Anchored in Excellence

How Massachusetts' Education and Healthcare Institutions Drive Regional Economic Growth

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Greater Boston Chamber of Commerce

ESI ECONSULT SOLUTIONS INC.
economics | strategy | insight

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How Massachusetts' Education and Healthcare Institutions Drive Regional Economic Growth

The Greater Boston Chamber of Commerce commissioned this report to better understand the role of hospitals and universities as key anchors of the Massachusetts economy today. Massachusetts has established itself as a global leader in research, innovation, patient care, and higher education. This study quantifies how the state's health care and educational institutions – its Eds and Meds – contribute to local and national economic vitality, regional and global competitiveness, and strengthens the quality of life for all Massachusetts residents. While many institutions in the Commonwealth regularly undertake their own individual analyses, we believe this is the first comprehensive analysis of the economic impact of the Commonwealth's health care and educational institutions.

A robust economic analysis was made possible by several partners, including the Association of Independent Colleges and Universities in Massachusetts (AICUM), the Massachusetts Health & Hospital Association (MHA), and the Massachusetts League of Community Health Centers (Mass League), who generously shared the most recent anonymized data available on their operations and the populations that they serve. In total, 88 universities and colleges, and 93 health systems, were included, including major research universities such as Harvard University, MIT, Boston University, and the University of Massachusetts system, alongside specialized institutions, liberal arts colleges, and community hospitals that serve local populations.

The customized economic impact model presented here uses IMPLAN software's input/output modeling system, which is based on the U.S. Bureau of Economic Analysis's (BEA) Benchmark Input-Output (I-O) Accounts. The model examines three categories of institutional spending: (1) direct annual operating expenditures including procurement and employee wages, (2) capital investments including new construction and major renovations, and (3) ancillary spending by students, patients, and visitors. These spending categories are employed to assess the cumulative impact of healthcare and educational institutions on the Boston and Massachusetts economy, jobs and local industry employment, as well as the state and federal tax base. Further, the analysis quantifies the value of a higher education degree from Massachusetts institutions to the local economy, the economic impact of recent federal policy changes to Medicaid and research funding, and the broader social and cultural impacts from the state's robust health care and educational ecosystem.

The report finds that the Commonwealth's Eds and Meds produce $155.9 billion in annual economic output, support more than 858,000 jobs, and contribute nearly $4.1 billion in annual tax revenue to the state. The economic contributions are geographically distributed throughout the state and the nation, and the benefits shared across industries far beyond health care and education, including more than 222,000 jobs in real estate, retail and wholesale trade, finance and insurance, and accommodations and food service. This report was commissioned at a critical time when the economic contributions of hospitals and universities – and the innovation economy they foster – are at risk due to changes in federal policy, which are projected to affect $5.9 billion in economic output in the state, and $515 million in state and federal tax revenue. Massachusetts universities and colleges, and teaching hospitals and academic centers, help train and produce tomorrow's workforce and graduates enjoy a significant wage premium of 15 to 50 percent more in annual income than non-graduates.

Collectively, the collaboration fostered between industry, academic institutions, and government, has produced a thriving Massachusetts economy that cultivates an exceptional talent pipeline and serves as an innovation hub where outstanding science, groundbreaking discoveries, and visionary leadership drive the creation of novel treatments, medical devices, and scientific breakthroughs that enhance patient health and quality of life throughout Massachusetts and globally. These educational and healthcare institutions serve as anchors for economic development, attracting businesses and talent while fostering an environment that supports entrepreneurship and technological advancement. This report provides a critical foundation to understanding the full economic value that educational and healthcare institutions provide to Massachusetts, as well as the national and global economy.

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Massachusetts Eds and Meds:

Economic Powerhouse

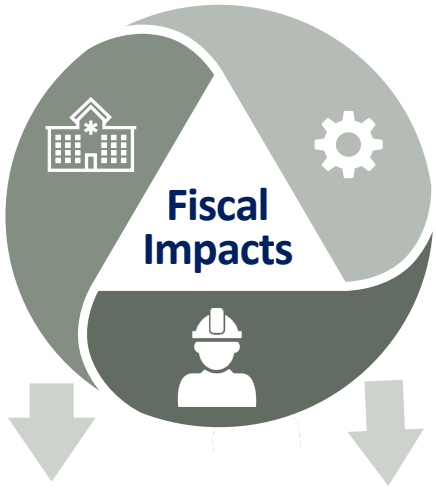
Massachusetts' higher education and healthcare institutions generate massive annual economic impacts that ripple from local communities through the national economy.

Boston: $69.5 billion in economic impact, supporting 353,440 FTE jobs with $35.0 billion in employee compensation

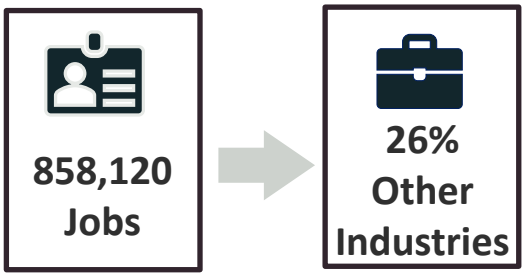
Greater Boston Region: $118.3 billion in economic impact, supporting 625,580 FTE jobs with $56.0 billion in employee compensation

Commonwealth of Massachusetts: $155.9 billion in economic impact, supporting 858,120 FTE jobs with $71.1 billion in employee compensation

United States: $179.5 billion in economic impact, supporting 944,440 FTE jobs with $77.6 billion in employee compensation



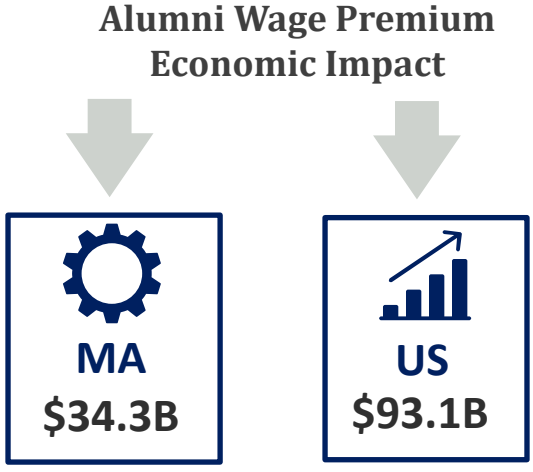
Massachusetts Eds and Meds support 858,120 total jobs, of which 222,900—or 26 percent—are in industries beyond health care and education, such as real estate, accommodation and food services, and retail.



Alumni Wage Premium: Lifetime Economic Driver

Massachusetts university graduates earn significantly more than they would without their degrees, creating sustained economic benefits:

Individual Annual Wage Premiums in Massachusetts:
Associate's: +$6,510 per year, per alumnus
Bachelor's: +$27,614 per year, per alumnus
Advanced: +$21,555 per year, per alumnus



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Proposed Federal Funding Cuts as Economic Threat

Combined Medicaid and NIH Funding Cuts in Massachusetts leads to:

Massachusetts:

$5.9B in lost economic output

$142M in lost state tax revenue

United States:

$6.8B in lost economic output

$373M in lost federal tax revenue

Innovation and Competitiveness Leadership

#1

NIH Funding per Capita

$5.2B in 2023

15.5

Patents per 10,000 Residents

Highest in the nation

$7.8B

Life Sciences Venture Capital

In 2024

62M SF Lab Space

Largest concentration in the nation

1,700+

Life Sciences Companies

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Letter from the CEO

At the Chamber, we participate in many discussions about the Massachusetts economy. Such conversations are incomplete without acknowledging the role the so-called “Eds & Meds” have played in our economic success for generations. Many of us boast that Massachusetts is a leader in health care and higher education, and there is plenty of evidence to support that assertion. We host the best hospitals and research institutions in the world.[1] Massachusetts has the highest percentage of bachelor’s, graduate or professional degree holders of all states, and is home to the top universities in the country.[2] Massachusetts develops cures for the sick, new waves of technological advances, and new generations of talent for the global workforce.

Beyond the care and education each hospital, college, university, and community health center provides is a vital economic engine to our cities and towns, the Commonwealth as a whole, and our nation. These institutions form the foundation of our state economy, providing jobs for residents, economic activity for our businesses, and tax revenue for the state.

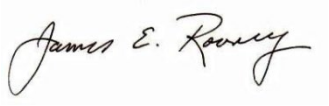
Our higher education and health care systems have been facing the headwinds of increasing costs and changing demographics for the past decade or more. But as we confront unpredictable changes to federal and state policy, and escalating rhetoric directed at hospitals and universities, we risk taking for granted how fortunate the Commonwealth is for hosting a diverse array of community colleges, public and private universities, and local, regional, and large hospitals. In this context, we decided to dig deeper to analyze their true impact on the economy.

Each of these institutions alone brings enormous worth to the Commonwealth, and many track and report their own data on their significant contributions to their local community and to the economy. What is missing, however, is a proper analysis of their aggregate impact across the state.

To analyze the economic impact of our hospital and higher education institutions, the Greater Boston Chamber of Commerce commissioned this report to provide a holistic economic analysis in Boston, the Greater Boston region, and across Massachusetts.

The results reinforce the claim that our health care and higher education systems, our “Eds & Meds,” provide the foundation of the state’s economy. With $155.9 billion in annual economic contributions and more than 858,000 jobs supported, over 1 in 5 people working in Massachusetts are directly or indirectly tied to these institutions.

The massive economic impacts of the industries and employers analyzed in this report are just one way they contribute to the Commonwealth. There are numerous other economic and social contributions not addressed in this report, whether driving the creation of our dynamic life sciences ecosystem, advancing science and technology across the world, or the simple civic services they provide to their local municipality. With this report, we hope we can restart the conversation about the total value our “Eds & Meds” provide to our communities, our cities, and that we can partner with our state and elected and appointed government officials to embrace a public policy agenda that protects these critical industries.



James E. Rooney
President and CEO

[1] Kayser, Alexis. “World’s Best Hospitals 2025.” Newsweek, 26 Feb. 2025, https://rankings.newsweek.com/worlds-best-hospitals-2025.
[2] McCann, Adam. “Most & Least Educated States in America (2025).” WalletHub. 10 Feb. 2025, https://wallethub.com/edu/e/most-educated-states/31075. Whitford, Emma and Janet Novack. “America’s Top Colleges.” 26 Aug. 2025, https://www.forbes.com/top-colleges/.

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1. Introduction

1.1. Purpose of Report

The Greater Boston Chamber of Commerce commissioned this comprehensive economic impact analysis to better understand the role of hospitals and universities as key anchors of the Massachusetts economy. This study quantifies how these institutions—commonly referred to as "Eds and Meds"—sustain the Commonwealth's economic vitality, foster regional and global competitiveness, and strengthen the quality of life for all Massachusetts residents through job creation, industry growth, economic output, and contributions to the tax base.

Massachusetts has established itself as a global leader in research, innovation, patient care, and higher education. The Commonwealth ranks second nationally in overall National Institutes of Health funding and first per capita[1], with Boston leading all American cities in federal research investment.[2] Boston and the surrounding Cambridge area form the world's largest life sciences cluster, with over 1,200 biotechnology companies operating in the region, including industry giants like Moderna, Biogen, and Vertex Pharmaceuticals. Massachusetts-based biopharma companies raised $18.2 billion in venture capital in 2023, representing almost a quarter of all life science venture capital funding in the United States.[3] This concentration of world-class educational and healthcare institutions creates a unique ecosystem that attracts talent, investment, and opportunity from around the world, representing a significant competitive advantage for Massachusetts.

The analysis examines the economic impact of higher education and hospital institutions throughout the Commonwealth of Massachusetts on local, regional, state, and national economies. These institutions generate economic value through four distinct channels: their annual operations, including procurement and employee wages; capital investments in new construction and major renovation projects; ancillary spending by students, patients, and visitors; and the alumni wage premium, defined as the additional earnings that university graduates make compared to individuals without a college degree or certification. Massachusetts Eds and Meds serve as anchor institutions that attract businesses and talent while fostering an environment that supports entrepreneurship and technological advancement. The presence of these institutions signals to businesses and entrepreneurs that Massachusetts offers the intellectual capital and infrastructure necessary for success in the global knowledge economy.

Amid evolving federal policy landscapes, it is important to understand the strengths of the Massachusetts economy. Quantifying the full economic impact of Massachusetts' education and healthcare institutions reveals not just the direct economic contributions of these sectors, but also their role in fostering innovation, attracting and retaining talent and enhancing quality of life throughout the

[1] "Which states get the most federal health and science funding." Axios, 29 Jan. 2025, www.axios.com/2025/01/29/federal-health-science-funding-states-map.
[2] "Healthcare and Life Sciences." City of Boston, www.boston.gov/government/cabinets/economic-opportunity-and-inclusion/healthcare-and-life-sciences. Accessed 4 Aug. 2025.
[3] "Top US Life Science Hubs. Where Should You Expand?" Foothold America, www.footholdamerica.com/blog/from-boston-to-san-diego-where-should-your-life-science-company-expand-in-the-us.

Commonwealth. This analysis provides a comprehensive foundation for understanding the full economic value that educational and healthcare institutions provide to Massachusetts, documenting their contributions with robust quantitative data that establishes their importance as drivers of the Commonwealth's economic prosperity.

1.2. Participating Institutions

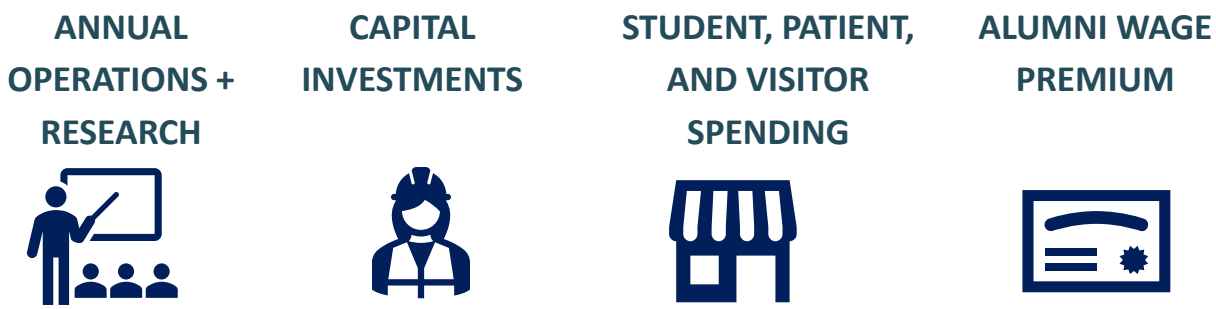
This comprehensive study encompasses the full spectrum of Massachusetts' higher education and healthcare institutions, including public and private universities, community colleges, teaching hospitals, and health systems throughout the Commonwealth. The analysis includes major research universities such as Harvard University, MIT, Boston University, and the University of Massachusetts system, alongside specialized institutions, liberal arts colleges, and community hospitals that serve local populations.

The institutions are distributed across the Commonwealth, from the concentration of world-renowned institutions in the Greater Boston area to the regional universities and community colleges that serve Western and Central Massachusetts. This geographic distribution ensures that the economic impact analysis captures the full breadth of institutional activity across urban, suburban, and rural communities. A full list of participating universities and hospitals can be found in Appendices A (universities and hospitals) and B (Massachusetts Health Center Program participants).

1.3. Drivers of Local Economic Impacts

As anchor institutions that attract people and resources from all over the world, Massachusetts universities and hospitals ("Eds and Meds") play a crucial role in the regional economy. Economic contributions can be broken into four distinct categories:

1. **Annual operations**, which include procurement and employee wages, as well as **research** and innovation expenditures;
2. **Capital investments**, including new construction and major renovation projects;
3. **Ancillary spending** by students, patients, and visitors; and
4. The **wage premium** enjoyed by Commonwealth alumni, who pay taxes and spend a portion of their added earnings in the economy



1.4. Methodology and Data Sources

Econsult Solutions, Inc. (ESI) employed industry-standard economic modeling techniques to estimate the direct economic activity generated by Massachusetts universities and hospitals; and to translate that activity into total economic output, employment, and earnings, as well as tax revenue impact. Economic impacts were quantified in the aggregate. The analysis addresses four distinct geographic levels:

- the City of Boston;
- the Greater Boston Region encompassing Essex, Middlesex, Norfolk, Plymouth, and Suffolk Counties;
- the Commonwealth of Massachusetts; and
- the United States.

This multi-level approach enables stakeholders to understand how institutional activity ripples through different economic geographies.

This study aims to quantify the aggregate economic impact of Massachusetts' educational institutions and healthcare organizations through a comprehensive methodology that prioritizes accuracy while maintaining conservative assumptions. Rather than conducting individual impact calculations for each institution and summing the results, this analysis employs a harmonized approach that integrates existing economic impact studies with supplementary research to develop reliable estimates of collective contributions.

The data collection process involved multiple complementary strategies: gathering existing economic impact studies commissioned by participating institutions and associations, reviewing annual reports and audited financial statements, and collecting publicly available institutional data including employment figures, operating budgets, student enrollment numbers, patient volumes, and research expenditures. For institutions with operations spanning multiple geographic regions, spending was allocated to the location of the primary campus or main hospital facility to ensure accurate regional impact attribution.

To maintain methodological rigor and comparability across time periods, all financial data were standardized to 2025 dollars using appropriate inflation adjustments based on source year (i.e., FY2023 financials were inflated to current terms). Throughout the analysis, conservative assumptions were deliberately employed to avoid overstating economic impacts, with all methodological choices and assumptions clearly documented and explained. This approach ensures that the resulting aggregate figures represent a defensible lower bound of the true economic contribution of Massachusetts' education and healthcare sectors.

Select institutions provided data inputs on institutional activity, which were verified and supplemented with other public data sources. Therefore, the analysis should be understood to represent the current annualized level of activity for the member institutions, rather than representing the impact for any specific fiscal year. For universities, capital spending was estimated based upon the operational budget and enrollment figures. For hospitals, capital spending—as well as other figures such as operational expenditures, discharges, emergency room visits, and outpatient expenditures—were provided by the Massachusetts Health & Hospital Association (MHA).

