



University of Rochester & Affiliates

2015 NYS Economic Impact

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Prepared for:

University of Rochester

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Summary

That the University of Rochester is the largest employer in the Rochester area is well known. Yet as the largest private employer in Upstate New York and tied for 6th across the Empire State, the University's significance extends far beyond the Rochester/Finger Lakes region. As noted below, headcount employment at UR is nearly 29,000. On a "full time equivalent" basis, total employment is estimated to be about 24,000 (a detailed breakdown can be found in the body of the report).

University of Rochester and its Affiliates Employee Counts

	Counts
University of Rochester	21,936
Highland Hospital	2,686
The Highlands*	699
FF Thompson	1,513
Jones Memorial	480
Nicholas H. Noyes Memorial	547
Visiting Nurse Service/Signature Care	742
High Tech Rochester/BioVenture**	14
Total	28,617

*Includes Highlands at Brighton, Highlands at Pittsford, and Highlands Living Center

**Includes Excell Partners, Inc.

A few additional numbers describe UR's current impact and how that impact has grown since the last CGR economic impact study only two years before.

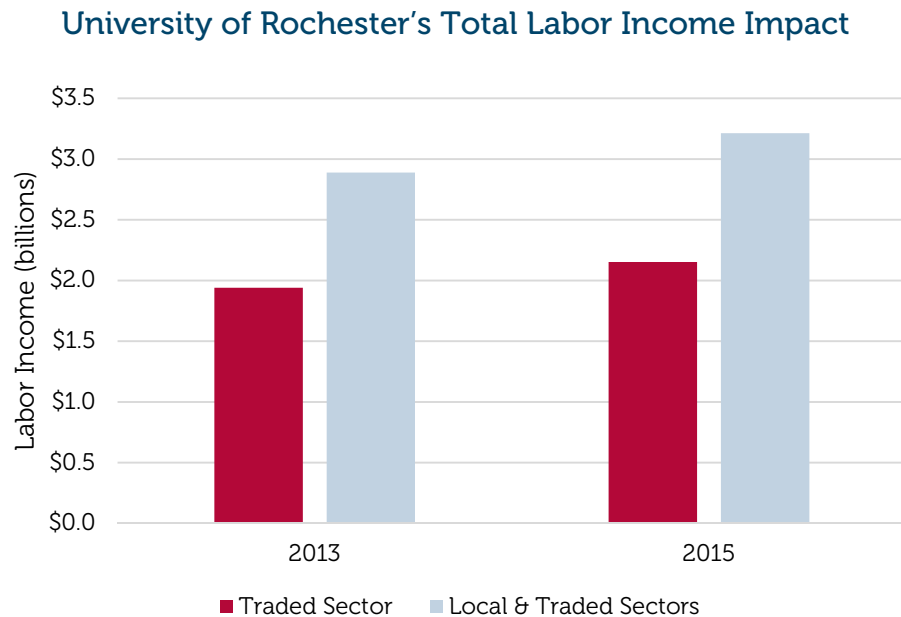
The University of Rochester's Employment Impacts (thousands of jobs)

Area of Business Activity	Traded Sector			Local & Traded Sectors		
	2013	2015	% Change	2013	2015	% Change
Employment Impact	28.3	30.8	9%	43.2	47.8	10%
Purchases Impact	2.0	2.0	-2%	3.9	4.3	9%
Capital Investments Impact	2.9	3.3	13%	2.9	3.3	13%
Student Spending Impact	0.9	1.0	3%	0.9	1.0	3%
Visitor Activity Impact	0.1	0.1	-6%	0.1	0.1	-6%
Total	34.4	37.2	8%	51.1	56.3	10%

The largest impact is generated by the direct employment of workers at a wide range of skill levels at UR. Adding the spillover impact brings the total employment figure to

about 37,000 jobs in New York State if only the traded sector is considered*. For both the local and traded sector combined, more than 56,000 jobs (direct and spillover) are generated in New York State.

The individuals either directly employed by the University or indirectly through the spending of the University or its employees earn an estimated \$3.2 billion dollars. These payroll dollars are the lifeblood of the local economy.



Posting a total labor income increase of 11% since 2013, the University continues to expand, promising continued expansion both on campus and in the community. This continued growth will be seen most visibly in the completion of the Imaging and Autism Center on East River Road, the Goergen Institute for Data Science, the second phase of the Golisano Children's Hospital development, and the High Technology of Rochester Business Accelerator. All of Rochester is aware of the new Interstate 390 Interchange, a transportation improvement that was largely stimulated by the University's expanding footprint. Less visible to the general public, but still significant to the larger economy will be the Laboratory for Laser Energetics Pulsed Power Initiative.

* "Traded sector" refers to those activities at the University that service more than the Rochester community, e.g. specialized clinical care and the educational mission. This concept is discussed in greater detail in the body of the report.

Finally, the University remains deeply engaged in the economic expansion of the region outside its corporate presence, playing a vital role in the Finger Lakes Regional Economic Development Council and the Upstate Revitalization Initiative.

Acknowledgements

This report is a team effort between CGR and many University of Rochester employees. CGR wishes to thank everyone who helped to provide the data necessary to perform the analysis. They are: Bob Andler, David Armstrong, Laura Brophy, Jonathan Burdick, Tanya Burt, Lucy Carroll, Chris Colaluca, Laurel Contomanolis, Holly Crawford, Jean Dalmath, Esther Dash, Rhea Deichman, Christine DelRegno, Daryl Drader, David Englert, Vini Falciano, Debbie Flotterton, Tom Ford, Diane Frank, Chris Garland, Wendi Heinzelman, Alicia Johnson, Nancy Kita, Rebekah Lewin, Jennifer Linton, Carole Lombard, Doris Ludek, Judy Marshall, Theresa Mazzullo, Sharon McCullough, Pat Murphy, Sue O'Connor, Lisa O'Dell, Dennis O'Donnell, Barry Palatas, Celia Palmer, Jon Peterson, Michelle Pfeiffer, Mary Rogan, Cam Schauf, John Schoen, Paula Smith, Helene Snihur, Brenda Sobeck, John Soures, Kathleen Strojny and Mark Ventress. In particular, we thank Josh Farrelman for their time in coordinating data requests, answering questions, and providing feedback on the report.

Staff Team

Mike Silva, Data Analyst, organized and analyzed data, helped define consistent methodology, and contributing to drafting portions of the report.

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Introduction

The University of Rochester (UR) engaged the Center for Governmental Research (CGR) to assess the economic and fiscal impact of the University and its affiliates on the State of New York during 2015. The report is the third in a series of reports exploring the impact of the university. CGR analyzed the broad diversity of specialized academic schools and affiliated organizations to develop a profile of the University's wide ranging economic and fiscal impact.

Our Approach

CGR's technical approach to analyzing economic impact is consistent with the standard practice of economic impact analysis. CGR has made every attempt to replicate the previous study's methodology, thus providing a consistency of results.

There are a few distinct changes to which we wish to call attention. First, prior studies limited the economic impact to the Rochester-Finger Lakes region. As UR's footprint has expanded beyond this region, we chose to model the statewide impact instead. Although most of the impact remains regional, the underlying economic multipliers have been changed to reflect the state instead of the region. The study now includes some data, particularly regarding purchasing, that was excluded from prior studies. Second, staff review of the prior methodology prompted a few changes in approach.

Given these differences, CGR revised the 2013 study according to the changes adopted in 2015. Comparisons between the 2013 study and the 2015 study reflect the adjusted 2013 estimates.

