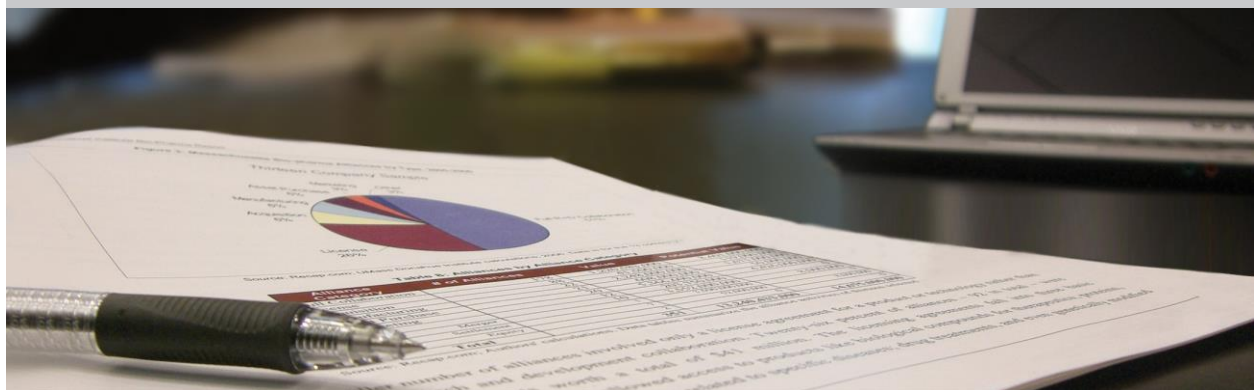


FY18 University of Massachusetts Economic Contribution Analysis

Prepared for the UMass President's Office

February 2020



UMASS DONAHUE INSTITUTE
Economic & Public
Policy Research

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The University of Massachusetts Donahue Institute is an outreach and economic development arm of the University of Massachusetts President's Office. Established in 1971, the Institute strives to connect its clients with the resources of the University, bridging theory and innovation with real world public and private sector applications. For more information: www.donahue.umassp.edu.

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EPPR produces in-depth economic impact and industry studies that help clients build credibility, gain visibility, educate constituents, and plan economic development initiatives. EPPR is known for providing unbiased economic analysis on state-level economic policy issues in Massachusetts and beyond, and has completed a number of industry studies on IT, defense industries, telecommunications, health care, and transportation. Their trademark publication is called *MassBenchmarks*, an economic journal that presents timely information concerning the performance of and prospects for the Massachusetts economy, including economic analyses of key industries that make up the economic base of the state.



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Executive Summary: UMass System Economic Contributions

The University of Massachusetts System offers invaluable educational opportunities in a wide array of disciplines and engages in important research activities recognized throughout the world. The general public tends to understand UMass's role in these key areas, but is often unaware that the institution is also a major contributor to the statewide economy. UMass not only makes a direct contribution to the Massachusetts economy through the spending and jobs supported by its academic, administration, and construction activities, but also generates a "ripple effect" that leads to an even larger impact in the economy as a result of demand on suppliers of goods and services as well as employee spending.

The purpose of this report is to perform an objective analysis to quantify the economic contributions of the University of Massachusetts System and its campuses on the Commonwealth's economy. The results of the economic contributions analysis for fiscal year (FY) 2018 indicate that:

- **The UMass System generated \$7.5 billion in economic activity in FY2018.** The UMass System (across all campuses) is a key economic driver in the Commonwealth, directly or indirectly affecting every person in the state. In FY2018, the University of Massachusetts contributed \$7.5 billion in economic activity to the Massachusetts economy. This includes the contributions of the local operating expenditures of the University, one-time major construction expenditures, the spending of the University's faculty and staff, and the spending of its students. Much of the UMass spending flows beyond the campuses to a variety of suppliers of goods and services, generating significant benefits for the Massachusetts economy.
- **FY2018 represented a robust period of construction for UMass, making a significant contribution to the Massachusetts economy.** Included in this \$7.5 billion total contribution were one-time building and infrastructure project expenditures totaling \$435 million in direct construction expenditures and over \$326 million in additional economic activity for a total of approximately \$762 million in one-time construction contributions. These construction projects were financed through University expenditures, the UMass Building Authority and the Commonwealth's Division of Capital Asset Management (DCAM). DCAM funding alone contributed over \$23 million directly to these projects in FY2018. All told, these construction projects supported 4,033 jobs in the Commonwealth. Unlike other campus activities such as payroll expenditures, construction on the campuses can spike or fall from year-to-year and thus either amplify or diminish its overall effect on the Massachusetts economy depending on the cycle. The new facilities, however, continue to play important roles after they are constructed by contributing to the University's competitive position to attract students, employees, and researchers. Benefits to UMass are long-term from new or renovated academic buildings, laboratories, athletic facilities, and other key infrastructure like heating plants and parking garages.

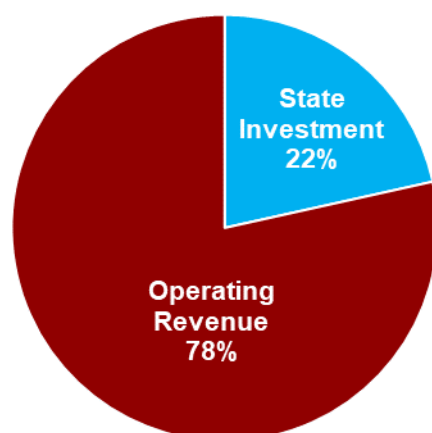
- **State investment in UMass leverages significantly greater economic activity.** In FY2018, the state's \$752 million investment in the UMass System helped leverage and support \$7.5 billion in economic activity in Massachusetts, an amount 10 times greater than the state's investment.
- **UMass employee payroll recirculates through the Massachusetts economy causing positive economic effects.** A notable share of UMass' spending also makes its way to employees in the form of salaries and wages, which is then circulated into the Massachusetts economy through typical household spending activities. In the Fall of 2018, the University employed 17,622 full- and part-time faculty and staff (excluding student employees).
- **UMass generates additional jobs beyond the campuses.** The spending of the University, its employees and students helped to support an additional 31,693 jobs in the Commonwealth throughout FY2018. Including faculty and staff, the University supported a total of 49,315 jobs in the Commonwealth.
- **UMass student off-campus spending further supports the Massachusetts economy.** In the Fall of 2018 (in FY2018), UMass System student enrollment was 74,705 (including undergraduates, graduate students, continuing education students, law students, and students in the Graduate Schools of Nursing, Biomedical Science and Medicine) and these students directly spent a substantial amount of money off-campus in the economy, which, in turn, generated additional economic activity.
- **UMass enrolled 74,705 students in the Fall of 2018.** There were 57,079 undergraduate students and 17,626 graduate students. 82.7 percent of all enrolled undergraduate students were in-state.
- **Each of the five University campuses generated substantial economic contributions for Massachusetts in FY2018.** By campus, contributions ranged from \$2.5 billion for Amherst and \$1.8 billion for the Medical School, respectively, to \$1.2 billion, \$1.2 billion and \$550 million for each of the Boston, Lowell and Dartmouth campuses.
- **The UMass System employed 17,622 full- and part-time faculty and staff in FY2018.**
- **More than 320,000 alumni live and work in the state.** Sixty-three percent of undergraduate alumni, 50 percent of graduate alumni, and 60 percent of all alumni remain in the state after graduation.¹

¹ <https://www.umassp.edu/sites/umassp.edu/files/publications/2019%20Annual%20Indicators%20Report.pdf>

- **The UMass System attracted \$374 million in federally funded research to the state in FY2018.²**
The amount of federally funded financial aid in FY2018 was \$438 million.³

The following figures and tables illustrate the main findings of the economic contributions analysis.

Figure 1. UMass System Operating Revenues Were 78% of Total Budget while State Revenues Comprised 22% in FY2018

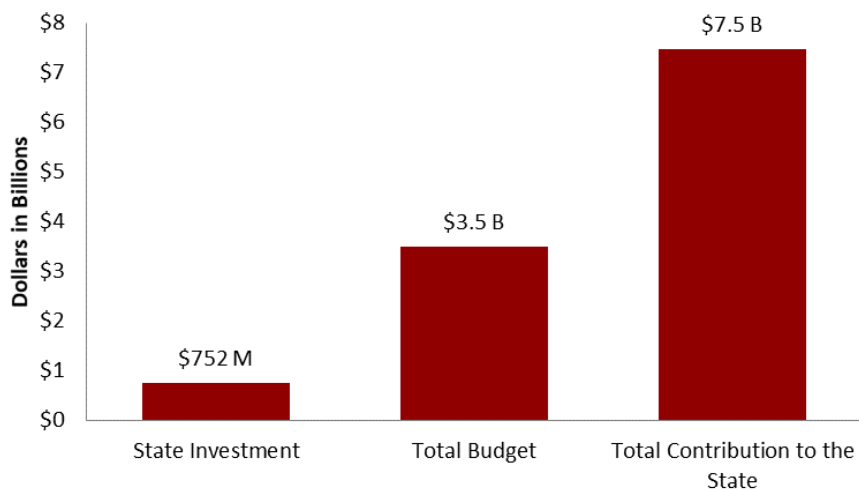


Sources: UMass Controller's Office, UMass President's Office, UMDI analysis

² <https://www.umassp.edu/sites/umassp.edu/files/publications/FY%202018%20R%26D%20Expenditures%20Report%20-%20Abridged%20Version%202.0%20%281%29.pdf>

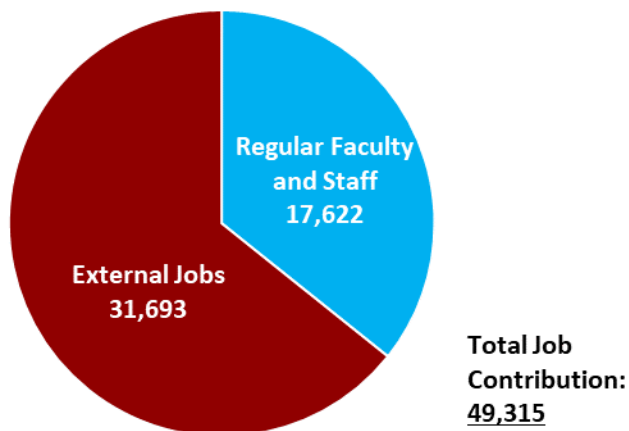
³ https://www.umassp.edu/sites/umassp.edu/files/publications/FY19%20Financial%20Aid%20Report.pptx_.pdf; Calculated by UMDI

Figure 2. State Investment in the UMass System Generated \$7.5 Billion in Massachusetts Economic Activity in FY2018



Sources: UMass Controller's Office, UMDI analysis

Figure 3. The UMass System Supported 49,315 Jobs in the Massachusetts Economy in FY2018



Sources: UMass Controller's Office, UMDI analysis

Table 1. FY2018 Economic Activity Contributions of the UMass System

Economic Output	State Investment	Campus Budget	Total Economic Activity (Output)
UMass Amherst	\$360,160,899	\$1,287,074,000	\$2,549,118,379
UMass Boston	\$135,604,815	\$454,316,000	\$1,218,350,860
UMass Central Administration	\$159,860	\$158,484,000	\$262,680,793
UMass Dartmouth	\$83,751,511	\$255,062,000	\$549,773,282
UMass Lowell	\$117,668,189	\$463,792,000	\$1,188,665,610
UMass Medical School	\$54,559,641	\$1,009,033,000	\$1,822,942,207
UMass System Total	\$751,904,915	\$3,493,829,000	\$7,475,700,052