Economic impacts are the sum of direct activity attributable to Massachusetts Eds and Meds institutions (either direct spending by institutions on operations and capital activity or spending drawn into the area by students, patients, and visitors, and the spillover impacts of that direct activity). Within an interconnected economy, each dollar of direct expenditures generates multiple waves of spillover impacts through spending on goods and services purchased within a given region ("indirect impacts") as well as spending resulting from the labor income generated by the initial activity that ripples through the region ("induced impacts") (Figure 1.1). Together, these three layers of impact create a multiplier effect that amplifies these institutions' economic contributions throughout Boston, the Greater Boston Region, Massachusetts, and the United States. ESI used IMPLAN modeling software to estimate indirect and induced impacts and sum them with the direct activity to produce total economic impact. IMPLAN also estimates the number of jobs that are supported by the spillover impacts (indirect and induced impacts). For ease of comprehension, ESI converted these jobs into Full-Time Equivalent (FTE) jobs for reporting purposes. Throughout the study, fiscal revenues are recorded separately, following each economic impact category.

IMPLAN is a sophisticated economic modeling system that analyzes how money flows through an economy. At its core, IMPLAN tracks how money moves between different sectors of the economy, like a giant spreadsheet showing all the economic relationships. When one industry spends money, IMPLAN tracks that spending ripple out to affect other industries. IMPLAN breaks this spending movement down into 528 different industry sectors based on NAICS (North American Industry Classification System) codes. For each sector, it calculates the regional purchase coefficient (RPC), which measures the proportion of local demand for a good or service that is met by local suppliers.

When modeling the Massachusetts Eds and Meds' impacts, IMPLAN takes direct spending data and:

1. Maps it to the appropriate industry sectors;
2. Applies the local RPCs to determine how much spending stays in the region;
3. Uses its matrix of industry relationships to calculate the indirect impacts as that spending ripples through local supply chains;
4. Calculates induced impacts as employees spend their wages locally; and
5. Aggregates all these effects to show total impact on output, employment, and labor income.

IMPLAN incorporates leakage, which is the flow of money leaving a local economy through imports or taxes, to provide a realistic analysis of economic impacts within a specific area. Its advanced modeling capabilities make it a trusted tool for economic impact analysis, widely used by governments, universities, and consulting firms to assess how changes in one sector influence the broader economic system. This reliability has established IMPLAN as a standard in the field.

Figure 1.1: Economic Impact Methodology

Source: Econsult Solutions, Inc. (2025)

1.5. Report Organization

- **Section 2** quantifies the economic impact of the Massachusetts universities and hospitals' consolidated annual operations, which encompass significant direct employment and spending on various goods and services. This spending ripples through the city, regional, state, and national economies, amplifying its impact.
- **Section 3** quantifies their capital expenditures and translates that footprint into economic impact.
- **Section 4** estimates the ancillary spending by Massachusetts universities and hospitals students, patients, and visitors, including those who visit the region due to Athletics programming and events, as well as health system patients and their visitors. Their commensurate effect on local economic output, employment supported, and tax revenue generated are analyzed.
- **Section 5** dives into the impact of recent and proposed federal policy changes on these institutions' contributions to the region as a research and innovation hub—attracting human capital, new businesses, and investors to the area.
- **Section 6** estimates the aggregate wage premium enjoyed by Massachusetts university alumni living and working in the city, region, state, and country—and the positive impact of a portion of that additional household earnings being spent in the regional economy.

- **Section 7** discusses the broader qualitative impacts that enhance the communities in which these institutions are located.
- **Section 8** contains aggregate economic and fiscal impact tables for the City of Boston; Greater Boston Region; the Commonwealth of Massachusetts; and the United States. Economic impacts from 37 Massachusetts Health Center Program participant organizations are incorporated in the aggregate analysis.

2. Economic Impact from Annual Operations

2.1. Section Overview

Massachusetts universities and hospitals (MA Eds and Meds) are major economic engines for Massachusetts in their capacity as employers and purchasers of goods and services. These institutions directly employ hundreds of thousands of people across the Commonwealth, from faculty and researchers to healthcare professionals, administrative staff, and support personnel. This direct, local economic activity has several spillover effects on the broader Massachusetts economy, further supporting regional employment and tax revenue. This section uses annual operating expenditures across the 88 universities and 93 health systems.

It is estimated that direct and spillover impacts from the MA Eds and Meds support $130.4 billion in annual economic impact in Massachusetts, supporting 705,000 FTE jobs with $63 billion in employee compensation.

2.2. Aggregate Direct Operating Footprint

Direct operations at each geographic level have spillover effects that increase economic activity and sustain employment across a variety of industries. Total economic impact constitutes the direct expenditures made by MA Eds and Meds institutions, the indirect impacts from institutional purchases of goods and services from vendors in each region, and the induced expenditures from employees redistributing their income as household spending.

To determine the magnitude of the direct, indirect, and induced impact within these economies, it is necessary to first understand the level and composition of annual expenditures within each of these geographies—as economic impact depends largely on where expenditures occur. Boston-based Eds and Meds have estimated operating expenditures of more than $43 billion in the city. In the Greater Boston Region, they reach more than $68 billion; and in aggregate, the MA Eds and Meds institutions' annual operating expenditures are estimated to be more than $86 billion (Figures 2.1 and 2.2).

Figure 2.1: MA Eds and Meds Annual Operating Expenditures by Region – Carving Out the Previous Region ($B)

Institution	Boston	Greater Boston Region (minus Boston)	Massachusetts (minus Greater Boston)	Total
Universities	$19.2	$14.0	$6.9	$40.2
Hospitals	$24.4	$10.4	$11.1	$45.9
Grand Total	**$43.6**	**$24.4**	**$18.0**	**$86.1**

Source: Econsult Solutions, Inc. (2025); MHA (2025); MA Eds and Meds (2025); Various online public sources (2025)

Figure 2.2: MA Eds and Meds Annual Operating Expenditures by Region – Cumulative Total ($B)

Institution	Boston	Greater Boston Region	Massachusetts
Universities	$19.2	$33.3	$40.2
Hospitals	$24.4	$34.8	$45.9
Grand Total	**$43.6**	**$68.0**	**$86.1**

Source: Econsult Solutions, Inc. (2025); MHA (2025); MA Eds and Meds (2025); Various online public sources (2025)

2.3. Aggregate Economic Impact

Direct operational spending impacts the regional economy, supporting local businesses and higher employment across various industries. The total economic impact is the sum of direct expenditures made by the MA Eds and Meds institutions, the indirect impacts generated from spending with a variety of local suppliers, and the induced impacts resulting from the institutions' employees spending wages within their local communities. Indirect and induced impacts grow with each geographic level, due to more purchasing and recirculation occurring within the larger geography as well as a larger multiplier effect.

Including these spillover impacts, operational activities have an economic impact of (Figure 2.3):

- $60.7 billion within the City of Boston economy each year, supporting over 310,000 FTE jobs with $31.7 billion in employee compensation.
- $100.2 billion within the Greater Boston Region each year, supporting over 523,000 FTE jobs with $50.4 billion in employee compensation.
- $130.4 billion within the Commonwealth of Massachusetts each year, supporting over 705,000 FTE jobs with $63.1 billion in employee compensation.
- $149.7 billion within the United States economy each year, supporting 776,000 FTE jobs with $68.1 billion in employee compensation.

Figure 2.3: Economic Impact from MA Eds and Meds Annual Operating Expenditures, Cumulative Total by Region ($B)[4,5]

Impact	Boston City	Greater Boston Region	Massachusetts	United States
Total Economic Impact ($B)	**$60.7**	**$100.2**	**$130.4**	**$149.7**
Universities				
Direct Output ($B)	$19.2	$33.3	$40.2	$40.2
Indirect and Induced Output ($B)	$5.6	$12.8	$17.2	$25.4
Total Output ($B)	**$24.9**	**$46.1**	**$57.4**	**$65.7**
Total Employment (FTE)	179,000	314,000	407,000	436,000
Employee Compensation ($B)	$14.3	$25.5	$30.7	$32.7
Hospitals				
Direct Output ($B)	$24.4	$34.8	$45.9	$45.9
Indirect and Induced Output ($B)	$11.4	$19.3	$27.0	$38.2
Total Output ($M)	**$35.8**	**$54.1**	**$72.9**	**$84.0**
Total Employment (FTE)	131,000	209,000	298,000	340,000
Employee Compensation ($B)	$17.3	$24.9	$32.4	$35.4

Source: Econsult Solutions, Inc. (2025); IMPLAN (2023)

2.4. Industry Distribution of Economic Impact from Annual Operations

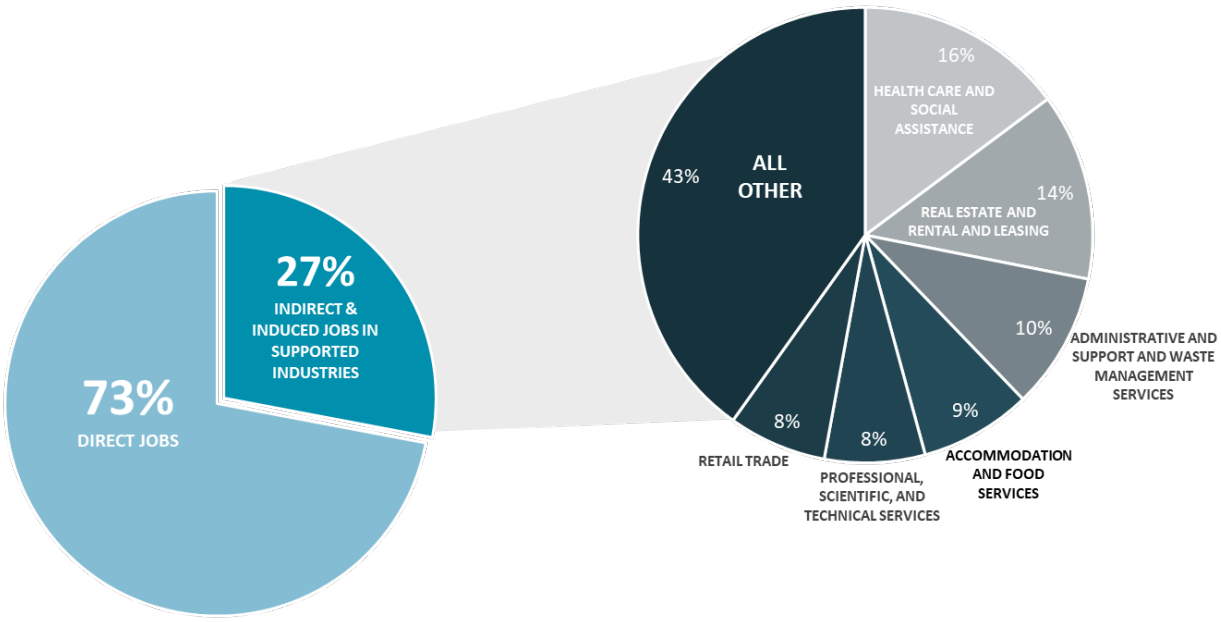
While MA Eds and Meds directly employ hundreds of thousands of people, their economic reach extends far beyond their own campuses and facilities. Through purchasing goods and services from local vendors and the subsequent spending by their employees, these institutions create a ripple effect that supports employment across diverse sectors of the Massachusetts economy.

Of the 705,000 FTE jobs supported by MA Eds and Meds operations in Massachusetts, more than 190,300—or 27 percent—are generated through indirect and induced economic activity in industries outside of higher education and hospital institutions. The spillover employment is concentrated in several key sectors: Health Care and Social Assistance (16 percent), Real Estate and Rental and Leasing (14 percent), Administrative and Support and Waste Management Services (10 percent), Accommodation and Food Services (9 percent), Professional, Scientific, and Technical Services (8 percent), and Retail Trade (8 percent) (Figure 2.4).

[4] Economic impact figures focus on geographies that are concentric circles—as one goes from smaller geographies to larger geographies (i.e., the difference between Greater Boston and Boston is the impact in the parts of Greater Boston outside of Boston)—whereas tax revenue impact is to separate government entities (Commonwealth of MA and US federal government are different entities; and therefore those numbers do not overlap.

[5] Sums may not total due to rounding.

Figure 2.4: Industry Distribution of Statewide Employment Impact from MA Eds and Meds Operations



Source: Econsult Solutions, Inc. (2025); IMPLAN (2023)

2.5. Aggregate Tax Revenue Impact from Annual Operations

Although most MA Eds and Meds institutions are nonprofit institutions, their direct operations generate substantial tax revenues to the Commonwealth of Massachusetts and to the federal government. These institutions increase their subsequent tax bases directly by employing staff that generate taxable income, and indirectly via spending by vendors and employees in the private economy. It is estimated that economic impacts from the MA Eds and Meds institutions generate (Figure 2.5):

- $3.6 billion in tax revenue for the Commonwealth of Massachusetts annually; and
- $6.2 billion in tax revenue for the United States federal government each year.

Figure 2.5: Estimated Annual Tax Revenue Impact from MA Eds and Meds Operations in the City of Boston, Commonwealth of Massachusetts, and the United States Governments ($B)

Impact	Commonwealth of Massachusetts	Federal
Total Tax Revenue Impact ($B)	**$3.6**	**$6.2**
Universities		
Income Tax	$1.0	$2.5
Sales Tax[6]	$0.5	$0.1
Business Tax	$0.2	$0.5
Total ($B)	**$1.7**	**$3.0**
Hospitals		
Income Tax	$1.1	$2.6
Sales Tax	$0.5	$0.1
Business Tax	$0.2	$0.5
Total ($B)	**$1.8**	**$3.2**

Source: Econsult Solutions, Inc. (2025); IMPLAN (2023)

[6] Sales taxes at the Federal level refers to excise taxes and custom duties.

3. Economic Impact from Capital Investments

3.1. Section Overview

In addition to their annual operations, Massachusetts universities and hospitals (MA Eds and Meds) contribute significantly to the Commonwealth's economy through substantial capital investments in infrastructure and facilities. This section quantifies the aggregate capital investment footprint of these institutions and translates it into measurable economic impact across multiple geographic levels—local, regional, state, and national—using industry-standard input-output modeling techniques.

Capital investment data was systematically collected from multiple sources to ensure comprehensive coverage of the sector's infrastructure spending. For hospitals, detailed capital expenditure information was obtained through the Massachusetts Health & Hospital Association (MHA). For universities, capital investment figures were sourced from existing economic impact studies and institutional financial reports. Where gaps existed, publicly available data including audited financial statements and capital project announcements were utilized to develop reliable estimates.

The analysis employs IMPLAN economic modeling software to capture both the direct effects of capital spending and the broader ripple effects that flow through supply chains and local economies. These investments support not only construction and related industries but also generate sustained economic activity as projects create lasting infrastructure that enhances institutional capacity and regional competitiveness.

Beyond quantifying economic output and employment impacts, this section also examines the tax revenue implications of capital investments, detailing how these expenditures contribute to state and federal tax bases through direct project spending, vendor payments, and the induced economic activity generated by worker compensation and business-to-business transactions.

In aggregate, Massachusetts universities and hospitals generate more than $7.5 billion in annual economic impact in Massachusetts, supporting almost 36,000 FTE jobs with $3.1 billion in employee compensation.

3.2. Aggregate Direct Capital Investments

Capital investments made by the MA Eds and Meds have significant economic and fiscal impacts at the local, regional, state, and national levels. The institutions' aggregate annualized capital spending is approximately $4.8 billion (in 2025-dollar terms) within Massachusetts. These project costs include new construction, renovations, state-of-good-repair expenses, and the purchase and procurement of materials and services. These expenditures reach a wide range of manufacturers and professional service providers in addition to construction companies within the Commonwealth.

Data and Methodology

To estimate the aggregate annual capital investments for the MA Eds and Meds, ESI used a combination of data from previous economic impact studies, institutions' financial statements, and information directly provided by institutions.

- **Previous economic impact studies:** Direct capital investments for 59 AICUM member institutions for FY2022 were utilized from a past economic impact study; and then the capital investments were inflation-adjusted to 2025-dollar terms.[7]
- **Institutions' financial statements**: For the remaining universities included in the study, annual capital investments for each institution were obtained from each university's financial statement, which records "construction in progress" for each fiscal year. The construction in progress line item presents net new capital investments made by each of the institutions. The value of capital investments from the financial statements were inflation-adjusted to 2025-dollar terms.[8]
- **Data from institutions:** Massachusetts Health and Hospital Association (MHA) provided capital investments for 89 acute and post-acute hospitals as of FY2023. These values were inflation-adjusted to 2025-dollar terms.[9,10]

Following industry-standard estimates, the aggregate capital spending for the MA Eds and Meds was disaggregated into two primary components: hard construction costs, representing 80 percent of total expenditures; and soft costs, accounting for the remaining 20 percent.[11] Hard costs refer to costs associated with the physical construction of a project, including materials, labor, and equipment. Soft costs are those associated with a project that are not directly tied to physical construction, including fees for services, permits, and administrative costs.

This breakdown enables more precise economic impact modeling by distinguishing between direct construction activities and associated professional services. These cost categories were also aggregated by the geographies included in this analysis. The geography for direct capital investment was determined based upon the location of the institution's main campus.

Annually, and in aggregate, there are $2.1 billion in direct, net new capital investments within Boston; $4 billion within the Greater Boston Region (including the City of Boston); and $4.8 billion within all of Massachusetts (Figure 3.1).

[7] "Economic Impact of AICU Mass", Econsult Solutions, Inc., https://econsultsolutions.com/economic-impact-of-aicu-mass/.
[8] For some universities, their financial statements were not available. The value of capital investments was determined based on universities of similar operating and enrollment size.
[9] It is worth noting that for some hospitals, the capital investment was reported as zero as of FY2023.
[10] Of 93 health systems included in the study, 4 small hospitals' data was not available.
[11] Construction hard costs are expenses for tangible, physical elements of the building, like materials, labor, and equipment; while soft costs are intangible, non-construction expenses such as architectural fees, legal and financing costs, permits, and insurance necessary for project completion but not directly tied to the physical construction itself.

Figure 3.1: Aggregate Capital Investments, by Geography of Interest – Cumulative Total, FY2025 ($B)

Institution	Category	Boston	Greater Boston Region[12]	Massachusetts[13]
Universities	Hard Costs	$0.5	$1.7	$2.2
	Soft Costs	$0.1	$0.4	$0.5
	Total Universities	***$0.7***	***$2.2***	***$2.7***
Hospitals	Hard Costs	$1.1	$1.5	$1.7
	Soft Costs	$0.3	$0.4	$0.4
	Total Hospitals	***$1.4***	***$1.9***	***$2.1***
	Net Total Investments	**$2.1**	**$4.0**	**$4.8**

Source: Econsult Solutions, Inc. (2025); Massachusetts Health and Hospital Association (2025)

3.3. Aggregate Economic Impact from Capital Investments

Figure 3.2 demonstrates the annualized aggregate economic impact from capital investments carried out by all universities and hospitals in Massachusetts:

- In Boston, the institutions' capital investments generate more than $2.7 billion in economic impact, supporting 11,300 FTE jobs with almost $1 billion in employee compensation.
- In the Greater Boston Region, the institutions' capital investments generate $6.1 billion in economic impact, supporting 27,800 FTE jobs with almost $3 billion in employee compensation.
- In Massachusetts, the institutions' capital investments generate almost $7.5 billion in economic impact, supporting 35,900 FTE jobs with almost $3 billion in employee compensation.
- At the national level, the institutions' capital investments generate $9.3 billion in economic impact, supporting 41,500 FTE jobs with almost $4 billion in employee compensation.

