



UMASS DONAHUE INSTITUTE



University of Massachusetts Lowell Economic Development Study

Prepared by

UMass Donahue Institute
Economic and Public Policy Research

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UMass Lowell Economic Impacts from Operations

The total jobs impacts combine construction expenditures, UMass Lowell payroll, student expenditures, and operations expenditures on Massachusetts and the southern New Hampshire region. The economic impacts are based on those analyzed for the “University of Massachusetts Economic Contribution Analysis FY 2013” but now with the geographic inclusion of southern New Hampshire.

The economic contributions shown in this part of the analysis, stemming from “University of Massachusetts Economic Contribution Analysis FY 2013”, are the result of four categories of expenditures that are all endemic activities relating to the running of UMass Lowell:

- **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).

Total Jobs Impacts from UMass Lowell Operations on Massachusetts and the Southern New Hampshire Region, 2013

Employment Impacts (Jobs)	
Regular Faculty and Staff	1,976
External Jobs	5,121
Total Jobs Supported by UMass Lowell	7,097

Source: UMass Donahue Institute

The total job numbers at UMass Lowell are higher in the current study than the UMass system study as payroll now includes UMass Lowell workers who reside in New Hampshire. The previous study’s intent was to exclusively analyze the economic effects taking place within the Commonwealth of Massachusetts.

Total Economic Contributions from UMass Lowell Operations on Massachusetts and the Southern New Hampshire Region, 2013

Economic Activity (Output)	
Direct Effect	\$391,073,082
Indirect Effect	\$166,944,923
Induced Effect	\$296,029,436
Total Effect	\$854,047,441

Source: UMass Donahue Institute

In a similar manner as the job numbers, UMass Lowell’s contributions to economic output have also increased by including the effects of dollars spent in New Hampshire by UMass Lowell employees as well as by university expenditures in southern New Hampshire.

The **total economic impacts** as estimated by the IMPLAN model are the sum of direct, indirect, and induced impacts.

- **Direct impacts** are only those associated specifically with the activity taking place taking place at UML and affiliated programs (e.g., employees, their payroll, the value of the services they produce).
- **Indirect impacts** are generated when material, equipment or other intermediate purchases (supplier purchases) are made to support the direct activity taking place at UML and affiliated programs.
- **Induced impacts** are generated by UML-affiliated and supplier workers spending their earnings in the statewide/regional economy. For example, spending by these workers supports jobs in retail, restaurants, entertainment, real estate, personal finance, etc.

Total External Jobs Impacts by Industry from UMass Lowell Operations on Massachusetts and Southern New Hampshire Region, 2013 (draft impacts)

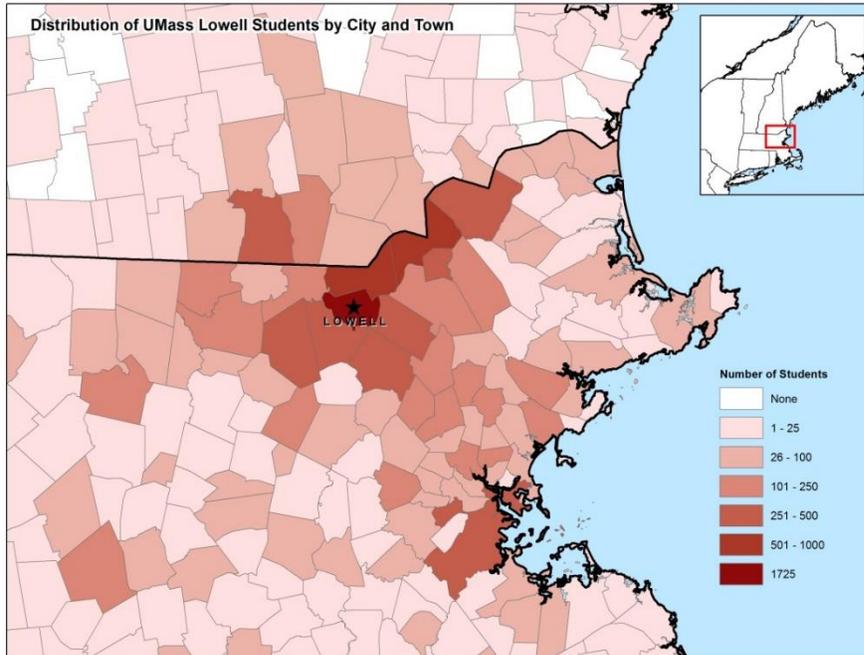
Industry	External Jobs
Professional and Business Services	997
Education and Health Services	866
Retail Trade	781
Leisure and Hospitality	665
Construction	488
Real Estate and Rental and Leasing	441
Other Services	229
Financial Activities	203
Information	126
Wholesale Trade	117
Transportation and Warehousing	112
Manufacturing	44
Government	31
Utilities	11
Natural Resources & Mining	9
TOTAL	5,121

