



UMASS DONAHUE INSTITUTE



University of Massachusetts Economic Contribution Analysis FY 2015

Prepared for the UMass President's Office

Prepared by

UMass Donahue Institute
Economic and Public Policy Research

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UMass System Economic Contributions – Summary of Key Findings

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 often is not aware of the fact 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) 2015 indicate that:

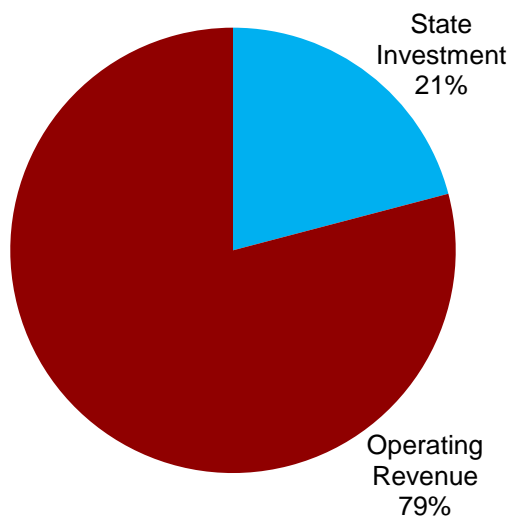
- **The UMass system generated \$6.2 billion in economic activity in FY 2015.** The UMass system (across all campuses) is a key economic driver in the Commonwealth, directly or indirectly affecting every person in the state. In FY 2015, the University of Massachusetts contributed \$6.2 billion in economic 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.
- **FY 2015 represented a robust period of construction for UMass, making a significant contribution to the Massachusetts economy.** Included in this \$6.2 billion total contribution were one-time building and infrastructure project expenditures totaling more than \$502 million in direct construction expenditures and over \$421 million in additional economic activity for a total of approximately \$925 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 \$49 million directly to these projects in FY 2015. All told, these construction projects supported 5,013 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 FY 2015, the state's \$621 million investment in the UMass system helped leverage and support \$6.2 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'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 2014 (FY 2015), the University employed approximately 16,777 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 26,870 jobs in the Commonwealth throughout FY 2015. Including faculty and staff, the University supported a total of 43,647 jobs in the Commonwealth.
- **UMass student off-campus spending further supports the Massachusetts economy.** In the Fall of 2014 (in FY 2015), UMass system student enrollment was 69,090 (including undergraduates, graduate students, continuing education students, and 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.
- **Each of the five University campuses generated substantial economic contributions for Massachusetts in FY 2015.** By campus, contributions ranged from \$2.1 billion for Amherst and \$1.6 billion for Worcester, respectively, to \$1.1 billion, \$922 million and \$466 million for each of the Boston, Lowell and Dartmouth campuses.

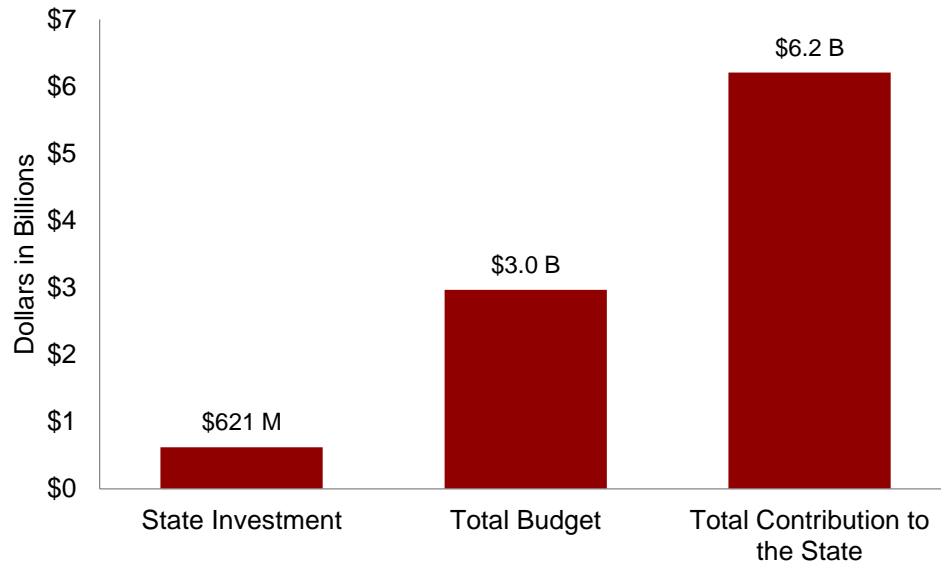
The following figures and tables illustrate the main findings of the economic contributions analysis.

Figure 1. UMass System Operating Revenues Were 79% of Total Budget while State Revenues Comprised 21% in FY 2015



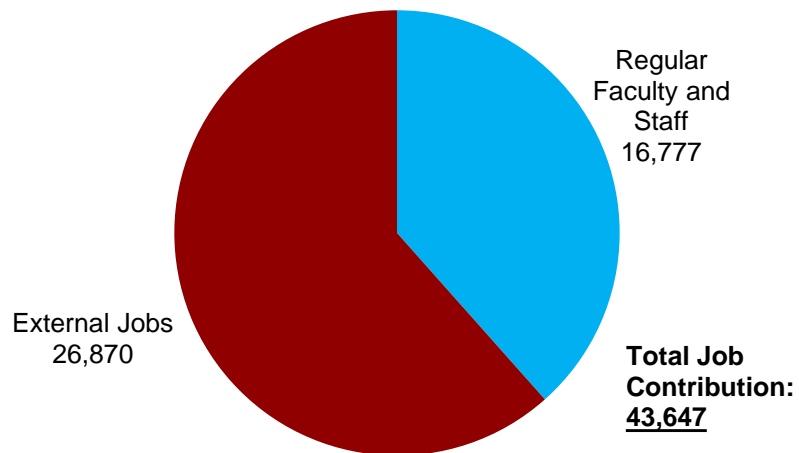
Sources: UMDI Analysis, UMass Controller's Office, UMass President's Office