Although the analysis captures direct capital investments exclusively within Massachusetts, the total economic impact grows substantially when expanding the geographic scope to the national level. This increase reflects the broader supply chain networks and economic multiplier effects that extend beyond state borders as Massachusetts-based spending generates economic activity throughout the United States.

[12] Greater Boston Region includes investments at the Boston City level.
[13] Massachusetts includes investments at the Greater Boston Region level and investments outside of the Region within the rest of Massachusetts.

Figure 3.2: Annual Economic Impact from Massachusetts Universities and Hospitals Capital Investments, Cumulative Total by Geography

Impact	Boston	Greater Boston Region	Massachusetts	United States
Total Economic Impact ($B)	**$2.7**	**$6.1**	**$7.5**	**$9.3**
Universities				
Direct Output ($B)	$0.7	$2.2	$2.7	$2.7
Indirect and Induced Output ($B)	$0.2	$1.2	$1.6	$2.6
Total Output Universities ($B)	**$0.9**	**$3.3**	**$4.3**	**$5.3**
Total Employment (FTE)	3,700	15,500	20,900	24,300
Employee Compensation ($B)	$0.4	$1.4	$1.7	$1.9
Hospitals				
Direct Output ($B)	$1.4	$1.9	$2.1	$2.1
Indirect and Induced Output ($B)	$0.4	$0.9	$1.2	$1.9
Total Output Hospitals ($B)	**$1.8**	**$2.8**	**$3.3**	**$4.0**
Total Employment (FTE)	7,600	12,300	15,000	17,200
Employee Compensation ($B)	$0.9	$1.2	$1.4	$1.5

Source: IMPLAN (2023); Econsult Solutions, Inc. (2025)

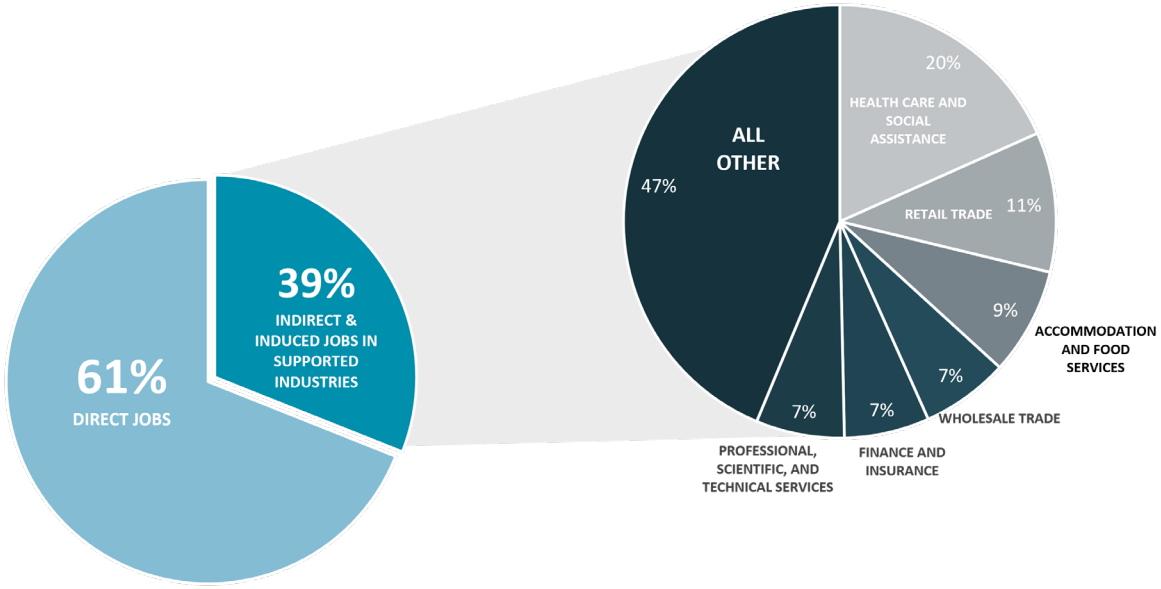
3.4. Industry Distribution of Economic Impact from Capital Investments

The economic impact of MA Eds and Meds' capital spending extends far beyond the construction sector. As dollars flow through the economy—from construction contracts to vendor purchases to workers' paychecks—they generate employment across diverse industries. The aggregate annual capital spending on institutional infrastructure and facilities supports almost 36,000 FTE jobs within Massachusetts each year, with approximately 14,000 of these positions created through indirect and induced economic activity in sectors outside of universities and hospitals.

These spillover jobs are distributed across multiple industries: Health Care and Social Assistance (20 percent); Retail Trade (11 percent); Finance and Insurance (7 percent); Accommodation and Food Services (7 percent); Professional, Technical, and Scientific Services (7 percent); and Wholesale Trade (7 percent) (Figure 3.3).

This demonstrates how institutional capital spending serves as a powerful economic catalyst. Through direct construction activities, vendor relationships, and supply chain linkages, these expenditures create a multiplier effect that supports thousands of jobs across the Commonwealth—from construction and engineering firms to equipment manufacturers, professional service providers, and materials suppliers. Capital investments by Massachusetts universities and hospitals thus generate substantial cross-sector economic impacts that reach well beyond their core healthcare and education missions.

Figure 3.3: Industry Distribution of Employment Generated by Massachusetts Eds and Meds' Annualized Capital Investments, in Massachusetts



Source: Econsult Solutions, Inc. (2025); IMPLAN (2023)

3.5. Aggregate Tax Revenue Impact from Capital Investments

Capital spending by Massachusetts universities and hospitals generates significant tax revenues for the Commonwealth of Massachusetts and the federal government. These investments expand both state and federal tax bases through two primary mechanisms: directly by creating employment that generates taxable income, and indirectly through the economic activity created when vendors and employees spend their earnings throughout the broader economy.

It is estimated that the MA Eds and Meds capital investments generate $190 million of tax revenue in Massachusetts; and $448 million in federal tax revenues (Figure 3.4).

Figure 3.4: Estimated Annual Tax Revenue Impact from Aggregate Massachusetts Institutions' Annual Capital Investments ($M)

Impact	Commonwealth of Massachusetts	Federal
Total Tax Revenue Impact	**$190**	**$448**
Universities		
Income Tax	$56	$227
Sales Tax[14]	$34	$4
Business Tax	$15	$35
Total Universities' Impact	**$104**	**$266**
Hospitals		
Income Tax	$45	$149
Sales Tax	$28	$3
Business Tax	$12	$30
Total Hospitals' Impact	**$86**	**$181**

Source: Econsult Solutions, Inc. (2025); IMPLAN (2023); Commonwealth of Massachusetts (2025)

[14] Sales taxes at the federal level refer to excise taxes and custom duties.

4. Economic Impact from Ancillary Spending

4.1. Section Overview

Beyond producing economic impact through their operations, universities and hospitals within the Commonwealth draw outside spending into the region through their diverse student population, patients, and their visitors. While core spending for students such as tuition, housing, and healthcare services are captured within universities' operational impact, the additional off-campus spending by institutions' national and international student bodies, patients, and visitors creates critical economic opportunities for surrounding communities. These impacts are especially pronounced in the hospitality, retail, transportation, and food service sectors. These ancillary expenditures generate meaningful tax revenues at the state and national levels.

In aggregate, the economic impact of ancillary spending from students, patients, and visitors is $14.5 billion in total output within the Commonwealth, supporting 98,100 jobs with almost $3.5 billion in compensation. This activity generates $514 million in tax revenue to the Commonwealth each year.

4.2. Aggregate Direct Student Spending

Students' economic impact on Massachusetts extends beyond tuition payments to include substantial off-campus or "ancillary" spending on necessities, services, and entertainment. The universities host national and international students whose spending—distinct from a university's operational footprint—on room and board, books and supplies, retail, and transportation does not flow directly to universities and instead circulates within the local, regional, and state economies. It reflects either new economic activity from out-of-state students or retained local spending that might otherwise have left the region had local students chosen to attend college elsewhere.

Data and Methodology

Data sources for student spending calculations were derived from multiple complementary sources to ensure comprehensive coverage and accuracy.

Student Enrollment

Student enrollment at the undergraduate and graduate levels for all the Massachusetts universities included in the analysis was collected from the Integrated Postsecondary Education Data System (IPEDS).[15] ESI further utilized data from the AICUM 2023 Economic Impact Study and publicly available data for institutions to determine students' residence type. Students are categorized as living on-campus, off-campus, or living with parents ("commuters"). The total enrollment across all universities in Massachusetts is 590,250 (Figure 4.1).

[15] IPEDS Data Center, https://nces.ed.gov/ipeds/datacenter/InstitutionByName.aspx?goToReportId=5&sid=59d8e024-b2dc-4d9a-9eed-bda8d4b69774&rtid=5.

Figure 4.1: Estimated Total Enrollment by Residence Type and by Geography of Interest[16]

Residence Type	Boston	Greater Boston Region (minus Boston)	Massachusetts (minus Greater Boston Region)	Massachusetts
On-Campus	51,820	79,800	77,770	209,390
Off-Campus	100,610	95,080	75,390	271,080
Commuter	38,150	57,750	13,880	109,780
Total Enrollment	**190,580**	**232,630**	**167,040**	**590,250**

Source: AICUM (2023), IPEDS (2025), Econsult Solutions (2025), Various Other Public Sources (2025)

Student Spending

The AICUM economic impact study also provided information on students' spending patterns for the 59 private institutions which were inflation-adjusted to 2025 dollars for these institutions. These estimates were further used as benchmarks for similar institutions that did not have direct information. For institutions that did not have detailed spending breakdowns, estimates were developed using the average spending patterns observed among comparable institutions within the same geographic region and institutional type, based on operating budget and enrollment size.

Several methodological adjustments were made to avoid double-counting and ensure accurate economic impact measurement. Room and board expenses paid to universities—for those students living in institution-owned housing and purchasing meal plans—were excluded from local economic impact calculations, as these payments represent revenue to the institution rather than external economic activity. Similarly, housing expenses were eliminated for commuter students living in their family homes, as this spending does not represent new economic activity attributable to the institution.[17]

The analysis focused specifically on spending categories that flow directly into the local economy through private vendors and service providers. Off-campus housing expenses for students renting apartments or houses from private landlords were included, as were food purchases from local restaurants, grocery stores, and other food service establishments. Transportation spending included public transit, parking fees, vehicle maintenance, fuel purchases, and occasional ride-sharing services.

Geographic distribution of student spending was allocated based on the location of each institution and observed commuting and shopping patterns. Students attending Boston-region institutions were assumed to concentrate their spending within the Greater Boston metropolitan area, while students at institutions in Western or Central Massachusetts were assumed to spend primarily within their respective regional economies.

[16] It should be noted that enrollment by geography is determined by an institution's location of their main campus for the purposes of this analysis. For institutions with multiple campuses (with the exception of the UMass system), the enrollment is determined to be at the location of the main campus.

[17] Fo both on-campus and commuter students, some ancillary spending is included and calculated; however, since housing and food/beverage expenses are predominantly covered by housing payments to the universities (for on-campus students) or by family (for commuter students), these ancillary spending patterns are much less than those for students living in off-campus housing.

It is estimated that student spending represents more than $8.5 billion in spending that takes place within Massachusetts (Figures 4.2 and 4.3): $3.1 billion taking place in Boston; and $6.2 billion taking place in the Greater Boston Region.

Figure 4.2: Estimated MA Universities' Student Spending by Category – Carving Out the Previous Region ($B)

Category of Spending	Boston	Boston Region (minus Boston)	MA (minus Boston Region)	Massachusetts
Housing	$1.6	$1.2	$0.9	$3.7
Food	$0.6	$0.6	$0.4	$1.6
Retail	$0.6	$0.9	$0.8	$2.3
Transportation	$0.3	$0.4	$0.3	$0.9
Total	**$3.1**	**$3.0**	**$2.4**	**$8.5**

Source: Econsult Solutions, Inc. (2025); IPEDS (2025); Various university survey information (2025)

Figure 4.3: Estimated MA Universities' Student Spending by Category – Cumulative Total by Region ($B)

Category of Spending	Boston	Greater Boston Region	Massachusetts
Housing	$1.6	$2.8	$3.7
Food	$0.6	$1.2	$1.6
Retail	$0.6	$1.5	$2.3
Transportation	$0.3	$0.6	$0.9
Total	**$3.1**	**$6.2**	**$8.5**

Source: Econsult Solutions, Inc. (2025); IPEDS (2025); Various university survey information (2025)

4.3. Aggregate Direct Spending by Visitors to Massachusetts Universities

University visitors represent a significant source of external economic activity, bringing new spending into Massachusetts communities from outside the regional economy. The primary categories of university visitors include prospective students and their families conducting campus visits; family members and friends visiting current students; attendees at athletic events; participants in cultural and academic events; and visitors to graduation and other ceremonial occasions.

Data and Methodology

Data sources for visitor spending calculations combined information from the AICUM Economic Impact Study with publicly available information and industry benchmarks.

The analysis incorporated spending data from the U.S. Travel Association's domestic travel surveys, which provide detailed breakdowns of visitor spending by trip purpose and duration. Regional tourism data from the Massachusetts Office of Travel and Tourism supplemented these national patterns with state-specific information about visitor spending levels and patterns. Hotel occupancy and average daily

rate data from STR Global provided benchmarks for accommodation expenses in different regions of Massachusetts.

Visitor spending estimates were developed using a tiered approach based on visitor origin and trip duration. Local visitors, defined as those traveling less than 50 miles to reach the institution, were assumed to generate minimal incremental economic impact, as their spending largely represents redirected local economic activity. Regional visitors, traveling 50 to 100 miles, were categorized as day-trippers with spending concentrated on food, transportation, and miscellaneous retail purchases. Out-of-state and international visitors were assumed to require overnight accommodation and to generate the highest levels of spending per visit. These visitors typically stay multiple days and spend money on lodging, multiple meals, transportation, retail purchases, and entertainment. Spending estimates for this category were based on U.S. General Services Administration per diem rates, adjusted upward to reflect the discretionary nature of many university-related visits.

The analysis incorporated conservative assumptions about visitor frequency and spending levels to avoid overestimating economic impacts. Specific spending categories included lodging expenses at hotels, bed and breakfasts, and other commercial accommodations; food and beverage purchases at restaurants, cafeterias, and retail establishments; transportation costs including airfare, rental cars, parking, and ground transportation; and retail purchases including university merchandise, gifts, and general shopping. It is estimated that within Massachusetts, annual spending by university visitors is $297 million, with $82 million taking place in Boston; and $237 million taking place in the Greater Boston Region (Figures 4.5 and 4.6).

Figure 4.5: Estimated MA Universities' Visitor Spending by Category – Carved Out by Region

Category of Spending	Boston	Boston Region (minus Boston)	MA (minus Boston Region)	Total
Hotel ($M)	$42	$71	$29	$141
Food ($M)	$34	$73	$27	$134
Misc. Retail ($M)	$4	$7	$3	$14
Transportation ($M)	$2	$4	$2	$8
Total ($M)	**$82**	**$155**	**$60**	**$297**

Source: Econsult Solutions, Inc. (2025), GSA (2025), Various university survey information (2025)

Figure 4.6: Estimated MA Universities' Visitor Spending by Category – Cumulative Total by Region

Category of Spending	Boston	Greater Boston Region	Massachusetts
Hotel ($M)	$42	$113	$141
Food ($M)	$34	$107	$134
Misc. Retail ($M)	$4	$11	$14
Transportation ($M)	$2	$6	$8
Total ($M)	**$82**	**$237**	**$297**

Source: Econsult Solutions, Inc. (2025), GSA (2025), Various university survey information (2025)

Estimated Aggregate University Student and Visitor Ancillary Spending

Combining ancillary spending by students and visitors to Massachusetts universities, the total estimated ancillary spending reaches $8.8 billion in Massachusetts. The model adjusts for the economic "retail margin"—where spending flows outside the region (i.e., manufacturers and wholesalers). Only local margins (such as retail markups) are retained in regional output. Following these adjustments, the revised estimates for captured ancillary spending are $2.3 billion in Boston; $4.8 billion in the Greater Boston Region; and $6.6 billion in Massachusetts (Figure 4.7).

Figure 4.7: Estimated Aggregate Ancillary Spending by Spending Category – Cumulative Total by Region ($B)

Category of Spending	Boston	Greater Boston Region	Massachusetts
Housing and Hotel	$1.7	$2.9	$3.9
Retail Food Stores (Student Spending)	$0.6	$1.2	$1.6
Restaurants (Visitor Spending)	$0.1	$0.1	$0.1
Misc. Retail	$0.6	$1.5	$2.3
Transportation	$0.3	$0.6	$0.9
Total	**$3.2**	**$6.4**	**$8.8**
Retail Margin	($0.9)	($1.6)	($2.2)
Total Modellable Spending	**$2.3**	**$4.8**	**$6.6**

Source: Econsult Solutions, Inc. (2025), IMPLAN (2023), GSA (2025), Various university survey information (2025)

4.4. Aggregate Direct Spending by Massachusetts Hospitals' Patients and Visitors

Hospital-related visitor spending represents a substantial and often overlooked component of healthcare institutions' economic impact. This spending category encompasses both patients who travel to Massachusetts for specialized medical care and the family members, caregivers, and companions who accompany them during treatment episodes.

Data and Methodology

The Massachusetts Health and Hospital Association (MHA) provided aggregate data on patient volumes and type of hospital visits such as number of discharges, deliveries, Emergency Department visits, and outpatient visits.

The National Association of Healthcare Access Management contributed survey data about family member and companion travel patterns associated with healthcare episodes. Regional medical tourism data from organizations such as the Medical Tourism Association provided spending pattern estimates for patients and families traveling for medical care.

In aggregate, Massachusetts hospitals drew over 32 million patients and visitors to the region (Figure 4.8).

