NMCOG exceeded its estimates in terms of the number of attendees at most of its public meetings. The participation of the CEDS Committee was fairly steady, but due to some vacancies that developed, there is room for improvement in this area. NMCOG also needs to develop an evaluation tool to be used in conjunction with its public forums.

2. Data Development and 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.

NMCOG continues to provide extensive data to the public through its website and through personal requests. The presence of the *Greater Lowell Comprehensive Economic Development Strategy (CEDS) for 2004-2008* on our web site has provided the most complete and detailed document regarding economic development data to date. We continue to receive inquiries on updated economic information from the public, with over 100,000 inquiries made to our website each year. It is unknown how many public agencies, non-profits and small businesses have come to rely on the demographic data and information developed through our annual CEDS planning process in developing the Annual CEDS Updates and Five-Year CEDS. However, NMCOG receives several calls per month on development opportunities in the region based on the information available through the website.

NMCOG also shares updated economic development documents with its local communities as part of the CEDS process. The communities often request data from NMCOG when developing grant applications. Through our work with the Towns of Chelmsford, Tyngsborough and Westford, updated economic development data has been provided as part of the Tyngsborough Economic Development Plan, the Chelmsford Master Plan and the Westford Comprehensive Master Plan. In the development of Chapter 43D applications, NMCOG utilized economic data to address economic distress issues, as well as to demonstrate how well a community has done economically. Similarly, in the development of the Housing Production Plans for Dracut and Billerica, updated housing statistics have been used to address the information requirements established by DHCD.

NMCOG has not had many requests for copies of the Five-Year CEDS, principally because it is available on our web site. Our annual requests and referrals far exceed the evaluation criteria we originally outlined for this component. As the U.S. Census representative for this region, we have already provided local growth information to the U.S. Census and will be providing additional data to our communities once the 2010 U.S. Census data is released.

3. CEDS Marketing and 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

levels 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.

As part of NMCOG's transition period from the previous Executive Director to the current Executive Director, presentations were made before the Boards of Selectmen in Dracut, Pepperell, Westford, Chelmsford and Tyngsborough, as well as a joint presentation before the Dunstable Board of Selectmen and Planning Board, regarding the services provided by NMCOG. As part of that presentation, we focused on our CEDS document and "grass-roots" planning process and encouraged their involvement in our public effort. We also explained how we request projects on an annual basis to include on our CEDS Priority Project list.

Based upon the quantitative and qualitative measures established in 2004, NMCOG needs to do more marketing of the CEDS document and program. Even though our six presentations fall within the "good" category, there is a need to broaden our marketing efforts. In our public forums, we stress how the CEDS document is important to regional development in Greater Lowell. Since our Council is comprised of elected officials from the City Council/Boards of Selectmen and Planning Boards, we spend a great deal of time educating them on the benefits available under the CEDS program.

While the awarding of Public Works funding to the City of Lowell for the Hamilton Canal Redevelopment is gratefully anticipated, there is the feeling by our suburban communities that only the City of Lowell can benefit from the program. We have been working to educate these officials that layoffs at major industries within the suburban communities will have as big an impact on eligibility for funding as unemployment rates or per capita income figures.

During the next five years, it will be important to maintain EDA as a viable economic development partner at the federal level in order to successfully market the CEDS program at the regional and local levels. The economic development partners in the Greater Lowell region will continue to participate in the CEDS planning process as long as they believe that there is some benefit to be realized by their individual communities and the region overall.

B. Goals and Objectives

As outlined in the *Greater Lowell Comprehensive Economic Development Strategy (CEDS) for 2004-2008*, the establishment of quantitative and qualitative measures for the ten CEDS Goals is more difficult than dealing with the CEDS Implementation Process. NMCOG has not had sufficient program experience or the staffing to fully document the total number of jobs created or dollars invested by specific goal. Also, as mentioned in the Five-Year CEDS document, each regional or local organization responds to the funding requirements from their federal or state funding agency. For instance, even though we've been working closely with the GLWIB, they respond directly to the funding requirements established by the U.S. Department of Labor (DOL) and the Massachusetts Executive Office of Labor and Workforce Development (EOLWD). However, even given these limitations, NMCOG continues to work with its economic development partners to respond to the CEDS requirements as efficiently and effectively as

possible. Outlined below are the evaluation components for the ten CEDS Goals established in the Five-Year CEDS:

1. 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.

