

# **The Economic Impact of the University of Notre Dame**

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# Executive Summary

The University of Notre Dame – a 173-year-old independent Catholic institution of higher learning located in South Bend, Indiana – is a major contributor to the economy of the South Bend area, both as a major regional enterprise and through its mission of education, research and service to the community. And as a national (and increasingly, a global) institution, Notre Dame also has a growing impact on the world beyond South Bend.

## Notre Dame as an enterprise

- In the fall of 2013, the University of Notre Dame directly employed 5,713 people (excluding students and temporary workers), making it the largest employer, public or private, in St. Joseph County.
- Between the fall of 2006 and the fall of 2013, the number of people employed at Notre Dame grew by 823 – an increase of 16.8 percent.
- From fiscal year 2009 through fiscal year 2014, Notre Dame invested \$572.6 million in construction and renovation of University facilities, creating jobs for local area residents and contracting opportunities for local businesses, and at the same time enhancing Notre Dame's ability to fulfill its mission of education, research and service to the community.
- Taking into account the number of people employed directly at Notre Dame, their wages and salaries, Notre Dame's payment to local vendors and contractors, and the indirect impact of University spending on payroll, purchasing and construction, we estimate that in fiscal year 2014, University spending directly and indirectly accounted for:
  - 9,781 full-time-equivalent (FTE) jobs in St. Joseph County;
  - Nearly \$641.3 million in wages and salaries; and
  - Nearly \$935.1 million in County-wide economic output.
- In fiscal year 2014, Notre Dame students' off-campus spending directly and indirectly accounted for:
  - 1,611 FTE jobs in St. Joseph County;
  - More than \$43.0 million in wages and salaries; and
  - Nearly \$135.7 million in County-wide economic output.
- Off-campus spending by non-local visitors to Notre Dame in fiscal year 2014 directly and indirectly accounted for:
  - 3,258 FTE jobs in St. Joseph County;

- \$87.9 million in wages and salaries; and
  - \$232.2 million in County-wide economic output.
- Combining the impact of University spending with the impact of student and visitor spending, we estimate that in fiscal year 2014 (as shown in the table below), Notre Dame directly and indirectly accounted for:
    - 14,650 FTE jobs in St. Joseph County;
    - \$772.2 million in wages and salaries; and
    - \$1.3 billion in County-wide economic output.

**Notre Dame’s total economic impact in St. Joseph County, FY 2014 (jobs in FTE, earnings and output in \$000s)**

	Jobs	Wages	Output
<b>Impact of University spending</b>			
Direct	6,874	\$517,846.3	\$593,375.8
Indirect/induced	2,907	\$123,430.1	\$341,691.9
<i>Subtotal, University spending impact</i>	<i>9,781</i>	<i>\$641,276.4</i>	<i>\$935,067.7</i>
<b>Impact of student spending</b>			
Direct	1,248	\$27,272.2	\$93,154.7
Indirect/induced	363	\$15,765.8	\$42,523.0
<i>Subtotal, student spending impact</i>	<i>1,611</i>	<i>\$43,038.0</i>	<i>\$135,677.7</i>
<b>Impact of visitor spending</b>			
Direct	2,559	\$57,153.3	\$150,755.8
Indirect/induced	699	\$30,754.1	\$81,448.1
<i>Subtotal, visitor spending impact</i>	<i>3,258</i>	<i>\$87,907.4</i>	<i>\$232,203.9</i>
<b><i>Total impact</i></b>	<b><i>14,650</i></b>	<b><i>\$772,221.8</i></b>	<b><i>\$1,302,949.3</i></b>

## Developing human capital

- Notre Dame is preparing its students to succeed in tomorrow’s economy, with high-quality programs in fields such as bioengineering, computer science, applied mathematics, nanoelectronics and energy, and by providing extensive opportunities to gain international experience.
- Several indicators demonstrate the value of a Notre Dame education. For example, in PayScale’s 2013-14 survey of the earnings of U.S. college graduates, Notre Dame tied for 24<sup>th</sup> place among all U.S. colleges and universities, with an average mid-career salary of \$110,000.
- Although most Notre Dame students come from outside the South Bend area and leave after they graduate, the University is still a significant contributor to the area’s college-

educated workforce. Based on 2013 ACS data, we estimate that Notre Dame graduates accounted for approximately 16 percent of all St. Joseph County residents who had at least a bachelor's degree.

## **The growth of University research**

- Between fiscal year 2010 and fiscal year 2014, research spending at Notre Dame grew from nearly \$110.4 million to \$182.2 million – an increase of 65 percent. In addition to supporting additional jobs and income, the growth of the University's research enterprise is helping to lay the groundwork for creation of new businesses and new jobs in the South Bend area.

## **Innovation and entrepreneurship at Notre Dame**

- During the past decade, Notre Dame has greatly expanded its efforts to see that the results of its research are translated into new products, new businesses and new jobs. These efforts have included:
  - Development of the first building planned for Innovation Park at Notre Dame – a 55,000 square-foot building offering office, lab and meeting space for start-up companies, an “entrepreneurial greenhouse” for aspiring Notre Dame entrepreneurs, and a variety of support services for client companies;
  - Providing increased support for faculty research aimed at preparing new technologies for commercialization;
  - Expanding entrepreneurship education and development programs, including ESTEEM, a one-year master's degree program focusing on the commercialization of new technologies;
  - Launching the Irish Innovation Fund, a program that provides seed capital for new ventures created by Notre Dame students;
  - Providing access to a network of nearly 400 experienced entrepreneurs, advisors and investors through the Irish Entrepreneurs Network.

## **Investing in and serving the community**

- Since 2000, Notre Dame has worked closely with the City of South Bend, Kite and other local institutions and community partners to revitalize the City's Northeast Neighborhood. In particular, the University took the lead in development of the Eddy Street Commons, a \$215 million mixed-use development project that includes ground-floor retail and

restaurants with apartments and offices above, other residential development, a hotel and parking.

- Other recent off-campus investments have included development of the Notre Dame Center for Art and Culture, the purchase of the former St. Joseph High School building and the development of an environmental research and education center in St. Patrick's Park.
- In addition to these investments, Notre Dame works with a wide range of partners to serve the community that has been its home for 173 years – for example, through:
  - The University's continuing support for the Robinson Community Learning Center;
  - The work of more than 3,330 Notre Dame students who during the 2013-2014 academic year participated in community-based learning courses offered by the University; and
  - More than 758,740 hours of community service work performed by more than 4,830 Notre Dame students and more than 340 University faculty and staff in 2013-2014.
- As it has grown from a regional to a national and now a global university, Notre Dame's commitment to service has expanded as well. Its Alliance for Catholic Education (ACE), for example, provides teacher training, professional development, consulting and other services for approximately 200 Catholic elementary and secondary schools through the U.S. ACE is also a partner in efforts to improve Catholic schools in Ireland, Chile and Haiti.

## **Building the future at Notre Dame**

As great as Notre Dame's impact has been – in the South Bend area, nationally and increasingly around the world – it could for several reasons be even greater in the future:

- The growth of enrollment at Notre Dame during the past five years means that in years ahead, the pool of University graduates will continue to grow – especially those with degrees in engineering, science, business and special programs such as ESTEEM.
- A growing research enterprise will directly create new jobs for faculty members, other researchers, research technicians and support staff, and will also expand the base of new knowledge from which new products and services, businesses and jobs are developed.
- Over the next decade, Notre Dame's investments (described above) in the development of a new "entrepreneurial ecosystem" on and around its campus could translate into the development of additional new businesses and jobs, both in the South Bend area and elsewhere.

- Investment of \$712 million over the next three years in new construction and renovation of University facilities will provide jobs for local residents and business opportunities for local contractors, and will further enhance the University's ability to fulfill its mission.

## **Introduction and overview**

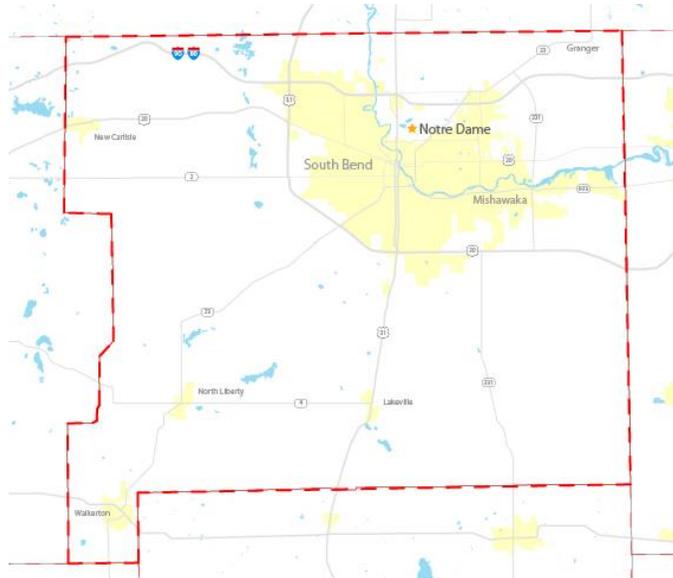
The University of Notre Dame du Lac is an independent Catholic institution of higher learning located on a 1,250-acre campus in South Bend, Indiana. The University was founded in 1842 by Rev. Edward Sorin, a member of the Congregation of the Holy Cross, and two years later was chartered by the state as a degree-granting institution. Today, Notre Dame is a major university with more than 12,000 undergraduate, graduate and professional students enrolled in seven colleges:

- College of Arts and Letters
- College of Science
- College of Engineering
- School of Architecture
- Mendoza College of Business
- Graduate School
- Law School

Notre Dame is a nationally recognized research university, with \$182 million in research spending in fiscal year 2014. And through a network of partnerships with institutions, organizations and communities, the University is extending its impact throughout the U.S. and across the world.

Notre Dame is also a major contributor to the economy of South Bend and St. Joseph County – one of the County’s largest employers, a source of business for local companies, an investor both on and beyond its campus, and a source of innovation and new business development. At the same time, the University’s development over the past 173 years and its continuing effectiveness today are in many ways rooted in its relationship to the communities in which it is located.

**Figure 1: Map of South Bend, Indiana and the Michiana Region**



## Purpose and organization of the report

In order to understand more fully Notre Dame’s economic impact, University administrators asked Appleseed, a New York City-based economic development consulting firm, to assess Notre Dame’s role in the economy of the South Bend area, and in the ongoing transformation of the local economy. This report presents the results of Appleseed’s analysis.

- To set a context for our analysis of Notre Dame’s economic impact, Part One of the report provides a brief overview of current economic conditions and recent trends in South Bend and St. Joseph County.
- Part Two assesses the impact of the University as an enterprise – as an employer, a buyer of goods and services, and a sponsor of construction projects.
- Part Three analyzes the impact of spending by University students and by visitors to the University.
- Part Four discusses Notre Dame’s role in the development of the region’s human capital.
- Part Five discusses the impact of the University’s growing research enterprise.
- Part Six discusses Notre Dame’s role in the development of new businesses.
- Part Seven examines the various forms of community engagement at Notre Dame, including its role in the revitalization of neighborhoods near its campus.
- Part Eight briefly discusses several reasons why the University’s economic impact – in South Bend, St. Joseph County and beyond – could be even greater during the next five to ten years than it is today.

# **Part One: Notre Dame in context – the economy of St. Joseph County**

Understanding Notre Dame's economic impact requires an understanding of the local context within which the University operates. This part of the report provides a brief overview of recent demographic and economic trends in South Bend and in St. Joseph County.

## **Years of decline and recovery**

St. Joseph County is located in north central Indiana, just below the Michigan state line. The U.S. Census Bureau estimates that in 2013, the population of the County totaled 266,709 – an increase of about 0.4 percent since 2000. About two-thirds of the County's residents are concentrated in three adjoining communities:

- South Bend, the County's largest city, with a population of 101,975 in 2013 – a decline of 5.4 percent since 2000;
- Mishawaka, a smaller city with a population of about 48,800 in 2013 – an increase of 4.9 percent since 2000; and
- Granger, a suburban area with a population of about 29,070 in 2013 – an increase of 2.8 percent since 2000.

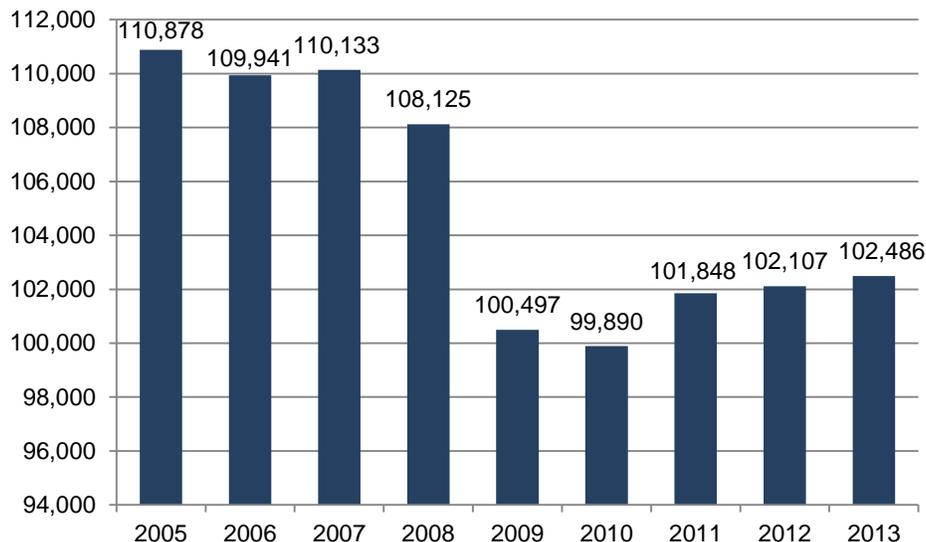
After never fully recovering from the economic downturn that occurred in 2000-2001, St. Joseph County was hit hard by the recession that began in 2008. Between 2007 and 2010 (as shown in Figure 2), private payroll employment fell by 9.3 percent – a loss of more than 10,000 jobs.