Figure 4.8: Estimated Total Patients and Visitors to Massachusetts Hospitals, by Visitor type

Visitor Type	Boston	Greater Boston Region (minus Boston)	Massachusetts (minus Greater Boston Region)	Massachusetts
Local	6,005,660	7,212,760	6,230,270	19,448,690
Regional	3,002,830	3,606,380	3,115,140	9,724,350
Out-of-Town	1,000,940	1,202,130	1,038,380	3,241,450
Total Patients and Visitors	**10,009,430**	**12,021,270**	**10,383,790**	**32,414,490**

Source: MHA (2025), Econsult Solutions (2025)

Patient and visitor spending estimates were developed based on several key variables including length of stay, estimated patient origin, and type of medical stay (outpatient, ED visits, etc.). Emergency and urgent care visits were assumed to generate minimal visitor spending, as these episodes typically involve local patients and brief treatment durations. Planned procedures and longer-term treatments were assigned higher visitor spending estimates reflecting the need for advance travel planning and extended local accommodations.

Spending categories for hospital visitors included commercial lodging at hotels. Food and beverage expenses included restaurant meals, hospital cafeteria purchases, and grocery shopping for extended stays. Transportation costs encompassed airfare for out-of-state visitors, rental car expenses, parking fees at medical facilities, and local ground transportation including taxi and ride-sharing services.

Geographic distribution of hospital visitor spending was allocated based on the location of major medical facilities and the regional healthcare market areas they serve. Boston-area academic medical centers were assumed to generate the highest levels of medical tourism and visitor spending, while community hospitals were assigned spending levels reflecting their primarily local service areas.

It is estimated that within Massachusetts, annual spending by Massachusetts hospitals' patients and visitors is more than $4.1 billion, with $1.3 billion taking place in Boston; and $3 billion taking place in the Greater Boston Region. The model adjusts for economic "retail margin"—where spending flows outside the region (i.e., manufacturers and wholesalers). Only local margins (such as retail markups) are retained in regional output. Following these adjustments, the revised estimates for captured ancillary spending are $1 billion in Boston and $2.8 billion in the Greater Boston Region (Figure 4.9). The model adjusts for the economic "retail margin" again where spending flows outside the region. Following these adjustments, the revised estimates for captured ancillary spending are $1.1 billion in Boston; $2.4 billion in the Greater Boston Region; and $3.6 billion in Massachusetts (Figure 4.10).

Figure 4.9: Estimated MA Hospitals' Patients and Visitor Spending by Category – Carved Out by Region

Category of Spending	Boston	Boston Region (minus Boston)	MA (minus Boston Region)	Massachusetts
Hotel ($M)	$3	$4	$3	$10
Food ($M)	$1	$1	$1	$3
Misc. Retail ($M)	$375	$451	$389	$1,216
Transportation ($M)	$901	$1,082	$935	$2,917
Total ($M)	**$1,280**	**$1,538**	**$1,328**	**$4,146**

Source: Econsult Solutions, Inc. (2025); MHA (2025); Various university survey information (2025)

Figure 4.10: Estimated MA Hospitals' Patients and Visitor Spending by Category – Cumulative Total by Region

Category of Spending	Boston	Greater Boston Region	Massachusetts
Hotel ($M)	$3	$7	$10
Food ($M)	$1	$2	$3
Misc. Retail ($M)	$375	$826	$1,216
Transportation ($M)	$901	$1,983	$2,917
Total ($M)	**$1,280**	**$2,818**	**$4,146**
Retail Margin ($M)	($174)	($383)	($563)
Total Modellable Spending ($M)	**$1,106**	**$2,435**	**$3,583**

Source: Econsult Solutions, Inc. (2025); MHA (2025); Various university survey information (2025)

4.5. Aggregate Economic Impact from Aggregate Ancillary Spending

The influx of spending from students, patients, and visitors has a multiplier effect throughout the regional and state economies. In aggregate, the economic impact from ancillary spending is $14.5 billion in total output within the Commonwealth, supporting 98,100 jobs with almost $3.5 billion in employee compensation (Figure 4.11).

Figure 4.11: Economic Impact from MA Eds and Meds Annual Ancillary Spending, Cumulative Total by Geography

Impact	Boston City	Greater Boston Region	Massachusetts	United States
Total Economic Impact	**$4.4**	**$10.1**	**$14.5**	**$16.4**
Universities				
Direct Output ($B)	$2.3	$4.8	$6.6	$6.6
Indirect and Induced Output ($B)	$0.4	$1.4	$2.1	$3.0
Total Output ($B)	**$2.7**	**$6.2**	**$8.7**	**$9.6**
Total Employment (FTE)	9,300	29,800	46,500	49,900
Employee Compensation ($B)	$0.5	$1.3	$1.7	$2.0
Hospitals				
Direct Output ($B)	$1.1	$2.4	$3.6	$3.6
Indirect and Induced Output ($B)	$0.6	$1.5	$2.2	$3.2
Total Output ($B)	**$1.7**	**$3.9**	**$5.8**	**$6.8**
Total Employment (FTE)	14,800	33,900	51,600	55,400
Employee Compensation ($B)	$0.6	$1.2	$1.7	$2.0

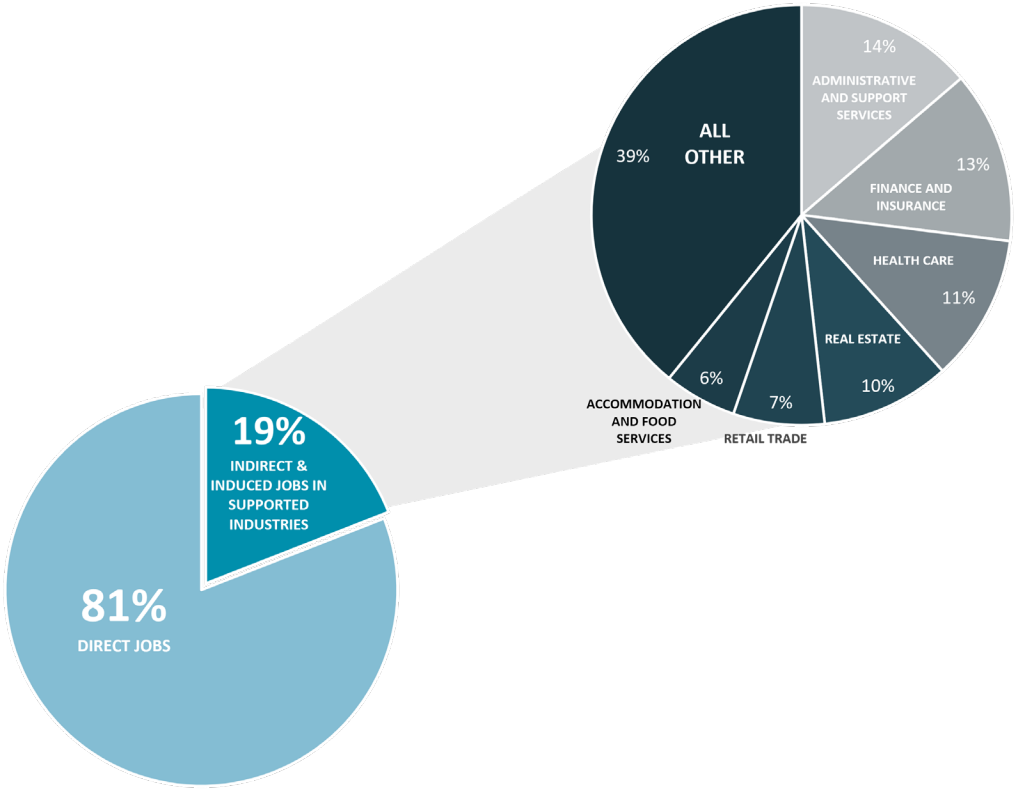
Source: IMPLAN (2023); Econsult Solutions, Inc. (2025)

4.6. Industry Distribution of Aggregate Economic Impact from Ancillary Spending

Ancillary spending by students, patients, and visitors creates a significant economic multiplier effect as these dollars circulate through the Massachusetts economy. When students buy textbooks, patients' families book hotel rooms, and visitors dine at local restaurants, their spending supports employment far beyond the immediate point of sale.

Of the 98,100 jobs generated by this ancillary spending, more than 18,600—or 19 percent—stem from indirect and induced economic impacts in sectors outside the initial transaction. These spillover jobs are distributed across diverse industries including Real Estate, Finance and Insurance, and Administrative and Support Services (Figure 4.12). This demonstrates how the presence of Massachusetts universities and hospitals attracts outside spending that ripples through the broader economy, supporting a broad range of jobs within the Commonwealth.

Figure 4.12: Industry Distribution of Employment Generated by Ancillary Spending Associated with Massachusetts Institutions within Massachusetts



Source: Econsult Solutions, Inc. (2025); IMPLAN (2023)

4.7. Aggregate Tax Revenue Impact from Ancillary Spending

The fiscal impacts of spending by the MA Eds and Meds students, patients, and visitors boosts various local, state, and federal tax bases, generating subsequent tax revenues each year. It is estimated that the economic impact from ancillary spending annually produces $300 million in tax revenue for the Commonwealth of Massachusetts; and $739 million in tax revenue for the United States federal government (Figure 4.13).[18]

Figure 4.13: Estimated Annual Tax Revenue Impact from Aggregate Ancillary Spending from Massachusetts Eds and Meds Institutions ($ Million)

Impact	Commonwealth of Massachusetts	Federal
Total Tax Revenue Impact	**$300**	**$739**
Universities		
Income Tax	$57	$231
Sales Tax[19]	$81	$27
Business Tax	$35	$173
Lodging Tax	$8	
Total	**$181**	**$430**
Hospitals		
Income Tax	$56	$243
Sales Tax	$43	$6
Business Tax	$19	$61
Lodging Tax	$1	
Total	**$119**	**$309**

Source: Econsult Solutions, Inc. (2025); IMPLAN (2023)

[18] Massachusetts has a state room occupancy excise tax rate of 5.7%. Depending on the city or town, a local option room occupancy tax and other taxes and fees may also apply.
[19] Sales taxes at the Federal level refers to excise taxes and custom duties.

5. Impact from Federal Funding Cuts

5.1. Section Overview

Recent federal policy changes pose significant threats to the financial foundation that supports Massachusetts' educational and healthcare institutions. The National Institutes of Health has proposed indirect cost caps and funding reductions across all federal agencies that particularly impact Massachusetts, which leads the nation in NIH funding per capita. Additionally, the One Big Beautiful Bill Act (OBBBA) includes provisions that will reduce Medicaid funding and create new administrative procedures that threaten healthcare institutions' financial sustainability.

These federal funding challenges come at a time when Massachusetts institutions face increasing costs for personnel, facilities, research equipment, and patient care. Federal funding reductions will force institutions to make difficult choices about program offerings, employment levels, and community services that could have lasting impacts on the Massachusetts economy and the communities these institutions serve.

The economic losses from federal funding cuts will extend far beyond the institutions themselves, affecting suppliers, contractors, and the broader communities that depend on institutional spending. The following analysis quantifies the potential economic losses while recognizing that the full impacts may be even greater as institutions adjust their operations and strategic priorities in response to reduced federal support.

5.2. Aggregate Revenue to Massachusetts: Medicaid Funding

Massachusetts hospitals and healthcare institutions receive substantial revenue from Medicaid programs that support care for low-income residents, elderly patients, and individuals with disabilities. Medicaid funding supports both direct patient care and graduate medical education programs that train the next generation of healthcare professionals.

Current Medicaid funding to Massachusetts healthcare institutions approaches $11.2 billion annually, representing a crucial revenue source that enables institutions to provide care for vulnerable populations while supporting their broader missions.[20] This funding supports employment for thousands of healthcare workers while generating economic activity throughout the healthcare supply chain.

[20] Medicaid in Massachusetts, Georgetown University, https://ccf.georgetown.edu/wp-content/uploads/2025/02/Medicaid-is-Vital-to-Massachusetts-2025-Fact-Sheet.pdf.

The OBBBA includes provisions that will significantly reduce Medicaid funding to Massachusetts, with The Congressional Budget Office (CBO) estimating that over 326,000 individuals in the state will lose Medicaid coverage by 2034.[21] Further, the Commonwealth Fund estimates that Massachusetts will lose approximately $17 billion in Medicaid funding by 2029, or $1.7 billion annually, once provisions are fully phased in. State officials project that total cuts to Massachusetts' federal healthcare funding could reach $3.5 billion annually.[22]

The reductions will affect multiple aspects of Medicaid funding, including restrictions on provider taxes and state-directed payments that Massachusetts has used to maximize federal matching funds. Work requirements and increased administrative procedures will likely cause eligible individuals to lose coverage due to paperwork challenges. As a result, healthcare institutions across the state will experience reduced patient volume and revenue.

5.3. Quantifying Economic Losses to Massachusetts: Federal Funding Cuts to Medicaid

The projected $1.7 billion in annual reduction in Medicaid funding will generate substantial economic losses throughout Massachusetts. Using standard economic impact methodologies, this funding reduction will result in **approximately $3.3 billion in lost economic output, affecting an estimated 13,600 jobs with $1.4 billion in lost employee compensation within Massachusetts (Figure 5.1).**

Figure 5.1: Estimated Projected Loss in Economic Impact from Federal Medicaid Funding Cuts

Impact	Massachusetts	US
Direct ($B)	($1.7)	($1.7)
Indirect and Induced ($B)	($1.6)	($2.1)
Total ($B)	**($3.3)**	**($3.8)**
Employment (FTE)	(13,600)	(15,700)
Employee Compensation ($B)	($1.4)	($1.5)

Source: IMPLAN (2023), Econsult Solutions (2025)

Healthcare institutions will face direct revenue losses that force reductions in staffing, services, and capital investments. These direct cuts will ripple through the healthcare supply chain, affecting medical device manufacturers, pharmaceutical companies, construction firms, and other businesses that serve healthcare institutions. The induced effects will extend throughout the Massachusetts economy as displaced workers and reduced institutional spending create additional economic contractions.

The geographic distribution of these losses will reflect the current distribution of Medicaid-dependent healthcare services, with safety net hospitals and community health centers facing particularly severe impacts. Rural hospitals and community hospitals that serve high proportions of Medicaid patients may

[21] "Amended Senate Budget Bill Would Trigger Nearly 20 Million People Losing Health Insurance", CBO, https://www.jec.senate.gov/public/_cache/files/571213e9-247f-4821-858c-2bac03d3bc89/6.30---jec-minority-health-insurance-losses.pdf.
[22] "Opinion: One Big Disaster for Massachusetts Health Care", Boston Globe, https://www.bostonglobe.com/2025/07/17/opinion/obbba-masshealth-medicaid-cuts/#:~:text=care.

face existential threats that could eliminate essential healthcare services in their communities. Additionally, these Medicaid losses could force hospitals to eliminate less profitable but essential services such as obstetrical care, psychiatric treatment, and emergency services in some communities.

Industry Distribution of Employment Losses to Massachusetts Due to Cuts in Medicaid Healthcare Allocations

Medicaid funding cuts to the Commonwealth of Massachusetts, beyond loss in economic impact, can negatively affect job creation in the state. This impact will be distributed across several industries, including health care, professional and technical services, real estate, finance, and accommodation and food services (Figure 5.2).

Figure 5.2: Top 6 Indirect and Induced Industries with the Highest Employment Losses from Federal Medicaid Funding Cuts

Source: IMPLAN (2023), Econsult Solutions (2025)

Tax Revenue Impact of Losses to Massachusetts Due to Cuts in Medicaid Healthcare Allocations

The estimated reduction of $3.3 billion in economic activity statewide results in decreased household income, business revenues, and consumption; which, in turn, will result in lower tax revenues for the Commonwealth of Massachusetts and the Federal Government. In total, Federal Medicaid cuts are projected to reduce Massachusetts' tax revenue by almost $81 million and federal tax revenue by almost $210 million (Figure 5.3).

Figure 5.3: Estimated Tax Revenue Losses Due to Federal Medicaid Funding Cuts ($M)

Tax Impact	Massachusetts	Federal
Income Tax	($45.5)	($180.3)
Sales Tax[23]	($24.6)	($3.2)
Business Tax	($10.8)	($26.0)
Total	**($80.9)**	**($209.5)**

Source: IMPLAN (2023), Econsult Solutions (2025)

5.4. Aggregate Direct Research Activity in Massachusetts

Massachusetts leads the nation in federal research funding, receiving $8.57 billion annually in federal research funding[24], from sources such as the National Institutes of Health, the National Science Foundation, and the Department of Defense. This research funding supports thousands of highly skilled jobs while generating innovations that benefit both Massachusetts and the broader society.

The research funding supports not only direct research activities but also graduate student training, postdoctoral fellowships, and research infrastructure that contribute to Massachusetts' position as a global leader in innovation. Federal research funding also attracts private sector research partnerships and helps Massachusetts institutions compete for talented faculty and students from around the world.

Recent data indicates that Massachusetts has already lost over $1.27 billion in NIH grant funding since March 2025[25], or 15 percent of total of research funding to Massachusetts in FY2024. As the state with the most funding from the NIH per capita, this disproportionate impact reflects Massachusetts' leadership position in federal research funding; but also demonstrates the vulnerability of the Commonwealth's research enterprise to federal policy changes.

5.5. Quantifying Economic Losses to Massachusetts: Federal Research Grant Funding Cuts

The projected $1.3 billion[26] in annual reduction of NIH research funding will generate substantial economic losses throughout Massachusetts. Using standard economic impact methodologies, this funding reduction will result in approximately $2.6 billion in lost economic output, affecting an estimated 8,700 jobs with $1.0 billion in lost employee compensation within Massachusetts (Figure 5.4).

[23] Sales taxes at the Federal level refers to excise taxes and custom duties.
[24] Nietzel, Michael T. "Massachusetts Governor Proposes New $400 Million State Research Fund." Forbes, 1 Aug. 2025, www.forbes.com/sites/michaeltnietzel/2025/08/01/massachusetts-governor-proposes-new-400-million-state-research-fund/.
[25] Bean, Mackenzie. "NIH Grant Funding Losses, by State." Becker's Hospital Review, 19 June 2025, www.beckershospitalreview.com/finance/nih-grant-funding-losses-by-state/. The NIH funding loss estimate of $1.27 billion is current as of June 2025 and is based on Grant Watch reporting.
[26] This is a conservative figure and based on an estimate of NIH funding losses to the Commonwealth: https://www.beckershospitalreview.com/finance/nih-grant-funding-losses-by-state/ https://www.beckershospitalreview.com/finance/nih-grant-funding-losses-by-state/

Figure 5.4: Estimated Projected Loss in Economic Impact from NIH Grant Funding Cuts

Impact	Massachusetts	US
Direct ($B)	($1.3)	($1.3)
Indirect and Induced ($B)	($1.3)	($1.6)
Total ($B)	**($2.6)**	**($2.9)**
Employment (FTE)	(8,700)	(10,100)
Employee Compensation ($B)	($1.0)	($1.1)

Source: IMPLAN (2023), Econsult Solutions (2025)

Industry Distribution of Employment Losses to Massachusetts Due to Cuts in NIH Research Allocations

NIH research funding cuts to the Commonwealth of Massachusetts, beyond loss in economic impact, will negatively affect job creation. This impact will be distributed across several industries, including

health care, professional and technical services, real estate, retail, administrative and support services, and accommodation and food services (Figure 5.5).

