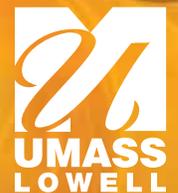


A person wearing a full-body yellow protective suit and safety glasses is working in a laboratory. They are holding a green pen and writing on a piece of paper. The background is a bright, yellow-tinted laboratory setting with various pieces of equipment and a window looking out onto a building.

The Innovation Effect:

How UMass Lowell Benefits Lowell and the Region

Fall 2015





“The whole university has embraced this idea of entrepreneurship and economic development.”

– Chancellor Jacquie Moloney

Shaping the Region's Future

The University of Massachusetts Lowell generates \$854 million in annual economic impact that supports 7,097 jobs in Massachusetts and southern New Hampshire, a new UMass Donahue Institute study asserts. But the numbers tell only part of the story of the university's dynamic growth and transformational impact on the region. With its emphasis on research and an entrepreneurial campus culture, UMass Lowell is helping to shape the region's future.

As the linchpin of Lowell's "innovation hub," the university is a force behind today's iteration of the city's post-industrial resilience and reinvention. The cradle of the American Industrial Revolution has survived the boom-and-bust cycles of textile manufacturing and the minicomputer industry, and today UMass Lowell's research centers are exploring the science and processes of the future—nanotechnology, advanced materials, printed electronics, robotics, clean energy and medical devices.

And through the enterprising use of the UMass Lowell Inn & Conference Center, the Tsongas Center at UMass Lowell, and, more recently, University Crossing, the university has effectively become the workhorse of the region's visitors and convention business—producing increasing economic benefits to the city as thousands of researchers, academics and other visitors from around the globe flock to conferences and other gatherings.

"The whole university has embraced this idea of entrepreneurship and economic development," says Chancellor Jacquie Moloney, who was a guiding force in crafting UMass Lowell's strategic plan. "It's an ethos of integrating our approach to applied research to have an impact on the community while helping industry to think more creatively, weaving this all together in a self-supporting environment."

In ways large and small, these activities add incalculable richness to the economic, cultural and intellectual life of the region well beyond the value of \$854 million in economic impact.

Note: Figures in the Donahue Institute report are from 2014.

JOBS IMPACT AND ECONOMIC CONTRIBUTIONS

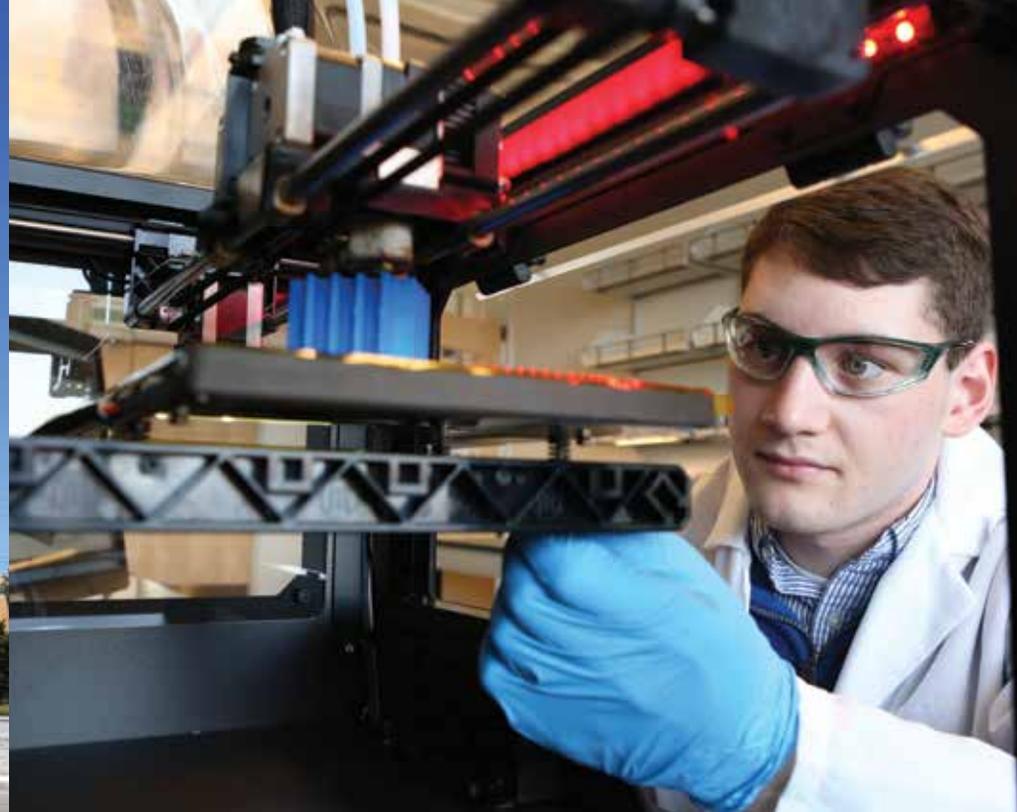
Employment Impacts (Jobs)