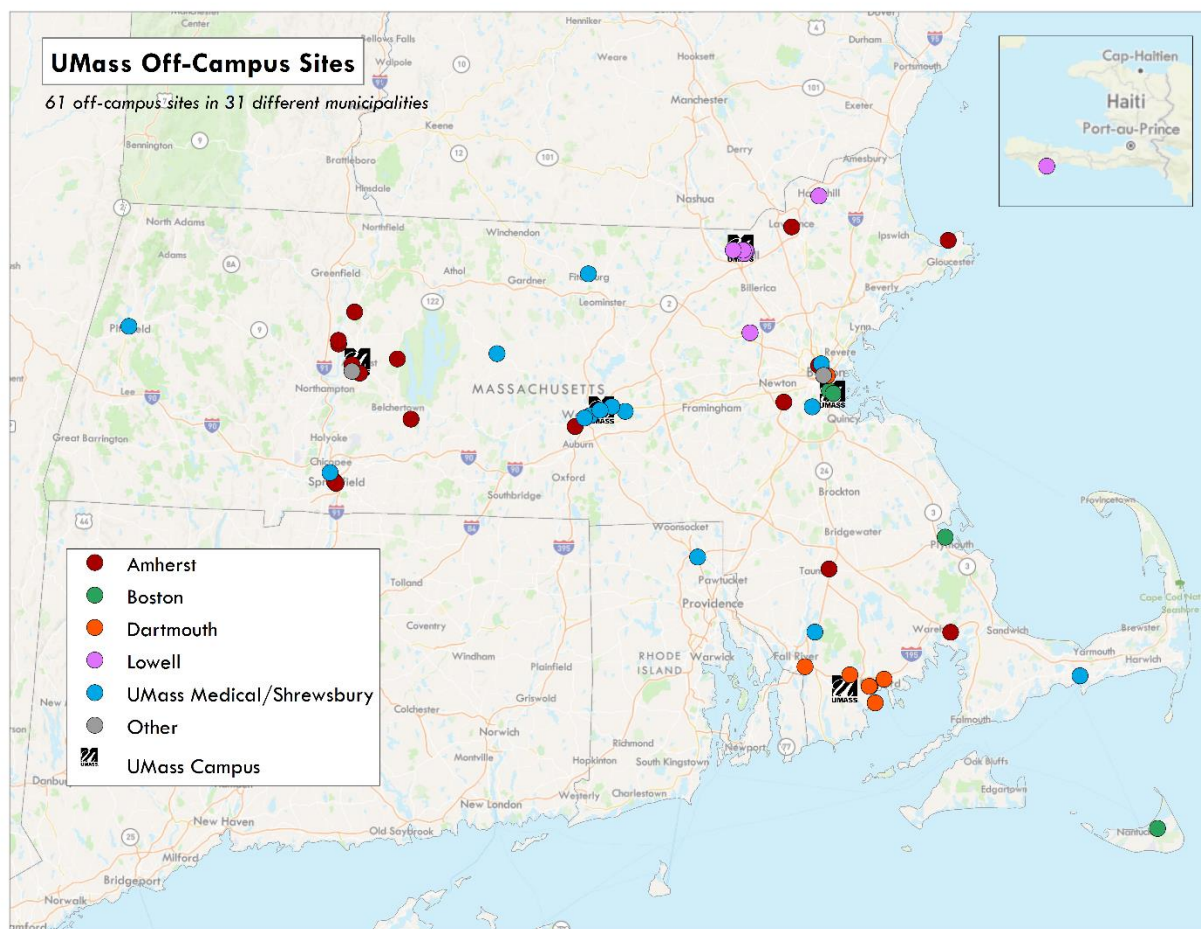
Sources: State investment and campus budget data were provided by the UMass Controller's Office. Total economic activity estimates derive from UMDI analysis. The Campus Budget and Total Economic Activity totals for the campuses do not sum to the UMass System Total because the UMass System Total excludes intercampus transfer payments to avoid double-counting.

Table 2. FY2018 Employment Activity Contributions of the UMass System

Employment	Regular Faculty and Staff	External Jobs	Total Jobs
UMass Amherst	5,728	10,939	16,667
UMass Boston	1,981	6,377	8,358
UMass Central Administration	388	643	1,031
UMass Dartmouth	1,185	2,617	3,802
UMass Lowell	1,839	5,623	7,462
UMass Medical School	6,501	5,494	11,995
UMass System Total	17,622	31,693	49,315

Sources: Regular faculty and staff figures were provided by the UMass Controller's Office and include all non-student and non-seasonal, full-time equivalent (FTE) employees. External job estimates derive from UMDI analysis. For the purposes of economic analysis, regular faculty and staff include only residents of Massachusetts. UMass Lowell has a large number of employees who live in New Hampshire and are not included in the analysis.

Figure 4. UMass Campus Locations and Significant Off-Campus Sites



Introduction

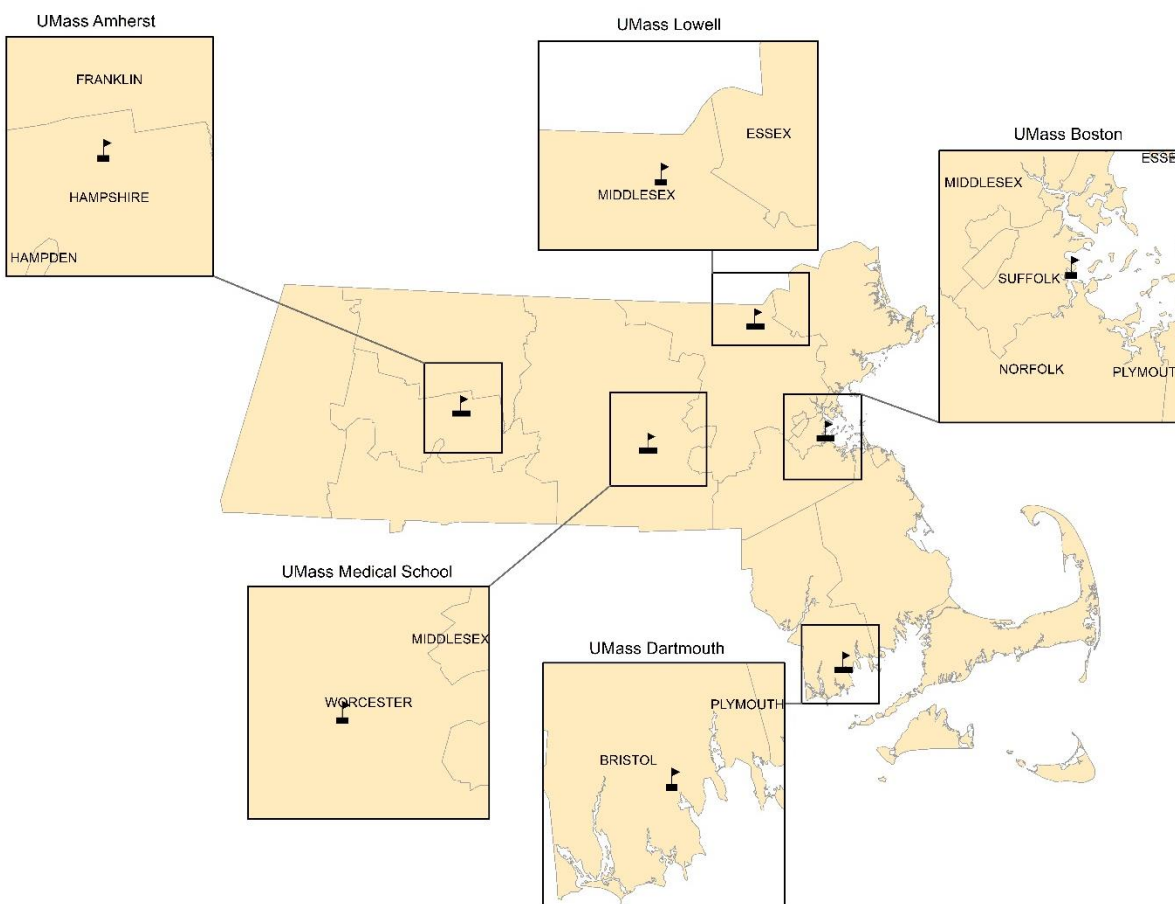
This report was prepared by the Economic and Public Policy Research (EPPR) group at the UMass Donahue Institute (UMDI) at the request of the University of Massachusetts Office of the President.

The purpose of this report is to perform an objective analysis that quantifies the economic contributions of the University of Massachusetts System and its campuses on the Commonwealth's economy. We identified certain direct, indirect, and induced economic contributions that the University of Massachusetts makes to the statewide economy. The positive economic contributions that the University of Massachusetts makes are exceptionally substantial and are based upon a highly-regarded and well-documented economic impact model, Impact Analysis for Planning ("IMPLAN"), that produce economic impact multipliers appropriate for the University of Massachusetts System. The results of the analysis are based on a conservative consideration of FY2018 University expenditures. The economic impact model (IMPLAN), methodological approach, and data sources used in this analysis are described in further detail in the Appendix of the report.

This study examines the economic contributions of the entire UMass System as well as for the five campuses by following a consistent analytical framework. The study encapsulates the economic contributions of the five campuses:

- UMass Amherst
- UMass Boston
- UMass Dartmouth (including the Law School)
- UMass Lowell
- UMass Medical School (including Worcester City Campus Corporation and UHealthSolutions)

Figure 5. Map of the UMass System



Separate sections, providing more detailed data on respective economic contributions, are devoted to each campus within the body of this study. Together, these five campuses in combination with the UMass Central Administrative Services’ operations (including the UMass President’s Office, UMass Foundation, Edward M. Kennedy Institute for the United States Senate, and the UMass Building Authority) comprise the “UMass System”.

The results of our analysis are presented in terms of UMass’ economic contributions to the Commonwealth of Massachusetts’ economic output (or “economic activity”) and jobs in FY2018.⁴ The economic contributions are the result of four categories of expenditures that are all fundamental activities relating to the operation of the University of Massachusetts:

⁴ The analysis was careful to count only activity likely to have an impact in Massachusetts and excluded payroll of non-Massachusetts residents and expenditures made to non-Massachusetts vendors.

- **Operating expenditures**, comprising a wide variety of University spending for the purpose of purchasing goods and services required for its educational, research, and public services activities;
- **Payroll spending** of regular (non-seasonal) and non-student University employees;
- **Student spending** on off-campus living expenses, books, transportation, and various personal expenses related to attending school in the UMass System; and
- **Construction expenditures** for one-time capital projects funded by the University (through the UMass Building Authority) and on behalf of the University (through the Division of Capital Asset Management, or DCAM).

Beyond the economic output and jobs resulting from these four categories of expenditures, the UMass System also serves as a catalyst for the Massachusetts economy in many other ways that were beyond the scope of this study. These include urban revitalization (UMass activities can spur others to make their own investments nearby the campuses), travel and tourism (visitation to the campuses), business activities resulting from UMass innovations and industry partnerships (i.e., sales and jobs associated with start-ups or existing enterprises that apply UMass innovations to market products or services sold in the U.S. and worldwide), and entrepreneurship and business start-ups (UMass plays a direct role in various incubators, accelerators and small business support centers).

UMass Amherst Economic Contributions

The University of Massachusetts offers invaluable educational opportunities in a wide array of disciplines and engages in important research activities recognized throughout the world. The general public tends to understand UMass's role in these key areas, but is often unaware that the institution is also a major contributor to the statewide economy. UMass not only makes a direct contribution to the Massachusetts economy through the spending and jobs supported by its academic, administration, and construction activities, but also generates a "ripple effect" that leads to an even larger impact in the economy as a result of demand on suppliers of goods and services as well as employee spending.

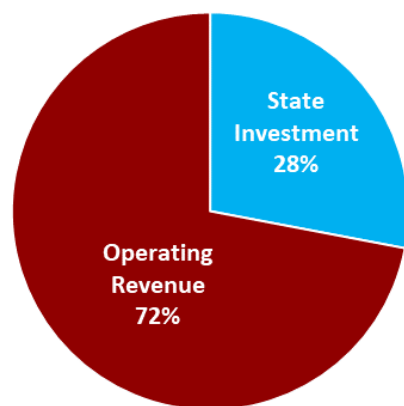
The results of the economic contributions analysis of the UMass Amherst campus for FY2018 indicate that:

- **UMass Amherst generated \$2.5 billion in economic activity in FY2018.** UMass Amherst is a key economic driver in the Commonwealth, directly or indirectly affecting every person in the state. In FY2018, UMass Amherst contributed \$2.5 billion in economic activity to the Massachusetts economy. This includes the contributions of the local operating expenditures of UMass Amherst, one-time major construction expenditures, the spending of the Amherst campus' faculty and staff, and the spending of its students. Much of the UMass spending flows beyond the campus to a variety of suppliers of goods and services, generating significant benefits for the Massachusetts economy.
- **FY2018 represented a robust period of construction on the Amherst campus, making a significant contribution to the Massachusetts economy.** Included in this \$2.5 billion total contribution were one-time building and infrastructure project expenditures totaling more than \$175 million in direct construction expenditures and over \$111 million in additional economic activity for a total of approximately \$287 million in one-time construction contributions. These construction projects were financed through University expenditures, the UMass Building Authority and the Commonwealth's Division of Capital Asset Management (DCAM). DCAM funding alone contributed more than \$22 million directly to these projects in FY2018. All told, these construction projects supported 1,374 jobs. Unlike other campus activities such as payroll expenditures, construction on the campuses can spike or fall from year-to-year and thus either amplify or diminish its overall effect on the Massachusetts economy depending on the cycle. The new facilities, however, continue to play important roles after they are constructed by contributing to the University's competitive position to attract students, employees, and researchers. Major construction projects taking place at UMass Amherst in FY2018 included the Olver Design Building, the expansion of the Isenberg School of Management, the fitout of the Life Sciences Laboratories, the Chiller Plant Upgrades, and the Research Laboratory Renovations, among others.
- **State investment in UMass Amherst leverages significantly greater economic activity.** In FY2018, the state's \$360 million investment in UMass Amherst helped leverage and support \$2.5 billion in economic activity in Massachusetts, an amount 7 times greater than the state's investment.

- **UMass Amherst employee payroll recirculates through the Massachusetts economy causing positive economic effects.** A notable share of UMass Amherst's spending also makes its way to employees in the form of salaries and wages, which is then circulated into the Massachusetts economy through typical household spending activities. In the Fall of 2018 (FY2018), UMass Amherst employed 5,728 full- and part-time faculty and staff (excluding student employees).
- **UMass Amherst generates additional jobs beyond the campus.** The spending of UMass Amherst, its employees and students helped to support an additional 10,939 jobs in the Commonwealth throughout FY2018. Including faculty and staff, UMass Amherst supported a total of 16,667 jobs in the Commonwealth.
- **UMass Amherst student off-campus spending further supports the Massachusetts economy.** In the Fall of 2018 (FY2018), UMass Amherst student enrollment was 30,593 (including undergraduate and graduate students) and these students directly spent a significant amount of money off-campus in the economy, which, in turn, generated additional economic activity.

