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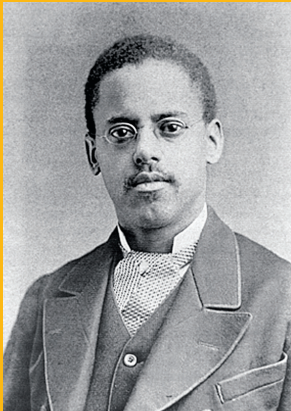
# City of Ideas:

*Reinventing Boston's Innovation Economy*

The Boston Indicators Report 2012

# About Our Cover

The light bulb is a universal symbol of “new ideas.” We are using it on the cover to highlight Boston’s role in the history of revolutionary ideas and groundbreaking inventions and as a reminder of the



gains for the common good made possible by offering opportunity to all. **Lewis Latimer** was born in Chelsea in 1848 to George and Rebecca Latimer, fugitive slaves who had escaped to Boston. When their owner from Virginia arrived to take them back, Boston abolitionists, including Frederick Douglass, raised funds to purchase their freedom. Their son, Lewis, began his career as a low-level draftsman, eventually working for Alexander Graham Bell and playing a major role in the invention of the telephone. And, while Thomas Edison is credited with inventing the light bulb, it was

Lewis Latimer who patented the carbon filament and threaded socket, enabling the light bulb’s mass production and widespread use. This year, the carbon filament light bulb is being phased out in favor of more energy-efficient light bulbs. The question raised by our cover is this: Where are the Lewis Latimers of our day who, through persistence and opportunity, will create the next wave of innovation and jobs for Bostonians in the complex and demanding 21st century?

# City of Ideas

## *Reinventing Boston's Innovation Economy*



## The Boston Indicators Report 2012

A PROJECT OF THE BOSTON FOUNDATION AND GREATER BOSTON'S CIVIC COMMUNITY

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March 2012



CITY OF BOSTON • MASSACHUSETTS

OFFICE OF THE MAYOR

Dear Friends,

True progress, I have said often, should be shared widely. This report, issued by the Boston Indicators Project, is another reminder that we should make sure Boston's path-breaking work reaches all of our neighbors.

The report's main prescription for building a true "innovation" economy is engagement, and it fits our city to a T. Boston's efforts on civic engagement are now nationally, and increasingly internationally, recognized: From the early days of community policing to our strategy of New Urban Mechanics, from our efforts to engage families at Parent University to our community-based successes in greening our city and our newest neighborhood-based approaches to improving health and reducing obesity.

Our vibrant Innovation District itself is a testament to the progress that results from embracing collaboration, and there and across our city, we are strong because our relationships are strong. As I noted at the outset of this year so full of potential: In order to reach up, we have to reach out. Engagement, in this era, is the key to prosperity and to success that is more widely shared.

In government, I'm fond of saying that to accept the status quo is to move backwards. And so it is that even though Boston has added jobs faster than other cities, has built a school system that ranks among the best among urban districts in the country, and has invested to create vibrant neighborhoods, we must continue to push forward. A city can't get ahead—nor stay there—without constant innovation and change. This report reminds us of that.

Sincerely,

Thomas M. Menino  
Mayor of Boston



Dear Members of the Greater Boston Community,

The “firsts” on the cover of this report underscore Boston’s role in the history of ideas and its penchant for reinvention over almost four centuries. This sixth biennial report from the award-winning Boston Indicators Project reminds us how far Boston has come, and of daunting challenges ahead.

The Boston we see today reflects a half century of persistent leadership by those who believed in and worked for what it could become. Boston emerged from decades of economic stagnation in the late 1950s and ’60s through the vision and tenacity of Mayors Hynes and Collins. It transcended white flight, the violent reaction to school desegregation and threat of bankruptcy in the ’70s and early ’80s to become a world-class city through the optimism and drive of Kevin H. White, Mayor of Boston from 1968 to 1983, whose towering legacy was celebrated with his passing early this year. Under the leadership of Mayor Raymond L. Flynn, from 1984 to 1993, Boston saw racial healing and neighborhood revitalization, building on the city’s growing diversity. In the early ’90s, emerging from deep recession, Boston entered an immensely productive period of city building, school reform and the transition to a full-fledged knowledge economy under the leadership of Mayor Thomas M. Menino. Today, Boston is one of the most job rich, well-educated, ethnically diverse, youthful and dynamic cities in the world.

However, as this report also documents, Boston’s evolution has occurred in an increasingly global and competitive economy. On the one hand, external challenges reinforce the value of our deeply rooted institutions, embedded culture of innovation and wellspring of young talent. On the other hand, we are more aware than ever of our vulnerability to economic and environmental shocks. This means that we must redouble our efforts to prepare our young people for still greater competition and likely shocks.

Our short-term challenge is twofold. First, macro-economic trends have not been kind to households on the low end of the economic ladder, with automation and the off-shoring of well-paid manufacturing jobs diminishing opportunities for those with less education, rewarding those with advantages and widening the gap between. The housing boom and bust exacerbated that trend and left pockets of foreclosed properties in low-income neighborhoods of color and stressed households throughout the region.

While education is the key to opportunity for all and to innovation and competitiveness, our second challenge is the degree to which rising health care costs have outpaced our investment in education. The coming retirement of the Baby Boomers points to both increased need on the part of employers for skilled workers and greater opportunity for young workers. To meet that need and potential we must rebalance our priorities and extend educational excellence to all children, with the goal of eliminating stubborn racial and ethnic inequities and disparities.

The great good news is that Boston faces these challenges as a changed city. Today, with our unprecedented diversity, our status as a global node of innovation, our strong community networks and technology-enabled collaboration, we each represent and carry a portion of our city’s future as the leaders and innovators of Boston’s 21st century identity, always in the spirit of the “city on a hill, with the eyes of the world upon it.”

Paul S. Grogan  
President and CEO  
The Boston Foundation

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## *About the Boston Indicators Project*

**S**ponsored and coordinated by the Boston Foundation in partnership with the City of Boston and the Metropolitan Area Planning Council, the Boston Indicators Project has been a primary data resource for the Greater Boston community for more than a decade. Its goals are to democratize access to high quality data and information, foster informed public discourse and track progress on shared civic goals.

In addition to tracking a comprehensive framework of key indicators, the Project produces biennial reports chronicling Boston's accomplishments and the full array of challenges facing the city and region as well as timely special reports on such critical topics as poverty and education. These reports build on expert and stakeholder convenings, data analysis and reviews of recent research. Over the years, they have helped to catalyze an on-going set of conversations throughout the community about our region's economic competitiveness and the key challenges facing Boston:

- 2000 *The Wisdom of Our Choices: Progress, Change and Sustainability*. Provides baseline data for the height of Boston's high-tech boom, and warns of the regional knowledge economy's disparate effect on more- and less-well educated Boston residents.
- 2001–2002 *Creativity and Innovation: A Bridge to the Future*. Emphasizes post-recession Boston's creative economy assets and the challenge of talent retention in a high-cost city and region.
- 2003–2004 *Thinking Globally/Acting Locally: A Regional Wake Up Call*. Notes intensifying global competition for talent and jobs and the need for a coherent response.
- 2005–2006 *A Time Like No Other: Charting the Course of the Next Revolution*. Details Boston's outsized historic and current role in the world and seven crisis/opportunity pairs that, together, reframe Boston's challenges as the foundation for future growth.
- 2007–2009 *A Great Reckoning: Healing a Growing Divide*. Highlights rising income inequality in Boston and the region and its harmful effects.
- 2008, 2011 *Boston's Education Pipeline: A Report Card*. A comprehensive view of the entire arc of Boston's system of educational opportunities and outcomes.
- 2011 *The Measure of Poverty*. A short report on poverty in Boston over the last two decades and today.

The Boston Indicators Project's award-winning website [www.bostonindicators.org](http://www.bostonindicators.org) tracks change across 10 sectors and six cross-cutting topics. It also contains research postings and innovations by sector, as well as a blog about how Boston and the region are making progress toward shared civic goals for 2030, Boston's 400th anniversary.

The Boston Indicators Project also collaborates with the Metropolitan Area Planning Council to offer access to Boston and regional data, data mapping and visualization tools through the MetroBoston DataCommon, [www.metrobostondatacommon.org](http://www.metrobostondatacommon.org), built on the open source platform Weave, which was developed by faculty and graduate students at the University of Massachusetts-Lowell with partners nationwide through the Open Indicators Consortium (OIC).

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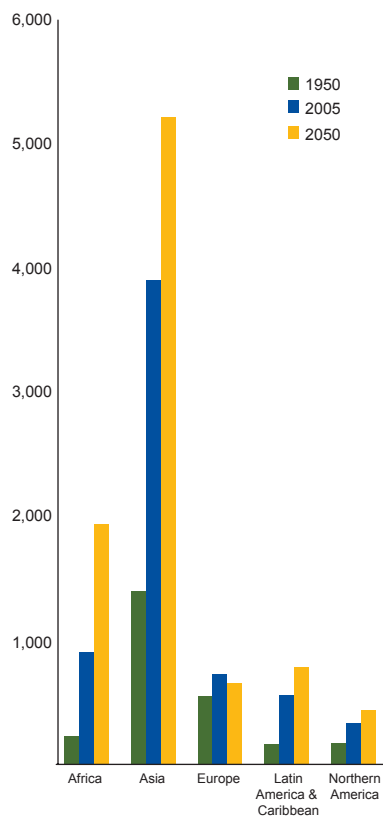
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# The Global Context: Accelerating Change



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World Population Growth by Region 1950–2050 (in Millions)



Source: US Census Bureau International Data Base

**Boston’s economy does not exist in a vacuum, and is subject to global forces and trends. Its future jobs prospects rest on its capacity to respond creatively to the pace, scale and scope of change.**

**Dizzying Population Growth.** From one billion in 1800 to two billion in 1925, four billion in 1975, six billion in 1999, and seven billion in 2011, humanity’s growth is spurring a global competition for potable water, arable land, ocean fisheries, energy, raw and building materials, skilled workers and jobs. Today, Asians constitute 60% of the total world population; Africans 15%; Europeans 11%; Latin Americans and Caribbeans 9%; and North Americans—Americans, Canadians and Mexicans—8%.

**The Rise of Emerging Economies:** China doubled the percent of adults with a BA in just one decade, ranks first in Internet use and clean-tech investment and jobs, and is now targeting the biotech industry. India is innovating products for the world’s poor, from cars and medical procedures to tablet computers. Brazil is energy independent and booming. Bangladesh and Vietnam are low-cost manufacturing hubs. McKinsey projects that by 2025, more than 20 of the top global cities will be in Asia—up from eight in 2007.

**Automation and Vanishing Jobs:** “Smarter” machines are quickly replacing human labor, boosting productivity and profits but eliminating jobs: first in factories, then service jobs such as bank tellers and, now with advanced software, architects, lawyers, doctors and astronauts. Chinese factory workers earned \$1.36 per hour in 2008, 4% of the American equivalent, yet even there, factory owners are automating and off-shoring. Globally, three billion workers now compete for 1.2 billion jobs, yet jobs are shrinking as populations grow.

**Rapid Aging:** By 2050, people age 65 and over are expected to outnumber children under the age of four by two and a half to one; in developed nations, seniors will have increased from one in 12 in 1950 to one in four. In China, one child will be caring for two aging parents. Due to recent immigration, US workers are relatively young compared to those in other wealthy developed nations.

**Climate Change, Extreme Weather, Adaptation:** The Earth is warming, with increasingly extreme weather and a projected 7- to 23-inch sea-level rise by century’s end that could rise further with accelerated melting of the Antarctica and Greenland ice sheets. The great majority of climate scientists have concluded that the upward trend in greenhouse gas emissions must be reversed by 2020 to prevent catastrophic damage and irreversible trends. Adaptation has replaced sustainability as the new watchword.



# Introduction:

## “Nothing Will Be the Same Ever Again”

### *A Time for Innovation and Reinvention*

The Great Recession of 2008 shifted the tectonic plates of the world economic order. The Chief Human Resource Officers of 300 of the nation’s largest employers summed up that shift in their 2011 *Blueprint for Jobs in the 21st Century*: “Whether we refer to a flattening world, a revolution of digitization, or the evolution of the emerging markets, nothing will be the same ever again.” Our greatest challenge, they added, is “to create and sustain quality jobs in the new hyper-competitive global economy of the 21st century.”

They also warn that: “Americans are not being educated in sufficient numbers to meet the demands of today’s highly technical work processes and products. Labor costs in the US are high and going higher, driven in large part by health care costs. There is no coordinated commitment by all the various institutions involved in generating economic opportunity to take the steps necessary to restore America’s competitiveness and provide employment security.”

Boston is well positioned to navigate this period of global change and challenge, as it has done in every century since its founding. In the early 19th century, Boston ships plied the improbable China Trade on the Atlantic and Pacific Oceans. The city entered the 20th century as a manufacturing hub for shoes and textiles and emerged at the century’s end as a global node of financial services and high tech innovation.

The next several decades may be Boston’s most transformative. The Great Recession revealed and intensified changes in the very structure of the American economy—and that of Greater Boston—that were obscured for three decades by cyclical booms and busts and by economic indicators that failed to tell us all that we needed to know. Today, the sleeping giant of an engaged citizenry is awakening to a new economic landscape. Automation has eliminated millions of America’s industrial jobs and is moving up the value chain. The off-shoring of jobs to low-wage nations has eliminated millions more. Climate change and cyber security pose unknown threats. And as political transformation blows across the world, stalemate at home impedes progress.

In this dynamic environment, complacency is Greater Boston’s greatest threat. While jobs may be in short supply, there is no shortage of work.

**Greater Boston, with Boston at its hub, has the wherewithal to innovate solutions to our own greatest challenges and to become a living laboratory for solutions to the greatest challenges on Earth. The first step is to acknowledge the limitations of the current innovation economy and the need for a more inclusive economic paradigm that engages all Bostonians as problem-solvers and informed consumers to invent and secure a range of good 21st century jobs.**

Whether we will succeed in creating broad-based and shared prosperity depends on our willingness to confront hard truths, to shake off “old new thinking,” and to align scarce resources on shared goals.

This report takes the measure of Boston by looking “under the hood” of standard economic indicators and ahead to the year 2030, Boston’s 400th anniversary.



## REPORT HIGHLIGHTS

### *The Global Economic Context—Change & Competition:*

**Global population increased from 1.6 billion in 1900 to 7 billion in 2011 and is heating up both the climate and the competition for resources, talent and jobs.** Today, 3 billion workers over age 15 are competing for 1.2 billion jobs, while automation is fast replacing human labor. Greater Boston is well positioned to compete in this fast-moving global economy but Bostonians' future jobs prospects depend on our capacity to grasp and respond creatively to the accelerating pace and scope of global change.

### *The National Economic Context—Volatility & Inequality:*

**Public policy and business practices over the past 30 years have reshaped the US economy and the distribution of its benefits.** Soaring gains in worker productivity from automation and the off-shoring of jobs increased profits but undermined wage gains. Declines in top marginal tax rates for corporations and individuals contributed to a structural deficit in federal revenue and to constraints on spending for education, infrastructure and small business—the foundations of job growth. The economy became more dependent on volatile investor-fueled bubbles and debt-fueled consumer spending, while rising costs for health care, housing and college tuition sapped household savings and fueled record household debt. These trends were highly disadvantageous to middle- and low-income households.

### *Greater Boston's Innovation Economy—World-Class & Outperforming:*

**Greater Boston has outperformed the nation and its counterparts, with higher growth, lower unemployment and greater housing stability.** The region's unparalleled concentration of institutions of higher education provide a wellspring of highly educated talent that, in turn, anchors innovation economy clusters, attracting research and venture capital funding, with multiplier effects across other sectors. From the Recession's trough in 2009 through 2010, the Metro Boston economy grew by 4.8%—the highest rate among all large US metros. From 2002 to 2010, the Milken Institute ranked Massachusetts #1 on its Science & Technology State Index, and the Metro Boston statistical area 4th in the world in patent filings.

### *Boston—An Emerging 21St Century City:*

**Boston is completing three decades of sustained city building and economic transformation, emerging as one of the most job-rich, well educated, ethnically diverse, youthful and dynamic cities in the nation and the world.** In 2011, Boston was ranked the top "global innovation city" by 2thinknow, and listed by Mercer as third to Honolulu and to San Francisco among US cities and 36th worldwide in its quality of life. With about 10% of the Commonwealth's population, Boston accounts for 18% of the state's jobs. Boston jobs are concentrated in innovation economy clusters such as higher education, health care and financial services.

### *"Under the Hood:"*

**Greater Boston's jobs picture is complex and economic change can be swift. Standard top-level economic indicators don't tell us everything we need to know. For example:**

### Complexities

- In the 1990s, all Metro Boston industries grew jobs with the exception of *Manufacturing*. In the 2000s, only the *Educational & Health Services* and *Leisure & Hospitality* industries added employees, while jobs declined by 113,000. Metro Boston’s comparatively “hot” economic growth rate of 4.8% in the year 2009/2010 generated job growth of just 0.4%. From January to November 2011, Metro Boston added 38,000 jobs (seasonally adjusted), largely in *Health Care & Social Assistance*, with 150,000 workers remaining unemployed.
- If each of the 71,000 vacant jobs in Massachusetts in the second quarter of 2010 (the latest data available) had been filled by one qualified unemployed worker—overcoming the skills/jobs mismatch entirely—three workers would still have been without a job. In other words, skills training for vacant jobs, while essential, will not solve the region’s employment challenge: significant job growth is also needed.

### Disparities

- While Boston’s knowledge economy is highly resilient and dynamic, the loss of high-paid, low-skilled manufacturing jobs has widened income inequality and contributed to youth unemployment and racial/ethnic disparities in health and education.
- Massachusetts is among the most progressive states in creating ladders of opportunity and in fiscal prudence and foresightedness, yet its budget is balanced on a tax structure that is disadvantageous to low-income households and on cuts in programs proven to protect vulnerable families and to boost opportunity. And Massachusetts Lottery sales—the only source of Unrestricted State Local Aid—are drawn disproportionately from lower-income municipalities.

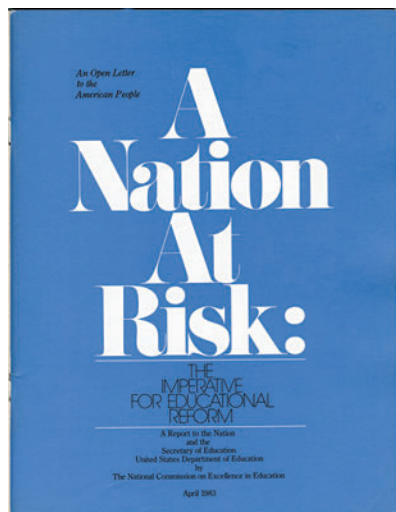
### Vulnerabilities

- *Education & Health Services* is reportedly the region’s premier growth industry. Yet within that industry, health care is expanding *at the expense of* education—the innovation economy’s core asset. Given the region’s aging and increasingly diverse workforce and the importance of preparing young people to succeed in the hyper-competitive global economy, this inter-industry conflict is arguably the single greatest threat to the region’s future prosperity.
- Greater Boston’s innovation economy is highly volatile, as evidenced in our recent economic history. It is essential to prepare now for contraction in the European economy, our most important trading partner, and for projected reductions in federal spending for research, health care and defense. Moreover, McKinsey Global predicts retrenchment in the biotech and pharmaceutical industries.
- The region’s economy is vulnerable to the coming Baby Boomer exodus, requiring a seamless system of education and training to prepare a more diverse young workforce.

### **The Big Shift—Reinventing Boston’s Innovation Economy:**

The first step is to understand weaknesses in the current innovation economy paradigm and to strengthen its resilience and sustainability through greater opportunity and shared prosperity. Reinventions might include: new measurement and civic engagement paradigms; a new consumer spending paradigm to inform investment in health care, housing and education as well as hyper-local purchases and regional exchange; innovation of the products and services that we and the rest of the world need now—from cost-effective quality health care to new building materials, clean-tech energy and adaptable infrastructure.

## The National Context: We Were Warned



The nation’s economy would almost undoubtedly be stronger today—and Americans much more competitive—had the nation responded to two wake up calls some 30 years ago. The first came in 1976, when the OPEC Oil Embargo sent fuel and food prices soaring. In a 1979 speech, President Jimmy Carter warned of rising energy dependence and reliance on consumer spending to drive growth. The second came in the highly publicized 1983 report *A Nation At Risk*, commissioned by President Ronald Reagan’s Secretary of Education. That report boldly warned of growing global competition and declining American competitiveness:

**“Our once unchallenged preeminence in commerce, industry, science, and technological innovation is being overtaken by competitors throughout the world... We compete with them for international standing and markets, not only with products but also with the ideas of our laboratories and neighborhood workshops...”**

**“Learning is the indispensable investment required for success in the ‘information age’ we are entering... Our goal must be to develop the talents of all to their fullest. Attaining that goal requires that we expect and assist all students to work to the limits of their capabilities.”**

Despite these warnings, domestic policy across four presidencies promoted and subsidized not education but consumption: Americans’ purchase of bigger cars and trucks; bigger and second homes; more and increasingly expensive health care; bigger sugary drinks. Free-trade agreements facilitated American’s purchase of furniture, appliances and consumer electronics made elsewhere.

Over three decades, Americans fell behind in educational excellence, in green- and clean-tech energy innovation and jobs, in infrastructure repair and innovation, and in the global balance of trade. Many of the “best and brightest” went into paper-economy jobs in finance and consulting—including 47% of Harvard seniors in 2007 and 41.5% of Princeton’s in 2008—starving the real-world economy of its life blood: young talent and new start-ups.

**Hard as it is to grasp, today, in comparison to our peers in other wealthy developed nations, Americans are the most personally indebted, the most incarcerated, the most income unequal, the most overweight and obese, pay the most for health care, consume the most energy per capita (next to Canada), and have the least intergenerational mobility (next to Britain), according to the Organisation for Economic Cooperation & Development (OECD).**

It didn’t have to be that way. We were warned.



## A “New Normal”

For much of the 20th century, Americans’ fortunes rose and fell together. Today, that is no longer true.