Faculty and Staff.....	1,976
External Jobs	5,121
Total Jobs Supported by UMass Lowell	7,097

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



Rising in Research

One of the fast-growing components of the UMass Lowell portfolio is research, through which faculty and students expand knowledge and commerce and develop new technologies, processes and products. Since 2007, university expenditures on research and development have soared from \$36 million to \$65 million a year—and continue to climb. In fiscal 2015, research awards to the university from government, corporate and foundation sources jumped more than 50 percent over the prior year and should continue to boost spending in the coming years.

Research activities at UMass Lowell exert an overall economic impact of \$104 million and support 529 jobs in the region annually, the Donahue Institute report states.

In the past eight years, the university has created 200,000 square feet of new research space including the cutting-edge, \$80-million Saab Emerging Technologies and Innovation Center that opened on North Campus three years ago. Part of the complex is home to the Raytheon-UMass Lowell Research Institute, a groundbreaking collaboration between the technology giant and the university. Raytheon will contribute up to \$5 million to undertake joint research at the Saab Center between UMass Lowell faculty and students and Raytheon scientists in the development of radar and other communications systems.

RURI, as it is known, is one of 11 university-level research centers and institutes at UMass Lowell. Others focus on advanced materials (including a partnership with the U.S. Army Natick Soldier Research, Development & Engineering Center), public health, terrorism and security studies, nanomanufacturing, wind energy and robotics.

UMASS LOWELL RESEARCH AND COMMERCIAL VENTURES & INTELLECTUAL PROPERTY (CVIP)

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

ANNUAL RESEARCH EXPENDITURES



Source: UMass Donahue Institute

UMass Lowell has also established a dozen “seed centers” targeted for research growth. These include efforts in biomanufacturing, biomedical imaging, energy and climate change, space science, data sciences and cybersecurity, Asian American studies, Jack Kerouac and program evaluation.

In addition, hundreds of companies in Massachusetts and New Hampshire employ the laboratories, equipment and faculty expertise offered by the university’s Core Research Facilities.

M2D2 and Innovation Hub

UMass Lowell's expansion this year of the Massachusetts Medical Device Development Center (M2D2) and the creation of the UMass Lowell Innovation Hub represents a dramatic commitment to the future of the regional economy.

The opening of state-of-the-art facilities serves the dual purpose of creating additional space for entrepreneurs to transform ideas into viable businesses within growing sectors of the area's economy and being a catalyst for additional revitalization of the old factories along the Hamilton Canal District near downtown Lowell.

M2D2, which works in collaboration with UMass Worcester and its medical school, contributed \$75.5 million to the economy in 2014 and supported 370 jobs, the Donahue Institute report states.

Launched in 2007, the incubator for startup companies opened 14,000 square feet on two floors of the refurbished Wannalancit Mills near East Campus in 2011. With this year's expansion, M2D2 is beginning to lease an additional 11,000 square feet on the top floor of the former Freudenberg Nonwovens building at 110 Canal St. in Lowell's Hamilton Canal District. The UMass Lowell Innovation Hub occupies another 11,000 square feet on the floor below, offering shared space and facilities for startup firms involved in advanced materials and manufacturing, clean tech and energy, robotics, sensors and information technology.

