CHANGES IN THE REGIONAL ECONOMY

AN ANALYSIS OF

REGIONAL ECONOMIC PERFORMANCE

IN METROPOLITAN BOSTON

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Introduction

This report examines regional economic performance. We consider the economic well-being of residents living in Greater Boston, describe the workforce, and examine the industries that make up the region's economic structure. In looking at Greater Boston's economic position, the report addresses the following questions:

- How have the economic lives of Metro Boston residents been affected by the changing economy?
- What are the characteristics of the region's workforce?
- What is the structure of the regional economy and how has it changed?
- How does the region compare on a number of indices of economic health?

Greater Boston's Economic Well-Being: A Fragile Prosperity

Greater Boston fares well on most indicators of overall economic well-being, such as per capita income, poverty rate, and unemployment, especially when compared to the U.S. as a whole. Many regions would be envious to be in Greater Boston's place. Despite this standing, there are signs that the region's relative prosperity is fragile, as it has growing levels of income disparity, widening along geographical and racial lines. The last recession hit the region hard, and by historical standards unemployment remains elevated. A high cost of living undercuts the earning power of families, and eats away at the economic stability of those on fixed incomes.

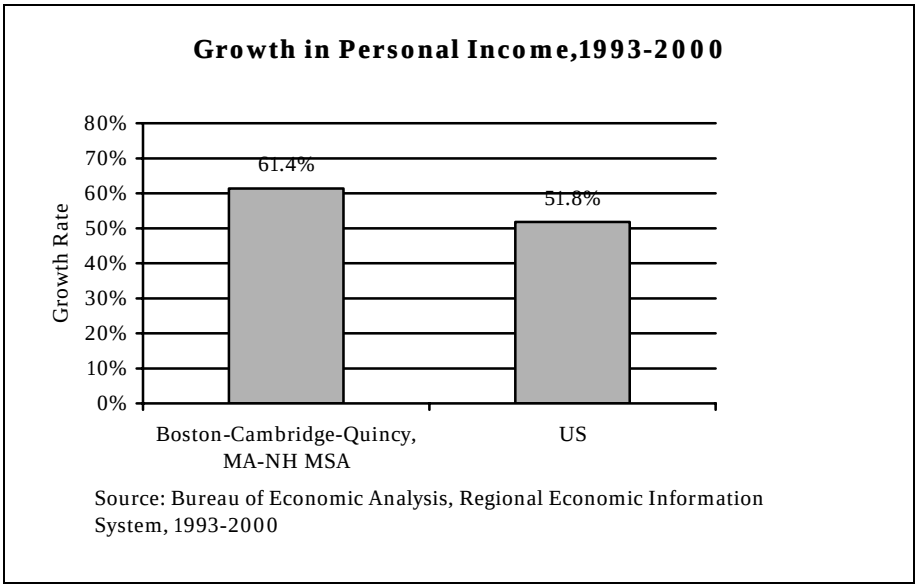
Relatively high prosperity during the 1990's and today relative to the nation as a whole.

Residents of the Boston metropolitan area[1] benefited from the economic expansion of the 1990's. Jobs increased by 483,000 from 1991 to 2000, many of them in high paying high-tech and innovation sectors. Those wages and salaries added more money to the region's already high personal income. In 1993 the Boston region ranked 8th in the nation in personal income.[2] Despite this already high base, the region's income growth still outpaced the national average over the next decade. Between 1993 and 2000,

[1] See Appendix B for a discussion of the different definitions of the Boston metropolitan area used throughout this document.

[2] Bureau of Economic Analysis, Regional Economic Information System, 1993-2000

personal income in the Boston metro region grew by 61.4 percent, while the growth rate for the nation as a whole was only 51.8 percent.[3] (See Chart).



That elevated level of income still remains high today, despite some tough times during and after the 2001-2002 recession. In 2003, for example, the year for which the most recent data area available, the Boston region[4] had an estimated per capita income of $31,948. That average put Metro Boston 5th among 361 metro areas in the U.S. That is 37 percent higher than the national average according to the Bureau of Economic Analysis. Household and family incomes are also high, with the Boston region's median household income an estimated $58,971 and median family income $76,701 in 2003, the most recent year for which data are available. Those income levels are 35 percent and 47 percent higher than the nation as a whole. (See Chart).

Income Characteristics of the Boston MA-NH PMSA Relative to the United States, 2003

	Per Capita Income	Median Household Income	Median Family Income
Boston PMSA	$31,948	$58,971	$76,071

[3] Bureau of Economic Analysis, Regional Economic Information System, 1993

[4] We use two sources to present the personal income data here. The per capita income data are from the U.S. Census Bureau's American Community Survey. The ranking and comparison data are from the Bureau of Economic Analysis. The Census Bureau and BEA use different definitions of the metro region. The Census Bureau uses a smaller area with a population of roughly 3.3 million in 2003 called the Boston MA-NH PMSA. BEA uses a county-based definition which covers the Boston-Cambridge-Qunicy, MA-NH MSA. That definition includes 4.4 million people in the region. A more thorough discussion on these and other geographic definitions of the region, see Appendix B.

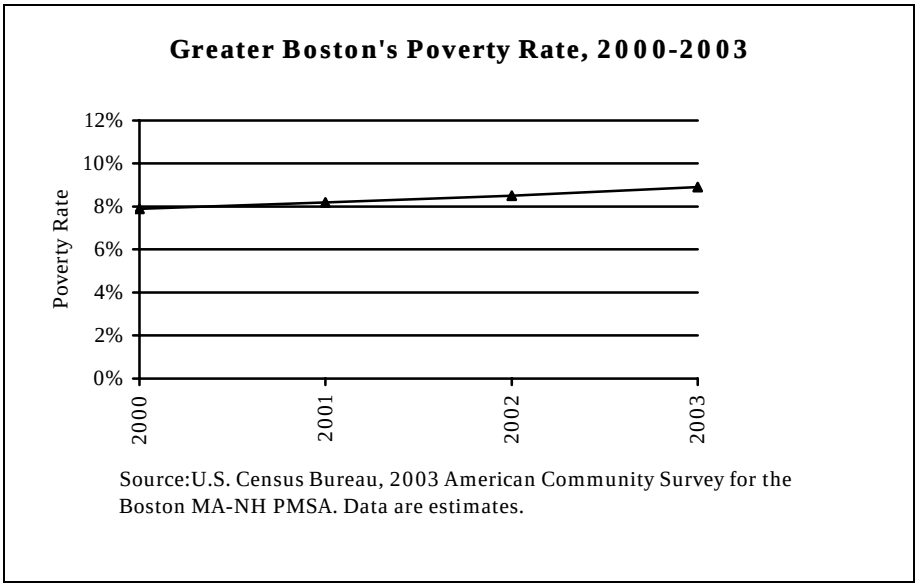
United States	$23,110	$43,564	$52,273

Source: U.S. Census Bureau, 2003 American Community Survey, Data are estimates.

Underlying this prosperity is rising disparity between the haves and have-nots.

Although the region enjoyed a strong economy and relatively high levels of income during the 1990's, income disparities grew in the region and exist today. These disparities are driven primarily by geography and somewhat by race.

In 1990, the region had a poverty rate of 8.2 percent. That rate increased to 8.6 percent by the time the 2000 Census was completed. For its part, Massachusetts suffered the decade's third-largest poverty rate increase. More recent data estimates from the Census Bureau's American Community Survey show that the rate of poverty continues on an upward trend from 2000 to 2003. (See Chart).



Source:U.S. Census Bureau, 2003 American Community Survey for the Boston MA-NH PMSA. Data are estimates.

Not only is poverty increasing, but the level of income disparity between residents of the region's central city and suburbs has become worse. Two indices of central city-suburb disparity show that widening gap. According to an index compiled by The Brookings Institution, greater Boston's ranking among the 50 largest metro regions grew worse in terms of central city-suburb income disparity. Among 50 regions tracked between 1990 and 2000, Metro Boston went from a rank of 15th worst in 1990 to 13th worst in 2000.[5] A similar index compiled by the Lewis Mumford Center for Comparative Urban and Regional Research shows Greater Boston's central city-suburb disparity also on the rise. The Center's data show Greater Boston's level of disparity growing between 1990 and 2000, from "moderate disparity" in 1990 to "high disparity" in 2000.[6] A third

[5] The Brookings Institution, *The Living Cities Census Series*, October 2004.

[6] Lewis Mumford Center for Comparative Urban and Regional Research, *Central City-Suburb Disparity Index*, 2002.

study by David Terkla, an economist from the University of Massachusetts Boston, shows that the region is experiencing a "distressing expansion of inequity, not only among individuals, but also among communities."[7] Inner-core cities, such as Boston, Chelsea, Everett, Lynn, Malden, Quincy, and Revere, got poorer from 1990 to 2000 relative to the region's average household income. This contrasts to increasing incomes relative to the average among towns and suburbs along the I-495 corridor, in particular.

Greater Boston's income disparity is also greatest between racial groups. A study released in 2003 by PolicyLink shows that areas in the region with the highest concentration of poverty are majority persons of color. In Greater Boston's highest poverty census tracts (30 percent poverty or more), the study reports, 27 percent of the residents are Hispanic, 17 percent black, and 9 percent Asian. [8] These groups combined only make up 19 percent of the region's population.[9]

Feeding this fragile prosperity is a loss in jobs, lingering unemployment, and a high cost of living.

The region's residents have been hit with deep job loss and a recession that has been longer than the nation as a whole. The 2004 Index of the Massachusetts Innovation Economy showed that Massachusetts generated fewer jobs and had a deeper decline in job loss from 2002-2003 than any other leading technology state.[10] That job loss was centered in "innovation sectors," which are concentrated in the Boston metro region.[11] Greater Boston alone lost a total of almost 100,000 jobs between 2001 and 2003, according to regional data from the Bureau of Economic Analysis.[12]

The job loss has caused the number of unemployed workers in the region to double. There are roughly 30,000 more unemployed workers in Greater Boston than there were before the recession. In 2004, the region's unemployment rate was 4.7 percent. That is up from rates that went as low as 2.4 percent in 2000.[13] A growing number of discouraged workers who have dropped out of the labor force and a decline in population have kept the region's unemployment rate from rising even higher. (See Chart on Next Page).

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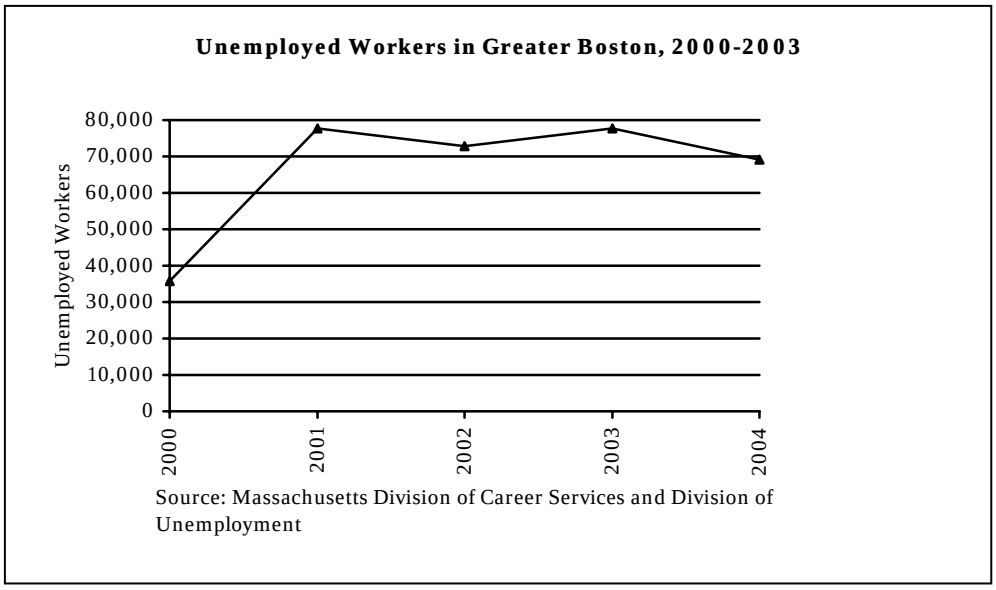
[7] David Terkla, *Growing Disparities among Greater Boston Communities during the 1990s*, Massachusetts Benchmarks, Fall 2003.
[8] Dwayne Marsh, et. al., *Promise and Challenge: Achieving Regional Equity in Greater Boston*, PolicyLink, May 2003.
[9] Guy Stuart, *Boston at the Crossroads*, Rappaport Institute of Greater Boston, Harvard University, Working Paper 12, December 14, 2004.
[10] The leading technology states to which Massachusetts is benchmarked are California, Colorado, Connecticut, Minnesota, New Jersey, and New York.
[11] These sectors include software, computers, innovation services, diversified industrial support, defense, textiles and apparel, financial services, healthcare technology and postsecondary education.
[12] Bureau of Economic Analysis, Regional Economic Information System
[13] Massachusetts Division of Career Services and the Massachusetts Division of Unemployment Assistance, Labor Market Information



Finally, the earning power of families living in Greater Boston is weakened by the region's high cost of living. Greater Boston residents and families contend with the nation's sixth highest cost of living, trailing the New York, San Francisco, Los Angeles, San Diego, and Washington DC metro regions.[14] (See Chart).