Figure 5.5: Top 6 Indirect and Induced Industries with the Highest Employment Losses from Federal Research Grant Funding Cuts

Source: IMPLAN (2023), Econsult Solutions (2025)

Tax Revenue Impact of Losses to Massachusetts Due to Cuts in NIH Research Allocations

The estimated reduction of $2.6 billion in economic activity statewide results in decreased household income, business revenues, and consumption, which, in turn, results in lower tax revenues for the Commonwealth of Massachusetts and the federal government. In total, NIH research cuts are projected to reduce Massachusetts' tax revenue by almost $61 million; and is further expected to reduce federal tax revenue by $164 million (Figure 5.6).

Figure 5.6: Estimated Tax Revenue Losses Due to Federal Research Grant Funding Cuts ($M)

Tax Impact	Massachusetts	Federal
Income Tax	($32.8)	($140.1)
Sales Tax[27]	($19.3)	($2.2)
Business Tax	($8.5)	($21.8)
Total	**($60.6)**	**($164.0)**

Source: IMPLAN (2023), Econsult Solutions (2025)

[27] Sales taxes at the Federal level refers to excise taxes and custom duties.

6. Economic Impact from Alumni Wage Premium

6.1. Section Overview

Massachusetts universities play a vital role in preparing their graduates for lifelong success in a competitive landscape, offering a foundation of learning and skills for alumni to increase their earning power. The high concentration of universities and colleges supports a robust knowledge economy that strengthens the state's tax base, and supports numerous industries and local businesses. This section describes the increased earning potential that alumni of the 88 universities and colleges in MA enjoy (i.e., the alumni wage premium). It further quantifies the induced effects of the Commonwealth's robust educational economy by assessing the impact of the additional earnings enjoyed by graduates on the city, region, state, and federal economies.

Massachusetts universities produce graduates who earn higher wages than they would without their degrees. These alumni spend their additional income locally, creating economic ripple effects that support jobs across all industries and generate tax revenue. This analysis calculates the total wage premium of Massachusetts university graduates—with separate estimates for those alumni of Massachusetts higher education institutions living within the rest of the United States.

In aggregate, the additional earnings of alumni educated in Massachusetts universities means billions of dollars in additional aggregate income circulating in the city, regional, state, and federal economies. Massachusetts universities have millions of alumni who now live across the country. Notably, many have stayed in Massachusetts, instead of returning to their home of origin. **The estimated 1.7 million graduates of Massachusetts universities and colleges who live and work in the Commonwealth are estimated to earn $38.4 billion more in income each year as a result of their education at Massachusetts universities. This translates into an additional $34.2 billion in economic impact within the Commonwealth economy annually, supporting more than 140,000 additional jobs with $11.9 billion in wages.**

6.2. Defining Alumni Wage Premium

In a knowledge economy, the education and intellectual capabilities of workers are treated as assets that determine a company's productivity and output. Workers who are credentialed, have expertise in highly in-demand skills, and matriculate from a higher education institution are more valued; and, in turn, receive higher wages for their work.

Wage premium analysis utilizes this framework to estimate the gain to the city, region, state, and federal economies due to alumni living within those defined regions that were educated at Massachusetts higher education institutions. Additional earnings attributable to alumni of Massachusetts universities living within these defined geographies are estimated and translated into additional spending power within each defined economy—which in turn supports employment and earnings, including within other industries. In aggregate, the additional earning potential means billions more dollars are circulating within the city, region, state, and even federal economies.

6.3. Aggregate Direct Alumni Wage Premium

For the purposes of this study, alumni counts and their subsequent premiums correspond with the home locations of alumni. ESI allocated those estimated home locations to Boston, the Greater Boston Region, Massachusetts, and the United States. Using data from a previous study conducted for the Association of Independent Colleges and Universities in Massachusetts (AICUM), ESI extrapolated an expected number of alumni for the remaining schools in Massachusetts that are not part of AICUM; and subsequently, Lightcast data was used to estimate where these alumni reside. The total number of alumni of Massachusetts higher education institutions throughout the United States was estimated using publicly available NCES and Census Bureau data. This method yielded a total of approximately 4.8 million living alumni, with approximately 1.2 million alumni living in Boston; 690,000 living in the Greater Boston Region (minus the City of Boston); 420,000 living within the rest of Massachusetts (minus the Greater Boston Region); and 2.5 million living in the United States (outside of Massachusetts).

Data and Methodology

Data obtained from Lightcast—which aggregates data from the Integrated Postsecondary Education Data System (IPEDS) and professional LinkedIn profiles by higher education institution and alumnus(a) home location—indicates that approximately 2.3 million alumni of Massachusetts universities and colleges live within the Commonwealth. Based on Massachusetts' total population of 7.1 million residents[28], the alumni per capita rate of 32.8 percent indicates that approximately one-third of all state residents hold degrees from Commonwealth higher education institutions.

It is estimated that 122,600 students receive degrees from Massachusetts higher education institutions each year.[29] ESI conservatively estimated the total count of living alumni outside of Massachusetts by assuming that 50 percent of graduates leave the state upon graduation. To reach the cumulative number of living alumni, ESI multiplied the annual count by 40 years (to conservatively estimate a 40-year career span), yielding a total of 2.5 million alumni of Massachusetts higher education institutions living across the country (minus those living in Massachusetts). More detail regarding the extrapolated alumni figures can be found in Appendix C.

The U.S. Bureau of Labor Statistics employment-population ratio of 70.1 percent estimates the proportion of alumni 25 and older with a college degree who are employed.[30] This ratio is used to estimate the proportion of alumni who work within the state and rest of the country—rather than those alumni who are retired or who have opted out of the traditional workforce due to various circumstances. This yields an estimated almost 3.4 million total working alumni—1.7 million alumni working within the Commonwealth of Massachusetts, and over 1.7 million alumni working within the rest of the United States (minus Massachusetts).

[28] U.S. Census Bureau. "U.S. and World Population Clock." U.S. Census Bureau, www.census.gov/popclock/. Accessed 5 Sept. 2025.
[29] Education Data Initiative. "College Graduation Statistics." Education Data Initiative, https://educationdata.org/number-of-college-graduates. Accessed 8 Sept. 2025.
[30] Bureau of Labor Statistics. "Employment Situation Summary - Employment Status of the Civilian Population 25 Years and Over by Educational Attainment." U.S. Bureau of Labor Statistics, www.bls.gov/news.release/empsit.t04.htm.

Figure 6.1: Geographic Distribution of Massachusetts Universities' Alumni in the Workforce, by Degree Type

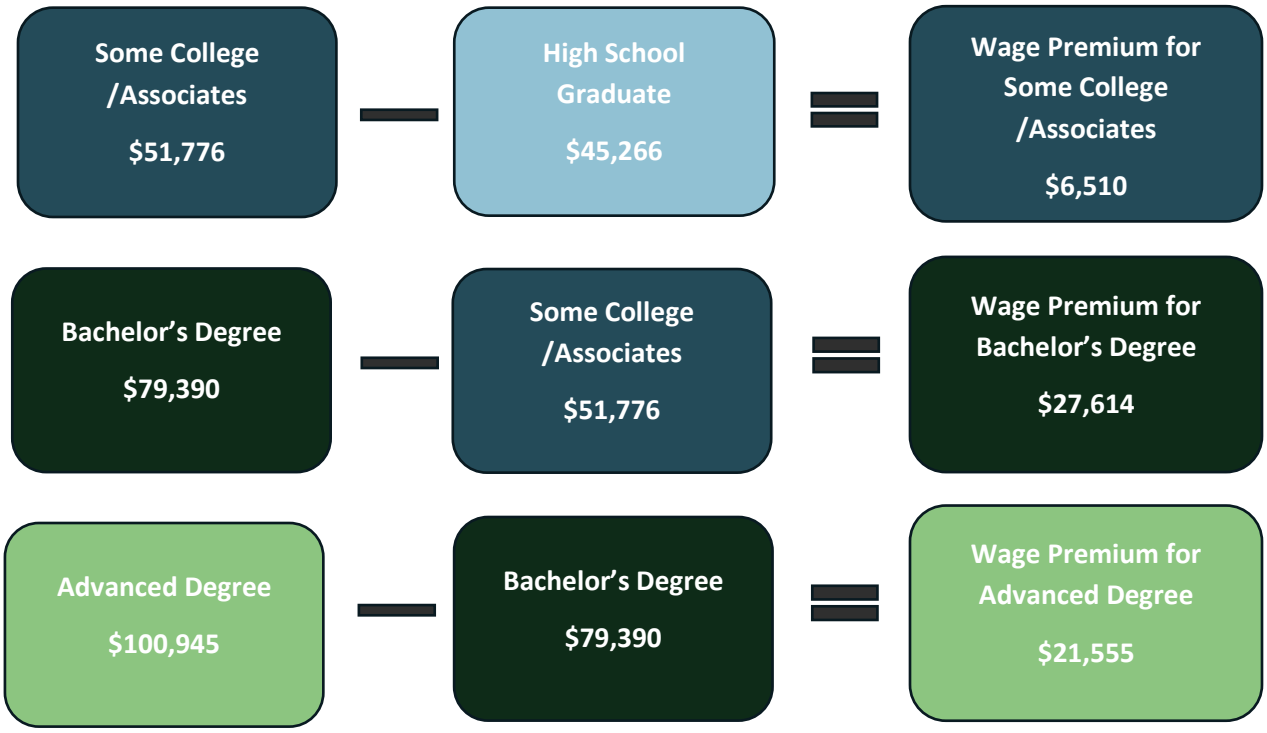
Degree Type	Estimated Total Alumni	Estimated Percentage of Working Alumni	Est. total Employed Alumni	Boston	Greater Boston Region (minus Boston)	MA (minus the Greater Boston Region)	US (minus MA)
Associate's	446,000	70.1%	313,000	84,000	47,000	29,000	153,000
Bachelor's	2,398,000	70.1%	1,689,000	440,000	247,000	150,000	853,000
Advanced	1,950,000	70.1%	1,373,000	347,000	194,000	118,000	713,000
Total Working Alumni	**4,794,000**	**70.1%**	**3,375,000**	**871,000**	**488,000**	**297,000**	**1,719,000**

Source: Econsult Solutions, Inc. (2025); BLS (2025); Lightcast (2025)

Aggregate wage premium was determined by multiplying the estimated number of aggregate working alumni within each geography by an estimated wage premium for each degree type. The individual wage premium amount for each degree type was determined to be the difference between median household income for alumni of a given degree attainment level and the median household income for all residents at one degree attainment level below. So, for example, the wage premium for an alumnus(a) with a Bachelor's degree living in the Commonwealth is the median household income for an alumnus(a) with a Bachelor's degree ($79,390) minus the median household income for a Commonwealth resident with an Associate's degree ($51,776). The subsequent wage premium is $27,614 (Figure 6.2).

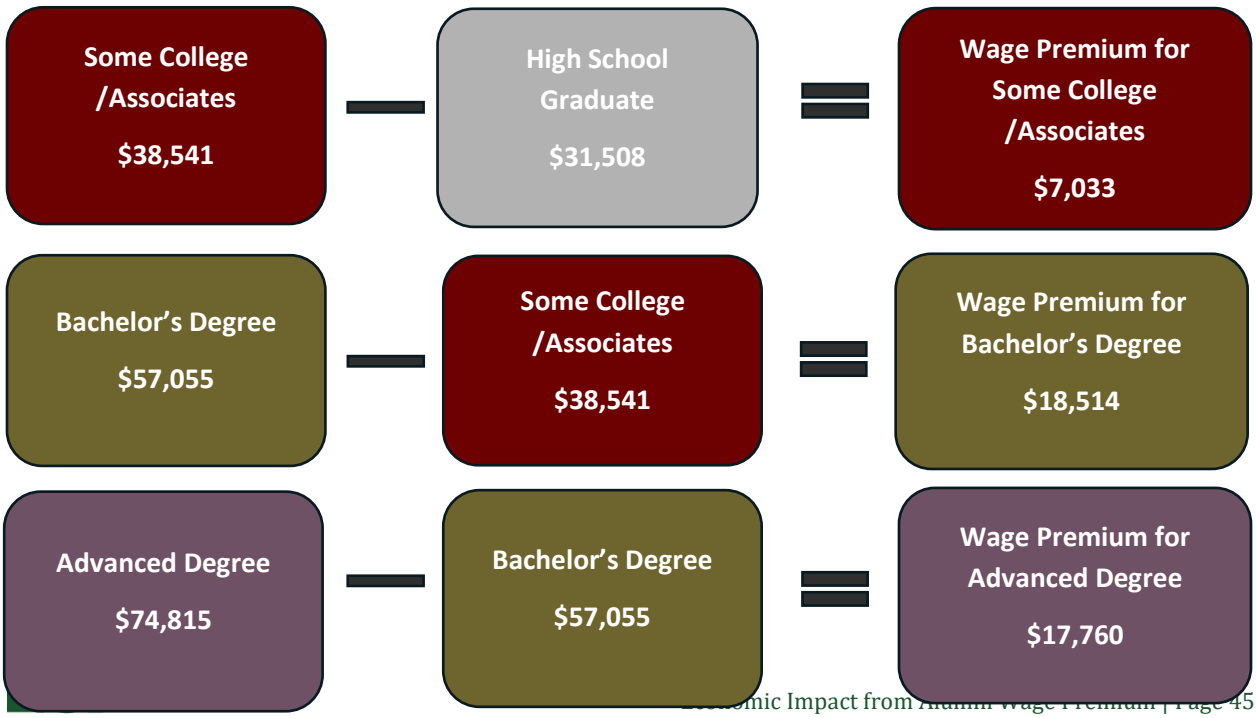
Due to different earnings levels in Massachusetts versus those in the rest of the United States, the wage premium was estimated separately for these two groups of working alumni. For those living and working within Massachusetts, the median earnings of the state of Massachusetts was used to estimate the wage premium. For those living in the rest of the United States, the median earnings of the country as a whole were used to estimate the wage premium to more accurately reflect the earnings level of these individuals (Figure 6.3).

Figure 6.2: Estimated Individual Wage Premium for Massachusetts University Alumni Living in Massachusetts



Source: American Community Survey (2023); College Scorecard (2025); Econsult Solutions, Inc. (2025)

Figure 6.3: Estimated Individual Wage Premium for Massachusetts University Alumni Living in the United States, Minus Massachusetts



Source: American Community Survey (2023); College Scorecard (2025); Econsult Solutions, Inc. (2025)

The alumni wage premium is then applied to the volume of Massachusetts degree holders estimated to be working within each geography by degree level—Associate's, Bachelor's, or Advanced. [31] The resulting aggregate annual wage premium represents the additional household income generated by Massachusetts alumni due to the education and credentials they received from those institutions. This aggregate annual wage premium is estimated to sum to approximately $20.2 billion within Boston; $11.3 billion within the Greater Boston Region (minus the City of Boston); $6.9 billion within the Commonwealth of Massachusetts (minus the Greater Boston Region); and $29.5 billion within the United States (minus Massachusetts). In sum, the aggregate annual wage premium associated with Massachusetts university alumni living within the United States is approximately $67.9 billion (Figure 6.4).[32]

Figure 6.4: Aggregate Wage Premium of Massachusetts Universities' Alumni, by Geography ($B)

Degree Type	Boston	Greater Boston Region (minus Boston)	MA (minus Greater Boston Region)	US (minus MA)	Aggregate within US
Associate's Degree	$0.5	$0.3	$0.2	$1.1	$2.1
Bachelor's Degree	$12.1	$6.8	$4.1	$15.8	$38.9
Advanced Degree	$7.5	$4.2	$2.5	$12.7	$26.9
Total	**$20.2**	**$11.3**	**$6.9**	**$29.5**	**$67.9**

Source: American Community Survey (2023); College Scorecard (2025); Econsult Solutions, Inc. (2025)

6.4. Economic Impact from Aggregate Alumni Wage Premium

The wage premium produces an enormous impact both because alumni are able to contribute to these economies at a higher level; and they have more disposable income to spend within these economies.

The effects of this additional household spending are estimated to generate on an annual basis (Figure 6.5):

- $17.8 billion in total output within Boston, supporting 62,000 induced jobs with $6.7 billion in employee compensation;
- $28.1 billion in total output within the Greater Boston Region, supporting 109,000 induced jobs with $10.0 billion in employee compensation;
- $34.3 billion in total output within Massachusetts, supporting 140,000 induced jobs with $11.9 billion in employee compensation; and
- $93.1 billion in total output within the United States, supporting 384,000 induced jobs with $28.0 billion in employee compensation.

[31] The advanced degree designation includes all graduates with an advanced degree higher than bachelor's, including Master's, PhD, EdD, JD, MD, and any additional terminal degrees.
[32] For cumulative wage premium totals by geography, please refer to figure 5.4, line 1 (aggregate alumni wage premium).