In all, M2D2 has been home to 34 startup companies that have attracted \$61.3 million in private funds and grants.

By combining the engineering and business development expertise of UMass Lowell with the medical and clinical trial strengths of UMass Worcester's faculty and researchers, M2D2 offers an ecosystem to create early-stage prototypes, attract investment funding, secure intellectual property rights and navigate the regulatory process.

Besides cultivating startups from within the UMass Lowell community, M2D2 attracts firms from the Boston-Cambridge life sciences cluster. Industry partners pay sponsorships and evaluate emerging products and companies.

The opening of the Innovation Hub expands the scope to a wider range of technologies that can tap into university resources and research expertise in a facility that includes a prototype and fabrication development workshop.

MASSACHUSETTS MEDICAL DEVICE DEVELOPMENT CENTER (M2D2)

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 COMPANIES AND CAPITALIZATION

Medica Matrix (2008).....	\$3.6M
Vasotech (2008).....	\$5M
206 Ortho (2010).....	\$4.1M
Flow Forward (2011).....	\$6.7M
Safe Path Medical (2011).....	\$1.3M
KnipBio (2015).....	\$2M

Source: M2D2



**SPOTLIGHT ON M2D2:
MUCH MORE THAN A WORKSPACE
FOR INFOBIONIC**

UMass Lowell provided the founders of InfoBionic more than just a workspace in which to launch their remote monitoring system for heart arrhythmia.

“It gave us space with other medical device technologies to help us get liftoff, leverage the facilities to meet with angel investors, work with one of the professors in computer science and provided paid interns from the computer science and business programs,” says Nancy Briefs, one of four cofounders and now CEO of InfoBionic.

“We like being close to the university and our intent is to stay here at M2D2 as long as we can,” Briefs says. “We like the support. We like the environment. It helps us tremendously.”

InfoBionic moved into M2D2 at Wannalancit in the fall of 2011 and has attracted \$28 million in private investment for its Cloud-based architecture that will allow monitoring of arrhythmia, an irregular heartbeat, no matter where the patients are when they are using the device.

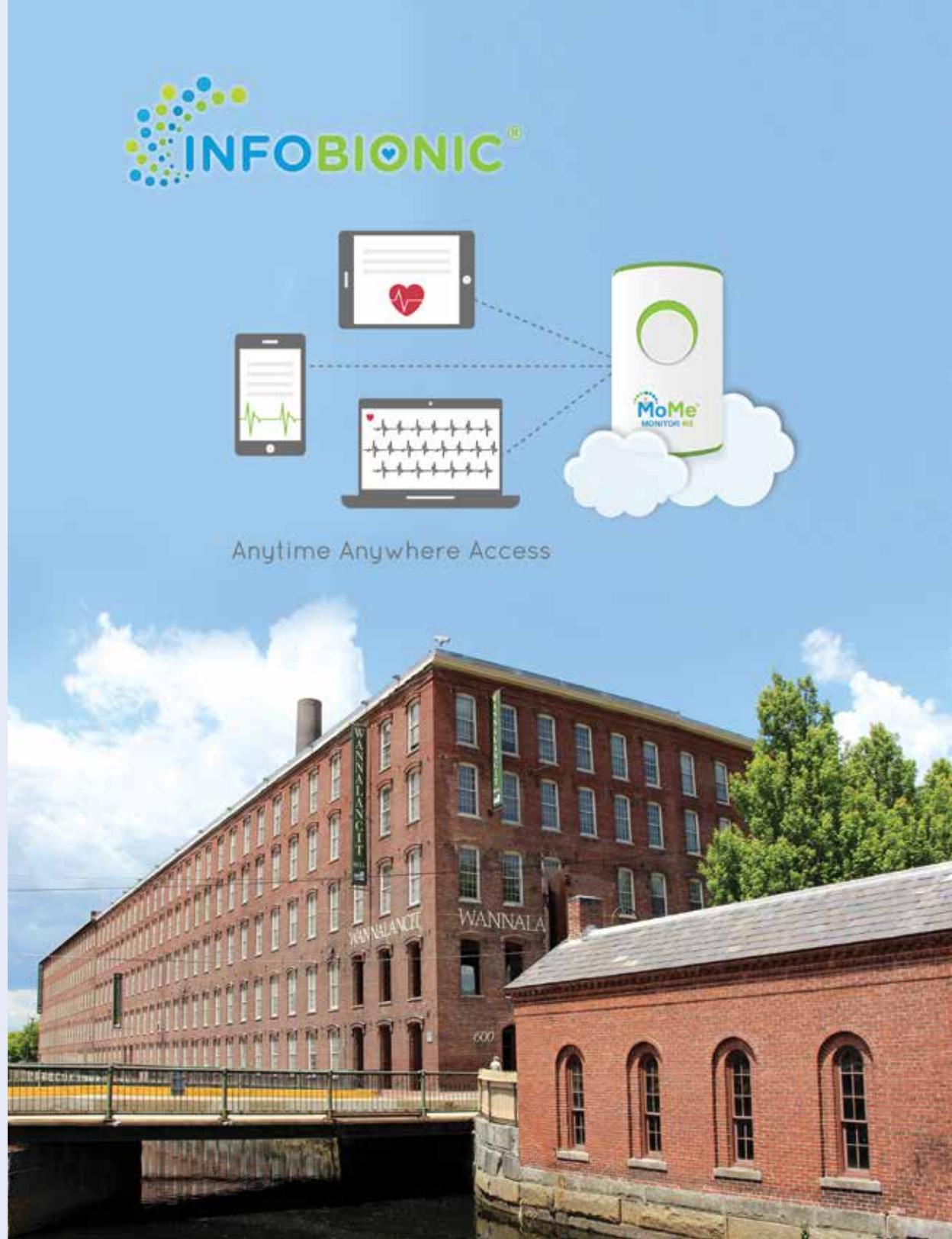
The firm is awaiting U.S. Food and Drug Administration approval and is on track to be in the commercial market by 2016, Briefs says.