What Is Measured

CGR's economic impact studies estimate the wages and jobs that an institution stimulates as a result of its business operations. We attempt to answer the question, "How is the economy larger because of this institution's activity in the community?" We analyze five primary areas of business activity conducted by UR in order to quantify the economic impact. The five areas include:

- Employee wages and spending;
- Purchases;
- Capital investments;
- Visitor spending; and
- Student spending.

Geographic Scope

New York State is the level of analysis for estimating the economic and fiscal impacts. This is a departure for previous studies as the five-county Rochester metro area (Monroe, Livingston, Orleans, Ontario and Wayne Counties) was the geographic scope for the analysis of economic impact.

Time Period

CGR has attempted to consider estimated impacts for calendar year 2015; however some data were only available for the fiscal or the academic years. Given the uneven nature of capital expenditures, CGR uses a five year rolling average to estimate the economic impact of capital expenditures.

Data Sources and Modeling

All data for the study was provided by UR. The data were gathered independently by CGR from the various academic schools and affiliated organizations and compiled for analysis by CGR. Where necessary, CGR consulted with external sources to obtain benchmarks for analysis (e.g. the average hotel room rate was obtained by sampling local hotels). We also consulted data from U.S. government bureaus of the Census, Economic Analysis (BEA), and Labor Statistics (BLS); the New York State Department of Tax and Finance, plus a number of other sources.

CGR used IMPLAN, a regional input-output modeling system, to estimating the spillover economic impacts. The IMPLAN database, created by MIG, Inc., is a widely accepted model of economic activity. It consists of two major parts: 1) a national-level technology matrix and 2) estimates of sectoral activity for final demand, final payments, industry output and employment for each county in the U.S. along with state and national totals. Data are updated annually. IMPLAN estimates the direct, indirect and induced impacts of economic change through the use of multipliers, and estimates the impact of an increase in demand in a particular sector on 440 different industries/sectors of the local economy.

Traded vs. Local Sector Impacts

The goal of any economic impact analysis is to assess how the economy in question is larger as a consequence of the activity being studied. In layman's terms the question posed is this: How would the economy be smaller if the activity were to disappear?

Economists distinguish between economic activities that bring dollars into a region (i.e. dollars earned from trading with other regions) from those that simply reallocate dollars already "earned" from other trading. This might be illustrated as activities that "grow the pie" versus those that change the way the "pie is sliced." A new grocery

store, for example, will not attract spending from shoppers living outside the region; instead, the new store only reallocate spending on groceries that would have occurred anyway.

Although this is an important distinction, the dividing line between a “traded” activity and a purely local one is not easily drawn for an institution as complex as the University of Rochester. In theory, the traded sector is defined as those aspects of UR that would not be provided by another entity if UR did not exist. If UR were to disappear, the millions of dollars flowing into Rochester to support UR Medicine’s research enterprise would also disappear. By contrast, normal childbirth or appendectomies would be unlikely to move to Cleveland or Tampa if Strong or Highland hospitals were to close.

While this is an important distinction, it is impossible to divide every dollar of revenue flowing to an institution like the University of Rochester according to source. Although CGR treats the educational function of the University as part of the “traded sector,” some UR students may have chosen to attend another college or university in the region had they not been accepted at the University of Rochester. We do not attempt to draw such distinctions in this study.

CGR does, however, distinguish between clinical service revenue to Strong or Highland hospitals that would likely be earned in the local economy anyway if these hospitals were to close. Although routine surgery would be performed in the area regardless, Strong Hospital’s highly regarded (and quite large) liver transplant program is unusual and attracts patients from outside the region. Local residents who receive liver transplants would otherwise travel to another city if Strong did not provide this service. Analysis of UR Medicine data suggests that approximately 37% of clinical revenue flowing to Strong Memorial Hospital is highly specialized. It is this is the component of the clinical service revenue that CGR includes as part of UR’s unique contribution to the Rochester economy and qualifies as the traded sector.

The remaining 63% represents routine medical procedures that could be satisfied by other health care providers were these services not available from UR Medicine. Employees and direct spending related to these types of procedures are considered “local” and are not counted in the economic impact analysis of the traded sector.

Types of Economic Impact Effects

Direct Effects

The direct economic effects come from the actual expenditures of the University of Rochester in the community—i.e., the institution is directly involved with the transaction. Added to the direct expenditures is the local spending of students and visitors to campus and/or the hospitals. Examples of direct expenditures include:

- UR and its affiliates' payroll expenditures for faculty, physicians, staff, residents, and students;
- UR and its affiliates' purchases of goods and services from a variety of suppliers; and
- UR's payment to a construction firm for a capital improvement project (new building).

Spillover Effects

Spillover effects result from the subsequent spending of the recipients of the direct expenditures. In some studies this is subdivided for analysis into "indirect" and "induced" impact. For example, a vendor company that supplies a product or service to the University of Rochester uses the proceeds of that sale to make expenditures of its own, typically for both materials and labor. Similarly, employees of the University of Rochester spend their wages, which become income for other businesses in the region. These types of expenditures are categorized as spillover. Specific examples of types of spillover impacts include:

- The firm hired to construct a new building buys materials from local businesses. The local businesses will, in turn, have income to hire workers. Those workers will then spend money in the community. The spending of the businesses affected by the construction, and also the spending of the employees of those businesses, is considered spillover.
- A resident or lab tech purchases dinner in a restaurant, and the restaurant then uses the money to pay suppliers or staff.

Our Findings

Economic Impact Summary

CGR explores both the traded sector economic impact and also reports a broader look at the role UR plays in the economy, its total economic footprint.

Employment Impacts

UR continues to expand its employee base and its overall footprint resulting in a larger impact on the New York State economy. Since the last study of calendar year 2013, UR's has increased its employment impact by 8% for both traded sector only and in aggregate.

Figure 1 – The University of Rochester’s Total Employment Impacts



Table 1 – The University of Rochester’s Employment Impacts (thousands of jobs)

Area of Business Activity	Traded Sector			Local & Traded Sectors		
	2013	2015	% Change	2013	2015	% Change
Employment Impact	28.3	30.8	9%	43.2	47.8	10%
Purchases Impact	2.0	2.0	-2%	3.9	4.3	9%
Capital Investments Impact	2.9	3.3	13%	2.9	3.3	13%
Student Spending Impact	0.9	1.0	3%	0.9	1.0	3%
Visitor Activity Impact	0.1	0.1	-6%	0.1	0.1	-6%
Total	34.4	37.2	8%	51.1	56.3	10%

As noted in the table below and in our detailed summaries that follow, the largest impact is generated by the direct employment of over 24,000 FTE workers at UR. The money spent by UR to pay them is the single largest source fueling the economic engine at UR.

Adding the spillover impact brings the total employment figure to about 37,000 jobs in New York State if only the traded sector is considered. For both the local and traded sector combined, more than 56,000 jobs (direct and spillover) are generated in New York State.

**Table 2 – UR’s Employment Impact in New York State
(thousands of jobs)**

Area of Business Activity	Traded Sector			Local & Traded Sectors		
	Direct	Spillover	Total	Direct	Spillover	Total
Employment Impact	15.5	15.3	30.8	24.6	23.2	47.8
Purchases Impact	1.3	0.7	2.0	2.9	1.4	4.3
Capital Investments Impact	1.8	1.5	3.3	1.8	1.5	3.3
Student Spending Impact	0.7	0.3	1.0	0.7	0.3	1.0
Visitor Activity Impact	0.1	0.0	0.1	0.1	0.0	0.1
Total	19.5	17.7	37.2	30.1	26.3	56.4

Labor Income Impacts

Jobs—many well-paid—translate into paychecks for the thousands of employees identified above. The wages spent by UR employees fuel the economy in countless ways.