Figure 2. State Investment in the UMass System Seeded \$6.2 Billion in Massachusetts Economic Activity in FY 2015



Sources: UMDI Analysis, UMass Controller's Office

Figure 3. The UMass System Supported 43,647 Jobs in the Massachusetts Economy in FY 2015



Sources: UMDI Analysis, UMass Controller's Office

Table 1. FY 2015 Economic Activity Contributions – The UMass System

Economic Output	State Investment	Campus Budget	Total Economic Activity (Output)
UMass Amherst	\$298,422,749	\$1,127,566,000	\$2,069,850,511
UMass Boston	\$110,295,020	\$406,875,000	\$1,085,006,011
UMass Central Administration	\$0	\$85,633,000	\$198,400,522
UMass Dartmouth	\$70,006,324	\$220,601,000	\$466,103,413
UMass Lowell	\$96,631,884	\$403,772,000	\$921,942,269
UMass Worcester	\$45,842,880	\$859,407,000	\$1,584,017,851
UMass System Total	\$621,198,857	\$2,970,588,000	\$6,205,082,949

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. FY 2015 Employment Contribution – The UMass System

Employment	Regular Faculty and Staff	External Jobs	Total Jobs
UMass Amherst	5,393	8,743	14,136
UMass Boston	2,287	5,560	7,847
UMass Central Administration	404	750	1,154
UMass Dartmouth	1,329	2,255	3,584
UMass Lowell	1,509	4,618	6,127
UMass Worcester	5,855	4,943	10,798
UMass System Total	16,777	26,870	43,647

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.

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 objective of the 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. We identified certain direct, indirect, and induced economic contributions that the University of Massachusetts makes to the statewide economy. The positive economic contributions of the University of Massachusetts makes are exceptionally significant 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 FY 2015 University expenditures. The approach, data sources, and economic impact model (IMPLAN) used in the analysis are described in further detail in the Methodology section 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
- UMass Lowell
- UMass Worcester (including the UMass Medical School, Worcester City Campus Corporation and UHealthSolutions)

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 analysis results are presented in terms of UMass's economic contributions to the Commonwealth of Massachusetts' economic output (or "economic activity") and jobs in FY 2015.¹ The economic contributions are the result of four categories of expenditures that are all endemic activities relating to the running of the University of Massachusetts:

- **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 living expenses, books, transportation, and various personal expenses related to attending school in the UMass System; and

¹ 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.

- **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).

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 (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 often is not aware of the fact 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.

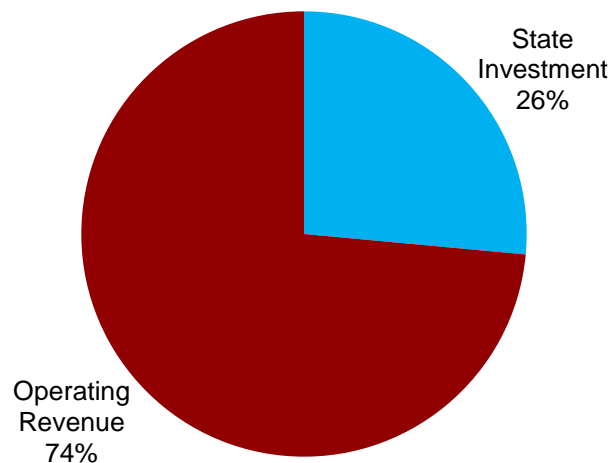
The results of the economic contributions analysis of the UMass Amherst campus for FY 2015 indicate that:

- **UMass Amherst generated \$2.1 billion in economic activity in FY 2015.** UMass Amherst is a key economic driver in the Commonwealth, directly or indirectly affecting every person in the state. In FY 2015, UMass Amherst contributed \$2.1 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.
- **FY 2015 represented a robust period of construction on the Amherst campus, making a significant contribution to the Massachusetts economy.** Included in this \$2.1 billion total contribution were one-time building and infrastructure project expenditures totaling more than \$197 million in direct construction expenditures and over \$158 million in additional economic activity for a total of approximately \$355 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 \$10 million directly to these projects in FY 2015. All told, these construction projects supported 2,045 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 FY 2015 included the Tilson Electrical Substation, Champions Center Basketball facility, South College Academic Facility, and renovations to the W.E.B. DuBois Library and Furcolo Hall, among others.
- **State investment in UMass Amherst leverages significantly greater economic activity.** In FY 2015, the state's \$298 million investment in UMass Amherst helped leverage and support \$2.1 billion in economic activity in Massachusetts, an amount nearly 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 2014 (FY 2015), UMass Amherst employed approximately 5,393 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 8,743 jobs in the Commonwealth throughout FY 2015. Including faculty and staff, UMass Amherst supported a total of 14,136 jobs in the Commonwealth.
- **UMass Amherst student off-campus spending further supports the Massachusetts economy.** In the Fall of 2014 (FY 2015), UMass Amherst student enrollment was 24,960 (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.