Manufacturing was especially hard-hit, with employment in that sector declining over the same three-year period by more than 20 percent – a loss of about 3,500 jobs. Several other industries also sustained heavy job losses, including construction (a loss of 1,600 jobs), retailing (more than 1,500 jobs), administrative and support services (more than 1,100 jobs) and wholesale trade (about 800 jobs).

Job losses were particularly severe in South Bend. Between 2007 and 2010, private employment in the City fell by 10.4 percent – a loss of about 5,900 jobs.

As job losses mounted, the County's unemployment rate rose from just 4.9 percent in 2007 to 11.5 percent in 2009. Unemployment in South Bend rose even higher, averaging 13.0 percent in 2010.

**Figure 2: Total private employment in St. Joseph County, 2005-2013**



Source: QCEW (Indiana Department of Workforce Development – Research and Analysis)

Since 2010, the local economy has begun to recover. Between 2010 and 2013 the County gained back about 2,600 private payroll jobs – an increase of about 2.6 percent. During the same period, the unemployment rate for County residents fell to 8.8 percent.

The recovery accelerated in 2014, with private payroll employment in St. Joseph County rising to 105,495 in the third quarter, and the County’s unemployment rate falling to 6.7 percent. Nevertheless, despite its gradual recovery, the County had by late 2014 gained back only about 55 percent of the private-sector jobs lost during the recession.

In order for employment in St. Joseph County to return to its pre-recession level – or to the higher levels of the late 1990’s – several more years of sustained growth will be needed.

## **Growth in higher education**

As communities in St. Joseph County seek to create new jobs and build a stronger and more resilient economy, the County’s colleges and universities can be a particularly valuable resource.

Higher education is in itself a major industry in St. Joseph County. In 2013, the County’s private and public colleges and universities employed more than 9,500 people – 8.2 percent of all public and private payroll employment in the County. Higher education is one of the County’s leading “export” industries, bringing in hundreds of millions of dollars in revenue each year from outside the County, much of which is then spent locally.

And while by no means immune to the effects of the recession, higher education was one of the few major industries in St. Joseph County that kept growing during the downturn in the nation's economy – and it has kept growing since. Between 2007 and 2013, the County's private colleges and universities added about 970 jobs.

Colleges and universities also contribute to the vitality of the St. Joseph County economy through activities related to their mission of education, research, and service to the community. In an economy that is increasingly built on knowledge and innovation, higher education is critical to the County's continued growth. Colleges and universities can:

- Provide young residents of the County with the skills today's economy requires;
- Attract talented young people to St. Joseph County from elsewhere in Indiana and the U.S., and from around the world;
- Through the cultural, recreational and other opportunities they offer, enhance the community's ability to attract and retain talented people;
- Generate ideas that lead to the creation of new businesses, new products and new services;
- Provide services that support the growth of local businesses; and
- Help local communities and County residents adapt to the demands of a changing economy.

Among St. Joseph County's colleges and universities, none has a greater impact on the local economy than the University of Notre Dame du Lac. The next part of the report assesses the University's impact as a major enterprise in its own right; and those that follow examine the multiple ways in which Notre Dame contributes to the local economy through activities related to its mission.

# Part Two: Notre Dame as an enterprise

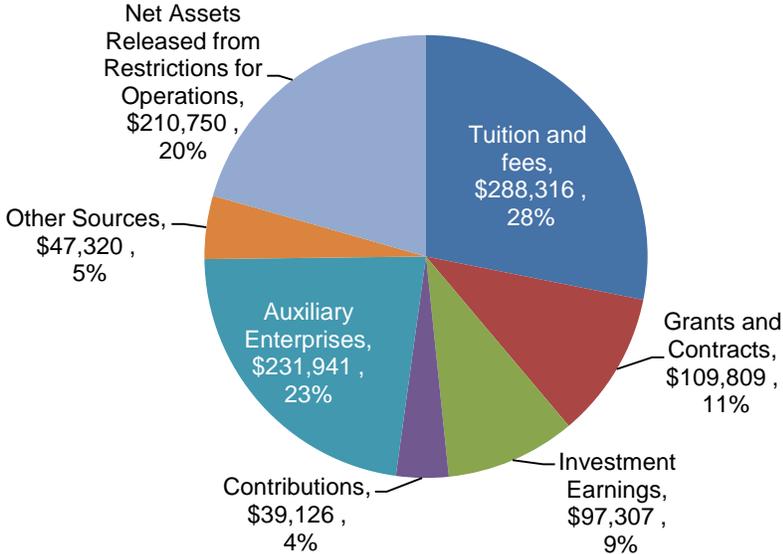
As a major enterprise in its own right, the University of Notre Dame contributes in several ways to the economy of South Bend and St. Joseph County – as a major income generator, a leading employer, a buyer of goods and services from local businesses and a sponsor of construction projects. This part of the report addresses the University’s impact in each of these areas.

## Notre Dame as an income generator

In fiscal year 2014, Notre Dame’s operating revenue totaled more than \$1.0 billion. As Figure 3 shows:

- Tuition and fees (net of University scholarships and financial aid) totaled \$288.3 million (28.1 percent of all revenues);
- Auxiliary enterprises generated \$231.9 million (22.6 percent of all revenues);
- Net assets released to support operations totaled nearly \$210.8 million (20.6 percent of all revenues);
- Grants and contracts totaled \$109.8 million (10.7 percent of all revenues) – including nearly \$85.5 million from federal agencies and nearly \$24.0 million from private organizations;
- Investment earnings totaled \$97.3 million (9.5 percent of all revenues); and
- Contributions and other sources totaled \$86.4 million (8.4 percent of all revenues).

Figure 3: Notre Dame revenues by source, FY 2014 (in \$000s)



Notre Dame generates nearly all of its revenue from sources outside South Bend and St. Joseph County, much of which is spent within the local area. In fiscal year 2014, Notre Dame’s spending within St. Joseph County (including wages and salaries paid to Notre Dame employees, payments for employee health care and payments to local vendors and contractors) totaled nearly \$535.9 million – an amount equivalent to 52.3 percent of total University revenues during the same period.

Notre Dame’s endowment (valued at nearly \$8.2 billion as of June 30, 2014) plays an important role in supporting University spending within the local community as well. In fiscal year 2014, more than \$270.7 million was distributed from Notre Dame’s endowment to support University operations and capital projects. Of this total, 35 percent was used to provide scholarships and fellowships for students, 31 percent was used to support faculty chairs and academic programs, 14 percent went towards libraries and other endowment programs, 14 percent was used for general operations, and approximately 6 percent for capital projects.

**Notre Dame as an employer**

In the fall of 2013, Notre Dame directly employed 5,713 people (excluding students and temporary employees), approximately 92.3 percent of whom worked full-time. In addition, the University employed 1,192 graduate students as research and teaching assistants, and 3,070 undergraduates in a variety of part-time jobs. In fiscal year 2014, the University’s payroll (including students and temporary employees) totaled nearly \$458.5 million.

As Table 1 shows, Notre Dame is the largest employer, public or private, in St. Joseph County.

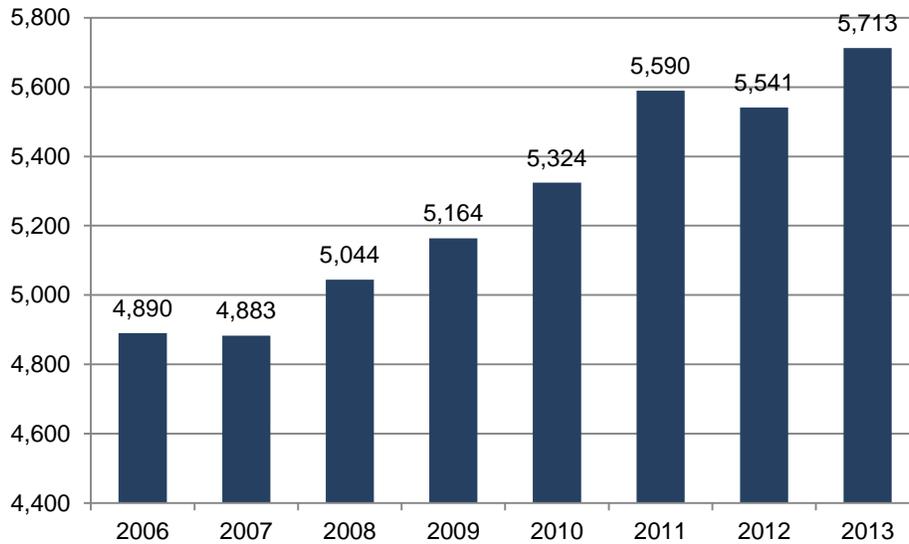
**Table 1: Ten largest employers in St. Joseph County, as of 2013**

<b>Company</b>	<b>Number of employees</b>
University of Notre Dame	5,713
Beacon Health Systems	3,400
AM General	2,858
Trinity Health / St. Joseph Regional Medical Center	2,597
IU South Bend	1,445
Schurz Communications, Inc.	1,000
Robert Bosch	760
Honeywell International Inc.	700
Press Ganey Associates, Inc.	685
Liberty Mutual	650
1 <sup>st</sup> Source Corporation	586
The South Bend Clinic	574

*Sources: University of Notre Dame, St. Joseph County Chamber of Commerce*

Notre Dame is also noticeable for its growth in employment. As shown in Figure 4, between fall 2006 and fall 2013, the University added a total of 823 jobs, an increase of 16.8 percent.

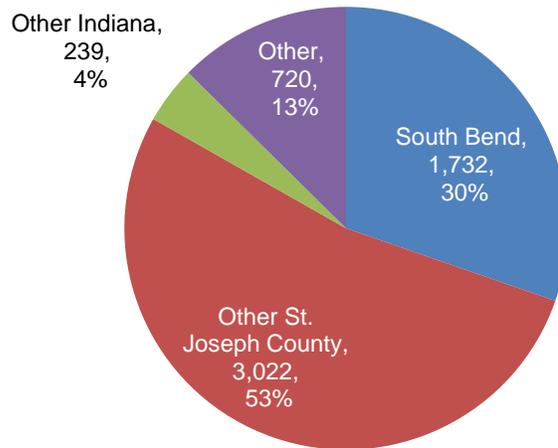
**Figure 4: Growth in full- and part-time employment at Notre Dame, fall 2006 – fall 2013**



### ***Where Notre Dame employees live***

As Figure 5 shows, in the fall of 2013, 4,754 non-student employees of Notre Dame (83.2 percent of all University non-student employees) lived in St. Joseph County, and 239 (4.2 percent) lived elsewhere in Indiana. An additional 720 non-student employees (12.6 percent of all University non-student employees) lived outside the State of Indiana.

**Figure 5: Notre Dame full- and part-time employees by place of residence, fall 2013**

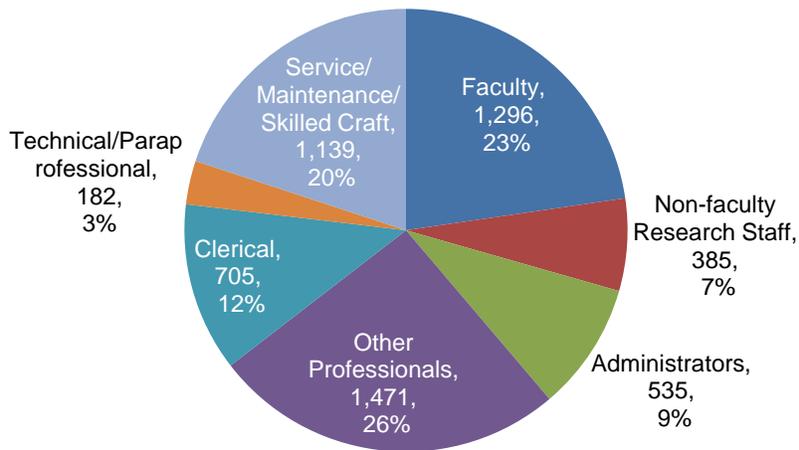


In addition to being one of the largest employers in the county, Notre Dame is a major employer of county residents. In 2013, approximately 4.3 percent of all employed residents of St. Joseph County were employed by Notre Dame.

### ***The diversity and quality of employment at Notre Dame***

Notre Dame offers a variety of high-quality jobs. As Figure 6 shows, in the fall of 2013, faculty accounted for 22.7 percent of total non-student employment; other professionals for 25.7 percent; clerical staff for 12.3 percent; administrative staff for 9.4 percent; non-faculty research staff for 6.7 percent; technical and paraprofessional staff for 3.2 percent; and service, maintenance and skilled craft staff for 19.9 percent.

