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PUBLIC MANAGEMENT

# CITY OF BOSTON



*This work was completed as part of the Public Management course at the School of Advanced Studies (SAA), University of Turin, under the supervision of Prof. Valerio Brescia. The elements presented in this assignment have been developed in accordance with the guidelines defined by Professors Paolo Biancone, Silvana Secinaro, Valerio Brescia, and Davide Calandra .*

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**1. Mayor's letter:**



CITY OF BOSTON • MASSACHUSETTS

OFFICE OF THE MAYOR  
MARTIN J. WALSH

March 22, 2021

The Honorable Maureen Feeney  
Office of the City Clerk  
1 City Hall Square, Room 601  
Boston, MA 02201

Dear Madam Clerk,

Having been nominated by President Biden and confirmed by the United States Senate to serve as Secretary of Labor, I hereby resign the Office of Mayor of the City of Boston, effective at 9:00 p.m. on March 22, 2021.

Serving as Mayor for the past seven years has been the honor of my life and a dream come true for a child of immigrants who grew up in our city. When I was first inaugurated, I said I would listen, I would learn, and I would lead together with the people of Boston, and that's what we've done.

Together we created good jobs and affordable homes in every neighborhood, and we made our city safer. We invested in our young people, funding universal, high-quality pre-kindergarten; new and fully renovated school buildings across our city; and free community college for low-income students. We led the nation in climate action to protect our city and our planet. We strengthened health and quality of life in our communities with historic investments in parks, libraries, streets, sidewalks, bike and bus lanes. We created the nation's first municipal Office of Recovery Services and expanded access to mental health and trauma treatment. We provided permanent housing for over 2,300 formerly homeless individuals, and ended chronic homelessness among veterans. We restored Boston's reputation as a leader in arts and culture. We began to heal old wounds by addressing systemic racism, so we can truly be a city where everyone can thrive. We brought greater diversity to City employment at every level, and we made community engagement more inclusive and accessible. We modernized services and took good care of our finances, putting the City in a strong position to take us even further in the years ahead.

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In this past year our strength was tested like never before, and I could not be more proud of how Boston responded to the global COVID-19 pandemic. We set an example for the nation by following the science, putting the safety of our residents first, and working around the clock to help vulnerable residents and small businesses. We showed that our strength as a city is rooted in our compassion and our belief in equity for all people.

Over the past several weeks, my team and I have worked closely with Council President Kim Janey and her team on a smooth transition. Bostonians can have confidence there will be no interruption in city operations or services.

In my new role as our nation's Secretary of Labor, I will draw deeply on the lessons I have learned in Boston these last seven years and throughout my life in our city. I will be forever grateful to the people of Boston for shaping who I am and granting me the privilege of serving as your Mayor.

Sincerely,



Martin J. Walsh  
Mayor of Boston



**Our City:**

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Boston, the capital and largest city of Massachusetts, holds a unique place in American history and culture. Founded in 1630, it boasts a rich and storied heritage, often referred to as the “Cradle of Liberty” due to its pivotal role in the American Revolution. In 2021, Boston’s government saw notable changes.

Martin J. Walsh served as the Mayor of Boston during the year but stepped down to become the U.S. Secretary of Labor, leading to Kim Janey’s appointment as Acting Mayor. The city’s legislative body, the Boston City Council, comprising 13 members, played a significant role in shaping policies and regulations.

In terms of fiscal management, Boston’s 2021 budget stood at approximately \$3.7 billion, with allocations for critical services such as education, public safety, transportation, and infrastructure development. This year, the city faced unprecedented challenges brought on by the COVID-19 pandemic, necessitating swift and strategic governmental responses to safeguard public health and provide support to local businesses and residents. Notably, development projects continued to reshape Boston’s skyline, with ongoing construction of new buildings, infrastructure enhancements, and urban planning initiatives designed to secure the city’s future as a thriving and dynamic urban center.

#### **Contacts:**

 311 - Boston City Hall

 617-635-4500 - Mayor

 1 CITY HALL SQUARE, SUITE 500 ,BOSTON, MA 02201-2013

 311@boston.gov

## **2. General Data and Context:**



All Topics	Boston city, Massachusetts
<b>Persons in poverty, percent</b>	17.6%
<b>Population</b>	
Population Estimates, July 1, 2022, (V2022)	650,706
Population estimates base, April 1, 2020, (V2022)	675,632
Population, percent change - April 1, 2020 (estimates base) to July 1, 2022, (V2022)	-3.7%
Population, Census, April 1, 2020	675,647
Population, Census, April 1, 2010	617,594
<b>Age and Sex</b>	
Persons under 5 years, percent	4.8%
Persons under 18 years, percent	15.7%
Persons 65 years and over, percent	11.8%
Female persons, percent	52.0%
<b>Race and Hispanic Origin</b>	
White alone, percent	50.1%
Black or African American alone, percent (a)	23.5%
American Indian and Alaska Native alone, percent (a)	0.3%
Asian alone, percent (a)	9.7%
Native Hawaiian and Other Pacific Islander alone, percent (a)	0.1%
Two or More Races, percent	9.6%
Hispanic or Latino, percent (b)	19.8%
White alone, not Hispanic or Latino, percent	44.0%
<b>Population Characteristics</b>	
Veterans, 2017-2021	13,713
Foreign born persons, percent, 2017-2021	28.1%
<b>Housing</b>	
Housing units, July 1, 2022, (V2022)	X
Owner-occupied housing unit rate, 2017-2021	34.8%
Median value of owner-occupied housing units, 2017-2021	\$610,400
Median selected monthly owner costs -with a mortgage, 2017-2021	\$2,565
Median selected monthly owner costs -without a mortgage, 2017-2021	\$854
Median gross rent, 2017-2021	\$1,783
Building permits, 2022	X
<b>Families &amp; Living Arrangements</b>	
Households, 2017-2021	271,950
Persons per household, 2017-2021	2.30
Living in same house 1 year ago, percent of persons age 1 year+, 2017-2021	80.5%
Language other than English spoken at home, percent of persons age 5 years+, 2017-2021	36.6%

In 2021, Boston, MA had a population of 673k people with a median age of 32.6 and a median household income of \$81,744. Between 2020 and 2021 the population of Boston, MA

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declined from 689,326 to 672,814, a –2.4% decrease and its median household income grew from \$76,298 to \$81,744, a 7.14% increase.

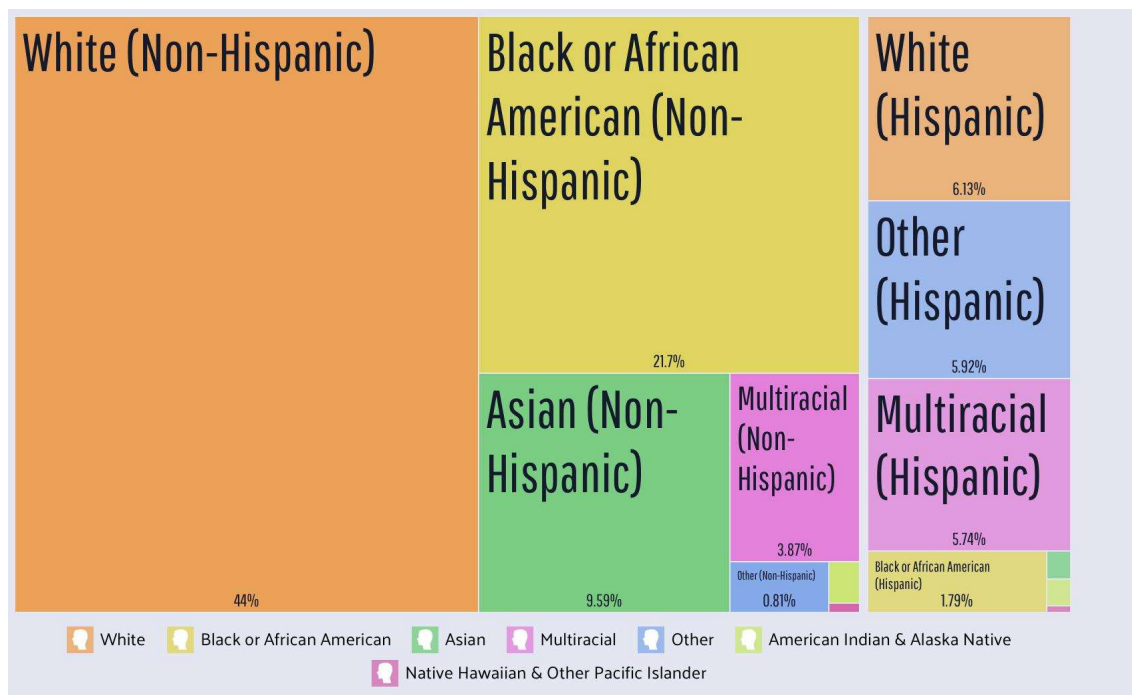
The 5 largest ethnic groups in Boston, MA are White (Non-Hispanic) (44%), Black or African American (Non-Hispanic) (21.7%), Asian (Non-Hispanic) (9.59%), White (Hispanic) (6.13%), and Other (Hispanic) (5.92%).

As of 2021, 86.3% of Boston, MA residents were US citizens, which is lower than the national average of 93.4%. In 2020, the percentage of US citizens in Boston, MA was 85.9%, meaning that the rate of citizenship has been increasing.

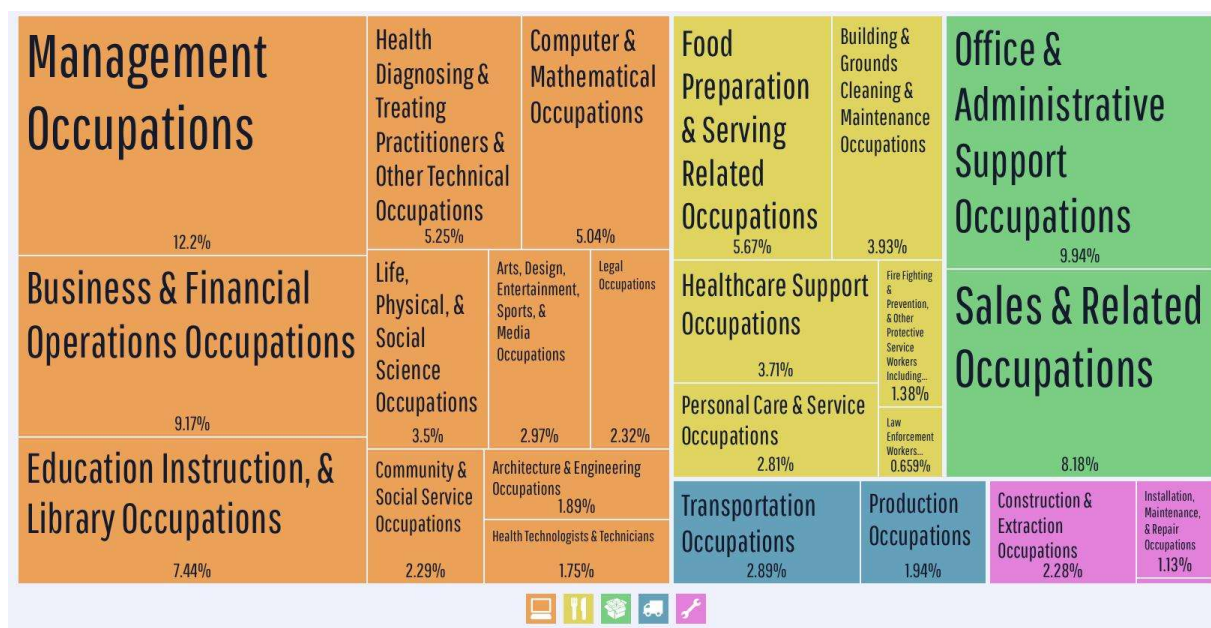
In 2021, there were 2.03 times more White (Non-Hispanic) residents (296k people) in Boston, MA than any other race or ethnicity. There were 146k Black or African American (Non-Hispanic) and 64.5k Asian (Non-Hispanic) residents, the second and third most common ethnic groups.