The firm has grown from three employees to 16.

When it outgrows the incubator space, InfoBionic intends to remain in the Merrimack Valley, Briefs says, and plans to outsource manufacturing to a firm in the state.



Anytime Anywhere Access



SPOTLIGHT ON INNOVATION HUB: NONSPEC BORN ON CAMPUS

Of the dozens of companies nurtured by the university, Nonspec stands out as the purest distillation of the entrepreneurial ethos coming to life on the university's campus.

Born as a UMass Lowell senior "capstone" project to demonstrate command of the four-year curriculum in mechanical engineering, a team of undergraduates went on to beat 39 other teams on campus to win the 2013 "DifferenceMaker" top prize of \$5,000 with its design for a low-cost, expandable prosthetic hand.

The award was the first of several and helped to underwrite the creation of Nonspec as it developed low-cost, adjustable prosthetics designed for children in underdeveloped nations. To date, Nonspec has won or raised \$180,000 and was one of the first companies to rent space in the UMass Lowell Innovation Hub on the third floor of 110 Canal St.

With help from UMass Lowell's plastics and mechanical engineering and business departments, the prototype evolved from metal to plastic and can now be adapted to full prosthetic limbs from shoulder to fingertip or hip to toe, according to Jonathan Perez de Alderete, one of the company's founders.

Unlike traditional prosthetics, Nonspec's are designed to be adapted as young patients grow, eliminating the need for larger and costly replacements.

At a cost of pennies on the dollar compared to products currently in the market, the prostheses can be mass-produced and are being test marketed at clinics on several continents, Perez de Alderete says.

Nonspec currently has employees working in Lowell, India and Germany.



NONSPEC

UMass Lowell Inn & Conference Center

In each of its four years, the Deshpande Symposium for Innovation and Entrepreneurship In Higher Education has grown in size and scope, drawing hundreds of forward-thinking academics and other leaders to the UMass Lowell Inn & Conference Center (ICC). In 2015, attendance exceeded 300 from more than 100 institutions across the United States and Canada, Europe, Asia and Africa.

Besides UMass Lowell and Middlesex Community College, the list of academic institutions on the steering committee included major universities from six other states and a province in Canada.