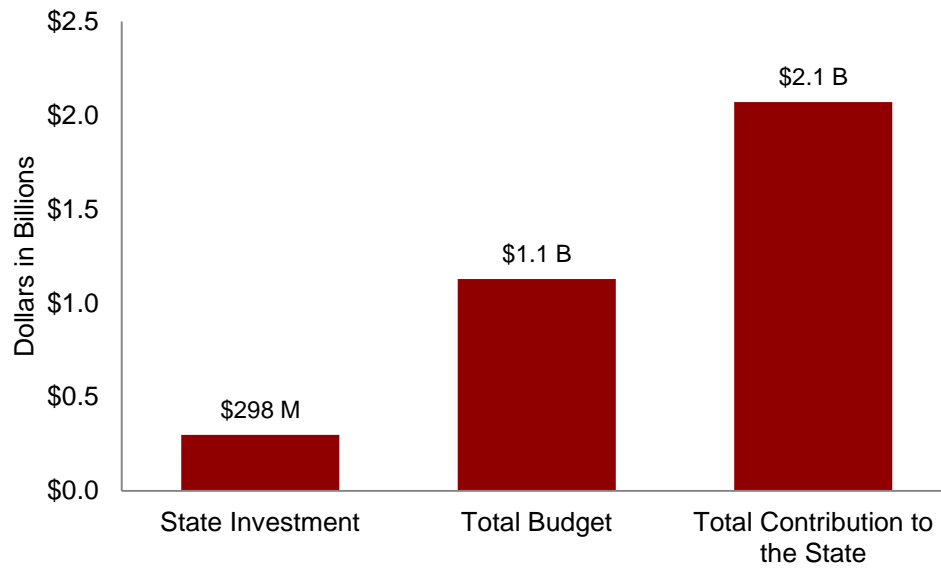
The following figures and tables illustrate the main findings of the economic contributions analysis.

Figure 4. UMass Amherst Operating Revenues Were 74% of Total Budget while State Revenues Comprised 26% in FY 2015



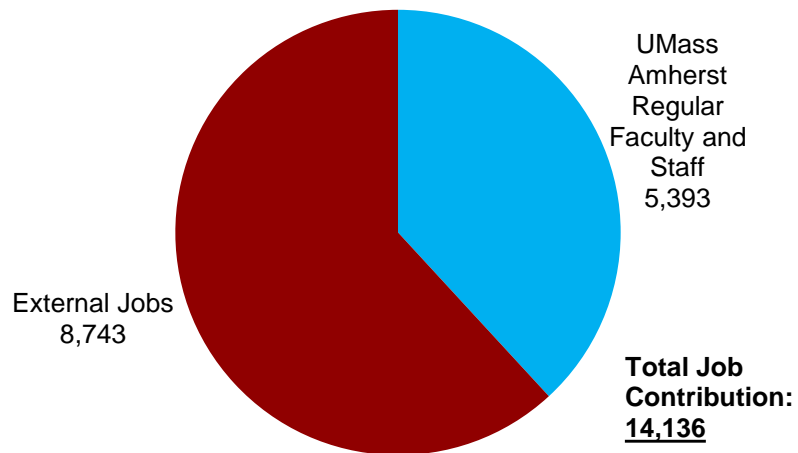
Sources: UMDI Analysis, UMass Controller's Office, UMass President's Office

Figure 5. State Investment in UMass Amherst Seeded \$2.1 Billion in Massachusetts Economic Activity in FY 2015



Sources: UMDI Analysis, UMass Controller's Office

Figure 6. UMass Amherst Supported 14,136 Jobs in the Massachusetts Economy in FY 2015



Sources: UMDI Analysis, UMass Controller's Office

Table 3. FY 2015 Economic Activity and Employment Contributions – UMass Amherst

Economic Output	State Investment	Campus Budget	Total Economic Activity (Output)
	\$298,422,749	\$1,127,566,000	\$2,069,850,511
Employment	Regular Faculty and Staff	External Jobs	Campus Total
	5,393	8,743	14,136

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. External job estimates derive from UMDI analysis.

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 often is not aware of the fact 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 FY 2015 indicate that:

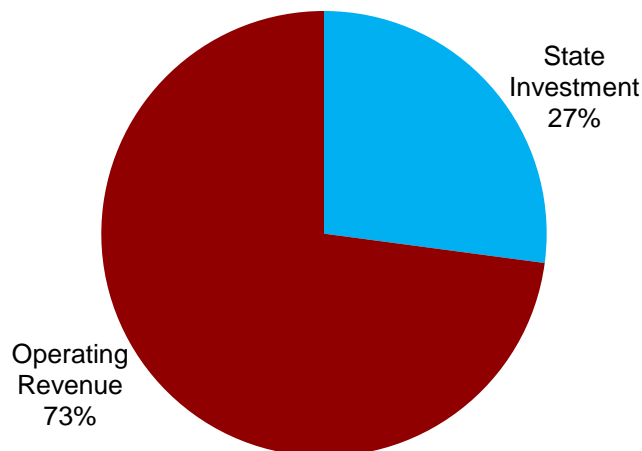
- **UMass Boston generated \$1.1 billion in economic activity in FY 2015.** UMass Boston is a key economic driver in the Commonwealth, directly or indirectly affecting every person in the state. In FY 2015, UMass Boston contributed \$1.1 billion in economic activity to the Massachusetts economy. This 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.
- **FY 2015 represented a robust period of construction on the Boston campus, making a significant contribution to the Massachusetts economy.** Included in this \$1.1 billion total contribution were one-time building and infrastructure project expenditures totaling more than \$135 million in direct construction expenditures and over \$132 million in additional economic activity for a total of over \$267 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 \$26 million directly to these projects in FY 2015. All told, these construction projects supported 1,354 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 FY 2015 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), and the Harborwalk and Shoreline Stabilization Project, among others.
- **State investment in UMass Boston leverages significantly greater economic activity.** In FY 2015, the state's \$110 million investment in UMass Boston helped leverage and support \$1.1 billion in economic activity in Massachusetts, an amount almost 10 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 2014 (FY 2015), UMass Boston employed approximately 2,287 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 5,560 jobs in the Commonwealth throughout FY 2015. Including faculty and staff, UMass Boston supported a total of 7,847 jobs in the Commonwealth.
- **UMass Boston student off-campus spending further supports the Massachusetts economy.** In the Fall of 2014 (FY 2015), UMass Boston student enrollment was 16,756 (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.