U.S. Metropolitan Areas with Highest Cost of Living, Fourth Quarter 2003

Metropolitan Areas	Cost of Living Index
New York-Wayne-White Plains, NY-NJ	217.1
San Francisco-San Mateo-Redwood City, CA	169.8
Los Angeles-Long Beach-Glendale, CA	148.8
San Diego-Carlsbad-San Marcos, CA	139.8
Washington-Arlington-Alexandria, DC-VA-MD-WV	138.8
Boston-Quincy, MA	136.9
Fairbanks, AK	124.7
Philadelphia, PA	120.8
Santa Fe, NM	118.3
Burlington-So.Burlington, VT	116.2

Source: U.S. Census Bureau, Statistical Abstract of the United States, ACCRA Cost of Living Index, Fourth Quarter 2003.

A major driver to the high cost of living is the region's well-documented climb in housing prices even as incomes fall. Metro Boston has the third highest housing prices in the nation, according to one local study.[15] Another strong factor is the rising costs in health care.

[14] U.S. Census Bureau, Statistical Abstract of the United States, *ACCRA Cost of Living Index*, Fourth Quarter 2003.

[15] Myron Orfield, Thomas Luce, and Benjamin Oleson, *Boston Metropatterns: A Regional Agenda for Community and Stability in Greater Boston*, October 2001.

Greater Boston's Workforce:

A Highly Skilled, But Slow Growing Talent Base

Firms in Greater Boston compete globally in an environment where access to appropriately skilled labor is one of the most critical factors in their competitiveness. This is especially true for the region's concentration in innovation and knowledge-intensive industries: biotechnology, software and communication services, financial services, higher education, defense-related manufacturing, information services and health care technology. These industries are well-positioned to compete due to the region's highly skilled and talented workforce.

There are some threats to this competitive position and the region's renowned world class workforce. The labor force has stopped growing, save for foreign born immigrants. Roughly one-third of the workforce is under-skilled or unprepared for jobs in the new economy. Recent graduates, some of the most highly educated workers in the nation, are finding it more difficult to choose Greater Boston as their long term home.

A highly educated workforce with a concentration in science and engineering

Working age residents of Greater Boston are among the highest educated in the nation. In 2000, almost 4 in 10 residents 25 years and older in metropolitan Boston earned a Bachelors degree or higher. Only the San Francisco and Washington, D.C. metro regions fair better among large regions. (See Chart on Next Page).

The state and region also has a high concentration of students graduating with science and engineering degrees. These graduates fuel the growth of technology and research-based companies and industries and give the region a strong workforce advantage. In 2003, Massachusetts' colleges and universities awarded almost 5,000 students with undergraduate or graduate level engineering degrees.[16] The region ranked 3rd among the 50 largest metro regions in degrees awarded in both science and engineering, according to the Progressive Policy Institute's New Economy Index. Metropolitan Boston trailed only smaller "college towns," Austin and Raleigh-Durham, on this Index.[17] Data from the National Science Board show that Massachusetts as a whole ranks 4th among the 50 states for share of 18 to 24 year old residents earning a bachelors degree in science or engineering. Massachusetts only trails Vermont, Montana, and South Dakota, all states with a small total of 18 to 24 year old residents.[18] One area of concern, however, is that the region's lead may be fading. The 2004 Index of the Massachusetts Innovation Economy reports that the rate of increase in engineering degrees awarded in the state is slowing relative to the nation as a whole.

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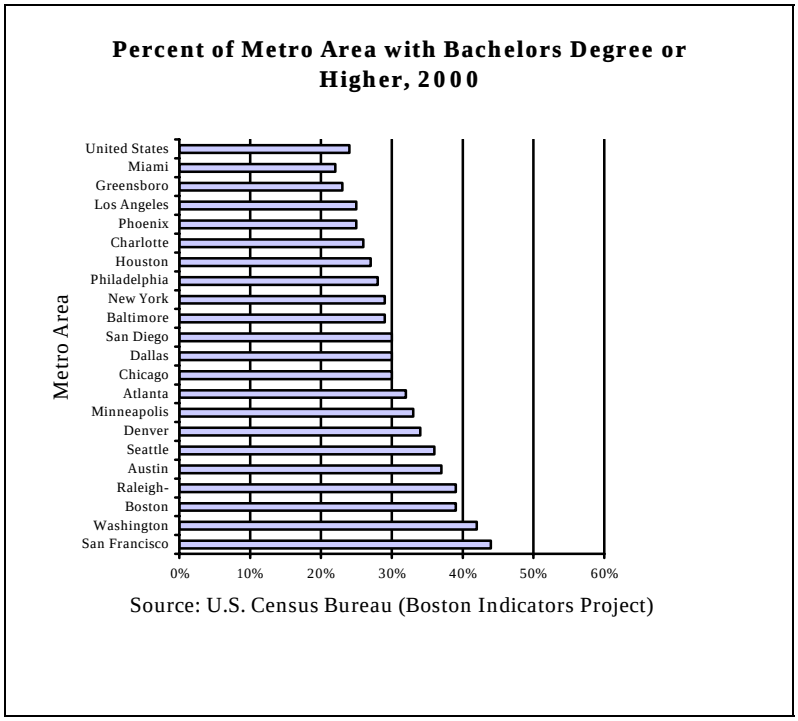
[16] Massachusetts Technology Collaborative, *2004 Index of the Massachusetts Innovation Economy*, Westborough Massachusetts, 2004.

[17] The Metropolitan New Economy Index, Progressive Policy Institute, April 2001.

[18] National Science Board, Natural sciences & engineering bachelor's degrees conferred per 1,000 18–24-year-olds, by state: 1990, 1995, and 2000.



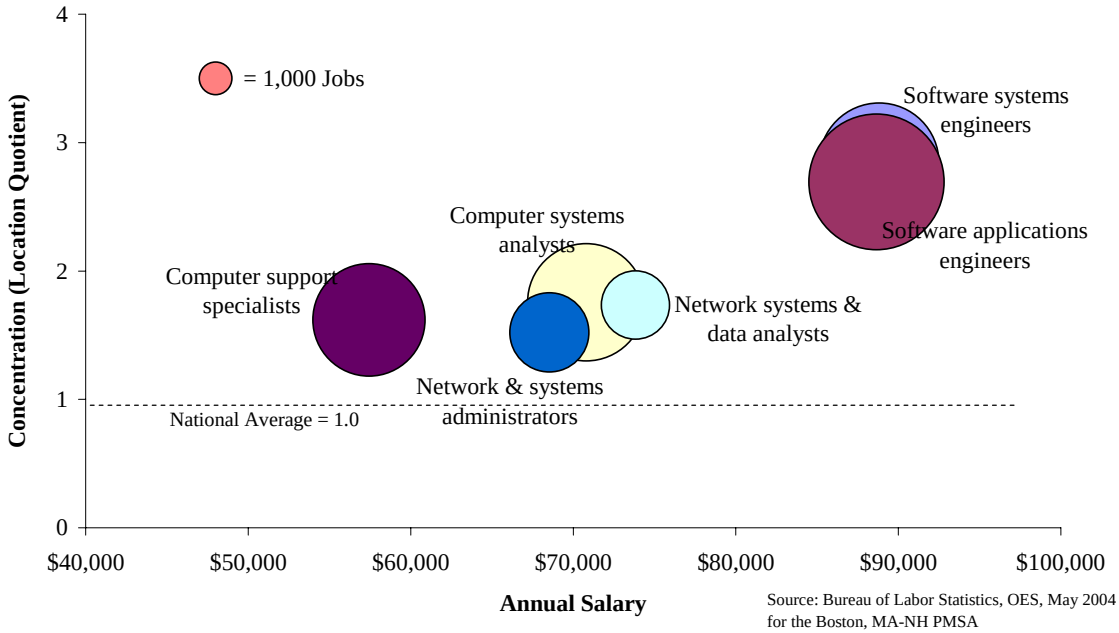
A talent base that is concentrated in high-skill, technical occupations

One of the region's greatest labor assets is its residents' occupational skill base. Workers who live in the region are concentrated in occupations that require high levels of creativity, acquired skill, and education. The region's residents have a number of core occupational strengths relative to the workforce in other metro areas and the U.S.

One of these core strengths is computer software and systems engineers. These occupations include people who design and develop software, write program code, and analyze computer system needs. In 2004 there were upwards of 80,000 residents in the region working in this occupational field. Software engineers and system analysts have a particularly high concentration, almost two to three times the concentration of the labor force in the U.S.[19] (See Chart). The Milkin Institute's 2004 State Technology and Science Index ranked Massachusetts 1st in the nation in concentration of software engineers.[20]

[19] Bureau of Labor Statistics, Occupational Employment Statistics, May 2004.
[20] Ross DeVol and Rob Koepp, State Technology and Science Index: Enduring Lessons for the Intangible Economy, Milkin Institute, March 2004.

Software and Computer Systems Occupations with High Concentration in Greater Boston Relative to U.S., 2004

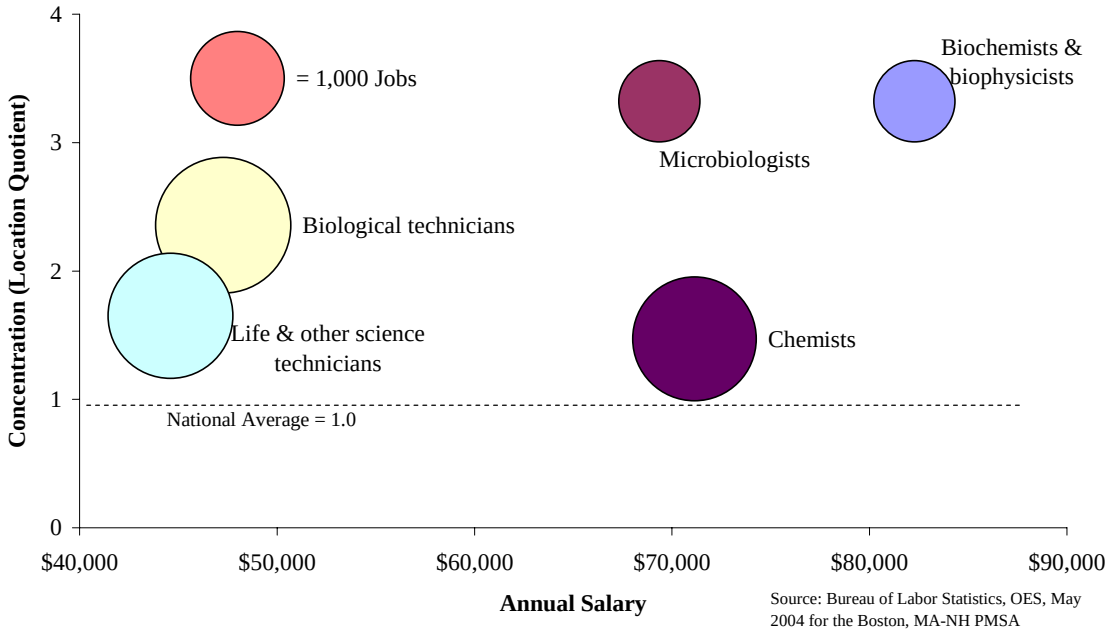


Source: Bureau of Labor Statistics, OES, May 2004 for the Boston, MA-NH PMSA

The Milkin Index also ranked Massachusetts 3rd in the nation in concentration of life science occupations, another core occupational strength. Like software, regional data for metropolitan Boston show certain life science occupations, biophysicists, microbiologists, and biomedical engineers, at two to three times the concentration of the U.S. labor force. The overall size of this occupational cluster is much smaller, with close to 30,000 residents in life sciences occupations in 2004.[21] (See Chart on Next Page).