In many ways, the symposium exemplifies what the ICC has become to the larger community—a gathering place for experts in many fields from around the region, nation and world to share ideas and knowledge. As a result, UMass Lowell is the portal through which many enter the city and view its vibrant culture and history.

Each year, dozens of events are coordinated by academic, research and administrative departments of UMass Lowell. These university-sponsored events have drawn an average of more than 3,000 visitors annually from outside the area. They are introduced to Lowell's many attractions and provide a major boost to the local economy.

The ICC generated \$4.7 million in economic activity and supported 85 jobs in 2014, in addition to the overall \$28.3 million and 414 jobs impact of the other university facilities serviced by Aramark, the UMass Lowell food services vendor, the UMass Donahue Institute report calculated. Besides university events, the ICC hosts functions for business, civic and cultural groups as well as individuals from Greater Lowell.

Besides the Deshpande Symposium, UMass Lowell-affiliated groups to gather at the former downtown hotel in the past year include The Charles S. Peirce International Centennial Congress, attended by 265 scholars of philosophy, with keynote remarks by speakers from Illinois, Pennsylvania, Florida and Indiana as well as Brazil, France, Canada and the United Kingdom.

In one recent month alone at the ICC, the Florida-based Society for Community Research and Action held its biennial conference, attended by 500 community psychology educators, researchers and practitioners; the UMass Lowell mechanical engineering department sponsored a Concussion Prevention and Diagnosis workshop that drew 150 visitors; and the UMass Medical School held its 14th Annual Immunology and Microbiology Research Retreat, attended by about 100.

Other UMass Lowell departments that have scheduled smaller conferences at the center for their academic peers from the U.S. and abroad include the departments of chemical, nuclear and plastic engineering, computer science, admissions, student financial aid, English, history, political science, health sciences, physics and the veterans counseling center.

UMASS LOWELL INN & CONFERENCE CENTER AND ARAMARK

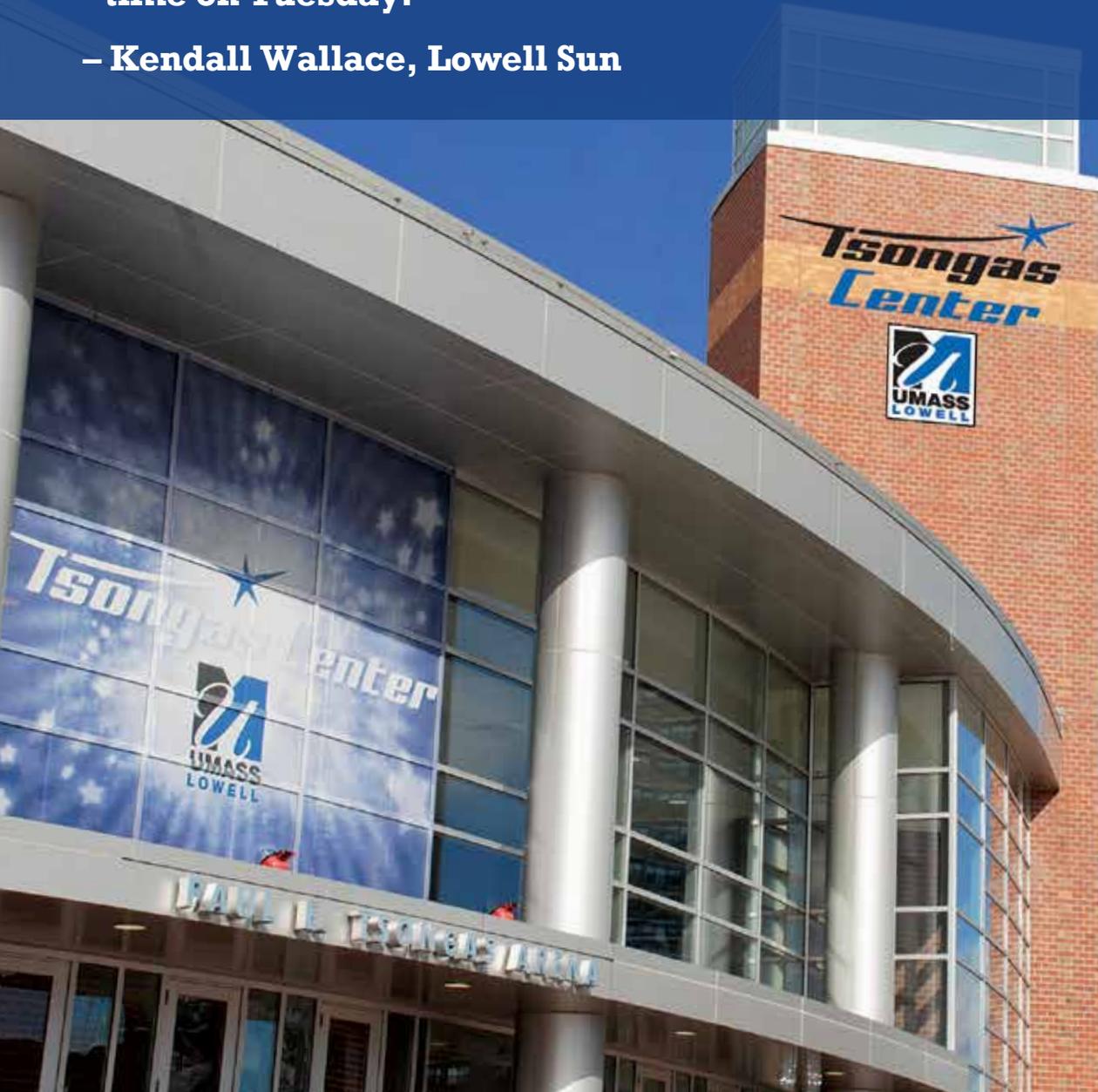
ICC	Employment	Output
Direct Effect	75	\$3,186,648
Indirect Effect	5	\$788,100
Induced Effect	5	\$743,238
Total Effect	85	\$4,717,986