Source: UMass Donahue Institute

The ripple effects of UMass Lowell’s operations have a significant impact on jobs in other industries in Massachusetts and southern New Hampshire. As UMass Lowell’s expenditures (e.g., to suppliers) and university employee and student spending ripple through the economy, it supports thousands of jobs in a range of industries. The largest effects are on professional and business services (a sector that includes legal, scientific research, engineering, computer systems design, management, administrative support, etc.), education and health, retail trade, and leisure and hospitality (includes restaurants and entertainment).

Regional Reach of UMass Lowell

Origins of UMass Lowell Students



Source: UMass Lowell

In total, UMass Lowell has an enrollment of approximately 17,000 students. The University has students from all fifty states as well as about 900 students from overseas. In most years, the origins of the students are primarily from Massachusetts and New Hampshire. These two states account for over 80 percent of the UMass Lowell student body, graduate and undergraduate. Middlesex and Essex counties in Massachusetts are the leading origin counties for UMass Lowell students. The City of Lowell, accounting for approximately 10 percent of all UMass Lowell students, leads all other cities and towns in terms of student origins.

Origins of UMass Lowell Students – Top Counties, Cities, and Towns

Origin of Students by County	Students	Origin of Students by City and Town	Students
Middlesex	7,055	Lowell	1,725
Essex	2,936	Methuen	554
Worcester	1,115	Dracut	508
Hillsborough	704	Boston	493
Suffolk	615	Chelmsford	451
Norfolk	530	Haverhill	424
Rockingham	365	Billerica	419
Plymouth	296	Lawrence	397
Bristol	242	Tewksbury	348
Hampden	114	Westford	273
Rest of MA and NH	269	Rest of MA and NH	8,649
Total	14,241	Total	14,241

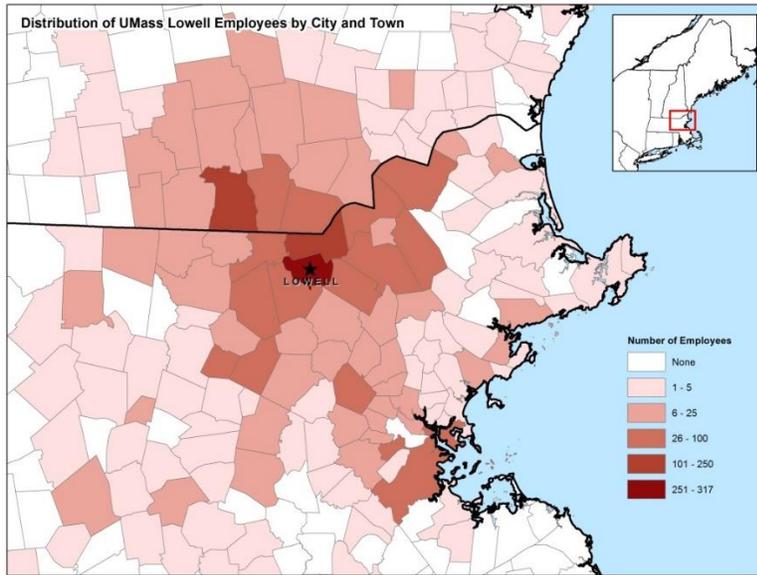
Source: UMass Lowell, 2013

Origins of Non-MA and Non-NH UMass Lowell Students – Other States and International

Origin of Students (excl. MA and NH)	Students
Rhode Island	251
Connecticut	152
California	144
New York	143
New Jersey	129
Pennsylvania	92
Texas	74
Florida	73
Ohio	49
Georgia	48
Rest of the U.S.	607
International	889