19.8% of the people in Boston, MA are hispanic (133k people).

The following chart shows the 7 races represented in Boston, MA as a share of the total population.



The most common job groups, by number of people living in Boston, MA, are Management Occupations (45,638 people), Office & Administrative Support Occupations (37,209 people), and Business & Financial Operations Occupations (34,345 people). This chart illustrates the share breakdown of the primary jobs held by residents of Boston, MA.



### 3. Ranking and Positioning

Boston has been named the #1 United States’s best student college city in rankings released by QS Quacquarelli Symonds, the London-based company that specializes in analysis of global higher education and rankings of different types of academic programs.

Globally QS Top Ten Student Cities Worldwide:

1. London
2. Munich
3. Seoul and Tokyo (tied)
4. Berlin
5. Melbourne
6. Zurich
7. Sydney
8. Paris (tied)
9. Montreal (tied)
10. 9.Boston (tied)

In this year’s list, a total of 115 university cities are included, of which 15 are American.

The *QS Best Student Cities Ranking* are based on the following six metric categories:

1. Rankings: The number and quality of the city’s universities.



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2. **Desirability:** The measure of the quality of life in a city, and the extent to which prospective students wish to study in that particular location.
  3. **Affordability:** The affordability indicators cover several cost-of-living metrics, including average tuition and fees.
  4. **Employer Activity:** This indicator group captures the extent to which a city's university graduates are sought after by employers. It relies on over 75,000 responses to the *QS Employer Survey*, while also factoring in the levels of youth employment in a city
  5. **Student Mix:** The diversity and tolerance of the city including the presence of a large student population.
  6. **Student Voice:** Recommendations by students who've studied in the city; based on the views of 95,747 survey respondents.

#### **4. Public administration group**

The public administration group in Boston represents a dynamic and interconnected network of entities working collectively to maintain public order, deliver essential public services, and promote the welfare of the city's residents. This structure is vital to the city's functioning and reflects its dedication to addressing the diverse needs of its community. Please note that the specific composition and roles of these entities may have evolved since my last update, so it's recommended to consult official city reports and sources for the most current information.

The "City of Boston" functions as the central entity in the city's public administration group, with Martin J. Walsh serving as Mayor as of 2021. The Mayor is the city's chief executive officer, responsible for shaping the city's strategic direction, managing the budget, and implementing policies to address residents' needs.

The "***Boston City Council***," comprising 13 members, 7 females and 6 males, operates as the city's legislative body, passing ordinances, approving the budget, and maintaining accountability within the government. A variety of city departments, each with a commissioner or director, oversee specific functions, such as public safety, education, transportation, public health, and housing. In addition, advisory councils and commissions collaborate with the city government to provide guidance on topics like arts and culture, housing, and veterans' services.

The "***Boston Public Schools Committee***" supervises the public school system, ensuring the delivery of quality education to the city's students through elected committee members. Please note that the specific individuals in these roles may have changed since my last update, so for the most current information, it is advisable to consult official city sources.

★ ★ ★ BOSTON ★ ★ ★

## City Councilor At-Large Debate



Annissa Essaibi-George



Michael F. Flaherty



Althea Garrison



David Halbert



Julia Mejia



Erin Murphy



Alejandra St. Guillen



Michelle Wu

**Boston Public Schools (BPS):** The Boston School Committee is the governing body of the Boston Public Schools. The School Committee is responsible for:

- Defining the vision, mission, and goals of the Boston Public Schools;
- Establishing and monitoring the annual operating budget;
- Hiring, managing, and evaluating the Superintendent; and
- Setting and reviewing district policies and practices to support student achievement.

Their mission and vision for 2021 where:

- Vision: A nation-leading, student-centered public school district providing equitable, and excellent, well-rounded education that prepares every student for success in college, career, and life.
- Mission: Every child, in every classroom, in every school gets what they need.

BPS is governed by a 7-member School Committee, appointed by the Mayor from among nominees recommended by a broad-based Nominating Committee. Members serve 4-year terms. Current members and term expiration dates are: Alexandra Oliver-Dávila, Chairperson. Michael D. O'Neill, Vice-chairperson. Dr. Hardin Coleman. Jeri Robinson. Dr. Lorna Rivera. Quoc Tran. So in total 5 males and 2 females.

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**Boston Police Department:** Public safety and law enforcement are entrusted to the Boston Police Department. This department is responsible for ensuring the safety and security of the city’s residents and visitors, with sworn officers and civilian employees working diligently to prevent and respond to crime.



**Boston Fire Department:** The Boston Fire Department is a critical component of the city’s public administration group, overseeing fire protection, emergency medical services, and fire prevention

services. This department plays a vital role in responding to fires, medical emergencies, and hazardous materials incidents, ensuring the safety of the community.

**19A) Breakdown of Employees by Race and Gender**

*Active Employees as of April 1, 2021*

	<b>Female</b>	<b>Male</b>	<b>Total</b>	<b>% of Total</b>
<b>Asian</b>	6	17	23	1%
<b>Black</b>	23	269	292	18%
<b>Hispanic</b>	10	120	130	8%
<b>Not Specified</b>	2		2	0%
<b>White</b>	50	1109	1159	72%
<b>Total</b>	91	1515	1606	100%
<b>% of Total</b>	6%	94%	100%	

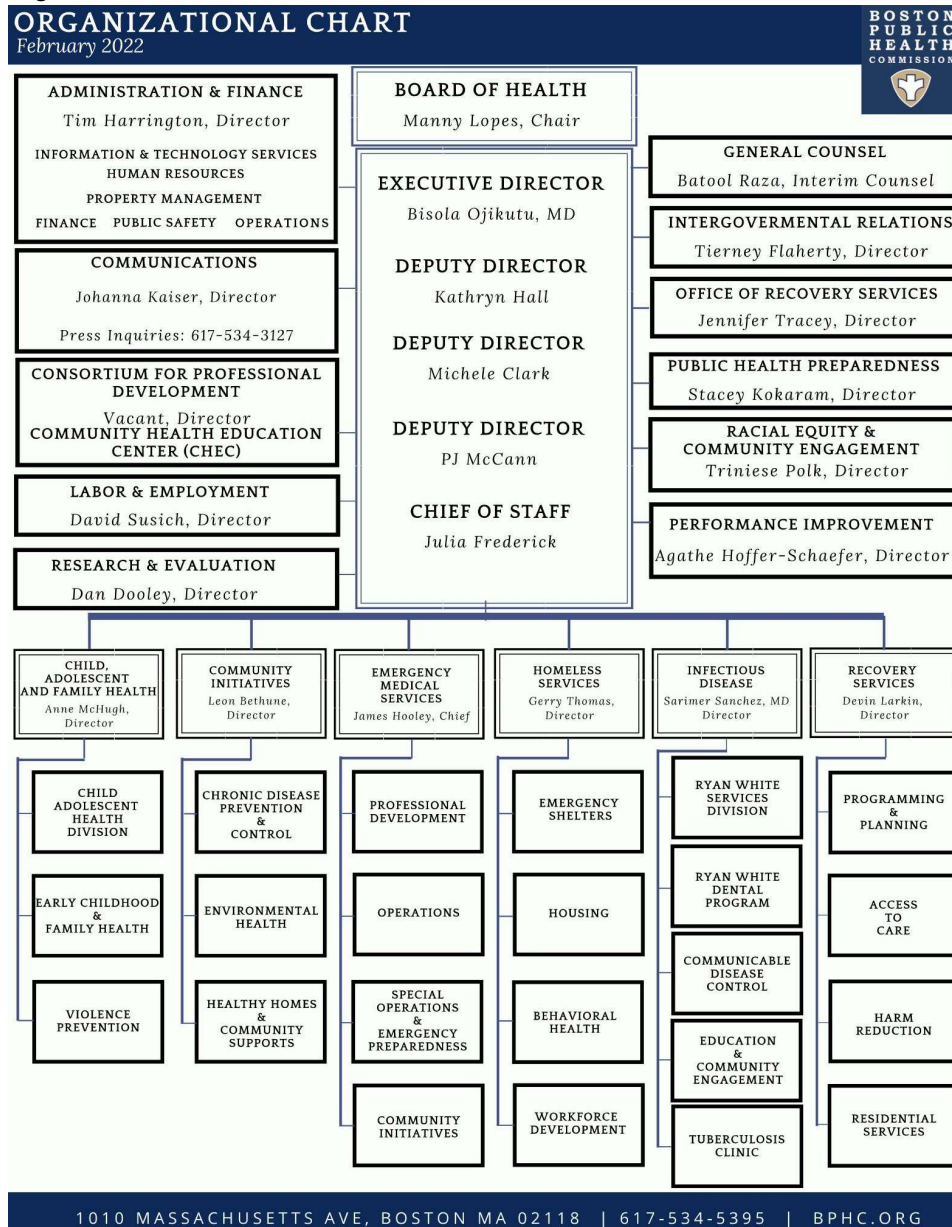
**19B) Breakdown of Top Ten Dept Salaries by Race and Gender**

*Active Employees as of April 1, 2021; Top 4 Salaries*

	<b>Female</b>	<b>Male</b>	<b>Total</b>	<b>% of Total</b>
<b>Black</b>	0	1	1	5%
<b>White</b>	0	18	18	95%
<b>Total</b>	0	19	19	100%
<b>% of Total</b>	0%	100%	100%	

**Boston Public Health Commission:** The Boston Public Health Commission is the country's oldest health department. Governing (BPHC) is a seven-member board of health, appointed by the Mayor of Boston.

Public service and access to quality health care are the cornerstones of our mission - to protect, preserve, and promote the health and well-being of all Boston residents. With a focus on individuals who are most vulnerable. We offer more than 40 services for residents of Boston. An organizational chart can be found online.



**Massachusetts Bay Transportation Authority (MBTA):** While not under direct control by the city, the Massachusetts Bay Transportation Authority (MBTA) plays a pivotal role in providing public transportation services within Boston and the Greater Boston area. It operates an extensive network of buses, commuter rail, subway, and ferries, connecting the city with its suburbs and facilitating urban mobility.

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The MBTA Board of Directors consists of seven members, including the Secretary of Transportation and one member with municipal government experience. The rest are appointed by the Governor, and they include a rider and resident of an environmental justice population, and a person recommended by the President of the AFL-CIO.

The board was composed of 6 males Thomas P. Glynn, Chair. The Honorable Thomas Koch, Mayor of Quincy, Vice Chair. Robert Butler, Eric L. Goodwine, Thomas M. McGee, and The Honorable Charlie Sisitsky, Mayor of Framingham. And 1 woman Chanda Smart.