### Broad Prosperity: 1946–1979

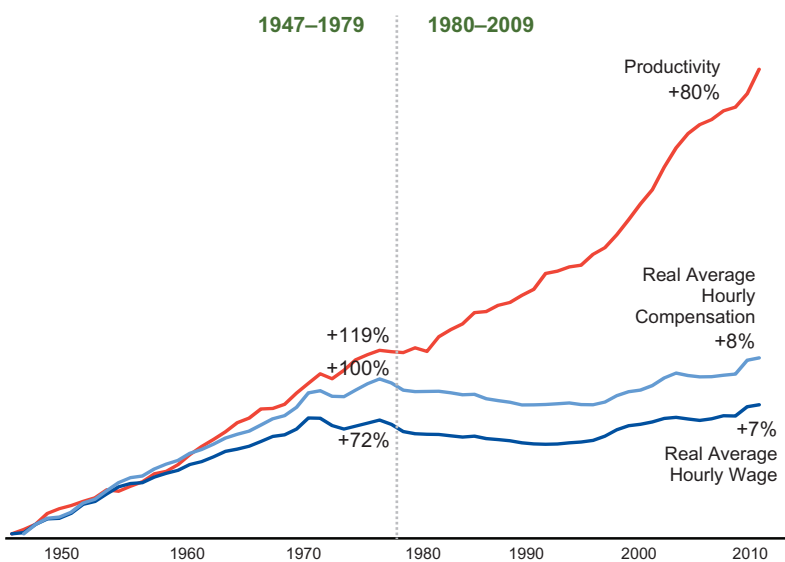
For three decades after World War II, from 1947 to 1979, US growth and productivity soared as returning soldiers went to college and purchased new homes—both subsidized by the GI Bill. The federal government invested in major new infrastructure, from the federal highway system to rural electrification. Earnings rose for all groups, but especially for those at the bottom.

### The Divorce of Productivity from Wage Gains: 1979–2011

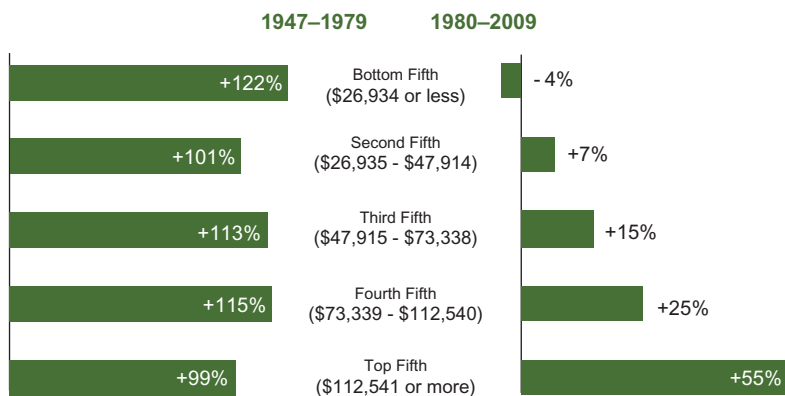
Automation of manufacturing and service jobs combined with offshoring to low-wage nations fueled productivity, growth and profits but eliminated millions of American jobs. Wages stagnated in most sectors but salaries in the financial sector soared. The share of income for the bottom fifth of Americans lost ground while the top 1% of earners rose from about 10% of the nation’s pretax income in 1980 to more than 20% in 2007, a level not seen since 1928. This shift represents a radical change from America’s economy for much of the 20th century. Henry Ford, who first mass-produced automobiles early in the 20th century, paid workers wages sufficient to afford his cars to sustain his market. Today’s new auto workers cannot purchase the new cars they make.

In the US economy today—70% dependent on consumer spending—consumers are pulling back to deleverage near-record-level debt, while businesses deleverage employees in the name of efficiency. With high deficits, government is also cutting back. The result is slow wage and job growth and reduced consumer spending—a vicious cycle.

The Great Prosperity / The Great Regression  
Changes in Productivity and Earnings US, 1947–2009

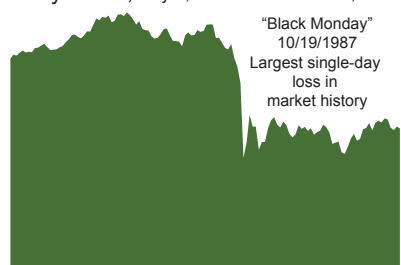


Change in Income by Quintiles  
In 2009 Dollars



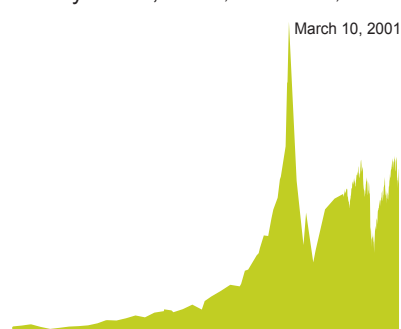
Source: US Bureau of Economic Analysis, Adapted from Robert Reich, New York Times Sept. 3, 2011

Dow Jones Industrial Average  
Daily Close, July 1, 1987–December 31, 1987



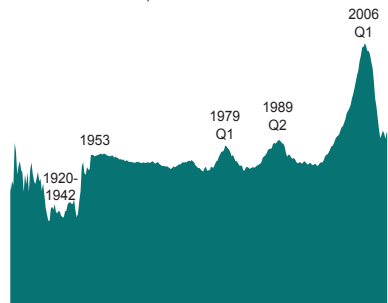
Source: Dow Jones Industrial Average

NASDAQ Composite Index  
Daily Close, Dec. 31, 1970–Oct. 31, 2011



Source: NASDAQ

Real Home Price Index  
US, 1890–2011:Q2



Source: Rober Shiller, *Irrational Exuberance 2nd Edition*

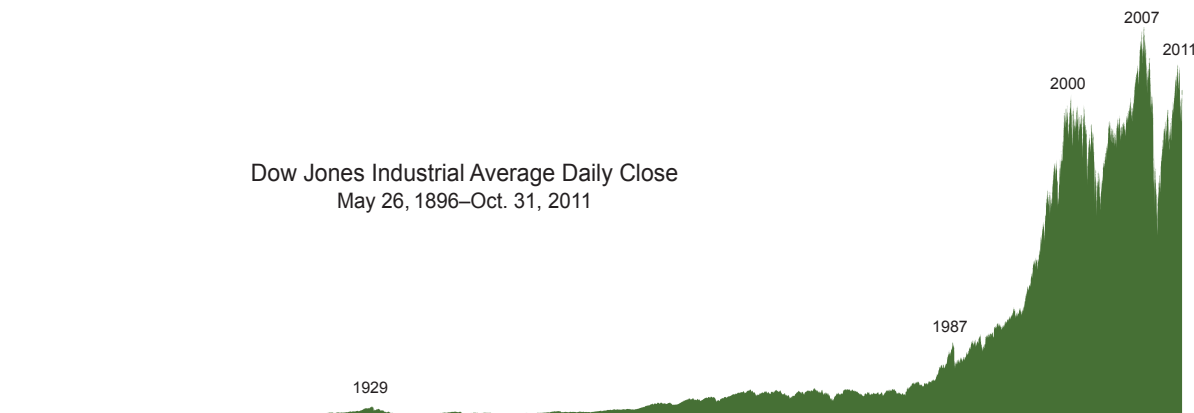
## Bubbles and Debt: A Fragile Foundation for Growth

The Great Recession revealed and intensified structural trends long underway in Boston and the nation. Looking at the US economy across decades and even a century, it is clear that in recent decades, speculative booms and busts have played an increasingly large role in the US economy, with an accompanying increase in volatility:

- **The 1980s real estate boom** fueled consumer spending and stock price increases, but crashed in the 1987 Savings & Loan (S&L) crisis. Loosened regulations allowed the staid Savings & Loan industry to operate more like commercial banks, and they made increasingly risky loans. When Congress eliminated tax incentives for holding commercial real estate, the loans went bad, triggering the greatest one-day percentage drop in US stock market history: 22.6%. The sudden loss of tax revenues hit states and the nation hard.
- **The dot.com bubble of the late 1990s** reflected private equity, venture capital and stockholder speculation on the value of high-tech companies, leading to a record NASDAQ close in 2000. The bubble burst in March 2001, sending the US economy into a recession that hit Greater Boston particularly hard with a sharp loss in high tech and manufacturing jobs.
- **The housing bubble of 2001–2006** combined easy credit and lax regulation with predatory lending, recklessness and greed. That bubble burst in mid-2006, devaluing home prices as well as sub-prime mortgage-backed securities, which in turn led to the near-collapse of the US and global banking system in late 2008.

More than a century of US stock market history shows that the US economy has entered a period of great volatility—a “new normal”—after many decades of relative stability.

Dow Jones Industrial Average Daily Close  
May 26, 1896–Oct. 31, 2011



Source: Dow Jones Industrial Average

## The Biggest Bubble: US Health Care

**US health care costs have increased by at least 2% more than the economy as a whole annually for three decades, absorbing an ever-greater share of wages, business investment and public budgets.**

In 2010, America's public and private health care spending totaled \$2.6 trillion—almost 18% of GDP, up from 9.2% in 1980.

To put that in perspective, the annual spending on health care in the US now equals about half of what China, with four times the population, spends annually on everything. High US health care costs are also an obstacle to American job growth, adding a premium to American jobs and exports and, according to the Human Resources Officers of 300 major US corporations, is a key to why many US employers are not hiring Americans.

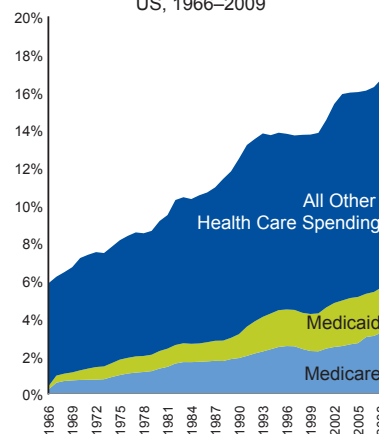
The Kaiser Family Foundation reports that in 2011, the average annual premium for family health care coverage through an employer reached \$15,073, 9% higher than in 2010, with the average employer share at \$10,944, up 113% since 2000, and the average worker's share at \$4,129, up 131%. In contrast, since 2000, median household income, when adjusted for inflation, declined by 5% over the decade.

**US health care costs are twice the average of those in other wealthy developed nations, all of which provide health care coverage to all of their people. Yet despite these high costs, Americans' health ranks among the lowest.** This discrepancy is often explained in terms of America's greater diversity and disparities, yet insured, white, middle-class Americans now rank lower in health status than all British residents. And white Americans' life expectancy is shorter than that of all Canadians—who spend 40% less. Another cited explanation for the discrepancy is unequal access to beneficial medical innovations.

However, National Institute of Medicine (IOM) research finds that the cost discrepancy in health spending between the US and its peers is due to the US health care system wasting about one-third of its cost through inefficiencies and a lack of focus on preventable disease. Nationally in 2009, that “wasted one-third” equaled about \$765 billion of the total \$2.2 trillion spent. In Massachusetts, the “wasted one-third” equaled more than \$20 billion in that single year. As a point of reference, the approximately \$20 billion estimated by the Institute of Medicine to be wasted *annually* in public and private health care spending in Massachusetts is roughly equivalent to 124 times the MBTA's FY12 budget shortfall of \$161 million, more than 5 times the size of the MBTA's \$4.6 billion unfunded capital investments, and more than the \$15 to \$19 billion needed *over the next 20 years* to maintain the current state of the Commonwealth's entire transportation network, as projected by the Transportation Finance Committee.

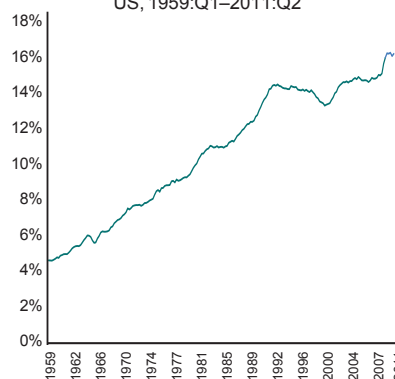
Harvard economist Edward L. Glaeser, writing in *The Boston Globe*, concludes: “Ever-increasing health costs pose a threat to America's economic future... The current situation has to change.”

Spending on Health Care as a % of Gross Domestic Product  
US, 1966–2009



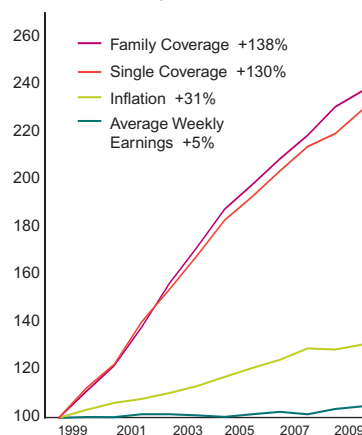
Source: Centers for Medicare & Medicaid Services;  
US Bureau of Economic Analysis

Health Care as % of  
Personal Expenditures  
US, 1959:Q1–2011:Q2



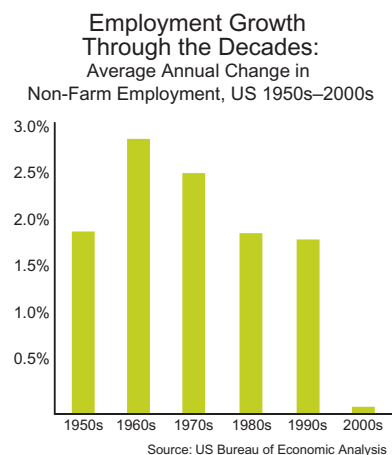
Source: US Bureau of Economic Analysis

Change in Health Care Premiums,  
Average Earnings & Inflation  
US, 1999–2010



Source: Kaiser/HRET Survey of Employer Sponsored Benefits  
US Bureau of Labor Statistics

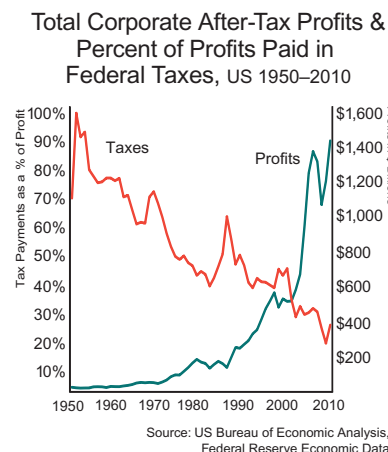
## *New Territory: Rising Profits, Falling Taxes, Fewer Jobs*



In recent years, rising US corporate profits and lower taxes have not resulted in job and wage gains to the same extent as in earlier decades—when tax rates were higher.

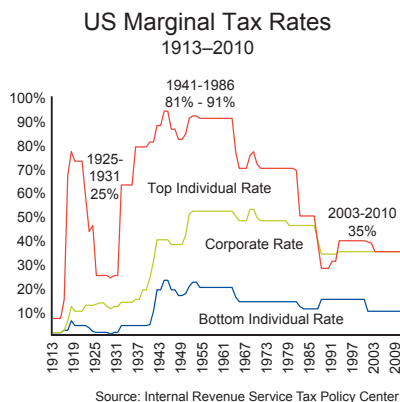
Over the last decade, despite two recessions, US corporate profits soared to record levels. In 2010, US corporations posted \$1.4 trillion in post-tax profits, up from \$507 billion in 2000—a 178% increase over the decade. By comparison, post-tax corporate profits in the US rose by 40% in the 1950s and by 90% in the 1960s.

**In contrast to earlier decades, however, rising corporate prosperity did not translate into job growth. From 2000 to 2010, total US employment grew by an average annual rate of 0.1%—a fraction of growth in previous decades. This reflects in part the sea-change of increasing productivity through automation and off-shoring.**



Today’s jobless recovery is occurring against the backdrop of sharply declining corporate taxes. Marginal corporate income tax rates peaked at 54% in the 1950s. For much of the 1950s and 1960s, the percent of profits paid in federal taxes stood above 50%. Since the Tax Reform Act of 1986, individual and corporate tax rates have been at their lowest since the 1920s, dropping below 30% in the 1980s and 1990s and remaining at 35% from 2003 to 2010. In 2010, US corporations paid slightly more than 23% of their profits in federal taxes—the lowest rate since the 1940s.

As tax rates fell, so did the share of federal revenues from corporate income taxes—from 30% of total US revenue in the 1950s to 7.5% in 2010—while the share of tax revenues from individuals remained constant at about 40%. Coupled with steep job losses and declining household incomes during and after the Great Recession, these trends have resulted in the lowest federal tax revenues in more than 50 years: 14.8% of GDP in 2010, down from a steady 18% since the 1950s.



Federal tax policy has been a major factor in the nation’s \$14 trillion debt and annual budget shortfall, leaving few resources to assist those who are out of work or who require retraining to compete in the global economy.



## The Consequences: Mountains of Personal Debt

Fast-rising health care, housing and college tuition costs in combination with rising debt and slow job and wage growth could not be sustained. A mild 2007 recession and declining home prices triggered a financial meltdown in late 2008. Americans lost a significant portion of net worth, much of which was tied up in home equity.

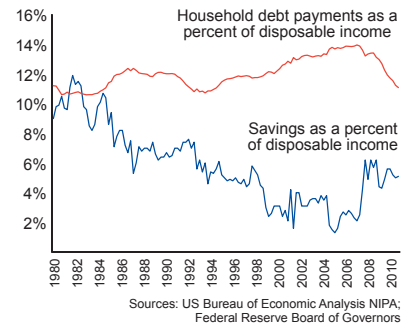
**Household Debt:** In late 1981, the US personal savings rate was nearly 12% but by late 2005—the peak of the housing and credit bubble—it had fallen to 1.3% of total disposable income, a record low since the 1930s. On the eve of the Great Recession, in late 2007, household debt payments in the US had reached almost 14% of household disposable income—a 30-year high.

**Mortgage Debt:** Consumer debt peaked at above 14% of disposable household income just before the Recession, while total outstanding mortgage debt peaked at \$10.6 trillion in early 2008—nearly 163% higher than the decade before. By mid-2011, 27.5% of homeowners nationwide were underwater or treading water with negative or near-negative housing equity, including almost 20% of Massachusetts homeowners. Economist Martin S. Feldstein wrote in the New York Times that, “since the housing bubble burst in 2006, the wealth of American homeowners has fallen by some \$9 trillion, or nearly 40 percent... The overhang of mortgage debt prevents homeowners from moving to areas where there are better job prospects and from using home equity to finance small business startups and expansions.”

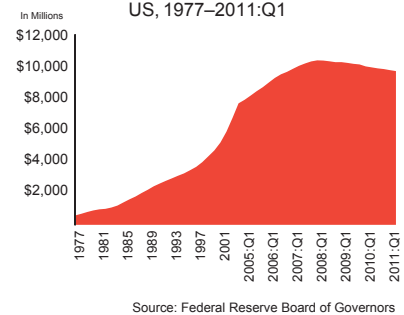
**Student Debt:** In June 2011, total US student debt had reached \$830 billion, exceeding revolving credit debt at \$826 billion (of which 98% is credit card debt) for the first time. The Project on Student Debt found that graduates of the Class of 2010 from Massachusetts’ public and private four-year colleges and universities had the nation’s 12th highest average student debt-load, at \$25,541, with all New England states in the top 15.

**Increasing Wealth Disparity:** Black, Latino and Asian households were disproportionately targeted by predatory lenders prior to the Great Recession, and lost a disproportionate share of their wealth in the Recession largely due to declining home values. Between 2005 and 2009, the median household net worth of whites declined by 16%, for Asians and African Americans by 53%, and for Latinos by 66%, exacerbating historic patterns of wealth disparity. In 2009, more than 33% of African American and Latino households had zero or negative net worth compared to 19% of Asian and 15% of white households, according to the Pew Research Center.

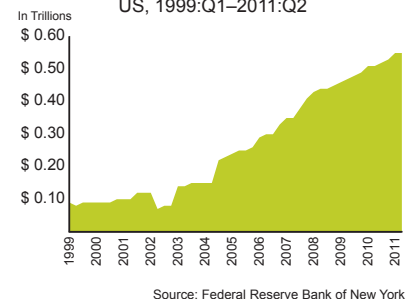
Personal Savings Rate & Household Debt Service Ratio  
US, 1980:Q1–2011:Q2



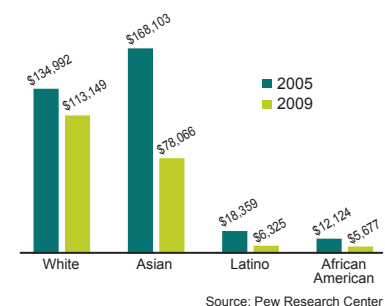
Outstanding Mortgage Debt  
US, 1977–2011:Q1



Total Outstanding Student Debt  
US, 1999:Q1–2011:Q2

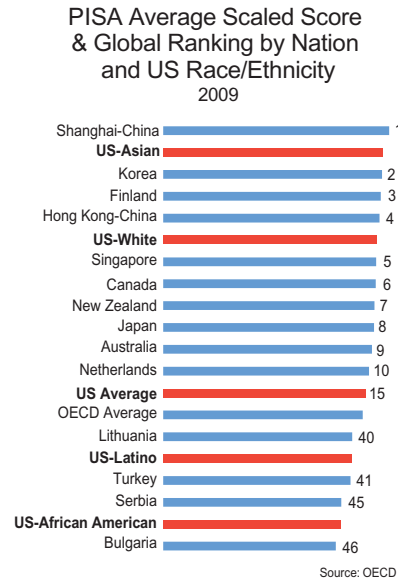


Change in Median Household Net Worth by Race/Ethnicity,  
US, 2005 and 2009



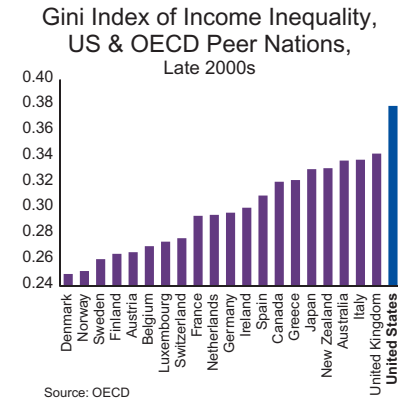
## Declining Equality and Mobility

The scale of the damage wrought by structural changes in the nation's economy is now coming into full view.