Figure 2 – University of Rochester’s Total Labor Income Impact



**Table 3 – University of Rochester’s Labor Income Impacts
(millions of dollars)**

Area of Business Activity	Traded Sector			Local & Traded Sectors		
	2013	2015	% Change	2013	2015	% Change
Employment Impact	\$1,663.4	\$1,858.0	12%	\$2,529.1	\$2,823.6	12%
Purchases Impact	\$91.8	\$88.7	-3%	\$174.3	\$184.7	6%
Capital Investments Impact	\$142.9	\$161.7	13%	\$142.9	\$161.7	13%
Student Spending Impact	\$38.5	\$40.1	4%	\$38.5	\$40.1	4%
Visitor Activity Impact	\$3.8	\$3.6	-6%	\$3.8	\$3.6	-6%
Total	\$1,940.4	\$2,152.1	11%	\$2,888.5	\$3,213.7	11%

UR’s labor income impact totals nearly \$2.1 billion (direct and spillover) in New York State in the traded sector; and over \$3.2 billion (direct and spillover) when considering the local and traded sector combined. The total wage impact changed from the previous study’s level by 11% for both the traded sector only the local and traded sector combined.

**Table 4 – University of Rochester’s Labor Income Impact in New York State
(millions of dollars)**

Area of Business Activity	Traded Sector			Local & Traded Sectors		
	Direct	Spillover	Total	Direct	Spillover	Total
Employment Impact	\$1,113.5	\$744.5	\$1,858.0	\$1,693.9	\$1,129.7	\$2,823.6
Purchases Impact	\$59.9	\$28.8	\$88.7	\$125.4	\$59.3	\$184.7
Capital Investments Impact	\$92.6	\$69.0	\$161.7	\$92.6	\$69.0	\$161.7
Student Spending Impact	\$25.2	\$14.9	\$40.1	\$25.2	\$14.9	\$40.1
Visitor Activity Impact	\$2.2	\$1.4	\$3.6	\$2.2	\$1.4	\$3.6
Total	\$1,293.5	\$858.6	\$2,152.1	\$1,939.4	\$1,274.3	\$3,213.7

Economic Impact Estimate Details

Employee Wages and Spending

For the purposes of this report, employees of University of Rochester include all adjunct faculty, full time faculty, post-doctoral fellows, research and teaching fellows, medical residents, and staff at the University of Rochester. In addition, CGR includes all employees of Strong Memorial Hospital, FF Thompson Health Care, Visiting Nurse Service (VNS), Visiting Nurse Signature Care, Highland Hospital, High Tech Rochester, Excell Partners, Inc., the Highlands Living Center, and both the Highlands at Pittsford and the Highlands at Brighton. In expressing the economic impact, CGR will refer to this entire body as University of Rochester employees.

The table below provides the employee count as of 12/31/15. This includes full-time, part-time and time as reported (TAR) individuals and is not a full-time equivalent number. The table does not include graduate students and undergraduate students. Overall, UR expanded its headcount by 11% as compared to December 2013.

Table 5 – University of Rochester and its Affiliates Employee Counts

	Counts
University of Rochester	21,936
Highland Hospital	2,686
The Highlands*	699
FF Thompson	1,513
Jones Memorial	480
Nicholas H. Noyes Memorial	547
Visiting Nurse Service/Signature Care	742
High Tech Rochester/BioVenture**	14
Total	28,617

*Includes Highlands at Brighton, Highlands at Pittsford, and Highlands Living Center

**Includes Excell Partners, Inc.

The table below summarizes the full-time equivalent number of UR employees reported on December 31, 2015. The FTE count is 10% higher than the end of December 2013.

Table 6 – University of Rochester and its Affiliates Full-Time Equivalent Counts

	Total
University of Rochester	19,351
Highland Hospital	2,174
The Highlands*	470
FF Thompson	1,208
Jones Memorial	329
Nicholas H. Noyes Memorial	437
Visiting Nurse Service/Signature Care	617
High Tech Rochester/BioVenture**	12
Total	24,598

*Includes Highlands at Brighton, Highlands at Pittsford, and Highlands Living Center

**Includes Excell Partners, Inc.

In estimating the economic impact of UR, CGR only includes the wages of those employees with zip codes in New York State. However, it is clear that an employee with a permanent address outside NYS may rent an apartment as well as buy groceries and gas in NYS from time to time. Due to the case-by-case nature of these situations,

CGR chose to only include those wages of employees with a zip code in New York State.

During the 2015 calendar year, UR paid wages of more than \$1.6 billion to employees living in New York State. The largest component of UR's economic impact in the NYS economy is based on the wages it pays to its employees and the subsequent buying power that generates for them. Not only does UR directly employ over 24,000 full-time equivalent workers, but the spending by these employees spurs on an estimated 23,000 jobs in NYS. When adjusting to account only for traded sector impact UR direct employment figure drops to an estimated 15,500 workers and the spending of those employees spurs on an additional 15,000 jobs in the NYS economy.

Table 7 – Employment Impacts

	Direct	Spillover	Total
Local & Traded Sectors Combined			
Employment (thousands of jobs)	24.6	23.2	47.8
Labor Income (millions of dollars)	\$1,693.9	\$1,129.7	\$2,823.6
Traded Sector Only			
Employment (thousands of jobs)	15.5	15.3	30.8
Labor Income (millions of dollars)	\$1,113.5	\$744.5	\$1,858.0

UR Remains One of New York State's Top 10 Private Employers

With nearly 29,000 employees (25,000 FTE) UR is by far the largest employer in the Western New York. CGR has updated its list of New York State's top private employers for this study to put UR's employment in a statewide context. Since private employment figures aren't public information, CGR has used various business journals, market research reports, and self-reported numbers to provide the most accurate data. With each new publication of this list, we have grown more confident that we are capturing the right firms and institutions. However, we remain cautiously aware that with no publicly available statewide source to independently verify our findings, there is a possibility that the list is incomplete.

The following is what CGR believes to be the largest private sector employers in New York State and their full-time equivalent employment numbers for the year ended 2015. We have used full time equivalents to provide a better comparison of employment impact.

Table 8 – Top 20 Private Employers in NYS 2015
Full-time equivalent employees located in the state

Rank	Company Name	NYS Employment
1	Northwell Health	45,000
2	Mount Sinai Health System*	31,000
3	Walmart*	28,000
4	Verizon NY Inc.**	27,000
5	Montefiore Health System	27,000
6	University of Rochester	25,000
6	JP Morgan Chase**	25,000
6	Citigroup Inc.**	25,000
9	New York Presbyterian	21,000
10	NYU/NYU Langone Medical Center	19,000
11	Macy's Inc.*	19,000
12	Wegmans Food Markets	17,000
13	Columbia University	16,000
14	Cornell University/Weill Medical College	16,000
15	Consolidated Edison	15,000
16	Cablevision	14,000
17	Bank of America**	14,000
18	Rochester Regional Health System*	13,000
19	Morgan Stanley**	13,000
20	Memorial Sloan-Kettering Cancer Center*	11,000

*Headcount reported; adjusted by CGR for likely part-time workers.