In addition to Monica Tibbits-Nutt, Acting Secretary of Transportation.

**Third Sector Partnerships:** Boston engages in partnerships with various Third Sector organizations, including nonprofits, community groups, and social service agencies. These collaborations address a wide range of social and civic issues, such as homelessness, affordable housing, youth services, and more. The city often provides funding and support to these organizations through grants and programs, reflecting its commitment to enhancing the overall well-being of Boston's population.

### **Partners with Non-Profits Reception**

#### **LARGE BUILDING GREEN ENERGY RETROFITS**

The Large Building Green Energy Retrofits Program ("Retrofits Program") has been created to support Deep Energy Retrofits (DERs), measures that will significantly reduce the energy consumption and the carbon emissions footprint of Boston's existing affordable housing. The program will help enable the owners of affordable housing buildings across the city to improve health, safety, and comfort for those residents, while also helping to move Boston closer to its goal of achieving carbon neutrality by the year 2050. The Retrofits Program is funded by American Rescue Plan Act (ARPA) dollars that were allocated for this purpose under the leadership of Mayor Michelle Wu and authorized by the City Council in July 2022. For the purposes of this Request for Proposals, a Deep Energy Retrofit is defined as a scope of work that combines envelope improvements, energy efficiency measures, systems upgrades, and/or the incorporation of on-site renewable energy generation to successfully reduce energy consumption by at least 50% relative to a baseline established prior to any alterations being made. While the elimination of embodied and operational carbon emissions, or decarbonization, is not a requirement of this program, this is a vitally important long-term goal. It is expected that the DER will include improvements to (or the addition of) ventilation systems to ensure appropriate indoor air quality.

#### **PROGRAM-PILOT ROUND(Funding)**

AOP is available on a rolling basis under this Pilot Round that allows new development teams to apply to become an AOP Developer and to allow for rolling basis of applications indefinitely or until funds are depleted.

### **5. Consolidated Financial Statements**

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This year's financial statements show that the Boston Federal Reserve Bank remitted \$1.54 billion to the U.S. Treasury – a part of the \$109 billion the Federal Reserve System as a whole remitted to the U.S. Treasury during 2021. Every year, the Federal Reserve remits excess earnings to the U.S. Treasury after expenses, dividends, and reservation of an amount to maintain surplus.

The Federal Reserve Board engaged KPMG to audit the 2021 combined and individual financial statements of the Reserve Banks and the financial statements of the five limited liability companies (LLCs) that are associated with the Board of Governors' actions to address the coronavirus pandemic, of which four LLCs are consolidated in the statements of the Federal Reserve Bank of New York and one LLC is consolidated in the statements of the Federal Reserve Bank of Boston.<sup>1</sup>

In 2021, KPMG also conducted audits of internal controls over financial reporting for each of the Reserve Banks. Fees for KPMG services totaled \$9.8 million, of which approximately \$2.3 million were for the audits of the LLCs.<sup>2</sup>

It's appropriate to mention the existence of the comprehensive annual financial report, informing any readers who wish to obtain more detailed information. These are just some abstracts.

## Federal Reserve Bank of Boston

# Consolidated Statements of Condition

As of December 31, 2021 and December 31, 2020

(in millions)

		2021	2020
<b>ASSETS</b>			
Gold certificates		\$ 335	\$ 337
Special drawing rights certificates		196	196
Coin		13	31
Loans:	Note 4		
Loans to depository institutions		32	62
Other loans		15	4,773
System Open Market Account:	Note 5		
Securities purchased under agreements to resell		-	22
Treasury securities, net (of which \$681 and \$755 is lent as of December 31, 2021 and 2020, respectively)		98,885	111,293
Federal agency and government-sponsored enterprise mortgage-backed securities, net		44,873	47,377
Government-sponsored enterprise debt securities, net (of which \$0 are lent as of December 31, 2021 and 2020)		44	59
Foreign currency denominated investments, net		923	1,054
Central bank liquidity swaps		152	849
Accrued interest receivable		519	677
Consolidated variable interest entity: Assets held, net (including \$520 and \$129 measured at fair value as of December 31, 2021 and 2020, respectively)	Note 6	29,707	51,790
Other accrued interest receivable		-	36
Bank premises and equipment, net	Note 7	108	110
Asset - Treasury funding of lending facility credit protection	Note 4	-	1,500
Interdistrict settlement account		53,573	-
Other assets		58	34
Total assets		<u>\$ 229,433</u>	<u>\$ 220,200</u>
<b>LIABILITIES AND CAPITAL</b>			
Federal Reserve notes outstanding, net		\$ 72,969	\$ 62,284
System Open Market Account:	Note 5		
Securities sold under agreements to repurchase		36,480	4,852
Other liabilities		40	130
Deposits:			
Depository institutions		103,751	107,297
Other deposits		19	1,861
Interest payable to depository institutions and others		1	-
Consolidated variable interest entity: Other liabilities	Note 6	152	187
Deposit - Treasury funding of lending facility credit protection	Note 4	-	1,500
Accrued benefit costs	Notes 9,10	132	128
Accrued remittances to the Treasury		51	12
Interdistrict settlement account		-	4,919
MMLF facility fees payable to the Treasury	Note 4	-	130
Other liabilities		27	22
Total liabilities		<u>213,622</u>	<u>183,322</u>
Reserve Bank capital			
Capital paid-in		\$ 1,459	\$ 1,470
Surplus (including accumulated other comprehensive income of \$9 and \$8 at December 31, 2021 and 2020, respectively)		292	310
Total Reserve Bank capital		<u>1,751</u>	<u>1,780</u>
Consolidated variable interest entity formed to administer credit and liquidity facilities: Non-controlling interest	Note 6	14,060	35,098
Total Reserve Bank capital and consolidated variable entity non-controlling interest		<u>15,811</u>	<u>36,878</u>
Total liabilities and capital		<u>\$ 229,433</u>	<u>\$ 220,200</u>



# Consolidated Statements of Operations

For the years ended December 31, 2021 and December 31, 2020

(in millions)

		<u>2021</u>	<u>2020</u>
<b><u>INTEREST INCOME</u></b>			
Loans:	Note 4		
Loans to depository institutions		\$ -	\$ 1
Other loans		6	187
System Open Market Account:	Note 5		
Securities purchased under agreements to resell		-	15
Treasury securities, net		1,676	1,485
Federal agency and government-sponsored enterprise mortgage-backed securities, net		541	707
Government-sponsored enterprise debt securities, net		2	3
Foreign currency denominated investments, net		(2)	(2)
Central bank liquidity swaps		1	22
Total interest income		<u>2,224</u>	<u>2,418</u>
<b><u>INTEREST EXPENSE</u></b>			
System Open Market Account:	Note 5		
Securities sold under agreements to repurchase		\$ 7	\$ 15
Depository institutions and others		114	175
Total interest expense		<u>121</u>	<u>190</u>
Net interest income		<u>2,103</u>	<u>2,228</u>
<b><u>OTHER ITEMS OF INCOME (LOSS)</u></b>			
System Open Market Account:	Note 5		
Federal agency and government-sponsored enterprise mortgage-backed securities (losses) gains, net		(1)	15
Foreign currency translation (losses) gains, net		(87)	74
Other		1	1
Reimbursable services to government agencies		6	5
Other components of net benefit costs	Notes 9, 10	-	(16)
MMLF facility fees to the Treasury	Note 4	(4)	(130)
Other		18	16
Total other items of loss		<u>(67)</u>	<u>(35)</u>
<b><u>OPERATING EXPENSES</u></b>			
Salaries and benefits		\$ 237	\$ 201
Occupancy		32	34
Equipment		10	8
Other		107	66
Assessments:			
Board of Governors operating expenses and currency costs		87	79
Bureau of Consumer Financial Protection		28	24
Total operating expenses		<u>501</u>	<u>412</u>
Reserve Bank net income from operations		1,535	1,781
Consolidated variable interest entity: Income (loss), net	Note 6	804	(2,400)
Consolidated variable interest entity: Non-controlling interest (income) loss, net	Note 6	(788)	2,402
Reserve Bank and consolidated variable interest entity net income before providing for remittances to the Treasury		1,551	1,783
Earnings remittances to the Treasury		1,544	1,784
Net income (loss) after providing for remittances to the Treasury		<u>7</u>	<u>(1)</u>
Change in prior service costs related to benefit plans	Note 9, 10	(2)	13
Change in actuarial gains (losses) related to benefit plans	Note 9, 10	3	(8)
Total other comprehensive income		1	5
Comprehensive income		<u>\$ 8</u>	<u>\$ 4</u>

# Consolidated Statements of Operations

For the years ended December 31, 2021 and December 31, 2020

(in millions)

		2021	2020
<b><u>INTEREST INCOME</u></b>			
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Change in actuarial gains (losses) related to benefit plans	Note 9, 10	3	(8)
Total other comprehensive income		<u>1</u>	<u>5</u>
Comprehensive income		<u>\$ 8</u>	<u>\$ 4</u>

**Taxes:**

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The Reserve Banks are exempt from federal, state, and local taxes, except for taxes on real property. The Bank's real property taxes were \$9 million for each of the years ended December 31, 2021 and 2020, and are reported as a component of "Operating expenses: Occupancy" in the Consolidated Statements of Operations.

**Budget:**

The \$3.61 billion FY21 Operating Budget and \$3.00 billion FY21-FY25 Capital Plan come at a time of great local, national and international economic turbulence, brought on by the coronavirus pandemic. The City's primary focus is responding to the immediate needs of residents and businesses affected by the coronavirus.

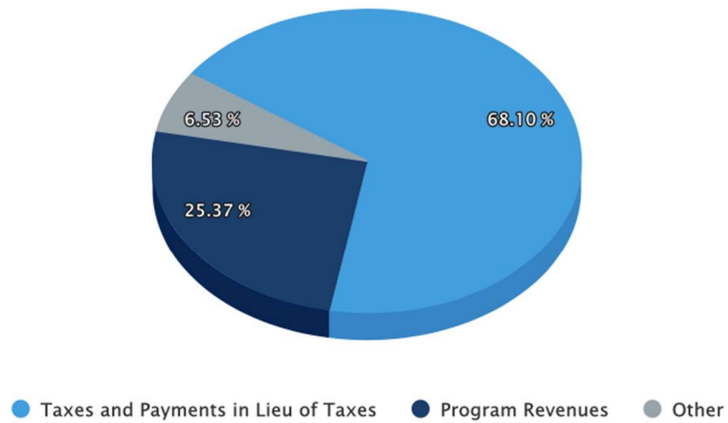
This fiscally responsible budget will ensure the City is prepared for economic uncertainties, while maintaining a well-resourced city government that is prepared to respond to the needs of Boston.