[21] Bureau of Labor Statistics, Occupational Employment Statistics, May 2004.

Life Sciences Occupations with High Concentration in Greater Boston Relative to U.S., 2004



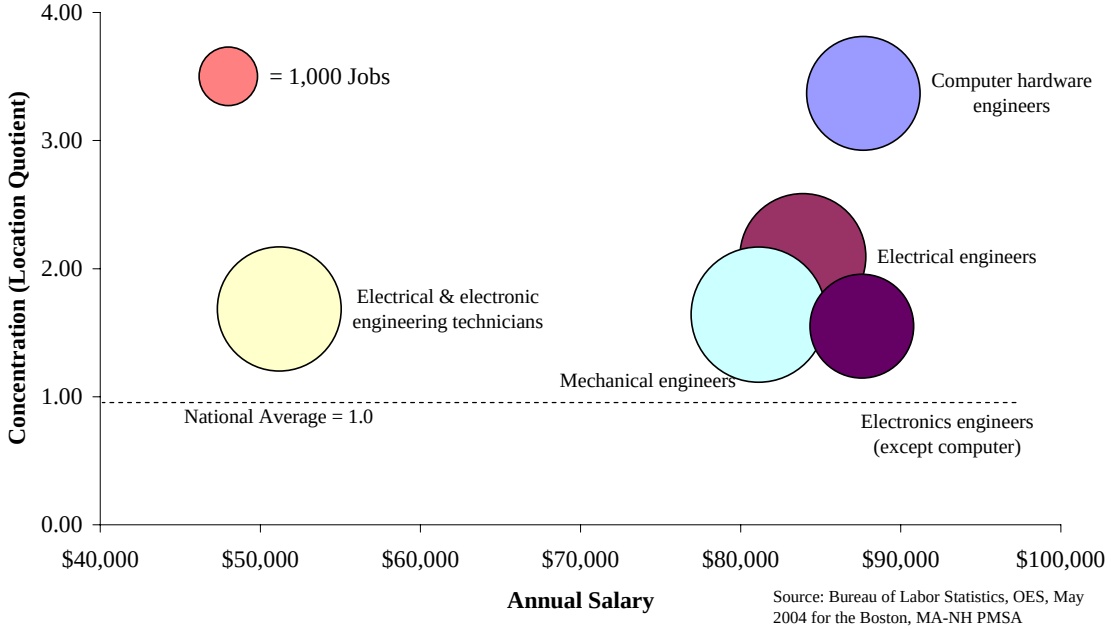
Source: Bureau of Labor Statistics, OES, May 2004 for the Boston, MA-NH PMSA

A third core occupational strength of residents is engineering. Many of these engineers design, develop, test, and supervise the manufacturing of technology products. Some are more involved with broader production-related problems such as designing and planning control systems and assuring product quality. Others may be heavily involved in the research and development of new products. The region's labor force has developed engineering specialties in the areas of biometrics, signal processing, computer sciences, advanced materials, and, most recently, nanotechnology fabrication.

There are upwards of 42,000 residents in Greater Boston who are engineers.[22] A large portion of these being electrical and electronic-related engineers and mechanical engineers. Smaller groupings of engineers include those in the computer, industrial, and civil fields. (See Chart on Next Page).

[22] Bureau of Labor Statistics, Occupational Employment Statistics, May 2004.

Engineering Occupations with High Concentration in Greater Boston
Relative to U.S., 2004



Source: Bureau of Labor Statistics, OES, May 2004 for the Boston, MA-NH PMSA

A stagnant labor force

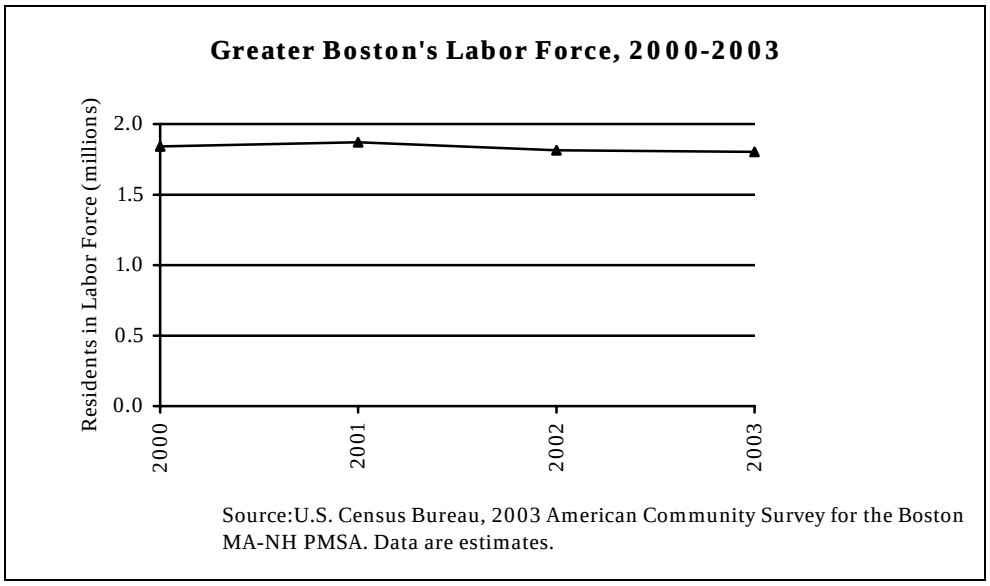
Only foreign migration has kept the state and region's labor force from falling into a tailspin over the last 25 years. New immigrants kept Massachusetts growing during the 1980s and from shrinking in the 1990s, say the authors of *The Changing Face of Massachusetts*, a recent study prepared Mass INC and Northeastern's Center for Labor Market Studies.[23] More recently net domestic out-migration has surged as fewer U.S. residents have moved to Massachusetts and more people have moved out. This loss has left foreign immigrants to make up a larger part of our labor force. More than 1 in 6 of the state's labor force in 2004 were foreign born workers and that share has nearly doubled since 1980.

The influx of foreign immigrants has not been able to stave off the high levels of recent domestic out-migration. In 2003, for example, roughly 45,000 Massachusetts residents moved out of the state. Even though that year foreign immigration was at its highest in Massachusetts in more than 10 years, *net migration* was still a loss of 11,000 residents in the state.[24] In 2004 that trend continued. Massachusetts lost a net of 3,852 people, according to Robert David Sullivan of Mass Inc. Even though that is a small

[23] Andrew M. Sum, Johan Uvin, Ishwar Khatiwada, and Dana Ansel, *The Changing Face of Massachusetts*, MassINC and Center for Labor Market Studies, June 2005.
[24] Massachusetts Technology Collaborative, *2004 Index of the Massachusetts Innovation Economy*, Westborough Massachusetts, 2004.

number in total, Massachusetts ranked 50th in the nation for population growth in 2004 and was the only state to experience a net decrease in population.[25]

More general estimates for Greater Boston show how many workers left or dropped out of the region's labor force after the recession. Between 2001 and 2003, the Boston PMSA labor force shrunk by an estimated 68,000 workers.[26] Some of these workers may have stopped looking for jobs and gone back to school. Other may have become frustrated by the lack of post-recession job opportunities and decided to stay home with children or pursue early retirement. No doubt, however, a good chunk of those workers left the region altogether to find new or better jobs elsewhere. (See Chart).



A core of under-skilled workers

Well over one million of Massachusetts' 3.2 million workers do not have the skills required by employers in the state's current and emerging high-demand job sectors, according to MassINC's New Skills for a New Economy initiative.[27] These workers are undereducated, under-trained, or with a set of skills no longer in demand. As a result, good jobs in some of the state's fastest growing industries are going unfilled because not enough workers have the skills to perform them.

[25] Robert David Sullivan, *Shrinking Pains*, Commonwealth Magazine, 2005.
[26] U.S. Census Bureau, American Community Survey, 2001-2003.
[27] John Comings, Andrew Sum, and Johan Uvin, "New Skills for a New Economy: Adult Education's Key Role in Sustaining Economic Growth and Expanding Opportunity," The Massachusetts Institute for a New Commonwealth, December 2000.

MassINC estimates that fully one-third of the Commonwealth's adult workforce is in this situation. That would mean roughly 600,000 workers in Greater Boston, if the estimate were extended conservatively to this region.[28]

Some of these adult workers never finished high school. Others earned their high school diploma but have limited skills. Still others are immigrants with limited English abilities. In addition, a growing number have skills and credentials that prepared them for jobs that have been eliminated due to outsourcing. (See Chart).

Estimated Universe of Need for Adult Education in Massachusetts, 1998-1999

Group in Need	Number
Immigrants with limited English-speaking skills	195,000
Adults lacking a high school diploma or GED	280,000
Adults employed/unemployed with low-literacy proficiency	667,000
Total	1,142,000

Source: MassINC, New Skills for a New Economy, December 2000.

A narrow lead in the "brain exchange"

Massachusetts and the region compete for skilled workers with specific states with high-tech, knowledge-intensive economies. Right now Greater Boston enjoys one of the nation's highest concentrations of education talent in the nation and world. The region's 74 colleges and universities enroll roughly 265,000 students each year. Many of those students stay in the region after they graduate. A recent study reports that eight of the region's largest research universities have produced 310,000 graduates that still live in the Boston metropolitan area.[29] That is roughly 30 percent of all residents in the region who have four-year degrees or higher.[30]

However, the region is narrowly winning the "brain exchange" contest, according to research sponsored by The Boston Foundation and Greater Boston Chamber of Commerce.[31] That research says that Greater Boston is losing its young adults at an alarming rate. More than half of Greater Boston's college graduates leave the area after receiving their degrees. Also, the region is losing its young adult population nearly three times as fast as the nation. Greater Boston lost 15.8 percent of its young adults between

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[28] Futureworks arrived at this calculation by estimating that one-third (600,000) of the Boston PMSA's labor force in 2003 (1.8 million) would be in one of the three categories of need (language challenged, education credential challenged, or new literacy challenged).

[29] These research universities include Boston College, Boston University, Brandeis University, Harvard University, Massachusetts Institute of Technology, Northeastern University, Tufts University, and University of Massachusetts Boston.

[30] Appleseed, *Engines of Economic Growth: The Economic Impact of Boston's Eight Research Universities on the Metropolitan Boston Area*, 2003.