**Slipping US Competitiveness in Education:** On the 2009 PISA International Reading Exam, American students placed 17th among 65 wealthy nations and citistates. While Asian American students placed second to 1st-place Shanghai and white American students scored between 4th place Hong Kong and 5th-place Singapore, Latino American students scored between 40th-place Lithuania and 41st-place Turkey, and African American students scored between 45th-place Serbia and 46th-place Bulgaria.

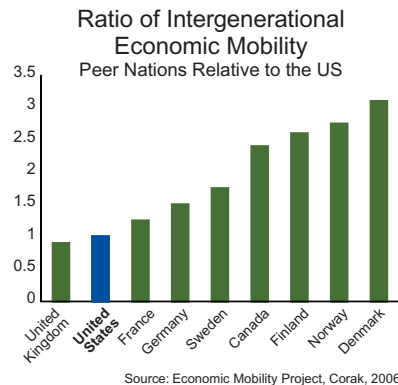
**These results underscore the risk to US competitiveness in the nation's persistent racial/ethnic achievement gap. Black and Latino students are the growth tip of America's young workforce.**



**Widening Income Inequality:** The gap between rich and poor in the US now exceeds that of all other wealthy developed nations. This stark measure reflects less progressive tax rates and the doubling of the share of the nation's wealth by the top 1% over the past three decades. Between 2002 and 2006 alone, the top 1% captured nearly three-quarters of all economic gains.

**Declining Mobility and Opportunity:** Research by the Pew Charitable Trusts' Economic Mobility Project found that when it comes to intergenerational mobility, Germany is now 1.5 times more inter-generationally mobile, Canada is 2.5 times more mobile and Denmark is 3 times more mobile than the United States.

An example of the sharp decline in economic opportunity in the US can be seen in the trajectory of black teenagers. Since the onset of the Recession in 2007, their employment-to-population ratio has declined by half.



**The US is now challenged to take stock of current conditions and to chart a way forward to broad-based economic renewal and prosperity. In that task, Boston—a city of ideas reflecting the expertise of a diverse population, academic and community-based experts and great innovative capacity—has much to offer.**

# Greater Boston's Innovation Economy: World Class Status

**M**etro Boston has nearly completed its transition from a manufacturing to a knowledge-based economy—one of the first in the world. Grounded in an unparalleled constellation of public and private higher education institutions, Greater Boston attracts a wellspring of young talent as well as research funds and venture capital to turn innovations into new business spin-offs.

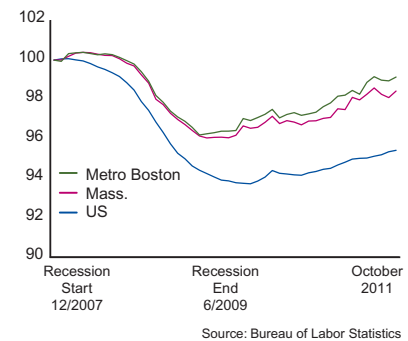
The region's highly educated workforce and ready capital have attracted and helped to expand such "new economy" clusters as insurance and financial services, computer hardware and software, medical care and the life sciences, high tech manufacturing, technical and business services, materials development and clean-tech energy innovation. These sectors, often in partnership with the public sector, in turn have generated multiplier effects such as job growth across other industries, from real estate to hospitality.

Today, the combination of private investment, federal research and development funding and public initiatives, such as the Massachusetts Life Sciences Initiative, Advanced Manufacturing Initiative, MassChallenge venture fund and Massachusetts Green High-Performance Computing Center in Holyoke, continue to buoy the region's economy, even in challenging times. As a result:

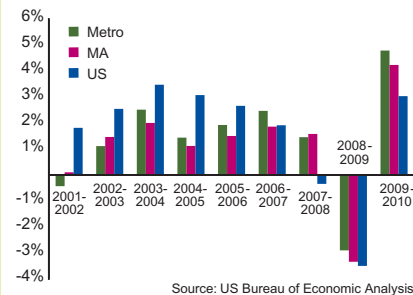
- **The Milken Institute has ranked Massachusetts number one on its biennial Science & Technology State Index from 2002 to 2010, and Metro Boston tops the Life Science Cluster.**
- **According to SustainLane, Metro Boston ranks 5th in the nation in clean-tech industry growth.**
- **In a study reported on in *The Atlantic*, Richard Florida ranked Boston 6th among the top 25 most economically powerful cities in the world—ahead of Beijing, Hong Kong and Sao Paulo. The study was based on "gross regional product, the region's banking and financial institutions and its innovation index," or patents generated.**
- **The Boston Metropolitan Statistical Area is ranked 4th in the world at 2.5% of all patent filings and 7.2% of US patent filings, according to the Organisation of Economic Cooperation and Development (OECD).**

Boston and Cambridge are the region's most concentrated locus of talent, expertise and innovation, with renowned institutions of higher education, culture and medicine, providing great ballast to the Greater Boston economy in volatile economic times.

Total Monthly NonFarm Employment  
US, Mass. & Metro Boston, Dec. 2007–Oct. 2011



Annual Change in Real GDP  
US, Mass. & Metro Boston, 2001–2010



Massachusetts Innovation Industry  
Cluster Employment, 2010:Q1

Total	1,186,000
Health Care Delivery	337,000
Financial Services	159,000
Postsecondary Education	141,000
Business Services	139,000
Software & Communications Services	131,000
BioPharma & Medical Devices	73,000
Scientific, Technical and Management Services	62,000
Diversified Industrial Manufacturing	40,000
Defense Manufacturing & Instrumentation	38,000
Computer & Communications Hardware	35,000
Advanced Materials	31,000

Source: Massachusetts Technology Collaborative

*A Cross Section of Boston's Innovation, Knowledge & High-Tech Economy Clusters by Employment & Wages, 2011:Q1*

Industry Cluster	Average Monthly Employment	Average Weekly Wage
<b>Health Care Delivery</b>		
General Medical & Surgical Hospitals	69,242	\$1,396
Ambulatory Health Care Services	18,195	\$1,547
<b>Knowledge-Based Industries</b>		
Colleges & Universities	33,208	\$1,231
Legal Services	14,550	\$2,111
Management & Technical Consulting Services	11,631	\$2,690
Accounting & Bookkeeping Services	7,349	\$1,686
Advertising & Related Services	3,608	\$2,130
Junior Colleges	1,441	\$984
<b>Financial Services</b>		
Other Financial Investment Activities	19,569	\$5,929
Depository Credit Intermediation	14,860	\$3,857
Insurance Carriers	14,612	\$2,691
Security & Commodity Investment Activities	11,258	\$6,855
<b>High Tech</b>		
Scientific Research & Development Services	7,660	\$1,465
Computer Systems Design & Related Services	6,304	\$2,275
Software Publishers	942	\$2,977
<b>Business Services</b>		
Management of Companies & Enterprises	6,081	\$3,060
Architectural & Engineering Services	5,589	\$1,565
<b>Information Technology</b>		
Wired Telecommunications Carriers	1,535	\$2,340
Data Processing & Related Services	434	\$2,198
<b>Bio-Pharma &amp; Medical Devices</b>		
Pharmaceutical & Medicine Manufacturing	855	\$1,746
Medical Equipment & Supplies Manufacturing	65	\$1,207
<b>Software &amp; Communications Services</b>		
Wireless Telecommunications Carriers	322	\$1,286
<b>Computer &amp; Communications Hardware</b>		
Semiconductor & Electronic Components	198	\$1,401

\*Many detailed industries are included in more than one industry cluster

Source: Massachusetts Department of Labor & Workforce Development, Data: ES-202; Industry Definitions: Identifying & Defining: Life Science, Bio-Tech, High-Tech, Knowledge Industries and Information Technology Industries, July 2007

## Boston's Outsized Economic Role

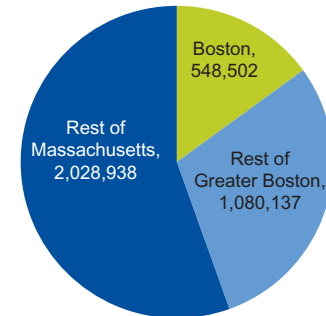
The City of Boston is the “nested” engine of the region’s innovation economy and plays an outsized role in the world and in Massachusetts’ employment landscape. While Boston accounts for 10% of the Commonwealth’s population, it generates 18% of its jobs. Ranked as the top “global innovation city” by 2thinknow, an Australian firm, and 3rd to Honolulu and San Francisco among US cities—36th worldwide—for its quality of life by Mercer in 2011, Boston today is reaping the benefits of three decades of sustained city building and increasing racial/ethnic diversity.

After decades of declining and then slow population growth, the 2010 Census showed a rebound, with Boston’s population, at 614,594, exceeding 600,000 for the first time since 1970. Boston’s population—slightly more than half residents of color—reflects an influx of newcomer immigrants, young adults, families with children and downsizing Baby Boomers.

**With a greater percentage of 20–34 year-olds than any other major US city, expansion of major cultural, medical and educational institutions, revitalization of the Theater District and opening of the Rose Kennedy Greenway, Boston’s vibrant culture drives a strong convention and tourism industry. In 2010, it drew \$6.4 billion in spending and employed more than 40,000. Boston and the Commonwealth have also invested in major infrastructure improvements that, along with education reform and increased environmental sustainability, have enhanced the quality of life throughout the city’s neighborhoods.**

Boston maintains a robust employment base in key innovation economy clusters. *Health Care Delivery and Post-Secondary Education* are its largest employers and account for more than 38% of regional employment in those industries. The city’s *Financial Activities* cluster employs more than half of the region’s *Finance, Insurance and Real Estate* workforce. *Professional & Business Services* is the city’s second-largest industry.

Massachusetts Total Employment by Location, Q1 2011



Source: Massachusetts Department of Labor & Workforce Development ES202

Employment by Industry, Boston, Greater Boston & Massachusetts 2010:Q1

	MA	Greater Boston*	Boston	Boston % of Region
Total Employment	3,109,075	1,628,639	548,502	33.70%
Education & Health Services	864,719	440,787	169,242	38.40%
Professional & Business Services	465,186	298,189	91,425	30.70%
Financial Activities	205,856	144,263	79,301	55.00%
Trade Transportation & Utilities	564,952	254,447	61,715	24.30%
Leisure & Hospitality	289,741	149,202	55,683	37.30%
Public Administration	132,732	74,957	37,600	50.20%
Other Services	132,972	64,169	21,853	34.10%
Information	89,140	58,582	14,197	24.20%
Manufacturing	251,547	92,594	8,730	9.40%
Construction	106,278	49,230	8,720	17.70%
Natural Resources & Mining	5,953	2,220	36	1.60%

\*Boston-Cambridge-Quincy NECTA Division  
Source: Massachusetts Department of Labor & Workforce Development, ES202

## RECAP BOSTON 2010–2011



Even in these tough and tumultuous economic times, Bostonians have many reasons to celebrate.

**Accelerating Student Success from Cradle to Career:** Massachusetts’ Act Relevant to the Achievement Gap, signed into law in January 2010, doubled statewide charter school seats, enabled superintendents to intervene in underperforming schools and created new Innovation Schools, augmented by a \$250 million federal Race to the Top grant, with \$31.9 million for the Boston Public Schools (BPS) and its ambitious Acceleration Agenda. Greater Boston’s leading philanthropies, the BPS and the City of Boston formed a historic partnership, the Boston Opportunity Agenda, pooling resources to strengthen Boston’s Pre K–16 pipeline through investment in exemplary programs, with measurable targets, such as Thrive in 5 and Success Boston.

**The Nation’s Cleanest Urban Waterways:** Boston Harbor and the Charles River now top the nation’s cleanest urban waterways. In 2011, the Charles River won the prestigious International Riverprize, while Boston Harbor’s new tunnel has all but eliminated sewer overflows and storm-water discharge to the city’s beaches. In an effort championed by Mayor Menino, scientists, public agencies and students embedded more than 100,000 dime-size clams in tidal flats to naturally clean and maintain Boston Harbor’s eco-system.



**A Flourishing Innovation District:** Mayor Menino transformed 1,000 acres of South Boston’s waterfront—the largest tract of underdeveloped land in Boston—into an “Innovation District” to build on the city’s world-class infrastructure and produce world-class products and services. Already, 100 firms have located in the district and 3,000 new jobs have been created.

**Growing Diversity, Greater Inclusivity:** Acknowledging progress since the violent 1970s, the National Urban League chose “majority-minority” Boston for its 2011 annual conference. The Urban League of Eastern Massachusetts, Commonwealth Compact, the Boston Foundation and the Museum of Science coordinated four major public forums, “Boston Talks Race,” one held at the museum to highlight its exhibit “Race, Are We So Different?”



**Breakthrough Technologies to Improve City Services:** *Government Technology* magazine and the Center for Digital Government recognized Boston’s Chief Information Officer as one of the nation’s “Top 25 Doers, Dreamers, and Drivers.” Named “Public Officials of the Year” by *Governing Magazine*, the Co-Chairs of the Mayor’s Office of New Urban Mechanics worked to enhance services through smartphone apps such as Citizens Connect. The Boston One Card combines students’ MBTA card, library card and Community Centers pass in one. Code for America created ClassTalk, an online forum among teachers and students. And the NTIA awarded Boston \$4.3 million in federal stimulus funds for Internet training in schools, libraries, community centers and public housing, building on the Timothy Smith Network.

**Decline in Homelessness, Upgrades in Public Housing:** Boston's 2010 homeless census showed a decline of 30% over five years thanks to the Housing First program of supportive services. Boston gained more than 650 new affordable housing units through Habitat for Humanity, community development corporations and private developers. The Boston Housing Authority, with the Madison Park CDC, completed the Orchard Gardens renovation in Roxbury, phase one of Washington-Beech in Roslindale, and began work on Old Colony in South Boston. The City purchased and improved Boston's only trailer park, in West Roxbury.

**The Greening of Boston:** The US Green Building Council awarded the Boston Housing Authority (BHA) a Leadership in Energy and Environmental Design (LEED) Gold certification for its Washington-Beech renovation, the first Bay State subsidized housing development to receive that designation. The Massachusetts Clean Energy Center's Wind Technology Testing Center opened in Charlestown to test land-based and offshore wind turbine technologies, while Boston was the nation's first to sign up for the International Council for the Climate Resilient Communities Program. National Grid is building a solar generation facility at Commercial Point in Dorchester, the last of five statewide. And the Boston Tree Party planted heirloom apple trees on the Rose Kennedy Greenway.

**Healthier, Fresher Foods:** The Boston Food Policy Council brings together national, regional and local expertise and is expanding access to nutritious foods and opportunities for urban gardening and farming. New easy-to-use electronic-benefit transfer cards—Bounty Bucks—enabled the more than 82,000 residents enrolled in the Supplemental Nutrition Assistance Program (SNAP) to buy fresh produce at 50% off for up to \$20 at local farmers' markets. Mayor Menino and the Boston City Council brought 25 food trucks to the City and the Boston Public Schools entered into a new contract for fresher, healthier meals.

**Eco-Transit:** The MBTA introduced 25 hybrid fuel-efficient buses to Boston's three busiest routes, and Boston's Hubway Bike-Share system was launched by the City of Boston, the Metropolitan Area Planning Council, MassDOT, the Boston Region Metropolitan Planning Organization, the Federal Trust Administration and New Balance Corporation—starting with 600 bikes at 61 rental bike stations. EVboston, part of Boston's Complete Streets, provided three parking spaces in front of City Hall Plaza for electric car recharge.

**Flourishing Arts & Culture:** In November 2010, Boston's Museum of Fine Arts unveiled the new Art of the Americas Wing, with 53 new galleries of artworks from South, Central, and North America. Theater lovers celebrated the rehabilitation and reopening of the Boston Opera House, Paramount Theatre and Modern Theatre in Boston's Theater District. And property owners in Downtown Crossing and parts of the Theater and Financial districts agreed to supplement city services through an Improvement District supported by annual fees.



## *A Cautionary Tale: Boston's Wild Ride in the 21st Century's First Decade*

**I**n 2000, Boston and San Jose sat atop a dot.com boom that pulled even inner-city teens with no work history into a tight labor market. The US basked in undisputed global leadership. The federal budget registered a historic surplus.

The high-tech bubble burst in early 2001, triggering a national recession that hit Boston and Massachusetts disproportionately hard. Six months later, 9/11 shocked the nation. In October, the US entered what would be a decade of war. That same year, the Federal Reserve Bank lowered interest rates from 6.5% to 2.5%—the lowest since 1962.

Easy credit combined with lax regulation of the housing and financial sectors, the “Bush” tax cuts of 2001 and 2003 and aggressive lending fueled a national frenzy of home building, buying and refinancing that buoyed the stock market, construction industry and consumer spending.

High-interest sub-prime mortgages, culled disproportionately through predatory lending practices in low-income communities of color such as Roxbury, Dorchester and Mattapan, were bundled by the finance sector into exotic new securities for sale on global markets. As home prices soared, newly “wealthy” homeowners and speculators opened their wallets wider, incurring unprecedented debt. In early 2004, triple-deckers in Dorchester sold for as much as a half a million dollars.

At the same time, globalization was exerting its unstoppable force on major Boston corporations. In 2003, Manulife Financial of Canada purchased John Hancock, founded in Boston in 1862. In 2004, North Carolina’s Bank of America purchased FleetBoston Financial, which had already subsumed the First National Bank of Boston, founded in 1784, as well as BayBank and Shawmut Bank and Providence’s Fleet Bank. In 2005, Cincinnati’s Procter and Gamble purchased Gillette, founded in Boston in 1901. In 2005, the Atlantic Monthly, founded in Boston in 1857, moved to Washington. Boston’s white-shoe law firms rushed to consolidate. In 2006, Macy’s purchased Filene’s department stores, born in Boston in 1909, and sold Filene’s flagship store in Downtown Crossing.

Boston’s housing bubble peaked in 2005 and the nation’s peaked and then burst in 2006. Falling home prices triggered a recession and deflated the value of the high-interest US sub-prime mortgage-backed securities. Undercapitalized and unprepared to bear large losses, America’s financial sector was on the brink of collapse. The stock market tanked, decimating the savings of millions. Credit markets froze. Joblessness and foreclosures quickened.

Since then, Boston’s vibrant economy has buffered its residents from the Recession’s harshest effects, with lower unemployment rates, population and job growth, major new infrastructure investment and a rebounding tourism industry. However, the recessionary economy has favored Bostonians with a college degree or advanced skills, leaving those without credentials on shaky ground.



# UNDER THE HOOD: Standard Measures Don't Tell Us Everything We Need to Know

**“If we have the wrong metrics, we will strive for the wrong things...”**

—Stiglitz and Sen, *Mismeasuring Our Lives: Why GDP Doesn't Add Up*

**T**he region’s innovation economy is fluid, evolving with both creative and destructive force at often surprising speeds.

From 1990 to 2000, the region’s innovation economy grew and diversified, with job gains of 313,000 shared across nearly every major industry. *Professional & Business Services* grew by 114,000; *Education and Health Services* increased by nearly 62,00; *Information, Leisure & Hospitality* and *Financial Activities* each added more than 25,000. In 1990, manufacturing was the largest sector with 354,000 jobs, but by 2010 had declined to 195,000.

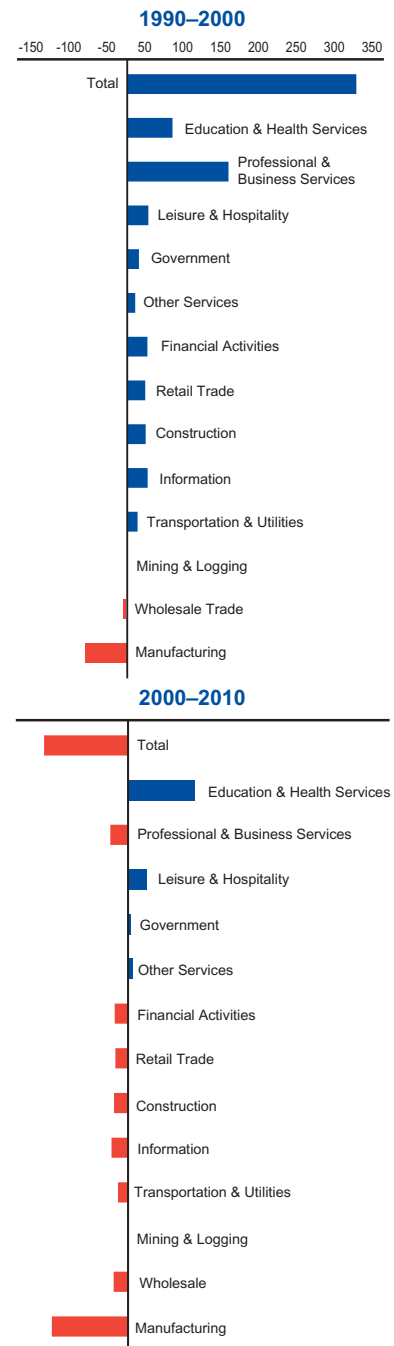
From 2000-2010, however, two recessions erased many of these gains, with a loss of 113,000 jobs. From the onset of the 2001 recession through 2004, only Michigan gained *fewer* jobs than Massachusetts, according to Northeastern University’s Center for Labor Market Studies. Over the decade, *Education & Health Services* and *Professional & Business Services* and *Leisure & Hospitality* added jobs. Other sectors shrank: *Manufacturing*; *Professional & Business Services*; *Information*; *Financial Activities*; and *Wholesale and Retail Trade*.

Prior to the Great Recession of 2007–2009, headlines trumpeted prosperity, and few warnings. We can now see in the rear-view mirror that top-level economic measures obscured important vulnerabilities.