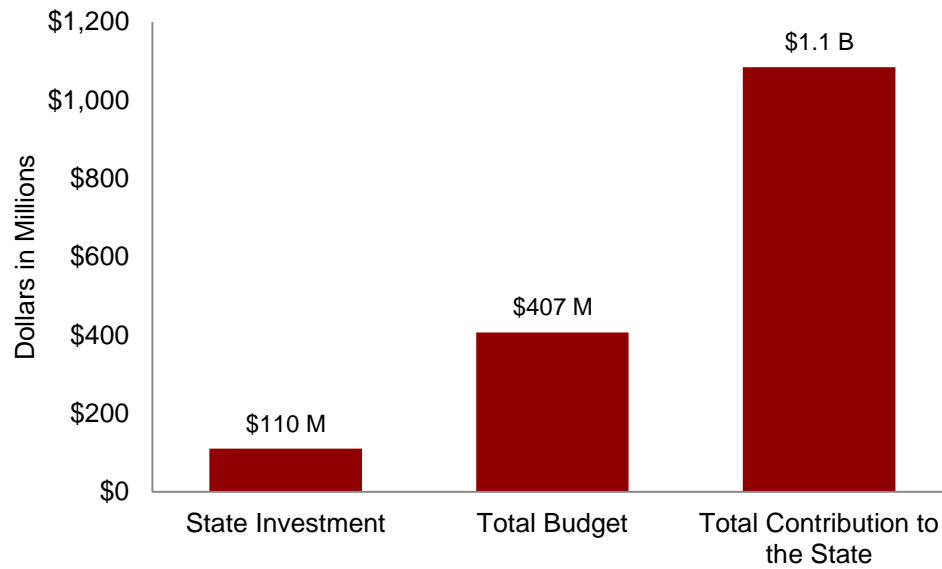
The following figures and tables illustrate the main findings of the economic contributions analysis.

Figure 7. UMass Boston Operating Revenues Were 73% of Total Budget while State Revenues Comprised 27% in FY 2015



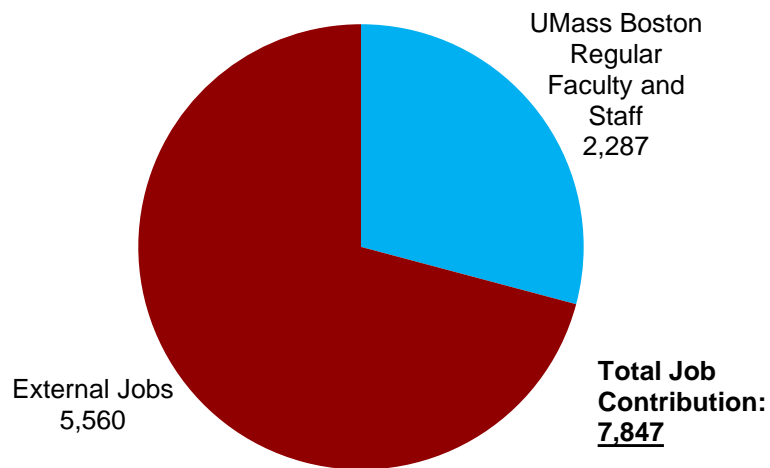
Sources: UMDI Analysis, UMass Controller's Office, UMass President's Office

Figure 8. State Investment in UMass Boston Seeded \$1.1 Billion in Massachusetts Economic Activity in FY 2015



Sources: UMDI Analysis, UMass Controller's Office

Figure 9. UMass Boston Supported 7,847 Jobs in the Massachusetts Economy in FY 2015



Sources: UMDI Analysis, UMass Controller's Office

Table 4. FY 2015 Economic Activity and Employment Contributions – UMass Boston

Economic Output	State Investment	Campus Budget	Total Economic Activity (Output)
	\$110,295,020	\$406,875,000	\$1,085,006,011
Employment	Regular Faculty and Staff	External Jobs	Campus Total
	2,287	5,560	7,847

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. External job estimates derive from UMDI analysis.