**Figure 6: Notre Dame full- and part-time employment by occupation, fall 2013**



Notre Dame pays wages and salaries that are above average for north central Indiana, and provides a wide range of benefits to employees, including:

- Health, dental and vision care insurance;
- Flexible spending accounts;
- Life, disability and long-term care insurance;
- Retirement plans;
- Long-term disability and long-term care insurance;
- Adoption benefits; and
- An employee assistance program.

The University also provides opportunities for education and training for its employees and their families.

- Through the University's education and learning programs, employees have the opportunity to develop their skills in areas such as computer and software skills, management, project management and workplace safety. Participation in these programs during fiscal year 2014 totaled more than 5,200.
- The University offers a tuition remission program that provides employees with tuition for one 3-credit undergraduate or graduate course per semester at Notre Dame. In fiscal year 2014, Notre Dame provided \$570,225 in tuition remission.
- Under the University's tuition reimbursement program, employees may also take courses at other higher education institutions. The program reimburses employees for undergraduate or graduate degree coursework up to \$1,500 per fiscal year for courses

taken at other colleges and universities. In fiscal year 2014, the University provided \$106,930 in tuition reimbursement.

- Educational benefits are not limited to employees themselves. The University also provides a tuition benefit that provides up to 100 percent of undergraduate tuition to Notre Dame, or 50 percent of Notre Dame's tuition (or tuition and fees of the non-Notre Dame institution, whichever is lower) to a non-Notre Dame institution, to dependent children of employees. In fiscal year 2014, the University provided more than \$14.8 million in tuition benefits to children of its employees.

## **The impact of purchasing and construction**

In addition to the people it employs directly, Notre Dame generates jobs in South Bend, in St. Joseph County and elsewhere in Indiana through its purchases of goods and services from local companies, and through construction and renovation of its facilities.

### ***Purchases of goods and services***

Notre Dame spent \$320.1 million on purchases of goods and services (excluding construction) during fiscal year 2014. Of this total:

- Nearly \$75.3 million (23.5 percent) was paid to suppliers located in St. Joseph County; and
- Nearly \$18.0 million was paid to suppliers located elsewhere in Indiana.

In addition to its direct payments to University suppliers, in fiscal year 2014, Notre Dame spent \$63.8 million on health care provided to University employees, of which nearly \$38.2 million was paid to health care providers located in St. Joseph County, and \$3.7 million to health care providers located elsewhere in Indiana.

Table 2 provides a list of leading categories of goods and services purchased by Notre Dame from businesses located in St. Joseph County and elsewhere in Indiana.

**Table 2: Leading commodities and services (excluding construction) purchased from businesses located in Indiana, FY 2014 (in \$000s)**

<b>Commodity or service</b>	<b>Purchasing by Notre Dame</b>
<b>St. Joseph County</b>	
Health care <sup>1</sup> (including employee health care)	\$39,766.3
Travel, entertainment and special events	\$14,368.4
Printing, photography and duplication services	\$5,809.0
Food products and kitchen supplies	\$5,737.5
Furniture and furnishings	\$5,450.5
MRO parts, supplies and machinery	\$4,485.9
Subcontracts with other universities	\$3,916.4
Books and periodicals	\$3,577.8
Environmental and science services	\$3,423.3
Payments and donations to non-profit organizations	\$2,902.0
Utilities	\$2,694.6
Consulting, legal and professional services	\$2,219.5
<b>Elsewhere in Indiana</b>	
Health care (including employee health care)	\$6,634.1
Subcontracts with other universities	\$2,633.7
Building and maintenance services	\$2,514.0
HVAC services	\$2,057.1
Utilities	\$838.7
Food products and kitchen supplies	\$747.3
MRO parts, supplies and machinery	\$670.5
Real estate	\$617.8
Uniforms and other supplies	\$536.5
Consulting, legal and professional services	\$503.7

Using the IMPLAN input-output modeling system, we estimate that in fiscal year 2014, Notre Dame’s purchases of goods and services, along with payments for employee health care, directly supported 931 full-time-equivalent (FTE) jobs in St. Joseph County, and an additional 190 FTE jobs elsewhere in Indiana.

### ***Construction***

In addition to generating jobs and economic activity through its purchases of goods and services, Notre Dame also generates business for local economies and jobs for local residents through construction and renovation of University facilities. Between fiscal years 2009 and 2014, campus construction spending totaled \$572.6 million – an average of \$95.4 million annually.

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<sup>1</sup> For both St. Joseph County and the State of Indiana, the health care spending numbers included in Table 2 combine payments for employee health care, and other types of health care spending such as the cost of health services for University athletic teams.

In fiscal year 2014, Notre Dame spent \$76.8 million on construction and renovation of facilities, of which:

- Nearly \$26.5 million (34.5 percent) was paid to contractors located in St. Joseph County; and
- Nearly \$10.3 million (13.4 percent) was paid to contractors located elsewhere in Indiana.

Using IMPLAN, we estimate that in fiscal year 2014, spending by Notre Dame on construction and renovation of facilities directly supported 229 FTE jobs with contractors in St. Joseph County, and an additional 97 FTE jobs with contractors located elsewhere in Indiana.

### **The Campus Crossroads Project**

In the spring of 2013, Notre Dame launched an intensive, nine-month study of the feasibility of expanding its football stadium, and at the same time integrating it more effectively into the day-to-day life of the University. The product of this effort is the Campus Crossroads Project – the largest construction project in Notre Dame’s history.

The \$400 million, 750,000 square-foot project involves construction of three new structures, all attached to the stadium, that will provide additional classrooms, research space, digital media facilities and space for student activities, along with performance, event, meeting and hospitality space.

- A new building on the west side of the stadium will house a new student life center.
- A new building on the stadium’s east side will provide classrooms, research and office space for Notre Dame’s anthropology and psychology departments, and a new digital media center.
- A third building at the south end of the stadium will house the music department and the University’s sacred music program.

In addition to these academic and student uses, the upper levels of the east and west buildings will be integrated into the stadium, providing new premium seating for 3,000 to 4,000 spectators, club facilities, and other amenities and support functions. In addition to increasing the stadium’s capacity and providing needed academic space, the additional space and support facilities the project provides will make it possible to expand the range of activities the stadium can accommodate – including, for example, events in sports other than football, concerts and other events.

The Campus Crossroads Project will contribute in several ways to the continued growth of the economy of South Bend and St. Joseph County.

- We estimate that over three-and-a-half years of design and construction, the project will have directly supported 3,134 person-years<sup>2</sup> of employment in construction and related industries, with \$206.3 million in wages.
- Through the multiplier effect, we estimate that the University’s direct spending on Campus Crossroads will indirectly support 2,138 additional person-years of employment in St. Joseph County, with \$100.6 million in wages.
- When completed, additional academic space provided (or freed up by) the three new buildings will support the hiring of 80 new faculty members, and thus the continued growth of the University’s educational programs and its research enterprise.
- The new Digital Media Center will greatly enhance Notre Dame’s capacity to produce content for online learning, thus giving the University a greater capacity to export its services electronically from its base in South Bend.
- By expanding the stadium’s seating capacity and expanding the range of events the facility can accommodate, the project will increase the number of visitors the University attracts each year.

## Indirect and induced effects

Notre Dame’s impact on the local economy goes beyond the direct impact of its spending on payroll, purchasing and construction. It also includes “indirect and induced” (or “multiplier”) effects. Local companies from which Notre Dame buys goods and services use some of the money paid to them by the University to buy goods and services from *other* local businesses; and those businesses in turn buy some of what they need from still other companies in St. Joseph County. The jobs, wages and sales generated by University suppliers’ spending within St. Joseph County make up the *indirect* impact of University spending.

Similarly, Notre Dame’s employees (and the employees of its local suppliers) spend part of their earnings within St. Joseph County – for housing, utilities, food, child care, entertainment and other routine household needs. The jobs, wage and salaries supported by employees’ household spending make up the *induced* effect of University spending.

Using the IMPLAN input-output modeling system – a modeling tool commonly used in economic impact analyses – we can measure the indirect and induced effects of University spending. We

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<sup>2</sup> A person-year is equivalent to the time worked by one full-time employee over the course of one year. In addition to one person working full-time for a year, it could, for example, represent the work of two people, each of whom is employed full-time for six months; or two people who each work half-time for the full year. For a two-year construction project, 500 person-years of employment would be the equivalent of having 250 people employed full-time for two years.

estimate that through these effects, Notre Dame’s direct spending on payroll, purchasing and construction in fiscal year 2014 indirectly accounted for:

- 2,907 FTE jobs in St. Joseph County;
- \$123.4 million in wages and salaries; and
- Nearly \$341.7 million in County-wide economic output.

## Direct, indirect and induced effects of University spending

Taking into account the number of people employed at Notre Dame and their wages and salaries; the direct impact of Notre Dame’s payments to local vendors and contractors, and the indirect and induced impact of University spending on payroll, purchasing and construction, we estimate that in fiscal year 2014 (as shown below in Table 3), University spending directly and indirectly accounted for:

- 9,781 FTE jobs in St. Joseph County;
- Nearly \$641.3 million in wages and salaries; and
- Nearly \$935.1 million in County-wide economic output.

**Table 3: Direct, indirect and induced impact of Notre Dame spending in St. Joseph County, FY 2014 (jobs in FTE, earnings and output in \$000s)**

	Jobs	Wages	Output
<b>Direct spending impact</b>			
Payroll	5,713	\$458,489.5	\$458,489.5
Purchasing/construction	1,161	\$59,356.8	\$134,886.2
<i>Subtotal, direct impact</i>	<i>6,874</i>	<i>\$517,846.3</i>	<i>\$593,375.8</i>
<b>Indirect and induced effects</b>			
Employee spending	2,213	\$92,102.8	\$259,051.4
Contractor and vendor spending	695	\$31,327.4	\$82,640.5
<i>Subtotal, indirect/induced impact</i>	<i>2,907</i>	<i>\$123,430.1</i>	<i>\$341,691.9</i>
<b>Total impact</b>	<b>9,781</b>	<b>\$641,276.4</b>	<b>\$935,067.7</b>

## Contributing to state and local revenues

Despite its tax-exempt status, Notre Dame’s operations generate tax revenues for state and local government in several ways. In fiscal year 2014, Notre Dame’s payments to state and local governments included:

- Nearly \$13.4 million in Indiana State income taxes withheld from the wages and salaries of University employees;

- \$222,287 in Indiana unemployment insurance taxes;
- \$446,948 in property taxes;
- Nearly \$1.3 million in water and sewer fees;
- \$600,000 in voluntary payments to local governments;
- Nearly \$533,700 in other local government taxes and fees (including the St. Joseph County hotel tax); and
- More than \$38,600 in miscellaneous fees to the State of Indiana.

## Part Three: The impact of student and visitor spending

Like the money that Notre Dame itself spends on payroll, purchasing and construction, off-campus spending by Notre Dame students and by visitors to the University also has an impact on the local economy.

### The impact of student spending

In the fall of 2013, a total of 12,124 students were enrolled at Notre Dame, including 8,477 undergraduates and 3,647 graduate and professional students. Approximately 97.0 percent of all undergraduates and 95.8 percent of all graduate and professional students came to Notre Dame from somewhere outside St. Joseph County.

The impact of student spending is determined in part by whether students live on-campus, or elsewhere in South Bend and the surrounding communities. In the fall of 2013, approximately 76.3 percent of all undergraduates and 16.2 percent of all graduate and professional students lived in University-owned housing.

Table 4 provides Appleseed's estimates (based on data provided by the University) of annual off-campus spending by undergraduate and graduate and professional students, based on whether they live on- or off-campus. We estimate that in fiscal year 2014, off-campus spending by Notre Dame students – on off-campus housing, food, transportation, entertainment and other personal expenses – totaled \$109.3 million.

**Table 4: Estimated off-campus spending by Notre Dame students, FY 2014**

Type of student	Number of students	Per student off-campus spending	Total off-campus spending
<b>Undergraduate</b>			
Living on-campus	6,467	\$1,950	\$12,610,650
Living off-campus	2,010	\$14,462	\$29,068,620
<i>Subtotal, Undergraduate</i>	<i>8,477</i>	<i>\$4,917</i>	<i>\$41,679,270</i>
<b>Graduate/Professional</b>			
Living on-campus	591	\$7,900	\$4,668,900
Living off-campus	3,056	\$17,980	\$54,946,880
<i>Subtotal, Graduate/Professional</i>	<i>3,647</i>	<i>\$16,347</i>	<i>\$59,615,780</i>
<b>Summer Session</b>			
Living on-campus	96	\$1,950	\$187,200
Living off-campus	1,797	\$4,365	\$7,843,905
<i>Subtotal, Summer Session</i>	<i>1,893</i>	<i>\$4,243</i>	<i>\$8,031,105</i>
<b>Total, all students</b>	<b>14,017</b>		<b>\$109,326,155</b>

Using IMPLAN, we estimate that in fiscal year 2014 (as shown in Table 5), off-campus spending by Notre Dame students directly and indirectly accounted for:

- 1,611 FTE jobs in St. Joseph County;
- More than \$43.0 million in wages and salaries; and
- Nearly \$135.7 million in County-wide economic output.