In terms of the quantitative measures, the Greater Lowell region has benefited economically from the growth in high tech industries. In particular, the City of Lowell and the Town of Billerica have experienced exceptional growth in these areas since the early 2000s. Economic growth in the other communities has often been limited by infrastructure barriers, particularly sewer and water infrastructure. Each community is trying to address these barriers on a local and regional basis. As of 2009, the region had submitted only one economic adjustment application and three planning applications to EDA. One public works application has been submitted by the City of Lowell for infrastructure improvements needed to commence construction on the Hamilton Canal Redevelopment project and another public works application is being developed for the Hamilton Crossings project.

The regional economic development capacity at NMCOG has grown appreciably since 2004. The Greater Lowell region had not had a relationship with EDA since 1994 and now there is an ongoing annual CEDS planning process in place. We have an annual RFP process for CEDS Priority Projects, which is more extensive than the OEDP process in place in 1994. There is a permanent CEDS Committee, even though we need to find some replacements for long-serving members. There has also been greater recognition of the advantages that can be derived from a comprehensive “grass-roots” economic development planning process. The number of projects that have been completed or started since 2004, as outlined in the Project Status Report section, have been quite significant.

Since the submission of the *Greater Lowell CEDS for 2004-2009*, several Greater Lowell communities have made significant strides in improving their ability to attract economic development in partnership with the state. For example, the communities of Billerica, Chelmsford, Lowell, Pepperell, and Tewksbury have established Priority Development Sites (PDS) under the Chapter 43D of the Massachusetts General Laws. By designating a site as a PDS, the community agrees to make local permitting decisions within 180 days of the filing of a complete development permit application. In exchange the community receives the following benefits:

- priority consideration for state infrastructure grants;
- priority consideration for quasi-public financing and training programs;
- brownfields remediation assistance;
- enhanced marketing of the parcel by the state;
- technical assistance provided by the regional planning agencies; and
- competitive advantage for economic development opportunities.

The Billerica PDS has resulted in the expansion of EMD Serono and the addition of 100 jobs. Through the PDS program, Billerica was able to secure \$150,000 from the Interagency Permitting Board (IPB) to advance its expedited permitting activities and study infrastructure barriers to further development along Route 3, from Route 128 to I-495. Through its involvement with Billerica, NMCOG focused on potential “branding” opportunities along Route 3 and worked closely with the Towns of Billerica, Bedford and Burlington to address common infrastructure issues along the Middlesex Turnpike.

The City of Lowell has established a Growth District on the site of the Hamilton Crossings project. Under its “Growth Districts Initiative”, EOHED will partner with municipalities that have identified one or more areas within their communities as being appropriate locations for significant new growth, whether commercial, residential or mixed-use. Within those identified “growth districts”, EOHED works with the community and property owners to make the district truly “development ready” with respect to local permitting, state permitting, site preparation (including brownfields remediation), infrastructure improvements, and marketing. The objective is to create a level of “development readiness” comparable to that available at the former Devens Army base, a location proven to be highly attractive to new development. As a result of this designation, the City received \$3 million in funding from EOHED to address transportation and infrastructure needs related to the project.

NMCOG has fully supported development efforts by its member communities. NMCOG actively participated in the five Visioning Sessions for the Hamilton Canal Redevelopment project. NMCOG supported the Town of Dracut in its efforts to attract businesses through the use of the state’s Economic Development Incentive Program (EDIP), which allows for the development of Tax Increment Finance (TIF) agreements between the town and private business. The Town of Dracut created an Economic Opportunity Area (EOA) in the Navy Yard neighborhood and established a TIF agreement with a property owner. NMCOG worked with the Town of Pepperell on the reutilization of the former Pepperell Paper Mill site, preparing a Chapter 43D application and providing technical assistance relative to the EDIP program. NMCOG staff also assisted the Town of Tewksbury in establishing the Tewksbury Economic Development Committee as a means to promote economic development and to attract private investors to the community. NMCOG also assisted the Town on the Lowell Junction project.

2. Workforce Development

Increase the supply of skilled workers for industry in the region through the integration of the economic development and workforce development systems.

Since 2004 job growth in Greater Lowell has lagged behind that of the state as a whole. Across employment sectors, including the traditional blue-collar industries such as manufacturing and construction, there is a strong trend toward an increasing percentage of jobs requiring higher-level skills and credentials, including post-secondary degrees and certificates. The challenges facing the region in terms of its workforce are related to the fact that there is an increasing population of immigrants whose educational attainment is lower than the native population and the region’s population is aging. A major concern of manufacturers in the region is the significant shortage of younger, technically-skilled professionals in the field. Attracting a future

pipeline of workers and providing the academic and technical skills needed to prepare these workers is a priority for employers. According to the GLWIB, half of the dislocated workers receiving services at the Career Center are under the age of 45 years. There is a significant potential supply of workers to fill the pipeline if the right connections are made by educational and workforce development organizations.