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 often is not aware of the fact 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 FY 2015 indicate that:

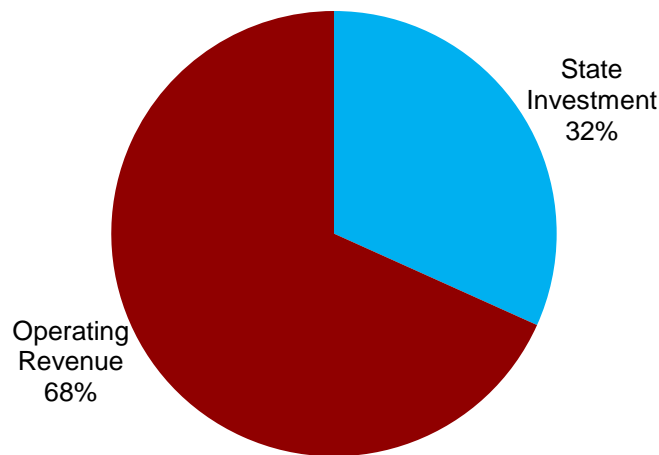
- **UMass Dartmouth generated \$466 million in economic activity in FY 2015.** UMass Dartmouth is a key economic driver in the Commonwealth, directly or indirectly affecting every person in the state. In FY 2015, UMass Dartmouth contributed \$466 million in economic activity to the Massachusetts economy. 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.
- **FY 2015 represented a strong period of construction on the Dartmouth campus, making a significant contribution to the Massachusetts economy.** Included in this \$466 million total contribution were one-time building and infrastructure project expenditures totaling nearly \$27 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). DCAM funding alone contributed almost \$5 million directly to these projects in FY 2015. All told, these construction projects supported 264 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 FY 2015 included the expansion of the School of Marine Sciences and Technology and improvements to the Charlton College of Business, classrooms, teaching laboratories, and learning spaces, among others.
- **State investment in UMass Dartmouth leverages significantly greater economic activity.** In FY 2015, the state's \$70 million investment in UMass Dartmouth helped leverage and support \$466 million in economic activity in Massachusetts, an amount almost 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 2014 (FY 2015), UMass Dartmouth employed approximately 1,329 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 2,255 jobs in the Commonwealth throughout FY 2015. Including faculty and staff, UMass Dartmouth supported a total of 3,584 jobs in the Commonwealth.
- **UMass Dartmouth student off-campus spending further supports the Massachusetts economy.** In the Fall of 2014 (FY 2015), UMass Dartmouth student enrollment was 9,111 (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.

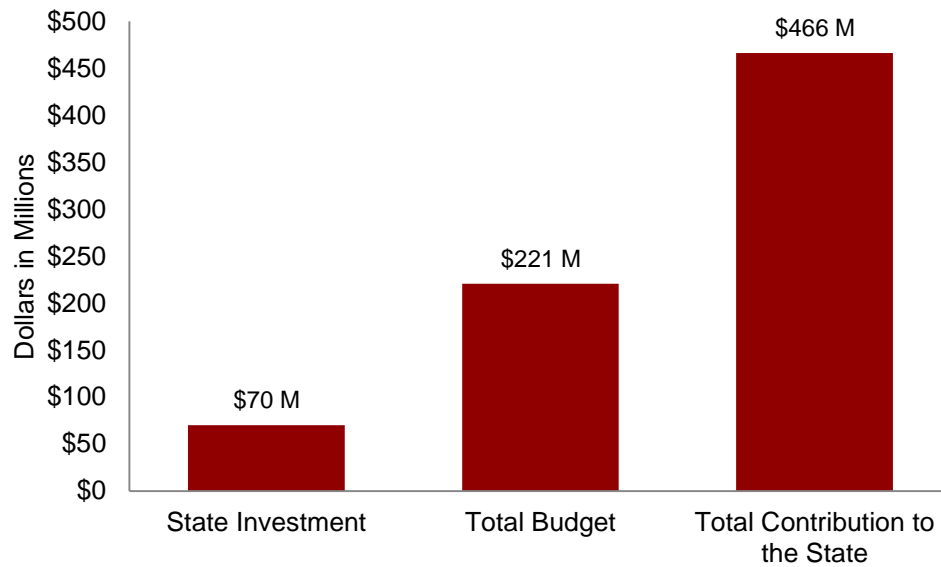
The following figures and tables illustrate the main findings of the economic contributions analysis.

Figure 10. UMass Dartmouth Operating Revenues Were 68% of Total Budget while State Revenues Comprised 32% in FY 2015



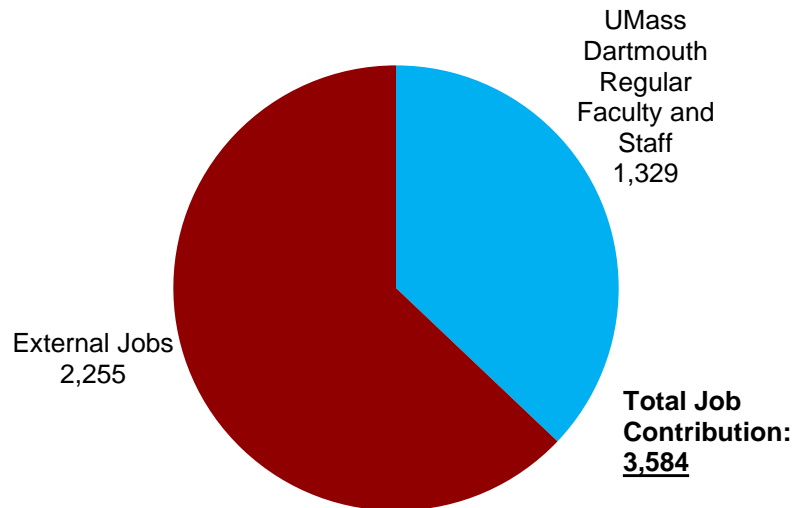
Sources: UMDI Analysis, UMass Controller's Office, UMass President's Office

Figure 11. State Investment in UMass Dartmouth Seeded \$466 Million in Massachusetts Economic Activity in FY 2015



Sources: UMDI Analysis, UMass Controller's Office

Figure 12. UMass Dartmouth Supported 3,584 Jobs in the Massachusetts Economy in FY 2015



Sources: UMDI Analysis, UMass Controller's Office

Table 5. FY 2015 Economic Activity and Employment Contributions – UMass Dartmouth

Economic Output	State Investment	Campus Budget	Total Economic Activity (Output)
	\$70,006,324	\$220,601,000	\$466,103,413
Employment	Regular Faculty and Staff	External Jobs	Campus Total
	1,329	2,255	3,584

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. External job estimates derive from UMDI analysis.