[31] The Boston Consulting Group, *Preventing a Brain Drain: Talent Retention in Greater Boston*, Prepared for The Boston Foundation and Greater Boston Chamber of Commerce, October 2003.

the ages of 20 and 34 from 1990 and 2000; that same group of young adults declined by only 5.4 percent nationally during that time.[32]

Economic Structure:

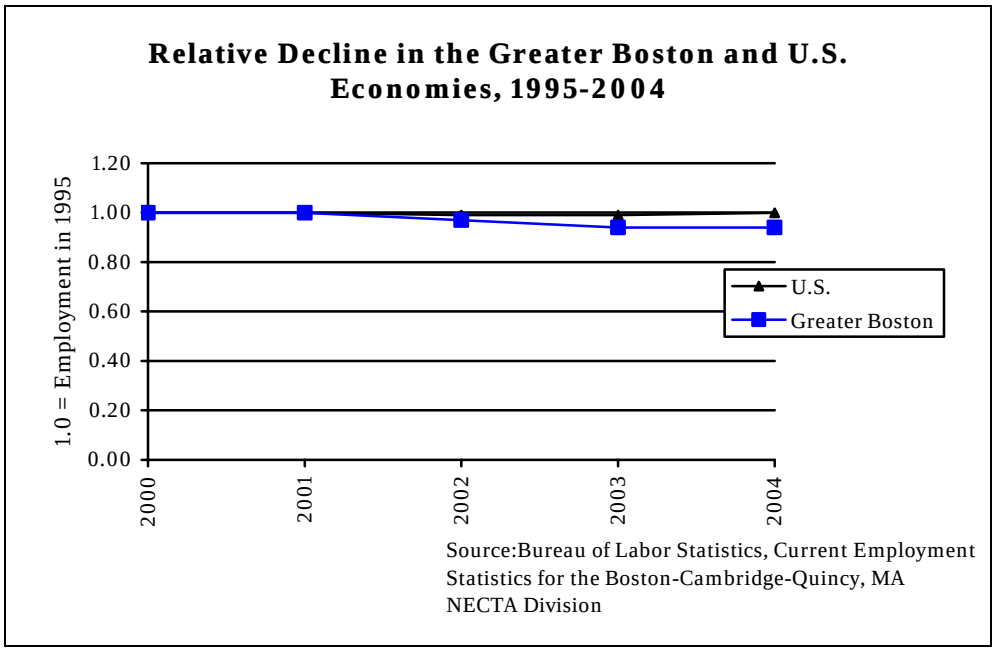
An Economy Driven by Innovation and Technology

Metropolitan Boston has the fourth largest regional economy in the U.S. and 23rd largest in the world.[33] It leads the nation in segments of the financial services, life sciences, and health care industries. It also has considerable strength in educational services (colleges and universities), professional and technical services (such as engineering and consulting services), computers, and other information-related industries (software). Many of these industries are broadly conceived as the high technology sector.

The high technology sector and its associated industries were disproportionately affected by the last economic recession. These industries, along with others, lost thousands of jobs, and led the region into an economic slide that has been deeper and longer than the nation as a whole.

Greater Boston lost more than 6 percent of its job base from its peak before the recession. That is roughly 110,000 jobs lost since 2000. The decline has yet to reverse. While Greater Boston continued to lose jobs through 2004, the US gained 1.48 million jobs.[34] (See Chart on Next Page).

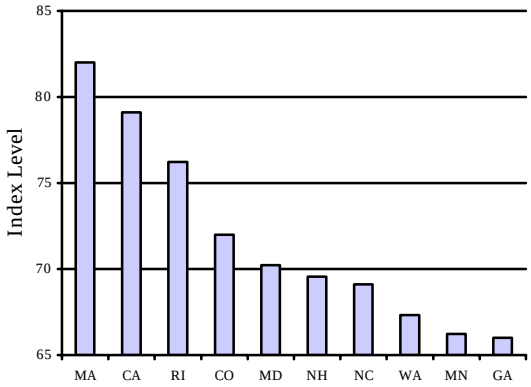
[32] The Boston Consulting Group, *Preventing a Brain Drain: Talent Retention in Greater Boston*, Prepared for The Boston Foundation and Greater Boston Chamber of Commerce, October 2003.
[33] Charles Euchner, ed., *Governing Greater Boston: Meeting the Needs of the Region's People*, Rappaport Institute for Greater Boston, Cambridge, Massachusetts, 2003 Edition.
[34] Bureau of Labor Statistics, Current Employment Statistics.



A core of technology that cuts across industries

Massachusetts is a top leader in concentration of technology and the dynamism that results. According to the Milken Institute's State Technology and Science Index in 2004, Massachusetts ranked 3rd in the nation in a composite that measures high-tech employment, payroll, net business formation and growth. In fact, according to the index, Massachusetts dominates the measures. For example, Massachusetts leads all states on the Index's Risk Capital and Entrepreneurial Infrastructure Composite measure. This measure gauges and ranks each state's patent and IPO activity, business creation activity, and venture capital infrastructure; all key indicators of a state's ability to support new ideas and transfer that know-how to new products and economic activity. (See Chart on Next Page).

Risk Capital & Entrepreneurial Infrastructure Index, Top Ten States, 2004



Source: Milken Institute

Another report closer to home, *Choosing to Lead: The Race for National R&D Leadership & New Economy Jobs* by Mass Insight and Batelle, identifies the technologies that fuel Greater Boston's economy.[35] These six core technologies are

- computer sciences;
- genomics and proteomics;
- disease research and drug discovery;
- biomedical device technologies;
- renewable energy; and
- nanotechnology fabrication.

To a lesser degree, the region has some technological strength in these four secondary technologies:

- advanced materials;
- sensing, optical and electro-mechanical devices;
- signal processing; and
- environmental sciences.

All ten of these core and secondary technologies cut across the region's industry drivers that generates innovation and spurs growth in the region's manufacturing, professional and technical services, financial services, health care, software and communication services, higher education institutions and the creative cluster industries.

[35] Batelle and Mass Insight Corporation, *Choosing to Lead: The Race for National R&D Leadership & New Economy Jobs*, Part of The Massachusetts Technology Road Map and Strategic Alliances Study, 2004.

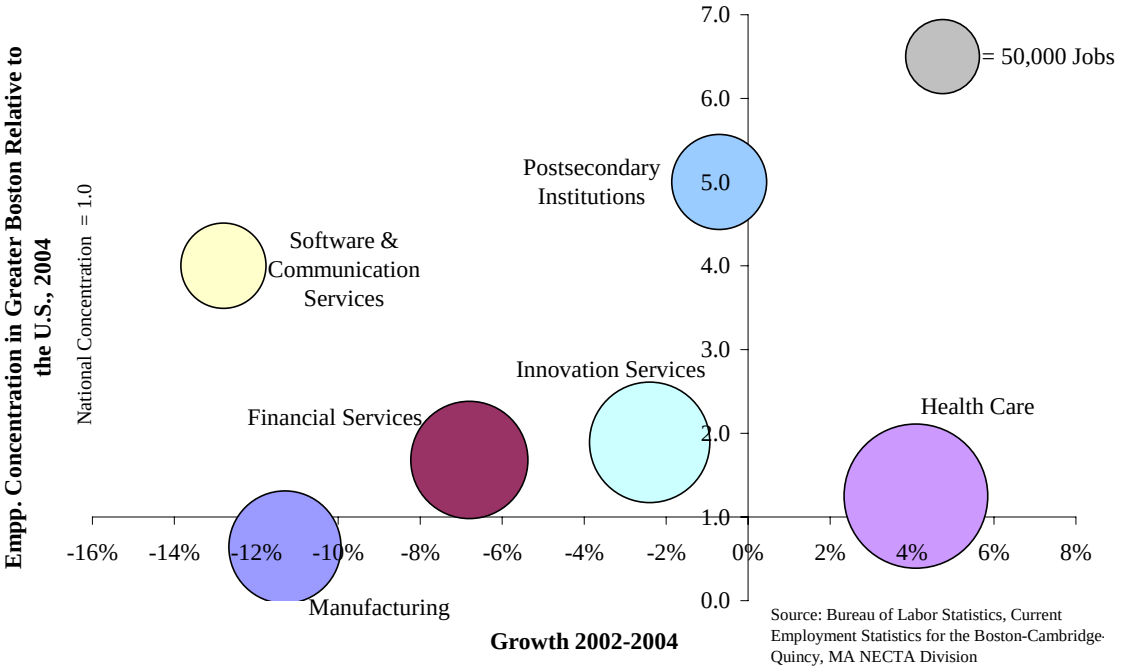
Professional and technical services: A driver of innovation

This grouping of industries roughly corresponds to the definition of innovation services used by the Index of Massachusetts Innovation Economy. These are the numerous engineering companies, consulting firms, and scientific and research employers that make Greater Boston their home base. The Boston Indicators Project reports that "Boston regularly exports consulting expertise across the world, supporting initiatives from the development of groundbreaking new software to research in high-tech sectors to social sector innovations in community-based health care and youth programming."[36] In short, employers from this industry serve every conceivable sector. Their product is knowledge and the introduction of new ideas, goods, services, and practices.

In 2004, there were 132,000 jobs in this industry segment in the region. The innovation services industry is concentrated in Greater Boston almost two times the national average. It declined by 3,200 jobs between 2002 and 2004, or -2.4 percent.[37] but, it is still one of the largest single traded-sector industry clusters in the region. *Choosing to Lead: The Race for National R&D Leadership & New Economy Jobs* identifies innovation services as the largest of the state's nine leading industry clusters. It trails only health care (188,000 jobs) among all major industry sectors in the region. (See Chart on Next Page).

[36] From "Maintaining the Region's Competitive Edge," The Boston Indicators Project, extracted http://www.tbf.org/indicators2004/economy/indicators.asp?id=2205, August 2005.
[37] Bureau of Labor Statistics, Current Employment Statistics.

Industry Concentration in Greater Boston Relative to the U.S.



Financial services: Still a leader despite some tough times

A close second in size among the region's traded-sector industries is financial services which is a mix of banks and insurance, asset management and real estate holding companies. In 2004 there were approximately 125,000 jobs in this industry in Greater Boston.[38] And the industry continues to have a relatively high concentration in the area. In 2004, jobs in finance and insurance were concentrated 1.7 times in Greater Boston than the U.S. Jobs from the industry represented 7.6 percent of the region's total employment that same year.

The region's industry has, however, struggled since the recession. Greater Boston's total employment in financial services dropped by 9,000 jobs from 2002 to 2004, a decline of nearly 7 percent. Part of that decline is a result of rapid consolidation in the industry. Most notable have been local mergers of John Hancock with ManuLife and FleetBoston with Bank of America.

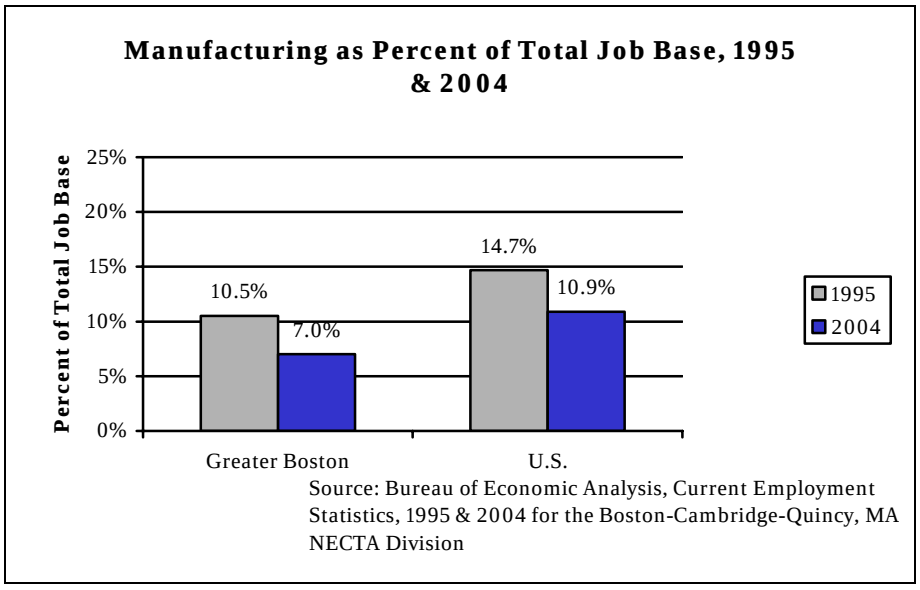
Still, Greater Boston's strength is in the asset management segment of the industry. Twenty-six of the top 300 firms in asset management are headquartered in Massachusetts---numbers one and two are in Boston (Fidelity and State Street)---according to a 2003 report.[39] The most highly compensated jobs in the industry are in these types of companies located in the inner core of the region. Increasingly these jobs

[38] Bureau of Labor Statistics, Current Employment Statistics.
[39] Arindam Bandopadhyaya, Miranda Detzler, and Mohsin Habib, *Down But Not Out: The Future of the Financial Services Industry*, College of Management, University of Massachusetts Boston, circa 2003.

are using technology as a core part of operation. Lower paying back-office jobs are located in the outer suburbs, such as the I-495 West sub-region.[40] These jobs are at most risk of continued decline as they are more likely to be outsourced to partners overseas or elsewhere.