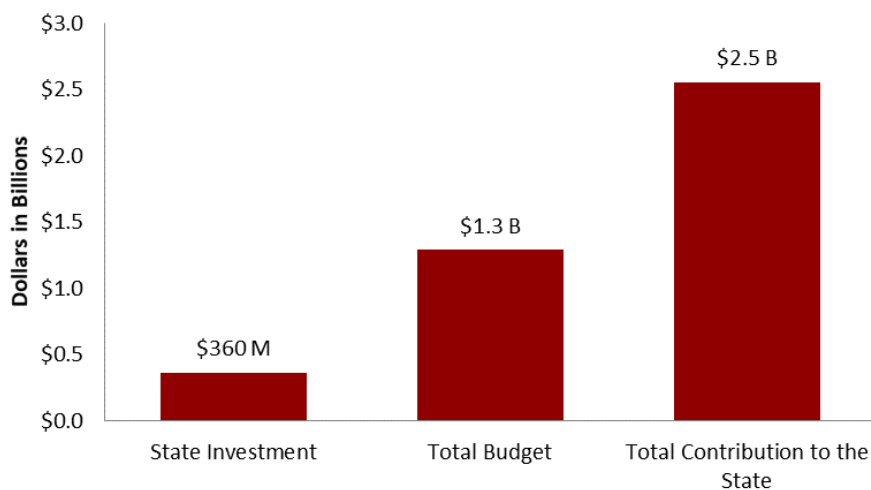
The following figures and tables illustrate the main findings of the economic contributions analysis.

Figure 6. UMass Amherst Operating Revenues Were 72% of Total Budget while State Investment Comprised 28% in FY2018



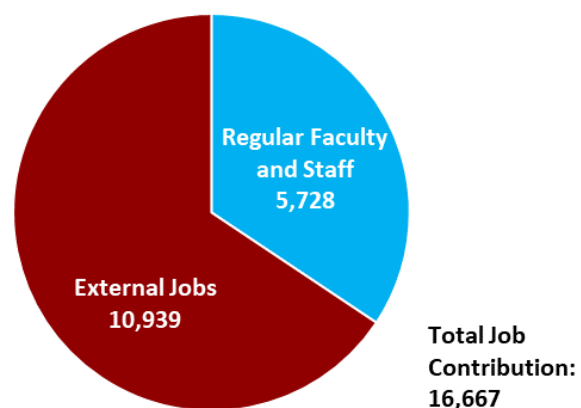
Sources: UMass Controller's Office, UMDI analysis

Figure 7. State Investment in UMass Amherst Generated \$2.5 Billion in Massachusetts Economic Activity in FY2018



Sources: UMass Controller's Office, UMDI analysis

Figure 8. UMass Amherst Supported 16,667 Jobs in the Massachusetts Economy in FY2018



Sources: UMass Controller's Office, UMDI analysis

Table 3. Summary of FY2018 Economic and Employment Contributions of UMass Amherst

Economic Output	State Investment	Campus Budget	Total Economic Activity (Output)
	\$360,160,899	\$1,287,074,000	\$2,549,118,379
Employment	Regular Faculty and Staff	External Jobs	Campus Total
	5,728	10,939	16,667

Sources: State investment and campus budget data were provided by the UMass Controller's Office. Total economic activity estimates derive from UMDI analysis. Regular faculty and staff figures were provided by the UMass Controller's Office and include all non- student and non-seasonal, full-time equivalent (FTE) employees who live in Massachusetts. External job estimates derive from UMDI analysis.

Figure 9. UMass Amherst Campus Locations and Significant Off-Campus Sites

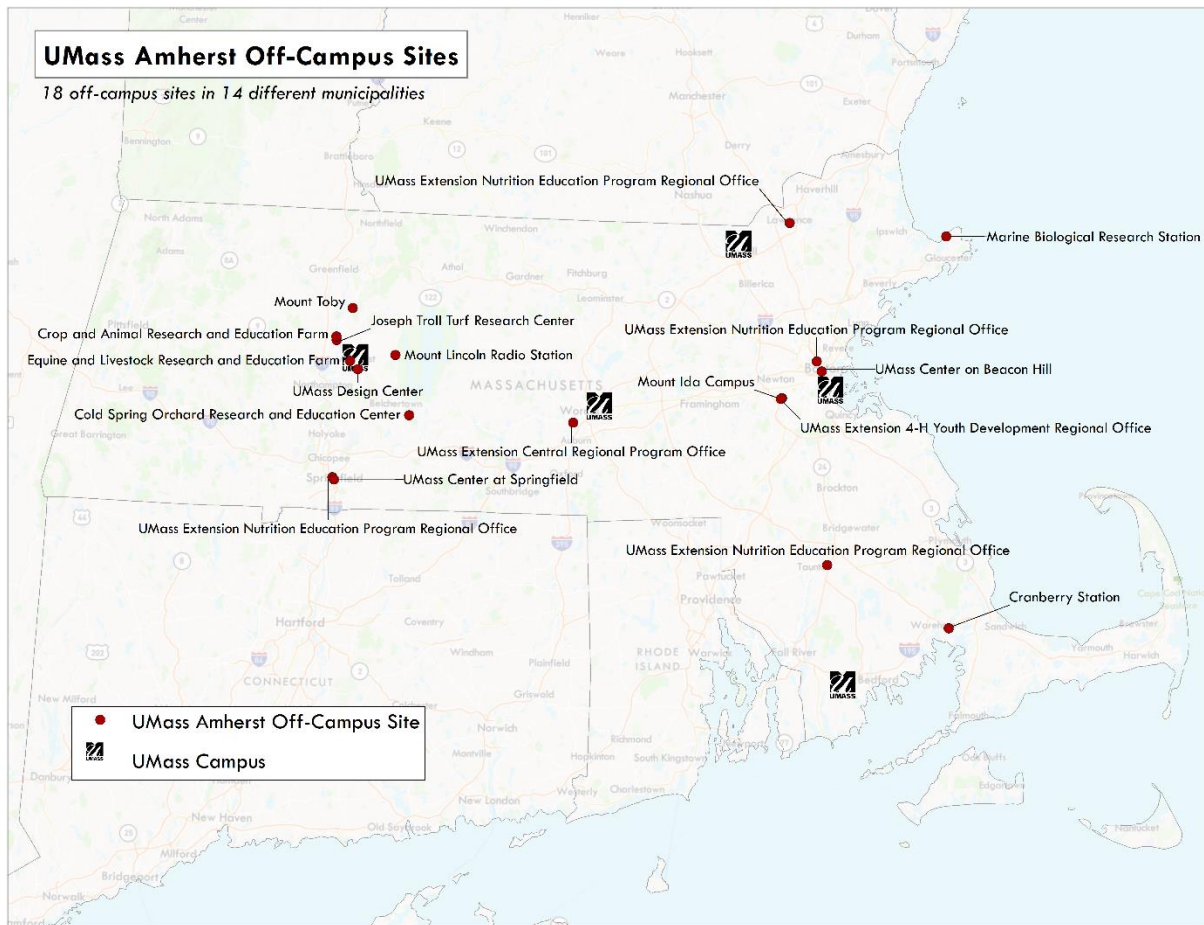


Table 4. Major UMass Amherst Off-Campus Sites

UMass Amherst & Site	Municipality	Site Description
Cold Spring Orchard Research and Education Center	Belchertown	UMass Amherst's Cold Spring Orchard is the site of significant research, graduate and undergraduate education in fruit-growing practices, and ongoing education and professional development for commercial orchardists through their observation and adoption of state-of-the-art management systems. The focus of the research is to find better ways to grow fruit in Massachusetts, including the testing of new varieties, the evaluation of more efficient horticultural techniques, and the development of more environmentally-friendly management approaches.
Joseph Troll Turf Research Center	South Deerfield	The UMass Joseph Troll Turf Research Center sits on 17 acres on River Road in South Deerfield. The research at the facility, conducted by faculty in the Stockbridge School of Agriculture, is oriented toward developing or refining techniques that will allow turf managers to protect their natural environment while maintaining turf that meets the demands of their facilities.
Crop and Animal Research and Education Farm	South Deerfield	The UMass Crop and Animal Research and Education Farm provides faculty, extension staff, and graduate students with support in applied research on vegetable crops, agronomic and bioenergy crops, organic agriculture, pest management, pasture management, and natural resource conservation. It is also home to the student-run "Student Farming Enterprise" that allows undergraduates to gain hands on experience in managing a small organic farm. The farm is also home to the University's Belted Galloway cattle herd which provides students with experience in the management and husbandry of cattle.
Cranberry Station	East Wareham	The UMass Cranberry Station, located in East Wareham, is an outreach and research center charged with maintaining and enhancing the economic viability of the Massachusetts cranberry industry through research and outreach. It also serves the public welfare by supporting economic development and the protection of the environment.
Marine Biological Research Station	Gloucester	UMass Amherst's Gloucester Marine Station works with a range of partners to advance community resilience, sustainable fisheries and discover blue economy opportunities on the North Shore with far-reaching applications in Massachusetts, New England and beyond.
UMass Equine and Livestock Research and Education Farm	Hadley	The UMass Equine and Livestock Research and Education Farm houses approximately 24 horses, 60 small ruminants (sheep/goats), and is also home to the UMass Mounted Police and Equestrian Team. Additionally, the farm serves as a host for a number of equestrian shows and farm related events – most notably the Bay State Livestock Classic held by the University every spring since 1935. It offers students the ability to acquire true hands-on animal management experience – a benefit not found at many other universities in the region.

UMass - Mount Lincoln Radio Station	Pelham	The Mount Lincoln Radio Station is managed by UMass Amherst and is the home of the Five Colleges radio station beacon.
Mount Toby	Sunderland	The Mt. Toby Demonstration Forest is managed by UMass Amherst's Department of Natural Resources Conservation and is used for teaching, research and demonstration. The department often coordinates with recreational users of the forest, as well as the Massachusetts Department of Conservation & Recreation and other organizations.
UMass Extension Nutrition Education Program Regional Office	Springfield	This office is the base for a staff of ten professional and paraprofessional educators who work with low-income families and individuals in western Massachusetts to improve their knowledge of good nutrition and related topics including physical activity. Program activities are funded by two federal programs: the Expanded Food and Nutrition Education Program (EFNEP) and the Supplemental Nutrition Assistance Program Education.
UMass Extension Nutrition Education Program Regional Office	Lawrence	This office is the base for a staff of seven professional and paraprofessional educators who work with low-income families and individuals in northeastern Massachusetts to improve their knowledge of good nutrition and related topics including physical activity. Program activities are funded by two federal programs: the Expanded Food and Nutrition Education Program (EFNEP) and the Supplemental Nutrition Assistance Program Education.
UMass Extension Nutrition Education Program Regional Office	Boston	This office is the base for a staff of seven professional educators who work with low-income families and individuals in Greater Boston to improve their knowledge of good nutrition and related topics including physical activity. Program activities are funded by the federal Supplemental Nutrition Assistance Program Education.
UMass Extension Nutrition Education Program Regional Office	Raynham	This office is the base for a staff of 12 professional and paraprofessional educators who work with low-income families and individuals in southeastern Massachusetts to improve their knowledge of good nutrition and related topics including physical activity. Program activities are funded by two federal programs: the Expanded Food and Nutrition Education Program (EFNEP) and the Supplemental Nutrition Assistance Program Education.
UMass Extension Central Regional Program Office	Worcester	This office houses program offices for the UMass Extension Nutrition Education Program (NEP) and the UMass Extension 4-H Youth Development Program (4-H) in central Massachusetts. NEP has staff of eight professional and paraprofessional educators who work with low-income families and individuals in central Massachusetts to improve their knowledge of good nutrition and related topics including physical activity. Program activities are funded by two federal programs: the Expanded Food and Nutrition Education Program (EFNEP) and the Supplemental Nutrition Assistance Program Education. Three 4-H staff support a base of adult volunteers working with youth ages 5-18 who help young people learn life skills in non-formal educational settings such as clubs, camps and afterschool programs.

UMass Extension 4-H Youth Development Regional Office	Newton	Five 4-H staff support a base of adult volunteers working with youth ages 5-18 who help young people learn life skills in non-formal educational settings such as clubs, camps and afterschool programs. The staff in this office work with volunteers in Suffolk, Middlesex and Essex counties.
UMass Extension 4-H Youth Development Regional Office	Walpole	Two 4-H staff support a base of adult volunteers working with youth ages 5-18 who help young people learn life skills in non-formal educational settings such as clubs, camps and afterschool programs. The staff in this office work with volunteers in Bristol and Norfolk counties.
UMass Design Center	Springfield	The UMass Design Center is a collaborative center that initiates innovation projects aimed at strengthening the connection between UMass and local towns. The Design Center provides students with opportunities to explore community outreach, urban design, and city planning.
UMass Center on Beacon Hill	Boston	The UMass Center on Beacon Hill provides classes in downtown Boston that serves individuals seeking to advance their education while working in the city's business, government, and commercial core.
UMass Center at Springfield	Springfield	The UMass Center at Springfield is a central location for students, offering traditional in-classroom learning, advanced telecommunications, and other course-specific opportunities. The center enables students to pursue continued adult education, professional certifications, and Bachelor's and Master's degrees.