**Table 5: Direct, indirect and induced impact of off-campus spending by Notre Dame students in St. Joseph County, FY 2014 (jobs in FTE, earnings and output in \$000s)**

	Jobs	Wages	Output
Direct	1,248	\$27,272.2	\$93,154.7
Indirect/induced	363	\$15,765.8	\$42,523.0
<b>Total</b>	<b>1,611</b>	<b>\$43,038.0</b>	<b>\$135,677.7</b>

## The impact of visitor spending

Off-campus spending by visitors to Notre Dame similarly contributes to the vitality of the local economy. Based on data compiled by the University, we estimate that at least 2.5 million visitors came to the Notre Dame campus during fiscal year 2014, 40 percent of whom (more than 1.0 million) came from outside St. Joseph County.<sup>3</sup>

Table 6 shows Appleseed’s estimates of non-local visitors to Notre Dame by type of event or purpose of visit during fiscal year 2014. As the data show, visitors attending on-campus intercollegiate athletic events represented the largest group of non-local visitors, accounting for 60.7 percent of all non-local visitors. Other visitors included:

- Participants in academic conferences;
- High school students (and their parents) interested in applying for admission to Notre Dame;
- People attending on-campus sports events or camps not involving Notre Dame teams;
- Commencement guests;
- People attending concerts and other performances;
- Participants in alumni reunions and other alumni events;
- Visitors attending masses at the Basilica of the Sacred Heart; and
- On-campus wedding guests.

<sup>3</sup> This estimate probably understates the total numbers of visitors to Notre Dame from outside the local area, since it leaves out several types of visitors for whom no data are available, such as friends and family members who visit Notre Dame students during the course of the year, and representatives of vendors, contractors, research partners and others who have business at the University.

**Table 6: Estimated non-local visitors to Notre Dame by purpose of visit, FY 2014**

Purpose of visit	Estimated number of non-local visitors
Football weekends	368,580
Other Notre Dame athletic events	248,890
Conferences	69,720
Pre-admission visits and other admissions programs	43,640
Other athletic events	43,370
Eck Visitors Center events	91,150
Sports camps	26,070
Commencement	22,710
Performances and other cultural events	19,250
Alumni Association reunion and other alumni events	3,220
Masses	62,500
Weddings	10,120
Notre Dame's Center for Arts and Culture	1,830
Warren Golf Course	6,500
<b>Total</b>	<b>1,017,550</b>

Based on data obtained from Visit South Bend Mishawaka on spending by visitors to St. Joseph County, we estimate that visitors to Notre Dame spent an average of \$190 per person, per trip on off-campus purchases such as hotel accommodations, food, shopping, entertainment and transportation in St. Joseph County. Visitors to Notre Dame thus spent a total of nearly \$193.1 million in St. Joseph County in fiscal year 2014 – about 39.6 percent of all non-local visitor spending in St. Joseph County.

Using IMPLAN, we estimate that in fiscal year 2014 (as shown in Table 7), off-campus spending by visitors to Notre Dame directly and indirectly accounted for:

- 3,258 FTE jobs in St. Joseph County;
- \$87.9 million in wages and salaries; and
- \$232.2 million in County-wide economic output.

**Table 7: Direct, indirect and induced impact of off-campus spending by non-local visitors to Notre Dame in St. Joseph County, FY 2014 (jobs in FTE, earnings and output in \$000s)**

	Jobs	Wages	Output
Direct	2,559	\$57,153.3	\$150,755.8
Indirect/induced	699	\$30,754.1	\$81,448.1
<b>Total</b>	<b>3,258</b>	<b>\$87,907.4</b>	<b>\$232,203.9</b>

## ***Notre Dame football as a generator of visitor traffic***

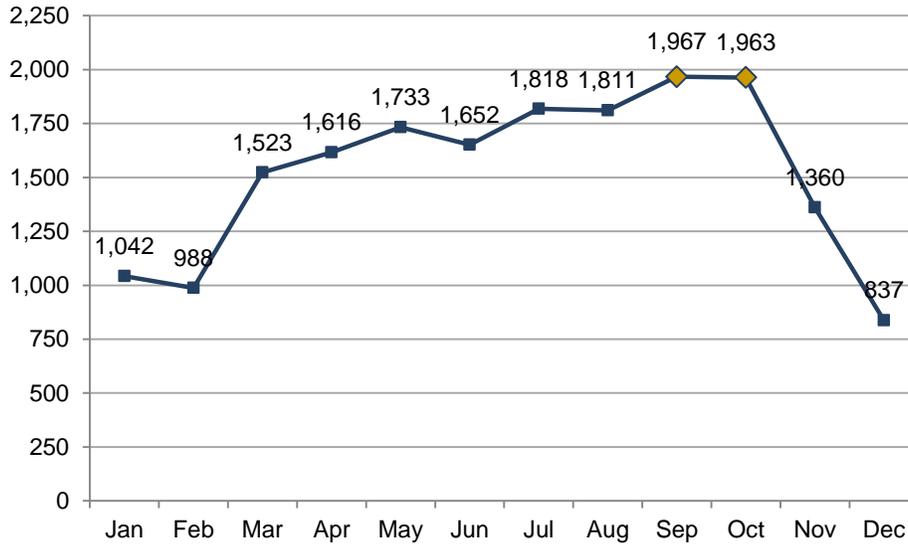
The number of people who come to South Bend for on-campus events at Notre Dame, and the multiple ways they affect the local economy, is most evident when we focus on the impact of a Notre Dame football weekend. Table 8 shows an estimate of the typical number of different types of visitors who come from outside St. Joseph County to attend football games at Notre Dame during a football season containing six home games. We estimate that during the 2013-14 Notre Dame football season, an average of more than 61,430 non-local visitors come to South Bend each football weekend to attend the home game, for other on-campus events that are scheduled around home games, or both.

**Table 8: Estimated number of non-local visitors to Notre Dame football home games by type of visitor, 2013-14 football season**

<b>Type of visitor</b>	<b>Estimated number of non-local visitors</b>
Football fans	299,220
Football media	6,000
Football visiting teams	900
Other tailgaters	61,310
Spring football media	150
Sports recruits	1,000
<b><i>Total</i></b>	<b><i>368,580</i></b>

The spike in visitor traffic into South Bend is evident from data on general aviation into and out of South Bend-Mishawaka Regional Airport. As Figure 7 shows, in 2013, the average number of general aviation flights into South Bend Regional Airport during the months in which Notre Dame had home football games was 36.6 percent higher than the monthly average during the rest of the year. (The gold diamonds in Figure 7 represent months during which Notre Dame played a home football game.)

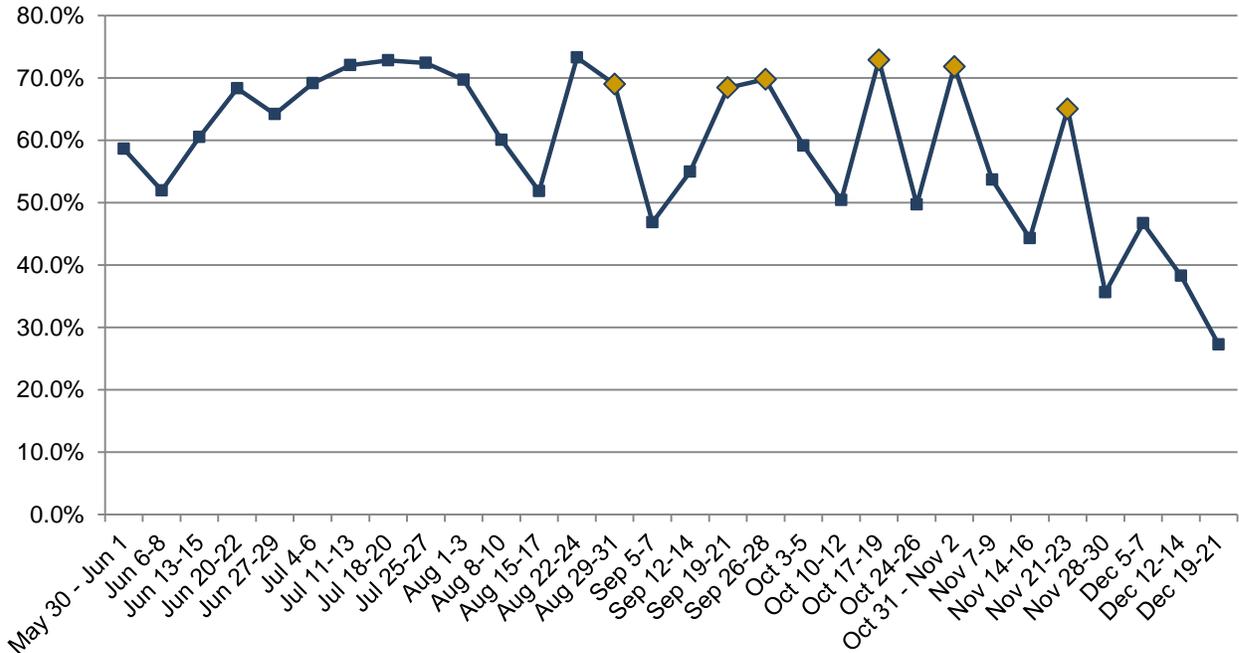
**Figure 7: Monthly general aviation air traffic at South Bend-Mishawaka Regional Airport, 2013**



*Source: St. Joseph County Airport Authority*

Notre Dame home football games also have a significant impact on demand for hotel rooms. As Figure 8 shows, occupancy rates at hotels in St. Joseph County spiked on weekends during which Notre Dame had a home football game. In 2013, the average occupancy rate on weekends during which Notre Dame had a football game was 23.8 percent higher than the average for non-football weekends during the period from May 30<sup>th</sup> to December 21<sup>st</sup>. (The gold diamonds in Figure 8 represent weekends during which Notre Dame played a home football game.)

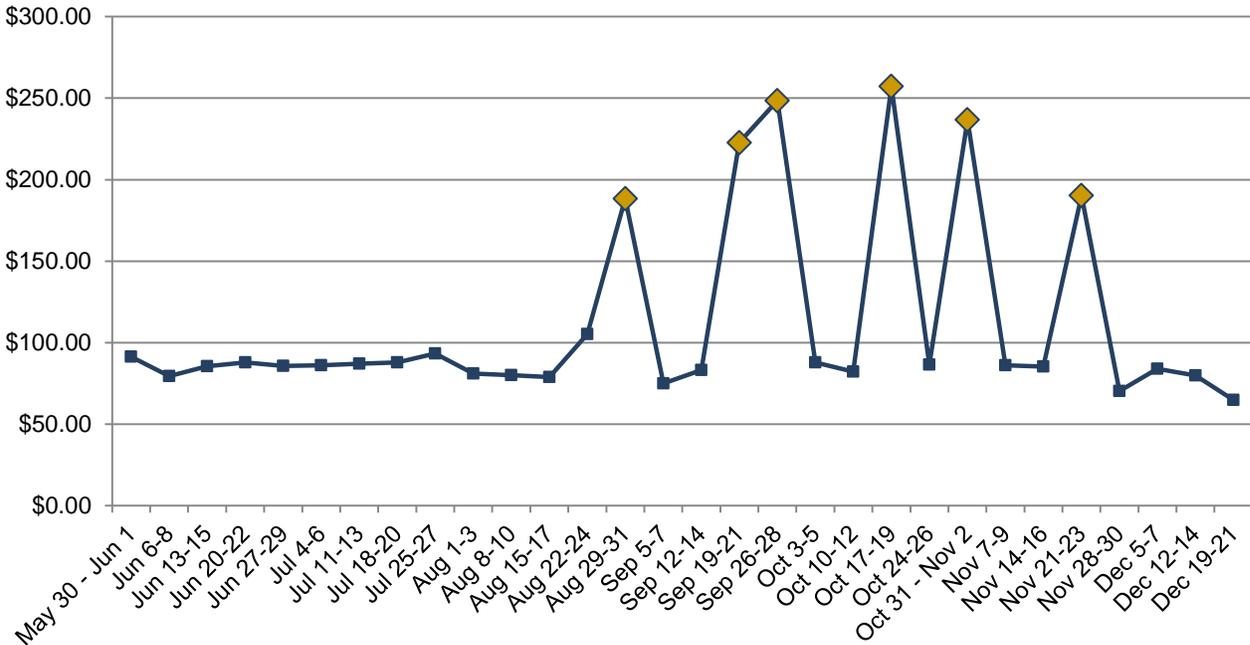
**Figure 8: Weekend (Thursday-Saturday) occupancy rates at hotels in St. Joseph County, 2013**



Source: South Bend/Mishawaka Convention and Visitors Bureau

As Figure 9 shows, average daily room rates at hotels in St. Joseph County also rose on weekends during which Notre Dame had a home football game during 2013. On the six weekends during which Notre Dame had a home game, the average cost of a hotel room in St. Joseph County exceeded \$220 – more than double the average for non-football weekends during the period from May 30<sup>th</sup> through December 21<sup>st</sup>; and on one of these football home game weekends, the average daily rate was \$257. (The gold diamonds in Figure 9 represent weekends during which Notre Dame played a home football game.)