Source: UMass Lowell, 2013

Place of Residence of UMass Lowell Employees



Source: UMass Lowell

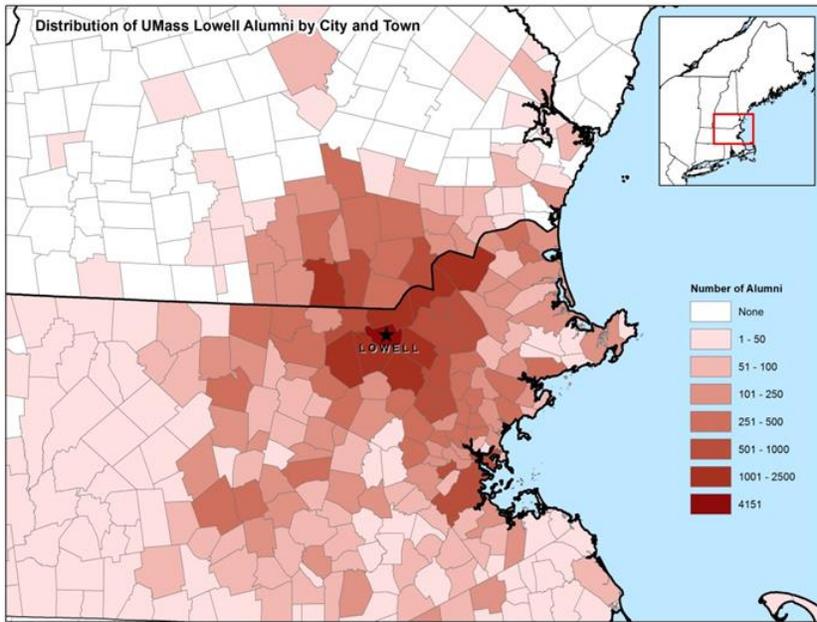
UMass Lowell employs approximately 2,000 people, including faculty and administrative positions. These people tend to reside within drivable commuting distances to the university. About 95 percent of employees reside in either Massachusetts or New Hampshire. Far more employees reside in Middlesex County than any other county in Massachusetts or New Hampshire. Among cities and towns, the City of Lowell is the top place of residence for UMass Lowell employees.

Place of Residence for UMass Lowell Employees – Top Counties, Cities, and Towns

Residence of Employees by County	Employees	Residence of Employees by City and Town	Employees
Middlesex	1,119	Lowell	317
Essex	294	Nashua	113
Hillsborough	274	Dracut	110
Rockingham	106	Chelmsford	87
Worcester	84	Andover	71
Suffolk	32	Westford	58
Norfolk	19	Tyngsborough	49
Plymouth	10	Hudson	47
Bristol	8	Methuen	46
Strafford	7	Pelham	37
Rest of MA and NH	23	Rest of MA and NH	1,041
Total	1,976	Total	1,976

Source: UMass Lowell

Place of Residence of UMass Lowell Alumni



Source: UMass Lowell

UMass Lowell alumni live throughout the United States and world. Today, they are largely concentrated in Eastern Massachusetts and Southeastern New Hampshire. UMass Lowell’s alumni are a key source for skilled labor serving the New England economy, including the region’s globally-recognized high technology, advanced manufacturing, finance, and healthcare sectors. Similar to the data for student origins and the place of residence for UMass Lowell employees, alumni are concentrated in Middlesex County. In terms of cities and towns, the top alumni locations are the City of Lowell and its surrounding suburbs – Chelmsford, Dracut, and Methuen.

Place of Residence for UMass Lowell Alumni – Top Counties, Cities, and Towns

Residence of Alumni by County	Alumni	Residence of Alumni by City and Town	Alumni
Middlesex	23,293	Lowell	4,151
Essex	9,645	Chelmsford	2,269
Hillsborough	4,362	Dracut	2,005
Worcester	4,010	Methuen	1,819
Rockingham	3,503	Haverhill	1,457
Norfolk	1,872	Nashua	1,254
Suffolk	1,143	Billerica	1,245
Plymouth	1,037	Tewksbury	1,178
Bristol	816	Westford	1,131
Barnstable	648	Andover	994
Rest of MA and NH	1,872	Rest of MA and NH	34,698
Total	52,201	Total	52,201