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 often is not aware of the fact 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.

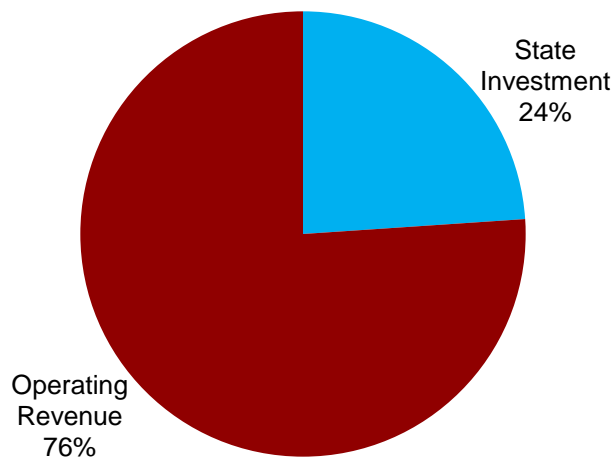
The results of the economic contributions analysis of the UMass Lowell campus for FY 2015 indicate that:

- **UMass Lowell generated \$922 million in economic activity in FY 2015.** UMass Lowell is a key economic driver in the Commonwealth, directly or indirectly affecting every person in the state. In FY 2015, UMass Lowell contributed \$922 million 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.
- **FY 2015 represented a strong period of construction on the Lowell campus, making a significant contribution to the Massachusetts economy.** Included in this \$922 million total contribution were one-time building and infrastructure project expenditures totaling more than \$92 million in direct construction expenditures and \$72 million in additional economic activity for a total of over \$164 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 almost \$7 million directly to these projects in FY 2015. All told, these construction projects supported 909 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 FY 2015 included the McGauvran Dining Center, North Quad Renewal and the renovation of the Leitch and Bourgeois residence halls.
- **State investment in UMass Lowell leverages significantly greater economic activity.** In FY 2015, the state's nearly \$97 million investment in UMass Lowell helped leverage and support \$922 million in economic activity in Massachusetts, an amount almost 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 2014 (FY 2015), UMass Lowell employed approximately 1,509 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 4,618 jobs in the Commonwealth throughout FY 2015. Including faculty and staff, UMass Lowell supported a total of 6,127 jobs in the Commonwealth.
- **UMass Lowell student off-campus spending further supports the Massachusetts economy.** In the Fall of 2014 (FY 2015), UMass Lowell student enrollment was 17,184 (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.

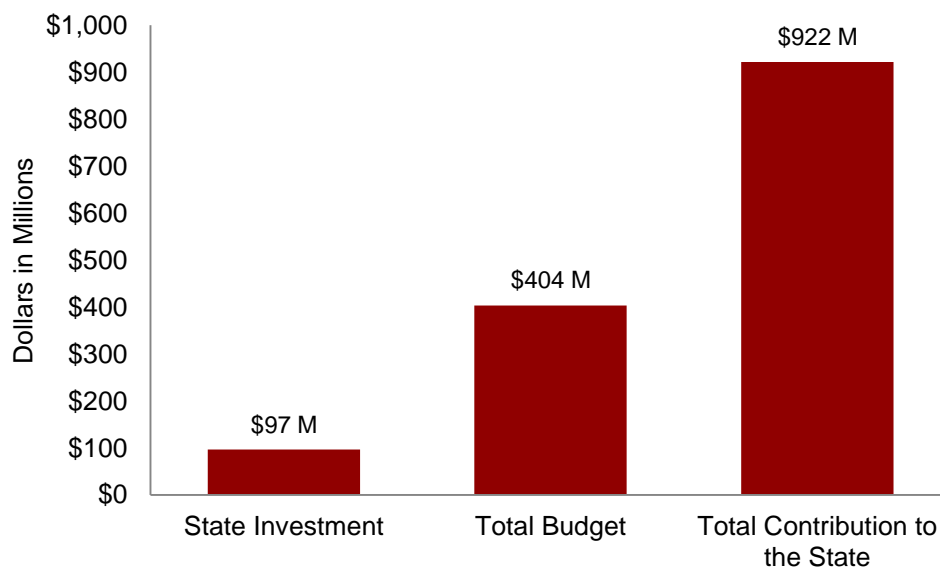
The following figures and tables illustrate the main findings of the economic contributions analysis.