**Figure 9: Weekend (Thursday-Saturday) average daily room rates at hotels in St. Joseph County, 2013**



Source: South Bend/Mishawaka Convention and Visitors Bureau

Taking into account the higher cost of hotel rooms during weekends in which Notre Dame played a home football game, we estimate that on football weekends during 2013, off-campus spending by visitors to Notre Dame football games averaged nearly \$18.5 million per football weekend, including an average of nearly \$14.7 million in off-campus spending by visitors from outside St. Joseph County per football weekend.

### **Adding it all up: the impact of University, student and visitor spending**

When the impact of Notre Dame’s spending on payroll, purchasing and construction is combined with the impact of student and visitor spending, we estimate that in fiscal year 2014, Notre Dame directly and indirectly accounted for:

- 14,650 FTE jobs in St. Joseph County;
- \$772.2 million in wages and salaries; and
- \$1.3 billion in County-wide economic output.

These combined impacts are summarized below in Table 9.

**Table 9: Notre Dame’s total economic impact in St. Joseph County, FY 2014 (jobs in FTE, earnings and output in \$000s)**

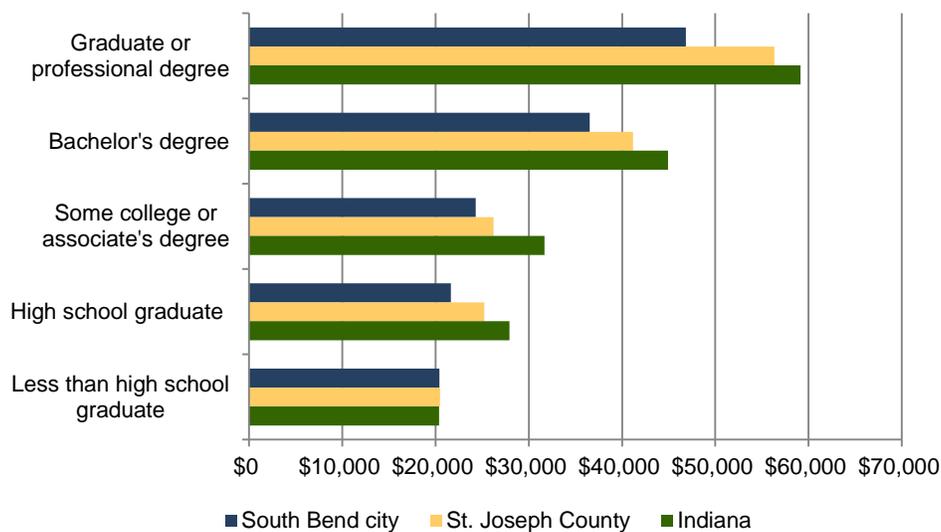
	<b>Jobs</b>	<b>Wages</b>	<b>Output</b>
<b>Impact of University spending</b>			
Direct	6,874	\$517,846.3	\$593,375.8
Indirect/induced	2,907	\$123,430.1	\$341,691.9
<i>Subtotal, University spending impact</i>	<i>9,781</i>	<i>\$641,276.4</i>	<i>\$935,067.7</i>
<b>Impact of student spending</b>			
Direct	1,248	\$27,272.2	\$93,154.7
Indirect/induced	363	\$15,765.8	\$42,523.0
<i>Subtotal, student spending impact</i>	<i>1,611</i>	<i>\$43,038.0</i>	<i>\$135,677.7</i>
<b>Impact of visitor spending</b>			
Direct	2,559	\$57,153.3	\$150,755.8
Indirect/induced	699	\$30,754.1	\$81,448.1
<i>Subtotal, visitor spending impact</i>	<i>3,258</i>	<i>\$87,907.4</i>	<i>\$232,203.9</i>
<b>Total impact</b>	<b>14,650</b>	<b>\$772,221.8</b>	<b>\$1,302,949.3</b>

## Part Four: Attracting and developing human capital

Human capital – the accumulated knowledge, skills, and experience of a community’s or a region’s workforce – is perhaps the single most important contributor to economic growth. Human capital can be especially critical in determining how quickly and how successfully communities can adapt to changes in the broader economic environment.

Data published by the U.S. Census Bureau highlight the impact of education on individual workers’ earnings. As Figure 10 shows, in 2013, the median earnings of St. Joseph County residents who had bachelor’s degrees were more than \$15,900 greater (63.2 percent higher) than the median earnings of those who had only a high school diploma; and the median earnings of those with graduate or professional degrees were more than \$31,100 greater (123.3 percent higher) than the median earnings of those who had no education beyond high school.

**Figure 10: Median earnings (in 2013 inflation adjusted dollars) by educational attainment for residents 25 years and older in South Bend, St. Joseph County and Indiana, 2013**



*Source: 2013 American Community Survey (1-Year Estimates), Social Explorer*

The economic value of education, however, is not limited to its impact on individual earnings. A study published by the Milken Institute in 2013 found that in U.S. metropolitan areas, increasing employed workers’ average years of school by one year increased regional GDP per capita by 10.5 percent and increased average real wages by 8.4 percent.

Higher education was found to have an even greater impact than education generally: Adding one year of schooling to the educational attainment of workers who already had a high school

diploma increased average GDP per capita by 17.4 percent and average real wages by 17.8 percent.<sup>4</sup>

Even non-college educated works benefit from these spillover effects. University of California economist Enrico Moretti has shown that “the earnings of a worker with a high school education rise by about 7 percent as the share of college graduates in his [metropolitan area] increases by 10 percent.”<sup>5</sup>

## Student enrollment at Notre Dame

In the fall of 2013, a total of 12,124 students were enrolled at Notre Dame, including 8,477 undergraduates and 3,647 graduate and professional students. Table 10 shows undergraduate and graduate and professional student enrollment by school.

**Table 10: Undergraduate and graduate enrollment by school, fall 2013**

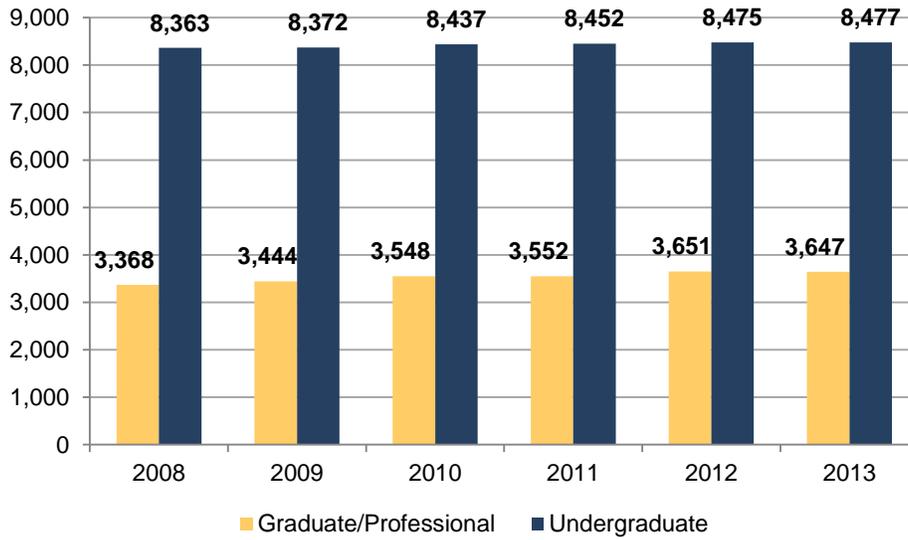
College/School	Undergraduate	Graduate/ Professional
School of Architecture	144	43
College of Arts and Letters	1,940	1,127
Mendoza College of Business	1,970	654
College of Engineering	1,109	483
College of Science	1,217	542
First Year of Studies	2,086	–
The Law School	–	548
Non-degree seeking	11	250
<b>Total</b>	<b>8,477</b>	<b>3,647</b>

As shown in Figure 11, between the fall of 2008 and the fall of 2013, total enrollment at Notre Dame grew by 3.4 percent – an increase of 393 students. During the same period, graduate and professional student enrollment grew by nearly 8.3 percent (279 students), and undergraduate student enrollment grew by approximately 1.4 percent (114 students).

<sup>4</sup> Ross de Vol et al, *A Matter of Degrees: The Effect of Educational Attainment on Regional Economic Prosperity*, The Milken Institute, February 2013, p.1.

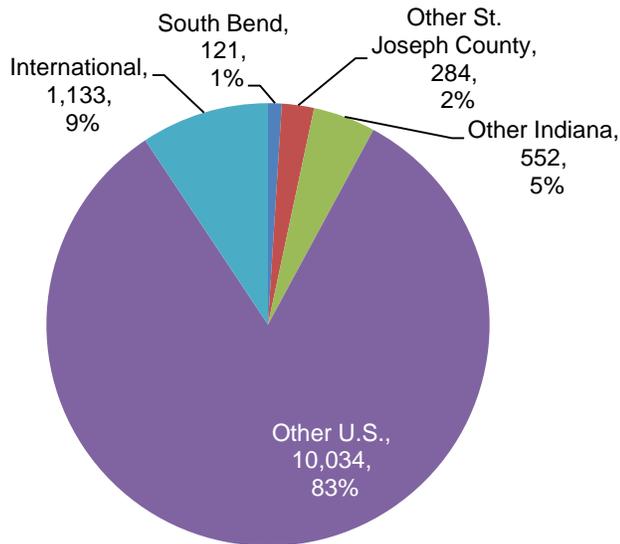
<sup>5</sup> Enrico Moretti, *The New Geography of Jobs*, Houghton Mifflin Harcourt, 2012, p. 100.

**Figure 11: Undergraduate and graduate enrollment, fall 2008 – fall 2013**



As shown in Figure 12, of all those enrolled in the fall of 2013, 405 students (3.3 percent of total enrollment) were residents of St. Joseph County, 552 students (4.6 percent) were from elsewhere in Indiana, and 10,034 students (82.8 percent) were from elsewhere in the U.S. International student enrollment totaled 1,133 – 9.3 percent of total enrollment. International students accounted for 5.1 percent of total undergraduate enrollment, and 19.2 percent of total graduate and professional enrollment.

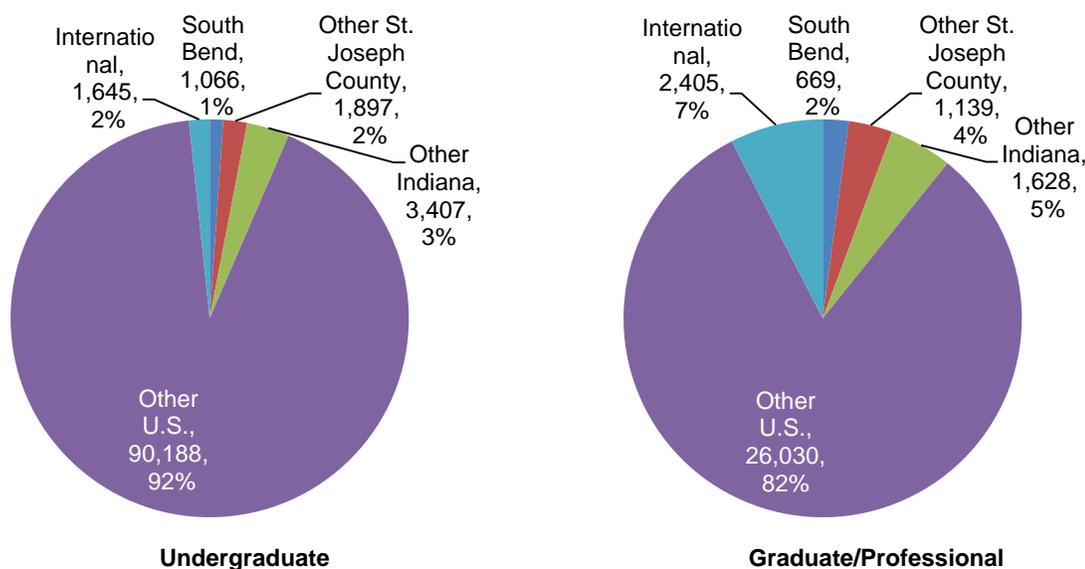
**Figure 12: Total enrollment by student's place of residence, fall 2013**



## Where Notre Dame alumni live

As of the summer of 2014 (as shown in Figure 13), of the 98,203 Notre Dame undergraduate alumni for whom current addresses are known, 2,963 (3.0 percent) lived in St. Joseph County, and an additional 3,407 (3.5 percent) lived elsewhere in Indiana. As of the same time period, of the 31,871 Notre Dame graduate and professional alumni for whom current addresses are known, 1,808 (5.7 percent) lived in St. Joseph County, and an additional 1,628 (5.1 percent) lived elsewhere in Indiana.

**Figure 13: Notre Dame alumni by place of residence, as of summer 2014**



Although most students come to Notre Dame from outside the South Bend area and leave after they graduate, the University is still a significant contributor to the area's college-educated workforce. Based on 2013 ACS data, we estimate that approximately 10.6 percent of all residents of St. Joseph County with bachelor's degrees or higher (4,771 out of 45,179) received one or more degrees from Notre Dame.

## Preparing students for a new economy

Education at Notre Dame has long been shaped, in the words of its President, Father John Jenkins CSC, by a commitment to "an unsurpassed undergraduate education that nurtures the formation of mind, body and spirit," and "post-baccalaureate programs that seek to heal, unify and enlighten." At the same time, Notre Dame seeks to ensure that its students are well-prepared for the world that awaits them after graduation.