Source: UMass Lowell

UMass Lowell Economic Impacts of Class of 2014 Working Graduates in Massachusetts

Total Economic Impacts of UMass Lowell Class of 2014 Graduates on Massachusetts

Class Outcomes	Employment	Output
Direct Effect	1,017	\$154,919,619
Indirect Effect	283	\$56,271,662
Induced Effect	377	\$54,348,072
Total Effect	1,678	\$265,539,353

Source: UMass Donahue Institute and IMPLAN based on salary and degree information included in UMass Lowell Undergraduate Career and Advanced Degree Outcomes, Class of 2013-2014.

Following commencement, UMass Lowell graduates begin jobs, with an estimated 83 percent of these with employers in the Commonwealth of Massachusetts (based on class of 2013-2014 outcomes survey). By contributing to the state economy, whether in healthcare, finance, manufacturing, or other business activity, UMass Lowell graduates make substantial contributions to the strength of the Massachusetts economy on an annual basis. Additionally, with the incomes they earn, UMass Lowell graduates also support the Massachusetts' housing, retail, entertainment, and restaurant sectors through their spending. The Class of 2014, alone, is estimated to contribute about \$265 million to Massachusetts economic output. The economic impacts for the class were estimated using salary estimates from the outcomes survey and assigning these values to Massachusetts industries using the IMPLAN model. Note that the average industry salary for first-year, post-graduation students is lower than the Massachusetts average for these same industries. For this reason, the multiplier effect (e.g., 1.6 for jobs; the ratio of direct effect to total effect employment) for first-year workers is lower than it would be for more experienced workers who earn higher salaries and wages.

As the Class of 2014 gains work experience, like the UML classes before them, their contributions to employers as well as their salaries, will increase. Older, more mature classes will have greater impacts due to higher salaries and higher workforce participation (recent graduating classes have a relatively low participation rate as many graduates continue their educations). Conservatively, the annual economic impacts of UMass Lowell classes with approximately 10 years of experience (e.g., Class of 2003) is \$388 million while those with roughly 20 years of experience (e.g., Class of 1993) is \$411 million. All told, the combined impacts of UMass Lowell graduates working in the Commonwealth would be in the billions of dollars.

The jobs impacts of UMass Lowell graduates will also escalate in time as they gain experience and earn higher salaries. Including multiplier effects, the Class of 2014 had a total employment impact of 1,678 jobs. A class with 20 years' experience and higher pay levels may contribute 2,600 jobs, in total, to the Massachusetts economy. This estimate assumes similar Massachusetts residency and labor participation rates as the class of 2013-2014.

These impact values for classes with more experience are estimated by escalating the class of 2014 wage and salary values based on average earnings of Massachusetts residents with a bachelor's degree by age group from the U.S. Census Bureau's Integrated for Public Use Microdata Series (IPUMS) data. The 10 years of experience category corresponds with 35 to 44 year olds while the 20 years of experience category corresponds with 45 to 54 year olds.

Co-op and Intern Programs

Total Economic Impacts of UMass Lowell Co-op Program on Northeastern Massachusetts and Southern New Hampshire Region, 2014 (draft impacts)

Co-Op Program	Employment	Output
Direct Effect	32	\$14,677,710
Indirect Effect	27	\$6,859,220
Induced Effect	25	\$3,494,092
Total Effect	85	\$25,031,022

Source: UMass Donahue Institute

UMass Lowell’s Co-op and intern programs, including the co-op program, co-op scholars, cost-share interns, and emerging scholars, combined, are estimated to have an annual economic impact of \$25.0 million in terms of output and 85 jobs. The “direct effect” jobs were derived, using the IMPLAN model, to translate the Co-op, intern, and scholar program’s wage and scholarship values into labor income. The labor income of the 368 students involved in these programs, in this case, translates to the equivalent of 32 industry jobs in Massachusetts. Co-op students tend to work in industries – finance, management, manufacturing, and scientific research – with high multiplier values, which explains the 2.6 multiplier in jobs (ratio between the total effect jobs, 85, and the imputed 32 direct effect jobs estimated for the programs).¹

The labor income estimates were derived in the following manner:

Co-op program. Based on an assumption (from historic co-op employment histories) that 199 of 250 co-op students in 2013-2014 worked in Massachusetts or New Hampshire. It was also assumed that students were paid \$18.91 per hour and worked an average of 33.5 hours per week, with 63 percent of students having a 6-month work period and the remaining having a 4-month work period.