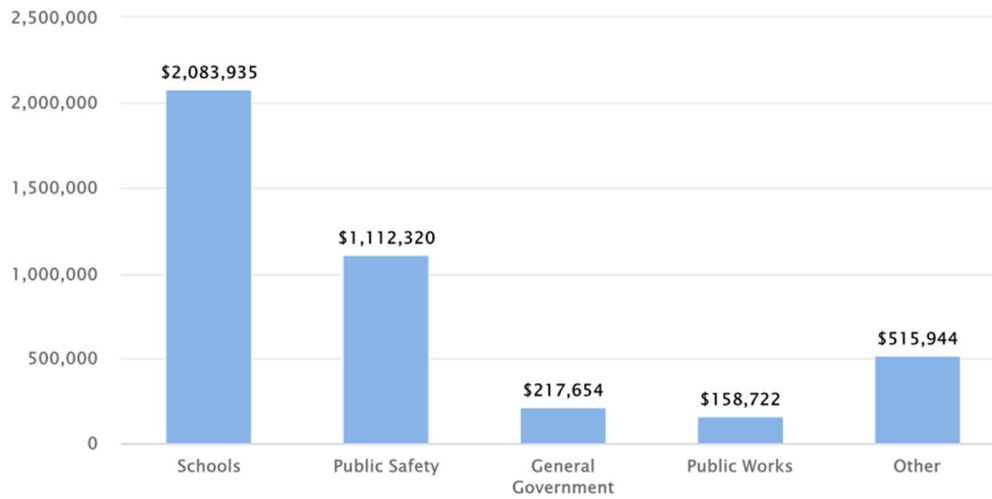
[Mayor Walsh on the Budget Overview 2021](#)

**Revenues distribution and expenses :**

**Revenues – Governmental Activities  
Fiscal Year 2021**



**Expenses – Governmental Activities FY 2021  
(in thousands)**



**6. DESCRIPTION OF MAJOR POLICIES**

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Throughout the year, with each stage of the pandemic having a smaller impact on our business, City of Boston supported health care systems, physicians, communities and one another. And, most important, Boston Scientific helped improve the lives of more than 30 million patients.

Throughout the year they challenged what's possible. This winning spirit led them to launch 145 new clinical trials, introduce 90 innovative products and enhance digital capabilities. They kept their focus on organic innovation and business development deals to support our category leadership strategy, including the acquisition of five companies in the past year that expand our portfolio and complement existing medical technologies. City of Boston invested in the growth while continuing to work on minimizing the impact on

the environment and advancing diversity, equity and inclusion (DE&I) goals. And around the world they supported local communities through health equity initiatives and more than 50,000 volunteer hours in more than 50 countries.

The need for strong environmental, social and governance initiatives among global citizens and businesses has never been greater. That's why sustainable and inclusive business practices are central to transform lives through medical solutions around the world. Boston Scientific were one of the first medical device manufacturers to pledge to achieve carbon neutrality by 2030 in all manufacturing and key distribution sites, and they are on track to meet our 2030 goal. In 2021 Boston Scientific expanded climate action goals by joining the United Nations Race to Zero and Business Ambition for 1.5°C campaign. By making this commitment, as posted on the annual report of Boston Scientific, they will build on their strong foundation and establish ambitious science-based targets that set them on a path to achieve net-zero carbon emissions across our entire value chain by 2050.

Moreover on the 2030 goals, the city has bounded a transportation plan called "Go Boston 2030" which strives to make getting around the city more equitable, reliable, and efficient. It's also helping the city prepare for the effects of climate change.

The plan aims to reduce transportation-related carbon emissions by 50% by 2030, decrease vehicle traffic, and increase use of public transit by 30%, walking by half, and biking by four times. The plan's 58 projects include bike lanes and slow streets, smart streetlights and signals, and self-driving vehicle policies and testing. So far, about half of the projects have been implemented or are in the design phase.

The Boston Transportation Department also launched the Vision Zero program in 2016 to eliminate serious and fatal traffic accidents by 2030. To achieve that goal, the city set a default speed limit of 25 mph in 2017, revamped bike lanes, and launched Boston's Safest Driver app in 2019.

Residents are encouraged to use the app to measure their driving trips against five metrics — rapid acceleration, harsh braking, sharp turns, at-risk speeding, and phone distraction. The app scores each trip and offers tips for how to improve their driving in the future.

## **7. METHODOLOGICAL NOTE**

In this methodological note, we adhered to established guidelines to ensure a rigorous and systematic approach in drafting the content. Our criteria for content selection emphasized relevance, accuracy, and alignment with the report's objectives. The methodology employed a

comprehensive approach, incorporating a thorough review of pertinent documents and consultation with subject matter experts. Key committees involved in the report's preparation, including those overseeing content review and quality assurance, played a pivotal role in maintaining the integrity of the information presented. This methodological framework serves as the backbone of our commitment to transparency, reliability, and a well-informed discourse in the final report.

## 8. DISSEMINATION PLAN

1	IDENTIFY INFORMATION	Popular financial report about Boston city including economic, financial, demographical, geographical and governmental data.
2	AUDIENCE	This report is dedicated for residents and businesses, government agencies and the general public of Boston city. In addition, to the readers of the European journal of volunteering and community-based projects.
3	CHANNELS OF DISSEMINATIONS	This POP is going to be available to the public in the form of report, by emails and newsletters, also on data portals and news outlets. and its going to be available on all social media platforms, such as twitter, facebook, and linkedin.
4	TIMING	The report is going to be published and available to the public on 1 november 2023.
5	ACCESSIBILITY	The report will be easy accessible to all stakeholders.
6	FEEDBACK MECHANISM	There will be a follow-up communication to address questions and concerns that may arise after the report's release.
7	COMPLIANCE	The report complies with legal and regulatory requirements of the protection of sensitive data.
8	FEEDBACK AND EVALUATION	We are going to collect feedback and evaluate the effectiveness of our plan for future improvements.

## THE SIX CAPITAL

### 1.INTELLECTUAL CAPITAL

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Boston's unique mix of intellectual capital, health care and medical research, higher education, financial services, and high technology have earned Boston a high rank on Fortune magazine's Best Cities for Business list in six out of the nine annual surveys it had published. While each survey in the series focused on a different characteristic held by American cities with successful business climates, Boston usually emerged at or near the top of the list. Boston's intellectual capital and entrepreneurial prowess were repeatedly cited as the principal reasons for Boston's selection as a "best city for business." The city's charm and livability also were praised. But it was the city's concentration of colleges and universities, world-renowned hospitals, cutting-edge research centers, and deep pocket venture capital and financial services firms that generally set Boston apart from its peers across the nation.

Boston's emphasis on collaboration between academia and industry fosters innovation across various sectors, notably in technology and biotechnology. The city's resilience and adaptability, deeply rooted in its history, contribute to its continuous intellectual evolution. Furthermore, a strong sense of community engagement and a dedication to social progress underscore Boston's intellectual values, reflecting a holistic approach to knowledge that goes beyond academic pursuits. These values collectively shape Boston's identity as a global intellectual powerhouse.

Some components of intellectual capital in a city include:

1. **Educational institutions:** Boston boasts a rich array of prestigious educational institutions, including Harvard University and the Massachusetts Institute of Technology (MIT), globally recognized for academic excellence. Other notable institutions like Boston University, Northeastern University, Boston College, Tufts University, and Suffolk University contribute to the city's diverse educational landscape. Additionally, specialized institutions such as the Boston Conservatory at Berklee highlight the city's commitment to the arts. These universities collectively shape Boston as a prominent hub for higher education, attracting students globally and fostering innovation and research across various disciplines.
2. **Skilled workforce:** Boston's skilled workforce is characterized by its exceptional education and expertise across various sectors. Fueled by prestigious institutions like MIT and Harvard, the city boasts a strong foundation in technology and innovation, with a workforce excelling in biotechnology, software development, and engineering. In healthcare and life sciences, Boston's workforce includes highly skilled professionals in research, medicine, and healthcare services. The finance and business sector benefit from a talented pool of individuals drawn to the city's robust financial district. The education and research field thrives with a workforce deeply engaged in academia and research. Additionally, Boston's influence extends to biotech and pharmaceuticals, making it a global hub for medical research and drug development. This diverse and dynamic skilled workforce positions Boston as a key player in innovation, culture, and economic growth.
3. **Innovation ecosystem:** Boston's innovation ecosystem is a dynamic blend of top-tier universities, robust research and development initiatives, and a thriving startup culture. Renowned institutions like MIT and Harvard drive cutting-edge research, fostering a continuous flow of innovative ideas. The city's commitment to biotechnology and healthcare innovation is evident, with a leadership role in medical research and technology. A vibrant startup scene, supported by incubators and venture capital, contributes to the city's dynamic entrepreneurial spirit. Boston's technology sector,

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focusing on software development, artificial intelligence, and robotics, benefits from a skilled workforce and collaborative initiatives. The ecosystem thrives on collaboration, networking opportunities, and an overall entrepreneurial ethos, positioning Boston as a global innovation hub shaping the future of various industries.

- 4. Cultural and creative assets:** Boston's cultural and creative assets form a rich tapestry that blends historical significance with contemporary vibrancy. The city is adorned with world-class museums such as the Museum of Fine Arts and the Isabella Stewart Gardner Museum, showcasing its commitment to the arts. Renowned performing arts venues, including the Boston Symphony Orchestra and Boston Ballet, contribute to a dynamic cultural scene. Boston's literary heritage, seen in influential authors and historic libraries, adds to its intellectual capital. The diverse culinary scene, annual events like the Boston Marathon, and a unique intersection of culture with technology and science innovation further enhance the city's multifaceted cultural identity. Together, these assets create an enriching cultural experience for residents and visitors alike.
- 5. Research and development:** Boston's Research and Development (R&D) landscape epitomizes a global hub for innovation. Renowned academic institutions like MIT and Harvard spearhead cutting-edge research, particularly in biotechnology and healthcare. The city's technology and innovation hubs drive collaborative R&D efforts, spanning artificial intelligence, robotics, and software development. A thriving startup ecosystem, supported by incubators, fuels early-stage R&D initiatives. Boston actively promotes collaborative R&D through partnerships between academia, industry, and government, fostering interdisciplinary innovation. Substantial investments from both public and private sectors contribute to the city's position as a dynamic R&D hub. Across diverse sectors, including clean energy and advanced manufacturing, Boston's commitment to innovation continues to shape its role as a leader in global research and development.
- 6. Intellectual property:** Boston's intellectual property (IP) landscape is dynamic and multifaceted, driven by renowned academic institutions like MIT and Harvard, prolific in generating groundbreaking research and innovations. The city's biotechnology and life sciences sectors contribute significantly to IP, with a focus on novel medical treatments and technologies. In the technology sector, including artificial intelligence and robotics, Boston fosters innovation, creating valuable intellectual property. The vibrant startup scene adds to IP creation, with emerging companies protecting innovative ideas. Legal and consulting services specializing in IP support companies, while government initiatives and a collaborative culture further fortify Boston's position as a key player in the global IP landscape.
- 7. Access to information:** Boston excels in providing extensive access to information through a multifaceted infrastructure. The city's libraries, including the Boston Public Library, serve as hubs for diverse resources. Leading educational institutions like Harvard and MIT contribute to a wealth of academic information accessible to the public. Boston's thriving technology sector facilitates knowledge exchange through innovation centers. Cultural institutions offer historical and artistic information, while government initiatives promote transparency via open data. Media outlets, digital connectivity, and community initiatives collectively ensure that Boston residents enjoy a well-connected and informed environment, fostering collaboration and engagement.