Notre Dame offers its students a wide range of opportunities to work in fields that over the course of the next several decades are likely to be among the principle drivers of economic growth, both in the U.S. and globally. Below we cite just a few examples.

- Engineering undergraduates can select a concentration in ***Biomolecular Engineering***, focusing on how biologically active molecules interact with both living systems and inanimate chemical systems.
- The College of Engineering's bachelor's program in ***Computer Science*** prepares undergraduate engineering students with the knowledge and skills necessary to design, implement and evaluate computer-based systems using mathematical foundations, algorithmic principals and computer science theory. The program offers four different concentrations: Bioinformatics and Computational Biology, Media Computing, IT Leadership and Cloud Computing.
- Notre Dame's College of Science offers bachelor's, master's and doctoral degrees in ***Applied and Computational Mathematics and Statistics***. These programs prepare students to apply the resources and techniques of "big data" to a wide variety of problems, from cancer research to financial crises to improving our understanding of climate change.
- The College of Science offers a minor in ***Sustainability*** that is open to undergraduate students in all of Notre Dame's colleges and programs. The program allows students to integrate a focus on environmental issues into their work in other fields.
- Notre Dame also offers an interdisciplinary minor in ***Energy Studies***. The program aims to give students a basic understanding of energy sources, infrastructure and markets, as well as the political and societal dimensions of energy,
- In 2012, Notre Dame's Department of Economics introduced a new undergraduate major in ***International Economics***, which seeks to equip students with "both the analytical and cultural skills needed to navigate today's interconnected global economy." The program combines at least eight economics courses with seven to ten courses in foreign languages, culture and history. As of the fall of 2013, language options will include Arabic, Chinese, French, German, Italian, Japanese, Russian and Spanish.
- The University's joint ***MBA/Engineering*** program gives undergraduate engineering students the opportunity to pursue an MBA degree and a B.S. degree in engineering through a curriculum that integrates management and engineering. The first three years of the dual program focus on engineering, followed by a fourth year focused only on the MBA and a final fifth year during which the student takes courses for both degrees.
- In 2012, the College of Engineering, the College of Science and Notre Dame Law School launched a one-year professional master's degree program in ***Patent Law***, aimed at

preparing students who have undergraduate degrees in science or engineering to work as registered patent agents.

- The College of Science's cross-departmental ***Integrated Biomedical Sciences*** Ph.D. program, launched in the fall of 2013, offers students the opportunity to engage in biomedical research and training as part of one of the program's seven "thematic research and training clusters" that combine research being done across the College's different departments and disciplines, including work that is being done in collaboration with the Indiana University School of Medicine – South Bend. The research clusters focus on a variety of different topics, from genomics, cancer biology and immunology and infectious diseases to chemical biology and molecular pharmacology.
- Also started in the fall of 2013, Notre Dame and the Indiana University School of Medicine – South Bend offer a dual degree program, combining an MD degree from IUSM with an MS in Global Health from Notre Dame.

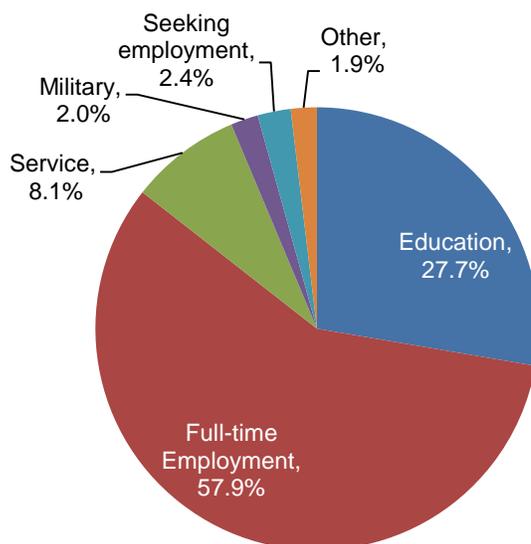
Through these and many other programs, Notre Dame helps ensure that its students are prepared to address the challenges of a fast-changing economy.

The value of a Notre Dame degree is reflected in survey data on the labor market experience of undergraduate students after graduation. As of six months after graduation (as shown in Figure 14), 57.9 percent of survey respondents from the class of 2014 were employed full-time, 27.7 percent were enrolled in graduate or professional school, 8.1 percent were participating in some type of community service program, and 2.0 percent were in military service. Only 2.4 percent were unemployed and seeking work.<sup>6</sup>

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<sup>6</sup> University of Notre Dame Career Center, *First Destination 2014*

**Figure 14: Primary post-graduation activity of Notre Dame graduates (class of 2014) six months after graduation**



The value of a Notre Dame undergraduate education is also reflected in the earnings of recent graduates. As Table 11 shows, the median earnings of 2014 graduates six months after graduation was \$57,728 – ranging from \$47,091 for graduates of the School of Architecture to \$65,805 for graduates of the College of Engineering.

**Table 11: Median salary of employed Notre Dame graduates (class of 2014) six months after graduation**

College/School	Median salary
School of Architecture	\$47,091
College of Arts and Letters	\$53,751
Mendoza College of Business	\$58,028
College of Engineering	\$65,805
College of Science	\$48,189
<b>University Total</b>	<b>\$57,728</b>

The economic advantages of an undergraduate Notre Dame education are not limited to new graduates. In PayScale’s annual ranking of U.S. colleges and universities in terms of alumni mid-career salaries, Notre Dame tied for 24<sup>th</sup> place with an average mid-career salary of \$110,000.<sup>7</sup> PayScale ranked Notre Dame behind Cal Tech, Princeton, Stanford, Harvard, MIT and several

<sup>7</sup> PayScale, 2013-14 College Salary Report

other institutions in this score, but ahead of University of Pennsylvania, Cornell, Duke, Columbia and many other leading universities.

## **Living and working in a global community**

One of the challenges confronting today's undergraduate and graduate students will be living and working in an increasingly integrated global economy. Notre Dame has long been a leader in providing students with opportunities to experience first-hand the global context of their work. The University offers year-long, semester-long and summer programs at more than 40 locations in over 20 countries. Locations available to students include:

- Global Gateways facilities – centers for Notre Dame's international programs in London, Dublin, Rome and Beijing, and the Tantur Institute for Ecumenical Studies in Jerusalem.
- Partner institutions with which Notre Dame has ongoing, multidimensional relationships – examples include:
  - University College Dublin
  - Universidad Popular Autónoma del Estado de Puebla, Mexico
  - Pontificia Universidad Católica, Santiago, Chile
  - University of Western Australia, Perth
- Universities with which Notre Dame has ongoing student exchange programs, such as the University of Hong Kong and Yonsei University in Seoul.
- Study abroad programs at other institutions operated by other U.S. universities or by organizations such as the Council for International Educational Exchange.

In addition to these study abroad programs, the University offers students the opportunity to gain international experience through other short-term cultural immersion programs and research and service learning opportunities abroad.

Notre Dame's commitment to international learning is evident in data on student participation. During the 2013-2014 academic year, 705 undergraduate students spent at least one semester studying abroad. In addition, 366 undergraduate students participated in summer study abroad programs, and 127 undergraduate students participated in short-term study abroad programs during the academic year. Among all those who were awarded bachelor's degrees in 2014, 36 percent (755 students) had participated in at least one semester of a Notre Dame study abroad program while enrolled.

Overall, in 2012-2013, Notre Dame ranked 12<sup>th</sup> among U.S. doctoral universities in terms of the percentage of undergraduate students who participated in study-abroad programs (53.3 percent).<sup>8</sup>

Notre Dame graduate students also have the opportunity to study abroad. During the 2013-2014 academic year, 65 graduate students spent at least one semester studying abroad. In addition, 32 graduate students participated in summer study abroad programs, and 157 graduate students participated in short-term study abroad programs during the academic year.

Along with the opportunities the University provides to study abroad, Notre Dame students also benefit from living with and learning alongside fellow students who come to South Bend from other countries. In the fall of 2013, 1,133 international students were enrolled at Notre Dame –9.3 percent of total enrollment, and an increase of 21.8 percent in international student enrollment since the fall of 2005.

## **Learning through experience**

Experiential learning plays an important role in undergraduate education at Notre Dame. Programs that combine practical experience with academic learning can take several forms, including participation in research projects (discussed in Part Five), service learning opportunities (discussed in Part Seven) and internships.

In part because of the extent and intensity of Notre Dame students' academic commitments during the regular academic year, most undergraduate internships occur during the summer. According to the University's 2014 Summer Experience Survey, 1,487 undergraduates (71 percent of total respondents) reported that they had participated in some type of internship during the summer of 2014. Other undergraduate summer experiences included research (14 percent of total respondents to the Summer Experience Survey), service and volunteer work (11 percent) and study abroad (4 percent).<sup>9</sup>

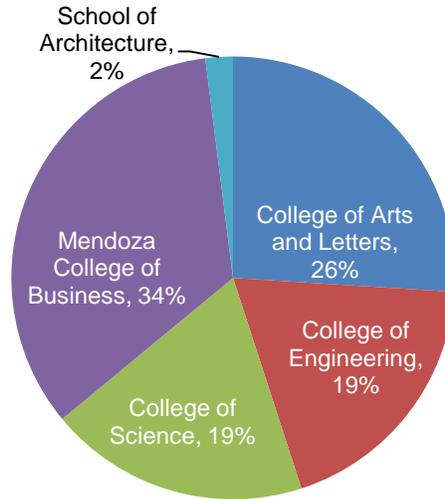
As Figure 15 shows, undergraduate students enrolled in the Mendoza College of Business accounted for the largest share of reported summer experiences (34 percent), followed by College of Arts and Letters (26 percent), College of Engineering (19 percent) and College of Science (19 percent).

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<sup>8</sup> Institute of International Education, "Institutions by Undergraduate Participation in Study Abroad, 2012/13", *Open Doors Report on International Educational Exchange (2014)*.

<sup>9</sup> University of Notre Dame Career Center, *Summer Experience 2014*

**Figure 15: Notre Dame undergraduate students participating in summer experiences by college, summer 2014**



We estimate that 37 percent of all undergraduate students enrolled in the College of Engineering in the fall of 2013 reported participation in a summer experience during the summer of 2014, 36 percent of all Mendoza College of Business undergraduate students, 33 percent of all College of Science undergraduate students, 32 percent of all School of Architecture undergraduate students, and 28 percent of all College of Arts and Letters undergraduate students.

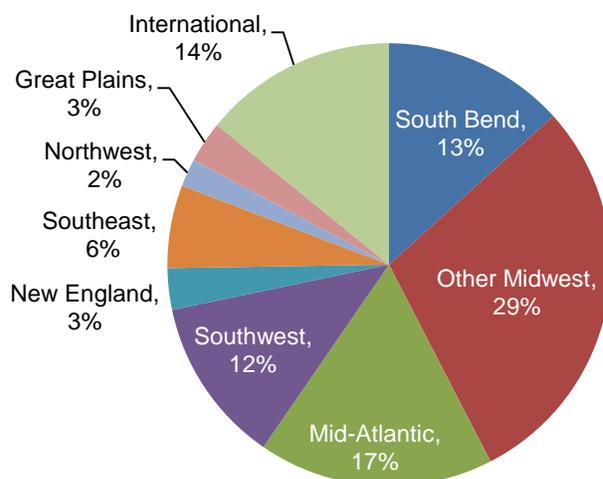
The settings in which undergraduate summer interns work are quite diverse. They include major corporations, financial institutions and professional service firms (especially for business, engineering and architecture students), public agencies, non-profit organizations and universities (including Notre Dame). About 70 percent of all reported undergraduate summer experiences in 2014 were paid positions, and in 15 percent of all summer experiences, students were unpaid but received academic credit for their work.

In the summer of 2014, 269 undergraduate students (13 percent of total respondents) participated in summer experiences located in the South Bend area. They included students who worked for Notre Dame and its affiliates (such as the Robinson Community Learning Center), as well as students who worked for other local organizations and businesses, including the American Red Cross, Data Realty, the Boys and Girls Club, the City of South Bend, the South Bend Tribune, F Cubed LLC, the St. Joseph County Chamber of Commerce, the Indiana University School of Medicine, Inovateus Solar, Catholic Charities, EPS LLC, USNano LLC and the Historic Preservation Commission of South Bend.

As shown in Figure 16, another 29 percent of all reported summer experiences were located elsewhere in the Midwest, and 17 percent in the Mid-Atlantic states. Consistent with growing

student interest in international education and experience, about 286 undergraduates (14 percent of total respondents) reported summer experiences located outside the U.S. in 2014.

**Figure 16: Geographic distribution of Notre Dame undergraduate summer experiences, summer 2014**



As student interest in internships has grown, so has the assistance that Notre Dame provides to students seeking them. The University’s Career Center assists students in the process of finding internships, and in some cases provides financial assistance as well – up to \$3,500 for food, transportation and housing for students taking full-time unpaid summer internships. For students who need help in covering their expenses, this assistance can sometimes be the difference between taking and not taking an internship.

## Executive education

In addition to its regular degree programs, Notre Dame offers a variety of executive education programs through its Mendoza College of Business.