Co-op scholars. Based on 141 students participating in either summer or academic year programs (2014), with each student receiving a scholarship of \$4,000.

Cost-share interns. Based on 20 students (annual average), receiving \$500 each in scholarships.

Emerging scholars. Based on 8 students (annual average), receiving stipends of \$2,500 each.

¹ The Class of 2014 multipliers are lower than the Co-op program multipliers shown, at least in part due to the higher degree of manufacturing, engineering, and scientific research engagement among the Co-op program participants as compared to the survey sample of the Class of 2014. The Co-op program methodology also translates Co-op wage and scholar income to their equivalents for Massachusetts industries using IMPLAN based on average industry wages which are higher than those for recently graduated students.

Massachusetts Medical Device Development Center (M2D2)

Total Economic Impacts of UMass Lowell’s M2D2 on Northeastern Massachusetts and Southern New Hampshire Region, 2014

M2D2	Employment	Output
Direct Effect	152	\$42,139,504
Indirect Effect	85	\$14,161,221
Induced Effect	133	\$19,164,257
Total Effect	370	\$75,464,982

Source: UMass Donahue Institute

M2D2 has an annual impact of over \$75 million in regional economic output and 370 jobs. These impacts are based on an assumption that 70 employees affiliated with M2D2 firms earn \$75,000 per year on average and that M2D2, in its most recent year, 2014, had funding of about \$25 million in private and grant funds. The 152 direct jobs value is an estimate that was imputed by the IMPLAN economic model based on these data.

UMass Lowell Research and Commercial Ventures & Intellectual Property (CVIP)

Total Economic Impacts of UMass Lowell’s Sponsored Research Expenditures on Northeastern Massachusetts and Southern New Hampshire Region, 2014

Research Expenditures	Employment	Output
Direct Effect	256	\$64,591,001
Indirect Effect	117	\$17,665,626
Induced Effect	156	\$21,912,934
Total Effect	529	\$104,169,561

Source: UMass Donahue Institute

Total research funding at UMass Lowell is about \$65 million, including sponsored research activities as well as other state, federal, and academic funding. Research funding associated with UMass Lowell has a total economic impact of over \$104 million and contributes over 500 jobs to the regional economy. The 256 direct jobs value is an estimate that was imputed by the IMPLAN economic model based on the research expenditures data.

Online and Continuing Education

Total Economic Impacts of UMass Lowell’s Corporate Revenues from Online and Continuing Education on Northeastern Massachusetts and Southern New Hampshire Region

Online and Continuing Education	Employment	Output
Direct Effect	372	\$40,648,841
Indirect Effect	60	\$12,134,403
Induced Effect	97	\$13,686,147
Total Effect	530	\$66,469,391

Source: UMass Donahue Institute

Based on revenues, \$40.6 million in 2014, the online and continuing education program at UMass Lowell has an annual impact of 530 jobs and a total economic effect of \$66.5 million on the regional economy. The 372 direct jobs value is an estimate that was imputed by the IMPLAN economic model from the revenue data provided by UMass Lowell.

Economic Impacts of the Tsongas Center

Total Jobs Impacts from the Tsongas Center on the Northeastern Massachusetts and Southern New Hampshire Region

Tsongas Center	Employment	Output
Direct Effect	259	\$4,811,554
Indirect Effect	35	\$3,701,170
Induced Effect	14	\$1,958,433
Total Effect	308	\$10,471,157

Source: UMass Donahue Institute

The Tsongas Center generated \$4.8 million in revenue in 2014, hosting 198 events. The Center acts as a catalyst for economic activity by drawing citizens, tourists, and dollars to Lowell and providing a boost to downtown businesses and the local economy. The Tsongas Center also contributes to keeping Downtown Lowell active during the evening and on weekends. The economic impact of the Center amounted to 308 jobs and \$10.5 million an economic output to the region in 2014. The 259 direct jobs value is an estimate that was imputed by the IMPLAN economic model from the revenue data provided by UMass Lowell.