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8. **Knowledge-based industries:** Boston's knowledge-based industries form a dynamic and diverse landscape, positioning the city as a global hub for innovation and intellectual capital. Biotechnology and life sciences thrive with cutting-edge research in genomics, pharmaceuticals, and medical devices. The technology sector, including software development and artificial intelligence, contributes to Boston's reputation as a tech innovation powerhouse. The city's healthcare and medical services, along with its world-class hospitals, are integral to the knowledge-based economy. Higher education institutions play a pivotal role in fostering research and innovation across disciplines. Boston's financial district hosts sophisticated financial services, while professional and scientific services, including legal and consulting, further enrich the city's knowledge-based industries. This multifaceted environment underscores Boston's influence in driving innovation and shaping the future across various sectors.
  9. **Quality of life:** Boston offers a high quality of life characterized by educational excellence, a vibrant cultural scene, and abundant economic opportunities. Renowned universities and cultural institutions contribute to intellectual and cultural richness, while top-tier healthcare facilities ensure access to quality medical services. The city's thriving economy, particularly in technology and finance, provides diverse job opportunities. Parks and green spaces offer recreational options, and historic architecture adds to the city's charm. Efficient public transportation, a diverse culinary scene, and a strong sports culture contribute to an engaging lifestyle. While the cost of living is notable, Boston's overall quality of life is shaped by its cultural, educational, and economic strengths.

## 2.HUMAN CAPITAL

Human capital describes an intangible activity or quality not listed on a company's balance sheet. It can be classified as the economic value of a worker's experience and skills. It includes education, training, intelligence, abilities, health, and other aspects valued by employers, such as loyalty and punctuality.



## OUR VALUES

*We believe in promoting a culture that makes City employees want to come to work every day, to a place they feel valued and supported.*

- 1 *Putting People First.* We are a City of neighbors. It's on us to empower the people who power the communities in which we live, work, and thrive every single day.
- 2 *Always Growing.* We are on a continuous journey to improve ourselves in order to make our employees' experiences better.
- 3 *Commitment to Service.* What we do in HR each day ripples outward to impact our community as a whole. Our calling to public service is what unites us.

### About the workers :

<b>COMPENSATION AND CLASSIFICATION</b>	Facilitate the process through which positions and jobs are assigned to a salary grade and step in grade, according to the expected duties, skills, competencies, level of experience, education, licenses, and certifications required to fulfill the job.
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<b>EMPLOYEE RELATIONS &amp; EMPLOYEE ASSISTANCE PROGRAM</b>	Support a positive relationship between the City and its employees, including open communication, feedback, counseling, support services and resolution of investigations, grievances and disciplinary actions in order to create the best work environment possible. Presence of trained clinicians leads a collaboration with authorities, commissions, employees and family members to restore and initiate well-being in work and life.
<b>POLICIES AND PROCEDURES</b>	Provide guidance to employees, managers and supervisors, and departmental leadership to ensure awareness, understanding, and compliance with all City policies, as well as applicable State and Federal requirements.
<b>LEAVE AND ABSENCE MANAGEMENT &amp; TALENT ACQUISITION</b>	We design, develop, and implement leave policies and programs to meet the work-life needs of employees in accordance with laws and regulations, as well as to attract and retain talent.
<b>LEARNING AND DEVELOPMENT</b>	Develop and deliver training to support City-wide initiatives, departmental operations, and individual ability to meet performance expectations according to role and level.
<b>UNEMPLOYMENT INSURANCE</b>	Help and support eligible unemployed workers access to unemployment benefits
<b>HEALTH BENEFITS AND INSURANCE</b>	The city is responsible for creating, updating, and managing health and insurance benefits available to City of Boston employees and retirees

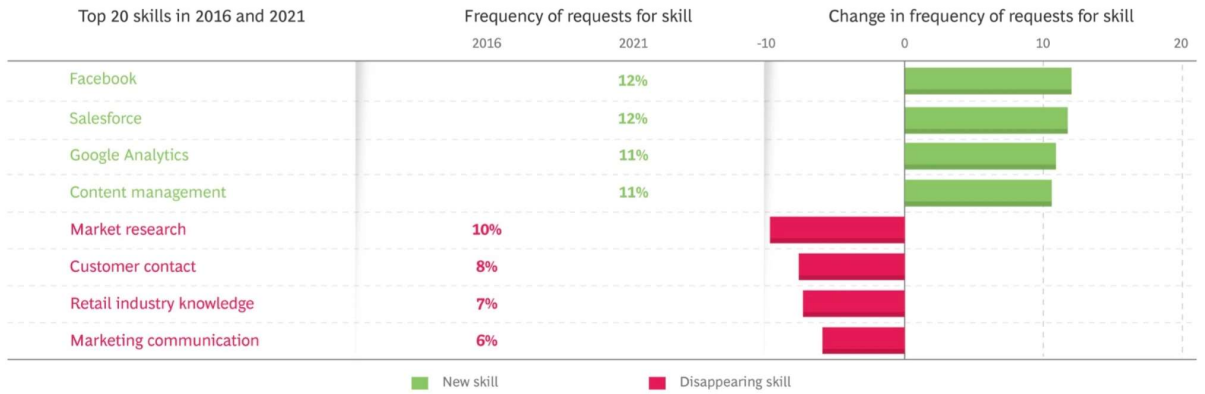
**About the skills :**

Looking at the data across job families reveals 4 big trends in skill change :

- Digital skills in non digital occupations
- Soft skills in digital occupations
- Visual communication

## How technology is influencing new and disappearing skills in the marketing specialist role

Top 20 new and disappearing skills of marketing specialists (2016 and 2021): How often the given skill is requested in a marketing specialist job posting (%)



Sources: Emsi Burning Glass job posting analytics; BCG.  
 Note: The analysis covered 2016 through the third quarter of 2021; n>15 million.

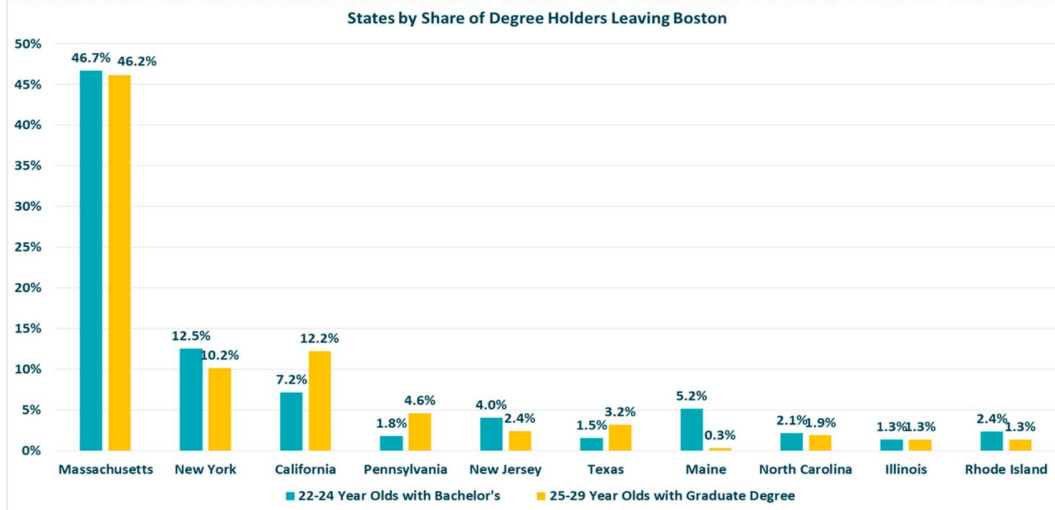
### About the education:

High school graduate, percentage of persons 25 years+ , 2017-2021	88,2%
Bachelor's degree, percentage of persons 25 years+ , 2017-2021	52,1%

Boston has been named one of the most educated cities in America in WalletHub's 2021 Most and Least Educated Cities in America list.

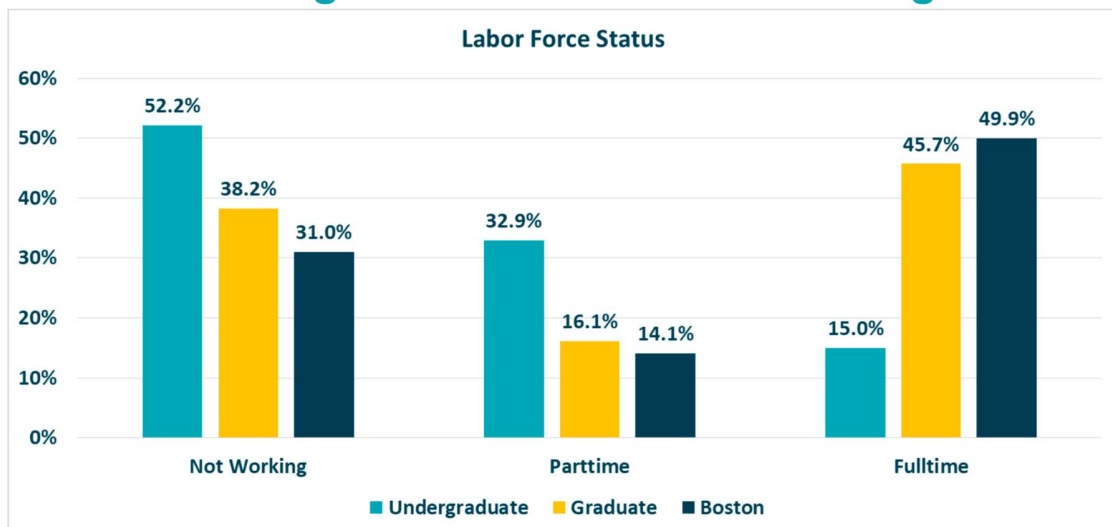
“Cities want to attract highly educated workers to fuel their economic growth and tax revenues,” said Adam McCann, WalletHub financial writer. “Higher levels of education tend to lead to higher salaries.”

## Almost half of out-migrating 22-24 year olds with a Bachelor’s and 25-29 year olds with a graduate degree remain in Massachusetts and of those 25% work in Boston



Source: 2017-2021 American Community Survey (IPUMS), BPDA Research Division Analysis

## College students participate in Boston’s workforce. Almost half of graduate students are working fulltime.



Source: 2021 American Community Survey (PUMS), BPDA Research Division Analysis

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## **About the intelligence :**

The former website of Boston Intelligence since 2009 is engaged in helping business and companies achieve significant growth by carefully targeting specific personas and regions with expert marketing strategies, navigate change , develop markets , maximize online marketing potential with award-winning programs, fractional CMO service options, lowering costs in order to be fiscally responsible and customized small team approach.

## **3. NATURAL CAPITAL**

The mouth of Thompson Island's eastern Salt Marsh. In the foreground, a flat grassy upland is filled with staghorn sumac in early Fall, identifiable by its thin, winding branches and intermixed dark green and bright red leaflets. Beyond the upland, deep blue water enters the frame through a thin channel from the harbor, whose water stretches beyond the upland on the upper right side of the frame. In the distance the two drumlins of Spectacle Island rise above the horizon.

From the densely settled downtown of Boston, extending over eleven miles seaward into the open Atlantic, the Boston Harbor Islands represent a remarkable diversity of natural features. As one of only three partially flooded drumlin fields in the world, and the only one in North America—with glacially carved hills rising above the sea as islands—the region provides insight into urban ecology, coastal ecosystems, and offers a critical perspective into adaptations to sea level rise and climate change.