Figure 13. UMass Lowell Operating Revenues Were 76% of Total Budget while State Revenues Comprised 24% in FY 2015



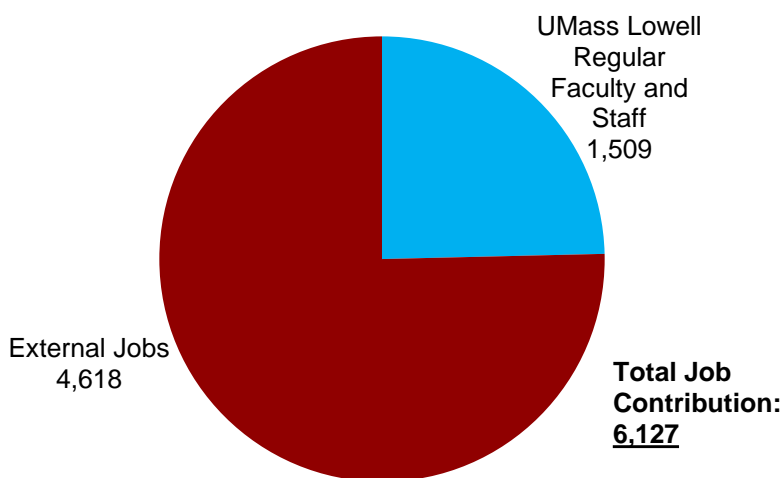
Sources: UMDI Analysis, UMass Controller's Office, UMass President's Office

Figure 14. State Investment in UMass Lowell Seeded \$922 Million in Massachusetts Economic Activity in FY 2015



Sources: UMDI Analysis, UMass Controller’s Office

Figure 15. UMass Lowell Supported 6,127 Jobs in the Massachusetts Economy in FY 2015



Sources: UMDI Analysis, UMass Controller’s Office. The number of UMass Lowell’s regular faculty and staff amount excludes employees who live outside of Massachusetts (UMass Lowell has a large number of faculty and staff who reside in New Hampshire), and the external jobs reflect the jobs supported by UMass Lowell’s economic activities that take place within Massachusetts.

Table 6. FY 2015 Economic Activity and Employment Contributions – UMass Lowell

Economic Output	State Investment	Campus Budget	Total Economic Activity (Output)
	\$96,631,884	\$403,772,000	\$921,942,269
Employment	Regular Faculty and Staff	External Jobs	Campus Total
	1,509	4,618	6,127

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. External job estimates derive from UMDI analysis.

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 often is not aware of the fact 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.

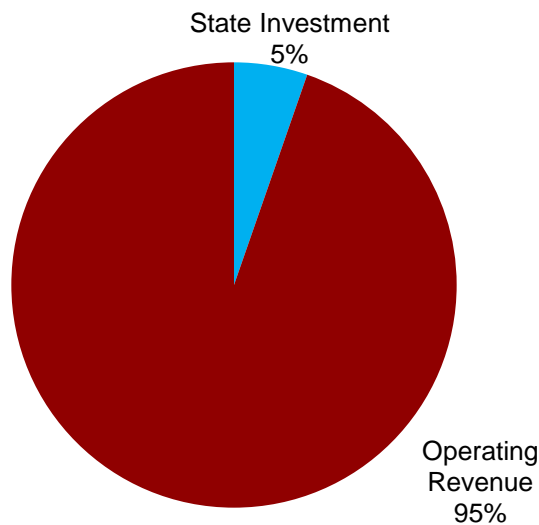
The results of the economic contributions analysis of the UMass Medical School for FY 2015 indicate that:

- **The UMass Medical School generated \$1.6 billion in economic activity in FY 2015.** The UMass Medical School is a key economic driver in the Commonwealth, directly or indirectly affecting every person in the state. In FY 2015, the UMass Medical School contributed \$1.6 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.
- **FY 2015 represented a strong period of construction at the Medical School, making a significant contribution to the Massachusetts economy.** Included in this \$1.6 billion total contribution were one-time building and infrastructure project expenditures totaling almost \$28 million in direct construction expenditures and nearly \$21 million in additional economic activity for a total of approximately \$49 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 \$116 thousand directly to these projects in FY 2015. All told, these construction projects supported 233 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 the UMass Medical School in FY 2015 included renovations to laboratories, among others.
- **State investment in the UMass Medical School leverages significantly greater economic activity.** In FY 2015, the state's nearly \$46 million investment in the UMass Medical School helped leverage and support \$1.6 billion in economic activity in Massachusetts, an amount almost 35 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 2014 (FY 2015), the Medical School employed approximately 5,855 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 4,943 jobs in the Commonwealth throughout FY 2015. Including faculty and staff, the UMass Medical School supported a total of 10,798 jobs in the Commonwealth.
- **UMass Medical School student off-campus spending further supports the Massachusetts economy.** In the Fall of 2014 (FY 2015), the UMass Medical School student enrollment was 1,079 (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.

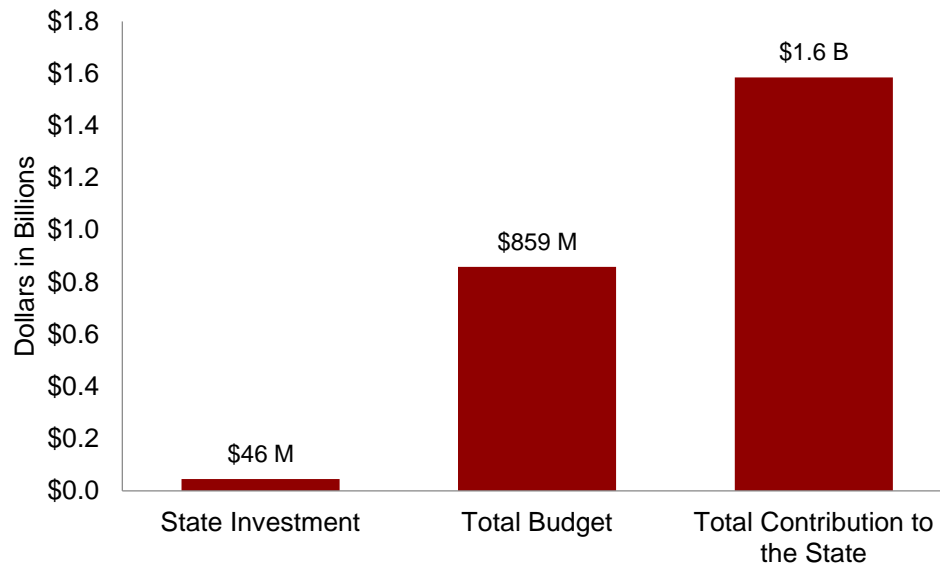
The following figures and tables illustrate the main findings of the economic contributions analysis.