With the appropriate Immigration and Custom Enforcement documentation and English language instruction, the region's immigrant population is a valuable asset in the emergent workforce. Community-based education and training agencies that provide basic education, GED preparation, English-as-a-Second language and computer literacy skills development have played a significant role in this area.

The GLWIB Board has played a major role in the workforce development initiatives in the Greater Lowell region. GLWIB strives to build capacity of the workforce system, close the skill gaps that exist between available workers and employers, and enhance the youth worker pipeline. As outlined in the Goal Attainment section, GLWIB has set the standard for workforce development programs in the region. By securing and allocating public and private funds for high quality, innovative and collaborative workforce development programs, GLWIB promotes a skilled and educated workforce, meets the needs of employers, and supports and sustains economic development, business competitiveness, and job creation in the Greater Lowell area.

The changing skill requirements for jobs became evident in the Spring of 2007 when the Merrimack Valley, Greater Lowell and North Shore Workforce Investment Boards, working with a number of customized manufacturers, developed a collaborative proposal designed to meet their workforce training needs. The proposal was approved and funded by the Commonwealth's Workforce Competitive Trust Fund (WCTF). The employers, many of which were engaged in aerospace and defense manufacturing, found that prospective and incumbent employees lacked basic reading, writing, math and communication skills. Companies also indicated that recent high school graduates were not prepared with the academic and technical skills needed for most entry-level positions. Furthermore, older and dislocated workers were intimidated by the changes in automated machine technology that require advance academic or technical skills. New collaborations between employers and educational partners were formed through this project that resulted in training and remediation designed specifically to meet the needs of new and incumbent workers, and the program has been sustained beyond the life of the grant. While the recent recession has slowed the demand for workers, as the economy improves, the issues identified in 2007 will continue to concern employers throughout the Greater Lowell region.

In July 2008, in response to a number of large dislocations in manufacturing plants in Massachusetts and southern New Hampshire affecting a significant number of workers from both states, the GLWIB and MVWIB in Massachusetts and the State Workforce Board of New Hampshire, and the New Hampshire Office of Workforce Opportunity, joined forces to apply for a Regional Innovation Grant (RIG) from DOL. Upon the awarding of the grant, a strategic plan was developed utilizing innovative and creative strategies to strengthen and sustain the manufacturing industry in the Merrimack Valley. The Plan focused on aligning workforce and economic development resources to address the economic impact of a continued decline in the

traditional manufacturing industries and to support the growth of new manufacturing employment opportunities.

The WCTF provided \$500,000 to the Merrimack Valley, Greater Lowell and North Shore WIBs for a two-year grant to provide training for new and incumbent workers in advanced manufacturing skill acquisition in the defense/aerospace sector. The project exceeded all planned performance goals by enrolling 262 participants, providing training for 219 new and incumbent workers, with 184 earning new skill credentials. Training developed through that project continues at the LARE Training Center and Northern Essex Community College.

GLWIB and NMCOG have shared their respective planning documents and have attended each other's training sessions to help integrate the economic development and workforce development systems. The GLWIB Director is a member of the Greater Lowell CEDS Committee and is also an appointed member of our nonprofit entity, NMEDD, Inc. NMCOG has responded to interview requests from GLWIB to improve their overall operations and has recommended different steps to tie both systems together more fully. As mentioned previously, we focused on the Workforce Development system through one of our Public Forums. This effort was achieved in conjunction with Middlesex Community College. Although the unemployment rate in the region has not been reduced, the efforts of GLWIB, Middlesex Community College and UMass Lowell help train the workforce needed for businesses in our region.

The Commonwealth of Massachusetts administers a Workforce Training Grant program that is funded through the state legislature and by employer contributions through a surcharge on unemployment insurance. Between 2004 and 2009, companies within the Greater Lowell region received more than \$ 2 million in grant funding to train over two thousand employees, as shown in Table 66 below.