UMass Boston Economic Contributions

The University of Massachusetts offers invaluable educational opportunities in a wide array of disciplines and engages in important research activities recognized throughout the world. The general public tends to understand UMass's role in these key areas, but is often unaware that the institution is also a major contributor to the statewide economy. UMass not only makes a direct contribution to the Massachusetts economy through the spending and jobs supported by its academic, administration, and construction activities, but also generates a "ripple effect" that leads to an even larger impact in the economy as a result of demand on suppliers of goods and services as well as employee spending.

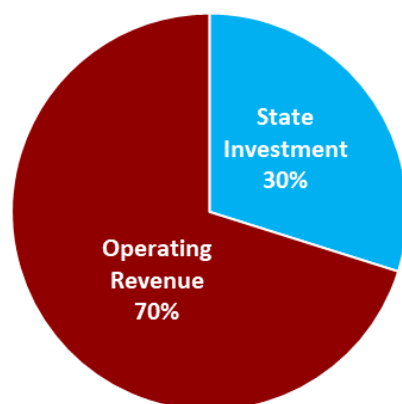
The results of the economic contributions analysis of the UMass Boston campus for FY2018 indicate that:

- **UMass Boston generated \$1.2 billion in economic activity in FY2018.** UMass Boston is a key economic driver in the Commonwealth, directly or indirectly affecting every person in the state. In FY2018, UMass Boston contributed \$1.2 billion in economic activity to the Massachusetts economy. This includes the contributions of the local operating expenditures of UMass Boston, one-time major construction expenditures, the spending of the Boston campus' faculty and staff, and the spending of its students. Much of the UMass spending flows beyond the campus to a variety of suppliers of goods and services, generating significant benefits for the Massachusetts economy.
- **FY2018 represented a robust period of construction on the Boston campus, making a significant contribution to the Massachusetts economy.** Included in this \$1.2 billion total contribution were one-time building and infrastructure project expenditures totaling more than \$129 million in direct construction expenditures and \$105 million in additional economic activity for a total of over \$234 million in one-time construction contributions. These construction projects were financed through University expenditures, the UMass Building Authority and the Commonwealth's Division of Capital Asset Management (DCAM). All told, these construction projects supported 1,393 jobs. Unlike other campus activities such as payroll expenditures, construction on the campuses can spike or fall from year-to-year and thus either amplify or diminish its overall effect on the Massachusetts economy depending on the cycle. The new facilities, however, continue to play important roles after they are constructed by contributing to the University's competitive position to attract students, employees, and researchers. Major construction projects taking place at UMass Boston in FY2018 included the University Hall General Academic Building, Utility Corridor and Roadway Relocation Project (for improved traffic and pedestrian circulation and utility connections to better accommodate future growth), the new Parking Garage, the Residence Hall and Dining Facility, the Clark Athletic Center Renovation, and the Elevator Upgrades Project, among others.
- **State investment in UMass Boston leverages significantly greater economic activity.** In FY2018, the state's nearly \$136 million investment in UMass Boston helped leverage and support \$1.2 billion in economic activity in Massachusetts, an amount 9 times greater than the state's investment.

- **UMass Boston employee payroll recirculates through the Massachusetts economy causing positive economic effects.** A notable share of UMass Boston's spending also makes its way to employees in the form of salaries and wages, which is then circulated into the Massachusetts economy through typical household spending activities. In the Fall of 2018 (FY2018), UMass Boston employed approximately 1,981 full- and part-time faculty and staff (excluding student employees).
- **UMass Boston generates additional jobs beyond the campus.** The spending of UMass Boston, its employees and students helped to support an additional 6,377 jobs in the Commonwealth throughout FY2018. Including faculty and staff, UMass Boston supported a total of 8,358 jobs in the Commonwealth.
- **UMass Boston student off-campus spending further supports the Massachusetts economy.** In the Fall of 2018 (FY2018), UMass Boston student enrollment was 16,164 (including undergraduate and graduate students) and these students directly spent a significant amount of money off-campus in the economy, which, in turn, generated additional economic activity.

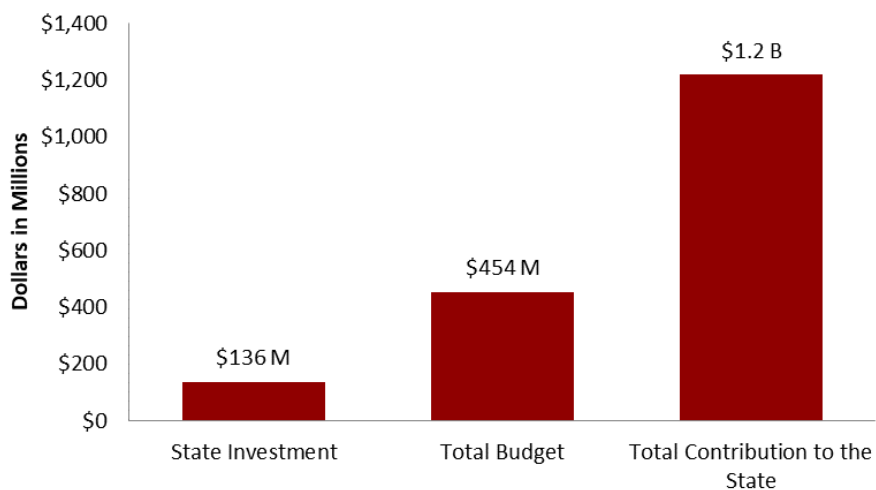
The following figures and tables illustrate the main findings of the economic contributions analysis.

Figure 10. UMass Boston Operating Revenues Were 70% of Total Budget while State Investment Comprised 30% in FY2018

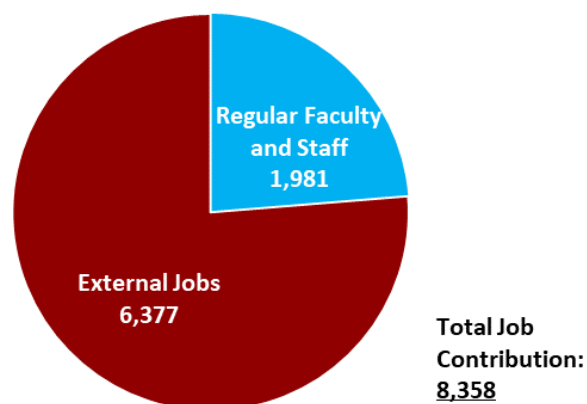


Sources: UMass Controller's Office, UMDI analysis

Figure 11. State Investment in UMass Boston Generated \$1.2 Billion in Massachusetts Economic Activity in FY2018



Sources: UMass Controller's Office, UMDI analysis

Figure 12. UMass Boston Supported 8,358 Jobs in the Massachusetts Economy in FY2018

Sources: UMass Controller's Office, UMDI analysis

Table 5. Summary of FY2018 Economic and Employment Contributions of UMass Boston

Economic Output	State Investment	Campus Budget	Total Economic Activity (Output)
	\$135,604,815	\$454,316,000	\$1,218,350,860
Employment	Regular Faculty and Staff	External Jobs	Campus Total
	1,981	6,377	8,358

Sources: State investment and campus budget data were provided by the UMass Controller's Office. Total economic activity estimates derive from UMDI analysis. Regular faculty and staff figures were provided by the UMass Controller's Office and include all non-student and non-seasonal, full-time equivalent (FTE) employees who live in Massachusetts. External job estimates derive from UMDI analysis.

Figure 13. UMass Boston Campus Locations and Significant Off-Campus Sites

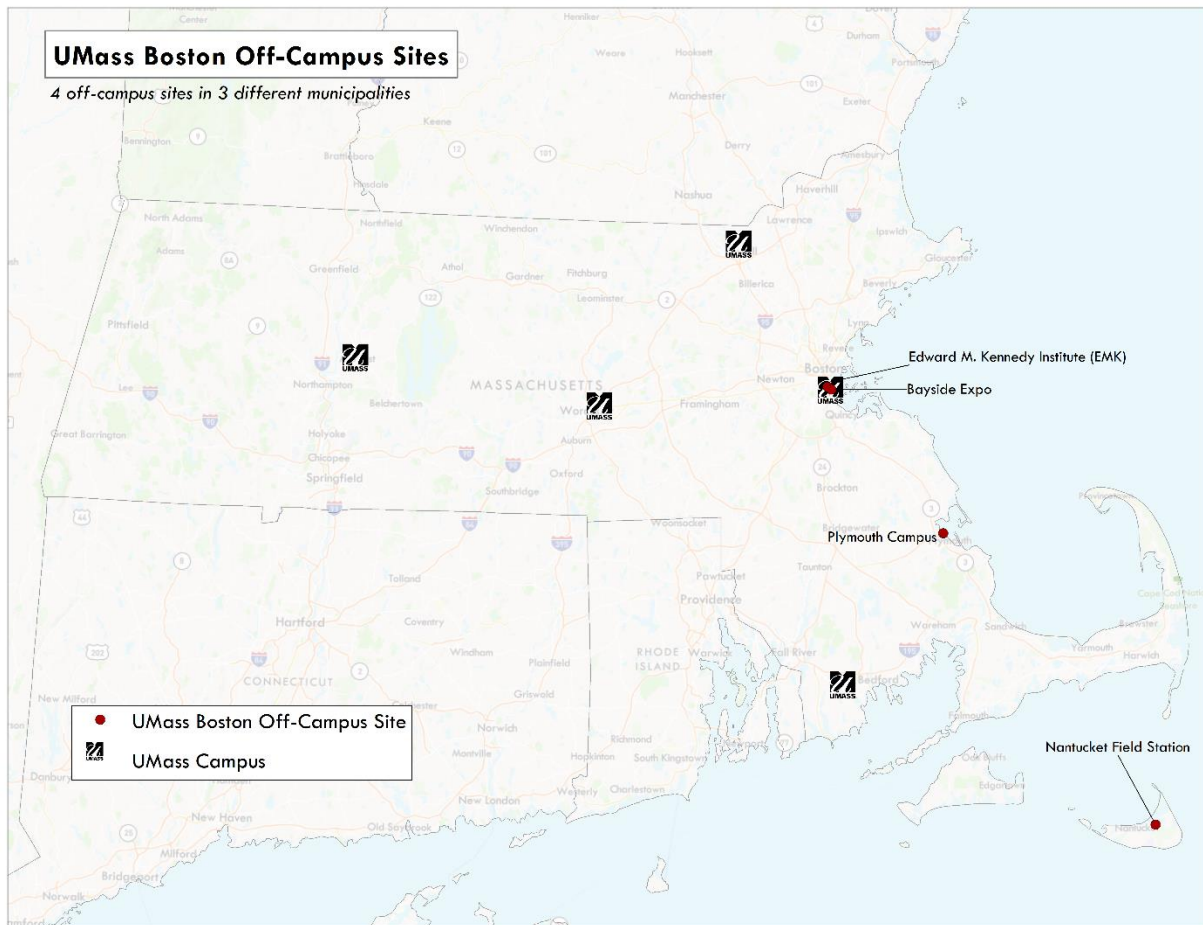


Table 6. Major UMass Boston Off-Campus Sites

UMass Boston & Site	Municipality	Site Description
Bayside Expo	Boston	The Bayside Expo Property is a UMass-owned parcel of land that will be utilized to build a mixed-use urban innovation campus. The site was formerly home to the Bayside Expo Center.
Nantucket Field Station	Nantucket	The Nantucket Field Station, one of the facilities of UMass Boston's School for the Environment, is a 107-acre field site of pristine salt marsh, rolling uplands, and harbor waterfront which provides education, research, and community service. We are a world-class research and educational institution and a deeply engaged member of the Nantucket community.
Plymouth Campus	Plymouth	Location in Plymouth where classes are held in sustainability, archeology, biomimicry.
Edward M. Kennedy Institute (EMK)	Boston	The Edward M. Kennedy Institute offers educational programs, public forums, and digital exhibits aimed to educate the public about government and civil discourse.

UMass Dartmouth Economic Contributions

The University of Massachusetts offers invaluable educational opportunities in a wide array of disciplines and engages in important research activities recognized throughout the world. The general public tends to understand UMass's role in these key areas, but is often unaware that the institution is also a major contributor to the statewide economy. UMass not only makes a direct contribution to the Massachusetts economy through the spending and jobs supported by its academic, administration, and construction activities, but also generates a "ripple effect" that leads to an even larger impact in the economy as a result of demand on suppliers of goods and services as well as employee spending.