A single River Hawks hockey game generates about \$196,000 of economic impact in the region, with over half of that representing economic effects for local (or regional) businesses, including restaurants, other entertainment facilities, hotels, as well as other support activities to the Center.

Economic Effects of a UMass Lowell Hockey Game

UMass Lowell Hockey	Employment	Output
Direct Effect	5	\$90,000
Indirect Effect	1	\$69,230
Induced Effect	0	\$36,632
Total Effect	6	\$195,862

Source: UMass Donahue Institute

UMass Lowell Inn and Conference Center and Aramark

Total Jobs Impacts from the UMass Lowell Inn and Conference Center on Northeastern Massachusetts and Southern New Hampshire Region

ICC	Employment	Output
Direct Effect	75	\$3,186,648
Indirect Effect	5	\$788,100
Induced Effect	5	\$743,238
Total Effect	85	\$4,717,986

Source: UMass Donahue Institute

The UMass Lowell Inn and Conference Center (ICC) has an annual economic impact of \$4.7 million and generates 85 total jobs for the region. This impact was measured using the IMPLAN economic model based on the ICC's annual revenues. The direct effect jobs, 75, are actuals provided by Aramark.

The \$4.7 million impact, shown above, does not include in its entirety the other economic effects that the ICC provides by playing host to regional and national conferences attended by people from around the world as many conference delegates stay at other hotels and eat at restaurants throughout the region. Conferences held at the ICC as well as the Tsongas Center have significant impacts on the regional economy. In the last fiscal year, 31 conferences were held at the two facilities. Based on data concerning the average size of conferences held at the ICC and the Tsongas Center, an estimated 4,300 people attended conferences at the facilities in the last year. About 1,400 of these attendees were participating in national/international caliber conferences that generate the greatest economic effects.

Based on assumptions from a national study, "The Economic Significance of Meetings to the U.S. Economy (2014)"², the direct local spending (accommodation, food, retail, entertainment, and recreation) for a major meeting/conference of 150 people in Lowell would be about \$55,000. Including multipliers, a conference of this size would yield about \$80,000 in economic output for the northeastern Massachusetts/southern New Hampshire region. This adds up to about \$535 in economic effects per attendee at national-caliber conferences held at either the ICC or the Tsongas Center.

Conferences, July 1, 2014 through June 30, 2015 held at the ICC or Tsongas Center:

- 31 conferences total
- 17 large conferences (over 100 attendees) with an average of 211 attendees
- 14 small conferences (under 100 attendees) with an average of 50 attendees

Total Jobs Impacts from Aramark Services (excluding ICC) on Northeastern Massachusetts and Southern New Hampshire Region

Aramark	Employment	Output
Direct Effect	339	\$16,768,557
Indirect Effect	18	\$3,255,274
Induced Effect	25	\$3,515,618
Total Effect	382	\$23,539,449

Source: UMass Donahue Institute

² PricewaterhouseCoopers

Beyond the ICC, Aramark handles UML campus catering, concessions, dining, and retail. Excluding its ICC-related operations, Aramark services at UMass Lowell have an annual economic impact of \$23.5 million and generate 382 total jobs for the region. This impact was measured using the IMPLAN economic model based on the ICC's annual revenues. The direct effect jobs, 339, are actuals provided by Aramark.

How the Economic Contributions of UMass Lowell Were Estimated

The economic contributions summarized in this report were generated using the IMPLAN³ economic model based on data provided by UMass Lowell for the activities included within the scope of this study. The data (e.g., research expenditures, the wage levels of Co-op students, revenues at the Tsongas Center, etc.), were converted by the UMass Donahue Institute into inputs suitable for use in the IMPLAN model that conform with the software's industry classifications and economic activity specifications (e.g., employee compensation and industry sales). With the prepared inputs entered into the software, the IMPLAN model then generates the economic contributions resulting from UMass Lowell's selected initiatives. The economic contributions shown in the study and generated by IMPLAN include multiplier effects (the increase in economic activity that results as payroll, expenditures, and business sales related to UMass Lowell reverberate through the regional economy).

³ For more information on the IMPLAN economic analysis software, please visit their website, www.implan.com.

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.

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