- Both on the South Bend campus and in Chicago, the Mendoza College of Business offers an Executive MBA program for working professionals. During the 2013-2014 academic year, 407 students participated in the program.
- The Mendoza College of Business has offered a master’s degree in Non-Profit Administration since 1954. The oldest and one of the highest-rated programs of its type in

the U.S., it combines intensive on-campus summer sessions with distance learning during the rest of the year. Each year, approximately 30 students enroll in the program.

- Mendoza also offers shorter executive education programs, both on an open-enrollment basis and for specific companies and organizations. During the 2013-2014 academic year, 209 students participated in open-enrollment programs; and the College delivered 16 custom executive education programs, with a total of 416 participants.
- The College also offers several online certificate programs in areas such as leadership, negotiation and intercultural management.

These programs allow the University to bring its strengths in management education to a wider audience, both in the South Bend area and beyond.

## Part Five: The impact of University research

Since at least the 1950's, scientific discovery and technological innovation have been among the most important sources of economic growth, both in the U.S. and increasingly throughout the world. America's research universities play an important role in this process. As of 2010, universities – with strong financial support from the federal government – accounted for about 55 percent of all spending on basic scientific research in the U.S.,<sup>10</sup> and are playing an increasingly active role in the translation of new knowledge into new products and services, new businesses and new jobs.

One of the most notable trends at Notre Dame during the past decade has been the growth of the University's enterprise. This growth contributes in several ways to the ongoing renewal of South Bend's (and the region's) economy.

- Each year, Notre Dame attracts millions of dollars in federal and other external research funding – most of which is spent in the South Bend area.
- Research conducted by Notre Dame faculty, staff and students expands the boundaries of knowledge in areas that in the years ahead are likely to be continuing sources of innovation and economic growth.
- Opportunities to participate in significant research projects enhance the education of Notre Dame students – and the ability of the University's graduates to participate in the continued development of the region's economy.
- The “intellectual capital” created by Notre Dame researchers provides a foundation for the creation of new products and services, new businesses, and new jobs.

This part of the report addresses all but the last of these four dimensions of University research; technology transfer and new business development are discussed in Part Six.

### A growing research enterprise

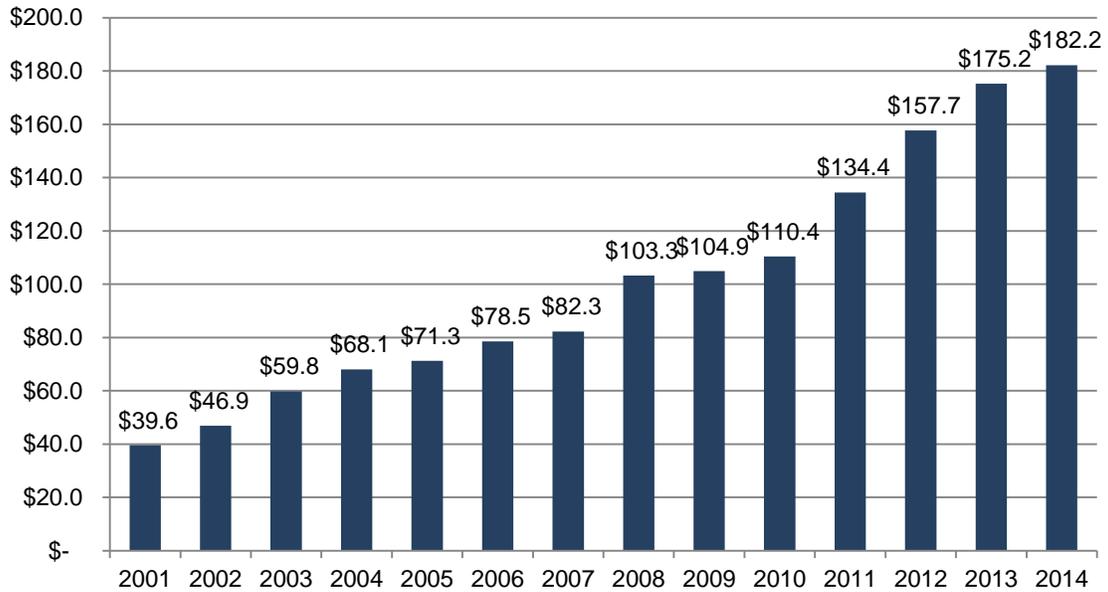
Between fiscal year 2010 and fiscal year 2014, research spending at Notre Dame grew by 65.0 percent, to \$182.2 million. As shown in Figure 17, this continued a pattern of strong growth that began earlier in the decade; since fiscal year 2001, Notre Dame's research spending has grown more than four-fold.

According to the National Science Foundation's (NSF) Higher Education R&D Survey, Notre Dame ranked 114<sup>th</sup> among U.S. universities in total research spending in 2013, up from 137<sup>th</sup> in 2010. Among U.S. universities that do not have a medical school, Notre Dame ranked 35<sup>th</sup>, up from 50<sup>th</sup> in 2010.

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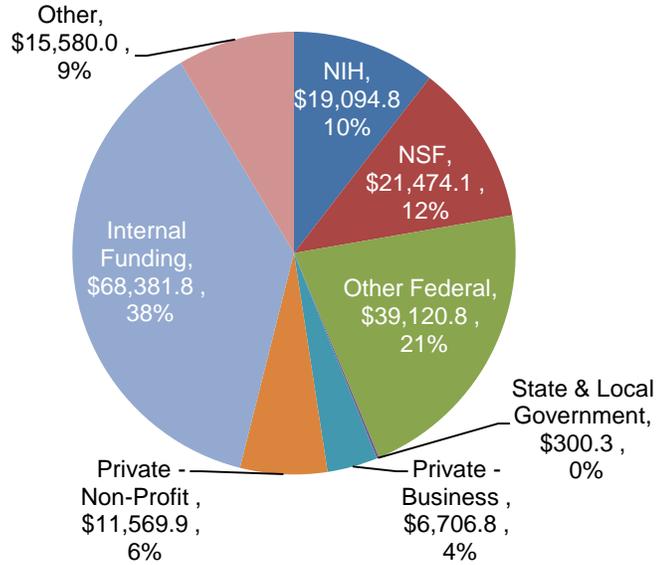
<sup>10</sup> The Science Coalition, *Sparkling Economic Growth*, April 2010, p.3.

**Figure 17: Notre Dame research spending, FY 2001 – FY 2014 (in \$ millions)**



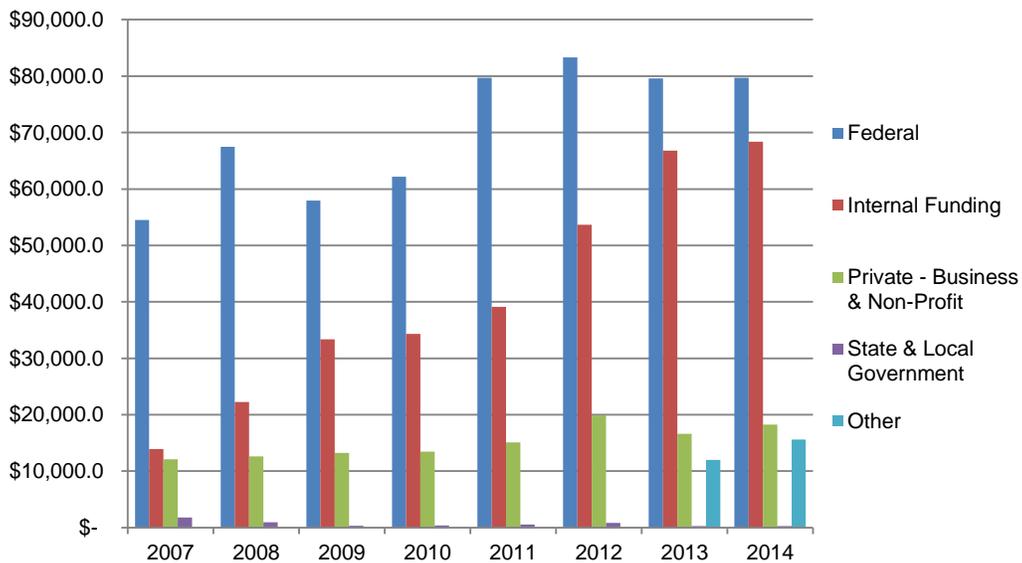
As shown in Figure 18, the federal government is Notre Dame’s leading source of research funding, accounting for 43.7 percent (nearly \$79.7 million) of total research expenditures in fiscal year 2014. Internal funding accounted for 37.5 percent (nearly \$68.4 million); private foundations and corporate partners for 10.0 percent (nearly \$18.3 million); and state and local government for less than 1 percent.

**Figure 18: Notre Dame research spending by source of funding, FY 2014 (\$000s)**



While federally-funded research spending grew by 28.2 percent between fiscal year 2010 and fiscal year 2014, corporate and foundation funding grew by 35.5 percent, and internal funding nearly doubled (as shown in Figure 19).

**Figure 19: Trend in Notre Dame research spending by source of funding, FY 2007 – FY 2014 (\$000s)**



Notre Dame's Strategic Research Initiative (SRI) has played a central role in the growth of internally-funded University research. In 2008, Notre Dame committed \$80 million to investments in new research initiatives in selected areas, including nanoelectronics, sustainable energy,

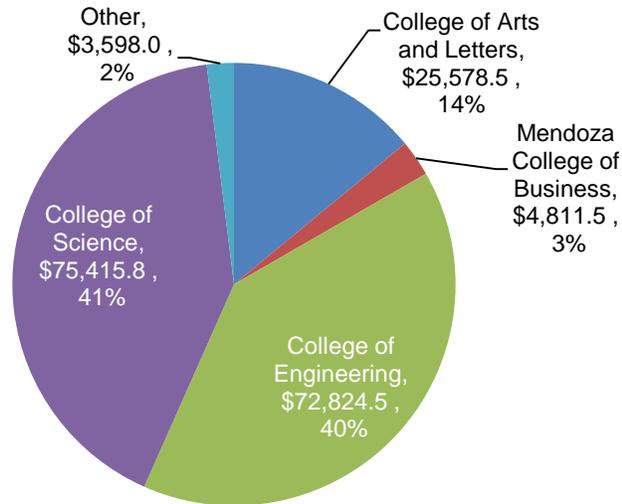
diagnostics and therapeutics, environmental change and global health. Funds were used to provide additional research support for faculty members, to hire new faculty and to purchase needed equipment.

The dramatic increase in Notre Dame's internally funded research spending is important for several reasons – both for the University and for the local economy.

- The increased commitment of internal resources enabled Notre Dame to continue the growth of its research enterprise through the recession – and now, to keep doing so even as overall federal funding for university research has begun to decline. The local economy benefits from this increase in spending.
- The commitment of internal funding for early-stage work in emerging areas of research has enabled the University to compete more effectively for new (and in some cases large-scale) federal funding in these areas.
- Internal funding can be particularly useful in helping the University attract the most talented faculty members, researchers and graduate students in high-priority areas – which in turn enhances Notre Dame's ability to compete for funding for federal and other external sources.
- Just as it can help incubate new research projects before external funding becomes available, internal funding can also support the additional work that is often needed to advance promising new technologies to a stage at which they can begin to attract private investment.

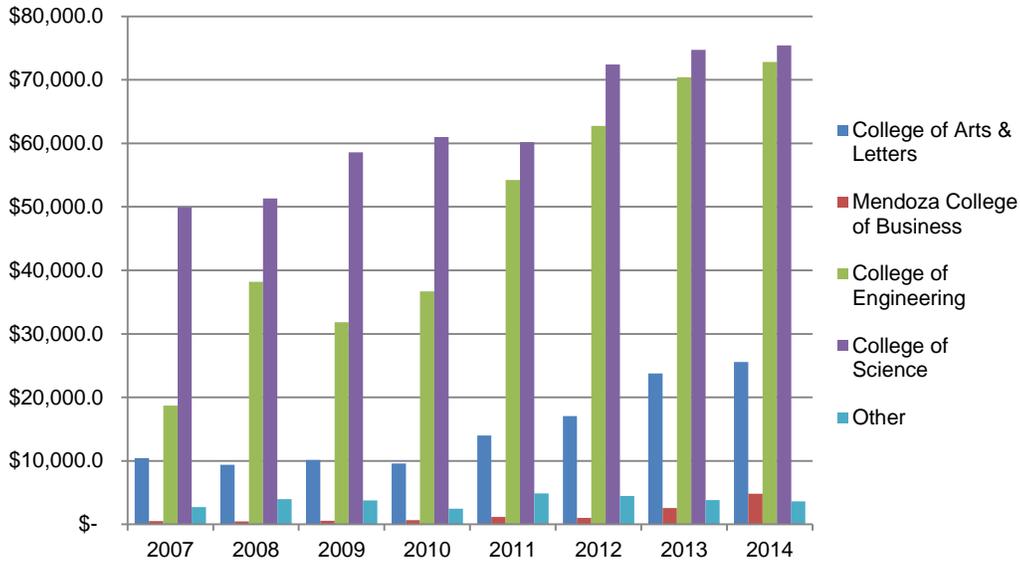
As Figure 20 shows, the College of Science led the University in research spending with \$75.4 million in fiscal year 2014 – 41.4 percent of total research spending. The College of Engineering ranked second at \$72.8 million (40.0 percent of total research spending), followed by the College of Arts and Letters with nearly \$25.6 million (14.0 percent) in fiscal year 2014.