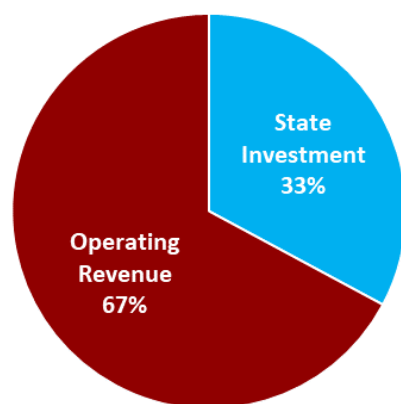
The results of the economic contributions analysis of the UMass Dartmouth campus for FY2018 indicate that:

- **UMass Dartmouth generated almost \$550 million in economic activity in FY2018.** UMass Dartmouth is a key economic driver in the Commonwealth, directly or indirectly affecting every person in the state. In FY2018, UMass Dartmouth contributed nearly \$550 million in economic activity to the Massachusetts economy. This includes the contributions of the local operating expenditures of UMass Dartmouth, one-time major construction expenditures, the spending of the Dartmouth campus' faculty and staff, and the spending of its students. Much of the UMass spending flows beyond the campus to a variety of suppliers of goods and services, generating significant benefits for the Massachusetts economy.
- **FY2018 represented a strong period of construction on the Dartmouth campus, making a significant contribution to the Massachusetts economy.** Included in this \$550 million total contribution were one-time building and infrastructure project expenditures totaling nearly \$26 million in direct construction expenditures and over \$21 million in additional economic activity for a total of \$48 million in one-time construction contributions. These construction projects were financed through University expenditures, the UMass Building Authority and the Commonwealth's Division of Capital Asset Management (DCAM). All told, these construction projects supported 270 jobs. Unlike other campus activities such as payroll expenditures, construction on the campuses can spike or fall from year-to-year and thus either amplify or diminish its overall effect on the Massachusetts economy depending on the cycle. The new facilities, however, continue to play important roles after they are constructed by contributing to the University's competitive position to attract students, employees, and researchers. Major construction projects taking place at UMass Dartmouth in FY2018 included the expansion of the School of Marine Sciences and Technology.
- **State investment in UMass Dartmouth leverages significantly greater economic activity.** In FY2018, the state's \$84 million investment in UMass Dartmouth helped leverage and support nearly \$550 million in economic activity in Massachusetts, an amount 7 times greater than the state's investment.

- **UMass Dartmouth employee payroll recirculates through the Massachusetts economy causing positive economic effects.** A notable share of UMass Dartmouth's spending also makes its way to employees in the form of salaries and wages, which is then circulated into the Massachusetts economy through typical household spending activities. In the Fall of 2018 (FY2018), UMass Dartmouth employed approximately 1,185 full- and part-time faculty and staff (excluding student employees).
- **UMass Dartmouth generates additional jobs beyond the campus.** The spending of UMass Dartmouth, its employees and students helped to support an additional 2,617 jobs in the Commonwealth throughout FY2018. Including faculty and staff, UMass Dartmouth supported a total of 3,802 jobs in the Commonwealth.
- **UMass Dartmouth student off-campus spending further supports the Massachusetts economy.** In the Fall of 2018 (FY2018), UMass Dartmouth student enrollment was 8,513 (including undergraduate, law students, and other graduate students) and these students directly spent a significant amount of money off-campus in the economy, which, in turn, generated additional economic activity.

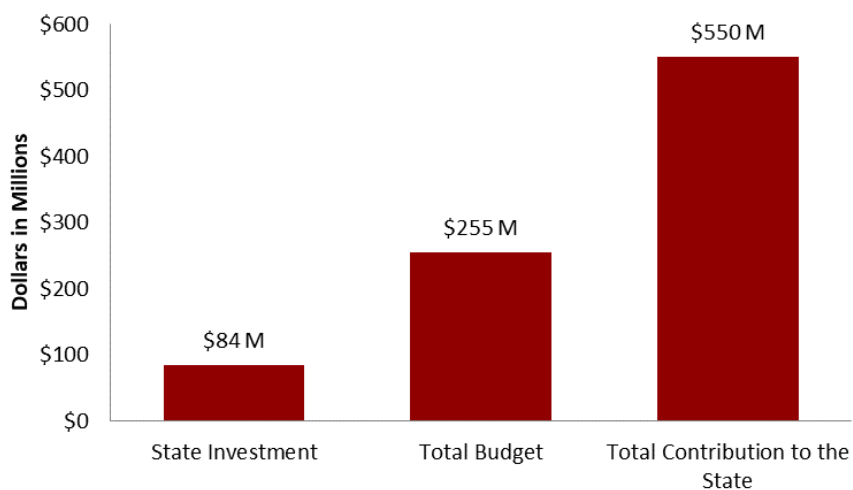
The following figures and tables illustrate the main findings of the economic contributions analysis.

Figure 14. UMass Dartmouth Operating Revenues Were 67% of Total Budget while State Investment Comprised 33% in FY2018



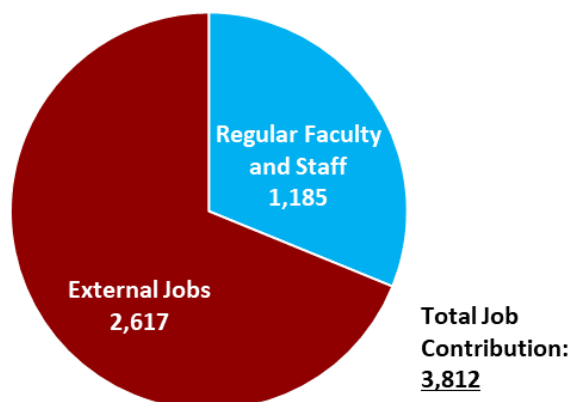
Sources: UMass Controller's Office, UMDI analysis

Figure 15. State Investment in UMass Dartmouth Generated \$550 Million in Massachusetts Economic Activity in FY2018



Sources: UMass Controller's Office, UMDI analysis

Figure 16. UMass Dartmouth Supported 3,802 Jobs in the Massachusetts Economy in FY2018



Sources: UMass Controller's Office, UMDI analysis

Table 7. Summary of FY2018 Economic and Employment Contributions of UMass Dartmouth

Economic Output	State Investment	Campus Budget	Total Economic Activity (Output)
	\$83,751,511	\$255,062,000	\$549,773,282
Employment	Regular Faculty and Staff	External Jobs	Campus Total
	1,185	2,617	3,802

Sources: State investment and campus budget data were provided by the UMass Controller's Office. Total economic activity estimates derive from UMDI analysis. Regular faculty and staff figures were provided by the UMass Controller's Office and include all non-student and non-seasonal, full-time equivalent (FTE) employees who live in Massachusetts. External job estimates derive from UMDI analysis.

Figure 17. UMass Dartmouth Campus Locations and Significant Off-Campus Sites

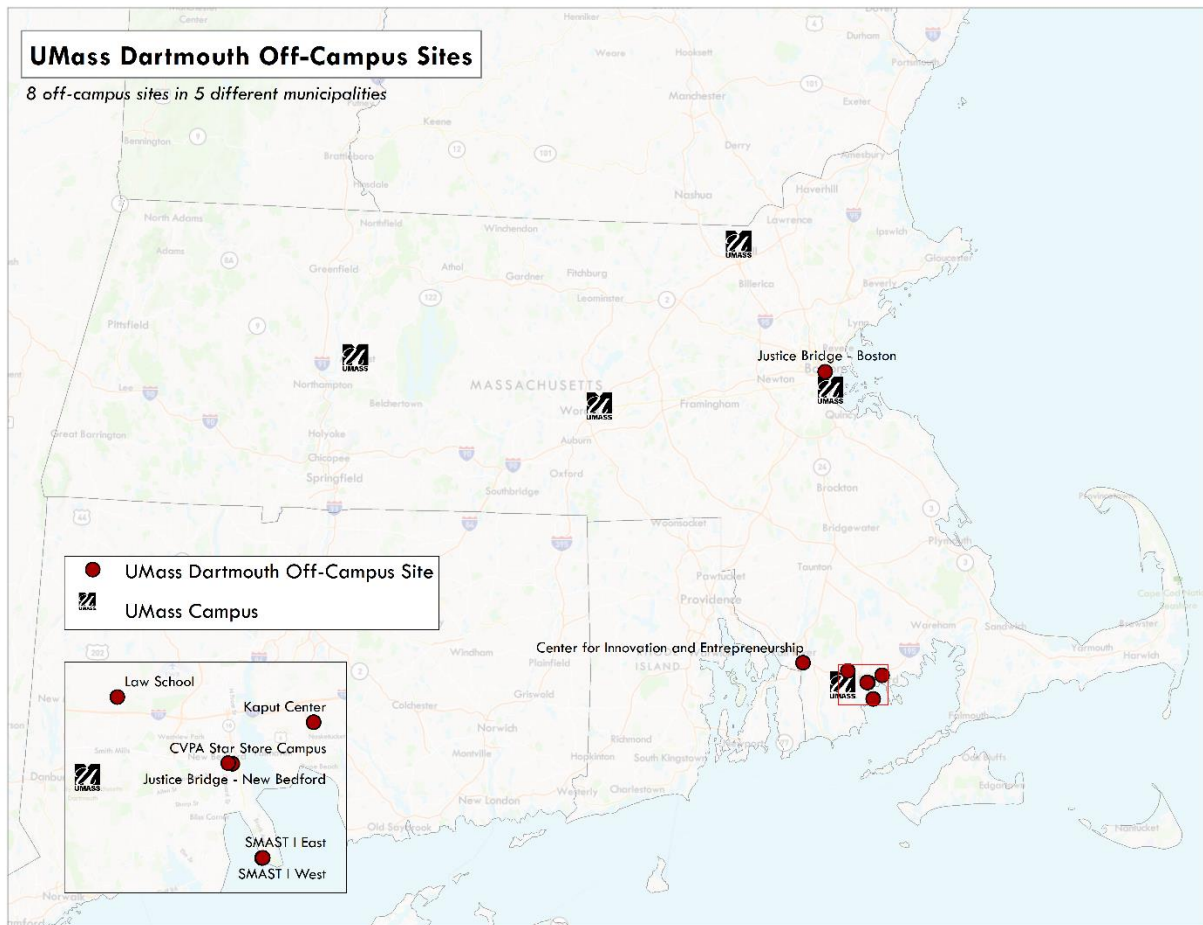


Table 8. Major UMass Dartmouth Off-Campus Sites

UMass Dartmouth & Site	Municipality	Site Description
Center for Innovation and Entrepreneurship	Fall River	In 2001, UMass Dartmouth opened the Advanced Technology Manufacturing Center (ATMC) in Fall River to encourage and support technology-focused businesses. In 2015, the ATMC reviewed and refined its mission to provide more experiential opportunities for UMass Dartmouth students and faculty and more proactively build economic development in the region.
Law School	Dartmouth	UMass Law is the only public law school in Massachusetts. The school is committed to providing an excellent, affordable, and accessible legal education that prepares its students to thrive in a changing profession, and advances justice through research, teaching and practice.
SMAST I West	New Bedford	The west campus of UMass Dartmouth's School for Marine Science & Technology (SMAST) offers graduate degree programs, which focus on interdisciplinary basic-to-applied marine sciences and the development of related innovative technologies.
SMAST I East	New Bedford	The east campus of UMass Dartmouth's School for Marine Science & Technology (SMAST) offers graduate degree programs, which focus on interdisciplinary basic-to-applied marine sciences and the development of related innovative technologies.
Kaput Center	Fairhaven	The KAPUT Center for Research and Innovation serves as an interdisciplinary research center in STEM education for graduate students and UMass Dartmouth faculty in the STEM Ph.D. programs.
CVPA Star Store Campus	New Bedford	The Star Store campus is a modern urban arts complex with studios, galleries, and state-of-the-art equipment. This complex offers New Bedford an art community of galleries, venues, and events for the local community.
Justice Bridge - Boston	Boston	Justice Bridge provides opportunities for recent law graduates to develop their legal skills by helping clients of modest means who need access to legal representation. This collaborative, community-oriented program serves unmet legal needs while giving new lawyers access to mentors, resources, technology services, and the chance to make an impact.
Justice Bridge - New Bedford	New Bedford	Justice Bridge provides opportunities for recent law graduates to develop their legal skills by helping clients of modest means who need access to legal representation. This collaborative, community-oriented program serves unmet legal needs while giving new lawyers access to mentors, resources, technology services, and the chance to make an impact.

UMass Lowell Economic Contributions

The University of Massachusetts offers invaluable educational opportunities in a wide array of disciplines and engages in important research activities recognized throughout the world. The general public tends to understand UMass's role in these key areas, but is often unaware that the institution is also a major contributor to the statewide economy. UMass not only makes a direct contribution to the Massachusetts economy through the spending and jobs supported by its academic, administration, and construction activities, but also generates a "ripple effect" that leads to an even larger impact in the economy as a result of demand on suppliers of goods and services as well as employee spending.