Once considered the dirtiest harbor in the United States, Boston Harbor has been rejuvenated and remains a vital ecological hotbed, containing rocky shores, sandy shores, salt marshes, sea grass beds, tidal mudflats and more. These ecosystems are important in sustaining local food webs and biodiversity, mitigating flood and storm impacts, and establishing the unique appeal and beauty of the area to all who live and visit here.

### **1. Green spaces in Boston and urban forests**

Boston is celebrated for its lush green spaces and urban forests that offer a welcome escape from city life and a chance to immerse in nature. Among the standout green spaces are the historic Boston Common and adjacent Public Garden, where the iconic Swan Boats and meticulously tended flowerbeds provide tranquility. The Esplanade, lining the Charles River, delivers breathtaking riverfront views and opportunities for jogging and picnicking, serving as the backdrop for festive events like the Fourth of July celebration. In the heart of the city, the Rose Kennedy Greenway combines greenery, public art, and cultural activities. On the other hand, Boston's urban forests, like the Arnold Arboretum and the Emerald Necklace designed by Frederick Law Olmsted, boast an impressive collection of trees, offer serene settings for nature enthusiasts, and create green corridors of diverse ecosystems. The city's commitment to preserving and expanding

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its urban tree canopy enhances air quality and wildlife habitat while contributing to its sustainability and climate resilience.

## **2. Boston's waterfront, water bodies , and wetlands:**

Boston's waterfront is a multifaceted treasure trove of history, commerce, culture, and entertainment. Notably, it was the stage for the Boston Tea Party in 1773, an event of monumental historical importance. Today, the waterfront is a bustling economic hub, particularly in the innovative Seaport District, where tech companies and startups thrive. The cultural scene shines with institutions like the New England Aquarium, dedicated to marine life and conservation, and the Institute of Contemporary Art (ICA), renowned for contemporary art exhibitions. It's also a gastronomic paradise, offering a profusion of restaurants with a focus on seafood and stunning harbor views. Boston Harbor, the city's central water body, has been revitalized, enhancing its recreational opportunities. The Charles River provides scenic beauty and leisure activities. Boston's wetlands, encompassing salt marshes and freshwater habitats, are integral for mitigating coastal erosion, purifying water, and supporting urban biodiversity. These natural assets are pivotal in the city's climate resilience efforts, underscoring their significance in Boston's diverse landscape.

## **3. Biodiversity**

Boston's commitment to biodiversity and climate resilience is evident in its multifaceted approach to environmental stewardship. The city's green spaces and urban forests not only provide habitat for a variety of wildlife, including urban creatures like squirrels and rabbits, but they also showcase plant diversity in areas such as the Arnold Arboretum and the Boston Harbor Islands. These conservation efforts are essential for preserving Boston's rich natural heritage. In parallel, Boston is actively addressing the challenges of climate change, particularly sea-level rise and storm resilience. Initiatives like fortifying the waterfront and implementing green infrastructure solutions are bolstering the city's ability to withstand extreme weather events. Furthermore, Boston's commitment to renewable energy, emissions reduction, and community engagement in climate resilience planning ensures that the city remains at the forefront of sustainability and readiness in the face of climate challenges. The synergy of biodiversity preservation and climate resilience makes Boston a forward-looking and environmentally conscious city.

Boston city adopts a lot of projects and innovations to maintain and improve its natural resources such as:

### **FORGING A PATH TO A SUSTAINABLE URBAN FOREST FOR ALL BOSTONIANS**

- Goal #1: Equity First Focus investments and improvements in under-canopied, historically excluded and socially vulnerable areas
- Goal #2: Proactive Care and Preservation Ensure trees/tree canopy are proactively cared for

- 
- Goal #3: Community-Led Ensure community priorities drive urban forest decisions and management
  - Goal #4: Prioritize and Value Trees Increase awareness and buy-in regarding the importance of trees in Boston, across the public and private sectors

Take urgent action to combat climate change and its impacts

Sustainable Development Goal 13 (SDG 13) is about taking urgent action to combat climate change and its impacts. SDG 13 has five targets which are to be achieved by 2030. The targets include: strengthen resilience and adaptive capacity to climate-related disasters (Target 13.1), integrate climate change measures into policies and planning (Target 13.2), build knowledge and capacity to meet climate change (Target 13.3), implement the UN Framework Convention on Climate Change (Target 13.a), and promote mechanisms to raise capacity for planning and management (Target 13.b).

"The Climate Action Plan 2021 provides a detailed plan for taking decisive action to achieve a 51% reduction in overall greenhouse gas emissions by 2030 and setting us on a path to reach net-zero emissions by no later than 2050, as committed to in the Programme for Government and set out in the Climate Act 2021.

### **1. Boston's Renewable Energy Plan**

"Earlier this month, Boston's Mayor Walsh called for cities around the country to explore a group purchase of renewable energy, apparently for municipal buildings and streetlights. The hope is that a lot of purchasing power could support the construction of large-scale and low-cost clean energy. According to news accounts, the cities might jointly buy from one or more facilities that could be located anywhere in the U.S. Boston City Hall plans to finalize a list of partnering cities and issue a request for information to renewable energy developers late in the summer."

### **2. Climate Resilience In Boston**

Boston's resilient harbor plan is bold and socio-ecologically innovative by associating green infrastructure and nature-based solutions to address climate impacts with a core focus on inclusivity and wealth creation for racial and ethnic minorities. But while the city seems committed to inclusive planning and ensuring that the preferences, needs, and identities of racial minorities are represented by the green infrastructure to be constructed, we have not heard much about climate gentrification or the risk of mid to long-term displacement of socially vulnerable residents.

### **3. Protecting public health with clean air and water**

City residents face serious health risks of living near sources of pollution—from East Boston residents dealing with jet fuel pollution near the airport, to Chinatown residents living by highways filled with polluting cars and trucks. Boston should take measures to mitigate and eliminate pollution. And as a coastal city, we can play a major role in safeguarding our ocean resources to



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protect marine biodiversity and improve water quality. Combating climate change is a key part of creating safe communities and promoting public health.

#### **4. Accelerating decarbonization**

The window to reverse the destructive momentum of climate change is closing quickly, and Boston is vulnerable to intense heat waves and destructive coastal flooding. We must commit to citywide carbon neutrality by 2040, with 100% of our energy coming from renewable sources by 2030, and a net-zero municipal footprint by 2024. These firm commitments demonstrate leadership to the nation while modeling a science-driven climate action plan that centers the safety and well-being of historically marginalized and impacted environmental justice communities.

## **4. PRODUCTIVE CAPITAL**

### **Transportation Under Greenovation**

The Office of Environmental and Energy Services is actively looking at various alternative transportation options to help decrease the City's greenhouse gas emissions.

- City of Boston has an alternative fuel vehicle procurement policy for city vehicles.
- The City's 450 diesel vehicles all run on a cleaner blend of biodeisel and ultra low sulfur fuel, reducing emissions by 12-17%.
- Boston is the largest municipal purchaser of biodeisel in New England.
- The City has undertaken a large-scale retrofit of its school bus fleet, using \$3.25 million from the EPA. Five hundred school busses, using ultra low sulfur diesel, are being equipped with pollution control technologies, reducing tailpipe emissions by more than 90%.

The Boston Bikes initiative seeks to make Boston a world-class bicycling city by creating safe and inviting conditions for all residents and visitors by expanding bike lanes, offering Ride-Along Fridays, and sponsoring the annual Hub on Wheels event.

- In 2009, the City of Boston announced the Complete Streets Initiative.
- Hubway bikeshare launched July 28, 2011 with 600 bicycles and 60 stations throughout Boston.

- 
- The City of Boston released its [Boston Bike Network Plan](#) in September 2013, which lays out a plan for creating safer streets for bicycling and identifies a comprehensive network of bicycle routes, calling for 75 miles of new facilities in the next five years.

### **Physical capital**

Boston's physical capital is a comprehensive blend of well-developed infrastructure and tangible assets crucial for the city's economic vitality. Robust transportation networks, including highways and the efficient "T" subway system, facilitate the movement of people and goods. The city's educational and research facilities, exemplified by institutions like MIT and Harvard, contribute to physical capital by fostering innovation and knowledge creation. Technology and innovation hubs, commercial and residential real estate, and iconic landmarks further enrich Boston's physical landscape. A strong financial district, reliable utilities, healthcare facilities, and a focus on sustainable initiatives collectively form the city's physical capital, supporting economic activities and enhancing overall quality of life.

### **Natural resources**

Boston's natural resources are characterized by its coastal geography and urban environment. The historical significance of Boston Harbor and waterways extends to trade, transportation, and recreation. The city's climate and green spaces contribute to environmental quality and urban well-being. Boston's coastal location offers potential for renewable energy exploration, such as wind and tidal energy. While not an agricultural hub, the city benefits from its proximity to fertile regions, ensuring access to fresh produce. Recognizing environmental challenges, Boston emphasizes resilience in the face of rising sea levels and climate change. While lacking traditional natural resources, the city strategically utilizes its geographical features and emphasizes sustainability.

### **Technological capital**

Boston's technological capital is shaped by renowned universities like MIT and Harvard, contributing to cutting-edge research and expertise. The city excels in biotechnology and life sciences, hosting innovation hubs for startups and established tech companies. A thriving startup culture, backed by venture capital, fuels technological innovation, while a strong emphasis on research and development spans diverse industries. Boston is a hub for EdTech, leveraging technology in education, and fosters a collaborative culture among academia, industry, and government. Access to funding further supports technological advancements, positioning Boston as a global leader in technology and innovation.

## **5. SOCIAL CAPITAL**

Social capital is "the networks of relationships among people who live and work in a particular society, enabling that society to function effectively".<sup>[1]</sup> It involves the effective functioning of social groups through interpersonal relationships, a shared sense of identity, a shared understanding, shared norms, shared values, trust, cooperation, and reciprocity. Social capital is a measure of the value of resources, both tangible (e.g., public spaces, private property) and intangible (e.g., actors, human capital, people), and the impact that ideal creators have on the resources involved in each relationship, and on larger groups. Some have described it as a form of capital that produces public goods for a common purpose, although this does not align with how it has been measured.

Social capital has been used to explain the improved performance of diverse groups, the growth of entrepreneurial firms, superior managerial performance, enhanced supply chain relations, the value derived from strategic alliances, and the evolution of communities.

**THE PROBLEM**

Social capital encompasses the value and strength of social networks that enable a society to function. Research has shown that strong social ties in a community improve public health outcomes, reduce crime, aid in disaster recovery, and more. Disparities in social infrastructure across neighborhoods, however, lead to some communities having weaker social ties than others.

**BACKGROUND**

Social capital has become an increasingly researched topic in the field of urban resilience within the past two decades. There are three primary types of social capital: 1) bonding social capital, or the connections between two similar groups of people, 2) bridging social capital, or the ties between two different groups of people, and 3) linking social capital, or the relationship between a hierarchical power (e.g., a government entity) and another group, such as a community. For this capstone project, we strive to understand how bonding social capital exists in Boston's neighborhoods. Our client, Aldrich Resilience Lab at Northeastern University, is currently working on a project to map social infrastructure "sites" (defined by the client as community centers, places of worship, social businesses, and parks) and determine which neighborhoods and city blocks host more social infrastructure than others. Our goal was not only to answer this primary question, but also to understand how social capital varies with racial and socioeconomic inequities, to learn why social infrastructure varies across Boston, and to offer policy recommendations for improved social capital.