Figure 6.5: Cumulative Annual Economic Impact Attributable to Massachusetts Universities' Alumni Wage Premium Effects within Geographies of Interest

Impact	Boston City	Greater Boston Region	Massachusetts	US
Aggregate Alumni Wage Premium ($B)	$20.2	$31.5	$38.4	$67.9
Total Induced Output ($B)	**$17.8**	**$28.1**	**$34.3**	**$93.1**
Total Employment (FTE)	**62,000**	**109,000**	**140,000**	**384,000**
Employee Compensation ($B)	**$6.7**	**$10.0**	**$11.9**	**$28.0**

Source: Econsult Solutions, Inc. (2025); IMPLAN (2023)

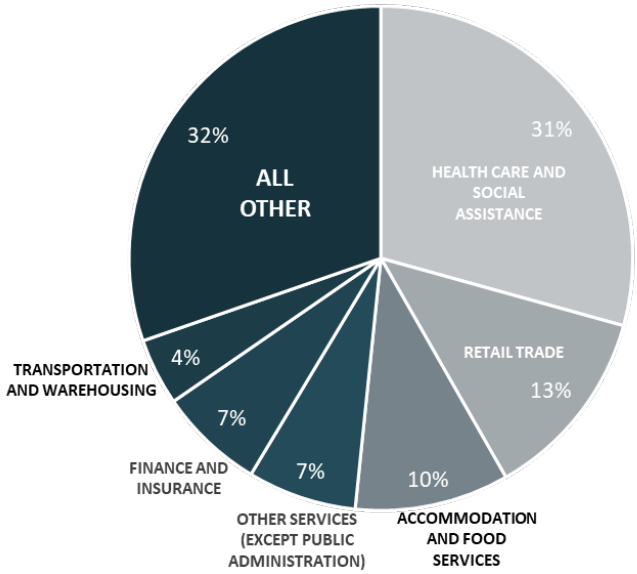
6.5. Industry Distribution of Economic Impact from Alumni Wage Premium

The enhanced earning power of Massachusetts university graduates creates economic ripple effects that extend throughout the Commonwealth's economy. As alumni spend their increased wages, they generate induced economic impacts across diverse sectors, with healthcare capturing the largest share at 31 percent of total employment supported by the alumni wage premium.

Retail trade accounts for 13 percent of this employment impact, demonstrating how alumni spending power sustains local businesses and commercial activity. Accommodation and food services comprise 10 percent, while other services (except public administration) represent 7 percent (Figure 6.6).

This broad distribution illustrates how higher education credentials translate into tangible economic benefits for communities across Massachusetts. The alumni wage premium does not only benefit graduates themselves—it strengthens the entire economic ecosystem, from high-skilled professional services to everyday consumer sectors, supporting jobs and businesses throughout the Commonwealth.

Figure 6.6: Industry Distribution of Employment Generated from Alumni Wage Premium of Massachusetts Institutions within Massachusetts



Source: Econsult Solutions, Inc. (2025), IMPLAN (2023)

6.6. Aggregate Tax Revenue Impact from Alumni Wage Premium

In addition to economic impacts, Massachusetts and the United States benefit from additional tax revenue generated directly from the wage premium associated with Massachusetts universities' graduates. The higher wage premium paid to alumni directly impacts personal income tax revenue and indirectly generates revenue in terms of income, sales, and business taxes collected from graduate spending. In Massachusetts, approximately $2.3 billion in state taxes are generated by MA Eds alumni; and in the United States, over $12.0 billion in federal taxes are generated (Figure 6.7).

Figure 6.7: Fiscal Impacts of the Wage Premium Associated with Massachusetts Universities' Alumni in the Commonwealth of Massachusetts and the United States ($ Million)

Impact	Commonwealth of Massachusetts	Federal
Income Tax	$388.2	$2,698.7
Income Tax by Alumni	$1,486.1	$8,147.5
Sales Tax[33]	$283.1	$168.0
Business Tax	$124.2	$1,010.0
Total	**$2,281.7**	**$12,024.1**

Source: Econsult Solutions, Inc. (2025), IMPLAN (2023), City of Boston ACFR (2024), Commonwealth of Massachusetts ACFR (2024)

[33] Sales taxes at the Federal level refers to excise taxes and custom duties.

7. A More Competitive and Innovative State Economy

7.1. Section Overview

Beyond the quantifiable economic impacts detailed in previous sections, Massachusetts' educational and healthcare institutions contribute to the Commonwealth's—and even the United States'—competitive position through numerous qualitative impacts that enhance innovation, workforce development, and quality of life. These institutions serve as anchors for economic development, attracting businesses and talent while fostering an environment that supports entrepreneurship and technological advancement.

The concentration of world-class educational and healthcare institutions creates a unique ecosystem that distinguishes Massachusetts from other states and regions. This ecosystem attracts investment, supports innovation, and provides the skilled workforce that knowledge-intensive industries require. The presence of these institutions signals to businesses and entrepreneurs that Massachusetts offers the intellectual capital and infrastructure necessary for success in the global economy.

As an example, Massachusetts hosts the world's most dynamic and flourishing life sciences ecosystem. Through collaboration between industry, academic institutions, and government, a thriving economy has emerged that cultivates an exceptional talent pipeline and serves as an innovation hub where outstanding science, groundbreaking discoveries, and visionary leadership drive the creation of novel treatments, medical devices, and scientific breakthroughs that enhance patient health and quality of life throughout Massachusetts and globally. In fact, 95% of the top global biopharma companies are located in Massachusetts; and the Commonwealth boasts the highest percentage of adults with a bachelor's degree or higher.[34] As discussed in Section 6, Massachusetts is number 1 in NIH funding per capita.

These broader impacts are crucial for understanding the full value that educational and healthcare institutions provide to Massachusetts and to the entire nation. They include contributions to healthcare access, educational opportunity, community engagement, workforce development, and innovation that extend far beyond the direct economic impacts measured in previous sections.

7.2. Healthcare Provision

Massachusetts hospitals provide essential healthcare services that extend far beyond their economic impact, serving as crucial safety nets for communities throughout the Commonwealth. These institutions provide emergency services, specialty care, and routine healthcare that supports the health and wellbeing of Massachusetts residents while attracting patients from throughout New England and beyond.

Teaching hospitals and academic medical centers play particularly important roles in advancing medical knowledge and training the next generation of healthcare professionals. These institutions conduct

[34] Massachusetts Life Sciences Center. "Why Massachusetts." Massachusetts Life Sciences Center, https://www.masslifesciences.com/why-ma/.

clinical research that leads to new treatments and medical devices, provide highly specialized care for complex conditions, and train physicians, nurses, and other healthcare professionals who serve communities throughout Massachusetts and beyond.

Commonwealth hospitals play multiple critical roles across Massachusetts. First, they provide essential medical services—including emergency care, routine treatment, and specialized services—that residents depend on for their health and wellbeing. Massachusetts residents also benefit from access to some of the nation's top-ranked hospitals in specialized areas such as cancer care (Dana-Farber Cancer Institute), pediatric medicine (Boston Children's Hospital), ophthalmology and otolaryngology (Massachusetts Eye and Ear Infirmary), and orthopedics (New England Baptist Hospital), ensuring that even the most complex medical conditions can be treated within the Commonwealth.

Additionally, these hospitals drive local economic activity and typically rank among the largest employers in their communities, supporting jobs and generating spending that strengthens local economies. Massachusetts healthcare institutions also demonstrate a strong commitment to serving all Commonwealth populations and reducing health disparities, which improves the overall health and productivity of the Commonwealth's workforce while providing residents throughout the state with an extensive range of healthcare options—from routine community care to world-class specialty treatment.

7.3. Affordability and Accessibility in Higher Education

Massachusetts' universities contribute significantly to educational opportunity and social mobility through their commitment to financial aid, accessibility programs, and community engagement. These institutions provide pathways for students from diverse backgrounds to access high-quality education that can transform their economic prospects and contribute to Massachusetts' skilled workforce.

Many Massachusetts institutions maintain substantial financial aid programs that make education accessible to students regardless of their family's financial circumstances. These programs represent significant institutional investments in expanding opportunity while building the diverse, talented workforce that Massachusetts industries require. The availability of financial aid helps ensure that Massachusetts can attract and retain talented students who might otherwise be unable to afford higher education.

Community colleges and regional universities play particularly important roles in providing accessible education that serves local communities while offering pathways for career advancement and economic mobility. These institutions often provide flexible scheduling, career-focused programs, and support services that enable working adults and non-traditional students to access higher education while maintaining family and work responsibilities.

Massachusetts stands out nationally as an exceptional state for higher education access and quality. Recent analysis has recognized Massachusetts as the best state in the US for college students by the national nonprofit tech company SmileHub.[35] This recognition reflects not only the state's educational excellence but also its remarkable geographic accessibility to higher education institutions. With so

[35] Healey-Driscoll Administration. "Healey-Driscoll Administration Celebrates Massachusetts Named 'Best State' for College Students." Mass.gov, 13 Dec. 2024, www.mass.gov/news/healey-driscoll-administration-celebrates-massachusetts-named-best-state-for-college-students.

many colleges and universities distributed throughout the Commonwealth, Massachusetts provides students with unprecedented access to educational opportunities. Massachusetts has expanded its free community college access through two key programs: MassReconnect (for students 25 and older) and the newer MassEducate program, which extends free tuition and fees to all residents without bachelor's degrees at any of the state's 15 public community colleges. This makes Massachusetts one of the most comprehensive and accessible free community college systems in the country, serving both full-time and part-time students regardless of income level.[36] This density of institutions helps ensure that educational opportunities are geographically accessible to residents across the state, supporting the principle that distance should not be a barrier to higher education access.

7.4. Engagement with and Investment in Local Communities

Massachusetts' educational and healthcare institutions serve as engaged community partners that contribute to local development, cultural enrichment, and social cohesion. These institutions regularly partner with local governments, community organizations, and businesses to address community challenges and support local economic development initiatives.

Universities and colleges provide cultural amenities including museums, performance venues, libraries, and athletic facilities that enhance community quality of life while attracting visitors and supporting local businesses. These institutions also provide educational opportunities for community members through continuing education programs, public lectures, and community partnerships that extend the benefits of higher education beyond enrolled students.

Healthcare institutions contribute to community health through health fairs, screening programs, health education initiatives, and partnerships with community organizations that address social determinants of health. These community benefits represent substantial institutional investments in local well-being that extend far beyond direct patient care services.

Many institutions maintain community investment programs that support local hiring, local purchasing, and partnerships with locally owned businesses. These programs help ensure that institutional spending generates maximum benefits for local communities while supporting economic development and entrepreneurship.

7.5. Producing Tomorrow's Workforce for Economic Competitiveness

Massachusetts' educational institutions play a crucial role in developing the skilled workforce that the Commonwealth's knowledge-intensive economy requires. These institutions provide education and training in fields ranging from healthcare and biotechnology to engineering and computer science that align with the state's economic development priorities and industry needs.

[36] "Healey-Driscoll Administration Celebrates One of the Most Comprehensive Free Community College Programs in the Country." Commonwealth of Massachusetts, Executive Office of Education, 2024, www.mass.gov/news/healey-driscoll-administration-celebrates-one-of-the-most-comprehensive-free-community-college-programs-in-the-country.

The concentration of top-tier research universities and specialized institutions creates a pipeline of talent that attracts businesses and supports innovation in key industry sectors. Companies often locate facilities near universities to access both research capabilities and talented graduates, creating clusters of related businesses that enhance Massachusetts' competitive position in global markets.

The Boston/Cambridge area reclaimed the top spot as the nation's leading biopharma cluster in 2024, overtaking the San Francisco Bay Area in venture capital financing and demonstrating Massachusetts' position as the undisputed leader in biomedical innovation. Boston/Cambridge's return to the top reflects its top rankings in three of five key criteria: the region leads the nation in NIH funding with 8,954 awards totaling $5.2 billion, as well as in lab space with almost 62 million square feet; and additionally, is number one in venture capital with $7.7 billion in 2023.[37] This ranking reinforces Massachusetts' status as housing over 1,700 life sciences companies and representing one of the world's most dynamic innovation ecosystems.[38] The Commonwealth's sustained leadership position builds on decades of early investment in biotechnology, scientific excellence from its world-class research universities and academic medical centers, and the creation of robust networks that have made Massachusetts the nation's premier destination for biotech innovation and commercialization.

Continuing education and workforce development programs help existing workers adapt to changing technology and economic conditions, supporting career advancement while helping Massachusetts businesses access the skilled workers they need. These programs represent important investments in maintaining the state's competitive position as technology and global competition continue to evolve.

7.6. Producing Innovation to Drive Regional Economies

Massachusetts' research universities and academic medical centers serve as engines of innovation that support new business formation, technological advancement, and economic growth. These institutions conduct research that leads to new products, services, and industries while providing the intellectual foundation for continued innovation and entrepreneurship. Technology transfer programs help translate academic research into commercial applications, supporting the formation of new companies and the development of new industries. Massachusetts leads the nation in many measures of innovation and entrepreneurship, with much of this success traceable to the research and development activities of its educational and healthcare institutions. This innovation leadership is reflected in Massachusetts holding the top position nationally for patents per capita, with 15.5 patents per 10,000 residents as of fiscal year 2022[39], significantly outpacing the national average and demonstrating the state's exceptional capacity for translating research into commercially viable innovations.

Massachusetts is home to one in every 10 jobs in R&D in the US, compared to 1 in 40 for all jobs throughout the economy.[40] The state's innovation strength is further evidenced by Massachusetts Life

[37] "Top 10 U.S. Biopharma Clusters 2024." Genetic Engineering & Biotechnology News, GEN, 2024, www.genengnews.com/a-lists/top-10-u-s-biopharma-clusters-2024/.
[38] Massachusetts Biotechnology Council. MassBio, 2024, www.massbio.org/.
[39] "Counting Patents: States with the Most Inventive Residents." Philomath News, 14 Mar. 2023, philomathnews.com/counting-patents-states-with-the-most-inventive-residents/.
[40] Melnik, Mark, and Rod Motamedi. "Economic Impacts of Research and Development Funding In Massachusetts." UMass Donahue Institute, donahue.umass.edu/our-publications/economic-impacts-of-research-and-development-funding-in-massachusetts.

Sciences companies raising $7.8 billion in VC funding in 2024[41], and the fact that over 700 different Massachusetts organizations received R&D awards in recent years, with the top three funders being the NIH, the Air Force, and the NSF.[42] Partnerships between institutions and established businesses support continued innovation and competitive advantage for Massachusetts companies. These collaborations help businesses access cutting-edge research while providing practical applications for academic research, creating a dynamic innovation ecosystem that benefits the entire Commonwealth.

R&D funding not only supports jobs at recipient institutions, but also supports blue-collar and service jobs in sectors that support the industry and its workers, including construction, food services, healthcare, retail, and administrative support. This broad economic multiplier effect demonstrates how research investments create what economists call "ripple effects," where every dollar of R&D funding generates additional economic activity throughout the Commonwealth's diverse industrial sectors.

[41] Startup Genome. "Ecosystem Startup Genome | Building World-Class Startup Ecosystems," 1 week ago, startupgenome.com/ecosystems/boston.
[42] "New UMass Study Finds that Proposed Cuts to Federal Research & Development Funding in Massachusetts Puts More than $16 Billion in Economic Activity at Risk." Amherst Indy, 1 Aug. 2025, www.amherstindy.org/2025/08/01/new-umass-study-finds-that-proposed-cuts-to-federal-research-development-funding-in-massachusetts-puts-more-than-16-billion-in-economic-activity-at-risk/.

8. Conclusion

8.1. Aggregate Economic and Tax Revenue Impacts of Massachusetts Universities and Hospitals

Massachusetts' higher education institutions and hospitals collectively represent one of the Commonwealth's most significant economic engines. These impacts reflect the institutions' roles as major employers, purchasers of goods and services, attractors of outside spending, and generators of enhanced human capital through their educational and healthcare missions.

Economic and fiscal impacts from a 2023 study on the economic impact of Massachusetts Health Center Program participants are represented and included as line items in the subsequent figures below. These impacts were reported in terms of Massachusetts results; and included federal and state fiscal revenues. Subsequent geographic-specific economic impact figures were extrapolated using the aggregate economic impact ratios between Massachusetts and those of Boston, the Greater Boston Region, and the United States. The tables of Massachusetts Health Center Program participant economic and fiscal impacts can be found in Appendix B.

- Within Boston, MA Eds and Meds activity generates over $69.5 billion in economic impact, supporting more than 353,400 jobs with approximately $35.0 billion in employee earnings (Figure 8.1).
- Throughout the Greater Boston Region, MA Eds and Meds activity generates approximately $118.3 billion in economic impact, supporting more than 625,580 jobs with approximately $56.0 billion in employee earnings (Figure 8.2).
- Throughout the Commonwealth of Massachusetts, MA Eds and Meds activity generates approximately $155.9 billion in economic impact, supporting more than 858,100 jobs with $71.1 billion in employee earnings (Figure 8.3).
- Within the United States, MA Eds and Meds activity generates approximately $179.5 billion in economic impact, supporting more than 944,400 jobs with $77.6 billion in employee earnings (Figure 8.4).