Table 66: State Workforce Training Grant Awards

Company	Community	Amount of Award	Number of Employees to be Trained	Description of Training
Lab Medical Manufacturing	Billerica	\$48,750	60	Lean manufacturing concepts.
Plumchoice Inc.	Billerica	\$209,851	267	Dispatch center/call center employee training regarding warranty and returns issues, and problem solving
Nuvera Fuel Cells	Billerica	\$50,000	55	Leadership and Management training and Project Management.
Obotech Inc.	Billerica	\$139,155	54	Project management, leadership development, customer service/sales training and technical training.
Spincraft	Billerica	\$50,000	66	Lean manufacturing concepts
FLIR Systems	Billerica	\$142,366	77	Financial management, communication and interpersonal skills, leadership and supervision training, human resource management.
Azonix Corp.	Billerica	\$42,720	44	Manufacturing tools and lean manufacturing

Table 66: State Workforce Training Grant Programs (Cont.)

Company	Community	Amount of Award	Number of Employees to be Trained	Description of Training
DL Tech Machine Inc.	Billerica	\$40,500	17	CAD and CNC programming
Lockheed Martin Corp.	Chelmsford	\$233,043	90	Expanded lean tool use; mechanical and electrical design; team building, meeting management, presentation skills, and program management; information system security.
Zoll Medical Corp.	Chelmsford	\$48,960	45	Total Quality Management, structured problem solving and basic quality tools.
Comcast	Chelmsford	\$214,657	155	Sales training, leadership and management training, customer service, project management and time management.
Dakota Systems	Dracut	\$44,000	60	Lean manufacturing concepts.
Aved	Lowell	\$98,972	99	Leadership training for senior and mid-level managers. Documentation training on new SOPs. Soldering training. Training and development training to create in-house trainers.
Cable Designs and Manufacturing Corp.	Lowell	\$50,000	100	Training on lean manufacturing concepts.
Washington Savings Bank	Lowell	\$38,980	26	Train retail staff on outstanding customer service, cross selling and effective management.
No. Mass. Telephone Workers Credit Union	Lowell	\$39,866	111	Sales training, customer service training, and leadership and management training
M/A COM Federal Credit Union	Lowell	\$6,610	10	Inside sales training, customer service, and effective communication skills.
Butler Bank	Lowell	\$44,400	54	Problem solving, supervision skills, and interpersonal skills
Coating Systems Inc.	Lowell	\$31,200	52	ISO 9001 quality system expectations, customer and regulatory requirements
GES US	Lowell	\$107,205	140	Training on Toyota production methods and lean manufacturing.
Jeanne D'Arc Credit Union	Lowell	\$138,355	125	Leadership and management training, advanced sales and train the trainer training.
Precision Technologies	Tyngsborough	\$49,000	30	Implement ISO into all facets of company
Juniper Networks Inc.	Westford	\$170,828	160	Training on Advanced Microsoft Project Management.
Cynosure Inc.	Westford	\$98,820	116	Customer service training, communications management, team building and training trainers
Totals		\$2,138,238	2,013	

Community Teamwork Inc. (CTI) provides some job training services for its clients. In 2007, CTI was awarded a \$550,000 Youth Build grant from the U.S. Department of Labor (DOL). In

2009, the agency received a Green Jobs Capacity Building Grant from DOL for \$77, 585, as well as a \$699,600 ARRA-funded Youth Build grant.

3. Education

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

Quantitative data related to the Graduation Rates for 2006-2008, graduating seniors self-reported post-graduation plans for 2004 and 2008, and MCAS Proficiency Scores in 2006 and 2008 for each school district in the region can be found in Appendix II.

Education and training will play an increasingly prominent role for both current and future job seekers. In Massachusetts, more than half (60%) of all new jobs related to growth will require an Associate's Degree or higher. While a Bachelor's Degree may be preferable, it is important to recognize that some form of post-secondary education will be essential for those seeking a rewarding career path with good pay and upward mobility. The Greater Lowell region continues to have one of the higher educated labor forces in the country. UMass Lowell, Middlesex Community College and many of the schools in the Greater Boston area have worked together to meet the needs of industry for a quality workforce.

The postsecondary institutions in Greater Lowell are generating a mix of Associate's degrees, Bachelor's degrees, graduate degrees and non-degree certificates that are appropriate to and aligned with the labor needs of the region's employers, especially in engineering and computer science, business administration, and healthcare. The community college system in Massachusetts provides associate degree programs and a number of certificate programs. UMass Lowell provides 120 degree and certificate programs in a wide variety of fields, and works closely with employers engaged in bio-manufacturing, plastics engineering, design and quality control through its Corporate Training Department. Recently, construction commenced on its Emerging Technology Center, which will further position the region as a leader in the technology industry.