The client's research employs mapping the locations of social infrastructure sites using three primary methods: 1) the Google Maps Places API, 2) virtual mapping via Google My Maps, and 3) in-person "ground-truth" mapping using the MapMarker smartphone application. These sites are plotted on the client's social infrastructure Google My Maps. The client provided our research team with a map of Boston with social infrastructure sites already plotted using the Google Maps Places API method. This map is divided into grid cells for every square kilometer of Boston; grid cells are color coded by neighborhood. The project team was tasked with creating a geospatial dataset of virtually mapped and "ground-truthed" social infrastructure sites to use for data analysis.



**DATA AND METHODOLOGY**

**Primary Research Questions**

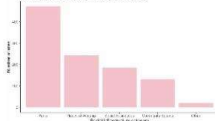
- 1) Which neighborhoods have more social infrastructure sites? What is the distribution of sites across the core Boston area?
- 2) What methods of data collection yield the best results in identifying the level of social infrastructure sites in a community?

For each new identified site, the team logged one of four statuses (new, confirmed, not social infrastructure, and not found) and categorized it into one of five types of social infrastructure (community spaces, places of worship, parks, social businesses, or other). The client determined the statuses and categories. Data collection yielded a total of 1,066 social infrastructure sites after removing sites not classified as social infrastructure.

Method	Total Number of New Sites
Google Maps Places API	516
Virtual mapping	507
"Ground-truth" mapping	45

The final dataset revealed that parks are the most common type of social infrastructure and community spaces are the least common.

Ratio of sites by neighborhood category



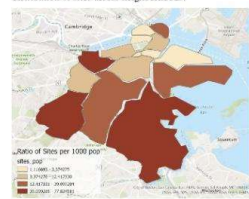
Below is a distribution of sites by neighborhood as well as a category for social infrastructure level. To compare methods, we ranked the neighborhoods by sites per capita for each method, divided these ranks into three levels (low, medium, and high), and determined that the API yields the same results as the virtual and "ground-truth" mapping methods.

Neighborhood	Population Size	Sites per 1,000 residents
Back Bay	18,176	2.6
Beacon Hill	5,458	4.0
Dorchester	44,086	1.9
Downtown	17,581	10.7
Fenway/Kenmore	32,598	3.7
Jamaica Plain	39,314	3.6
Mission Hill	17,406	1.6
Rosbury	52,944	4.6
South Boston	36,212	2.6
South End	16,193	3.5

**KEY FINDINGS**

**Key Finding #1: The ratio of sites per 1,000 residents in each neighborhood has an inequitable distribution.**

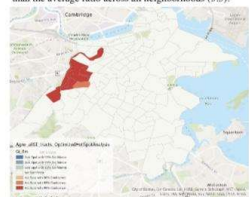
A quartile map created using ArcGIS highlights the distribution of sites across neighborhoods.



Neighborhoods with lighter colors have smaller ratios of sites per 1,000 residents, whereas darker colors indicate higher ratios. Downtown, for example, hosts the most social infrastructure per 1,000 residents (10.7 sites). This rate is over double that of Rosbury, which has 4.6 sites per 1,000 residents, even though the Downtown area has less than half the population that Rosbury does.

**Key Finding #2: Hotspots of social infrastructure exist in the neighborhoods of Jamaica Plain and Fenway/Kenmore.**

Hot spot analysis in ArcGIS reveals that clusters of social infrastructure exist in the four census tracts in the Jamaica Plain neighborhood and in one census tract in the Fenway/Kenmore neighborhood. The ratio of sites per 1,000 residents in these areas is 99% significantly higher than the average ratio across all neighborhoods (3.3).



**RECOMMENDATIONS**

Our recommendations are two-fold: first, we have recommendations for the client in terms of improving research; second, we have recommendations for the City of Boston on how to improve social ties based on our findings.

**Recommendations for the Aldrich Resilience Lab**

1. The Google Maps Places API with levels is the best method to identify social infrastructure within a community.
2. Consider the cultural and local context of social infrastructure, which will vary from neighborhood to neighborhood.
3. Identify a method to measure the quality of social ties that a social infrastructure site can produce.

**Recommendations for the City of Boston**

1. Increase the quantity of parks and community spaces in neighborhoods where the density of sites per 1,000 residents is disproportionate (e.g., Dorchester).
2. Qualitative observations reveal that many sites are underutilized. Initiative should be taken to maintain upkeep and encourage the community to utilize such spaces.
3. Create more opportunities for social businesses to thrive, like the Dorchester Avenue Project created by the Boston Planning and Development Agency.

**FUTURE WORK**

There are numerous opportunities for this research to expand. Some potential future options are as follows:

- Collect more qualitative data to overcome the current limitation of lacking cultural and local context.
- Define a more robust understanding of what a "quality" social infrastructure site looks like, and how the strength of social ties vary according to this quality level.
- Compare data with other social demographic variables to determine if any correlations and/or causations exist.
- Collect similar data in other cities for comparisons.

The large student population in Boston complicates analysis of the relationship between social capital and health outcomes. Communities that consist mainly of highly mobile, young adults will have low rates of morbidity and mortality that are not highly correlated with social, economic, and demographic characteristics of the area. Census tracts that contain high collegiate student populations will have comparatively low occurrences of deaths because those populations are likely to move on to different areas before reaching an age at which disease and death rates measurably increase. Because the young adult population is also less likely to participate in

elections and may have weaker ties to the community, it is harder to tease out the relationship in Boston between sociodemographics, social capital, and health outcomes.

Understanding of the causal relationship between social capital and health is still evolving. The analysis included in this report is entirely cross-sectional (a study of the relationship between variables at one point in time rather than sequentially) and ecological (a study of the characteristics of populations rather than individuals) and does not address the literature that examines mechanisms by which social capital, cohesion, and other factors might relate to the natural history of disease progression. Health disparities associated with income, education, race, and place are complex, multi-factorial relationships that cannot be reduced to a single etiology or mitigated by a single policy solution. The literature and this analysis suggest, however, that interventions aimed at strengthening community bonds and networks may be important public health strategies in Boston, particularly in the neighborhoods of Mattapan, North and South Dorchester, and the South End.

### Social Capital and Community Violence

	Stabbings per 10,000 persons	Shootings per 10,000 persons
<b>BOSTON</b>	<b>5.8</b>	<b>3.4</b>
Allston/Brighton	1.2	---
Back Bay	1.1	---
Charlestown	7.2	---
East Boston	10.2	---
Fenway	1.1	---
Hyde Park	5.6	2.8
Jamaica Plain	2.8	2.2
Mattapan	8.3	6.5
N. Dorchester	10.1	7.7
Roslindale	3.4	1.8
Roxbury	14.4	8.7
S. Boston	3.0	---
S. Dorchester	9.4	8.0
South End	6.6	3.7

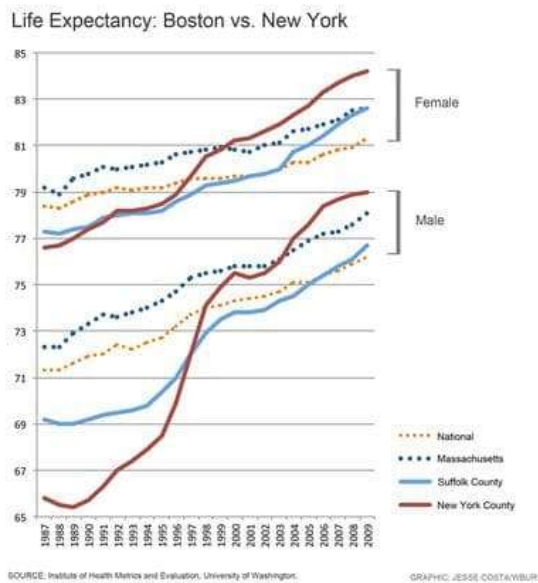
### Social Capital and Premature Mortality/Life Expectancy

Life expectancy in a city like Boston is influenced by various factors, including healthcare access, socio-economic conditions, education, and lifestyle choices. Boston, with its world-renowned healthcare institutions, educational opportunities, and cultural amenities, tends to have relatively

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high life expectancy. Access to quality healthcare, health education, and a robust healthcare infrastructure can contribute to longer and healthier lives for its residents.

It's important to note that while social capital and life expectancy are connected, other factors such as income inequality, healthcare quality, and public health policies also play a significant role in determining life expectancy in any city. Boston's specific life expectancy figures can be obtained from public health agencies, and research on social capital's impact on health outcomes can provide more specific insights into the city's context.



## Public Health Challenges in the Greater Boston Area

Massachusetts generally has better public health resources than most states, meaning more attention to these issues, and, in turn, more jobs. Also, while Boston has its share of challenges it's generally better off than the poorer communities such as Chelsea, Brockton, Lawrence. Massachusetts is also an interesting state in that it has very rural areas (e.g., Western Mass) that are often under-resourced and need more attention.

As a major metropolitan area, Boston can expect to face many of the same challenges as other large cities such as New York City. Likewise, the public health challenges in a city like Boston will of course be different from the challenges faced by more rural parts of the country. Below is a look at some of the most pressing public health challenges being faced in the Greater Boston area.

### 1. Hunger

Hunger and food insecurity are among the most common and detrimental public health challenges for large cities, including Boston.

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According to a report conducted by The Greater Boston Food Bank in 2021, hunger and food insecurity cost the state of Massachusetts a total of roughly \$2.4 billion annually, with one out of every 10 households (or roughly 700,000 people) unable to afford enough food. The study also found correlations between food insecurity and other major health issues. These conditions, and their associated costs, include:

- Rheumatology Diseases: \$76.9 million
- Obesity: \$132.7 million
- Mental Health Conditions: \$223.3 million
- Type Two Diabetes: \$251.1 million
- Special Education: \$520.3 million
- Pulmonary Diseases: \$572.6 million
- Poor General Health: \$635.4 million

The report also included a number of recommendations to state and federal policymakers to reduce hunger throughout the state, including:

- Increasing Massachusetts Emergency Food Assistance Program (MEFAP) funding
- Creating a common application for MassHealth and SNAP
- Mandating high-poverty schools serve breakfast after the bell
- Improving access to federal child nutrition assistance programs administered by the state
- Increasing funding for the Special Supplemental Nutrition Program for Women, Infants and Children (WIC) in the state budget

## **2. Homelessness and Addiction**

[In October of 2021, the city of Boston declared homelessness as a public health crisis.](#) The declaration was spurred by a rise in homelessness in the greater Boston area, which has led to the development of tent encampments in some locations.

Because these encampments lack basic infrastructure (such as plumbing and trash disposal), rodent populations in those areas have grown and subsequently led to a rise in rodent-borne diseases such as Leptospirosis.

This declaration was made with the intent to establish a centralized system to process interventions for those who need shelter or addiction services, as well as kick off the process of gradually reducing, and eventually eliminating, these encampments.

## **3. Access to Healthcare**

In 2016, the Boston Public Health Commission (BPHC) conducted a study to assess how accessible healthcare was to residents throughout Boston.