In the following pages, we look “under the hood” of standard economic measures. What we find is that:

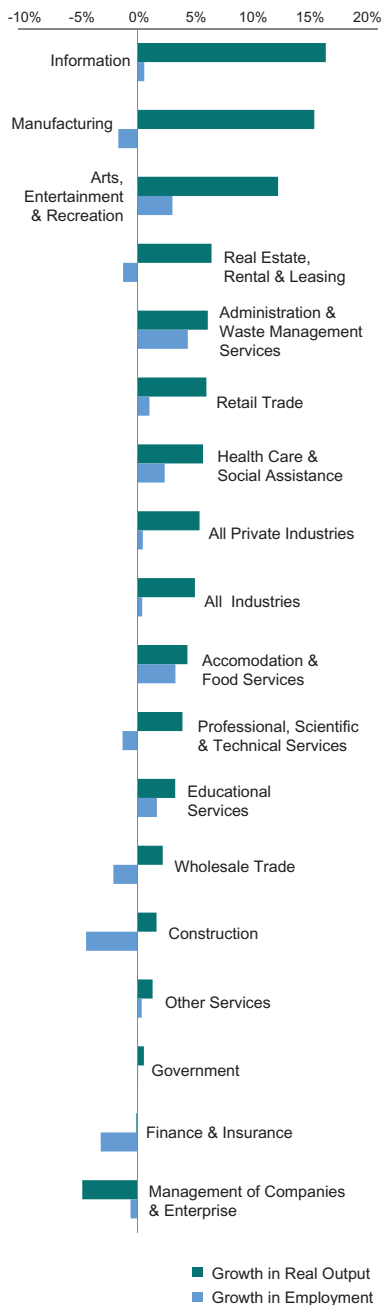
- 1) **Greater Boston’s jobs landscape is more complex than we generally acknowledge and standard measures don’t tell us everything we need to know;**
- 2) **The region’s innovation economy as currently configured is widening disparities and divides;**
- 3) **Pillars of the innovation economy are more vulnerable than we might think; and**
- 4) **We are underutilizing our full innovative capacity.**

Metro Boston Change in Employment by Industry (Jobs in 1,000s)



Source: Massachusetts Department of Labor & Workforce Development, Current Employment Statistics

Metro Boston Change in Real Output & Employment by Industry, 2009–2010



Source: US Bureau of Economic Analysis

## Robust Economic Growth Obscures Weak Job Gains

**Definition:** Since the end of the 1940s, Gross Domestic Product (GDP) has been the standard measure of economic growth for industrialized nations. By definition, GDP measures the total value of goods and services produced over a given time. At the most basic level, GDP is calculated by adding the value of personal spending by households and the government, the total value of exports minus the cost of imports, and the value of capital goods that are not meant for immediate consumption. Historically, the relationship between GDP and employment posits that every 3% increase in GDP translates into a 1% decline in unemployment.

Since 2009, the official end of the Great Recession, Metro Boston’s economic growth rate has outpaced Massachusetts and the nation. From 2009 to 2010, economic output grew by 4.8%—the highest rate among all large US metros and the region’s best since 2001. The rate of economic growth in Massachusetts also exceeded that of the nation. In the third quarter of 2011, Massachusetts’ year-to-date Gross State Product stood at a 3.9% compared to 2.7% for the US.

### Under The Hood:

Despite a relatively dynamic growth rate of 4.8% from 2009 to 2010, Metro Boston produced few new jobs. Average monthly employment increased by just 0.4%, or 9,000 jobs:

- The *Manufacturing* industry’s economic output grew by 16% as employment in the sector declined by 2%;
- The *Information* industry’s output increased by 16% while employment—*Print Publishers, News Industries, Software Development* and *Publishing*—grew by just 0.5%;
- Economic output in the area of *Arts, Entertainment & Recreation* grew by 12% as the sector added 3% more jobs—the highest rate of job growth among all industry sectors in the region.

In 2011, Metro Boston showed significant signs of recovery: from January through November, seasonally adjusted employment grew by 38,000. Nevertheless, total employment in Metro Boston as of November 2011 remained 123,000 lower than its peak in February 2001. Statewide, since the 2007 onset of the Great Recession, according to the University of Massachusetts’ Donahue Institute, “Massachusetts is achieving its output with 100,000 fewer workers,” with very uneven job gains and losses across the Commonwealth.

## Employment by Industry Obscures the Kinds of Jobs That Workers Have

**Definition:** *Employment data reported by Industry describe the major purpose of a place of work. Employment data reported by Occupation refer to the kind of work that individuals do to earn a living, regardless of their place of work. A single Occupation, such as Manager, can appear and be counted across many Industries.*

Today, Boston’s dominant industries are: *Education & Health Services*, with nearly 170,000 employees in 2011; *Professional & Business Services*, with more than 90,000 employees; and *Financial Activities*, with more than 73,000, together accounting for more than 60% of Boston’s 550,000 jobs. Within these super sectors are detailed industries describing specific goods produced and services rendered, such as *Software Publishers*, employing nearly 1,000 in the *Information* super sector. Boston’s largest detailed industries are: *Medical & Surgical Hospitals*, at 69,242 employees; *Colleges & Universities*, at 33,208; and *Financial Investment Activities*, at 19,569.

Innovation economy clusters differ from these classic categories and combine interrelated, geographically-concentrated sub-sectors. Massachusetts’ Innovation Economy clusters, defined by the Massachusetts Technology Collaborative, include, among others: *Financial Services*; *Information Technology*; *Post-Secondary Education*; *Health Care Delivery*; and *Diversified Industrial Manufacturing*. These clusters tend to have high weekly wages and be located in or near Boston and Cambridge. In the first quarter of 2011, the average weekly wage for *Security & Commodity Investment Activity* was \$6,855; for *Management & Technical Consulting*, \$2,690; for *Wireless Telecommunications Carriers*, \$2,340—well above Boston’s average weekly wage of \$1,664. (For details, see tables on pages 17 and 18).

### Under The Hood:

**Within an industry or a cluster are a wide range of occupations, many of which are seemingly unrelated.** For example, a study conducted by the Commonwealth Corporation found that just 50% of the jobs in Massachusetts’ *Health Care & Social Assistance* industry sector were health-related, while the other half were jobs such as accountants, janitors, secretaries, food service workers, child care workers, social workers. Each major industry and cluster creates a constellation of jobs at all levels. For example, Boston’s *Hospital* industry requires high-skilled doctors and nurses—54,000 in *Health Care Practitioner & Technical* occupations—but also thousands of low- and middle-skill workers.

Job growth in certain industries and occupations drive job growth in other fields. According to various studies, in Massachusetts every 100 jobs created in Marine Sciences yields 153 other jobs; every IT job creates five peripheral jobs; and, every Scientific R&D job creates nearly 15 additional jobs.

Employment by Industry Super Sector  
Boston, 2011:Q1



Source: Massachusetts Department of Labor & Workforce Development

Employment by Occupation,  
Boston, 2010

Office & Administrative Support	90,640
Health Practitioner & Technical	53,880
Business & Financial	48,800
Food Prep & Serving	45,540
Sales & Related	44,250
Management	35,060
Education, Library & Training	24,300
Computer & Mathematical	23,760
Building & Grounds Cleaning & Maintenance	19,240
Transportation & Material Moving	18,490
Health Support	15,420
Art, Design, Entertainment, Sports & Media	12,000
Legal	11,920
Protective Service	11,500
Installation, Repair & Maintenance	10,200
Community & Social Service	9,840
Personal Care	9,660
Construction & Extraction	8,050
Life, Physical & Social Science	7,970
Architecture & Engineering	6,950
Production	6,470

Source: Bureau of Labor Statistics, Occupational Employment Statistics

## OCCUPATIONS ARE POLARIZED BY WAGE AND RACE

**The median wage within an occupational category can obscure great variation and polarization.** In 2010, for example, the median wage for the *Health Practitioners and Technical* occupations was close to \$70,000. Within the category, however, wages ranged from \$32,000 for Pharmacy Technicians to \$155,000 for Pediatricians—with many more technicians than doctors.

**The racial/ethnic composition of the workforce varies greatly by occupation, with a strong relationship to wages. In general, Boston occupations with higher median wages have a much higher percentage of white workers.** For example, high-wage *Legal* occupations employ the highest percentage of white workers, at 83%, while the low-wage *Building & Grounds, Cleaning & Maintenance* occupations are 76% Latino and African American. The table below shows Boston’s employment, wages and workforce composition by race/ethnicity for selected detailed occupations within major occupation groups.

Employment, Earnings & Workforce Race/Ethnicity Composition for Select Occupations, Boston 2010*							
TYPE OF OCCUPATION	DETAILED OCCUPATIONS	EMPLOYMENT	MEDIAN ANNUAL WAGE	WORKFORCE COMPOSITION			
				White	Asian	African American	Latino
Healthcare Practitioners and Technical	Pediatricians	450	\$155,545	66%	15%	14%	4%
	Pharmacy Technicians	1,410	\$32,292				
Management	Sales Managers	1,540	\$134,746	73%	5%	13%	9%
	Social & Community Service Managers	970	\$63,127				
Education, Training and Library	Postsecondary Health Specialties Teachers	3,520	\$125,813	69%	8%	16%	7%
	Teacher Assistants	2,800	\$30,170				
Legal	Lawyers	8,510	\$124,496	83%	2%	11%	4%
	Legal Support Workers	140	\$52,031				
Architecture & Engineering	Computer Hardware Engineers	170	\$111,492	73%	8%	10%	6%
	Environmental Engineering Technicians	200	\$42,291				
Life, Physical and Social Science	Physical Scientists	90	\$110,315	57%	30%	4%	7%
	Biological Technicians	1,800	\$41,374				
Business & Financial Operations	Management Analysts	6,520	\$94,263	73%	10%	11%	5%
	Wholesale & Retail Buyers	440	\$50,061				
Arts, Design, Entertainment, Sports & Media	Producers & Directors	790	\$65,148	80%	6%	6%	7%
	Audio & Video Equipment Technicians	450	\$42,335				
Community & Social Service	Social Workers	340	\$53,053	46%	4%	38%	12%
	Social & Human Service Assistants	2,420	\$27,691				
Transportation & Material Moving	Excavating & Loading Machine & Dragline Operators	110	\$66,881	27%	8%	41%	21%
	Packers & Packagers	1,170	\$21,653				
Healthcare Support	Physical Therapist Assistants	360	\$51,073	23%	3%	58%	16%
	Home Health Aides	3,220	\$26,104				
Food Preparation and Serving Related	Chefs & Head Cooks	600	\$48,131	48%	12%	14%	24%
	Combined Food Preparation & Serving Workers	5,690	\$19,794				
Building & Grounds, Cleaning & Maintenance	Maids & Housekeeping Cleaners	3,030	\$32,046	18%	3%	27%	49%
	Janitors & Cleaners	13,960	\$30,890				

\* Detailed occupations have been selected as illustrative examples of high- and low-wage jobs within the Major Occupation Groups. For a complete list, visit [www.bostonindicators.org](http://www.bostonindicators.org)

Sources: Employment & Median Wage: Massachusetts Department of Labor & Workforce Development, Occupational Employment & Wages Staffing Pattern Data; Workforce Composition: 2006-2010 American Community Survey 5-Year Estimates

## Relatively Low Unemployment Masks Joblessness and a Skills Mismatch

**Definition:** *The official unemployment rate measures the number of workers in the labor force who are currently looking for but cannot find a job while the job vacancy rate measures available jobs that go unfilled. Both are measures of labor force supply and demand.*

### Unemployment rates in Boston, Metro Boston and Massachusetts remained lower than the nation’s during and after the Great Recession.

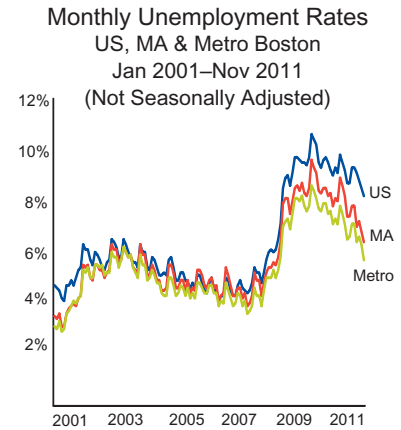
At the unemployment peak in January 2010, the US rate was 10.6% compared to 9.6% in Massachusetts, 8.6% in Metro Boston and 8.4% in the City of Boston. As of November 2011, rates had fallen to 8.7% nationwide, 7.4% in Massachusetts and 5.7% in Metro Boston. In December 2011, the US rate fell further to 8.5%. Unemployment continued to fall in December 2011 to 8.5% for the US, 6.8% in Massachusetts and 6% in Boston.

### Under The Hood:

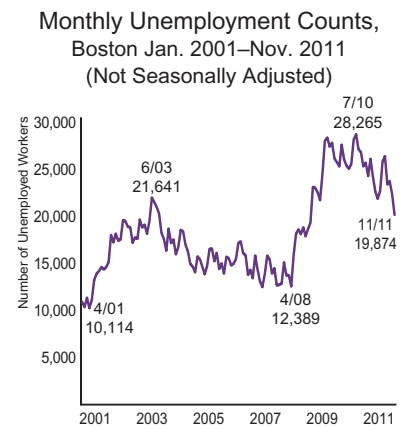
**Counterintuitively, as Massachusetts’ unemployment rates declined in 2010, the number of open jobs actually increased.** In the second quarter of 2010 (the latest date for which data are available) Massachusetts contained 71,151 unfilled jobs, up from a low of 54,000 in the second quarter of 2009, with more than half—about 37,000—in the Greater Boston region. At that point, there were 4.4 unemployed workers for every one unfilled job. If every open job in mid-2010 had been filled by one unemployed worker—entirely overcoming the skills mismatch—three would have remained without a job, equivalent to about 222,000 workers in total across Massachusetts. In Massachusetts as of 2011, 45% of officially unemployed workers have been jobless for more than six months.

In Metro Boston, as of November 2011, 146,835 workers remained officially unemployed. The City of Boston added 8,500 jobs from January through November 2011, while the number of unemployed workers fell by 5,800, with 19,874 remaining officially unemployed.

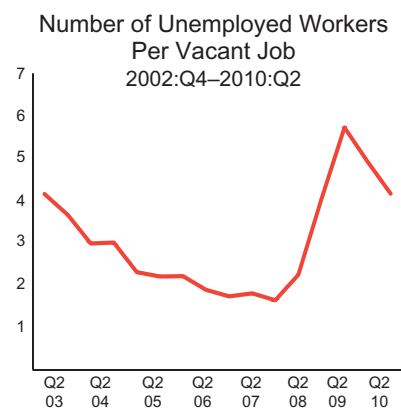
**Official unemployment figures, however, do not include all adults involuntarily working part-time, those in temporary jobs, the self-employed and those who gave up looking for a job and exited the workforce altogether. Combined, this figure totaled 14% in Massachusetts and 16% in the US through the second quarter of 2011. Official unemployment rates also do not include those who are incarcerated—which, on any given day in Massachusetts, amount to more than 11,000 people. Workers who have been incarcerated re-enter their communities with a CORI (Criminal Offender Record Information), and face particularly high hurdles to employment.**



Source: Bureau of Labor Statistics



Source: Bureau of Labor Statistics



Source: Massachusetts Department of Labor & Workforce Development

Greater Boston Job Vacancies by Occupation, Q2:2010

	Rate	Number
Life, Physical & Social Science	4.1%	1,571
Food Prep & Serving Related	3.9%	4,844
Computer & Mathematical	3.5%	3,168
Management	3.1%	3,326
Healthcare Support	3.1%	1,286
Sales & Related	3.0%	4,681
Personal Care & Service	2.8%	1,151
Transportation & Material Moving	2.5%	1,543
Community & Social Services	2.5%	782
Architecture & Engineering	2.30%	1,018
Healthcare Practitioner & Technical	2.2%	2,690
Arts, Design, Entertainment, Sports & Media	2.1%	715
Business & Financial Operations	2.0%	2,261
Education, Training & Library	1.7%	1,744
Protective Service	1.5%	625
Office & Administrative Support	1.4%	3,985
Building & Groundskeeping Maintenance	1.4%	792
Installation, Maintenance & Repair	1.2%	539
Legal	1.0%	189
Production	0.9%	468
Construction & Extraction	0.9%	371
Total	2.6%	37,774

Source: Massachusetts Department of Labor & Workforce Development Job Vacancy Survey

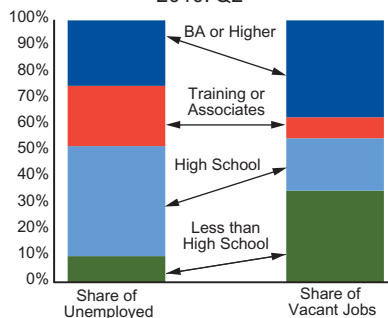
### Job Vacancy Rates Do Not Reflect the Number or Type of Available Jobs...

Reporting workforce demand by vacancy rates alone obscures the actual number of unfilled jobs. In Greater Boston, in the second quarter of 2010, for example:

- *Office & Administrative Support* occupations had a 1.4% job vacancy rate and nearly 4,000 open jobs—more than double the 1,571 jobs open in the Life, Physical & Social Science occupations, which had the highest vacancy rate at 4.1%;
- *Transportation & Material Moving and Community & Social Service* each had a job vacancy rate of 2.5%, but with 1,543 and 782 open jobs, respectively;
- In *Health Care*, demand varied between *Healthcare Support* occupations, with a vacancy rate of 3.1%, and 1,286 open positions, and *Healthcare Technical & Practitioner*, with a rate of 2.2%, but nearly 2,700 open jobs.

### ...And Educational Requirements Are Not the Same As Required Skills

Massachusetts Jobs/Skills Mismatch by Educational Attainment 2010: Q2



Source: Massachusetts Department of Labor & Workforce Development

In Massachusetts, many jobs remain vacant despite a large pool of unemployed workers, suggesting a jobs/skills mismatch. Vacancies as of the second quarter of 2010 (the latest available) showed:

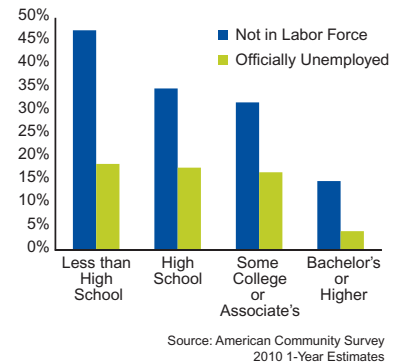
- High demand for high-skilled workers: 37% of open jobs required at least a BA, while 25% of unemployed workers had a BA or higher, indicating the need for more high-skilled workers. Often, filling a high-skilled job has a multiplier effect: For example, filling a vacant Computer Software Engineer position increases demand for middle-skilled Computer Support Specialists and low-skilled Receptionists & Information Clerks.
- A mismatch between unemployed middle-skilled workers' skills and job requirements: 8% of available jobs that required less than a BA but more than a high school diploma remained unfilled despite the fact that 23% of the unemployed held these credentials. Federal Reserve Bank of Boston research finds that over the last decade, the number of middle-skilled

workers in the Bay State has declined while their wage premium has risen. This suggests that even middle-skilled workers with an Associate’s degree or some college lack the actual skillsets required by employers with open jobs in certain industries.

- Low-skill-job churn: Low-skilled occupations comprised 55% of job vacancies while 50% of the unemployed have a high school diploma or less. These vacancies are largely attributable to high turnover. Employers reported that 80% of low-skilled openings were filled within 30 days and 13% of employers constantly recruited.

The jobs/skills mismatch at all skill levels suggests the need for a streamlined, responsive and adaptable education and training pipeline—Adult Basic Education, English as a Second or Other Language, CORI reform, tailored community college courses, BA degree completion efforts—in a fast-changing and diverse innovation economy.

Labor Force Participation & Unemployment by Educational Attainment  
Adults 25 Years and Older, Boston 2010



Detailed Occupations Accounting for Half of All Job Vacancies in Massachusetts, 2010:Q2

<b>HIGH SKILL</b> (BA or Higher)	<b>3,733</b>	<b>MIDDLE SKILL*</b> (Associate's, Vocational Certificate, Work Experience & On-the-Job Training)	<b>10,557</b>	<b>LOW SKILL</b> (Short-Term-On-the-Job Training)	<b>21,504</b>
Computer Software Engineers, Applications	953	Registered Nurses	2,234	Retail Salespersons	3,776
Financial Managers	723	Customer Service Reps.	1,648	Waiters & Waitresses	3,504
Accountants & Auditors	576	All Other Computer Specialists	1,057	Cashiers	2,851
Marketing Managers	523	Executive Secretaries & Administrative Assistants	950	Combined Food Prep & Serving Workers	2,002
Sales Managers	510	Cooks, Restaurant	945	Home Health Aides	1,518
Secondary School Teachers, Except Special & Vocational Ed.	448	Nursing Aides, Orderlies & Attendants	774	Counter Attendant, Cafe, Food, Coffee	1,297
		Managers of Retail Sales	588	Stock Clerks & Order Fillers	1,080
		Social & Human Service Assistants	519	Landscaping & Groundskeeping Worker	1,066
		Sales Representatives, Wholesale & Manufacturing, Tech & Scientific	482	Laborers & Freight, Stock & Material Movers	920
		Computer Support Specialists	463	Food Preparation Workers	761
		All Other Sales Reps.	450	Recreational Protective Service Workers	676
		Medical Secretaries	447	Receptionists & Information Clerks	610
				Janitor & Cleaner, Ex Maids & Housekeeping	523
				Amusement & Recreation Attendants	463
				Maids & Housekeeping Cleaners	457

These detailed occupations have the largest number of vacancies, accounting for half of all vacancies. All unlisted occupations had fewer than 477 openings.

\*The National Skills Coalition defines Middle Skill Jobs as “those that generally require some significant education and training beyond high school but less than a Bachelor’s degree. These postsecondary education or training requirements can include Associate’s degrees, vocational certificates, significant on-the-job training, previous work experience, or generally ‘some college’ less than a Bachelor’s degree.”