Manufacturing: Continuing its long decline

Along with many of the region's largest industries, manufacturing continued its decline during the last three years. It now represents only 7 percent of Metropolitan Boston's job base. Companies from that industry shed 14,600 jobs in the last three years, from 2002 to 2004.[41] Today the region has only 60 percent the concentration in manufacturing than the U.S. as a whole. (See Chart).



Even one of the regions remaining manufacturing mainstays, computer and electronics, has faced precipitous decline. Metropolitan Boston has two times the concentration of jobs in this segment of manufacturing than the nation as a whole. Semiconductors and defense-related instrumentation are particular strengths, together representing close to 23,000 jobs, but they have fared poorly as of late. Since 2002, jobs in these industries have declined by -16.2 percent[42] and evidence of this drop off is depicted by the announced lay offs from Boston area companies like Teradyne.

Two other important segments of manufacturing in the region are life sciences and health care technology. Life sciences, and the biotechnology segment, represent thousands of jobs in the region and some 30,000 in the state with Greater Boston being a world-wide leader in the industry. According to the report *MassBiotech 2010,*[43]

[40] David Terkla, *Industry Clusters in Metropolitan Boston*, 2004.
[41] Bureau of Labor Statistics, Current Employment Statistics.
[42] Bureau of Labor Statistics, Current Employment Statistics.
[43] The Boston Consulting Group, *MassBiotech 2010: Achieving Global Leadership in the Life-Sciences Economy*, Prepared for the Massachusetts Biotechnology Council, 2002.

companies in Massachusetts---the largest center being in Cambridge---represent 8 percent of the world's total pipeline of new drugs (pharmaceuticals as well as biotech). There are roughly 280 biotech companies in the state and among them are Wyeth, Biogen, Genzyme, and now Novartis (the Swiss pharmaceuticals giant that recently decided to locate its research headquarters in Cambridge). It is likely that Greater Boston will continue to be well-positioned to compete and maintain its industry leader status as the industry draws heavily on the talent and research breakthroughs that come from the region's universities and medical centers. The authors of *Boston Unbound* say that the competition is fierce, with 80 percent of states now chasing Boston with aggressive life sciences development.[44]

The health care technology sector, for its part, consists of roughly 26,000 jobs in the state.[45] Most of these jobs come from companies producing medical devices. According to a recent report on the medical devices industry by Alan Clayton-Matthews and Rebecca Loveland[46] the state has a relatively high concentration of jobs in this manufacturing segment and Massachusetts has 2.3 times the jobs concentrated in medical devices than does the rest of the nation.

Health care: A sector that keeps growing

Health care is one of the region's most recognized industries, partly because of the high quality of care and top-notch research that comes from the many hospitals and medical schools in the area. There are 188,000 jobs in the region's industry with hospitals, nursing homes, and doctor's offices representing 11.5 percent of Greater Boston's total employment. It is one of the bigger industries in the region, and one of the only industries to have grown since the recession as health care employers added 7,500 jobs between 2002 and 2004.[47]

Despite all of these jobs and the high reputation for the industry in the region, Greater Boston has only a slightly higher concentration of these jobs than the nation as a whole. In 2004, Greater Boston's concentration in health care jobs was 1.25 times greater than the U.S. as a whole. From 2002 to 2004, the industry's job base grew by 4.1 percent in Greater Boston and at the same time, the nation's job base in health care grew by 4.5 percent.[48]

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[44] Neal Pierce and Curtis Johnson, *Boston Unbound: Tapping Greater Boston's Assets and Talents to Create a World-Leading Citistate*, Commissioned by The Boston Foundation, May 2004.

[45] 2003 data from Massachusetts Technology Collaborative, *2004 Index of the Massachusetts Innovation Economy*, Westborough Massachusetts, 2004.

[46] Alan Clayton-Matthews and Rebecca Loveland, University of Massachusetts Donahue Institute, *Medical Devices: Supporting the Massachusetts Economy*, Prepared for the Massachusetts Medical Device Industry Council, May 2004.

[47] Bureau of Labor Statistics, Current Employment Statistics.

[48] In general, health care is not recognized as a traded-cluster. For example, the Index of the Massachusetts Innovation Economy does not track it as on the state's nine leading clusters for this reason. In contrast, David Terkla uses a broader definition of health care to include health services (hospitals, nursing homes, and physician offices) as well as drugs and pharmaceuticals and medical device manufacturing. Those latter segments of Terkla's definition of health care are traded-sector industries.

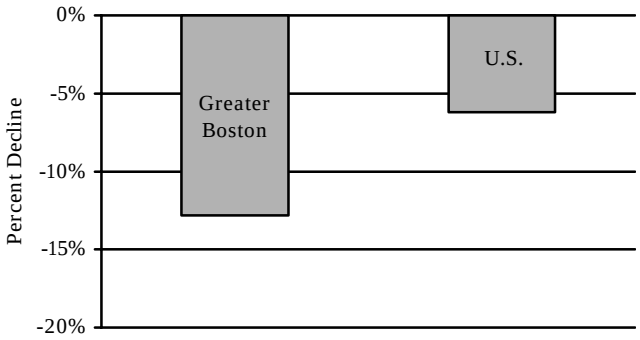
Postsecondary institutions: Another economic powerhouse

The region's 74 colleges and universities are increasingly recognized as one of its major industries. Sometimes they are grouped with other industries---such as the region's many consulting, engineering and research firms---to make up what economists refer to as the "knowledge creation cluster." On their own, however, the region's institutions of higher education make up a large industry sector, with a base of 82,000 jobs. This job base is five times more concentrated here than the U.S. as a whole. In 2004, employment from colleges and universities in metropolitan Boston represented 5 percent of the region's job base while the same industry only represented 1 percent of the U.S. job base. Just within a 9-mile radius of the Massachusetts state house, eight of the region's larger research universities employ more than half of the region's workers in the industry (48,750 jobs). Overall, a recent study says that, although the industry has declined slightly since the recession (losing 600 jobs between 2002 and 2004) universities remain a remarkably stable employer base for the region, historically weathering the ups and downs of the economy.[49]

Software and communication services: Struggling to recover

This industry was hit hard by the last recession. The region's software employers, computer design companies, and telecommunications firms contracted at two times the rate of the national average. That translated to 10,000 lost jobs in Greater Boston between 2002 and 2004 in this industry, or a -12.8 percent decline.[50] (See Chart on Next Page).

Decline of the Software and Communication Services Industry, 2002-2004



Source: Bureau of Economic Analysis, Current Employment Statistics for the Boston-Cambridge-Quincy, MA NECTA Division.

[49] Appleseed, *Engines of Economic Growth: The Economic Impact of Boston's Eight Research Universities on the Metropolitan Boston Area*, 2003.
[50] Bureau of Labor Statistics, Current Employment Statistics.

The *2004 Index of the Massachusetts Innovation Economy* reports that Massachusetts' software and communication services industry had the largest decline among leading technology states (California, Colorado, Connecticut, Minnesota, New Jersey, and New York) from 2002 to 2003. The report goes on to say that employment decreases will be difficult to regain as many of these jobs moved overseas or were lost due to new technologies.[51] Today there are less than 11,000 jobs in the telecommunications segment, 12,100 jobs in software, and 30,000 jobs in computer systems design and services. A recent report commissioned by the Massachusetts Telecommunications Council shows that there may be some signs of an upward trend in software jobs across the state, while the large losses in telecommunications (-18 percent from 2002 to 2004) may be slowing.[52]

The creative cluster: An emerging industry

The creative cluster, the mix of commercial enterprises and non-profit organizations that produce cultural products, supports more than 80,000 jobs in Massachusetts.[53] On the commercial side, these employers include graphic design and architectural firms, advertising agencies, new media companies and publishers. Greater Boston is the New England center for many of these endeavors. The region's nonprofit side of the cluster is home to some of New England's largest museums (Boston's Museum of Fine Arts and the Museum of Science), performing arts venues (Symphony Hall and The Wang Center), and art and music schools (Massachusetts College of Art and Berkley School of Music). They are all large employers in their own right.

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[51] Massachusetts Technology Collaborative, *2004 Index of the Massachusetts Innovation Economy*, Westborough Massachusetts, 2004.

[52] William Cutler Pickering Hale and Dorr, Castille Ventures, and Price Waterhouse Coopers, *The Telecommunications Industry in Massachusetts: Employment and Business Landscape*, Massachusetts Telecommunications Council, October 2004.

[53] Mt. Auburn Associates, *The Creative Economy Initiative: The Role of Arts and Culture in New England's Economic Competitiveness*, A Report by The New England Council, June 2000 and Gregory H. Wassall, *New England's Creative Economy: Employment Update*, Prepared for the Creative Economy Council, May 2004.

APPENDIX A:

LIST OF REVIEWED STUDIES, REPORTS, AND ARTICLES

Appleseed, *Engines of Economic Growth: The Economic Impact of Boston's Eight Research Universities on the Metropolitan Boston Area*, 2003.

Bandopadhyaya, Arindam, Miranda Detzler, and Mohsin Habib, *Down But Not Out: The Future of the Financial Services Industry*, College of Management, University of Massachusetts Boston, circa 2003.

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INSURING GREATER BOSTON'S PROSPERITY:

AN ANALYSIS OF COMPETITIVE CHALLENGES TO SUSTAINED ECONOMIC DEVELOPMENT IN METROPOLITAN BOSTON

2007

METROPOLITAN AREA PLANNING COUNCIL BOSTON, MA

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FutureWorks is a consulting and policy development firm who design and build strategies and institutions that promote sustainable, skill-based regional economic growth. FutureWorks core competencies are rooted in experience in linking sound theory to effective practice in economic and workforce development, postsecondary education, and civic improvement.

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EXECUTIVE SUMMARY

Greater Boston is a metropolitan region with economic assets extraordinarily well suited to the demands of today's knowledge-based economy.

The region is home to a cluster of world-class research universities that produce and attract cutting edge science and technology-based companies, venture capitalists and entrepreneurs. In addition, a remarkable constellation of health care institutions combined with university research and development capacity has made Greater Boston a magnet for biotechnology firms, catapulting the region into a global leadership position in life sciences over the past decade. Combined with its traditional strength and concentration in financial services and software, Greater Boston has truly become a leader in the 21st century knowledge-economy.

The steady stream of innovation and relatively high wealth that defines Greater Boston is made possible by one of the most highly educated workforces in the world. Approximately 40 percent of Boston area adults hold a bachelors degree, third highest among comparable metro regions in the United States. Greater Boston's eight research universities alone grant over 30,000 degrees each year providing employers with a fresh supply of talent on an annual basis. The region is also a national leader in concentration of science and engineering talent.

The traded sector industry clusters that make up the Greater Boston economy—higher education, health care, high technology and financial services—bring tremendous wealth to the region and its residents. Today, greater Boston residents have a median family income that is 47 percent higher than the nation as a whole.

From the outside, Greater Boston's economic prospects look bright. Living up to its reputation as a scrappy, live-by-your-wits metro, Boston survived globalization and deindustrialization to resurface as a world leader in advanced technology and knowledge-based industries. Nationally, Boston is heralded as a "comeback city." The region is often described as undergoing an economic "renaissance." All of these accolades are warranted. And yet those of us who make the region home know there are pressing economic development challenges that can undermine our economic prosperity.

In the past several years, Boston-area research, policy and advocacy organizations have produced a flurry of reports highlighting these challenges. These reports have brought attention to challenges surrounding university-industry collaboration, workforce development, immigration, housing, transportation, quality of life, and economic and social disparity. Much of this analysis was in response to the 2001-2003 recession in which Greater Boston lost close to 100,000 jobs. However, the body of work these reports collectively represent suggests something larger as well: a growing recognition that Greater Boston faces serious challenges and that business and civic leaders cannot afford to be complacent when it comes to economic competitiveness.