Figure 16. UMass Medical School Operating Revenues Were 95% of Total Budget while State Revenues Comprised 5% in FY 2015



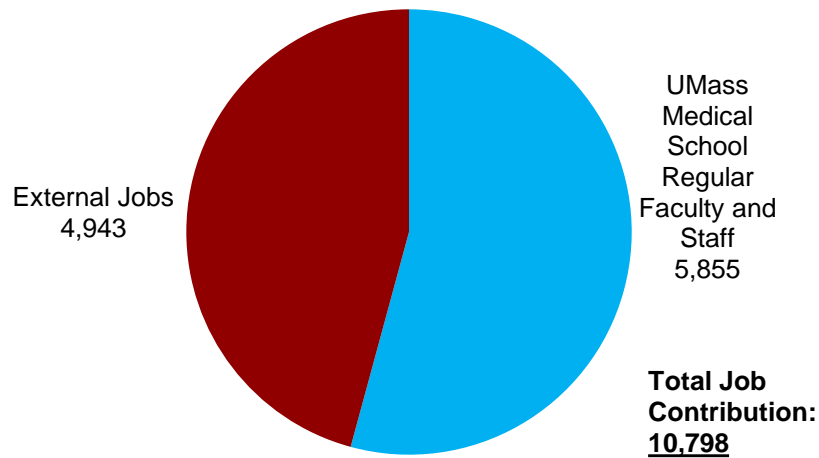
Sources: UMDI Analysis, UMass Controller's Office, UMass President's Office

Figure 17. State Investment in the UMass Medical School Seeded \$1.6 Billion in Massachusetts Economic Activity in FY 2015



Sources: UMDI Analysis, UMass Controller's Office

Figure 18. The UMass Medical School Supported 10,798 Jobs in the Massachusetts Economy in FY 2015



Sources: UMDI Analysis, UMass Controller's Office

Table 7. FY 2015 Economic Activity and Employment Contributions – The UMass Medical School

Economic Output	State Investment	Campus Budget	Total Economic Activity (Output)
	\$45,842,880	\$859,407,000	\$1,584,017,851
Employment	Regular Faculty and Staff	External Jobs	Campus Total
	5,855	4,943	10,798

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. External job estimates derive from UMDI analysis.

Appendix: Methodology

This section of the report 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 FY 2015. These economic contributions are the result of four categories of expenditures that are all endemic activities relating to the running 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 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).

Methodology and Use of the IMPLAN Model

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 (i.e., 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.

For the UMass economic contributions analysis, UMDI utilized MIG Inc.’s IMPLAN economic modeling system, a widely used and highly regarded proprietary software, to assess economic contributions. IMPLAN 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, and estimates direct, indirect and induced effects of investments and ongoing economic activity. 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 FY2015. **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.

UMDI uses the University’s total FY 2015 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.

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 industry sector scheme from 440 to 536 sectors, the results of the FY13 (or earlier) economic contribution analyses of the UMass system are not directly comparable to the results of the current analysis.

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 expenses, personnel payroll, 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 FY2015 and thoroughly inspected and approved by the campuses.

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 have also been excluded because these payments 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 2014. Campus employment excludes students as their economic activity is 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 based on payroll levels; 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 and describe general categories of spending that students incur while enrolled at the University of Massachusetts. Student expenditures are examined entirely in terms of the types of spending habits on books, transportation, personal expenses (including laundry and entertainment), and off-campus room and board (including food), that characterize undergraduate and graduate students.

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 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 2014.

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, the \$49.3 million in DCAM funds is 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 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 Administrative Services economic contribution and in the University system total.

Data Sources

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 as well as the Integrated Postsecondary Education Data System (or IPEDS, which is publicly available through the National Center for Education Statistics).

About Us

The UMass Donahue Institute (UMDI) is the public service outreach and economic development unit of the University of Massachusetts President's Office. Established in 1971, the UMDI coordinates multi-campus initiatives that link UMass, other public and private higher education, and other external resources with the needs of government agencies, corporations, and nonprofit organizations. UMDI provides significant economic and public policy analysis, organizational development, training, education, financial management education, research, and evaluation to federal and state agencies, nonprofits, industry associations, and corporations. UMDI draws on its unique position within higher education to serve as a bridge between theory, innovation, and real-world applications.

The Economic and Public Policy Research (EPPR) group is a leading provider of applied research, helping clients make more informed decisions about strategic economic and public policy issues. EPPR produces in-depth economic impact and industry studies that help clients build credibility, gain visibility, educate constituents, plan economic development initiatives, and prioritize investments. EPPR is known for providing unbiased economic analysis on state-level economic policy issues in Massachusetts and beyond, and has completed a number of economic studies on manufacturing, IT, defense industries, telecommunications, health care, and transportation. EPPR also features two experienced transportation economists with expertise working on economic impacts, benefit-cost analysis and industry profiles across all modes. 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.

For more information, visit www.donahue.umassp.edu and www.massbenchmarks.org.