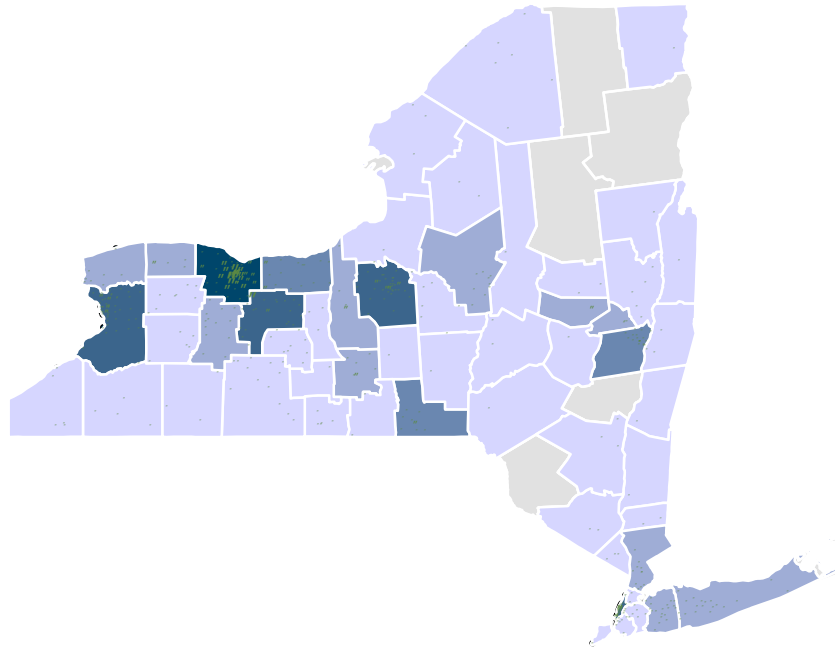
**Not published; estimate only.

With more than 25,000 FTE employees, the University of Rochester is in a three way tie for sixth largest employer in New York State in 2015. Across the board, healthcare and higher education remain the dominant players in New York State's economy. The majority of the largest firms are headquartered downstate, in New York City and on Long Island; though a few are located Upstate.

Purchasing Impacts

During 2015, the University of Rochester and its affiliates purchased goods and services totaling nearly \$1 billion (\$954 million). Of this total, about \$217 million was spent in New York State; touching all but five counties in the state. The following visualization depicts UR's purchasing footprint, both by location (dots) and magnitude (county shading).

Figure 3 – New York State Purchasing Footprint



CGR estimates that the purchases of goods and services by the University of Rochester and its affiliates sustain approximately 4,100 jobs in the state. The “traded sector” is responsible for 48% of these jobs.

UR has reached a size that it now can influence the locational decisions of input suppliers. Illinois-based Medline Industries relocates a 260,000-square-foot distribution center from Pennsylvania to Brockport in 2014. A five-year, \$250 million contract to become URMC’s prime vendor spurred the relocation. Medline expects to employ 40 workers at the site. A \$5.8 billion company, Medline is a direct supplier to hospitals, nursing homes, medical practice groups and retailers of surgical masks and gowns, scrubs, laboratory equipment, wound dressings, wheelchairs and other durable medical equipment and other medical supplies.

This kind of magnetic attraction boosts local job creation above what formal economic impact analysis is able to estimate.

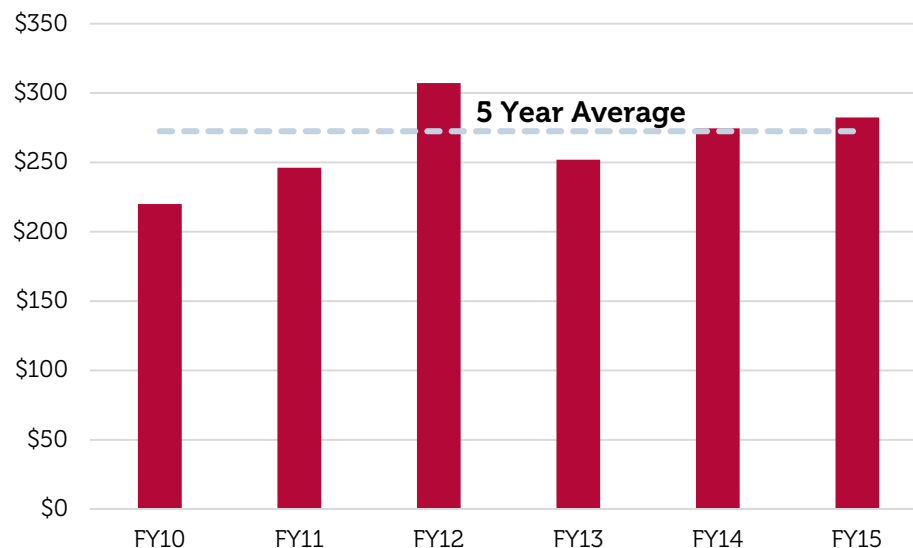
Table 9 – Purchasing Impact on New York State

	Direct	Spillover	Total
Local & Traded Sectors Combined			
Employment (thousands of jobs)	2.8	1.3	4.1
Labor Income (millions of dollars)	\$120.4	\$56.6	\$177.0
Traded Sector Only			
Employment (thousands of jobs)	1.3	0.7	2.0
Labor Income (millions of dollars)	\$59.9	\$28.8	\$88.7

Capital Investment: Past, Present & Future

The figures above exclude UR capital investment spending. Given the variable nature of capital expenditures, CGR uses a rolling average over five years to estimate the economic impact of the capital investments. During the past five fiscal years (FY2011 – FY2015), the University of Rochester and its affiliates have averaged a little over \$270 million in capital expenditures annually.

Figure 4 – University of Rochester Capital Expenditures
(millions of 2015 dollars)



CGR estimates the University of Rochester's average annual capital investments support around 3,300 jobs and bring in about \$162 million of labor income to the New York State economy.

Table 10 – Capital Investment Impacts

	Direct	Spillover	Total
Employment (thousands of jobs)	1.8	1.5	3.3
Labor Income (millions of dollars)	\$92.6	\$69.0	\$161.7

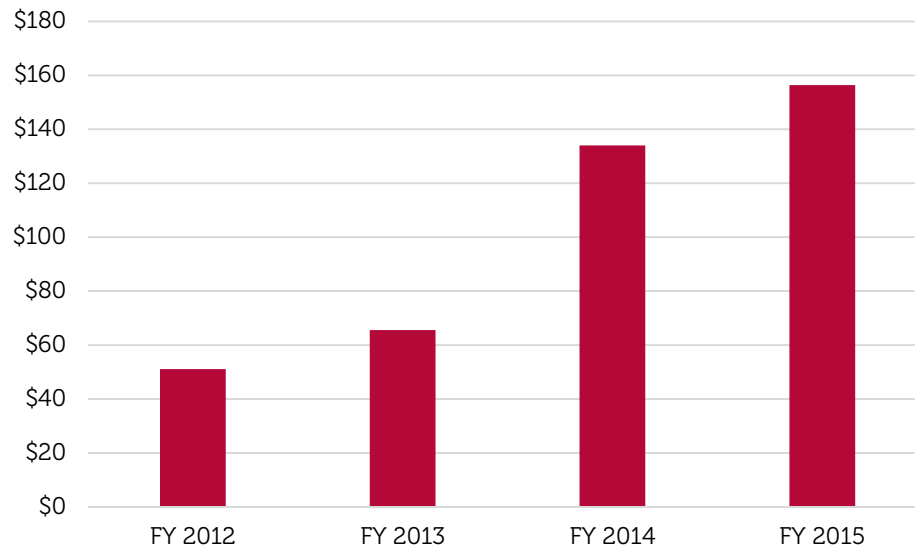
Interstate 390 Interchange

The expanding footprint of the University demonstrated the need for an additional interchange on Interstate 390. The \$70 million project—and the economic growth it will spur—would not have occurred without the urging of UR.