Sources: Educational Attainment & Training: Bureau of Labor Statistics, Measures of Education and Training, Occupational Outlook Handbook 2010; Job Vacancies: Massachusetts Department of Labor & Workforce Development Job Vacancy Survey

## SKILLS AND WAGES ARE NOT ALWAYS ALIGNED

While the highest paid occupations generally require the highest levels of education and skill, a number pay relatively low wages, including some of the most important with respect to the region’s competitiveness. For example, Boston’s *Adult Literacy & Remedial Education Teachers*, requiring a BA or higher, are paid a median annual wage of \$40,500, while *Meter Readers*, requiring short-term on-the-job training, have a median annual income of \$59,000. Wages for Boston’s Middle Skill Jobs can range from \$90,775 for *Radiation Therapists* to \$24,741 or less for *Hair Stylists*. And a number of Boston’s high-paid low-skill jobs, such as *Postal Clerks* and *Mail Carriers*, are particularly vulnerable to automation and to state and federal budget cuts.

**As employment in industries such as *Manufacturing and Construction* declines and *Leisure & Hospitality* grows, the region is losing well-paid low-skill jobs and replacing them with low-skill low-wage jobs such as food prep and personal care.**

Median Wages for Selected Top- and Bottom-Paid Occupations by Skill Level, Boston 2010\*

HIGH PAID		LOW PAID	
<b>Highly Skilled: BA or Higher</b>			
Sales managers	\$134,746	Adult literacy, remedial education, & GED teachers & instructors	\$40,532
Financial managers	\$133,694	Recreational therapists	\$37,655
Engineering managers	\$132,714	Survey researchers	\$35,374
Marketing managers	\$130,262	Substance abuse & behavioral disorder counselors	\$33,283
Computer & information systems managers	\$126,906	Community & social service specialists, all other	\$31,073
<b>Middle Skilled: Associate's or Vocational Certificate</b>			
Registered nurses	\$103,964	Nursing aides, orderlies, & attendants	\$31,836
Radiation therapists	\$90,775	Emergency medical technicians & paramedics	\$30,498
Appraisers & assessors of real estate	\$87,837	Preschool teachers, except special education	\$30,474
Diagnostic medical sonographers	\$81,826	Manicurists & pedicurists	\$27,664
Radiologic technologists & technicians	\$79,867	Hairdressers, hairstylists & cosmetologists	\$24,741
<b>Middle Skilled: Moderate- &amp; Long-Term Training and Related Work Experience</b>			
Detectives & criminal investigators	\$119,265	Tour guides & escorts	\$26,351
Industrial production managers	\$108,165	Cooks, restaurant	\$25,381
Postmasters & mail superintendents	\$107,006	Team assemblers	\$25,104
Real estate brokers	\$103,525	Sewing machine operators	\$22,569
Elevator installers & repairers	\$102,427	Fine artists, including painters, sculptors & illustrators	\$20,447
<b>Low-Skilled: Short-Term On-the-Job Training</b>			
Proofreaders & copy markers	\$60,053	Cleaners of vehicles & equipment	\$19,145
Meter readers, utilities	\$59,415	Amusement & recreation attendants	\$19,140
Court, municipal, & license clerks	\$58,313	Ushers, lobby attendants, & ticket takers	\$19,072
Postal service mail carriers	\$54,603	Cooks, short order	\$18,935
Postal service clerks	\$53,095	Locker room, coatroom & dressing room attendants	\$18,543

Source: Massachusetts Department of Labor & Workforce Development, Occupational Employment & Wages Staffing Pattern Data

\*Detailed occupations have been selected as illustrative examples of high-wage and low-wage jobs by minimum skills required. For a complete list, visit [www.bostonindicators.org](http://www.bostonindicators.org)



# The Innovation Economy Is Not Working for Everyone

**G**reater Boston’s highly educated workforce is its key asset, a magnet for research and development funds and a buffer in tough economic times. After the Great Recession, for most of those with a 4-year college degree, unemployment rates remained low, portfolios rebounded and homes values stabilized.

**In 2010, the percentage of 25- to 34-year-olds in Metro Boston with a BA or higher was 52%—the highest rate among all major US metros. Adults over 25 with a BA or higher increased from 31% in 2000 to 44% in 2010. And in Boston, 62% of young adults and 44% of all working-age adults had a 4-year college degree in 2010—one of the highest rates among major American cities.**

**However, educational attainment rates in Boston and the region are closely tied to race/ethnicity, and are not keeping pace with rapid demographic change.**

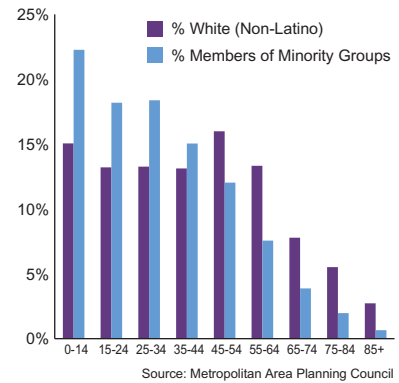
A 2011 report by the Metropolitan Area Planning Council, *The State of Equity in Metro Boston*, found that residents of the region under the age of 14 are the most likely to be of color—the growth tip of the workforce—while those over 45 are more likely to be white. As predominantly white Baby Boomers exit the workforce over the next 20 years, young people of color will increase their percentage as replacement workers, purchasers of homes, taxpayers, innovators, problem-solvers, and civic leaders.

Yet in Boston—with a population that is more than 50% of color and 75% of color among children—almost 40% of Latino and 25% of African American adults lack a high school diploma and fewer than one in four holds a 4-year college degree. That compares with almost 50% of Asian and more than 60% of white adults in Boston with a BA or higher.

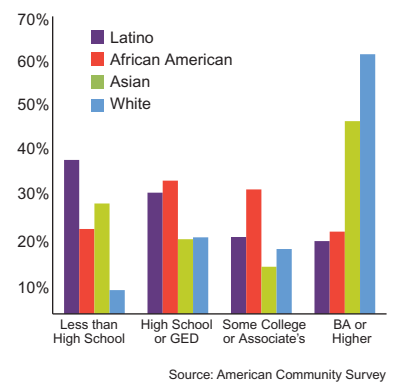
Race/ethnicity and educational attainment are also closely linked to employment. In 2010, Boston’s African American and Latino young men and women had unemployment rates of more than 25%, with African American young men at more than 35%.

And in Metro Boston, just 37% of foreign-born residents had a BA or higher in 2010 compared to 45%–54% in the metropolitan areas of Baltimore, Cincinnati, St. Louis and Pittsburgh.

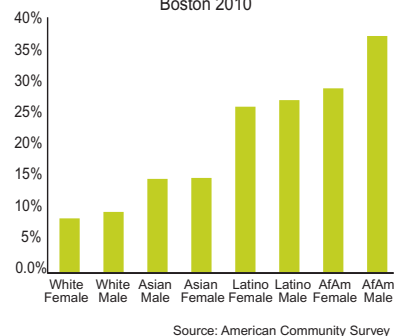
Population By Race/Ethnicity and Age, MetroBoston 2010



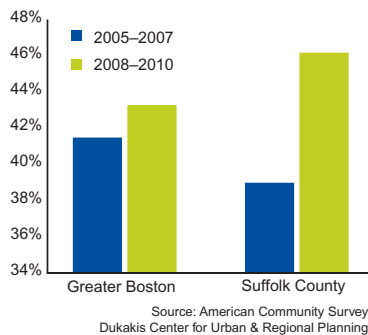
Educational Attainment by Race/Ethnicity  
Adults 25 Years & Older, Boston 2008–2010



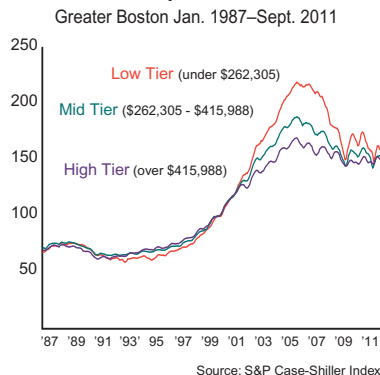
Unemployment Rate for the Population 16 to 24 by Race/Ethnicity & Gender, Boston 2010



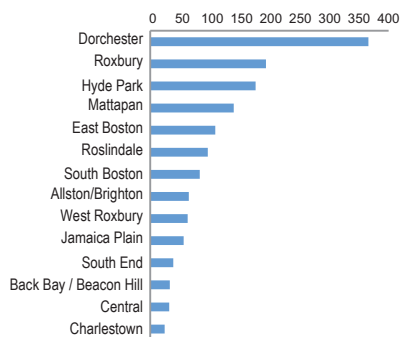
Percent of Households with Incomes Less than \$20,000 Paying More than Half of Income Towards Rent, Greater Boston & Suffolk County 2005–07 & 2008–10



Change in Case-Shiller Home Price Index by Tiered Price Greater Boston Jan. 1987–Sept. 2011



Foreclosure Petitions by Boston Neighborhood, 2010



## Losses in Housing Equity & Affordability

**Boston has among the highest housing prices in the nation and the third highest rental costs. Despite moderating home prices, housing affordability has declined in Boston and the region, with the greatest change a sharp increase in rental costs.**

In 2005-2007, prior to the Great Recession, about 42% of Greater Boston’s households earning less than \$20,000 spent more than half of their income on rent. Within Suffolk County alone (Boston, Chelsea, Winthrop, Revere), that figure was 39%. By 2008-2010, it had risen to 43% in Greater Boston and more than 46% in Suffolk County.

In terms of home equity, residents of low-income neighborhoods and communities were hit hardest by aggressive lending, higher peaks and harder falls.

**From the peak of the Greater Boston housing market in September 2005 through September 2011, homes with the lowest prices peaked higher, and they have subsequently lost the greatest share of value — down 27% compared to a decline of just 11% among homes with the highest value.**

**In Massachusetts, in the first quarter of 2011, more than 230,000 Massachusetts homeowners were under water on their mortgages by an average of \$120,000.**

In Boston, housing prices peaked early, in 2005, reflecting aggressive and often predatory lending, largely by out-of-state companies. In Dorchester, Mattapan, Roxbury, Hyde Park and East Boston—disproportionately the targets of predatory lending—home values have fallen by more than 30%, according to the 2011 edition of an annual study conducted by Northeastern University for the Boston Foundation, *The Greater Boston Housing Report Card*.

The softening market has also led to a rise in foreclosures, largely in the same neighborhoods. Reaching 1,215 in 2008, foreclosures in Boston declined to 821 in 2010. However, 66% of petitioned properties and 76% of foreclosure deeds in 2010 occurred in the targeted neighborhoods.

Boston rents have increased as previous homeowners and their tenants were forced to relocate.

## Widening Inequality, Deepening Poverty

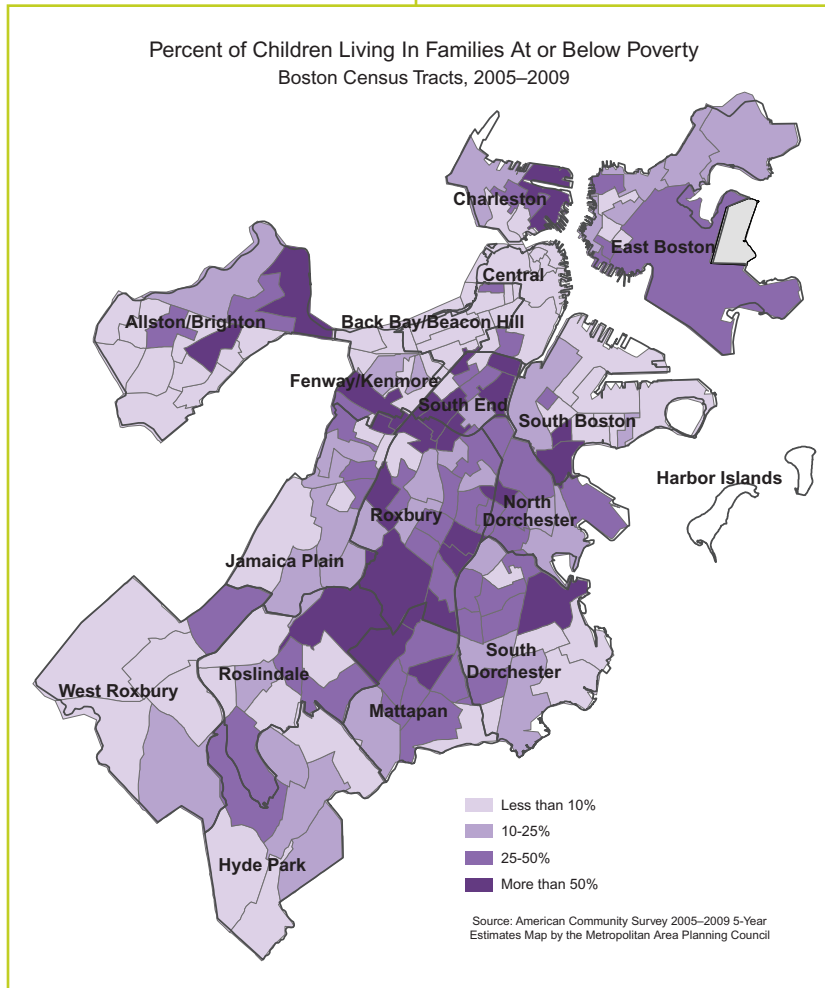
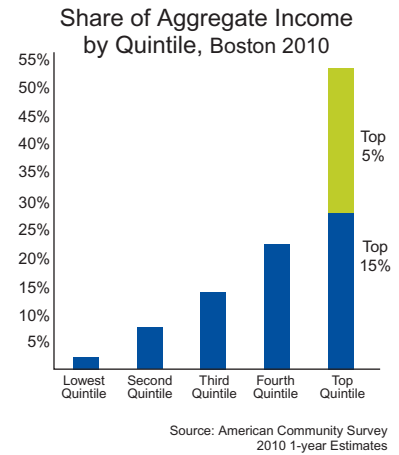
Income inequality in Boston has widened in part due to national trends and also due to a recent increase in both high- and low-income families. From 2006-2010, Boston families earning more than \$200,000 increased by 150% while families earning less than \$10,000 increased by about 50%.

In 2010, the top 20% of Boston earners accounted for more than 50% of aggregate income, and the top 5% accounted for about 25% of aggregate income. The lowest 20% of earners made up just 2.2% of total aggregate income in that year.

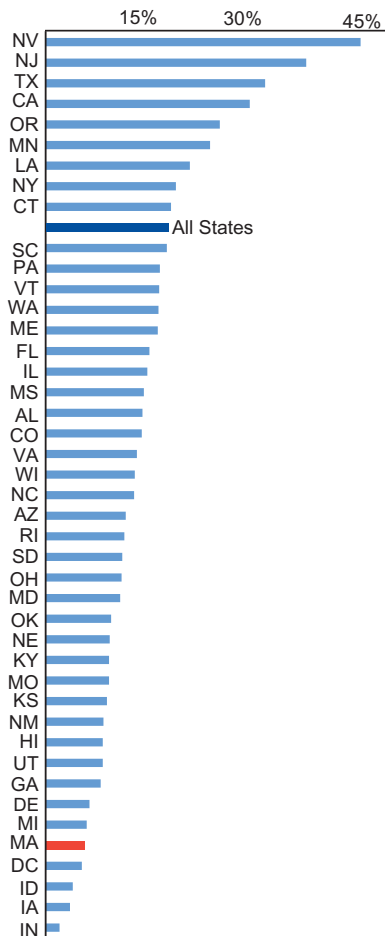
Like their counterparts in Massachusetts' Gateway cities, Boston's lowest-income children are predominantly of color and tend to live in neighborhoods with a high percentage of newcomer immigrants and single-parent households. Of an estimated 109,000 children under the age of 18 in Boston, 30,400, or 28%, lived at or below the Federal Poverty Standard averaged across 2005–2009 (\$22,050 for a family of four in 2009). About 14% of all children under 18 were living at or below half of that income threshold, in deep poverty.

Child poverty in Boston is highly concentrated in the neighborhoods of Roxbury, Dorchester and Mattapan (Census PUMA 03303), where the child poverty rate is 42%—the highest concentration of child poverty in the Commonwealth. (For greater detail about poverty in Boston, see the special 2011 report by the Boston Indicators Project, *The Measure of Poverty*, available at [www.tbf.org](http://www.tbf.org).)

**Educating low-income children of color to high global standards is essential for their future prospects in the hyper-competitive global economy—and for the region's competitiveness and growth.**

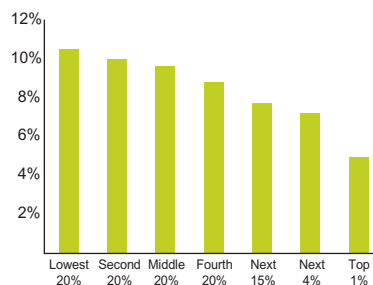


Ratio of Budget Shortfall to Total State Expenditures  
US States FY11



Source: Center on Budget & Policy Priorities

State & Local Taxes as a Percent of Personal Income by Quintile  
(After Federal Deductions), MA 2010



Source: Institute for Taxation and Economic Policy

## A Disproportionate Fiscal Burden on Low-Income Households

In this period of slow to no wage and job growth, as well as rising costs for essentials such as rent, food, fuel, health care and college tuition, it is essential to keep costs down for vulnerable residents and to expand bridges of opportunity for them. Instead, Massachusetts’ low-income households are bearing a disproportionately heavy fiscal burden.

In FY11, Massachusetts’ budget shortfall was 5.7% of its total projected expenditures—which ranked it 5th lowest among all of the states. By comparison, states with the highest deficit-to-expenditure ratio had double-digit shortfalls: Nevada, 45% of total expenditures; New Jersey, 37%; Texas at 30.5%; and California at 29.3%.

To close the revenue gap, the Massachusetts Legislature drew down part of the state’s Rainy Day Fund foresightedly built up during the good years. However, in FY10, the Legislature voted for a sales tax increase, which was projected to raise \$1 billion from FY10 through FY12.

### Budgets, Taxes and Other Revenue

**Massachusetts’ lowest-income households today pay the highest percentage of their income for all state and local taxes.**

In FY10, the lowest-income 20% of Massachusetts residents paid nearly 10% of their income in all state and local taxes combined, including the state’s income tax, while the wealthiest 1%—with incomes greater than \$580,000—paid less than 6%.

### The State Lottery—Sole Source of Unrestricted Local Aid

The Massachusetts State Lottery, the only source of Unrestricted State Local Aid, receives significantly more from less wealthy municipalities than it returns.

In FY11, Massachusetts residents and visitors spent \$4,427,961,000 on the Lottery, roughly equivalent to the \$4 billion provided to cities and towns in Chapter 70 education funding. A minimum of 45% must be allocated for prizes, less than 15% for administrative costs and about 3% for the Mass Cultural Council and Council on Compulsive Gambling. In FY11 almost \$899 million, or 20%, was returned to Massachusetts’ cities and towns in Unrestricted State Local Aid.

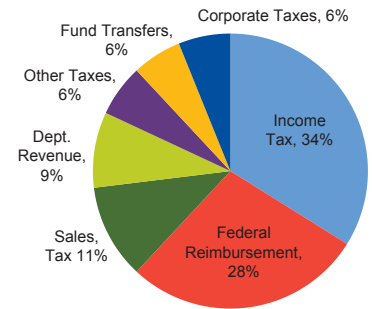
Among the top 20 municipalities in per capita sales, total Lottery sales equaled more than \$1.7 billion in FY11—about 40% of the total. Median per capita income in those communities is \$26,081, compared to \$33,460 state-wide, and in those communities, per capita Lottery sales constituted more than 3% of per capita income compared to 1.6% of per capita income statewide.

Together, those 20 municipalities, which include Boston, received about half of Unrestricted Local Aid, or some \$443 million in FY11—significantly less than the \$1.7 billion they contributed. During FY11:

- ❑ Springfield’s per capita Lottery sales were \$665 and it received \$209 per person in Unrestricted State Local Aid;
- ❑ Boston’s Lottery sales were \$785 per capita and it received \$259 per person in Unrestricted State Local Aid;
- ❑ Quincy contributed more than \$1,000 in per capita Lottery sales and received \$175 per person in Unrestricted State Local Aid.
- ❑ In Worcester, per capita Lottery spending was \$745 and it received \$194 per person in Unrestricted State Local Aid.

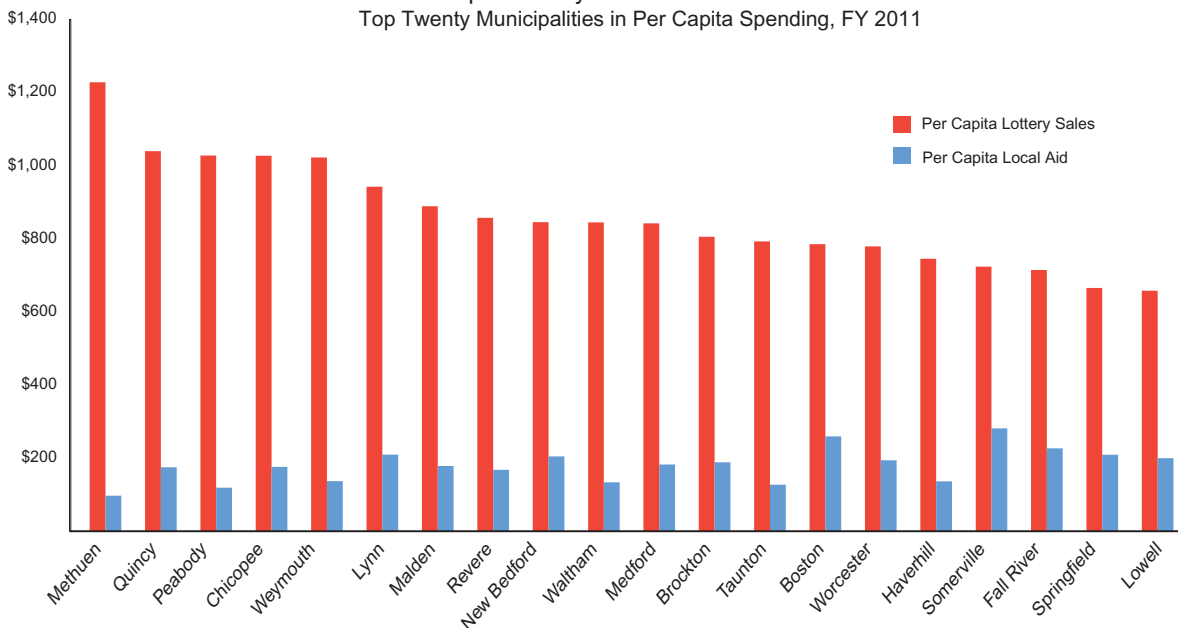
**BOTTOM LINE: Low-income households in Massachusetts pay the most in state and local taxes on a percentage basis. They also contribute more to the Massachusetts Lottery—the only source of Unrestricted Local Aid—than their cities and towns receive in return, with a shortfall in those municipalities of about \$1.25 billion (not counting individuals’ prize money) in FY11 alone.**

Massachusetts Revenues by Source FY2011



Source: Massachusetts Department of Revenue

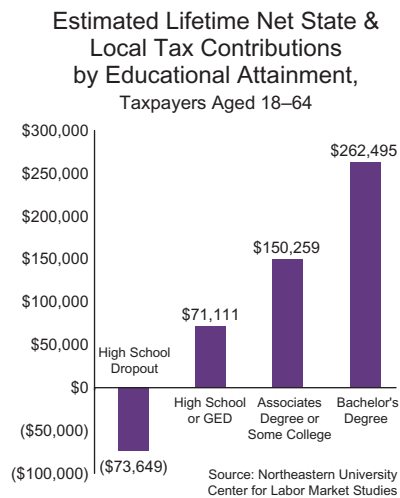
Per Capita Lottery Sales & Returned Local Aid  
Top Twenty Municipalities in Per Capita Spending, FY 2011



Source: Massachusetts State Lottery, US Census Bureau

### State Budget Cuts Risk Long-Term Harm and Consequences

The number of families qualifying for and utilizing state-funded services skyrocketed both during and after the Recession. However, funding for many programs that ease the burden of poverty and support children’s development, even those with proven high return-on-investment, were cut due to state budget shortfalls in FY09–12. Reductions in high-impact programs may reinforce educational disparities and lead to future declines in state tax revenues. For example:



- Every dollar invested in Head Start pre-kindergarten has been found to reduce special education by 62%, at \$11,000 per student annually, to increase lifetime earnings and to save \$7-\$9 in future public costs;
- Early Intervention programs saved Massachusetts cities and towns an estimated \$29 million in the 2009/2010 school year;
- Each dollar spent on education and workforce training for youth offenders is estimated to return a minimum of \$10.80 to the public.