Challenges to Regional Prosperity

This report is a synthesis of several recently completed reports and studies that each identifies challenges within a specific sector of the regional economy. In that context, the challenges presented in the second part have been identified by others. This report makes a new contribution to the identification of five common themes, found across all of the reports, which demonstrate the interrelated nature of the region's competitive challenges and the need for greater institutional coordination to solve them.

Attention to the five themes, identified in multiple reports and highlighted in this report, is critical to ensuring our region's prosperity over the next several decades. The common themes are:

- **Harnessing innovative capacity to spur widespread economic development**

  Despite a dazzling concentration of world-class research universities and global technology firms, Greater Boston has done a poor job of harnessing the benefits of innovative capacity for widespread economic development and opportunity. There is growing concern that we run the risk of becoming a high-level R&D center that fails to capture the downstream production, service and support positions (i.e., middle class jobs) so vital to a prosperous economy.

  We are hampered by an apparent inability to align our public system of higher education (state universities, state colleges and community colleges) with industry needs and economic development goals. A related problem is a regulatory environment that is perceived as "anticompetitive" by business leaders. If and when firms are ready to move from R&D to production, they face bureaucratic obstacles that are often greater than they face in other leading technology regions.

- **Human capital and workforce development**

  Greater Boston faces challenging labor force dynamics. The region is populated by a large proportion of highly skilled, highly compensated professionals, yet fewer of these people are choosing to stay in Massachusetts and make it their home. Recent studies show that the region is loosing young, highly educated workers to competitor regions and is experiencing no net in-migration of native-born citizens.

  International immigration is also having a major impact on the region's labor force. Each year immigrants make up a larger and larger share of our workforce. Yet international immigrants have lower education levels, on average, than native born workers and many face English language barriers. While nearly a third of international immigrants come to Massachusetts with high levels of education and skill, a larger proportion are unprepared to succeed in our knowledge-based economy.

  Solving the region's labor force challenge is no small task. At the high end of the labor market, we face stiff competition from metropolitan regions that offer comparable economic opportunity and a lower cost of living. At the lower end of the labor market we face the difficult issue of skill upgrading and economic integration.

This presents a particular challenge to our workforce development and community colleges, which many regional leaders say can be fragmented and disconnected from business and industry.

- **Cost of living and quality of life**

  Greater Boston has the third highest housing prices in the country in addition to high tuition and health care costs. The region's high cost of living has a direct and immediate impact on our ability to attract talent and is compromising a much-cherished quality of life.

  While Greater Boston is still a highly desirable metropolitan area in which to live and work, the cost of housing is fast eroding the quality of life. Individuals and families face stark trade-offs between house size and condition, desirable community, and commute time. Our region is at a disadvantage as firms and high skill workers increasingly seek to optimize income, opportunity and life style. Many competitor regions can offer comparable income and opportunity along with lower housing costs and shorter commutes (think Austin, TX and Portland, OR) to workers. Mobile workers—particularly young workers who have not yet laid down roots—are most likely to follow these more attractive life/work balances.

- **Growing social and economic disparity**

  One of the most troubling developments of the past decade in Greater Boston has been growing social and economic disparity. The vibrant economy of the 1990's rewarded highly educated, upper income individuals and families, but low-income residents—particularly those living in the urban core and satellite cities—saw a decline of real family income.

  Especially troubling is the growing geographic nature of the region's social and economic disparity. Recent research reveals a widening income and opportunity gap between affluent and low-income communities throughout the region. Inner-core cities in the region, such as Boston, Chelsea, Everett, Lynn, Malden, Quincy, and Revere, got poorer from 1990 to 2000. This contrasts to increasing incomes relative to the average among towns and suburbs along the I-495 corridor, in particular. Other studies show a disturbing increase in income disparity along racial lines in the region.

  Socially, our region becomes a less interesting place to live and work as communities become more homogenous. Economically, our region loses out when it fails to maximize the human and economic potential of all of our residents. Growing disparity also cuts at civic life. It becomes harder to develop a common platform for change on cross-cutting issues such as housing, public education, and economic assimilation when residents are geographically segregated from one another along lines of race and class.

- **Civic Infrastructure and regional perspective**

  Effectively addressing the interrelated economic development challenges facing Greater Boston will require inspired civic leadership. This is a challenge in a region known for complacency, fragmentation and parochialism.

  Greater Boston is characterized by a certain complacency that thwarts active intervention. There is a perception (real or imagined) that Boston is the "Hub of the Universe," and as such, many business and civic leaders display a remarkably laissez faire attitude toward the vexing growth and development issues facing the region. Greater Boston's business and civic leaders also exhibit limited capacity for collaboration and coordination. Whether the issues at hand are university-industry partnerships, workforce development or regional planning, effective cross-sector collaboration and coordination pose a tremendous challenge.

  A related challenge is the parochial nature of leadership in Greater Boston. All of the economic development challenges that face Greater Boston are metropolitan in scale. The interrelated issues of middle class job creation, human capital supply, housing, transportation and social and economic disparity cut across jurisdictional boundaries. These problems will not be solved by Boston, Cambridge, Chelsea, Framingham, Sudbury, Watertown or Wellesley. Rather, they will be solved when the region's civic and business leaders transcend urban-suburban rivalries and come together to develop solutions that are in the best interest of the entire metropolitan region.

How regional leaders address these common themes and the challenges they raise will determine greater Boston's growth trajectory in the decades to come. Will metropolitan Boston be a region in which economic prosperity and opportunity is widespread and available to all? Or will metropolitan Boston splinter into a region of "haves" and "have-nots"? Metropolitan Boston has tremendous economic assets that are remarkably well suited to this particular time in history. The question is whether Greater Boston's political, civic and business leaders can devise new structures and new collaborative mechanisms to solve vexing institutional challenges that have the potential to keep us from making the most of these assets.

There are multiple, encouraging signs of progress on this front. Many of the organizations and institutions mentioned throughout this report have spearheaded efforts to address the region's economic development challenges. MAPC's MetroFuture initiative has involved more than 1,000 residents in a conversation about the region's resources, challenges, and prospects for the future. Mass Insight, in partnership with numerous industry associations and economic development organizations, is leading a comprehensive science and technology initiative. Mass INC is tackling the workforce challenge through the News Skills for a New Economy Campaign. The Boston Foundation supports the large-scale workforce development effort known as *SkillsWorks* and is home to the award-winning Boston Indicators Project. The Commonwealth Housing Task Force is making headway on one of our toughest economic development challenges—encouraging greater housing production to moderate the high cost of living in Greater Boston.

Despite these strong efforts, there is no civic apparatus that brings together business, government, and community groups around a coherent regional economic growth and development agenda. Rather, Greater Boston is characterized by multiple groups working on related issues but without the benefit of a unifying framework. In issuing this report, MAPC seeks to advance a growing discussion on the need for decisive leadership and institutional coordination for the critical set of competitive challenges facing the region.

INTRODUCTION

Greater Boston benefits from a tremendous array of research, policy and advocacy institutions that produce a steady stream of analysis concerning its economic performance and socio-economic challenges. These institutions range from university-affiliated think tanks to private sector driven associations to independent non-profits. Each, in its own way, documents the region's changing social and economic dynamics, recommends strategies to set a civic agenda, and influences public policy.[54]

Work produced by these organizations help to paint a picture of the economic development landscape of Greater Boston. Not surprisingly, it is a complex landscape filled with multiple institutions and multiple players advocating multiple agendas. In an effort to get a handle on both the landscape and current mindset, FutureWorks conducted a scan of recent research, analysis and commentary produced by these institutions. Most of the material we reviewed was produced within the last three years. In fact the oldest report scanned for this document was the Mass INC report entitled, "New Skills for a New Economy," and it was released in 2001.

Since 2001, Boston-area research and policy organizations have produced a profusion of reports addressing economic competitiveness, university-industry collaboration, workforce development, immigration, quality of life, housing, transportation, and social and economic disparity. Many of these reports were a response to the 2001-2003 recession in which Greater Boston lost nearly 100,000 jobs. The body of work these reports collectively represent suggests something larger as well: a growing recognition that Greater Boston faces serious challenges and that business and civic leaders cannot afford to be complacent when it comes to economic competitiveness.

For better or worse, Greater Boston's civic culture has earned a reputation for complacency, parochialism and fragmentation.[55] A message that comes through loud and clear from recent analysis is that Greater Boston must establish new, more collaborative decision-making bodies to address the systemic challenges that negatively impact economic performance. In their absence, current thinking suggests, we may jeopardize our position as a world-class metropolitan region.

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[54] These institutions include Harvard University's Rappaport Institute, the University of Massachusets' Donahue Institute, Northeastern University's enter for Labor Market Studies, Mass INC, Mass Insight, The Boston Foundation, Massachusetts Technology Collaborative, the New England Council, and many more

[55] Throughout this report we refer to civic life, civic leaders and business-civic leaders. By civic life we mean the activities of the individuals and institutions broadly responsible for the well being of the citizenry. This includes government institutions as well as non-profit community organizations, advocacy groups and business organizations to the extent they are focused on issues that impact overall quality of life in a region. By civic leaders, we refer to those playing a leadership role in government and/or non-profit community and advocacy organizations – e.g. community foundations, community development corporations, environmental advocacy groups etc. By business-civic leader, we refer to private sector business leaders serving in a civic capacity. By business-civic organization, we refer to a variety of institutions that express the private sector's collective interest in public policy and civic life – e.g. Chambers of Commerce, business councils and roundtables, and industry associations.

There are encouraging signs of progress on this front. Many of the organizations and institutions mentioned throughout this analysis have spearheaded efforts to address the region's economic development challenges. Mass Insight, in partnership with numerous industry associations and economic development organizations is leading a comprehensive science and technology initiative. Mass INC manages the News Skills for a New Economy Campaign. The Boston Foundation supports the large-scale workforce development effort known as *SkillsWorks* and is home to the Boston Indicators Project. The Metropolitan Area Planning Council is deeply engaged in MetroFuture, a broad-based outreach effort to develop a 30-year growth and development plan for the region. The Commonwealth Housing Task Force is developing strategies to address one of our toughest economic development challenges—the high cost of living in Greater Boston.

Yet despite these strong efforts, there is no formal civic apparatus bringing business, government, and community groups together around a coherent regional economic growth and development agenda. Rather, Greater Boston is characterized by multiple groups working on related issues but without the benefit of a unifying framework.

Organization of the Report

In the sections that follow, we draw on new data and synthesize existing reports and analysis to describe Greater Boston's changing economic position. In the first section of the report we examine regional economic performance. We consider the economic well-being of residents living in Greater Boston, describe the workforce, and examine the industries that make up the region's economic structure.

The second section of the report identifies a series of interrelated issues that challenge the region's economic position. Most of these issues have been identified before, typically through an analysis of a particular topic in the region (e.g. technology transfer, housing, or skills shortage).[56] In this report we seek to make a new contribution by demonstrating the interrelated and overlapping nature of the region's competitive challenges. We organize these challenges through five "common themes"— harnessing innovation capacity to economic development, human capital and workforce development, cost of living and quality of life, social and economic disparity, civic infrastructure and regional perspective—in order to present a clear picture of where the region is today and what leaders need to focus on to ensure continued economic growth and prosperity.

[56] See Appendix A for a list of reports, studies, and analysis on Greater Boston consulted for this review.

COMPETITIVE CHALLENGES TO REGIONAL PROSPERITY

Overview

By virtually any standard, Greater Boston is an economic powerhouse. The metropolitan region contains economic assets that are unmatched by almost any other region of the world.