Goergen Institute for Data Science

Data science is the centerpiece of the University of Rochester's 2013-2018 strategic plan. The University has committed \$50 million, in addition to more than \$50 million it has invested in recent years towards the field of data science. The Goergen Institute for Data Science has been attracting more researchers and funding. In FY 2015, the 124 principle investigators of the IDS drew in \$156 million dollars of research money.

**Figure 5 – Summary of Awards by Fiscal Year
(millions of 2015 dollars)**



CGR estimates that the Goergen Institute for Data Science is responsible for 870 jobs in 2015 and a total payroll of \$61.1 million. An estimated \$4 million in income and tax revenue resulted from the IDS in 2015.

Table 11 – Economic and Fiscal Impact: IDS

	Direct	Spillover	Total
Employment	590	280	870
Labor Income (millions of dollars)	\$41.5	\$19.6	\$61.1
Income Tax (millions of dollars)	\$1.9	\$0.4	\$2.4
Sales Tax (millions of dollars)	\$1.1	\$0.5	\$1.6

A growing partnership with the Harris Corporation demonstrates the capacity and potential of data science made possible by the Goergen Institute. The Harris partnership demonstrates the viability of the Goergen Institute as originally conceived by UR. Harris’s Space and Intelligence Systems Division (formerly Exelis) anticipates that the partnership will bring new resources both to Harris and the Institute, both adding and retaining highly skilled jobs at Harris and spurring the development of new products and services.

Golisano Children’s Hospital Phase II

In the summer of 2015, after more than three years of planning and 30 months of construction, the \$145 million Phase I of new Golisano Children’s Hospital was complete. Currently, Golisano Children’s Hospital performs over 21,000 surgeries a year—for patients in the 17-county Finger Lakes region and beyond.

Over the next year or so, Phase II of the children’s hospital construction—a \$45 million project adding approximately 58,000 square feet—will be finished. This includes two pediatric intensive care units on the 6th Floor—one designed especially for pediatric heart patients. The expansion will accommodate growth to about 30,000 annual surgeries. CGR estimates that the construction phase will spur the creation of the equivalent of 300 full time, one year positions plus an additional 100 spillover jobs. Combined labor income will top \$20 million.

Table 12 – Anticipated Golisano Phase II Impacts

	Direct	Spillover	Total
Employment	300	100	400
Labor Income (millions of dollars)	\$15.3	\$5.9	\$21.2
Income Tax (millions of dollars)	\$0.6	\$0.2	\$0.8
Sales Tax (millions of dollars)	\$0.4	\$0.2	\$0.5

Components include:

- 4th Floor - Pediatric Surgery (29,000 sq. ft.; completion scheduled for 2017)

The William and Mildred Levine Pediatric Surgical Suite will include six new, larger pediatric-only operating rooms, including a dedicated operating room for cardiac

surgery and one for orthopaedic surgery, and 23 private pre- and post-operative rooms.

A new gastroenterology procedure suite—to treat disorders that involve the digestive system, liver, pancreas, and other areas—will be located in a newly renovated portion of Strong Memorial Hospital. The suite will be directly connected to our pre- and post-operative area in the Levine Surgical Suite by a new bridge. The suite will feature a procedure room, five patient prep rooms, and a nursing station.

Also on the 4th Floor will be the Clay E. and Rita M. Buzzard Pediatric Cardiology Catheterization Laboratory Suite and a new Pediatric-friendly waiting space for families.

- 6th Floor – Intensive Care (29,000 sq. ft.; completion scheduled for 2017)

Phase II will also involve intensive care. The sixth floor will house the Robbins Family Pediatric Intensive Care Unit (PICU) and Pediatric Cardiac Intensive Care Unit (PCICU) dedicated to Wal-Mart and Sam's Clubs. Together, they serve more than 1,000 children a year, making it the largest intensive care service for children in western and central New York.

The expanded unit will include 16 cardiac intensive care beds and 12 pediatric care beds. It will allow the hospital to accommodate the rising demand for care and further enhance efficiencies of having all beds co-located in the new facility. It will allow the hospital to accommodate the rising demand for care and further enhance efficiencies of having all beds co-located in the new facility.

It will also include the Elizabeth McAnarney MD Heart Recovery Suite with six beds for children after heart surgery.

Outpatient Imaging, Autism Care Building

Nearly completion is at 90,000-square-foot, three-story imaging sciences building on East River Road. The new site will provide the region's first outpatient interventional radiology clinic and the region's first stand-alone clinic to integrate care of autism with pediatric neuromedicine and child and adolescent psychiatry services.

The first two floors will hold the new Imaging Center, which will combine spacious, private patient spaces with advanced technology for diagnostics and treatment. The third floor will house the new William and Mildred Levine Autism Clinic, supported by a \$1 million gift from the William and Mildred Levine Foundation. The autism clinic will co-locate specialists in autism, child and adolescent psychiatry and neuromedicine services to offer multidisciplinary care to for children and teens. The \$28 million building will be completed in early 2017.

Laboratory for Laser Energetics Pulsed Power Initiative

UR's Laboratory for Laser Energetics has been a leader in optics, lasers, inertial confinement fusion research, and high-energy-density (HED) experiments for over 40 years. It is currently funded largely by National Nuclear Security Administration's (NNSA) Office of Inertial Confinement Fusion and is the leader of the direct-drive approach to ignition. Directors of the three weapons labs (Los Alamos, Lawrence Livermore and Sandia national laboratories) intend to coordinate high-energy-density efforts at the National Ignition Facility, the Z facility at Sandia, and the Omega laser facility at Rochester.

A pulse power facility is required to support the NNSA mission and continue and expand LLE's research with Sandia National Laboratories in pulse power. The magnetized linear inertial fusion concept advances fusion ignition and high yield, and other high-energy-density missions funded by NNSA. Exploiting the infrastructure associated with the OMEGA-EP laser, LLE would lead the world in building a source of ultra-high peak-power optical radiation of up to 100 Petawatts (10¹⁷ Watts) that would provide focused intensities up to 10²⁴ W/cm² intensity. One hundred times greater than any other facility in the world, it would surpass the Extreme Light Infrastructure initiative in Europe, funded at over €1 billion.

The proposal is to fund the expansion in three phases.

Individual Research Initiatives (Phase I)

- Building construction cost \$14.5MM
- LLE staffing to support research 20
- Materials and equipment purchased in NYS from FY16 onward \$4MM/yr

OMEGA EP 10MAmp LTD Pulse Power (PP) Construction and Operation (Phase II)

- Building construction cost FY18/19 ~\$41MM
- Project construction cost FY19 to FY22 ~\$86.5MM
- LLE staffing to support operations 40
- Materials and equipment purchased in NYS during operations \$4MM/yr

OMEGA EP Optical Parametric Chirped Pulse Amplification (OPCPA) System (Phase III)

- Project construction cost FY25 to FY28 ~\$55MM
- LLE staffing to support operations 15
- Materials and equipment purchased in NYS during operations \$4MM/yr

CGR estimates that this additional construction will add nearly 500 construction jobs plus potentially thousands of additional ongoing positions after the expansion has been completed and the new capabilities have been fully phased in. CGR is in the process of studying these ongoing impacts.