Change in State Funding for Select Services, FY09–FY12, in Millions

	FY09	FY12	% Change
Early Intervention	\$49.40	\$31.10	-37%
Health Promotion & Disease Prevention	\$14.70	\$3.40	-77%
Head Start	\$10	\$7.50	-25%
Universal Pre-K	\$12.10	\$7.50	-38%
Smoking Prevention	\$12.80	\$4.20	-67%
Teen Pregnancy Prevention	\$4.10	\$2.40	-41%
Women, Infants & Children Program (WIC)	\$13.60	\$12.40	-9%
Department of Youth Services	\$163.10	\$142.50	-13%
Employment Services Program	\$34.70	\$7.10	-80%

Source: Mass Budget & Policy Center

# Economic Change Can Be Swift: Our Innovation Economy May Be More Vulnerable Than We Think

**W**hile Boston, Greater Boston and Massachusetts are outperforming our peers in recovering from the Great Recession, the last time Massachusetts outperformed the nation after a recession was in 1981-82. And each recession over the past three decades has required a longer period of recovery—in the Bay State and nationally.

In Greater Boston, economic change has often come swiftly, upending or transforming whole sectors of the economy. Y2K merged into 2001 with Boston playing the role of the belle at the “dot.com” ball. In March of that same year, Boston faced disproportionate job loss and office vacancy rates in the dot.com bust. In 1980, Boston contained 51,300 *Manufacturing* jobs. Today it has fewer than 9,000—half the number it had in 2000—which has nearly severed the bridge to living-wage jobs for those without a college degree. Between 2001 and early 2011 in Boston, only *Education & Health Services* and *Leisure & Hospitality* added jobs, with a decline of 16,000 in *Professional & Business Services*, 12,500 in *Trade, Transportation & Utilities* and more than 11,000 in *Financial Activities*.

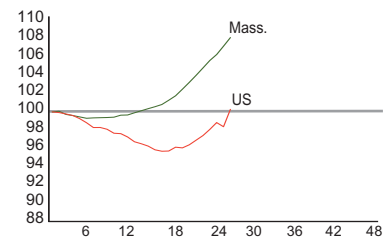
Rapid evolution is deeply encoded in the DNA of high-tech industries. Scott Kirsner, in his *Innovation Economy* column for The Boston Globe, reminds us of the speed and scale of change since just 2001. Then, Greater Boston’s biggest technology companies were:

- ❑ CMGI, the publicly-traded Internet holding company in Andover, with 5,718 employees;
- ❑ Arch Wireless Inc., a Westborough paging company, with 8,350 employees then and nine in Massachusetts today following a 2004 merger;
- ❑ Polaroid Corp., now entirely gone, taking with it 8,865 jobs;
- ❑ Defense contractor Raytheon, with 20,000 fewer employees globally than it has today; and
- ❑ Digital Equipment Corp., the biggest company ever built in Massachusetts, sold to Compaq in 1998 and sold in turn to Hewlett-Packard in 2001.

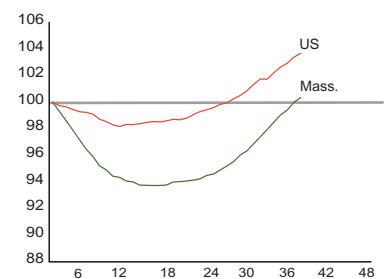
Today, the region’s tech sector is smaller, having declined by 47,000 jobs from 2001 to 2009, according to the Bureau of Labor Statistics. Computer and communications equipment manufacturing, from which half the jobs have disappeared, were replaced by growth in medical care, biopharma and hospitality.

Employment Recovery Through  
Recessions, Mass. & US  
(months to recover jobs lost)

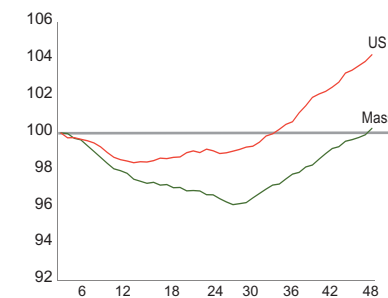
Recession: July 1981–November 1982



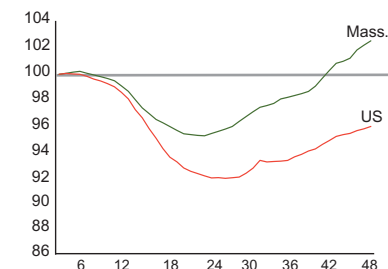
Recession: July 1990–March 1991



Recession: March–November 2001

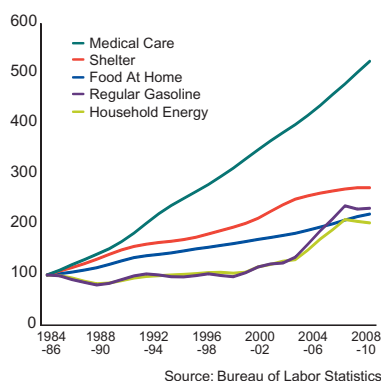


Great Recession:  
December 2007–June 2009

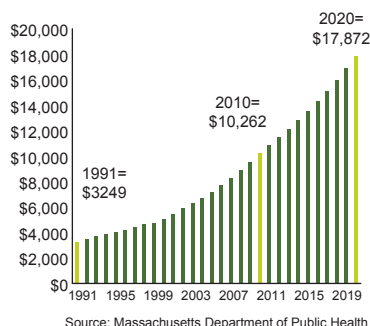


Source: Bureau of Labor Statistics

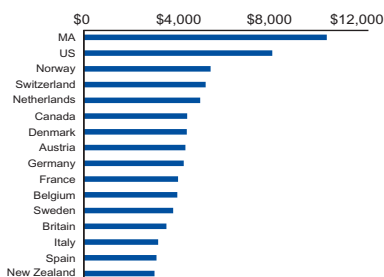
Greater Boston Consumer Price Index  
3-Year Averages, 1982–84 to 2008–10



Per Capita Health Spending,  
Real and Projected, MA 1991–2020



Per Capita Health Expenditures  
MA & OECD Nations, 2009–2010



## Health Care Is Crowding Out Investment in Education—Our Core Asset and the Key to Opportunity for All

“The more the health care sector grows, the more life it drains out of the rest of the Massachusetts economy.”

—Rick Lord, President and CEO, Associated Industries of Massachusetts (AIM)

*Education & Health Services* is Greater Boston’s premier super sector. It posted the region’s most robust job gains from 2000 to 2010 and is Boston’s largest employer, with 34 institutions of higher education and 22 medical facilities within the city limits.

**However, measuring health care and education in one industry sector, *Education & Health Services*, masks a zero-sum competition between them that could derail the region’s innovation economy.**

Greater Boston’s health care spending outpaced all other consumer expenditures well before passage of Massachusetts’ 2006 *Access to Affordable, Quality, Accountable Health Care Act*, which made Massachusetts the national leader in health care access.

In 2010, Massachusetts’ annual per capita public and private health care spending stood at \$10,262—among the highest in the world—or more than \$65 billion in total. According to the Massachusetts Public Health Department and RAND Corporation, by 2020, Massachusetts health care costs are projected to nearly double to \$17,872 per capita and \$123 billion annually. If that were to occur, health care costs would essentially eliminate other discretionary public and private spending.

**In response, the Patrick Administration, business and civic leaders as well as leaders within the health care industry are working to transform the current fee-for-service, fragmented approach to health care into a coherent, cost-effective and accountable system. At stake is nothing less than the Commonwealth’s capacity to invest in public education, infrastructure and community health and well-being.**

While health care covers individual access to increasingly sophisticated services and treatments, population health results from a combination of individual care, choices and effort and what the Centers for Disease Control and Prevention (CDC) call “the determinants of health”—a community’s constellation of educational and economic opportunity, safety, environmental and food quality and recreational amenities, of which the most important to health outcomes is education.



Yet rising health care costs are crowding out expenditures for these basic health determinants, leading to a decline in population health on key measures such as obesity, hypertension and Type 2 diabetes despite high health care costs: a vicious cycle.

**In Massachusetts from FY01—FY11, state funding for health care (Medicaid, Medicare, employee health benefits) increased by 75% at the expense of K-12 Education, Public Safety, Public Health, Public Higher Education and Environment & Recreation. To balance the FY12 state budget, Universal Pre-Kindergarten was cut by 38%, Adult Basic Education by 7% and Workforce Training by 15%.**

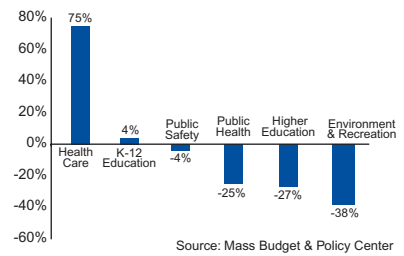
**Even within school districts, health care costs are crowding out spending on education.** From 2000 to 2007, according to a study by the Massachusetts Business Alliance for Education, employee health care costs rose by 13.6% each year—well above the average inflation rate of 3.4%. As a result, Chapter 70 funding intended to equalize resources across high- and low-income school districts, \$700 million total over that period, was overwhelmed by a \$1 billion increase in health care costs. For example, in the Boston Public Schools from FY01 through FY11—an era of great commitment to educational excellence—employee benefits, driven by rising health care costs, outpaced all other expenditures.

A 2011 study by the Massachusetts Budget & Policy Center found that all public school districts now spend more on health care than originally budgeted, but that high-income school districts absorb these additional costs through tax overrides or outside fundraising while low-income districts are forced to cut back on educational services. This is widening the gaps in educational opportunity that the Commonwealth’s 1993 Education Reform Act was designed to address.

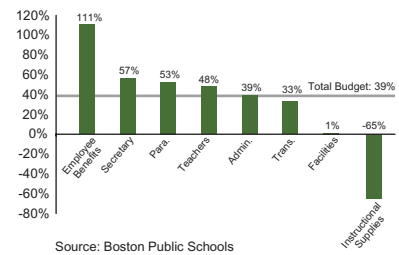
**Public higher education is also affected.** In 2001, Massachusetts ranked 13th among all states in per pupil public higher education funding, but by 2009 had dropped to 29th. Moreover, cuts in state funding for higher education have been offset by hikes in tuition and fees, fueling student debt or putting college out of reach altogether.

**The bottom line is that rising health care costs threaten the region’s core asset, a healthy and educated workforce. However, great care must be taken to offset necessary declines in health care jobs and spending with new jobs that reinforce community health and growth in other innovation sectors.**

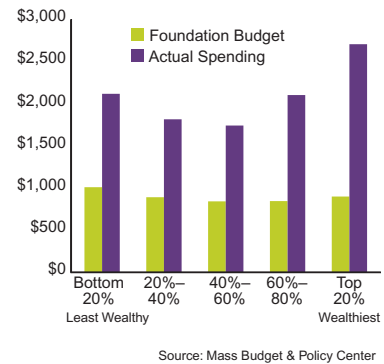
**Massachusetts State Spending Imbalance: Net Change by Category FY01–FY11**



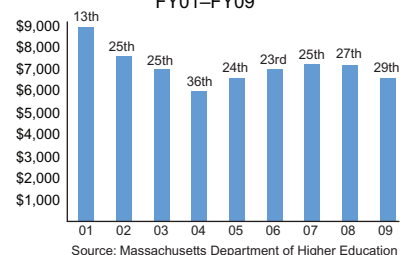
**Boston Public Schools Cost Increase by Category, General Fund FY01–FY11**



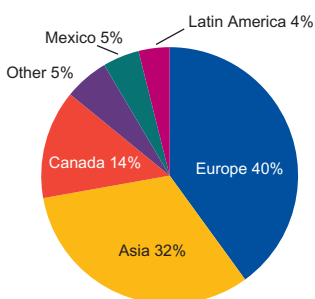
**Per Pupil Spending on Health Insurance, Massachusetts School Districts by Wealth Quintile Foundation Budget & Actual Spending, FY 2010**



**Massachusetts Funding for Public Higher Education: Per Pupil Funding (\$) and National Rank, FY01–FY09**

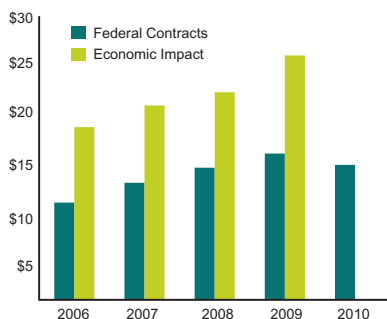


Massachusetts Exports by Region, 2010



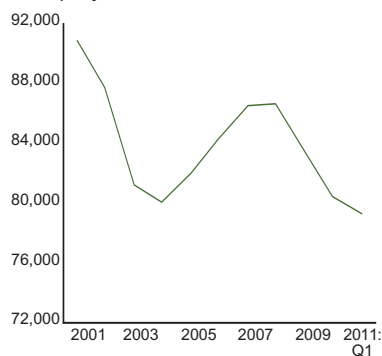
Source: WISER Trade

Economic Impact of the Defense Industry & Value of Total Federal Contracts MA 2006–2010 (\$ in Millions)



Source: Donahue Institute

Financial Activities Industry Employment, Boston, 2001–2011:Q1



Source: Massachusetts Department of Labor & Workforce Development

## Pillar Industries of the Innovation Economy Face Growing Head Winds

Greater Boston’s innovation clusters were a key driver of Massachusetts’ Gross State Product (GSP), employment and exports before, during and after the Recession. According to the Massachusetts Technology Collaborative’s *Index of the Massachusetts Innovation Economy 2011*, employment in 11 key innovation sectors grew to nearly 1.2 million, or almost 39% of state-wide employment, in the first quarter of 2010, 40,000 more workers than the 2005 average.

However, many pillars of Massachusetts’ innovation economy clusters—*Health Care Delivery, BioPharma & Medical Devices, Financial Services*—are vulnerable to impending funding cuts and global economic instability and competition, placing thousands of the region’s highest-paying industries and jobs at risk (see Civic Agenda, page 52, for details). For example:

**Exports:** By the end of the first quarter of 2011, Massachusetts’ exports had rebounded to pre-Recession levels, but 40% were bound for economically unstable Europe, the Bay State’s largest trading partner.

Among the state’s top 10 exports in 2010 were: Photo, Optic & Medical/Surgical Devices; Industrial Machinery & Computers; and Pharmaceutical Products. As of the second quarter of 2011, total exports—valued at \$7.6 billion—driven largely by Computer & Electronic Products and Primary Metal Products—exceeded pre-Recession peaks. However, instability due to high levels of sovereign debt in Greece, Ireland, Italy and other EU nations pose a risk to the current configuration of the region’s innovation economy. Moreover, between 2008 and 2018, statewide employment is projected to decline in *Computer & Electronic Product Manufacturing* by more than 13,000 jobs; in *Semiconductor & Electronic Component Manufacturing* by 5,800 jobs; and in *Computer & Peripheral Equipment Manufacturing* by 4,600 jobs.

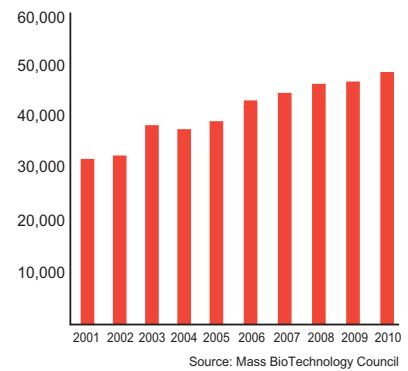
**Defense:** In the last decade, Massachusetts has received a disproportionate share of contracts from the US Departments of Defense and Homeland Security, but planned federal budget cuts could affect as many as 25,000 defense-industry jobs statewide. Between 2001 and 2009, the total economic output of Massachusetts’ Defense industries increased by 150%, from \$10.55 billion to \$25.99 billion, making the state the top recipient of federal defense contracts. However, from 2009 to 2010, in the wake of federal budget cuts, Massachusetts defense funding declined by 7%, with further cuts anticipated. The Donahue Institute at the University of Massachusetts estimates that 25,000 Massachusetts jobs could be affected.

**Finance:** Massachusetts and Boston are particularly vulnerable to a decline in the Finance Industry. *Financial Activities*—which include *Finance & Insurance and Real Estate & Rental & Leasing*—employed nearly 80,000 in Boston as of the first quarter of 2011, or nearly 15% of Boston’s total employment. Those jobs represent 38% of the sectors’ workers statewide and 55% of workers in Greater Boston. Moreover, in Boston from 2001 through 2010, total employment in *Financial Activities* declined by 13% compared to 2.5% nationwide, and between 2008 and 2018, Massachusetts is projected to lose more than 9,000 additional jobs in *Finance & Insurance*—more than any other industries except *Construction and Manufacturing*. Over that period, Boston is projected to lose nearly 3,500 *Finance & Insurance* jobs—the most of any industry.

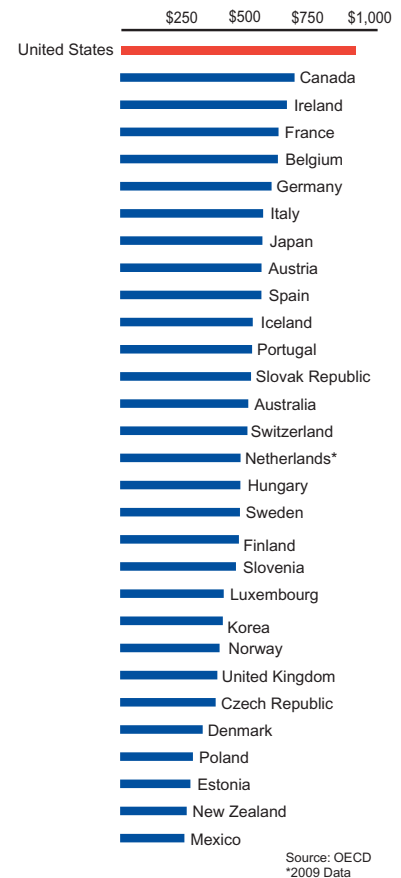
**BioPharma & Medical Devices:** Massachusetts’ BioPharma industry cluster grew during and after the Recession, but now faces public and private funding cuts as well as global competition. The *Bio-Pharma* industry is more deeply rooted in Massachusetts than in any other state in both its share of employment and funding. According to the Mass BioTech Council, *BioPharma* employs more than 44,000 workers statewide, with jobs in high-skill R&D as well as *Manufacturing*. However, this industry is increasingly vulnerable to external forces:

- ❑ Massachusetts stands to lose \$670 million in National Institutes of Health funding in 2013—a 9% reduction.
- ❑ Venture capital has begun to move elsewhere. A 2011 survey by the National Venture Capital Association found that 41% of venture capital had reduced funding in *BioPharma* and in *Medical Devices* over the past three years, with more than 40% planning to further reduce their funding.
- ❑ The New York Times reported that pharmaceutical companies cut nearly 300,000 jobs in the US between early 2000 and June 2011.
- ❑ McKinsey Global Institute reports that biotech is targeted for growth and investment in China’s new 5-year plan and, in a report entitled “Wake Up Call to Big Pharma,” concludes: “The good old days of the pharmaceutical industry are gone forever. Even an improved global economic climate is unlikely to halt efforts by the developed world’s governments to contain spending on drugs. Regulatory requirements—particularly the linkage among the benefits, risks and cost of products—will increase, while the industry pipeline shows little sign of delivering sufficient innovation to compensate for such pressures. The case for difficult times ahead is straightforward.”