Investment in Lowell's post secondary institutions has been significant since the *Annual CEDS Update for 2008* was submitted. Middlesex Community College received \$21 million from the State bond bill to expand its downtown campus and create a Performing Arts Center in the Rialto Building. UMass Lowell received nearly \$60 million through the state bond bill to build a \$40 million academic building on the South Campus, modernize the north quad, start a new medical device program, upgrade the M2D2 building at the site of the Institute of Plastics Innovation, upgrade civic and athletic facilities, improve stormwater management, and renovate Olney Hall on the North Campus.

The Middlesex Community College-Northern Essex Community College Partners for Progress was established in February 2009 and is dedicated to promoting economic development in the region by building awareness of the wealth of customized, cost-effective, education and training programs available to the region's businesses through the Business and Industry Centers at both community colleges. Together, Middlesex Community College and Northern Essex Community

College offer more than 2,700 non-credit workforce development courses and enroll more than 27,000 area residents in workforce training programs annually.

4. 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.

The Greater Lowell region has addressed this goal as well as any other goal. Every community in the region completed housing production plans for DHCD and the number of new Chapter 40B housing units created has been summarized in the Regional Economy section. Funding from HUD, DHCD and other public sources has enabled affordable housing to be built in the region.

The downturn in the housing market has depressed the values of the housing stock and increased the number of foreclosures in the region. When the Five-Year CEDS was completed in 2004, most people felt that the housing boom would go on for the foreseeable future.

The Lowell Foreclosure Prevention Task Force has been formed to address the foreclosure issues within Lowell. Members of the Lowell Foreclosure Prevention Task Force include AmeriHome Mortgage, TD Bank, Lowell City Council, DPD, City Manager's Office, Cambodian Mutual Assistance Association (CMAA), Coalition for a Better Acre (CBA), Community Housing Inc., CTI, Congresswoman Tsongas's Office, Enterprise Bank, Jeanne D'Arc Credit Union, LDFC, MassBank, MassHousing, Merrimack Valley Housing Partnership (MVHP), Merrimack Valley Project, Northern Middlesex Registry of Deeds-Registrar's Office, ONE Lowell, UMass Lowell Center for Family, Work and Community. Every LDFC member bank is a member of the Task Force Triage Committee. Counseling services are provided by the Homeownership Preservation Foundation in partnership with the Lowell Foreclosure Prevention Task Force agencies and volunteers for those homeowners concerned about or facing foreclosure.

In 2006, CTI provided 2,068 individual and family households with a total of \$552,945 in one-time, targeted funding assistance (fuel and rental/mortgage assistance, car repairs, childcare) that kept them in their homes and working, and prevented them from falling into the incredibly expensive and inefficient homeless shelter system. If these 2,068 households had fallen into the shelter system, the cost to the state—for one month of shelter at \$3,000 per family--would have been well over \$6 million. In 2008, the City of Lowell developed *Partnership for Change: Action Plan to End Homeless in the City of Lowell*, which outlined new initiatives and opportunities for Lowell and the Greater Lowell community to address the challenge of homelessness. As such, it opened what will be a continuing dialogue of difficult and complex economic and social choices, and housing affordability. The Action Plan provided a broad roadmap to assess the current system of “managing” homelessness and explore new, more innovative and cost effective “Prevention” and “Housing First” approaches that are greatly reducing and/or eliminating homelessness in communities all across America. A sixteen member executive committee was formed, along with eight subcommittees (NMCOG served on the Housing Subcommittee) to produce an eight point strategy to:

1. Prevent homelessness.
2. End individual and street homelessness.
3. Rapidly re-house families who become homeless and minimize the impact of homeless on children.
4. Identify at-risk youth and end youth homelessness.
5. Ensure that seniors can age in the community in peace and safety.
6. Move beyond shelter to housing.
7. Develop employment and educational assets.
8. Administer and oversee the Action Plan, measure progress and evaluate success.

The business community has indicated their interest in the production of housing that is affordable to their workforce. In order for businesses to expand or for other businesses to relocate in this area, there needs to be housing available for their workers. NMCOG has focused extensively on this area due to its strong correlation with a growing economy. The establishment of NMEDD, Inc., as the non-profit arm of NMCOG, will enable us to tie economic development and housing initiatives even closer together.

5. 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.

As outlined previously, ONE Lowell has been particularly helpful in assisting us in adding more minority members to our CEDS Committee. Similarly, ONE Lowell plays a unique role in advancing the causes of immigrants and minority groups within the City. Within the Goal Attainment section in the previous Annual CEDS Updates, the accomplishments of the organization have been recognized at the federal level, as well as at the local level.