Table 13 – Economic Impact of LLE Expansion: Construction

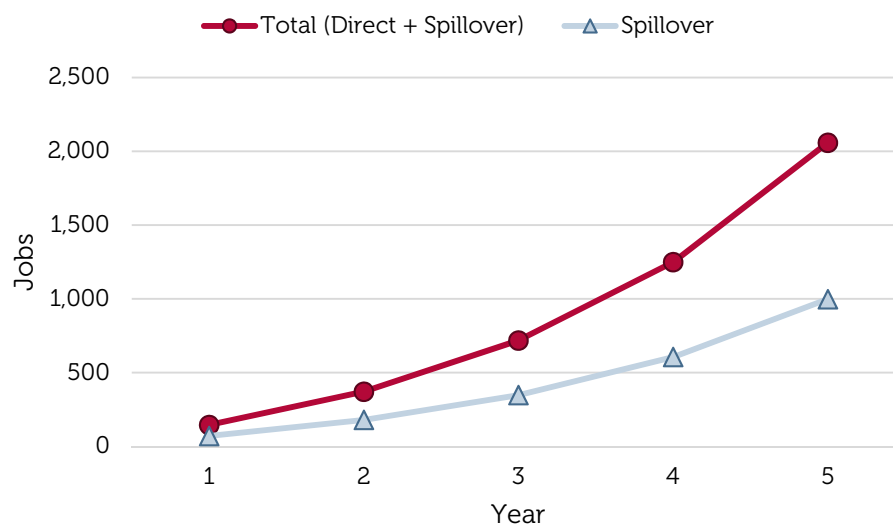
	Direct	Spillover	Total
Employment	370	120	490
Labor Income (millions of dollars)	\$18.9	\$7.3	\$26.1
Income Tax (millions of dollars)	\$0.7	\$0.3	\$1.0
Sales Tax (millions of dollars)	\$0.5	\$0.2	\$0.7

High Technology of Rochester Business Accelerator

The HTR Business Accelerator, just under construction at the downtown Sibley Building, is the cornerstone of the City of Rochester’s newly designated Downtown Innovation Zone. When fully renovated, the 68,000-square foot 6th floor will encompass co-working space, private offices and state-of-the-art labs (including wet labs for biotech innovation), conference rooms and an auditorium for programs, workshops and community events.

In fall of 2014, CGR assessed the economic impact of HTR’s forecast for the Business Accelerator. If these expectations are correct, employment in Business Accelerator startups plus “spillover” employment—will total around 2,000 FTEs by YEAR FIVE. Roughly half of these are directly employed by the startups and the other half is the result of spillover effects.

Figure 6 – Estimated Number of Jobs by Year



**Table 14 – Discounted Present Value: Labor Income
(thousands of dollars)**

	Year 1	Year 2	Year 3	Year 4	Year 5
Direct	\$3.8	\$9.4	\$17.8	\$30.3	\$49.0
Spillover	\$3.1	\$7.7	\$14.7	\$25.0	\$40.5

Labor income would grow from just under \$7 million in the first year to nearly \$90 million in year five. HTR assumes the following:

Over the first five years these startups are expected to generate about \$200M in labor income* in the Rochester metro area, plus a discounted present value total of about \$7.4 million in income tax revenue and \$6.1 million sales tax revenue during the first five years.

Excell Partners Impact Capital Fund

Excell Partners, a UR subsidiary, has recently established a new venture capital fund for the Rochester area. Named the Impact Capital Fund, it begins with \$11 million committed from an initial round of investment and is planned to grow to \$30-50 million through a combination of private and institutional investors, officials said.

Impact Capital is dedicated to giving second-round financing to regional companies looking to expand and is ready to take over where seed-funding firm Excell Partners Inc. has left off. Impact Capital’s general partners will begin selecting investments this year.

In addition, Excell was selected by Governor Cuomo to manage a \$2 million statewide MWBE Investment Fund to provide seed financing to certified minority- and women-owned business enterprises. The MWBE Investment Fund is an equity investment fund that was created to support innovation, job creation, and high growth entrepreneurship throughout the State. Through the Fund, Excell will invest in early stage MWBEs primarily in emerging technologies. The company will make seed and pre-seed investments in start-ups, with a focus on the fields of advanced materials, clean technology, life sciences and medical devices.

Visitor Spending Impacts

The University of Rochester hosted visitors throughout the year for events such as Meliora weekend, Commencement, concerts, recitals, athletic events, and admissions visits. Visitors to these events are a vital source of economic impact because they bring new dollars to the New York State economy. These visitors include alumni; prospective students and their families; family and friends of current students; visiting faculty that attend conferences or use research equipment; family and friends of

* This is the “discounted present value” of income received over the five year period using a discount rate of 2%.

Strong Memorial Hospital patients; musicians; athletic opponents and their fans; and UR fans and families of student athletes.

During 2015 CGR estimates visitors to UR lodged in local hotels for more than 40,000 nights (up by 10% from the 2013 study). CGR estimates that the influx of spending generated by visitors attending all of these events and activities resulted in approximately 100 jobs and over \$3.6 million of labor income in the NYS economy.

Table 15 – Visitor Spending Impacts

	Direct	Spillover	Total
Employment (thousands of jobs)	0.1	0.0	0.1
Labor Income (millions of dollars)	\$2.2	\$1.4	\$3.6

Student Spending Impact

Students generally do not have significant buying power during their on-campus experiences. However, the sheer volume of students means they do contribute to the economic activity New York State in a variety of ways. During the 2015 spring semester, UR:

- Enrolled 9,551 full-time undergraduate and graduate students;
- Provided housing to 5,214 undergraduate and graduate students; and
- Provided meal plans to 5,443 undergraduate and graduate students.

Many students continue classes during the summer. During the summer of 2015, UR:

- Enrolled 2,904 full-time undergraduate and graduate students; and
- Provided housing to 1,447 undergraduate and graduate students.

During the 2015 fall semester, UR:

- Enrolled 10,694 full-time undergraduate and graduate students;
- Provided housing to 5,310 undergraduate and graduate students; and
- Provided meal plans to 5,563 undergraduate and graduate students.

Based on these numbers, it is reasonable to assume that during the 2015 calendar year students either:

- Ate off-campus on a semi-regular basis—spending their money locally to eat in restaurants or shopping at grocery stores; and/or
- Lived off-campus, investing their living expenses in the Rochester economy.

CGR estimates that the spending by the students totals over \$95 million and supports in total about 1,000 jobs in the New York State economy as summarized in the table below:

Table 16 – Student Spending Impact

	Direct	Spillover	Total
Employment (thousands of jobs)	0.7	0.3	1.0
Labor Income (millions of dollars)	\$25.2	\$14.9	\$40.1

Fiscal Impact Summary

CGR's estimates of the fiscal impact of University of Rochester and its affiliates show that UR helps to generate more than \$125 million in sales tax, personal income tax, and local property taxes to State and local when considering the traded sector only. When one expands this to include both the local and traded sector, the total increases to over \$184 million. The following tables break out these totals by the type of tax revenue:

**Table 17 – Fiscal Impact on New York State: Traded Sector Only
(millions of dollars)**

	Direct	Spillover	Total
NYS and Local Sales Tax	\$33.4	\$22.2	\$55.6
NYS Personal Income Tax	\$49.9	\$18.5	\$68.4
Local Property Tax paid by UR	\$1.4	N/A	\$1.4
Total	\$84.7	\$40.7	\$125.3

**Table 18 – Fiscal Impact on New York State: Local and Traded Sector Combined
(millions of dollars)**

	Direct	Spillover	Total
NYS and Local Sales Tax	\$50.1	\$32.9	\$83.0
NYS Personal Income Tax	\$70.3	\$27.5	\$97.8
Local Property Tax paid by UR	\$3.4	N/A	\$3.4
Total	\$123.8	\$60.4	\$184.2

UR's Impact in Focus

CGR was asked to focus on a few specific parts of the University of Rochester and provide economic impact assessments. This section is the results of the analyses; these totals are included in the figures presented earlier in the report.