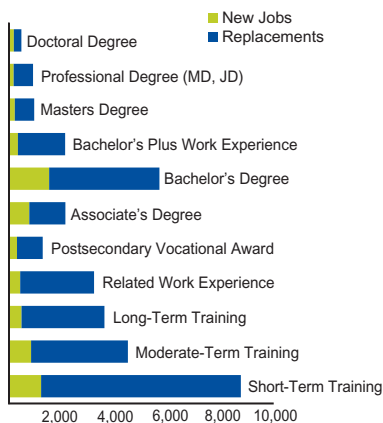
BioPharma Industry Cluster Employment, MA 2001–2010



Per Capita Spending on Pharmaceuticals & Other Medical Non-Durables US & Other Industrialized Nations, 2008



Projected Annual Job Openings by Skills/Educational Requirement Greater Boston,\* 2008–2018 Average



\*Boston-Cambridge-Quincy, MA  
NECTA Division

Sources: Projections: Massachusetts Department of Labor & Workforce Development; Educational Attainment: Bureau of Labor Statistics Measures of Education & Training, Occupational Outlook Handbook, 2010

## The Baby Boomer Exodus Requires Greater Workforce Preparedness

Nationally, from the beginning of 2011 to the end of 2030, about 10,000 Baby Boomers a day will turn 65. Massachusetts is particularly reliant on this older and disproportionately white workforce. Already, from 2000 to 2010, Bay State workers over age 55 increased by 55%, or 223,000, while those under 55 declined by 12%, or 261,000, according to MassINC and Northeastern University.

Massachusetts' Department of Labor & Workforce Development estimates that from 2008 to 2018, more than 32,000 jobs will open annually in Greater Boston: 26,000 replacement jobs and 6,000 new jobs. Through 2018, the region is projected to add 57,000 net new jobs. Extrapolating from the education and skill requirements of current jobs:

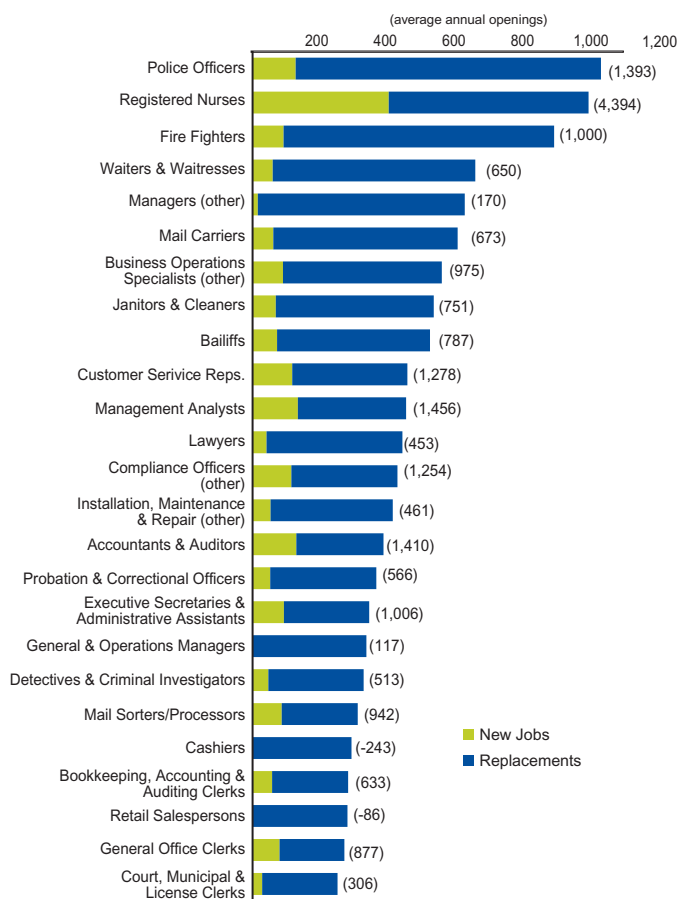
- 30%, or 10,000, of the annual openings will be “High-Skilled” jobs requiring a 4-year college degree: 75% replacements and 25% new. The largest net growth will be *Accountants & Auditors* (+1,410) and *Computer Software Engineers* (+1,159).

- 44%, or 14,000, of annual openings will be “Middle-Skilled” jobs requiring more than a high school diploma or less than a Bachelor's Degree: 80% replacements and 20% new. Most will be for *Police Officers*, *Fire Fighters* and *Registered Nurses*. (Note: Due to high standards in Boston, many nursing jobs here may require a Bachelor's Degree.)

- 26%, or 8,700 openings, will be “Low-Skilled,” including 86%, or 7,500, replacements for occupations such as *Janitors* and *Cashiers*, and 14% new. With a large percentage of replacements rather than new jobs, the total number of “Low-Skilled” jobs is projected to decline by 2018.

The bottom line is that Greater Boston's workforce and jobs landscape will be in great flux over the next two decades. The Nellie Mae Education Foundation projects that by 2020, 48% of Massachusetts' workers aged 25-29 will be of color, many of them being the young people who are falling behind in educational achievement today. **To respond to changing demographics and intensifying global competition, the region must develop a seamless and responsive system of technical, community-college and university-based education and training to prepare a more diverse young workforce both to replace aging Baby Boomers, and to enter—and create—new jobs.**

Occupations with the Largest Number of Projected Annual Job Openings (With Projected Net Growth) Greater Boston\*, 2008–2018,



# THE BIG SHIFT: A New Paradigm for Boston's Innovation Economy

**A**s a gauge of the degree to which globalization, automation and the Great Recession have transformed the local jobs outlook, consider this: Parents today think twice about asking their children, “What do you want to be when you grow up?” Instead, young people and their parents alike are wondering, “Will there be a job for me?” And there is no easy answer. For three decades, cyclical booms and busts obscured the increasingly fragile structure of the nation’s economy. At the same time, investment declined in the true foundations of a strong and resilient economy—healthy and well-educated workers, infrastructure improvements and small business start-ups—resulting in an erosion of American competitiveness and a widening economic and social divide.

As a result, many believe that this new century is the beginning of a long period of national decline. A counterargument can be made, however, that Boston, as hub of the Greater Boston region, is well positioned to respond to the daunting challenges of this new age, and that we have a responsibility to unleash our unparalleled innovative capacity. Success will not come easily, and requires true new thinking as well as unprecedented collaboration. The first step is to acknowledge current limitations and potential vulnerabilities.

First, the current configuration of the innovation economy is not working well for everyone, and, indeed, reinforces historic divides. Second, it may soon face a reversal of fortune. Even high-skilled jobs are being moved to low-wage nations, while increasingly sophisticated robots and software move up the jobs ladder, replacing human labor. Federal cuts in health care and defense loom, as does a recession in Europe, our major export partner. Federal, state and municipal policies are beginning to rein in unconstrained health care costs—a conundrum for a region so dependent on health care as a growth industry. And the Baby Boomer exodus has begun, raising the question of the preparedness of the region’s much more diverse young workforce.

In this difficult environment, Boston’s challenge—as elsewhere—is to generate sufficient good jobs for everyone to develop and apply his or her talents and aspirations gainfully. But where will these new jobs come from? Probably not from federal, state and municipal governments, which are fiscally weak and shedding jobs. And probably not from large companies boosting profits through automation and offshoring—contributing to local job loss.

The time has come, then, for Bostonians to come together to tackle the great 21st century challenge of creating a new paradigm for the local innovation economy—one that works well for everyone.



**“There is no place on earth better positioned to meet the challenges of a new decade or to make use of its new tools than here in Boston.”**

—Mayor Thomas M. Menino,  
5th Inaugural Address

## LIMITATIONS OF GREATER BOSTON'S CURRENT INNOVATION ECONOMY PARADIGM

**T**he first step in creating a new innovation economy paradigm is to acknowledge and address weaknesses in the current one, which is far removed from the common sense of our predecessors. Their hard-won wisdom was transmitted from generation to generation, in part through proverbs. For example, they advise us to take advantage of good times instead of waiting for a crisis, or, as they might have said, to *“make hay while the sun shines.”*

**A Narrow Definition of “Innovation:”** *Necessity is the mother of invention.* Using the word “innovation” to refer primarily to high-tech, high-profit products and services tends to ignore the potential contributions of others. Real solutions require the knowledge of all those with a major stake in the outcome—from developing a world-class education pipeline and cost-effective health care system to reducing greenhouse gases.

**Discounted Real-World Skills:** *Don’t put all your eggs in one basket.* With increasing threats—floods, cyber-attacks, breaks in supply chains—it is unwise to discount the hard-earned skills of farmers, fishermen and women, auto mechanics, precision tool makers, foresters, carpenters, electricians and plumbers essential to the region’s daily functioning and critical to its resilience in an emergency. Real-world skills applied to real-time crises is also a primary source of innovation.

**The Purchase of Local Companies and Promising Start Ups:** *Home is where the heart is.* Greater Boston’s innovation eco-system works extremely well—up to a point. Scott Kirsner of the Boston Globe points out that the region’s promising start-ups tend to put out the “for sale” sign before they can grow into major companies employing workers at scale. Corporate consolidation and off-shoring have also weakened local connections and accountability. The risk is that the region will become everyone’s petri dish rather than a generator of major local job growth.

**Failure to Nurture the Growth Tip of the Region.** *Waste not, want not.* Over the next 20 years, the region’s disproportionately white, educated Baby Boomers will exit the workforce. Many will be replaced by young people of color whose talents are not being fully developed by today’s education system.

**A Lack of Transparency:** *Look before you leap.* Some of the biggest losses in the recent downturn reflected buyers’ mistakes in response to aggressive marketing. A lack of transparency about actual costs, contractual details and options in the purchase of health care, housing, investment services and higher education prevents consumers from making the best decisions on their own behalf.

**Inequality at the Breaking Point:** *There but for the grace of God go I.* In the early 1940s, Abraham Maslow described basic human needs—food, shelter, warmth, safety, a sense of belonging, self-confidence, mutual respect—that must be met before a person can contribute to society as a creative problem-solver. Growing inequality and deepening poverty is forcing more and more residents to focus on basic needs, inhibiting their own and others’ discovery of their talents, interests and aspirations.

**A Blind Eye to the Greatest Challenge:** *An ounce of prevention is worth a pound of cure. A stitch in time saves nine.* There isn’t enough money in the world to remake failed infrastructure in the wake of predicted extreme weather events, requiring a much greater degree of innovation, preparation and collaboration.

## *The New Paradigm: Innovate Locally, Exchange Regionally, Export Globally*

**“Our economy is supposed to increase our well-being.  
It is not an end in itself.”**

—Stiglitz and Sen, *Mismeasuring Our Lives: Why GDP Doesn't Add Up*

To respond to intensifying global and national economic challenges, and to fulfill its potential for innovation and job growth, Boston's economy must encompass a more inclusive paradigm—one that engages the expertise and skills of all residents in real world problem-solving and focuses its imaginative capacity on creating sustainable prosperity broadly shared.

- **A New Measurement Paradigm:** In what for many is a fragile and even treacherous economic environment, high-level economic measures do not provide an adequate framework to inform effective personal, community and regional strategies. An improved framework of economic measurement would disaggregate data by community and demographic groups, highlight key long-term trends and report the social and environmental costs and benefits of various initiatives and legislation. Such a framework of data and measures would provide necessary tools to policymakers, businesses, communities and households seeking to understand and weigh their options. *This could take the form of a consortium among think tanks, the Federal Reserve Bank of Boston's New England Policy Center, the Boston Indicators Project and representatives of the 101 cities and towns served by the Metropolitan Area Planning Council.*
- **A New Civic Engagement Paradigm:** In a global economy and fast-changing times, decision-making requires a breadth of experience, knowledge and processes that allow for and encourage broad-based participation. In addition to the region's deep bench of government, civic and business leaders and academic experts, Boston has a wellspring of workers across a range of industries and trades, engaged and committed residents, newcomer immigrants, many of whom are entrepreneurs, and students from local homes and from around the world. Mayor Menino's Office of New Urban Mechanics has broken the mold on “peer-produced” governance, and the approach could be tapped in other domains. *New forms of engagement might include on-line crowd-sourcing, major convenings to surface and test new ideas and the development of new technologies and approaches to collaboration and problem-solving.*
- **A New Hyper-Global Growth Paradigm:** By developing solutions, products and services needed locally and by emerging global markets, Greater Boston can leapfrog into a new paradigm of innovation in the public, private and academic sectors through competitions—with prizes and publicity—developing fresh solutions in major areas of local and global change and challenge such as: the Transition to a Low-Carbon Economy;



## *Metro Boston Jobs with a Future*

### *A Partial List*

#### **Marine Resources**

Aquaculture Manager  
Coastal Zone Manager  
Marine Biologist  
Marine Robotics Operator  
Oceanographer  
Underwater Welder

#### **Green Building & Development**

Green Architect/Builder/Contractor  
Energy Efficiency Expert (Transit,  
Residential, Commercial/Industrial)  
Energy Efficiency Retrofitter  
Sustainability Manager  
Drinking Water/Waste Water Operator  
Hybrid Automotive Service Technician  
Weatherization and Insulation  
Technician/Crew Chief  
Energy Auditor/Home Energy Advisor

#### **Technology Innovation**

Bioinformatician  
Crowd-Sourcing Specialist  
Data Analyst  
Cyber-security Specialist  
Nanotechnician  
Online Local Exchange Coordinator  
Open Source Software Programmer  
Patent Lawyer  
Data Visualizer  
Statistician  
Digital Media Specialist  
Interface Designer  
Robotics Technician  
Mobile Media Developer

Community Health & Wellness; World Class Educational Methods; Products & Services; Adaptable Smart Growth Infrastructure & Housing; Sustainable Ocean Fisheries & Aquaculture; and Technology-Enabled Problem-Solving. *This approach builds on such efforts as the Mass Challenge, the Ignite Clean Energy Competition of the MIT Enterprise Forum, Harvard's Innovation Center and the Boston Innovation District.*

- **A New Consumer Spending Paradigm:** Consumer spending accounts for about 70% of national economic activity and growth, making it the greatest single tool in the economic toolbox. However, its potential for impact must be realized through informed and focused purchasing. For example:

  - **Hyper-Local Exchange:** In the face of flat or diminishing job growth, build regional resilience and sustain and transfer skills by supporting local businesses and industries through Boston's public markets, farm-to-school programs, farmers markets, community-supported agriculture, time-dollar exchanges, energy retrofits and the purchase of local fish, produce and goods and services.
  - **Capital and Technical Assistance for Small Businesses Expansion and New Start-Ups:** Small business expansion and new businesses are the greatest contributors to new job creation, with many ripe for growth if supported by local consumers. However, capital for growth is in short supply. Mechanisms to create and access needed capital—from local banks and credit unions to new funds—along with expert assistance—can significantly boost entrepreneurs' success rates. Entrepreneurial newcomer immigrants, who have already created thousands of new jobs in the region, may need assistance with language and an orientation to US business practices in order to expand.
  - **Triple-Bottom-Line Purchasing:** The purchase of local and regional products and services designed to make a profit while also creating or retaining jobs and meeting high environmental standards is a time-honored pathway to creating a higher quality of life and jobs for all. *Boston's new Public Market, "green" architects and contractors, restaurants that purchase from local farmers, and companies that offer apprenticeships to local students and "green" hotels (see Boston Green Tourism) are good points of departure. Online information and purchasing would accelerate impact.*
  - **Financial Literacy and Transparency:** While data about consumers is widely available and shared, transparent data about corporate and institutional practices are not. Information about federal, state and local taxes or in-lieu-of-tax payments, executive pay, pricing and quality data would greatly inform important major purchases and investments, assisting households to accumulate wealth and support



local and regional job growth. For example:

- **Education:** assistance in understanding and accessing financial aid, tuition and fees and clear statistics about graduation rates by race/ethnicity and household income;
  - **Health Care:** quality, cost and health outcome data and rankings to inform consumers of health care about how to achieve both cost savings and greater health;
  - **Housing:** mortgage and lease “small-print” information writ large, housing options across communities;
  - **Banking & Finance:** local business investment and mortgage lending track records, fees and services.
- **A New Municipal & Institutional Spending Paradigm:** Through a focused effort to purchase goods and services produced in the region, municipalities as well as major institutions—such as schools, colleges, universities and hospitals, many of which are nonprofit and pay no property tax or low in-lieu-of-tax payments—could greatly contribute to job retention and creation.
- **A New Jobs Paradigm:** As computers and robots perform an increasing share of human labor, new forms of human organization and exchange that reward talent, skills, hard work and achievement will be needed. For example, with slow to no job growth, how can those entering the labor market develop workplace skills and stay current in their field? And for seasoned workers with skills but no income, new ways to facilitate the exchange of goods and services might be non-monetary exchanges such as time dollars or sweat equity. *Nations such as Germany are blazing new trails in flex time, job sharing and mentoring, while others innovate jobs to fit skills people have. Colorado, Maine, New Hampshire, Oklahoma, Pennsylvania, New Jersey and Washington DC have passed new legislation allowing for job sharing, while companies explore flex time and job sharing.*

The essence and importance of the Big Shift could be conveyed by engaging the Boston area’s world-class advertising and marketing firms to create a major public relations campaign that would: encourage residents to “buy local;” educate the public about local industries that should be developed and supported, using local resources; help people understand the basic economic forces behind trends affecting their lives; inform families about the financial aid available for postsecondary institutions as well as options for healthy eating and recreation.

**In sum, Greater Boston, with Boston leading the way, has what it takes to make the Big Shift to an innovation economy that distributes its benefits more broadly, and, in the process, to add ballast and breadth to secure its future.**

### ***Community Health & Wellness***

Community Health Outreach Worker  
Home Health Associate  
Nurse Practitioner  
Nutritionist  
Out-of-School Activities Coordinator  
Personal Trainer  
Wellness Coach  
Genetic Counselor  
Out-of-School Athletic Director  
School Nurse  
Youth Coach  
Health Educator  
Patient Navigator  
Community Advocate  
Case Manager

### ***Clean-Tech Energy***

Clean-Tech Energy Researcher  
Solar Engineer  
Solar Electrician  
Hydro-electric Engineer  
Water Conservation Expert  
Wind Energy Engineer  
Fuel Cell Manufacturer  
Solar Rating Analyst

### ***Advanced Manufacturing***

Advanced Materials Researcher  
Precision Tool Maker  
Pre-Fab Green Housing Manufacturer  
Green Chemicals Engineer  
Wind Turbine Manufacturer  
Energy Auditor/Home Energy Advisor

### ***Regional Food Systems***

Hydroponics/Vertical Farmer  
Regional Markets Coordinator  
School Sales Coordinator  
Hospital Sales Coordinator  
Chef/Cook  
Local Food Distributor

## Possible Scenarios for Boston in 2030

**W**hat follows are five possible scenarios for Boston’s evolution from now through 2030, its 400th anniversary. Developed by stakeholders and experts in 2002 and 2003 through Scenario Planning Workshops, these first appeared in the 2004 Boston Indicators and are now reported in each biennial report. Each emphasizes trends present then and today that could come to dominate Boston over time. Which scenario do you think will describe Boston in 2030—and if you don’t like what you think it will be, what can you do to change the outcome?

### **BOUTIQUE BOSTON. Current trend: Influx of wealthy retirees, decline in public school students.**

Boston is an upscale college town, heritage theme park and active retirement community for the wealthy, with a few remaining clusters of high-tech innovation. Graduates of area colleges and universities and retired Baby Boomers make up an increasing percentage of Boston’s population, and developers are adding upscale hotel and condo complexes to the city’s skyline. The Boston Convention Center attracts record numbers of visitors, while tourists flock to the city’s cultural institutions, heritage sites and holiday celebrations. Most local workers are priced out and commute long distances.

**BALKANIZED BOSTON. Current trend: Widening income inequality.** Boston is “a tale of two cities,” with a sharp income and racial/ethnic divide. Some residents live in the dynamic 24-hour city center while others struggle to make ends meet in neighborhoods with high rates of poverty, youth violence and persistently low health and education outcomes. A stubborn mismatch between available jobs and younger workers’ educational attainment and skills eventually produced a downturn, with periods of unrest that further sapped Boston’s economic and cultural vitality, and it entered into decline.

**BRANCH-OFFICE BOSTON. Current trend: Rising global competition, sale of local companies to outsiders.** With a high quality of life and dense cluster of colleges and universities, research institutes, teaching hospitals, telecommunications capacity and cultural facilities but declining concentration of Fortune 500 corporate headquarters, Boston provides a hub for the mini- and satellite headquarters of multinational corporations whose executive teams can afford its high costs. As China, India and other emerging economies develop their own innovative capacity and high-skilled workforce, Boston loses its edge as a hub of innovation.

**BUST & BLOOM BOSTON. Current trend: Skyrocketing rents and home prices.** The booming real estate market fell fast and hard, leaving homes and storefronts vacant but creating a foothold for those who had been priced out of the market as Baby Boomers retired to less expensive areas around the country to recoup their savings. Boston attracted young artists, college graduates who could afford to stay and young innovators and entrepreneurs from around the world to become one of the world’s most diverse, vibrant and energy-efficient cities. With an engaged citizenry and curricula in its public schools and colleges heavily focused on problem solving, Boston is known throughout the world as a center of solutions and innovation.

**BOSTON THAT WORKS FOR EVERYONE. Current trend: Progress on a seamless, high quality education pipeline.** Boston is one of the most job-rich cities in the US and one of the most diverse. Boston’s renowned “cradle-to-grave” approach to education and health continues to create breakthroughs in early-child development, college completion and healthy aging. Its public schools are global models of excellence, having overcome historic racial/ethnic disparities. With its focus on clean-tech energy and high-tech city services, thriving neighborhood business districts, transit-oriented housing developments, regional food sourcing and vibrant waterfront and cultural districts, Boston is one of America’s most livable and dynamic cities—a global model of equitable growth and development.

# AN EMERGING CIVIC AGENDA

The next two decades will bring great demographic, economic and leadership change for Boston.

Since its inception, the Boston Indicators Project has hosted convenings of stakeholders and experts within and across sectors in which participants offered visions for Boston in 2030 and developed a consensus on key leverage points, with measurable goals to track progress.

Since 2004, the Project has tracked and reported progress on this four-part Civic Agenda to facilitate the alignment of civic action and resources. By 2030—and perhaps well before—we will know whether Boston and the region have succeeded in navigating this period of change and challenge. To date, progress on the key measures has been slow and uneven.

### *What is a Civic Agenda?*

**Analysis** and interpretation of current trends to create shared understanding.

**Agreement** reached through dialogue, debate and discourse about the nature of key challenges, threats, opportunities and goals.

**Alignment** on long-term goals and short-term targets.

**Action** that leverages assets to achieve impact through collaborative strategies, public/private partnerships and alliances.