Figure 8.1: Aggregate Economic Impact of MA Eds and Meds in Boston

Impact	Operations	Capital	Ancillary Spending	MA Health Centers	Total
Universities					
Direct Output ($B)	$19.2	$0.7	$2.3		$22.2
Indirect and Induced Output ($B)	$5.6	$0.2	$0.4		$6.2
Total Output ($B)	**$24.9**	**$0.9**	**$2.7**		**$28.5**
Total Employment (FTE)	179,000	3,700	9,300		192,000
Employee Compensation ($B)	$14.3	$0.4	$0.5		$15.2
Hospitals					
Direct Output ($B)	$24.4	$1.4	$1.1	$0.9	$27.8
Indirect and Induced Output ($B)	$11.4	$0.4	$0.6	$0.8	$13.2
Total Output ($B)	**$35.8**	**$1.8**	**$1.7**	**$1.7**	**$41.0**
Total Employment (FTE)	131,000	7,600	14,800	8,040	161,440
Employee Compensation ($B)	$17.3	$0.9	$0.6	$1.0	$19.8

Source: Econsult Solutions, Inc. (2025); Capital Link (2023); IMPLAN (2023)

Figure 8.2: Aggregate Economic Impact of MA Eds and Meds – Cumulative Total in the Greater Boston Region

Impact	Operations	Capital	Ancillary Spending	MA Health Centers	Total
Universities					
Direct Output ($B)	$33.3	$2.2	$4.8		$40.3
Indirect and Induced Output ($B)	$12.8	$1.2	$1.4		$15.4
Total Output ($B)	**$46.1**	**$3.3**	**$6.2**		**$55.6**
Total Employment (FTE)	314,000	15,500	29,800		359,300
Employee Compensation ($B)	$25.5	$1.4	$1.3		$28.2
Hospitals					
Direct Output ($B)	$34.8	$1.9	$2.4	$0.9	$40.0
Indirect and Induced Output ($B)	$19.3	$0.9	$1.5	$0.9	$22.6
Total Output ($B)	**$54.1**	**$2.8**	**$3.9**	**$1.8**	**$62.7**
Total Employment (FTE)	209,000	12,300	33,900	11,080	266,280
Employee Compensation ($B)	$24.9	$1.2	$1.2	$0.4	$27.8

Source: Econsult Solutions, Inc. (2025); Capital Link (2023); IMPLAN (2023)

Figure 8.3: Aggregate Economic Impact of MA Eds and Meds – Cumulative Total in Massachusetts

Impact	Operations	Capital	Ancillary Spending	MA Health Centers	Total
Universities					
Direct Output ($B)	$40.2	$2.7	$6.6		$49.5
Indirect and Induced Output ($B)	$17.2	$1.6	$2.1		$20.9
Total Output ($B)	**$57.4**	**$4.3**	**$8.7**		**$70.4**
Total Employment (FTE)	407,000	20,900	46,500		474,400
Employee Compensation ($B)	$30.7	$1.7	$1.7		$34.1
Hospitals					
Direct Output ($B)	$45.9	$2.1	$3.6	$1.8	$53.4
Indirect and Induced Output ($B)	$27.0	$1.2	$2.2	$1.7	$32.1
Total Output ($B)	**$72.9**	**$3.3**	**$5.8**	**$3.5**	**$85.5**
Total Employment (FTE)	298,000	15,000	51,600	19,120	383,720
Employee Compensation ($B)	$32.4	$1.4	$1.7	$1.4	$37.0

Source: Econsult Solutions, Inc. (2025); Capital Link (2023); IMPLAN (2023)

Figure 8.4: Aggregate Economic Impact of MA Eds and Meds in the United States

Impact	Operations	Capital	Ancillary Spending	MA Health Centers	Total
Universities					
Direct Output ($B)	$40.2	$2.7	$6.6		$49.5
Indirect and Induced Output ($B)	$25.4	$2.6	$3.0		$31.0
Total Output ($B)	**$65.7**	**$5.3**	**$9.6**		**$80.6**
Total Employment (FTE)	436,000	24,300	49,900		510,200
Employee Compensation ($B)	$32.7	$1.9	$2.0		$36.6
Hospitals					
Direct Output ($B)	$45.9	$2.1	$3.6	$2.1	$53.6
Indirect and Induced Output ($B)	$38.2	$1.9	$3.2	$2.0	$45.2
Total Output ($B)	**$84.0**	**$4.0**	**$6.8**	**$4.1**	**$98.9**
Total Employment (FTE)	340,000	17,200	55,400	21,640	434,240
Employee Compensation ($B)	$35.4	$1.5	$2.0	$2.0	$41.0

Source: Econsult Solutions, Inc. (2025); Capital Link (2023); IMPLAN (2023)

The economic impacts span all regions of Massachusetts, from the concentration of world-renowned institutions in the Greater Boston Region to the regional universities and community hospitals that serve as economic anchors in smaller communities throughout the Commonwealth. The diversity of institutional types and missions ensures that economic benefits reach communities across Massachusetts while supporting various industry sectors from construction and manufacturing to professional services and retail trade.

Tax revenue totals more than $4.1 billion annually for the Commonwealth of Massachusetts (Figure 8.5); and an additional $7.9 billion in federal tax collections generated by Massachusetts Eds and Meds institutional activity (Figure 8.6). These substantial tax contributions demonstrate the positive fiscal impact of these institutions—at the state and federal levels—and provide strong returns on any public investments that support their operations.

Figure 8.5: Aggregate Fiscal Impacts of MA Eds and Meds in Massachusetts ($M)[43]

Impact	Operations	Capital	Ancillary Spending	MA Health Centers	Total
Universities					
Income Tax	$978	$56	$57		$1,091
Sales Tax	$517	$34	$81		$632
Business Tax	$227	$15	$35		$277
Lodging Tax			$8		$8
Total	**$1,721**	**$104**	**$181**		**$2,006**
Hospitals					
Income Tax	$1,050	$45	$56		$1,151
Sales Tax	$543	$28	$43		$614
Business Tax	$238	$12	$19		$269
Lodging Tax			$1		$1
Total	**$1,831**	**$85**	**$119**	**$92**	**$2,127**

Source: Econsult Solutions, Inc. (2025); Capital Link (2023); IMPLAN (2023)

Figure 8.6: Aggregate Fiscal Impacts of MA Eds and Meds in the United States ($M)

Impact	Operations	Capital	Ancillary Spending	MA Health Centers	Total
Universities					
Income Tax	$2,472	$227	$231		$2,930
Sales Tax	$68	$4	$27		$99
Business Tax	$465	$35	$173		$673
Total	**$3,005**	**$266**	**$430**		**$3,701**
Hospitals					
Income Tax	$2,609	$149	$243		$3,001
Sales Tax	$65	$3	$6		$74
Business Tax	$519	$30	$61		$610
Total	**$3,193**	**$182**	**$310**	**$483**	**$4,168**

Source: Econsult Solutions, Inc. (2025); Capital Link (2023); IMPLAN (2023)

[43] The taxes represented in this table are direct taxes paid to State of MA – does not include tax revenue to the Greater Boston Counties

The economic impacts detailed in this analysis represent only the quantifiable benefits generated by these institutions. Additional qualitative benefits including healthcare provision, educational opportunity, community engagement, workforce development, and innovation generation provide substantial additional value that enhance Massachusetts' competitive position and quality of life.

8.2. Aggregate Economic Losses Due to Cuts in Federal Research and Healthcare Allocations

The federal grant funding challenges facing Massachusetts Eds and Meds institutions pose serious threats to the Commonwealth's economic prosperity and competitive position. Combined losses from Medicaid funding cuts and research funding reductions could eliminate $5.9 billion in annual economic output while affecting over 22,300 jobs, with $2.4 billion in employee compensation in Massachusetts; along with $142 million in State tax revenue losses (Figures 8.7 and Figure 8.8). Within the United States, combined losses from Medicaid funding cuts and research funding reductions in Massachusetts Eds and Meds could eliminate $6.7 billion in economic impact while affecting 25,800 jobs with $2.6 billion in employee compensation. Anticipated federal fiscal revenue losses reach $373 million (Figures 8.7 and Figure 8.8).

These potential losses represent more than just statistical reductions in economic activity. They threaten to undermine the ecosystem of innovation, education, and healthcare that distinguishes the Commonwealth of Massachusetts in global competition for businesses, talent, and investment. The concentration of losses in highly skilled sectors means the economic impact per job will be greater than typical employment reductions.

The geographic distribution of losses will affect communities throughout Massachusetts, though the Greater Boston region will experience the largest absolute impacts due to its concentration of major research institutions and teaching hospitals. Smaller communities that depend on regional universities or community hospitals may face disproportionately severe impacts relative to their local economies.

The timing and magnitude of federal funding cuts create particular challenges as institutions may need to make rapid adjustments that multiply the economic impacts. Long-term planning becomes more difficult when federal funding streams that have supported institutional growth and community investment face uncertainty.

Figure 8.7: Aggregate Economic Impact Losses from Federal Funding Cuts ($B)

Impact	Massachusetts	United States
Medicaid Funding Cuts		
Total Economic Impact Loss ($B)	($3.3)	($3.8)
Employment (FTE)	(13,600)	(15,700)
Employee Compensation ($B)	($1.4)	($1.5)
NIH Funding Cuts		
Total Economic Impact Loss ($B)	($2.6)	($2.9)
Employment (FTE)	(8,700)	(10,100)
Employee Compensation ($B)	($1.0)	($1.1)

Source: Econsult Solutions, Inc. (2025); IMPLAN (2023)

Figure 8.8: Aggregate Tax Revenue Impact Losses from Federal Funding Cuts ($M)

Impact	Massachusetts	United States
Medicaid Funding Cuts		
Income Tax	($46)	($180)
Sales Tax	($25)	($3)
Business Tax	($11)	($26)
Total	**($81)**	**($209)**
Research Funding Cuts		
Income Tax	($33)	($140)
Sales Tax	($19)	($2)
Business Tax	($8)	($22)
Total	**($61)**	**($164)**

Source: Econsult Solutions, Inc. (2025); IMPLAN (2023)

8.3. The Economic and Tax Revenue Impacts of the Alumni Wage Premium Associated with Alumni Educated in Massachusetts Higher Education Institutions

Among the most enduring economic contributions of Massachusetts higher education institutions is the enhanced earning power they provide to their graduates. The Commonwealth's universities and colleges equip students with knowledge, skills, and credentials that translate into higher lifetime earnings—a measurable wage premium that benefits not only individual alumni but the entire Boston, Greater Boston Region, Massachusetts, and United States economies. These graduates' increased purchasing power creates sustained economic activity that ripples through communities, supporting local businesses, generating tax revenue, and strengthening the region's economic foundation.

The alumni wage premium represents a long-term return on educational investment that compounds over time. Unlike the one-time impacts of capital construction or the annual cycles of operational spending, the wage premium generates continuous economic benefits throughout graduates' careers. As Massachusetts alumni spend their enhanced earnings on housing, goods, services, and experiences, they fuel demand across diverse sectors of the economy—from healthcare and retail to hospitality and professional services. This analysis quantifies both the estimated direct wage premium earned by Massachusetts university graduates and the broader economic and fiscal impacts generated when these enhanced earnings circulate through economies.

The effects of this additional household spending are estimated to generate on an annual basis (Figure 8.9):

- $17.8 billion in total output within Boston, supporting 62,000 induced jobs with $6.7 billion in employee compensation;
- $28.1 billion in total output within the Greater Boston Region, supporting 109,000 induced jobs with $10.0 billion in employee compensation;

- $34.3 billion in total output within Massachusetts, supporting 140,000 induced jobs with $11.9 billion in employee compensation; and
- $93.1 billion in total output within the United States, supporting 384,000 induced jobs with $28.0 billion in employee compensation.

Figure 8.9: Cumulative Annual Economic Impact Attributable to Massachusetts Universities' Alumni Wage Premium Effects within Geographies of Interest

Impact	Boston City	Greater Boston Region	Massachusetts	US
Aggregate Alumni Wage Premium ($B)	$20.2	$31.5	$38.4	$67.9
Total Induced Output ($B)	**$17.8**	**$28.1**	**$34.3**	**$93.1**
Total Employment (FTE)	**62,000**	**109,000**	**140,000**	**384,000**
Employee Compensation ($B)	**$6.7**	**$10.0**	**$11.9**	**$28.0**

Source: Econsult Solutions, Inc. (2025); IMPLAN (2023)

The higher wage premium paid to alumni directly impacts personal income tax revenue and indirectly generates tax revenue in terms of income, sales, and business taxes collected from graduate spending. In Massachusetts, approximately $2.3 billion in state taxes are generated by MA Eds alumni; and in the United States, over $12.0 billion in federal taxes are generated (Figure 8.10).

Figure 8.10: Fiscal Impacts of the Wage Premium Associated with Massachusetts Universities' Alumni in the Commonwealth of Massachusetts and the United States ($ Million)

Impact	Commonwealth of Massachusetts	Federal
Income Tax	$388.2	$2,698.7
Income Tax by Alumni	$1,486.1	$8,147.5
Sales Tax[44]	$283.1	$168.0
Business Tax	$124.2	$1,010.0
Total	**$2,281.7**	**$12,024.1**

Source: Econsult Solutions, Inc. (2025), IMPLAN (2023), City of Boston ACFR (2024), Commonwealth of Massachusetts ACFR (2024)

8.4. The Public Purpose of Public and Private Institutions

Massachusetts' educational and healthcare institutions, whether public or private, serve essential public purposes that justify continued support and protection from harmful federal policy changes. These institutions provide healthcare access, educational opportunity, workforce development, innovation generation, and community engagement that benefit all Massachusetts residents regardless of whether they directly interact with these institutions.

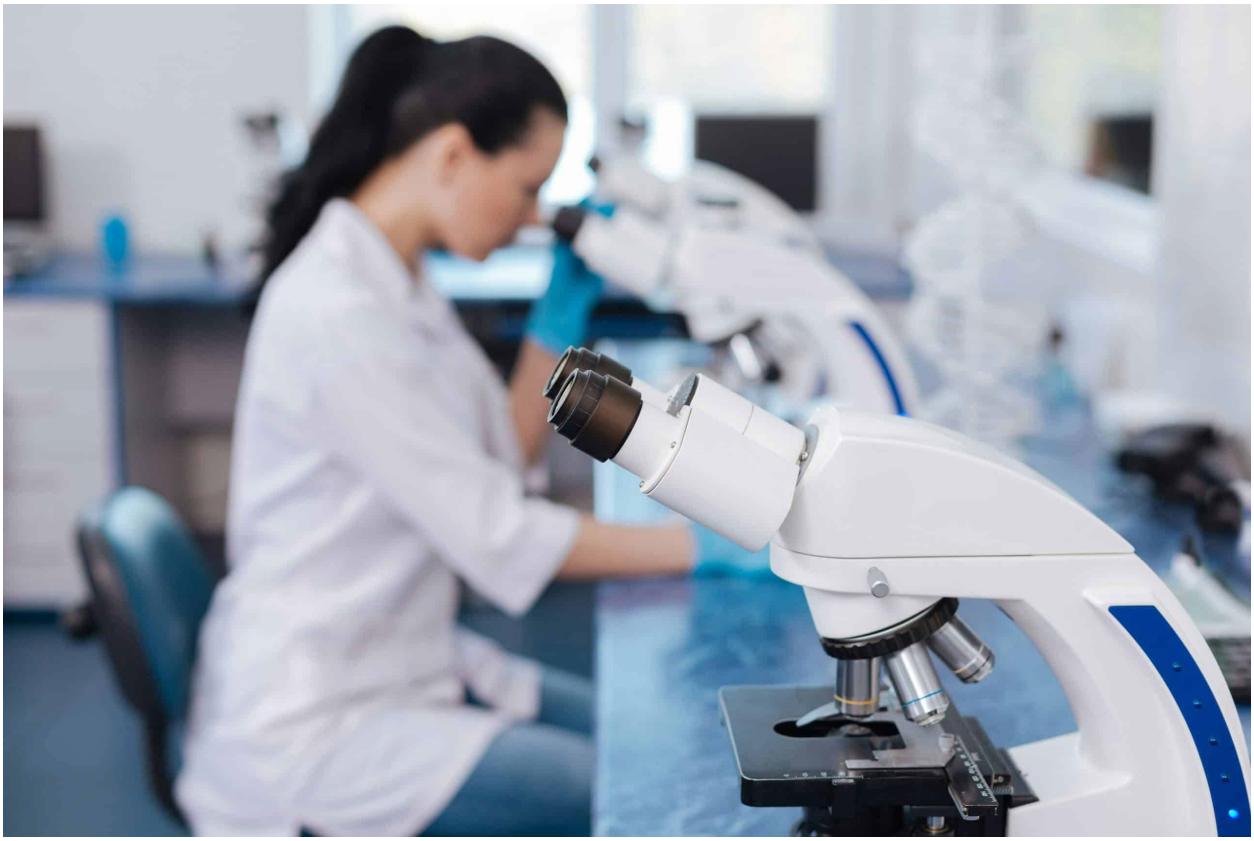
[44] Sales taxes at the Federal level refers to excise taxes and custom duties.

The public benefits generated by these institutions extend far beyond their immediate service areas and constituencies. Research conducted at Massachusetts institutions contributes to medical advances, technological innovations, and knowledge generation that benefit society broadly. Educational programs train professionals who serve communities throughout Massachusetts and beyond. Healthcare services provide safety nets that support public health and economic productivity.

The interconnected nature of Massachusetts' educational and healthcare ecosystem means that threats to any component affect the entire system. Research universities depend on teaching hospitals for clinical research opportunities. Hospitals depend on universities for trained healthcare professionals. Community colleges depend on four-year institutions for transfer opportunities. All institutions depend on the broader ecosystem for the talent attraction and innovation culture that supports their success.

Protecting and strengthening this ecosystem requires coordinated action by institutional leaders, state and local governments, business communities, and federal policymakers who recognize the national benefits generated by Massachusetts' concentration of world-class educational and healthcare institutions. The economic impact analysis presented in this report provides a foundation for advocacy efforts while demonstrating the substantial returns on investment that these institutions generate for Massachusetts and the nation.

The Commonwealth's leadership in education and healthcare represents a strategic asset that requires continued nurturing and protection. Federal policies that undermine this ecosystem threaten not only Massachusetts' economic prosperity but also the nation's capacity for innovation, workforce development, and healthcare advancement. Supporting these institutions through challenging times represents an investment in America's competitive future.



Appendix A: Participating Institutions

Figure A.1: Massachusetts Hospitals Included in Study

Hospital Name	City
Beth Israel Deaconess Medical Center	Boston
Boston Medical Center	Boston
Brigham and Women's Hospital	Boston
Massachusetts General Hospital	Boston
Tufts Medical Center	Boston
UMass Memorial Medical Center	Worcester
Baystate Medical Center	Springfield
Cambridge Health Alliance	1. Cambridge 2. Somerville 3. Everett
Lahey Hospital & Medical Center	Burlington
Mount Auburn Hospital	Cambridge
Saint Vincent Hospital	Worcester
Boston Medical Center-Brighton (previously Steward St. Elizabeth's Medical Center)[45]	Boston
Beth Israel Deaconess Hospital - Milton	Milton
Beth Israel Deaconess Hospital - Needham	Needham
Emerson Hospital	Concord
Milford Regional Medical Center	Milford
Nantucket Cottage Hospital	Nantucket
Newton-Wellesley Hospital	Newton
Winchester Hospital	Winchester
Anna Jaques Hospital	Newburyport
Addison Gilbert Hospital[46]	Gloucester
Athol Hospital	Athol
Baystate Franklin Medical Center	Greenfield
Baystate Noble Hospital	Westfield
Baystate Wing Hospital	Palmer
Berkshire Medical Center	Pittsfield
Beth Israel Deaconess Hospital - Plymouth	Plymouth
Beverly Hospital	Beverly
Brigham and Women's Faulkner Hospital	Boston
Cape Cod Hospital	Barnstable
Cooley Dickinson Hospital	Northampton

[45] Rebranded to "Boston Medical Center - Brighton." No longer under Steward's ownership.
[46] Data unavailable.