The International Institute has continued its work in the areas of refugee resettlement, education programs and legal services, and citizenship programs. The organization has a presence in Lowell and has been in operation since 1918. Hundreds of Cambodians have gained their citizenship by working with One Lowell and the International Institute.

NMCOG is seeking more opportunities to interact with the minority and low-income communities and has utilized the offices of CTI, ONE Lowell, GLWIB and CBA to determine the needs of these groups. NMCOG staff has participated at various city-sponsored events where there is a greater representation of minorities present. NMCOG needs to do more work in this area.

6. Pockets of Distress

Target assistance to those neighborhoods and communities in the region that have not shared the economic benefits of the regional economy.

The City of Lowell is the only community in the region that meets the EDA distress criteria related to unemployment rates and per capita income. For over two years, the average

unemployment rate in Lowell has exceeded the average national unemployment rate for the same period by more than 1%. In terms of per capita income, Lowell is slightly higher than 80% of the national per capita income according to the 2000 U.S. Census. However, most of the Census Tracts in the City are closer to 70% of the national per capita income, including the Census Tract in which the Hamilton Canal project is located.

This data has been documented in earlier sections of this document, and in the grant applications submitted by NMCOG for economic adjustment and short-term planning funds. Therefore, NMCOG has targeted its efforts to the City of Lowell, while also meeting the needs of its suburban communities that have experienced layoffs. In many cases, these layoffs in the towns directly impact Lowell residents.

Since the completion of the *Greater Lowell CEDS for 2004-2009*, several projects have been completed within Lowell's lowest income neighborhoods. The Acre Urban Renewal Plan was completed and the Lowell Senior Center was constructed on a site within the Acre neighborhood. In addition, a major grocery store was constructed nearby, providing access to affordable and fresh food for area residents. In 2008, Jeanne D'Arc Credit Union began constructing a new 50,000 square foot corporate headquarter on Father Morrisette Boulevard adjacent to downtown Lowell. The Credit Union has served minority neighborhoods in Lowell for many years. Lowell General Hospital announced plans to invest \$140 million to add a 230,000 square foot building, with a new emergency room, and 125 new beds and new operating rooms. The Hospital will be better able to serve the region's minority community following the expansion.

NMCOG worked continually with the EDA Regional Office to promote the Hamilton Canal project as a candidate for EDA Public Works funding. This project already has extensive support from the City of Lowell and the Commonwealth of Massachusetts and it makes a great deal of sense to include EDA as an economic development and financial partner. Completion of this project will bring tremendous economic opportunity to an area that has not seen any reinvestment in decades. NMCOG appreciates the support of the Regional Office in moving this critical project forward.

Among the list of CEDS Priority Projects, the top three projects for the region are located in the City of Lowell: Hamilton Canal, Hamilton Crossing and the JAM Plan. Groundbreaking on the Hamilton Canal Redevelopment project is anticipated in the near future. Design work is continuing on the Hamilton Crossing project and NMCOG staff is working with the developer in terms of providing technical assistance on an EDA public works application for the project. Portions of the JAM Plan have been completed, including the construction of the Early Parking Garage, demolition of derelict properties and site work related to the Hamilton Canal project and the new \$175 million courthouse.

7. 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.

As staff to the Northern Middlesex Metropolitan Planning Organization (NMMPO), NMCOG plays a unique role in the transportation arena for the state and region. NMCOG is the premier agency for Greater Lowell in addressing funding for highway and transit projects at the federal and state levels. NMCOG has also recognized the importance of tying economic development and transportation activities together. NMCOG is one of the few agencies to have a joint economic development/transportation component in its work plan with MassHighway, which provides support for a number of projects, including the Lowell Junction project.

A listing of many of the transportation projects and other infrastructure projects that have been completed or initiated since the 2004-2009 CEDS was submitted can be found below in Table 67. Many of these projects will have a significant impact on the region's capacity for accommodating future economic development. Whether it is based on the quantitative or qualitative measures, NMCOG clearly exceeds the evaluation criteria established for this goal.