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The report, titled the “Boston Healthcare Access Report (2020),” found that even though the city of Boston has adequate healthcare infrastructure and resources, vulnerable communities still experience barriers to accessing care. This was especially true amongst immigrants and non-English speaking members of the community. Significant gaps in coverage exist especially in areas related to dental care, behavioral health, and substance use.

What this report fails to touch on, however, is that these issues are far more prevalent and devastating to communities outside of the Boston metropolitan area. Access to primary, and especially specialty, care is becoming scarce in rural areas that don’t have resources similar to its city counterparts.

The study does make a total of 19 recommendations for ways to improve access to healthcare throughout the city, but we can also look at these recommendations for smaller communities as well. These are grouped in the following areas:

- Data standardization, collection, and sharing
- Policy and budget advocacy
- Workforce development, recruitment, and retention
- Opportunities to Advance Health Equity / Address Social Determinants of Health
- Capacity Building / Coordinated Response to Emerging Public Health Issues
- Patient Education and Resources
- Immigrant Rights Education for Staff
- Expand HelpSteps
- Health Insurance Outreach Events

## **The Role of Public Health Professionals**

As you can see, the city of Boston has been facing a number of public health challenges even before COVID-19 began stressing our healthcare system. It’s the role of public health professionals—**community health workers, health educators**, public health researchers, policy assistants/associates, etc.—to address these and other public health challenges to enable Boston and its residents to be as healthy as possible.

Boston Public Health Commission Report Highlights Disparities in Life Expectancy Between City Neighborhoods

The Boston Public Health Commission (BPHC) recently announced the release of several issue-based [Health of Boston reports](#). The Health of Boston reports compiled by BPHC examine the city’s health trends and the health status of residents. BPHC utilizes the data and insights gained

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from these reports to inform policy and program interventions to address urgent public health issues and promote greater health equity across our communities.

Among those concerning disparities are life expectancy along neighborhood and census tracts (subdivisions of neighborhoods).

Most notable is the nearly 23-year gap between a census tract in Back Bay where the life expectancy is 91.6 years and a census tract in Roxbury where life expectancy is 68.8 years. While this difference is lower than previous estimates that noted a 33-year disparity between census tracts (2003-2007), these findings indicate that significant challenges remain to advance health equity across the city of Boston.

The persistent health inequities in Boston were also pronounced in premature mortality (death before the age of 65 years). From 2017 to 2021, Black residents in Boston experienced the greatest increase in premature mortality rate (37.3%). Further, in 2021, premature mortality was more than twice as high in Dorchester (293.9) and Roxbury (282.9), neighborhoods with higher concentrations of Black and Latinx residents and lower median income, than it was in Back Bay, Downtown, and Beacon Hill (140.3).

The Health of Boston Reports also highlight persistent health inequity in chronic disease outcomes by race and ethnicity. Boston experienced some positive trends in health over the past several years, but striking disparities remain between demographic groups and neighborhoods.

- From 2015 to 2021, the cancer mortality rate decreased overall and specifically for breast cancer, colorectal cancer, liver cancer, and lung cancer, but the cancer mortality rate was highest among Black males and females. In 2021, the overall cancer mortality rate was highest among Black men (218.9) compared to Latinx men who had the lowest rate (117.9).
- From 2017 to 2021, there were no significant changes in heart disease mortality rates in Boston. However, in 2021, heart disease mortality was 37% higher for Black residents (158.55) compared with White residents (115.6).
- From 2017 to 2021, there were no significant changes in diabetes mortality rates. However, for Black female residents in 2020 and 2021 combined, the age-adjusted diabetes mortality rate per 100,000 was 3.3 times the rate for White female residents (38.1 vs. 11.5). Similarly, the diabetes mortality rate for Black male residents was almost 3 times that of White male residents (58.2 vs. 20.6).
- From 2017 to 2021, the age-adjusted asthma emergency department rate per 10,000 residents decreased by 52.0% overall for Boston residents, but the rate of asthma emergency department visits for Black residents (112.6) and for Latinx residents (55.7) were 9.0 and 4.4 times, respectively, higher than the rate for White residents (12.5).

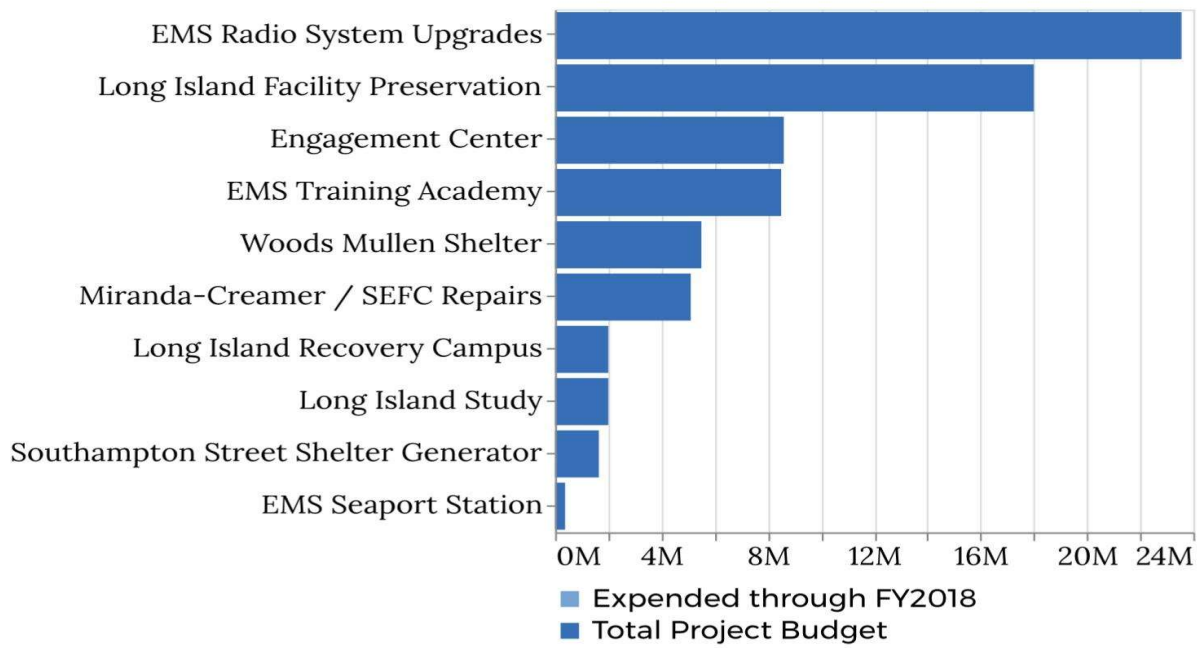


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## CAPITAL PROJECT SPENDING BY DEPARTMENT

SELECT A DEPARTMENT:

Public Health Commission ▼



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## 6. FINANCIAL CAPITAL

### Assets:

#### Net Position – Primary Government (In thousands)

	Governmental Activities	
	Total Primary Government	
	2021	2020 <sup>1</sup>
<b>ASSETS:</b>		
Current assets	\$ 2,455,874	\$ 2,254,988
Capital assets	2,500,911	2,332,075
Other assets	216,534	228,315
<b>Total assets</b>	<b>5,173,319</b>	<b>4,815,378</b>
<b>DEFERRED OUTFLOWS OF RESOURCES:</b>		
<b>Total deferred outflows of resources</b>	<b>560,215</b>	<b>711,559</b>
<b>Liabilities:</b>		
Current liabilities	1,142,531	878,455
Noncurrent liabilities	5,283,856	5,640,215
<b>Total liabilities</b>	<b>6,426,387</b>	<b>6,518,670</b>
<b>DEFERRED INFLOWS OF RESOURCES:</b>		
<b>Total deferred inflows of resources</b>	<b>383,698</b>	<b>169,126</b>
<b>NET POSITION:</b>		
Net investment in capital assets	1,058,576	950,089
Restricted	113,881	72,436
Unrestricted	(2,249,008)	(2,183,384)
<b>Total net position</b>	<b>\$ (1,076,551)</b>	<b>\$ (1,160,859)</b>

It's appropriate to mention the existence of the comprehensive annual financial report, informing any readers who wish to obtain more detailed information. These are just some abstracts.

### Fund Highlights:

Governmental Funds – Fund Balances – as of the close of fiscal year 2021, the City's governmental funds reported a combined ending fund balance of \$1.73 billion, a decrease of \$60.1 million from the prior year. Of this total amount, \$898.2 million represents the unassigned fund balance.

### Governmental Funds:

General Fund – Fund Balance – The General Fund is the chief operating fund of the City. The City's General Fund – Fund Balance Policy states in part to maintain a GAAP unassigned fund

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balance in the General Fund that is 15%, or higher, of GAAP General Fund operating expenditures for the fiscal year. The GAAP unassigned fund balance at the end of fiscal year 2021 was \$898.2 million, which represents approximately 24.2% of GAAP General Fund operating expenditures. The General Fund - fund balance decreased due to a decrease in excise taxes, investment income, fines, licenses and permits and department and other revenue mainly as a result of the impacts of the COVID-19 pandemic.

The City has established the General Fund-Fund Balance Policy to ensure that the City maintains adequate levels of fund balance to mitigate current and future risks (i.e., revenue shortfalls and unanticipated expenditures). The policy in full states that the City shall maintain a GAAP Unassigned Fund Balance in the General Fund that is 15% or higher than the current fiscal year's GAAP General Fund Operating Expenditures.

*Special Revenue Fund – Fund Balance* – The Special Revenue Fund accounts for the proceeds of specific revenue sources that are restricted or committed to expenditures for predefined purposes. The fiscal year 2021 Special Revenue Fund balance is reported at \$314.5 million, a \$17.1 million increase from fiscal year 2020. This increase was mainly driven by the increase in new federal programs related to COVID-19 relief.

*Capital Projects Fund – Fund Balance* – The Capital Projects Fund accounts for financial resources to be used for the acquisition or construction of major capital facilities, other than those financed by proprietary funds and pooled funds. The fiscal year 2021 Capital Projects Fund balance is \$86.4 million, a \$30.3 million decrease from fiscal year 2020.

*Other Governmental Funds – Fund Balance* – Other Governmental Funds account for assets held by the City in certain other governmental funds, as well as the activities related to DSRC and FBDC. The fiscal year 2021 Other Governmental Funds fund balance is \$120.4 million, a \$13.4 million increase from fiscal year 2020.

**Internal Service Fund:**

The City's Internal Service Fund accounts for the City's self-insurance program for health benefits provided by Blue Cross Blue Shield, Allways, and Tufts for City employees and their dependents. The Internal Service Fund is included as part of the governmental activities in the government-wide financial statements.

**Budgetary Highlights:**

General Fund budgetary highlights include ending fiscal year 2021 with a \$15.3 million surplus. There were no material variances between the original budget and final budget amounts. Unfavorable variances from the final budget to actual results occurred in public safety and judgments and claims.

Favorable results were reported for General Fund revenue sources, including \$20.7 million in payments in lieu of taxes, \$13.1 million of state aid, \$9.6 million in departmental and other revenue, \$5.2 million of property tax and \$0.4 million in investment income. Other available funds

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shows a revenue deficit of \$11.0 million, however, this is primarily a result of not transferring other available funds such as \$10.0 million of parking meter funds and \$1.0 million of cemetery Funds from the general fund.

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