Fairview Hospital	Great Barrington
Falmouth Hospital	Falmouth
Harrington Memorial Hospital	Southbridge
HealthAlliance - Clinton Hospital	1. Leominster 2. Fitchburg 3. Clinton
Heywood Hospital	Gardner
Holyoke Medical Center	Holyoke
Lawrence General Hospital	Lawrence
Lowell General Hospital	Lowell
Marlborough Hospital	Marlborough
Martha's Vineyard Hospital	Oak Bluffs
MelroseWakefield Hospital	1. Medford 2. Melrose
Mercy Medical Center	Springfield
MetroWest Medical Center	1. Framingham 2. Natick
Morton Hospital, A Steward Family Hospital	Taunton
Salem Hospital	Salem
Signature Healthcare Brockton Hospital	Brockton
South Shore Hospital	South Weymouth
Southcoast Hospitals Group	Fall River
Boston Medical Center-South (Steward Good Samaritan Medical Center)[47]	Brockton
Steward Holy Family Hospital[48]	Methuen
Sturdy Memorial Hospital	Attleboro
Dana-Farber Cancer Institute	Boston
Massachusetts Eye and Ear Infirmary	Boston
New England Baptist Hospital	Boston
Shriners Hospitals for Children - Boston	Boston
Boston Children's Hospital	Boston
Arbour Hospital	Boston
Fuller Hospital	Attleboro
HRI Hospital	Brookline
Bournewood Hospital	Brookline
Haverhill Pavilion Behavioral Health Hospital	Haverhill
Hospital for Behavioral Medicine	Worcester
McLean Hospital	Belmont
MiraVista Behavioral Health Center	Holyoke

[47] Rebranded to "Boston Medical Center - South" in May 2025. No longer under Steward's ownership.
[48] Rebranded to "Holy Family Hospital - Methuen" in 2024. No longer under Steward's ownership.

Southcoast Behavioral Hospital	Dartmouth
TaraVista Behavioral Health	Devens
Walden Behavioral Care	Waltham
Westborough Behavioral Healthcare Hospital	Westborough
BayRidge Hospital[49]	Lynn
Encompass Braintree Rehabilitation Hospital	Braintree
Encompass New England Rehabilitation Hospital	Woburn
Encompass Health Rehabilitation Hospital of Western Massachusetts	Ludlow
Fairlawn Rehabilitation Hospital, an affiliate of Encompass Health	Worcester
Spaulding Rehabilitation Hospital Boston	Boston
Spaulding Rehabilitation Hospital Cape Cod	Sandwich
Vibra Hospital of Southeastern Massachusetts	New Bedford
Whittier Rehabilitation Hospital Bradford	Haverhill
Whittier Rehabilitation Hospital Westborough	Westborough
PAM Health Stoughton	Stoughton
Spaulding Hospital Cambridge	Cambridge
VIbra Hospital of Western Massachusetts	Leicester
AdCare Hospital of Worcester	Worcester
Hebrew Rehabilitation Hospital	Boston
Franciscan Hospital for Children	Brighton
Cape Cod and Islands Community Mental Health Center	Pocasset
Corrigan Mental Health Center	Fall River
Solomon Carter Fuller Mental Health Center	Boston
Taunton State Hospital	Taunton
Worcester State Hospital	Worcester
Lemuel Shattuck Hospital	Boston
Tewksbury Hospital	Tewksbury
Western Massachusetts Hospital	Westfield

Source: Econsult Solutions, Inc. (2025)

[49] Data unavailable.

Figure A.2: Massachusetts Universities Included in Study

University Name	**Main Campus Location (City)**
Boston University	Boston
Massachusetts Institute of Technology	Cambridge
Olin College of Engineering	Needham
Babson College	Wellesley
Bentley University	Waltham
Boston College	Chestnut Hill
Worcester Polytechnic Institute	Worcester
Harvard University	Cambridge
Northeastern University	Boston
College of the Holy Cross	Worcester
MGH Institute of Health Professions	Boston
Wellesley College	Wellesley
Tufts University	Medford
Wentworth Institute of Technology	Boston
Stonehill College	Easton
Labouré College of Healthcare	Milton
Elms College	Chicopee
Anna Maria College	Paxton
Massachusetts College of Pharmacy and Health Sciences (MCPHS)	Boston
Williams College	Williamstown
Amherst College	Amherst
Merrimack College	North Andover
Assumption University	Worcester
Western New England University	Springfield
Simmons University	Boston
Boston Architectural College	Boston

Endicott College	Beverly
Bay Path University	Longmeadow
Regis College	Weston
Gordon College	Wenham
Brandeis University	Waltham
Emmanuel College	Boston
Wheaton College (Massachusetts)	Norton
Suffolk University	Boston
Smith College	Northampton
Mount Holyoke College	South Hadley
Clark University	Worcester
Curry College	Milton
Lasell University	Newton
Fisher College	Boston
Springfield College	Springfield
Cambridge College	Boston
Emerson College	Boston
Nichols College	Dudley
Eastern Nazarene College	Quincy
Lesley University	Cambridge
Hampshire College	Amherst
Dean College	Franklin
New England Conservatory of Music	Boston
Berklee College of Music	Boston
Montserrat College of Art	Beverly
Boston Baptist College	Boston
William James College	Newton
Bard College at Simon's Rock	Great Barrington
Franklin Cummings Tech	Boston

Boston Graduate School of Psychoanalysis	Brookline
New England College of Optometry	Boston
Thomas Aquinas College (Massachusetts)	Northfield
Urban College of Boston	Boston
Western New England University	Springfield
American International College	Springfield
Saint John's Seminary	Boston
Hellenic College Holy Cross	Brookline
University of Massachusetts-All Campuses	Amherst
Salem State University	Salem
Framingham State University	Framingham
Massachusetts Maritime Academy	Bourne
Worcester State University	Worcester
Bridgewater State University	Bridgewater
Westfield State University	Westfield
Fitchburg State University	Fitchburg
Massachusetts College of Liberal Arts	North Adams
Massachusetts College of Art and Design	Boston
Bunker Hill Community College	Boston
MassBay Community College	Wellesley
Roxbury Community College	Boston
Berkshire Community College	Pittsfield
Holyoke Community College	Holyoke
Northern Essex Community College	Haverhill
Bristol Community College	Fall River
Massasoit Community College	Brockton
North Shore Community College	Danvers
Quinsigamond Community College	Worcester
Cape Cod Community College	West Barnstable

Middlesex Community College	Lowell & Bedford
Greenfield Community College	Greenfield
Mount Wachusett Community College	Gardner
Springfield Technical Community College	Springfield

Source: Econsult Solutions, Inc. (2025)

Appendix B: Massachusetts Health Center Program Participants Economic and Fiscal Impacts

Figure B.1: Economic Impact: Massachusetts Health Center Program Participants[50],[51]

Impact	Boston	Greater Boston	Massachusetts	United States
Direct Output ($B)	$0.9	$0.9	$1.8	$2.1
Indirect and Induced Output ($B)	$0.8	$0.9	$1.7	$2.0
Total Output ($B)	**$1.7**	**$1.8**	**$3.5**	**$4.1**
Total Employment (FTE)	8,040	11,080	19,120	21,640
Employee Compensation ($B)	$1.0	$0.4	$1.4	$2.0

Source: Capital Link (2023)

Figure B.2: Fiscal Impact: Massachusetts Health Center Program Participants

	Massachusetts	United States
Fiscal Impact ($M)	$92	$483

Source: Capital Link (2023)

[50] National Association of Community Health Centers. "2023 Value Impact Analysis of the Massachusetts Health Center Program." NACHC, Feb. 2025, nachc.org/wp-content/uploads/2025/02/2023-Value-Impact-Analysis-of-the-Massachusetts-Health-Center-Program.pdf. Report prepared by Capital Link.

[51] Economic impact statistics from the 2023 study were reported in the National Association of Community Health Centers study in terms of impacts to the Commonwealth. Economic impact estimates included for Boston, the Greater Boston Region, and the United States were extrapolated from the reported Massachusetts impact figures, based upon the aggregate ratios of overall Massachusetts impact figures to those in Boston, the Greater Boston Region, and the United States.

Appendix C: Alumni Wage Premium Methodology

This appendix provides detailed documentation of the methodology used to estimate the total number and geographic distribution of Massachusetts university alumni for the wage premium analysis presented in Section 6. The estimation process involved multiple data sources and careful extrapolation techniques to account for incomplete coverage in existing datasets.

Data Sources and Limitations

The primary challenge in estimating the total alumni population was the incomplete coverage of available datasets of Massachusetts university alumni, including total number and geographic distribution. Lightcast data, which draws from LinkedIn profiles, provided valuable information about the geographic distribution of Massachusetts university alumni but significantly underestimated the total number of graduates. This necessitated a multi-step estimation process combining several data sources.

Primary Data Sources

- **2023 Economic Impact Study (EIS) for AICUM**: Provided comprehensive student enrollment and alumni data for 59 member institutions[52]
- **IPEDS (Integrated Postsecondary Education Data System)**: Source for enrollment data for non-AICUM institutions[53]
- **Lightcast**: Geographic distribution patterns for Massachusetts institutions' alumni[54]
- **U.S. Census Bureau**: Degree attainment data for national comparisons[55]
- **Bureau of Labor Statistics (BLS)**: Labor force participation rates[56]

Estimation Methodology

Step 1: Establishing Base Ratios from AICUM Data

Using comprehensive data from the 2023 AICUM Economic Impact Study, we established key baseline ratios:

- **AICUM Total Enrollment**: 261,968 students
- **AICUM Total Alumni**: 1,159,885 graduates
- **Working Alumni Rate**: 70.1% of total alumni
- **AICUM Working Alumni**: 1,159,885 x 0.701 (labor force participation rate of 70.1%) = 828,274 individuals

[52] Association of Independent Colleges and Universities in Massachusetts. AICUM Economic Impact Study Final. AICUM, aicum.org/wp-content/uploads/2025/04/AICUM-Economic-Impact-Study-Final.pdf.
[53] National Center for Education Statistics. Integrated Postsecondary Education Data System (IPEDS). U.S. Department of Education, nces.ed.gov/ipeds.
[54] Lightcast, lightcast.io.
[55] U.S. Census Bureau. Educational Attainment. U.S. Census Bureau, www.census.gov/topics/education/educational-attainment.html.
[56] U.S. Bureau of Labor Statistics. Civilian Labor Force Participation Rate. U.S. Bureau of Labor Statistics, www.bls.gov/charts/employment-situation/civilian-labor-force-participation-rate.htm.

- **Alumni-to-Enrollment Ratio**: 4.43 (1,159,885 ÷ 261,968)

Step 2: Extrapolating to Non-AICUM Institutions

For Massachusetts universities not included in AICUM, we applied the established ratios to current student enrollment data, which was found using IPEDS.

- **Non-AICUM Total Enrollment**: 266,824 students
- **Non-AICUM Estimated Total Alumni**: 1,181,386 graduates (266,824 × 4.43)
- **Non-AICUM Working Alumni**: 828,151 individuals (applying 70.1% BLS rate to the above figure)

Step 3: Massachusetts Alumni Totals

Combining AICUM and non-AICUM estimates:

- **Total Massachusetts Alumni**: 2,341,271 graduates: 1,159,885 (AICUM total) + 1,181,386 (non-AICUM estimated)
- **Total Working Alumni in Massachusetts**: 1,656,425 individuals (2,341,271 x 0.701 from BLS)

Step 4: National Distribution Estimation

To estimate the total number of Massachusetts university alumni residing throughout the United States, we employed a conservative multiplier approach:

- **Annual Graduate Production**: 122,630 alumni produced annually[57]
- **Conservative 40-Year Career Span Multiplier**: Applied to estimate total living alumni population throughout the US (122,630 x 40) = 4,905,200
- **Geographic Mobility Assumption**: An estimated 50% of total graduates leave Massachusetts and settle in other parts of the county = 2,452,600[58]

This methodology yielded:

- **Massachusetts Residents**: 2,341,271 alumni
- **Rest of United States**: 2,452,600 alumni
- **Total U.S. Alumni**: 4,793,871 graduates

Applying the 70% working rate (consistent with BLS data):

- **Total Working Alumni**: 3,375,598 alumni of Massachusetts universities living throughout the US

[57] Number of College Graduates. Education Data Initiative, educationdata.org/number-of-college-graduates.
[58] A general estimate based upon: "UMass Graduates Contribute More Than Knowledge to Mass Economy. Here's Why (Viewpoint)." MassLive, 2024, www.masslive.com/opinion/2024/05/umass-graduates-contribute-more-than-knowledge-to-mass-economy-heres-why-viewpoint.html.

Step 5: Geographic Distribution Analysis

Massachusetts Distribution: Used Lightcast data to determine the proportional distribution of Massachusetts university alumni across different regions within the state, accounting for concentrations in major metropolitan areas such as Boston and the Greater Boston Region.

National Distribution: For the wage premium calculations throughout the US (minus Massachusetts), median earnings were calculated for the entire country, with the exception of Massachusetts, which was calculated separately (see above).

Implications for Economic Impact Analysis

These alumni estimates form the foundation for calculating the wage premium effects described in Section 6. The conservative approach to estimation ensures that the economic impact calculations represent a reasonable lower bound for the actual contribution of Massachusetts university alumni to regional and national economic activity.

Appendix D: Input-Output Methodology

In an inter-connected economy, every direct dollar spent generates two spillover impacts:

- First, some amount of the proportion of that expenditure that goes to the purchase of goods and services gets circulated back into an economy when those goods and services are purchased from local vendors. This represents what is known as the **indirect effect** and reflects the fact that local purchases of goods and services support local vendors, who in turn require additional purchasing with their own set of vendors.
- Second, some amount of the proportion of that expenditure that goes to labor income gets circulated back into an economy when those employees spend some of their earnings on various goods and services. This represents what is known as the **induced effect** and reflects the fact that some of those goods and services will be purchased from local vendors, further stimulating the economy.

To model the impacts resulting from the direct expenditures of MA Eds and Meds, ESI developed a customized economic impact model using IMPLAN's input/output modeling system. Utilizing an industry standard approach, IMPLAN's input/output modeling system allows users to assess the economic and job creation impacts of industry-based events and public policy changes within a county or its surrounding area. IMPLAN has developed a social accounting matrix (SAM) that accounts for the flow of commodities through economics. From this matrix, IMPLAN also determines the regional purchase coefficient (RPC), or the proportion of local supply that satisfies local demand. These values not only establish the types of goods and services supported by an industry or institution, but also the high level at which they are acquired locally. This assessment determines the multiplier basis for the local and regional models created in the IMPLAN modeling system. IMPLAN takes these multipliers and divides them into 546 industry categories in accordance with the North American Industrial Classification System (NAICS) codes.

Explanation of Multipliers[59]

The use and application of multipliers are intuitive. Multipliers, in their most basic form, are the result of an algebraic analysis expressing how two inputs are interconnected in the production of an output. The result of the equation generates a multiplier that is broken down into direct, indirect, and induced effects. In a generalized example: if the multiplier for good *X* to good *Y* is 3, then the direct effect of good *X* on *Y* is 1, with indirect and induced effects of 2. Essentially, every unit of good *X* supports 2 units of good *Y*.

When implemented on a large complex scale, such as that of the US economy or any subsection of it, multiplier effects across industries can be complicated. However, the same general concept comes into play. Each industry has largely different and varied inputs into other industries. The quantity of the output is largely decided by the scale and efficiency of the industries involved. As a result, the sum of

[59] Lahr, Michael. "Input-Output Analysis: Technical Description and Application." Rutgers University Edward J. Bloustein School of Planning and Public Policy.

those inputs equates to an output product plus a value added/component. By arranging these inputs and outputs by industry in a matrix and performing some algebra to find the Leontief inverse matrix, each industry's effect on final demand can be estimated. Additionally, the direct, indirect, and induced effects can also be determined. Direct effects include direct purchases for production, indirect effects include expenses during production, and induced effects concern the expenditures of employees directly involved with production. Using building construction as an example, the direct effects would include materials, brick, steel, and mortar; the indirect effects would involve the steel fabrication and concrete mixing; and the induced effects would consider purchases by construction workers using their wages. While impacts vary in size, each industry has rippling effects throughout the economy. By using an input-output model, these effects can be more accurately quantified and explained.

IMPLAN is one of several popular choices for regional input-output modeling. Each system has its own nuances in establishing proper location coefficients. IMPLAN uses a location quotient to determine its regional purchase coefficient (RPC). This represents the proportion of demand for a good that is filled locally; this assessment helps determine the multiplier for the localized region. Additionally, IMPLAN also accounts for inter-institutional transfers (e.g., firms to households, households to the government, etc.) through its social account matrix (SAM) multipliers. IMPLAN takes the multipliers and divides them into industry categories in accordance with the North American Industrial Classification System (NAICS) codes, allowing a comprehensive breakdown of a region's multipliers by industry to be shown.

Despite the usefulness of input/output modeling, there are some shortcomings to the system. Notably, input-output models ignore economies of scale. Input-output models assume that costs and inputs remain proportionate through different levels of production. Further, multipliers are not generally updated on a timely basis; most multipliers are prone to be outdated with the current economy. If the multipliers are sourced from a year of a recession economy, the multipliers may not accurately represent the flows from an economic boom period. Additionally, multipliers may not capture sudden legal or technological changes which may improve or decrease efficiency in the production process.

Glossary of Terms for Input/Output Models

Multiplier Effect– the notion that initial outlays have a ripple effect on a local economy, to the extent that direct output leads to indirect and induced output.

Economic Impacts– total expenditures, employment, and labor income generated.

Tax Revenue Impacts– local and/or state tax revenues generated.

Direct Output– initial outlays usually associated with the project or activity being modeled; examples: one-time upfront construction and related expenditures associated with a new or renovated facility, annual expenditures associated with ongoing facility maintenance and/or operating activity.

Direct Employment– the number of annual jobs associated with direct output (including full- and part-time employment)

Direct Labor Income– the salaries and wages earned by employees, contractors, and proprietors as part of the direct output.

Indirect Output– indirect and induced outlays resulting from the direct output; examples: vendors increasing production to meet new demand associated with the direct output, workers spending direct labor income on various purchases within the local economy.

Indirect/Induced Employment– the number of annual jobs associated with indirect/induced output (including full- and part-time employment)

Indirect Labor Income– the salaries and wages earned by employees, contractors, and proprietors as part of the indirect output.

Total Output– the sum of direct output and indirect output.

Total Employment– the sum of direct employment and indirect employment.

Total Labor income– the sum of direct labor income and indirect labor income.

Source: Econsult Solutions, Inc. (2025)

Appendix E: About Econsult Solutions, Inc.

This report was produced by Econsult Solutions, Inc. (ESI), providing businesses and public policy makers with consulting and thought leadership services in urban economics, real estate, transportation, public infrastructure, economic development, public policy and finance, strategic planning, as well as expert witness services for litigation support.

ESI combines robust quantitative analysis with trusted expert insights to create sustainable solutions. The firm works collaboratively with its clients, and draws in expertise, when necessary, from our network of experts and partners across industries, regions, and management practices. Based in Philadelphia, the firm supports clients nationwide.

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