Table 67: Status of 2004-2009 CEDS Transportation and Infrastructure Projects

Community	Project	Status
Billerica	Republic-Esquire-Sterling Sewer	Complete
Billerica	Initial phase of town-wide sewer project	Complete
Billerica	Subsequent phases of town-wide sewer	Complete/ongoing
Billerica	Water Treatment Plant	Complete
Billerica	Route 4 Bridge	Complete
Billerica	Reconstruction of Alexander Road and Cook Street	Complete
Billerica	Signal upgrades along Route 3A (4 locations)	Complete
Billerica	Andover Road Bridge	Complete
Billerica	Rangeway Road Improvements	Complete
Billerica	Concord Road Phase II	Complete
Billerica, Chelmsford, Lowell, Westford, Tyngsborough	Route 3 Widening	Complete
Chelmsford	Princeton Street Bridge	Complete
Chelmsford	Town-wide sewer	Final phase nearing completion
Chelmsford and Westford	Bruce Freeman Rail Trail	Complete
Dracut	Lakeview Avenue Bridge	Complete
Dracut	Route 113 Industrial Zone Sewer Development	Complete
Lowell	Chelmsford, Plain and Powell Streets intersection improvements	Complete
Lowell	Combined sewer overflow project	Ongoing
Lowell	Morton Street Bridge	Under construction
Lowell	Hunts Falls Rotary Bridges	Under construction
Lowell	Rourke Memorial Bridge rehab	Complete
Lowell	Gallagher Square reconstruction	Complete
Lowell	Riverwalk Extension	90% Complete
Lowell Regional Transit Authority service area	2004-2009 Projects	Complete
Pepperell	Groton Street Bridge	Under construction
Tewksbury	Sewer Construction-phases 8, 9, 10 and 11	Complete
Tewksbury	Manley Street Brook restoration	Complete
Tewksbury	Water distribution system	Ongoing
Tewksbury	Final phase of sewer construction	Nearing completion
Tewksbury	Main and Shawsheen Streets Intersection improvements	Complete
Tyngsborough	Construction of temporary bridge over the Merrimack River	Complete
Tyngsborough	Tyngsborough Bridge rehab	Under construction
Westford	Route 225 Bridge over Beaver Brook	Complete
Westford	Route 110 and Powers Road intersection improvements	Under construction
Westford, Chelmsford, Lowell, Tewksbury	I-495 Corridor Study	Complete

The Route 225 relocation project in Westford and the Thorndike Street Pedestrian Bridge project in Lowell have been dropped from consideration.

In addition to the projects mentioned in the *Greater Lowell CEDS for 2004-2008*, several other transportation and infrastructure initiatives have moved forward since 2004. Intersection improvements have been constructed at the intersection of North Road and Dalton Road, and at the intersection of North Road and Parkhurst Road in the Town of Chelmsford. The Lowell Junction project progressed with \$12.6 million in funding provided through the Life Sciences Bill, \$1.4 million in Massachusetts Opportunity Relocation and Expansion (MORE) program funds, and \$1 million in Public Works and Economic Development (PWED) funds.

In Billerica, a new drainage system and five reconstructed roadways were completed in the Michael Road area (including Crooked Spring Road, Theresa Avenue, Hardwood Road, and Sheldon Street). Sewer Contract 33 at River Pines Phase II was completed in the summer of 2007, and consisted of installing 6.9 miles of 8” sewer line, 1.1 miles of low pressure sewer, 300 feet of 6” water main and 0.3 miles of force main sewers. Water main improvements and replacements were constructed at various locations throughout the Town commencing in July 2007. Funding for the \$1.7 million Shawsheen River Pump Station was approved at Spring 2008 Town Meeting, and construction began in November 2008. Sewer contract 34A was completed in Spring 2009.

The Town of Chelmsford approved \$15 million for the construction of the next phase of the sewer program in East Chelmsford. The North Chelmsford Waste District announced plans for a \$7.8 million water treatment plant near Edgelawn Avenue.

In Lowell, the National Park Service received \$490,000 in federal Alternative Transportation funds to replace sections of trolley track, bridges and passenger decks.

8. 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.

NMCOG plays a prominent role in the region as part of the Massachusetts Environmental Policy Act (MEPA) review process. Since the completion of the *Greater Lowell CEDS for 2004-2008*, NMCOG has reviewed an average of three development projects per month, which places the region in the “good” category. NMCOG actively worked on Open Space and Recreation Plans for its member communities and saw a 20-year old project come to fruition in the Bruce Freeman Bike Path.