Greater Boston is home to a cluster of world-class research universities that produce and attract cutting-edge science and technology-based leaders in computers, software and telecommunications. In addition, a remarkable constellation of health care institutions combined with a high university research and development capacity has made Greater Boston a magnet for biotechnology firms, catapulting the region to a global leadership position in life sciences over the past decade. Combined with its traditional strength and concentration in financial services, Greater Boston has truly become a leader in the 21st century knowledge-economy. The region's leadership role is reflected in the consistently high ranking it receives in national innovation and competitiveness indices. For the last several years Massachusetts/Greater Boston has ranked at the top of nearly every national index benchmarking science, technology, innovation and overall economic competitiveness.

The steady stream of innovation and economic expansion that defines Greater Boston is made possible by one of the most highly educated workforces in the world. Approximately 40 percent of Boston area adults hold a bachelors degree and the region boasts a remarkable concentration of talent in science and engineering. Greater Boston's eight research universities alone grant over 30,000 degrees each year providing employers with a fresh supply of talent on an annual basis. The traded sector industry clusters that compose the Greater Boston economy (higher education, health care, high technology and financial services) have brought tremendous wealth to the region and its residents. Despite the recent recession (from which Greater Boston has recovered more slowly than other leading technology regions), Greater Boston residents exhibit a median family income that is 47 percent higher than the nation as a whole.

In addition to its reputation for innovation and education, Greater Boston is known as a beautiful, livable region distinguished by history, culture, authentic neighborhoods, New England town centers and excellent recreation. Greater Boston is home to nearly one-half of all Massachusetts residents while the City of Boston serves as the urban center for the six-state New England region. Boston is home to the Boston Red Sox, the Boston Symphony Orchestra, the Boston Pops, renowned art and science museums, historic neighborhoods and architecture, an extensive underground subway system and a world-class urban parks system. For all of these reasons, Boston is a world-wide tourist destination that greets more than 15 million visitors every year.

From the outside, Greater Boston's economic prospects look bright. Living up to its reputation as a scrappy, live-by-your-wits metro, Boston survived globalization and deindustrialization to resurface as a world leader in the knowledge and advanced

technology economy. Nationally, Boston is heralded as a "comeback city" and the region is often described as undergoing an economic "renaissance." All of these accolades are warranted and yet those of us who make the region home know that there are pressing economic development challenges. The complementary pillars of our economy—innovative capacity and human capital—face troubling internal and external challenges. The housing crisis threatens our ability to attract and retain the very workers that distinguish us. Our population is polarizing along dimensions of race, income and geography at alarming rates. Growth in our labor force has virtually stalled and we have a clumsy regulatory environment. State university and community college systems don't measure up to competitor regions in terms of their contributions to technology transfer.

How we address these and other economic development challenges will determine the region's growth trajectory in the decades to come. Will metropolitan Boston be a region in which economic prosperity and opportunity is widespread and available to all or will metropolitan Boston splinter into a region of "haves" and "have-nots"? Our review of recent research, analysis and commentary on Greater Boston suggests that the greatest challenge facing metropolitan Boston today is not economic, but civic.[57] Metropolitan Boston has tremendous economic assets that are remarkably well suited to this particular time in history. The question is whether Greater Boston's political, civic and business leaders can devise new structures and new collaborative mechanisms to solve vexing institutional challenges that have the potential to keep us from making the most of these assets.

Competitive Challenges

Through the review process we identified a series of interrelated economic development challenges facing the region.[58] Most of these issues have been identified before, typically through an analysis of a particular topic in the region (e.g. technology transfer, housing, or skills shortage)[59] however, here we seek to make a new contribution by demonstrating the interrelated and overlapping nature of the region's competitive challenges.

We grouped these cross-cutting challenges into the following five categories: harnessing innovation capacity to economic development, human capital and workforce development, high cost of living and quality of life, social and economic disparity, and civic infrastructure and regional perspective. Our scan suggests that these are the overarching challenges that threaten Greater Boston's regional prosperity.

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[57] See FutureWorks, "A White Paper on Business-Civic Engagement in Metropolitan Boston," Prepared for MetroFuture, May 2005 and FutureWorks, *Minding Their Civic Business: A Look at the New Ways Regional Business-Civic Organizations are Making a Difference in Metropolitan North America*, Prepared for the Metropolitan Leadership Network and Ford Foundation, September 2004.

[58] Data and trends referenced in this section are attributed in Part I of this document, unless otherwise noted by a footnote.

[59] See Appendix A for a list of reports, studies, and analysis on Greater Boston consulted for this review.

Competitive Challenge #1:

Harnessing Innovative Capacity to Economic Development

Greater Boston's research and development capacity is legendary but as many analysts have noted, however, we have not capitalized on our R&D strengths to drive widespread industrial and product development that would create economic opportunity for a broad swath of our population. There is growing concern that we run the risk of becoming a high-level R&D center that fails to capture the downstream production, service and support positions (i.e. middle class jobs) so vital to a prosperous economy. There is also a growing consensus that a large part of the problem lies in our seeming inability to align our public system of higher education (community colleges, state colleges and state universities) with industry needs and regional economic development goals. Massachusetts is known throughout the world as a higher education leader and Greater Boston is home to some of the most esteemed research universities in the world yet our state university and community college systems are uncoordinated, under-utilized and under-funded. This is an area in which competitor states—most notably California and North Carolina—are establishing strategic alliances, and gaining a competitive advantage. Many of these competitor states also boast a strong cadre of private research universities, but they are investing in their public systems nonetheless.

Let us not forget that most research and development activity comes from the private sector[60] and unfortunately, Massachusetts continues to be hampered by a regulatory environment that prolongs the permitting and procurement process in the private sector. Many business leaders consider that environment "anticompetitive." If and when firms are ready to move from R&D to production, they face bureaucratic obstacles that are often higher than those present in other leading technology states. The biotechnology industry in particular, has been critical of the business climate and regulatory framework. Industry leaders from this sector compare Massachusetts and Greater Boston unfavorably to competitor states and regions that expedite permitting, infrastructure and site development to meet industry needs in a timely fashion. Reforms to the permitting system can be achieved while protecting the environment and advancing smart growth patterns, but reforms of this kind are overdue.

With support from all of the major technology-related business organizations, economic development organizations, and several of the region's largest employers, Mass Insight conducted the *Massachusetts Technology Road Map and Strategic Alliances Study* in collaboration with Battelle Memorial Institute's Technology Partnership Practice. That effort aimed to address these challenges and establish a coherent science and technology policy framework for Greater Boston and the state.

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[60] Private sector industry performed a projected $194 billion of R&D in 2003, or 68 percent of the national total, according to the *National Science Foundation's National Patterns of Research and Development Sources, 2003*.

Competitive Challenge #2:

Human Capital and Workforce Development

The changing nature of our workforce poses a significant challenge to continued economic dynamism and prosperity. While the Greater Boston region is populated by a large proportion of highly skilled, highly compensated professionals, fewer of these people are choosing to stay in Massachusetts and make it their home. Greater Boston is losing young, highly educated workers to competitor regions and is experiencing no net in-migration of native-born citizens. This is highly problematic from an economic development standpoint. During the heated-up economy of the late 1990's, employers experienced real difficulty filling both professional and technical level positions due to labor shortages. And though labor shortages dissipated with the 2001-2003 recession, they will surely resurface as the economy picks up.

International migration is also having a major impact on the region's labor force. A recent study of migration patterns shows that the share of immigrants in the Massachusetts labor force grew from 8.8 to 17 percent of the labor force between 1980 and 2004. Without international migration our labor force would have decreased in size over the past two decades yet international immigrants have lower education levels, on average, than native-born workers and many face English language barriers. While nearly a third of international immigrants come to Massachusetts with high levels of education and skill, a larger proportion are unprepared to succeed in our knowledge-based economy. It is now estimated that fully 30 percent of workers in Massachusetts lack the basic literacy, English language, and math skills required to perform and advance in the Greater Boston labor market. This bifurcation of our local labor market presents an enormous opportunity to develop a home-grown workforce that understands and is invested in the Greater Boston economy.

Solving our labor force challenge is no small task. At the high end of the labor market, we face stiff competition from metropolitan regions that offer comparable economic opportunity and a lower cost of living. There is clear and resounding consensus among business and civic leaders that controlling Greater Boston's housing costs is essential in order to retain existing talent and attract new talent to the region. At the lower end of the labor market we face the difficult issue of skill upgrading and economic integration. A theme echoed throughout recent research, analysis and commentary is the urgency of providing appropriate, industry-driven skills and training to low-skill native and foreign-born individuals alike in order to ensure a ready supply of skilled workers to the industries that need them. This presents a particular challenge as our workforce development and community college systems can be fragmented and disconnected from business and industry.

Competitive Challenge #3:

High Cost of Living and Quality of Life

A third critical challenge that has a direct and immediate impact on our ability to retain and attract the talent that fuels our innovation economy is the high cost of living in Greater Boston. Greater Boston has the third highest housing prices in the country in addition to high tuition and health care costs. Housing, in particular, has reached crisis proportions. Since 1997, median home prices have risen 81 percent in the state and over 100 percent in Boston. Individuals and families that purchased homes prior to the run-up may be sitting pretty but for many individuals and families in Greater Boston, the dream of home ownership is slipping away. Low-income families have been all but shut out of the housing market and recent research by Mass INC shows that native-born, middle class families are migrating in increasing numbers to other New England states in an effort to maintain a middle-class lifestyle. Even highly skilled, highly compensated professionals now find it difficult to afford housing that meets their needs in Greater Boston.

High housing costs impact economic competitiveness in several ways. Housing cost is the number one concern among Greater Boston employers when it comes to employee retention and attraction. Employers know that employees contemplating a move to Boston must weigh job opportunity and salary against housing costs and quality of life as they compare job offers. Similarly, employers considering Boston as a location must consider the high cost of housing and the stress this will place on employees as they assess the strengths and weaknesses of prospective site locations.

While Greater Boston is still a highly desirable metropolitan area in which to live and work, the cost of housing is fast eroding quality of life as individuals and families face stark trade-offs between house size and condition, desirable community, and commute time. This is critical from an economic competitiveness perspective because quality of life and quality of place considerations have become much more central to economic development in the past two decades.[61] In a global knowledge economy, both capital and labor are highly mobile and as a result, firms and workers increasingly seek to optimize income, opportunity and life style. If competitor regions can offer comparable income and opportunity along with lower housing costs and shorter commutes (think Austin, TX and Portland, OR), workers—particularly young workers who have not yet laid down roots—will follow.

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[61] James Segedy, "How Important is Quality of Life in Location Decisions and Local Economic Development?," *Dilemnas of Urban Economic Development*, ed. Richard Binghams and Robert Mier, Thousand Oaks, CA: Sage Publications, 1997. Paul Gottlieb, "Amenities as an Economic Development Tool: Is There Enough Evidence?" *ED Quarterly*. Sage Publications. August, 1994. Richard Florida, *The Rise of the Creative Class: And How It's Transforming Work, Leisure, Community and Everyday Life*, New York: Basic Books, 2002.

Competitive Challenge #4:

Growing Social and Economic Disparity

One of the most troubling developments of the past decade in Greater Boston has been growing social and economic disparity. The vibrant economy of the 1990's rewarded highly educated, upper income (top decile) individuals and families. But low-income residents—particularly those living in the urban core and satellite cities—saw a decline of real family income. The region experienced the third largest increase in poverty of any metro between 1990 and 2000 and Greater Boston now ranks as a "high disparity" region in terms of urban-suburban income disparity in national indices comparing U.S. metropolitan areas.

Particularly troubling is the growing geographic nature of the region's social and economic disparity. Recent research by Northeastern Center for Labor Market Studies shows a widening income gap between affluent and low-income cities and towns throughout the region. Between 1990 and 2000, the state's 20 wealthiest cities and towns with 20,000 people or more (including the Boston suburbs of Acton, Wellesley, Winchester, Lexington, Newton, Needham, Milton, Brookline, Belmont, Reading and Burlington) experienced an increase in median family income just over 10 percent with several posting gains of 14 percent of more. Conversely, the state's 20 least affluent cities and towns with 20,000 people or more (including the city of Boston and inner ring communities such as Everett, Revere, Chelsea, and Lynn) experienced a decline in median family income of 5 percent on average. The growing social and economic bifurcation of our region is even more pronounced when we consider that more and more native-born, middle class families are leaving for other New England states.