UR Medicine

UR Medicine has a total employment impact of over 40,000 jobs in 2015. Payroll totals \$2.3 billion which generates an estimated \$65 million in income tax and \$58 million in sales tax. If we look at only the traded sector, the employment impact would total 17,000, and \$1.2 billion in payroll. Income and sales tax totals a combined \$60 million.

**Table 19 – Economic and Fiscal Impact: UR Medicine
Local and Traded Sector Combined**

	Direct	Spillover	Total
Employment (thousands of jobs)	22.0	18.5	40.5
Labor Income (millions of dollars)	\$1,362.9	\$896.9	\$2,259.8
Income Tax (millions of dollars)	\$45.9	\$19.3	\$65.2
Sales Tax (millions of dollars)	\$35.2	\$23.2	\$58.3

**Table 20 – Economic and Fiscal Impact: UR Medicine
Traded Sector Only**

	Direct	Spillover	Total
Employment (thousands of jobs)	7.6	9.4	17.1
Labor Income (millions of dollars)	\$692.9	\$459.0	\$1,151.9
Income Tax (millions of dollars)	\$24.2	\$6.7	\$30.9
Sales Tax (millions of dollars)	\$17.7	\$11.7	\$29.4

Wilmot Cancer Center

The Wilmot Cancer Center, part of UR Medicine, has a total employment impact of over 1,400 jobs in 2015. The annual payroll impact is estimated at \$86 million with \$4.8 million in income and sales tax.

Table 21 – Economic and Fiscal Impact: Wilmot Cancer Center

	Direct	Spillover	Total
Employment	730	700	1,430
Labor Income (millions of dollars)	\$51.7	\$34.3	\$86.0
Income Tax (millions of dollars)	\$1.8	\$0.7	\$2.6
Sales Tax (millions of dollars)	\$1.3	\$0.9	\$2.2

School of Medicine and Dentistry

CGR estimates that in 2015, the School of Medicine and Dentistry has a total employment impact of 10,600 jobs, a total payroll impact of \$801 million and generated \$50 million in sales and income tax. The following table provides more detail on these impacts:

Table 22 – Economic and Fiscal Impact: School of Medicine and Dentistry

	Direct	Spillover	Total
Employment (thousands of jobs)	4.0	6.6	10.6
Labor Income (millions of dollars)	\$480.1	\$321.1	\$801.1
Income Tax (millions of dollars)	\$22.4	\$6.9	\$29.3
Sales Tax (millions of dollars)	\$12.4	\$8.3	\$20.7

Laboratory for Laser Energetics

In its current configuration, the Laboratory for Laser Energetics (LLE) has an employment impact of 750 jobs in New York State. The labor income totals slightly under \$50 million, and the resulting income and sales tax totals over \$3 million in 2015.

Table 23 – Economic and Fiscal Impact: LLE

	Direct	Spillover	Total
Employment	350	400	750
Labor Income (millions of dollars)	\$29.6	\$19.6	\$49.1
Income Tax (millions of dollars)	\$1.3	\$0.4	\$1.8
Sales Tax (millions of dollars)	\$0.8	\$0.5	\$1.3

Eastman School of Music

In 2015 the Eastman School of Music directly employs about 490 FTEs with a spillover impact of 280 jobs. Total payroll in 2015 come to \$34 million, with sales and income tax at about \$2 million.

Table 24 – Economic and Fiscal Impact: Eastman School of Music

	Direct	Spillover	Total
Employment	490	280	780
Labor Income (millions of dollars)	\$20.5	\$13.7	\$34.2
Income Tax (millions of dollars)	\$1.0	\$0.3	\$1.2
Sales Tax (millions of dollars)	\$0.5	\$0.4	\$0.9

The University's Research Enterprise

The sheer number of researchers at UR, funded by grants and contracts from government and industry, testifies to the concentration of talent and raw intelligence the University brings to bear on myriad problems.

In the medical school alone, research grants and contracts support well over 3,000 either wholly or in part. Based on total sponsored research funding and sector averages, CGR estimates that about 2,600 full time equivalents are engaged in sponsored research projects. Their activity generates an additional 1,300 jobs in the economy. Total payroll for all of these jobs totals and estimated \$312 million and generates \$19.6 million in income and sales tax revenue for state and local governments in 2015.

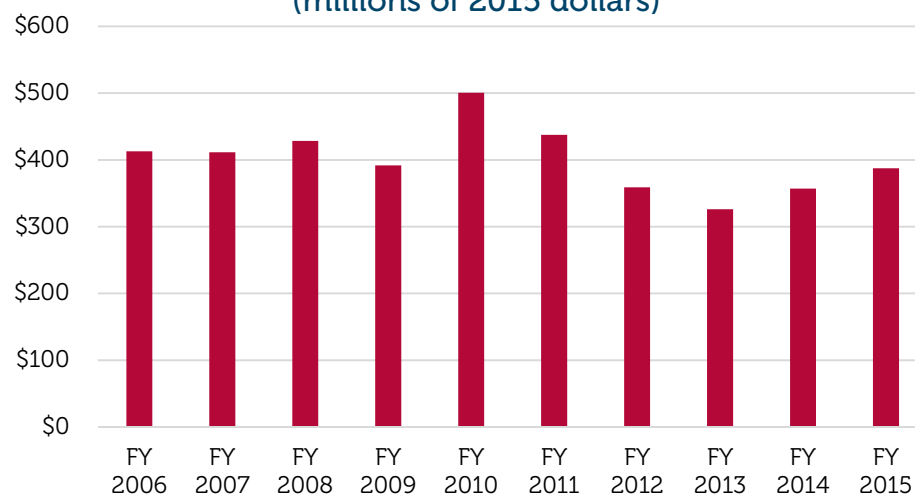
Table 25 – Economic and Fiscal Impact: UR’s Research Enterprise

	Direct	Spillover	Total
Employment (thousands of jobs)	2.6	1.3	3.9
Labor Income (millions of dollars)	\$187.2	\$125.0	\$312.2
Income Tax (millions of dollars)	\$8.8	\$2.7	\$11.5
Sales Tax (millions of dollars)	\$4.8	\$3.2	\$8.1

Grant Activity

UR has received nearly \$1.8 billion in external funding (federal and non-federal agencies) over the last five years. Total awards to the University of Rochester averaged \$373 million per year (in constant 2015 dollars) from FY2011 to FY2015. This is down in real terms by 13% from the \$429 million average for the preceding 5 year time period. The following figure illustrates the last ten years of external funding UR has received:

**Figure 7 – External Funding Received by Fiscal Year
(millions of 2015 dollars)**



Source: UR Office of Research and Program Administration

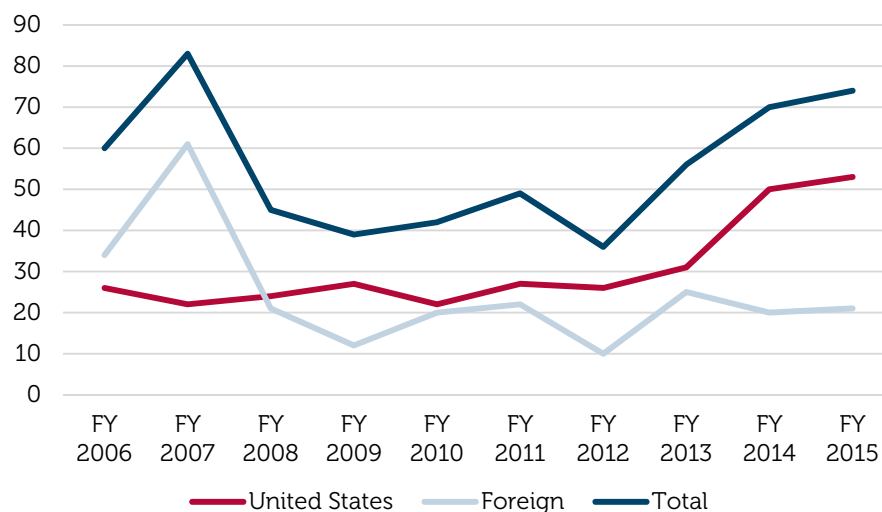
Patents, Royalties, and Start-Ups

More patents were issued, and the total invention disclosures were up from previous report. Royalty revenue was down slightly from 2011 figures, but the revenue per million of research funding remains high. The tremendous value of these innovative concepts is in their potential to be commercialized for economic development purposes.

Patents Issued

In 2015 the University of Rochester had 74 patents issued. This is up by 32% from the 2013 level. The growth over this time period is due to an increase in U.S. patents. UR has generally been increasing the number of patents issued per year since 2009.

Figure 8 – Total Number of Patents Issued by Fiscal Year

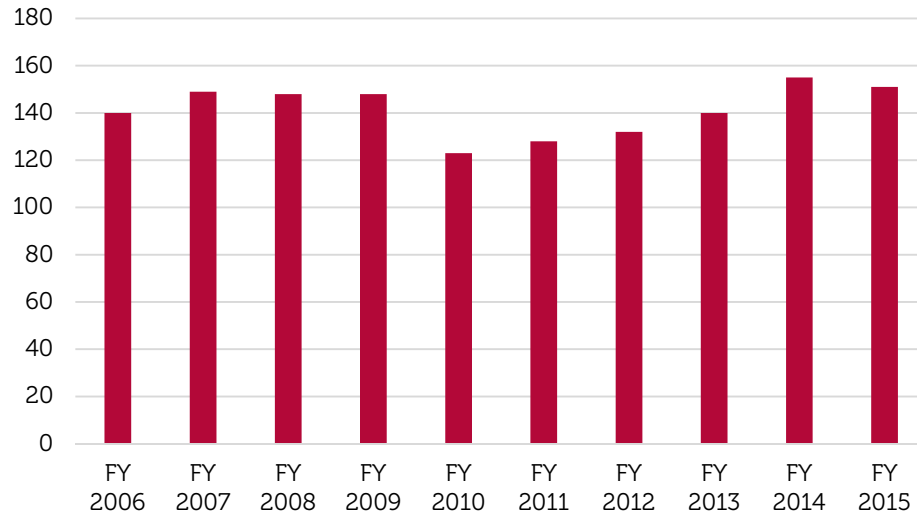


Source: UR Office of Technology Transfer

Invention Disclosures

UR had 151 invention disclosures in 2015. This is up slightly from the 140 from the last study. Over the past decade, UR averages about 140 disclosures each year.

Figure 9 – Number of Invention Disclosures by Fiscal Year



Source: UR Office of Technology Transfer

Royalty Revenue

Royalty revenue total \$22 million in 2015. This is down by in real terms by 25% of where it stood in 2013. Royalty revenues have been declining since 2008.

**Figure 10 - Royalty Revenue by Fiscal Year
(millions of 2015 dollars)**

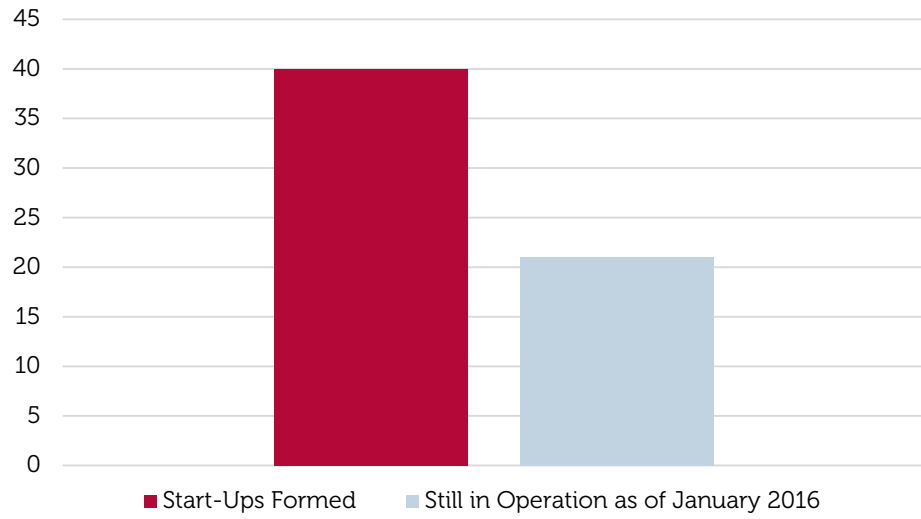


Source: UR Office of Technology Transfer

Start-up Companies

Since FY 2005, the U of R has been responsible for starting up 40 companies, 21 of which are still in operation as of January 2016 – a 53% survival rate. U.S. Census data indicate the survival rate among startup firms with a similar age range is 46%.

Figure 11 – Number of Local Start-up Companies Since FY 2005



Source: UR Office of Technology Transfer

Appendix

Revised 2013 Study Tables

The following tables provide revised estimates for the 2013 study that are comparable with the 2015 study.

**Table 26 – University of Rochester’s Employment Impact in 2013
(thousands of jobs)**

Area of Business Activity	Traded Sector			Local & Traded Sectors		
	Direct	Spillover	Total	Direct	Spillover	Total
Employment Impact	14.7	13.7	28.3	22.5	20.8	43.2
Purchases Impact	1.4	0.7	2.0	2.6	1.3	3.9
Capital Investments Impact	1.6	1.3	2.9	1.6	1.3	2.9
Student Spending Impact	0.7	0.3	0.9	0.7	0.3	0.9
Visitor Activity Impact	0.1	0.0	0.1	0.1	0.0	0.1
Total	18.4	16.0	34.4	27.4	23.7	51.1

**Table 27 – University of Rochester’s Labor Income Impact in 2013
(millions of dollars)**

Area of Business Activity	Traded Sector			Local & Traded Sectors		
	Direct	Spillover	Total	Direct	Spillover	Total
Employment Impact	\$996.8	\$666.6	\$1,663.4	\$1,517.2	\$1,011.9	\$2,529.1
Purchases Impact	\$62.2	\$29.6	\$91.8	\$117.6	\$56.7	\$174.3
Capital Investments Impact	\$81.9	\$61.0	\$142.9	\$81.9	\$61.0	\$142.9
Student Spending Impact	\$24.1	\$14.3	\$38.5	\$24.1	\$14.3	\$38.5
Visitor Activity Impact	\$2.4	\$1.5	\$3.8	\$2.4	\$1.5	\$3.8
Total	\$1,167.4	\$773.0	\$1,940.4	\$1,743.2	\$1,145.4	\$2,888.5