AN OPEN, DYNAMIC, EFFECTIVE CIVIC CULTURE	
1. Collaborative civic mechanisms that develop and execute coherent strategies in Boston and Metro Boston	↑
2. Leadership in all sectors that reflects the demographic diversity of Boston and Metro Boston	↑
WORLD CLASS HUMAN CAPITAL	
3. 3rd grade reading proficiency by race/ethnicity in Boston and Massachusetts	↔
4. Low rates of <i>preventable</i> chronic disease, beginning with a reversal of rising child and adult obesity rates in Boston and Massachusetts	↓
5. Elimination of the gap in two- and four-year college completion and attainment by race/ethnicity in Boston and Metro Boston	↔
21ST CENTURY JOBS & ECONOMIC STRATEGIES	
6. Job growth resulting from innovation and problem-solving across a range of skills, Metro Boston	↔
21ST CENTURY INFRASTRUCTURE & SUSTAINABILITY	
7. Housing that a median-income household can afford, Boston and Metro Boston	↓
8. Fiscally sound and safe multi-modal transit in Metro Boston	↓
9. Transit-oriented housing and development, Boston and Metro Boston	↑
10. Reduction in greenhouse gas emissions, Boston and Massachusetts	↑



## An Open, Dynamic, Effective Civic Culture

**2030 VISION:** Greater Boston’s civic, business, academic and community leaders reflect the region’s rich racial/ethnic diversity. Through partnerships and alliances, residents of all ages and backgrounds collaborate in generating new ideas and developing solutions to regional challenges. Boston is renowned for the quality of its public discourse, mentoring of new leaders, welcoming environment and alignment to accomplish shared goals.

**GOAL #1: Collaborative civic mechanisms to develop and execute coherent local and regional strategies.** The 2004 report *Boston Unbound* characterized Boston’s “civic soil” as “too politicized and confrontational” and Greater Boston’s civic leadership as “lacking the collaborative gene.”

**Measurable Progress:** Greater Boston’s civic leaders have made enormous progress in creating collaborative initiatives, with room for improvement in developing coherent strategies and aligning resources. (Please refer to the Boston Indicators website at [www.bostonindicators.org](http://www.bostonindicators.org) for details and examples.)

**GOAL #2: Leadership that reflects the full diversity—in race/ethnicity, gender and age—of the city and region in the for-profit, nonprofit and public sectors.** Challenging times demand a range of perspectives and expertise. Boston is a “majority-minority” city—53% of color, with more than 75% of those under the age of 18—and black and Latino young people constitute the growth tip of the region’s future workforce.

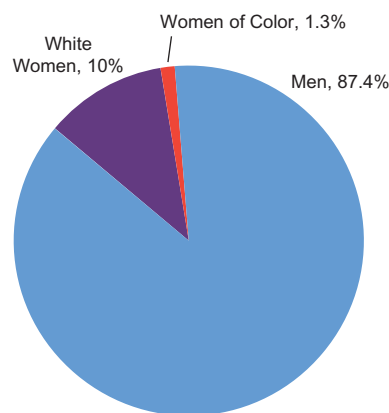
### Measurable Progress:

**The 100 Largest Public Companies in Massachusetts:** Women hold 11.3% of 843 seats on the boards of Massachusetts’ 100 largest public companies, with only 1.3% being women of color, which is virtually unchanged since 2006. Just six of the state’s 100 largest public companies are headed by a woman, in contrast to 28, or 25.2%, of the 111 Bay State hospitals.

**Massachusetts State Legislature:** Women comprise about 50% of the state’s population but 25% of Massachusetts’ state legislators, while people of color, who constitute about 25% of the population, make up just 6% of state legislators. Through the 2011 elections, there were 10 majority-minority state representative districts and two majority-minority state senate districts, but a new legislative map, based on the 2010 US Census and approved in late 2011, doubled majority-minority districts to 20 of the total 160, of which 10 are in Boston, exceeding advocates’ expectations.

**Boston City Council:** Boston’s 13-member City Council, until recently largely white and male, includes four councilors of color and one woman. In the 2011 election, its first woman of color and second Latino were the top at-large seat vote getters—a Boston milestone.

Board of Directors Gender Diversity, Massachusetts’ 100 Largest Public Companies, 2010



Source: The Boston Club

## World Class Human Capital

**2030 VISION:** Boston aligns health and education from early childhood. Massachusetts adopts this approach, gradually redirecting health care spending to maternal and infant health, quality early education, teacher training, after-school enrichment, technical training and lifelong learning, with great success and to worldwide acclaim. Boston’s highly educated workforce is renowned for its problem-solving prowess.

**GOAL #3: Educational excellence for all as reflected in proficient 3rd grade reading by race/ethnicity, Boston and Massachusetts.** The foundation for independent learning, 3rd grade reading proficiency reflects the quality of early development and education and predicts academic success. Third graders who cannot read well are four times less likely to graduate from high school by age 19 than proficient readers.

**Measurable Progress:** Statewide and in the Boston Public Schools, white and Asian 3rd graders have higher proficiency rates and are making greater progress than African American and Latino students—widening the achievement gap. In 2011, 61% of Massachusetts and 36% of Boston Public Schools 3rd graders scored Proficient, with little change since 2001 except among white and Asian 3rd graders in Boston.

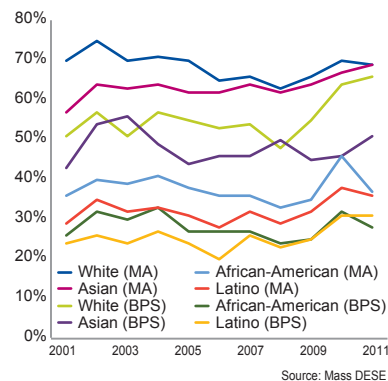
**GOAL #4: Low rates of preventable chronic disease, beginning with a reversal in childhood and adult obesity rates, Boston and Massachusetts.** Obesity is a risk factor for largely preventable hypertension, Type 2 diabetes, heart disease, strokes and some cancers.

**Measurable Progress:** Residents of Massachusetts and Boston have healthier weights than Americans overall but rates are climbing. In 2010, 23% of Massachusetts residents were obese—9% higher than in 1997 and a 2% gain since 2008. In Boston, obesity declined by 3% from 2008 to 2010, but with stark variations by income: 15% of Bostonians earning more than \$50,000 were obese in 2010, down 3% from 2001, while obesity rates for those earning less than \$25,000 and between \$25,000-\$50,000 have increased by 9% since 2001, to 27% and 25%, respectively. Among high school students in the Boston Public Schools in 2009, 18% were overweight and 15% were obese.

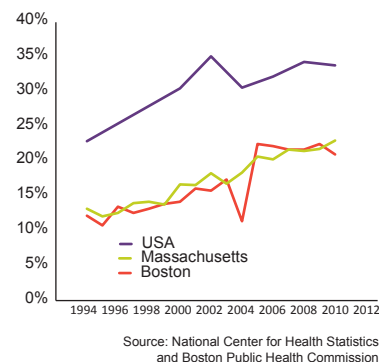
**GOAL #5: Elimination of the gap in educational attainment by race/ethnicity, Boston and Metro Boston.** Those with a college degree tend to fare better in the labor market, enjoy better health and contribute more in life-time taxes than their counterparts without a postsecondary education.

**Measurable Progress:** In 2010, 61% of Boston’s white adults had a BA or higher, up from 38% in 1990, and 45% of Asians, up from 32% in 1990. By comparison, 19% of African American adults held a BA or higher, up from 14% in 1990, and 17% of Latinos, up from 14% in 1990. As a point of reference, more than 80% of students in the Boston Public Schools are African American or Latino.

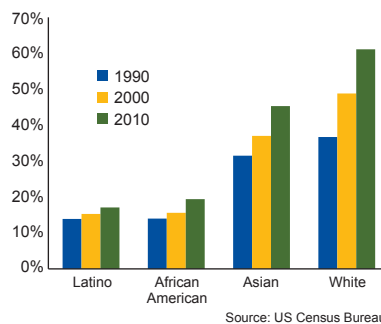
Percent of Third Graders Scoring Proficient or Above in MCAS Reading, MA & Boston, 2001–2011

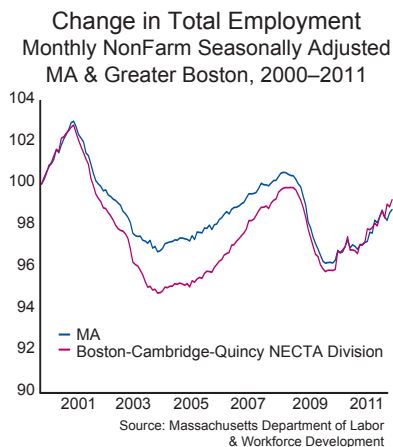


Adult Obesity Rate, Boston, MA, US 1994–2012 (BMI>30)



Percent of Adults 25 Years & Older with a Bachelor’s Degree or Higher by Race/Ethnicity, Boston, 1990–2010





**Massachusetts  
Economic Development  
Planning Council's  
Five Steps Towards  
a More Competitive  
Massachusetts Economy:**

1. Advance education and workforce development through coordination of education, economic development and workforce development programs.
2. Support innovative entrepreneurship.
3. Support regional development through infrastructure investments and local empowerment.
4. Increase the ease of doing business.
5. Address our cost competitiveness.

## 21st Century Jobs & Economic Strategies

**2030 VISION:** Homegrown and global talent collaborate to produce breakthrough local solutions to key challenges that spin off products and services for global markets, generating broad and sustainable prosperity.

**GOAL #6: Job growth in Boston and Greater Boston, with a focus on 21st century emerging industries to create solid career ladders and opportunities at all skill levels.**

**Measurable Progress:** Boston, Greater Boston and Massachusetts are slowly recovering from the Great Recession, but have not fully recaptured the jobs lost in the high-tech bust recession of 2001. **A number of public-private partnerships are stimulating investment in emerging and expanding industries, some showing great promise, including:**

**Clean-Tech Energy, Green Chemistry, Green Building & Retrofitting:** From innovation in heating, cooling, lighting, new building materials and clean-tech energy, Massachusetts is second only to California in venture capital funding in a sector estimated to become a \$5 trillion global industry.

**A Regional Food System:** From year-round hydroponic vegetable production, urban aquaculture and farm-to-city programs, new initiatives are targeting food security, local jobs and healthier diets in schools, hospitals and workplaces.

**Big Data Mining and Open Source Software:** Greater Boston is becoming a global node of open source innovation—Mayor Menino’s Office of New Urban Mechanics, Massachusetts’ opendata.gov, the MBTA’s apps challenge, gaming and data mapping software from MIT and UMass-Lowell—representing a robust community of independent open source developers.

**Sustainable Marine Fisheries:** Three of Massachusetts’ 25 top imports in 2010 were fish, crabs and lobsters, for a trade deficit of \$750 million. Research from the New England Aquarium, Woods Hole Oceanographic Institution, the Ocean Alliance, UMass-Amherst and in collaboration with Massachusetts Division of Marine Fisheries’ partnership in Gloucester, the fishing industry, hold promise for Massachusetts becoming a net exporter—sustainably.

**Creative Industries:** With its many schools of art and design, music, architecture and planning, Greater Boston is mixing creative expression and innovative problem-solving—from new forms of housing, transit and industrial design to film and digital media.

**Advanced Manufacturing and New Materials Development:** The Patrick Administration’s Advanced Manufacturing Collaborative builds on the region’s tradition of precision manufacturing while local patents respond to “game-changing” new materials such as aerogel and graphene.

## 21st Century Infrastructure & Sustainability

**2030 VISION:** Transit-oriented development has revitalized Greater Boston’s city and town centers, strengthening job clusters, shortening commutes and reducing sprawl, while its coastal and farmland preserves, vibrant culture and award-winning renewable energy system attract visitors from around the world. Boston’s neighborhoods are enlivened by housing of all types, state-of-the-art technology access, public art, shops and recreational amenities.

**GOAL #7: Median-income households can afford a median-priced home or apartment.** High housing costs absorb household resources, create obstacles to talent retention and recruitment and lead to homelessness and overcrowding. The threshold of affordability is defined by experts as 30% of household income spent for housing.

**Measurable Progress:** Despite moderating home prices, housing is less affordable in Boston and the region. In 2010, Boston’s median household income was \$49,893, with 57% of renters and 45% of homeowners spending more than 35% of their income on housing. Those spending more than 50% increased from 20% in 2000 to 25% in 2009. In Massachusetts, about half of renters spend more than 30% of their income on housing.

**GOAL #8: Fiscally sound multi-modal transit.** Transportation infrastructure—roads, bridges, public transit, airports and seaports—creates a region’s framework of economic dynamism and connectivity.

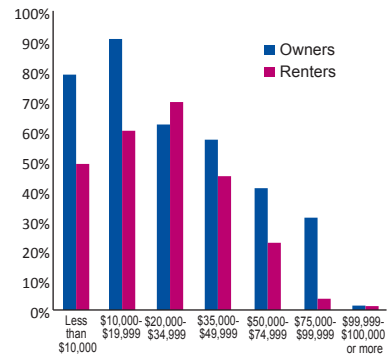
**Measurable Progress:** The Massachusetts Bay Transportation Authority (MBTA) faces a budget gap of about \$1 billion annually over 20 years for maintenance and capital needs. In FY12, 45% of the operating budget of the Massachusetts Department of Transportation (MassDOT) and MBTA was used to pay off debt, and the MBTA is considering fare hikes and service cuts. At the same time, “T” ridership hit a record high in October 2011, and 25 hybrid gas-electric buses came on line. Boston is promoting electric vehicles and, with the Metropolitan Area Planning Council and New Balance shoe company, launched the successful bike-sharing program Hubway.

**GOAL #9: Increased “smart growth” housing and commercial development.** Co-locating housing and commerce at or near public transit nodes and job centers promotes energy efficiency, walkability, universal accessibility, affordability and civic and cultural vitality.

**Measurable Progress:** In mid-2011, 31 cities and towns in Massachusetts had approved new Smart Growth zoning overlay districts under Massachusetts Chapter 40R/40S—with 20 in Greater Boston and total of 33—up from 26 in 2009. Approved districts allow for 12,000 potential units of housing. More than 1,400 units had been issued building permits.

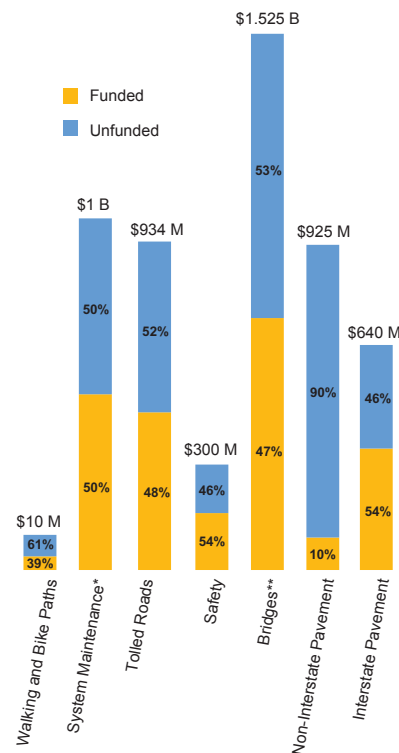
**#10 GOAL: Statewide reduction of greenhouse gas emissions of 25% by 2012, 40% by 2020 and 80% by 2050; Boston municipal operations’**

Percent of People Spending more than 35% of their Income on Housing by Income Group in Boston, 2010



Source: American Community Survey 1-Year Estimates

Massachusetts Department of Transportation’s Funded versus Unfunded Capital Improvement Projects, 2010

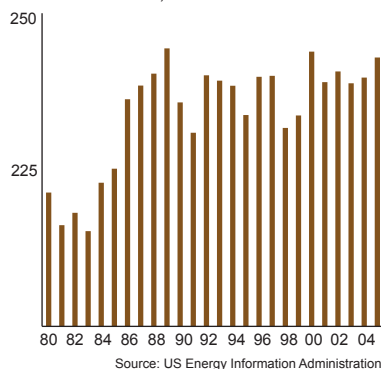


SOURCE: MassDOT, FY 2011 Capital Improvement Program via Transportation for Massachusetts (T4MA)

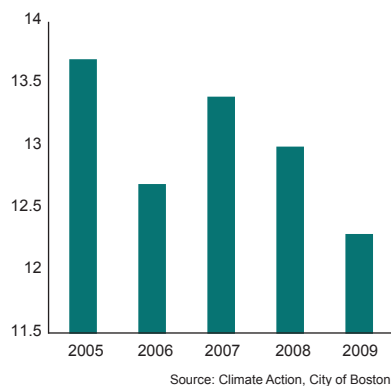
\* This is Non-Federal Aid System Maintenance

\*\* This program does not include the Accelerated Bridge Program projects

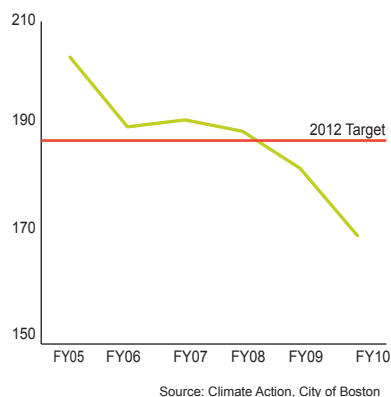
**Total Energy Consumption  
Millions BTU Per Capita  
MA, 1980–2005**



**Boston City-Wide Greenhouse Gas Emissions  
Tons Per Capita, Boston 2005–2009**



**Municipal Operations Adjusted Greenhouse Gas Emissions  
Thousands of Tons, Boston FY05–FY10**



**reduction of 25% by 2020; and a Boston-wide reduction of 25% by 2020 and 80% by 2050.**

**Measurable Progress:** Boston’s municipal greenhouse gas emissions declined by 9% from 2007–2012, exceeding Mayor Thomas M. Menino’s goal of 7%. With Massachusetts’ Renewable Portfolio Standard & Alternative Energy Portfolio Standard requiring that 20% of electricity sales come from renewable and alternative sources by 2020, Massachusetts was #1 on the annual scorecard of the American Council for an Energy Efficient Economy, topping California for the first time.

### *Boston’s New 21st Century Infrastructure Is Emerging*

**The Innovation District:** Spanning Fort Point Channel to Marine Industrial Park, the new district incorporates world-class infrastructure, major civic amenities—including the Boston Convention & Exhibition Center, the Institute of Contemporary Art, the World Trade Center, the Children’s Museum—hotels, condos and restaurants, with new micro-housing units and start-up incubator space.

**The Fairmount /Indigo Line:** Reconstruction of the commuter line from South Station through Dorchester and Mattapan to Hyde Park will serve more than 160,000 residents with Boston’s longest commutes and include new T stations, CDC-inspired housing and businesses linked by open space.

**Dudley Square:** The Ferdinand Building, in Dudley Square, will be renovated for Boston School Department use and an award-winning new Police Station opened. The Timothy Smith Network of community computing centers moved to the historic Eustis Street Fire House. and the Salvation Army opened the new Kroc youth and community center nearby.

**The East Boston Waterfront:** In 2011, Mayor Thomas M. Menino launched plans for the redevelopment of East Boston’s waterfront, to include new shops, restaurants, homes, public spaces and ferry service.

**Public Market on the Greenway:** City and state leaders approved plans for daily Public Market to showcase and facilitate the purchase of regional agricultural products.

**Cultural Expansion:** The Berklee College of Music and Mass College of Art and Design will add galleries, a performance center, residence halls and a Center for Design and New Media, while the Edward M. Kennedy Institute for the US Senate will showcase politics and participatory democracy.

**City Hall Plaza:** Planned upgrades include a state-of-the-art MBTA station, cutting-edge communication, universal-design accessibility, a greener landscape and an enhanced streetscape.

**Allston-Brighton Developments:** WGBH opened its state-of-the-art offices and Harvard University opened its Innovation Lab to foster entrepreneurship among students, faculty and the community and plans major new facilities.



## Conclusion: A Call for the Engagement of Boston's Full Innovative Capacity

**T**he year 2030 will mark Boston 400th anniversary. That milestone is just 18 years away. One generation. One cycle of change.

In 2030:

- ❑ A child born in Boston in 2012 will be completing high school, preparing for adulthood and embodying the outcomes of today's education reforms;
- ❑ The youngest Baby Boomer will turn 65, contemplating retirement as the nation transitions to a new generation of workers and leaders, with Boston's prospects closely tied to the quality of young peoples' dreams and skills;
- ❑ China, and perhaps India, will have replaced the US as the world's largest economy, with today's economic order altered beyond recognition;
- ❑ Technologies unimagined today will be in widespread use, for good and for ill;
- ❑ Global population will have reached 8 billion—an exponential rise from 1 billion in 1800—and the Earth may be passing the tipping point of irreversible climate change.

Renowned Harvard biologist E.O. Wilson has labeled these decades “a bottleneck for humanity unique in history.” He points out that humans evolved to respond to immediate crises and are ill equipped to think ahead, but that now “the rules are changing,” with “global crises rising within the life span of the generation now coming of age.”

McKinsey Global, in early 2012, underscored the economic implications of this view: “In a global economy characterized by greater resource scarcity, companies, consumers and countries that break with old patterns and take the lead should strengthen their competitive and economic position... Policy makers can help by raising awareness of resource-related risks and opportunities... and educating consumers and businesses to adapt their behavior to the realities of today's resource-constrained world... Implemented the right way, such moves could also strengthen the resilience of ecosystems.”

Arguably, no region on Earth today can equal Greater Boston's innovative capacity or its history of rapid economic reinvention.

Now is the time to engage the aspirations and expertise of all Bostonians as problem-solvers, change agents and innovators. Now is the time to create an innovation economy that works for everyone by facing head on our own greatest challenges and the greatest challenges on Earth.

**“We won't develop  
all of the solutions here,  
but we can start here.”**

—Mayor Thomas M. Menino



*8th Grade Students from the Edwards Middle School in Charlestown, Massachusetts. Every biennial Boston Indicators Report has featured students from the Boston Public Schools, beginning with pre-schoolers in 2000. These are the Bostonians who will drive and benefit from future innovations in the “City of Ideas.”*

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