Source: UMass Donahue Institute



“I’ve worked downtown for 50 years, [including] when we had major department stores and movie theaters, and never saw Merrimack Street as crowded. It looked like a busy day downtown in Boston at lunch time on Tuesday.”

– Kendall Wallace, Lowell Sun



Tsongas Center at UMass Lowell

The Tsongas Center at UMass Lowell shattered attendance records in fiscal year 2015, in part because of the university's emphasis on attracting conventions and other events, particularly in the summer months.

More than 330,000 patrons turned out during the year, peaking with an influx of summer visitors that had a visible effect on the local economy.

"I've worked downtown for 50 years, [including] when we had major department stores and movie theaters, and never saw Merrimack Street as crowded. It looked like a busy day downtown in Boston at lunch time on Tuesday," Kendall Wallace wrote in his Lowell Sun column.

He was referring to the throngs from a pair of events that drew a combined 36,023 visitors during a week at the end of June. The streets were jammed and there were long lines at every restaurant and sandwich shop in downtown Lowell.

The events were the congresses of the Future Medical Leaders and Future Science and Technology Leaders at the Tsongas. Both gatherings attract high school honor students, many accompanied by their parents, from around the United States.

In late May and early June, Jehovah's Witnesses held a series of five conventions at the Tsongas Center, attracting an average of more than 10,000 attendees at each.

In mid-July, the Life Teen regional conference of the Franciscan University of Steubenville brought 4,300 guests for three days and two nights.

The Tsongas Center, perhaps better known as the home of the UMass Lowell River Hawks hockey team, a major concert venue and the site of graduation ceremonies and sports tournaments, operates under its own entrepreneurial business plan.

The Tsongas Center delivered an annual impact of \$10.5 million and supported 308 jobs, according to the UMass Donahue Institute report. The City of Lowell calculates that Tsongas Center events generate an average of at least \$263,232 per year in parking revenue for the city treasury from the adjacent George Ayotte Parking Facility.