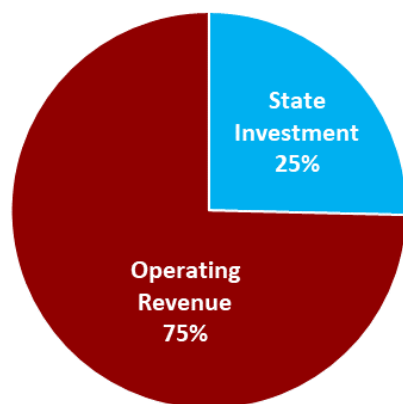
The results of the economic contributions analysis of the UMass Lowell campus for FY2018 indicate that:

- **UMass Lowell generated \$1.2 billion in economic activity in FY2018.** UMass Lowell is a key economic driver in the Commonwealth, directly or indirectly affecting every person in the state. In FY2018, UMass Lowell contributed \$1.2 billion in economic activity to the Massachusetts economy. This includes the contributions of the local operating expenditures of UMass Lowell, one-time major construction expenditures, the spending of the Lowell campus' faculty and staff, and the spending of its students. Much of the UMass spending flows beyond the campus to a variety of suppliers of goods and services, generating significant benefits for the Massachusetts economy.
- **FY2018 represented a strong period of construction on the Lowell campus, making a significant contribution to the Massachusetts economy.** Included in this \$1.8 billion total contribution were one-time building and infrastructure project expenditures totaling \$68 million in direct construction expenditures and \$57 million in additional economic activity for a total of over \$125 million in one-time construction contributions. These construction projects were financed through University expenditures, the UMass Building Authority and the Commonwealth's Division of Capital Asset Management (DCAM). DCAM funding alone contributed more than \$865 thousand directly to these projects in FY2018. All told, these construction projects supported 706 jobs. Unlike other campus activities such as payroll expenditures, construction on the campuses can spike or fall from year-to-year and thus either amplify or diminish its overall effect on the Massachusetts economy depending on the cycle. The new facilities, however, continue to play important roles after they are constructed by contributing to the University's competitive position to attract students, employees, and researchers. Major construction projects taking place at UMass Lowell in FY2018 included the renovation and expansion of Coburn Hall, the Fox Residence Hall Modernization, the Pasteur Hall Renovation, the Perry Hall Engineering Building, and the Perkins Place Renovation.
- **State investment in UMass Lowell leverages significantly greater economic activity.** In FY2018, the state's more than \$117 million investment in UMass Lowell helped leverage and support \$1.2 billion in economic activity in Massachusetts, an amount 10 times greater than the state's investment.

- **UMass Lowell employee payroll recirculates through the Massachusetts economy causing positive economic effects.** A notable share of UMass Lowell's spending also makes its way to employees in the form of salaries and wages, which is then circulated into the Massachusetts economy through typical household spending activities. In the Fall of 2018 (FY2018), UMass Lowell employed approximately 1,839 full- and part-time faculty and staff (excluding student employees).
- **UMass Lowell generates additional jobs beyond the campus.** The spending of UMass Lowell, its employees and students helped to support an additional 5,623 jobs in the Commonwealth throughout FY2018. Including faculty and staff, UMass Lowell supported a total of 7,462 jobs in the Commonwealth.
- **UMass Lowell student off-campus spending further supports the Massachusetts economy.** In the Fall of 2018 (FY2018), UMass Lowell student enrollment was 18,250 (including undergraduate and graduate students) and these students directly spent a significant amount of money off-campus in the economy, which, in turn, generated additional economic activity.

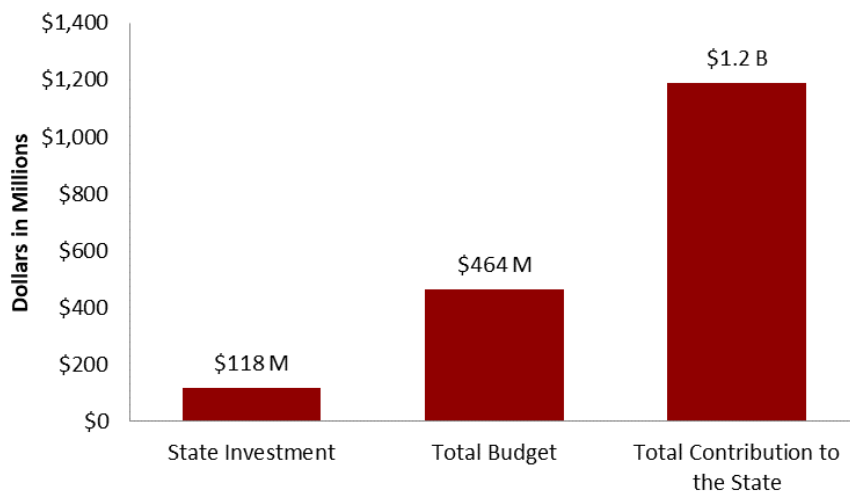
The following figures and tables illustrate the main findings of the economic contributions analysis.

Figure 18. UMass Lowell Operating Revenues Were 75% of Total Budget while State Investment Comprised 25% in FY2018

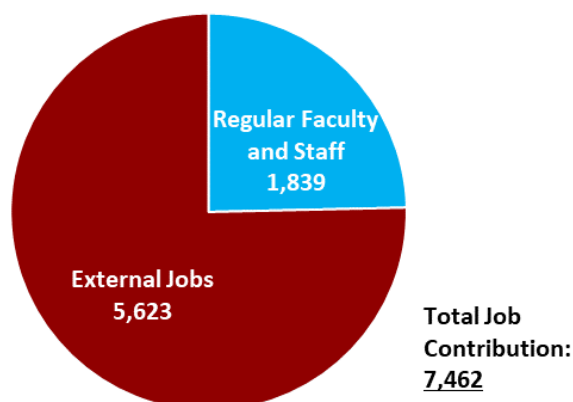


Sources: UMass Controller's Office, UMDI analysis

Figure 19. State Investment in UMass Lowell Generated \$1.2 Billion in Massachusetts Economic Activity in FY2018



Sources: UMass Controller's Office, UMDI analysis

Figure 20. UMass Lowell Supported 7,462 Jobs in the Massachusetts Economy in FY2018

Sources: UMass Controller's Office, UMDI analysis

Table 9. Summary of FY2018 Economic and Employment Contributions of UMass Lowell

Economic Output	State Investment	Campus Budget	Total Economic Activity (Output)
	\$117,668,189	\$463,792,000	\$1,188,665,610
Employment	Regular Faculty and Staff	External Jobs	Campus Total
	1,839	5,623	7,462

Sources: State investment and campus budget data were provided by the UMass Controller's Office. Total economic activity estimates derive from UMDI analysis. Regular faculty and staff figures were provided by the UMass Controller's Office and include all non-student and non-seasonal, full-time equivalent (FTE) employees who live in Massachusetts. External job estimates derive from UMDI analysis. For the purposes of economic analysis, regular faculty and staff include only residents of Massachusetts. UMass Lowell has a large number of employees who live in New Hampshire and are not included in the analysis.

Figure 21. UMass Lowell Campus Locations and Significant Off-Campus Sites

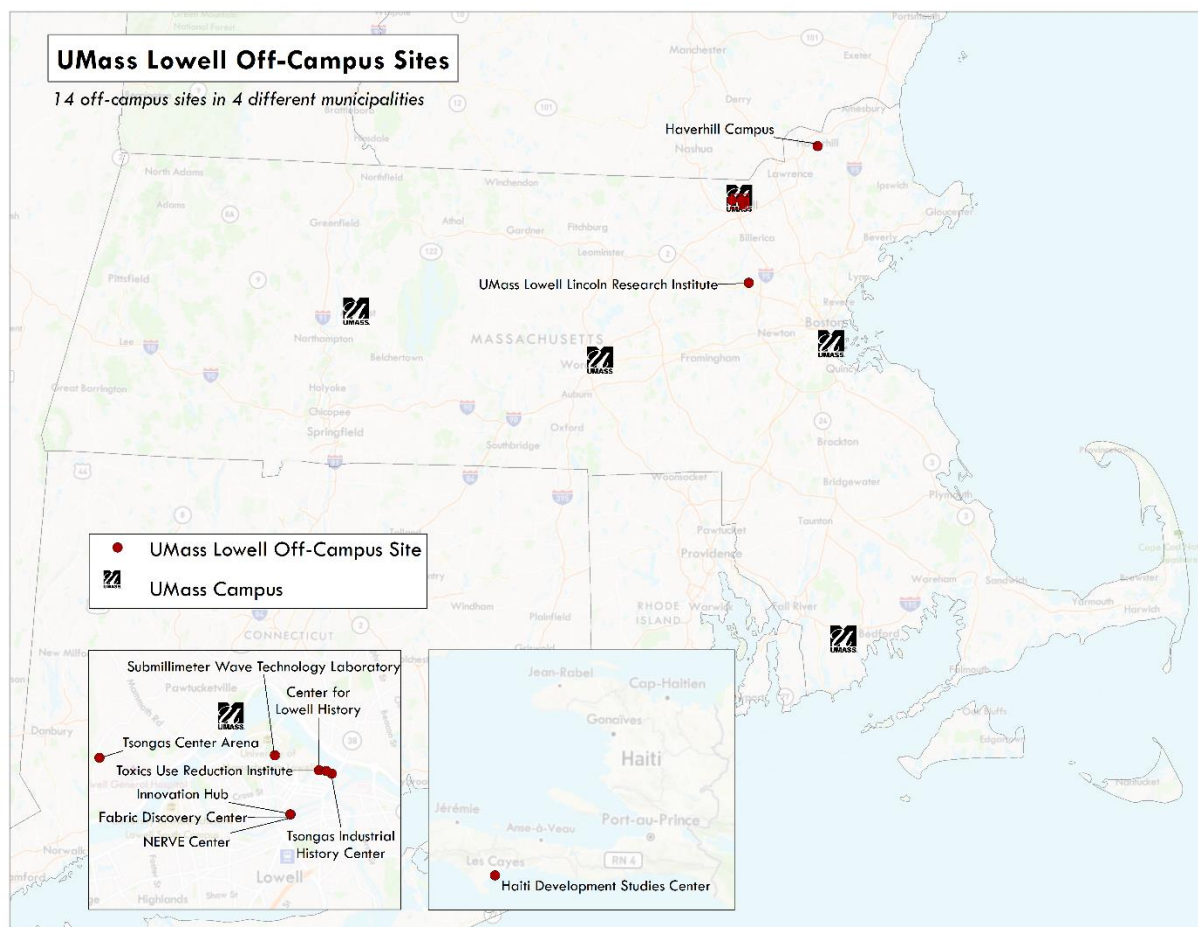


Table 10. Major UMass Lowell Off-Campus Sites

UMass Lowell & Site	Municipality	Site Description
Tsongas Industrial History Center	Lowell	An educational partnership between the Lowell National Historical Park and UMass Lowell and professional development provider, the Tsongas Industrial History Center is a hands-on center where students learn about the American Industrial Revolution through activities and tours of the sites where history—and science—happened.
Center for Lowell History	Lowell	Housed in the Lowell National Historical Park's Patrick J. Mogan Cultural Center, the UMass Lowell Center for Lowell History was established in 1971 to assure the safekeeping, preservation, and availability for study and research of materials in unique subject areas, particularly those related to the Greater Lowell Area and the University of Massachusetts Lowell.
Haiti Development Studies Center	Les Cayes, Haiti	With projects involving energy, water and food safety as a priority, the Haiti Development Studies Center focuses on examining health concerns, developing programs to decrease the impact of environmental contaminants, and assessing the efficacy of those programs.
UMass Lowell Research Institute	Lincoln	The University of Massachusetts Lowell Research Institute is leading a focused initiative linking our core competencies to Department of Defense requirements providing rapid and innovative solutions for defense and commercial customers.
Fabric Discovery Center	Lowell	The UMass Lowell Fabric Discovery Center is home to the first and only site in the nation that integrates discoveries from three Manufacturing USA Innovation Institutes.
Innovation Hub	Lowell	The third floor of 110 Canal St. in Lowell is an 11,000-square-foot incubator/accelerator that connects tech entrepreneurs with the knowledge and physical resources of the UMass Lowell community.
Massachusetts Medical Device Development Center	Lowell	The Massachusetts Medical Device Development Center (M2D2) is a lifeline for the state's smaller medical device companies, offering inventors and executives easy, affordable, and coordinated access to world-class researchers and resources at the UMass Lowell and the UMass Medical School campuses of the University of Massachusetts.
NERVE Center	Lowell	The UMass Lowell NERVE Center is an interdisciplinary robotics testing, research, and training facility that evaluates robotic capabilities, human performance, and human-robot interaction.
Toxics Use Reduction Institute	Lowell	The Toxics Use Reduction Institute (TURI) at the University of Massachusetts Lowell provides resources and tools to help businesses, municipalities, and communities in Massachusetts find safer alternatives to toxic chemicals.
Haverhill Campus	Haverhill	UMass Lowell's Haverhill satellite campus is located at Harbor Place in the heart of the city's vibrant downtown waterfront. This new facility is perfectly situated for entrepreneurs and working professionals who live and work in the Greater Merrimack Valley and Southern New Hampshire.
Innovation Hub	Haverhill	The Innovation Hub Haverhill located at 2 Merrimack Street, 3rd Floor, and Haverhill is the place for startups and entrepreneurs

		to develop, nurture and grow their business right in Haverhill along the Merrimack River.
UMass Lowell Lincoln North Research Center	Lincoln	The University of Massachusetts Lowell Research Institute is leading a focused initiative linking our core competencies to Department of Defense requirements providing rapid and innovative solutions for defense and commercial customers.
Submillimeter Wave Technology Laboratory	Lowell	As a major UMass Lowell research facility, the Submillimeter-Wave Technology Laboratory's (STL) primary mission is to engage with UMass Lowell students, faculty, and external sponsors to develop novel solutions to high frequency remote sensing, electromagnetic scattering, radar imaging, and dielectric materials characterization challenges in the microwave, millimeter-wave, and THz regions of the electromagnetic spectrum.
Tsongas Center Arena	Lowell	Open since 1998, The Tsongas Center Arena is a multi-purpose entertainment facility that hosts UMass sporting events, concerts, family shows, and other events.