The factors driving growing inequality in Greater Boston are complex. The region's labor market clearly rewards individuals equipped with the education and high skills demanded by an innovation economy. High-tech workers, scientists, engineers, medical doctors, university researchers, financial analysts, lawyers and consultants all benefit from the region's economic concentration in technical and knowledge-based industries and these highly compensated workers cluster in very specific communities throughout the region. Many high-tech employees, for example, live and work in and around Interstate 495. Population, job and income growth have been very strong in recent years in communities such as Bolton, Hopkinton, and Marlborough reflecting the economic impact of information technology in that part of the region. Further inside the city the demand for housing among scientific, medical and financial professionals has transformed the communities of Brookline and Cambridge into elite enclaves. High income families seeking good public school systems cluster in towns such as Newton, Belmont, Lexington and Winchester. Meanwhile, individuals and families facing serious economic barriers are increasingly clustered into specific communities in the metro region. New immigrants, particularly those with limited education and English language barriers, are locating in the region's poorest cities such as Chelsea, Revere and Lynn. Moreover, these communities have experienced significant decline in jobs and business establishments, further isolating low-income individuals and families from economic opportunity.

Growing economic disparity and geographic segregation by race and income are undesirable socially and economically. Socially, our region becomes a less interesting place to live and work as communities become more homogenous. It is also harder to develop a common platform for change on cross-cutting issues such as housing, public education, and economic assimilation when people are isolated from each other along lines of race and class. Furthermore, a growing body of academic research suggests that regions with higher rates of economic inequality perform less well than regions characterized by greater social equity.[62]

[62] Larry c. Ledebur and William Barnes, "All in It Together: Cities, Suburbs, and Local Economic Regions," Washington, D.C.: Woodrow Wilson Center Press, 1993. John Powell, "Sprawl, Fragmentation, and the Persistence of Racial Inequality: Limiting Civil Rights by Fragmenting Space," in *Urban Sprawl: Causes, Consequences and Policy Responses*, Gregory D. Squires, editor, Urban Institute Press: Washington, D.C., 2002. Manuel Pastor, Peter Dreier, J. Eugene Grigsby III, and Marta Lopez-Garza, *Regions That Work: How Cities and Suburbs Can Grow Together*, University of Minnesota Press, 2000.

Competitive Challenge #5:

Civic Infrastructure and Regional Perspective[63]

Effectively addressing the interrelated economic development challenges facing Greater Boston will require inspired civic leadership. This is a challenge in a region known for complacency, fragmentation and parochialism.

Our scan revealed two remarkably consistent themes with respect to civic leadership. First, Greater Boston is characterized by a certain complacency that thwarts active intervention. There is a perception (real or imagined) that Boston is the "Hub of the Universe." As such, many civic leaders display a remarkably *laissez faire* attitude toward the vexing growth and development issues facing the region. Second, Greater Boston's business and civic leaders exhibit limited capacity for collaboration and coordination. Whether the issue at hand is university-industry partnerships, workforce development, or regional planning, effective cross-sector collaboration and coordination pose a tremendous challenge. The combination of these civic traits (complacency and non-collaboration) results in limited, ad-hoc responses to challenges that require long-term, systemic solutions.

Another issue that is problematic from a civic perspective is the parochial nature of leadership in Greater Boston. All of the economic development challenges that face Greater Boston are metropolitan in scale. The interrelated issues of middle class job creation, human capital supply, housing, transportation and social and economic disparity cut across jurisdictional boundaries. These problems will not be solved by Boston, Cambridge, Chelsea, Framingham, Sudbury, Watertown or Wellesley. Rather, they will be solved when the region's civic and business leaders transcend urban-suburban rivalries and come together to develop solutions that are in the best interest of the entire metropolitan region.

The issue of civic leadership is made more complex in Greater Boston by a fragmented business culture. To date, the business community has not stepped forward with a compelling regional growth and development agenda. Business leadership in Greater Boston is split along key lines of industry sector (high tech, "eds and meds" and financial services) and geography (City of Boston, City of Cambridge, Route 128, and Route 495). A plethora of business organizations have developed over the years to service both specific industries and geographies but no dominant business-civic organization has emerged to represent the business community writ large on regional economic development and related issues of workforce, housing, and social equity.

With a recent wave of mergers and acquisitions sweeping Greater Boston, traditional business-civic leadership has been further weakened. Long standing corporate citizens headquartered in Boston including John Hancock, Gillette, Fleet and Filenes

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[63] See FutureWorks, "A White Paper on Business-Civic Engagement in Metropolitan Boston," Prepared for MetroFuture, May 2005 and FutureWorks, *Minding Their Civic Business: A Look at the New Ways Regional Business-Civic Organizations are Making a Difference in Metropolitan North America*, Prepared for the Metropolitan Leadership Network and Ford Foundation, September 2004.

have disappeared placing pressure on others to step up to the civic plate. In particular, there is growing pressure on leaders from the "eds and meds" sector to play a larger role in the civic life of the region. The need for stronger regional involvement of "eds and meds" was underscored with the release of a recent report demonstrating the tremendous economic impact research universities have on Greater Boston. The fact that eds and meds are "place-based" is also regarded as a big plus given recent industry restructuring. Additionally, the most recent Carol A. Goldberg Seminar report, *A New Era of Higher Education - Community Partnerships*: *The Role and Impact of Colleges and Universities in Greater Boston Today*, proposes collective action on the part of colleges and universities in metropolitan Boston to address regional growth and development issues.

The lack of a unified voice or structure in the business community contributes to a lack of institutional coordination around regional economic growth and development issues more broadly. Currently, there is no formal civic apparatus bringing business, government, and community groups together around a coherent regional economic growth and development agenda. Rather, Greater Boston is characterized by multiple groups working on related issues but without the benefit of a unifying framework.

Concluding Remarks

Our review suggests that the overarching economic development issue facing the region is building and maintaining civic institutions that will foster widespread economic growth and opportunity. Without them, Greater Boston could too easily devolve into a polarized region of rich and poor. The challenge for Greater Boston is to tap the creativity, skills and talent of its leaders to make sure this doesn't happen.

There are encouraging signs of progress on this front. Many of the organizations and institutions mentioned throughout this analysis have spearheaded efforts to address the region's economic development challenges. Mass Insight, in partnership with numerous industry associations and economic development organizations is leading a comprehensive science and technology initiative. Mass INC manages the News Skills for a New Economy Campaign. The Boston Foundation supports the large-scale workforce development effort known as *SkillsWorks* and is home to and producer of the Boston Indicators Project. The Metropolitan Area Planning Council is engaged in MetroFuture, a broad-based outreach effort to develop a 30-year growth and development plan for the region. To date however, these efforts have not congealed into a coherent economic development agenda characterized by widespread public and private sector support or accountability.

Greater Boston is a region that can accomplish just about anything it sets its collective mind to. A coordinated growth and development agenda created and endorsed by the region's prominent business, municipal and community leaders is certainly within our reach. If and when the region applies its hard-earned reputation for reinvention to the civic sphere, dramatic change can and will occur.

APPENDIX A:

LIST OF REVIEWED STUDIES, REPORTS, AND ARTICLES

Appleseed, *Engines of Economic Growth: The Economic Impact of Boston's Eight Research Universities on the Metropolitan Boston Area*, 2003.

Bandopadhyaya, Arindam, Miranda Detzler, and Mohsin Habib, *Down But Not Out: The Future of the Financial Services Industry*, College of Management, University of Massachusetts Boston, circa 2003.

A.T. Kearney, Sustainable Prosperity: An Agenda for New England, Prepared for The New England Council, 2005.

Barrow, Clyde, Rebecca Loveland, David Terkla, *The Marine Science and Technology Industry in New England*, May 2004.

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Batelle and Mass Insight Corporation, *Choosing to Lead: The Race for National R&D Leadership & New Economy Jobs*, Part of The Massachusetts Technology Road Map and Strategic Alliances Study, 2004.

The Boston Consulting Group, *MassBiotech 2010: Achieving Global Leadership in the Life-Sciences Economy*, Prepared for the Massachusetts Biotechnology Council, 2002.

The Boston Consulting Group, *Preventing a Brain Drain: Talent Retention in Greater Boston*, Prepared for The Boston Foundation and Greater Boston Chamber of Commerce, October 2003.

The Boston Foundation, *Thinking Globally/Acting Locally, A Regional Wake-Up Call: A Summary of the Boston Indicators Report 2002-2004*, March 2005.

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Comings, John, Andrew Sum, and Johan Uvin, *New Skills for a New Economy: Adult Education's Key Role in Sustaining Economic Growth and Expanding Opportunity*, The Massachusetts Institute for a New Commonwealth, December 2000.

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Mass Insight Corporation, *An Economy at Risk: Why We Need to Organize Our Universities, Health Care Institutions, and Technology Businesses to Compete with Other States*, Winter 2002-2003.

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Mt. Auburn Associates, *The Creative Economy Initiative: The Role of Arts and Culture in New England's Economic Competitiveness*, A Report by The New England Council, June 2000.

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Metropolitan Area Planning Council, *Starting Points for a Regional Vision: A Review of Municipal Plans in Metropolitan Boston*, August 2004.

Metropolitan Area Planning Council, *A Tapestry of Visions: A Findings Report Summarizing Results of the MetroFuture Visions Workshops*, December 2004.

Metropolitan Area Planning Council, *The Resonance of Regionalism: A Report on MetroFuture Polling and Survey Efforts*, January 2005.

Orfield, Myron, Thomas Luce, and Benjamin Oleson, *Boston Metropatterns: A Regional Agenda for Community and Stability in Greater Boston*, October 2001.

Pierce, Neal and Curtis Johnson, *Boston Unbound: Tapping Greater Boston's Assets and Talents to Create a World-Leading Cititstate*, Commissioned by The Boston Foundation, May 2004.

Stuart, Guy, *Boston at the Crossroads*, Rappaport Institute of Greater Boston, Harvard University, Working Paper 12, December 14, 2004.

Sullivan, Robert David, "Shrinking Pains," Commonwealth Magazine, 2005.

Sum, Andrew, Ishwar Khatiwada, Sheila Palma, and Paulo Tobar, *A Commonwealth Growing Apart: Family Income in Massachusetts*, prepared for the Workforce Solutions Group, September 2004.

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Terkla, David, "Growing Disparities among Greater Boston Communities during the 1990s," *Massachusetts Benchmarks*, Fall 2003.

Terkla, David, "Industry Clusters in Metropolitan Boston," *2004 Comprehensive Economic Development Strategy*, October 2004.

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APPENDIX B:

DEFINING THE METRO REGION

The MAPC planning area consists of 101 cities and towns in metropolitan Boston, stretching west from Boston to include most of the communities inside the I-495 corridor. According to the 2000 Census, the region's population was 3,066,394. The MAPC area does not correspond with standard definitions of the region used by federal and state data collection surveys. Therefore, throughout the document FutureWorks used data sources that define the geographic region of metropolitan Boston differently. These sources and geographic definitions include:

- The Bureau of Labor Statistics, Current Employment Statistics uses the Boston-Cambridge-Quincy, MA NECTA Division as defined by the Office of Management and Budget. That definition includes 97 towns surrounding Boston.

- The Bureau of Labor Statistics, Occupational Employment Statistics 2004 survey is calculated with data collected from employers in all industry sectors in the Boston, MA-NH PMSA, a 128 town area.

- The U.S. Census Bureau, 2003 American Community Survey uses the Boston, MA--NH PMSA. Using that definition, the region had an estimated population of 3.3 million in 2003.

- The Bureau of Economic Analysis, Regional Economic Information System, on the other hand, uses a county-based definition for its data. The Boston-Cambridge-Quincy, MA-NH (MSA) includes Essex, Middlesex, Norfolk, Plymouth, and Suffolk counties in Massachusetts and Rockingham and Strafford counties in New Hampshire. This definition the Boston metropolitan area had an estimated population of 4.4 million.