Quality of Life issues are important to the residents of the Greater Lowell region from an economic development perspective. The communities in this region have utilized funding through the Community Preservation Act to finance open space and historic preservation initiatives, as well as to support affordable housing projects

The Town of Billerica purchased the Call Street property along the Concord River, which will be utilized as Open Space and Conservation land, as well as the Cabot property along the riverfront area on the Concord River. The Town will be preparing a Master Plan to determine the future use of the Cabot land. A canoe launch and public access improvements were constructed as mitigation for the Route 4 Bridge project. This project was a collaborative effort between the Town, the Army Corps of Engineers, the National Park Service, and the U.S. Fish and Wildlife Service. The Lampson Field recreation improvements were also completed in 2007.

The Town of Chelmsford purchased 22 acres of farmland off Robin Hill Road under a 61A agreement for \$1.5 million using Community Preservation Funds. The Town of Pepperell received \$320,000 for the purchase of 140 acres of wildlife habitat at the Keyes property along River Road and Canal Street. In Tyngsborough, the Flint Pond Dam was funded through the environmental bond bill.

The Town of Westford acquired the 300+ acre East Boston Camp parcel and purchased the 111-acre Stepinski parcel. These properties are contiguous to the town wellfield and other town-owned land. The town is also expanding the Cameron Senior Center.

The City of Lowell received \$150 million in Brownfields funds from EPA to transform the parcel at Fay Street into a neighborhood park. Environmental Bond Bill funds were approved for the \$2.5 million Bellegarde Boathouse and the Concord River Greenway.

9. Technology

Enhance the region's strengths within its "cluster industries" by promoting technological advancements and expanding the technological infrastructure in the region.

UMass Lowell continues to lead the way on biotechnology and nanotechnology issues in the region. Its collaboration with Northeastern University and the University of New Hampshire has demonstrated its willingness to work with other universities to focus its efforts on nanotechnology. The passage of the Life Sciences bill in Massachusetts in 2008 provided more financial opportunities for private companies as the State competes with other states across the country. NMCOG's work with the Massachusetts Biotechnology Council and its member communities could lead the way in putting these communities at a greater advantage for attracting biotech, nanotech and other emerging technology firms. NMCOG has also worked with the City of Lowell to address the needs of these industries within its zoning ordinance.

The City of Lowell has benefited from the relocation of numerous technology companies, including Motorola, Xenith, Telles/Metabolix, Alliptia, and Global Energy Services. Other companies, such as Konarka, Alpha Imaging and DS Graphics, have expanded in the City. Billerica and Chelmsford have also benefited from the relocation or expansion of firms, such as EMD Serono and Nuvera Fuel Cells. Westford has benefited from the expansion of Red Hat, Puma and IBM. These trends are important to the overall growth of the economy in the region. The region has earned an excellent evaluation score on this goal.

10. 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.

The financial investments in the region have exceeded the evaluation criteria outlined in the Five-Year CEDS. As outlined in the Goal Attainment section, there are a number of retail, commercial and industrial projects being developed in the region. The State has focused on improvements to the Hamilton Canal and Lowell Junction projects and has maintained its commitment to economic development throughout the region. The Greater Lowell region has earned its reputation as a place for private firms to invest their money. The new headquarters for Jeanne D'Arc Credit Union reflects the confidence of local financial institutions in the economic future of this region.

Chelmsford Town Meeting approved a five-year TIF agreement with Arbor Networks, which specializes in security and network management. The former site of Skip's Restaurant was redeveloped as a retail plaza. IBM expanded its Westford facility, adding 42 new positions.

In 2007, Target announced that it would redevelop the Plain Street Shopping Center along the Connector by constructing a 137,000 square foot Target Store, generating \$1.6 million in new tax revenue and creating 200 jobs. At the same time, Lowe's announced that it would construct a 153,200 square foot retail store in Chelmsford Street at a cost of \$17 million, creating 110 jobs with an annual payroll of \$3.5 million. The City of Lowell received a \$2.2 million MORE grant to fund needed infrastructure improvements for the Lowe's project.

In 2008, Beacon Power relocated to Tyngsborough through its renovation of the former Hussey Plastics building. The company received \$5 million from the MassDevelopment Technology Fund and the Massachusetts Technology Collaborative to expand its flywheel production facility and create 20 additional clean energy jobs.

C. 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.

Since 2004, there has been significant movement on the Priority Project List, whereby important projects in the region have received their funding through sources other than EDA. The Status of the Priority Projects Listing provides an overview of every project that has been completed, started or

dropped from the 2004 Priority Project List. NMCOG will continue to apply for planning or economic adjustment funds to maintain the continuous, comprehensive “grass-roots” economic development planning process. NMCOG has exceeded the evaluation criteria for the CEDS Priority Projects component.