UMass Medical School Economic Contributions

The UMass Medical School offers invaluable educational opportunities encompassing medicine, a teaching hospital, research, nursing, and biomedical science. The general public tends to understand UMass's role in these key areas, but is often unaware that the institution is also a major contributor to the statewide economy. The UMass Medical School not only makes a direct contribution to the Massachusetts economy through the spending and jobs supported by its academic, administration, and construction activities, but also generates a "ripple effect" that leads to an even larger impact in the economy as a result of demand on suppliers of goods and services as well as employee spending.

The results of the economic contributions analysis of the UMass Medical School for FY2018 indicate that:

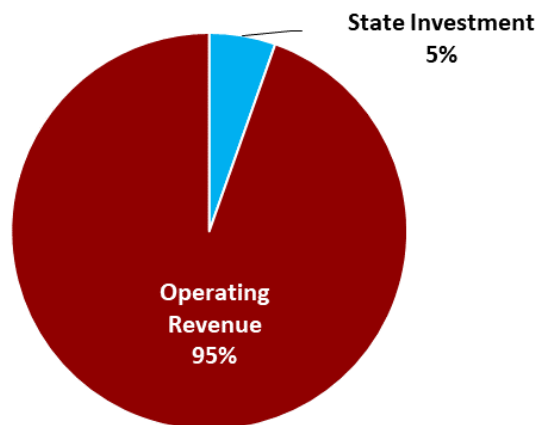
- **The UMass Medical School generated \$1.8 billion in economic activity in FY2018.** The UMass Medical School is a key economic driver in the Commonwealth, directly or indirectly affecting every person in the state. In FY2018, the UMass Medical School contributed \$1.8 billion in economic activity to the Massachusetts economy. This includes the contributions of the local operating expenditures of the UMass Medical School, one-time major construction expenditures, the spending of the Medical School's faculty and staff, and the spending of its students. Much of the UMass spending flows beyond the campus to a variety of suppliers of goods and services, generating significant benefits for the Massachusetts economy.
- **FY2018 represented a strong period of construction at the Medical School, making a significant contribution to the Massachusetts economy.** Included in this \$1.8 billion total contribution were one-time building and infrastructure project expenditures totaling more than \$31 million in direct construction expenditures and \$27 million in additional economic activity for a total of over \$58 million in one-time construction contributions. These construction projects were financed through University expenditures, the UMass Building Authority and the Commonwealth's Division of Capital Asset Management (DCAM). All told, these construction projects supported 246 jobs. Unlike other campus activities such as payroll expenditures, construction on the campuses can spike or fall from year-to-year and thus either amplify or diminish its overall effect on the Massachusetts economy depending on the cycle. The new facilities, however, continue to play important roles after they are constructed by contributing to the University's competitive position to attract students, employees, and researchers.
- **State investment in the UMass Medical School leverages significantly greater economic activity.** In FY2018, the state's more than \$54 million investment in the UMass Medical School helped leverage and support \$1.8 billion in economic activity in Massachusetts, an amount 33 times greater than the state's investment.
- **UMass Medical School employee payroll recirculates through the Massachusetts economy causing positive economic effects.** A notable share of the UMass Medical School's spending also makes its way to employees in the form of salaries and wages, which is then circulated into the Massachusetts economy through typical household spending activities. In the Fall of 2018

(FY2018), the Medical School employed approximately 6,501 full- and part-time faculty and staff (excluding student employees).

- **The UMass Medical School generates additional jobs beyond the campus.** The spending of the UMass Medical School, its employees and students helped to support an additional 5,494 jobs in the Commonwealth throughout FY2018. Including faculty and staff, the UMass Medical School supported a total of 11,995 jobs in the Commonwealth.
- **UMass Medical School student off-campus spending further supports the Massachusetts economy.** In the Fall of 2018 (FY2018), the UMass Medical School student enrollment was 1,185 (including students in the Graduate Schools of Nursing, Biomedical Science and Medicine), and these students directly spent a significant amount of money off-campus in the economy, which, in turn, generated additional economic activity.

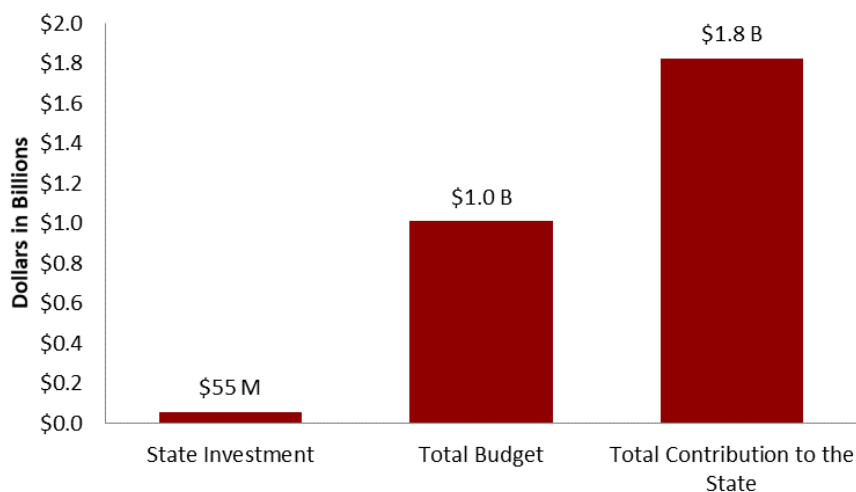
The following figures and tables illustrate the main findings of the economic contributions analysis.

Figure 22. The UMass Medical School Operating Revenues Were 95% of Total Budget while State Investment Comprised 5% in FY2018

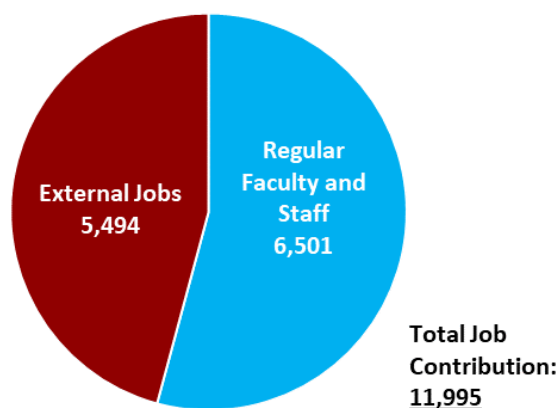


Sources: UMass Controller's Office, UMDI analysis

Figure 23. State Investment in the UMass Medical School Generated \$1.8 Billion in Massachusetts Economic Activity in FY2018



Sources: UMass Controller's Office, UMDI analysis

Figure 24. The UMass Medical School Supported 11,995 Jobs in the Massachusetts Economy in FY2018

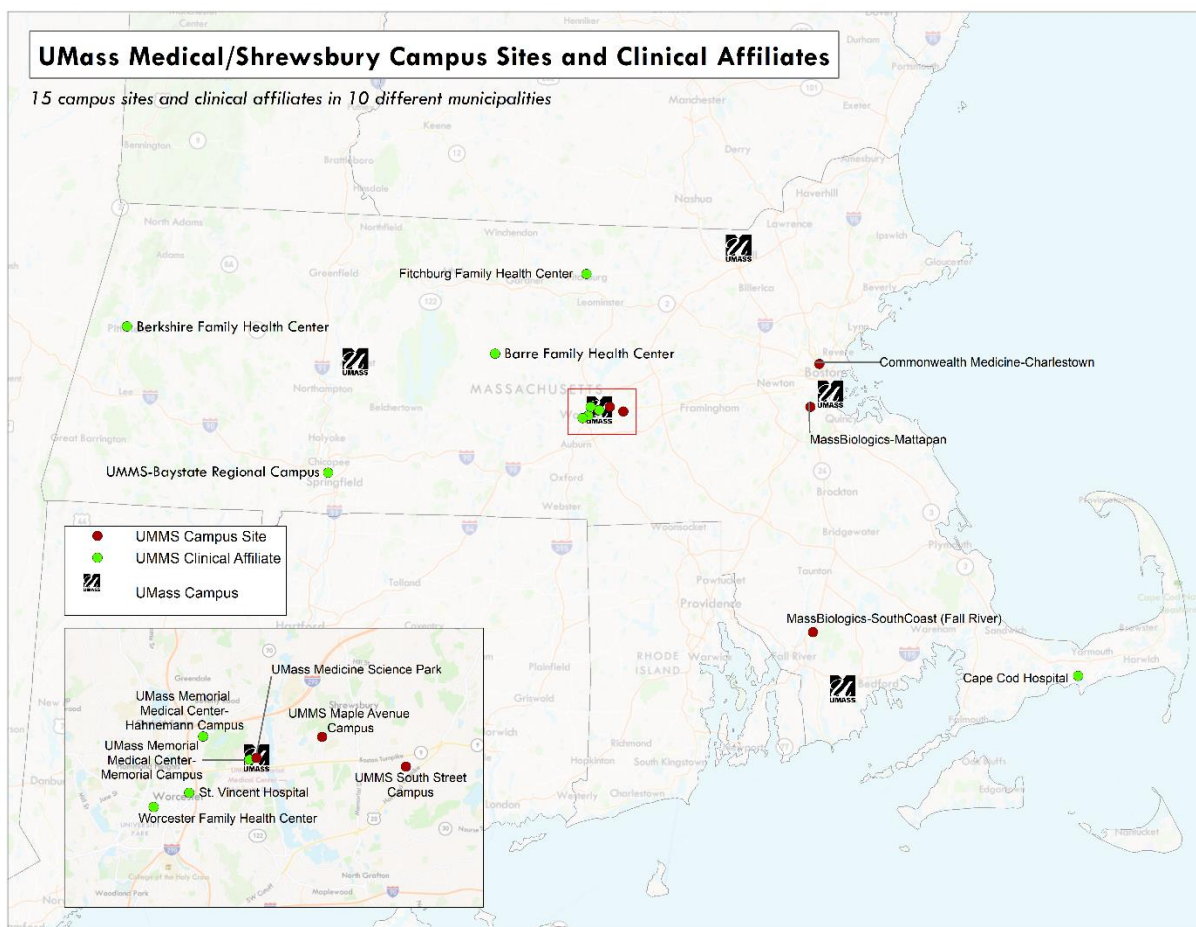
Sources: UMass Controller's Office, UMDI analysis

Table 11. Summary of FY2018 Economic and Employment Contributions of the UMass Medical School

Economic Output	State Investment	Campus Budget	Total Economic Activity (Output)
	\$54,559,641	\$1,009,033,000	\$1,822,942,207
Employment	Regular Faculty and Staff	External Jobs	Campus Total
	6,501	5,494	11,995

Sources: State investment and campus budget data were provided by the UMass Controller's Office. Total economic activity estimates derive from UMDI analysis. Regular faculty and staff figures were provided by the UMass Controller's Office and include all non-student and non-seasonal, full-time equivalent (FTE) employees who live in Massachusetts. External job estimates derive from UMDI analysis.

Figure 25. UMass Medical School Campus Sites and Clinical Affiliates



Note: The clinical affiliates are not operated by UMMS but are, nonetheless, critical to its academic mission.

Table 12. Major UMass Medical School/Shrewsbury Campus Sites and Clinical Affiliates

UMass Medical/Shrewsbury & Site	Municipality	Site Description
Campus Sites		
UMMS South Street Campus	Shrewsbury	UMMS owns and operates this large facility that includes a mix of tenants both internal and external to the University. A number of key UMMS offices are based at the South Street campus, including Commonwealth Medicine, Advancement, and Human Resources. The UMass President's Office also has a significant presence in the building.
UMass Medicine Science Park	Worcester	This R&D park contains 5 buildings, 99% leased (approx. 80% leased to businesses and agencies not affiliated with the Medical School). The park was purchased by the Medical School when the private developer announced plans to close it; UMass Medical invested in upgrades and improvements to the park and an aggressive leasing program has attracted biotech and health sciences tenants.
MassBiologics - Mattapan	Mattapan	The MassBiologics division of UMMS is based in Mattapan, where it operates two state-of-the-art R&D facilities: an FDA-approved biomanufacturing facility; and a research and administration building. Each year, the Mattapan site produces more than 1/3 of the nation's supply of Td vaccine, among other life-saving vaccines and biologics.
MassBiologics - SouthCoast	Fall River	The SouthCoast Facility serves as MassBiologics' contract manufacturing arm that provides the state's life sciences community with expertise in vector development and gene and cell therapy.
Commonwealth Medicine - Charlestown	Charlestown	The Commonwealth Medicine division of UMMS has more than 300 employees based full-time at the Schrafft Building in Charlestown. The Center for Healthcare Financing, one of Commonwealth Medicine's signature programs, is housed in Charlestown.
UMMS Maple Avenue Campus	Shrewsbury	The Maple Ave Campus is the former home of the Worcester Foundation for Biomedical Research, which was absorbed by UMMS in the late 1990s. Key facilities include the Rose Gordon and Hoagland-Pincus buildings. Currently, the site supports some specialized research core facilities and office-based grant funded research programs. In addition, UMMS partners with UMass Memorial Health Care to provide space for the programs associated with the Center for Mindfulness.