ECONOMIC IMPACT OF THE TSONGAS CENTER

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

TSONGAS CENTER UTILIZATION

Fiscal Year	2011	2012	2013	2014	2015
No. of events	132	146	146	198	197
Attendance	184,720	229,349	225,804	246,039	330,040
Revenues	\$4.1M	\$4.8M	\$3.2M	\$4.4M	\$4.7M

Source: UMass Donahue Institute

Bidding for summer conference business is part of a plan to maximize the use of university facilities during the summer period between academic semesters.

In the first full summer of aggressively pursuing conference and convention business, the hospitality program hosted 21 events, resulting in 35,000 "bed nights" for guests at UMass Lowell residence halls in addition to the many rentals in hotels throughout the area, according to Lauren Rojas, the university's executive director of hospitality and event services.

Groups using university facilities in summer 2015 also included Teach for America and the iD Tech Computer Summer Camp.

"This was our first sold-out summer," Rojas says.



**SPOTLIGHT ON THE TSONGAS CENTER:
RIVER HAWKS HOCKEY IS A SCORE FOR LOCAL ECONOMY**

When the River Hawks take the ice at the Tsongas Center, they are doing more than stirring the passions of their large fan base. They are stirring the local economy.

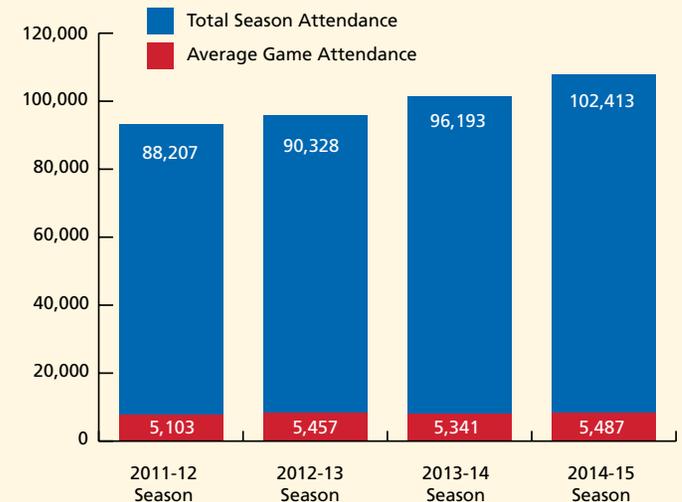
Packing them in generates about \$196,000 in local economic impact for each UMass Lowell hockey game, with more than half that amount benefiting nearby businesses in the Merrimack Valley, the UMass Donahue Institute report says. These businesses include restaurants, bars, hotels and companies that supply goods or services to the Tsongas.

The River Hawks ranked number 12 in the nation in NCAA Division I hockey attendance each of the past two seasons, averaging 5,487 per game in 2014-15, a boon for Lowell’s many dining spots.

For the upcoming 2015-16 season, the River Hawks will play at least 18 games on their home ice. If they win home-ice advantage in the Hockey East tournament (as they have in each of the past four years), they will be guaranteed two or three additional home dates.

A million-dollar-a-year loser until the City of Lowell sold it in 2010 to the university, the Tsongas has become a showcase entertainment and convention venue that now breaks even as a result of UMass Lowell’s \$10 million refurbishment and enterprising operational plan.

**UMASS LOWELL HOCKEY
ATTENDANCE**



Source: UMass Lowell Athletics Department



Tsongas Center

Competitive Energy

2ND
18:41

Competitive

Courier

DCU

Walmart

Align

SPRINT

THE MEDICAL CENTER UNION

UMASS LOWELL
UNIVERSITY OF MASSACHUSETTS

enMello.com

Combining Studies
Corporate & Distance
UMASS Education

TRINITY
UNIVERSITY OF MASSACHUSETTS

20 13

28

27

OWLET
21



The Innovation Effect:

How UMass Lowell Benefits Lowell and the Region

Steven F. Tello, Ed. D.

Associate Vice Chancellor
Entrepreneurship & Economic Development

Associate Professor
Management & Entrepreneurship
Manning School of Business

978-934-4240

Steven_Tello@uml.edu

University of Massachusetts Lowell
One University Ave.
Lowell, MA 01854

www.uml.edu