Clinical Affiliates		
UMass Memorial Medical Center - University, Memorial and Hahnemann Campuses	Worcester	The Memorial and Hahnemann campuses, together with the flagship University campus, comprise the UMass Memorial Medical Center, the primary clinical teaching affiliate of UMMS. These critical sites contribute to undergraduate and graduate medical education, nursing education and interprofessional training.
UMMS-Baystate Regional Campus	Springfield	UMMS-Baystate is the medical school's first-ever regional campus established in partnership with Baystate Health. The regional campus is home to the Population-based Urban and Rural Community Health Track, a specialized pathway for 100 medical students.
Cape Cod Hospital	Barnstable	Cape Cod Hospital, a clinical teaching affiliate of UMMS, serves as an increasingly important clinical rotation site for School of Medicine students conducting clerkships in specialties such as Surgery and OB/GYN.
Berkshire Medical Center	Pittsfield	Berkshire Medical Center is another long-time clinical teaching affiliate of UMMS.
Barre Family Health Center	Barre	These three health centers serve as primary training sites for UMMS's residency program in Family Medicine & Community Health.
Worcester Family Health Center	Worcester	
Fitchburg Family Health Center	Fitchburg	
St. Vincent Hospital	Worcester	St. Vincent Hospital is a clinical teaching affiliate of UMMS and serves as an important site for medical education and training for School of Medicine students.

Appendix A: Economic Contribution Analysis and IMPLAN

Economic Contribution Analysis

In a general sense, the goal of “economic contribution analysis” is to estimate the total contribution of an organization’s (in this instance, the University’s) various economic-generating activities to a regional or state economy (e.g., Massachusetts). The basic premise is that an initial investment in one sector of an economy (e.g., in higher education) spurs additional economic activity in other sectors as the money is re-spent within the region or state. The total economic contribution of the investment is estimated by tracing the flow and recirculating of money between industries and households until all of the initial investment eventually leaves the region or state through foreign or domestic trade, or is collected as a tax.

The IMPLAN Model

Input-output models, such as the IMPLAN model, examine the flow of money between industries and households in the economy. The UMass Donahue Institute built an input-output models using the IMPLAN Professional 3.0 model building software and data packages. The data used in the model are for 2018, which are the latest available. Model outputs are reported in 2018 dollars.

The IMPLAN modeling system combines the U.S. Bureau of Economic Analysis’ Input-Output Benchmarks with regional employment and wage data to construct quantitative models of the flow of goods and services between a region’s businesses and households (the final consumers), and estimates direct, indirect and induced effects of investments and ongoing economic activity. From these data, one can examine the effects of a change in one or several economic activities to estimate its effect on a specific state, regional, or local economy. The IMPLAN input-output accounts capture all monetary market transactions for consumption in a given time period. They are also based on industry survey data collected periodically by the U.S. Bureau of Economic Analysis and follow a balanced account format recommended by the United Nations. IMPLAN’s proprietary database details economic activity across hundreds of industry sectors, as well as “institutions” such as local, state and federal government and household spending. IMPLAN models reflect the most reliable and up-to-date knowledge about local spending patterns.

The total economic contribution of the UMass System as estimated by the IMPLAN model is the sum of direct, indirect, and induced effects of operating expenditures, construction expenditures, and employee and student spending.

- **Direct effects** refer to the initial investment of state funds that contribute to the University’s operating expenditures and one-time construction projects in FY2018.
- **Indirect effects** are generated by intermediate purchases for goods or services that support the educational, research and public service activities of the University. Payments made to architectural contractors, consulting firms for professional and business services, and vendors of construction materials and equipment are examples of indirect effects of state spending on the UMass System.

- **Induced effects** occur when income is spent on household-related goods and services. Employee payroll and student spending represent a significant portion of the induced impacts in this analysis.

The IMPLAN software and data package for Massachusetts are used to model the later rounds of local spending that follow. The model is specifically tailored to reflect the expenditure patterns and industry mix of Massachusetts, including information about when expenditures leave the state due to foreign and domestic trade and taxes. Finally, all rounds of spending are added together to produce the total contribution estimate. Due to recent changes to the IMPLAN income categories and revisions to its industry sector scheme, the results of earlier economic contribution analyses of the UMass System are not directly comparable to the results of the current analysis.

This analysis reports on two major types of economic contributions that are estimated by the IMPLAN model:

- **Outputs** are expenditures of the industry and supplier industries to produce the final good.
- **Employment** refers to all employees required to produce the outputs, including wage and salary employees, full-time and part-time employees, and the self-employed.

A **multiplier** is an index of how many times each dollar is re-spent in the economy of a geographical area and is expressed by a ratio of total outputs or employment to direct outputs or employment. An employment multiplier is an index of how each job in an economy supports related jobs in other industries. An output multiplier of 1.5 could be understood to mean that, out of every one dollar of direct expenditure, 50 cents is re-spent in the local economy.

Appendix B: Methodology and Data Sources

Methodology

This section details key elements of the methodological approach that the research team employed in the collection, organization and analysis of data on the economic contributions of the University of Massachusetts on the Massachusetts economy in FY2018. These economic contributions are the result of four major categories of expenditures essential to the economic activities related to the operation of the University:

- **Operating expenditures**, comprising a wide variety of University spending for the purpose of purchasing goods and services required for its educational, research, and public services activities;
- **Payroll spending** of regular (non-seasonal) and non-student University employees;
- **Student spending** on off-campus living expenses, books, transportation, and various personal expenses related to attending school in the UMass System; and
- **Construction expenditures** for one-time capital projects funded by the University (through the UMass Building Authority) and on behalf of the University (through the Division of Capital Asset Management).

At every level of the analysis, UMDI uses best practice and conservative assumptions in order to produce a complete and credible estimate of the economic contribution of the University on the Commonwealth of Massachusetts. In keeping with this approach, we undertook a detailed accounting of in-state and out-of-state expenditures. In other words, the inputs to the analysis and the IMPLAN model methodology are focused on including all elements of economic activity relevant to Massachusetts while excluding economic activity likely to leave the state (e.g., payroll earned by non-Massachusetts residents, spending on goods and services to non-Massachusetts businesses). As described above, we treat state appropriation differently from other revenue sources in our reporting of the initial contributions made by the University and the campuses, by removing the state appropriation, after the calculation of its contribution, from the reported revenues for each campus.

UMDI uses a detailed budget of University spending (including accounts payable vouchers, Procard transactions, employee-related expenses, personnel payroll and fringe, and construction) combined with estimates of student spending to identify University-initiated expenditures in each of 536 industries included within the IMPLAN proprietary economic impact modeling system. All University operating, construction, payroll, and student spending data consist of figures that have been audited for FY2018 and thoroughly inspected and approved by the campuses.

UMDI uses the University's total FY2018 revenues less state appropriated funds to represent the direct contribution of the University to the Massachusetts economy. Although the state appropriation is not considered part of the University's direct contribution to the Massachusetts economy, the indirect effects resulting from the University's spending of state appropriations are included as part of the University's total contribution.

Operating Expenditures

Operating expenditures include a wide variety of University spending for the purpose of purchasing goods and services required for its educational, research, and public services activities.

The analysis excludes all transactions that take place outside of the state. These types of transactions include hotel and transportation reimbursements for employees whose work required that they traveled out of state in addition to dollars spent on out-of-state goods and services. Transfer payments from one campus to another (e.g., recharges and central assessments) have also been excluded because these monies do not leave the UMass System and therefore do not re-circulate through the state economy.

Employment and Payroll

Payroll expenditures (employee compensation) for UMass faculty and staff contribute to the Massachusetts economy as wages and salaries are spent for a wide range of goods and services in the state. The value of the fringe payments made on an employee's behalf by the campuses was also included as a component of the analysis.

The payroll analysis assumes that employees spend all of their income in the state of residence; and the economic contribution of employee payroll and fringe was derived *only* from those University employees whose home addresses are located in Massachusetts. While employees undoubtedly spend income outside of the state and even abroad, this assumption underlies a more conservative estimate of University employee spending.

University and campus employment are reported by the UMass President's Office as full- and part-time regular (i.e., non-seasonal) employees as of October 2018. Campus employment excludes students as their economic activity is already captured by the estimates of student expenditures. Additional external (non-University) jobs supported elsewhere in the state include those supported by rounds of spending initiated by:

- The spending of the University for purchasing the goods and services required for its educational, research and public service activities;
- The spending on one-time construction projects (those funded through the UMass Building Authority, individual campus expenditures and the Massachusetts Division of Capital Asset Management [DCAM]);
- The spending of all UMass employees from their payroll; and
- Student spending in the local/state economy.

Student Spending

Student spending is captured by cost-of-attendance estimates which were provided by the UMass President's Office. Student expenditures are examined entirely in terms of students' spending habits on books, transportation, personal expenses (including restaurants, groceries, clothing, and entertainment), and off-campus room and board (including food), that characterize undergraduate and graduate students enrolled at the University of Massachusetts.

Students who live on campus are treated differently from students who live off campus. This distinction is important because on-campus students pay the University directly for room and board and these payments have been captured already in the operating expenditure analysis. Student fees similarly are direct payments to the University and have been captured in the operating expenditure analysis.

The fall enrollment head count is used as a proxy for the total number of students throughout the year and as such the analysis assumes no attrition and does not treat summer students separately. As with the employment head counts, the student head counts represent a snapshot of student enrollment as of October 2018.

The analysis assumes that all income derived from on-campus student jobs is consumed by the costs of attending the University and using University facilities. Thus student payroll is not included within the payroll expenditures component so as to avoid double-counting the economic contribution of student spending.

Construction

Through investments in infrastructure and buildings, the UMass System generates significant expenditures in construction on an annual basis. This analysis captures expenditures for new non-maintenance construction; and the data for new construction are from the University of Massachusetts Building Authority and the Division of Capital Asset Management.

University of Massachusetts Building Authority (UMBA): UMBA funds construction projects on each of the campuses, and these expenditures as well as interest expenses and bond-related payments are included in this analysis.

Division of Capital Asset Management (DCAM): Each campus benefits from expenditures for construction projects on their premises by the Commonwealth's Division of Capital Asset Management (DCAM). Since these funds are spent on behalf of the University, but are not received or spent directly by the University, we have included their contribution in this analysis both as a distinct analysis and as part of the total overall contribution of the University.

Funds spent by DCAM on behalf of the state are treated differently from state appropriation. For this analysis, DCAM funds are included in the reported revenues for the University (and therefore in the direct contribution), and the indirect effects resulting from DCAM's spending are also included in the University's contribution to the state. DCAM funds are considered differently than state appropriation because state appropriation originates from the legislature and would likely be spent for another purpose in Massachusetts even if the University did not attract the funds. By contrast, DCAM's bond funding originates from lenders and would not necessarily be spent in Massachusetts if the University did not attract the funds.

University-Affiliated Entities and Related Expenditures

In addition to economic activity generated by construction, administrative, public service, educational and research activities at each of the five campuses and the University Central Administrative Services, the analysis presented here considers the following University-affiliated entities as follows:

UMass Medical School, Worcester City Campus Corporation and UHealthSolutions: Economic and employment contributions by the UMass Medical School's affiliates, Worcester City Campus Corporation (WCCC) and UHealthSolutions, are included in the UMass Medical School analysis.

UMass Foundation: The University of Massachusetts Foundation is the main repository for each campus' foundation funds and endowments. Many campus foundation staff are employed by the respective campuses, and their payroll and employment contributions are included in the results for each campus. In addition, there are some operating and payroll expenditures made directly by the UMass Foundation. These are included in the UMass Central Administrative Services economic contribution and in the University System total.

Data Sources

Audited revenue data and operating, payroll and construction expenditure data for this analysis were provided by the University Controller's Office, the UMass Building Authority, and the UMass President's Office. Expenditure data for UHealthSolutions, a subsidiary of Worcester City Campus Corporation (itself a subsidiary of the UMass Medical School), were provided by the UMass Medical School in consultation with the University Controller's office. UMDI consulted with financial and executive staff at each of the five campuses to ensure that data collection reflected the full range of University economic activities, and that all financial operations of each campus were given due consideration and included in the analysis where possible and appropriate. In this analysis, one-time construction expenditures reflect data received from the UMass Controller's Office (for campus and DCAM expenditures) and the UMass Building Authority. Student enrollment and student budget data ("cost of attendance"), which drive student expenditures, were provided by the UMass President's Office.