**Figure 20: Notre Dame research spending by college, FY 2014 (in \$000s)**



Between fiscal year 2010 and fiscal year 2014, several Notre Dame colleges showed significant growth in research spending. As Figure 21 shows, the Mendoza College of Business grew by more than seven-fold (638.5 percent growth) and the College of Arts and Letters more than doubled its total research spending (167.8 percent growth). In addition, the College of Engineering nearly doubled its total research spending (98.5 percent growth) and research spending at the College of Science grew by 23.6 percent between fiscal years 2010 and 2014.

**Figure 21: Trend in Notre Dame research spending by college, FY 2007 – FY 2014 (in \$000s)**



## Research at Notre Dame: A force for good

Behind the growth of Notre Dame’s research enterprise has been the University’s overarching commitment to being “a force for good in the world.” In the context of this commitment, increasing research funding is not simply a means to grow the University; it provides the resources the University needs to have a positive impact.

With this emphasis on impact has come a heightened focus on research aimed at addressing some of the world’s most pressing problems. Some of this research is being done in areas in which Notre Dame has long-established strengths – and some in areas in which the University’s strengths are of a more recent vintage.

- The University’s ***Institute for Flow Physics and Control (Flow PAC)***, established in 2002, builds on more than a century of research in aerodynamics at Notre Dame. Among other projects, Flow PAC researchers are working on design changes that can increase the efficiency of aircraft engines, resulting in significant reductions in fuel consumption, greenhouse gas emissions and engine noise.

Since 2010, the Institute’s expertise in air flow physics and control has also been applied to the field of wind power. Its ***Lab for Enhanced Wind Energy Design (eWIND)*** is working to improve the efficiency of wind turbines, aimed at increasing their effectiveness in capturing the power of the wind and at the same time improving their durability. The Lab’s facilities include two wind turbines that were installed in 2012 at White Field, the site of one of the Institute’s research facilities.

- The ***Midwest Institute for Nanoelectronics Discovery (MIND)***, a collaborative research center led by Notre Dame and including researchers from Penn State, Purdue and the University of Texas-Dallas, is one of four university centers funded by the Semiconductor Research Corporation's Nanoelectronics Research Initiative (NRI). The goal of NRI is to develop new devices that can replace the complementary metal oxide semiconductor (CMOS) transistor as a logic switch. CMOS technology has over the years supported dramatic increases in computing power, but within a few years is likely to reach its physical limits.

MIND researchers at Notre Dame and Penn State have responded to this challenge by developing *tunneling field-effect transistors* (TEFT). These new transistors operate at significantly lower voltage, thus reducing the energy consumption. Further work on TEFT technology is now under way at semiconductor industry R&D labs both in the U.S. and elsewhere.

- Following on the success of MIND, the Semiconductor Research Corporation and the federal Defense Advanced Research Projects Agency (DARPA) in January 2013 announced a five-year award of \$30 million to a new Notre Dame-led, multi-university microelectronics research center, the ***Center for Low-Energy Systems Technology (LEAST)***. One of six new SRC-DARPA research centers that together make up the Semiconductor Technology Advanced Research Network (STARNet), LEAST explores the physics of new materials and devices, with the goal of developing more energy-efficient integrated circuits and systems.
- The ***Center for Sustainable Energy @ Notre Dame (cSEND)*** is a multi-disciplinary research center created in 2010 that focuses on making nuclear power safer, developing cleaner fossil fuel technology, and developing functional nanomaterials that can be used to improve the efficiency of solar energy cells.
- Notre Dame's ***Environmental Change Initiative***, launched in 2010, focuses on the interrelated problems of climate change, land use and invasive species, and their combined impact on water resources. ECI seeks "to provide solutions that minimize the trade-offs between human welfare and environmental health where trade-offs are unavoidable, and to discover win-win solutions where they are possible."
- Researchers at the ***Mike and Josie Harper Cancer Research Institute (HCRI)***, a collaboration between Notre Dame and the University of Indiana School of Medicine – South Bend, seek to understand the causes of and to develop more effective treatments for cancer. They work in areas such as cancer genomics, tumor detection, computational modeling, drug development and behavioral oncology. HCRI researchers have, for example, developed a new diagnostic technology that could provide a basis for early detection of certain types of oral cancer, at much lower cost than existing tests.

- The University's ***Eck Institute for Global Health***, established in 2009, is a university-wide institute that seeks to promote research, training and service to advance health standards, especially for people in low- and middle-income countries, who are disproportionately impacted by preventable diseases.

The study of tropical infectious diseases and the biology of their arthropod vectors has a long history at Notre Dame. The Institute's ***Center for Rare and Neglected Diseases*** focuses on neglected diseases in the U.S. and elsewhere, and supports programs in discovery and development of treatments for infectious (malaria and TB) and rare diseases.

- The ***Joint Institute for Nuclear Astrophysics (JINA)*** is a collaborative research center housed and led by Notre Dame, in partnership with Michigan State University and the University of Chicago. One of ten NSF Physics Frontier Centers, JINA seeks to foster interdisciplinary research in the areas of nuclear physics, astrophysics and astronomy. In 2011, the University's Nuclear Science Laboratory – one of JINA's core research laboratories – acquired a new nuclear particle accelerator through a \$4 million NSF grant to further expand JINA's research program; it is the first nuclear accelerator NSF has funded in nuclear physics in almost 25 years. Since its founding in 2002, JINA has expanded into a multinational research center with participating institutions from the U.S., Europe, Australia and Brazil.
- Notre Dame is a partner in two of the three advanced manufacturing institutes that have been created by the federal government. The mission of these institutes, each of which brings together multiple universities and corporate partners, is to support the revitalization of the manufacturing sector in the U.S. They are funded by the Department of Defense and other agencies. The institutes in which Notre Dame is participating – creation of which was announced by President Obama in February 2014 – are the ***Digital Laboratory for Manufacturing***, headquartered in Chicago, and the ***Lightweight Modern Metal Manufacturing Innovation Institute (LM3I)***, based in Canton, Michigan.
- In June 2014, Notre Dame announced the development of a new ***Turbomachinery Facility***, which when completed will be one of the nation's most advanced facilities for research on and development and testing of the turbines used in power plants and aircraft engines. The new \$36 million facility is being developed in collaboration with General Electric, Indiana Michigan Power, the Indiana Economic Development Corporation and the City of South Bend.

The Turbomachinery Facility will be located in a new building in South Bend's Ignition Park that is being developed and financed by Great Lakes Capital. Construction started in the fall of 2014, and the new facility will be fully operational by the summer of 2016. It will employ 60 people directly, and is expected to support \$15 million in annual research spending.

Notre Dame's research strengths, and its new research initiatives, are not limited to the physical sciences and engineering. For example:

- ***The Kroc International Institute for Peace Studies***, founded in 1986, is a leading center for study of the causes of violent conflict and of strategies for achieving sustainable peace. Research topics include sources of and responses to ethnic and religious conflicts, nonviolent social and political change and the effectiveness of economic sanctions.
- The ***Lab for Economic Opportunities***, started in the fall of 2012, is a partnership between Notre Dame and Catholic Charities USA that aims to develop more effective strategies and programs for reducing poverty, based on rigorous research. Current research topics include the effectiveness of emergency assistance in preventing homelessness, the effectiveness of high-quality pre-school programs in improving educational outcomes for young children and strategies for improving graduation rates among low-income community college students.

As the examples cited above suggest, one of the keys to the growth of Notre Dame's research enterprise has been its ability to collaborate effectively with a wide range of research partners – locally, throughout the U.S. and in other countries as well.

While economic development may not be a primary purpose of research programs such as those described above, they all contribute to the continued development of the knowledge base on which economic growth and expansion of economic opportunity are built.

## **Undergraduate research at Notre Dame**

Student participation in faculty research has long been a hallmark of graduate education in the U.S. – and this is no less true at Notre Dame than at other major research universities. Notre Dame, however, is also notable for the extent to which the opportunity to collaborate in faculty research projects (or to undertake their own) is available to undergraduate students as well.

Whether or not they plan to pursue graduate studies or careers in science, undergraduates benefit in several ways from participation in research projects. They develop skills in “active learning” that are applicable in many other settings, and get to explore a topic of interest to them in greater depth than they can in classroom courses. And they gain valuable experience in working as part of a team – in collecting, organizing and analyzing data – and in communicating the results of their work.

Below we cite several examples of programs through which Notre Dame supports undergraduate research.

- The ***Center for Undergraduate Scholarly Engagement (CUSE)*** promotes and supports student involvement in research and creative endeavors. Through CUSE, students can apply for grant funding for a variety of different types of projects. They may be student- or

faculty-initiated, but all are typically done under the guidance of a faculty mentor. In addition, the Center's online URND Undergraduate Research Connection system allows undergraduates and faculty to connect and find available on-campus research opportunities.

- Undergraduate students at Notre Dame have the opportunity to pursue independent research and creative projects through the **Undergraduate Research Opportunity Program (UROP)** offered through the University's Institute for Scholarship in the Liberal Arts. UROP provides both academic year grants, which can be used to fund independent research, creative projects, or the presentation of student research at conferences, and summer grants for research and creative projects pursued during the summer.

Academic year grants are available up to \$1,750 for research and materials, up to \$2,250 for senior theses, and up to \$1,500 for conference presentations. Summer grants are available for up to \$1,500 per month, for a maximum of three months.

- Through the Graduate School's **Research Experiences for Undergraduates (REU)** programs, undergraduate students have the opportunity to gain research experience working on-campus with Notre Dame faculty during 10-week programs that take place during the summer. The REU programs, which are open to undergraduates from any university (not just Notre Dame), include programs in the areas of scientific cloud computing, experimental research on wireless networking, physics, cell bio, computational science, chemistry, biochemistry and biology and nanotechnology.
- In addition to a variety of on-campus undergraduate research opportunities available during the academic year, the College of Science also offers sophomore and junior students enrolled in the College of Science the opportunity to participate in the **Summer Undergraduate Research Fellowships (SURF)** program – offered with support from donors and in collaboration with the Center for Undergraduate Scholarly Engagement, Indiana University School of Medicine – South Bend and Glynn Family Honors Program. Fellows participate in 9-10-week full-time research projects mentored by a Notre Dame College of Science faculty member during the summer while participating in campus workshops and other events and then give a formal presentation of their research at either a scientific conference or symposium during the following academic year. The program rewards fellows with a \$4,000 stipend and \$500 for supplies.
- During the academic year, each department in the College of Engineering offers hands-on research opportunities for undergraduates. In some cases students work as paid research assistants; and in others they can earn academic credit for their work.
- Students enrolled in the Mendoza College of Business have a variety of undergraduate research opportunities including the for-credit course **Research: Foresight in Business & Society** and a variety of faculty research assistantship opportunities in accounting, finance, management and marketing.

- Undergraduate students enrolled in the Colleges of Engineering, Arts and Letters, or Science interested in pursuing an interdisciplinary research or creative project during the summer may apply for funding through the ***Da Vinci Grant Program***. Students may apply as teams or alone and may design their own independent projects or propose a project related to their faculty mentor's research. The grant provides up to \$4,500 per student for use for travel, living expenses and the purchase of research materials.
- The Kellogg Institute for International Studies' ***International Scholars Program (ISP)*** provides opportunities and funding for students to learn how to undertake scholarly research as faculty assistants, to undertake their own primary research in developing countries, and to write senior theses.

Increased support for undergraduate research, along with wider recognition among students of the value of research experience, has led in recent years to steady growth in the number of undergraduates engaged in research. In the College of Science, for example, the percentage of graduating seniors who complete senior thesis research projects has grown from 18 percent for the class of 2008 to 50 percent for the class of 2013.

## **Doing good and driving growth**

Notre Dame's experience shows that university research can be a powerful force for good, and at the same time provide a source of growth in the local economy. The next part of the report examines several ways in which the University supports the translation of new knowledge into renewed economic growth.

## **Part Six: Business development**

The growth of Notre Dame's research enterprise has a direct impact on the economy of the South Bend area. Increased research funding supports the hiring of additional faculty, other researchers and support staff, and the growth of graduate student enrollment – all of which translates directly into increased local spending.

Over time, however, the University's research enterprise can have an even greater impact on the local economy. By serving as a source of new knowledge, ideas and innovations, and through its role in the development of human capital, University research can fuel the development of new products and processes and the creation of new businesses and jobs.

The translation of new knowledge into new products, businesses and jobs does not, however, occur automatically. It requires the creation of an environment – both within the University and in the surrounding community – that encourages faculty members, students, alumni, entrepreneurs and investors to collaborate in that process. This part of the report describes some of the multiple ways in which Notre Dame is helping to develop this kind of “entrepreneurial ecosystem” in the South Bend area and beyond. We focus in particular on:

- Notre Dame's technology transfer program;
- University support for the further research and development that is often needed to bring new technologies to a stage where they can begin to attract outside investment;
- Programs that are aimed at educating the next generation of entrepreneurs;
- Innovation Park at Notre Dame – a development that since its opening in 2009 has become a highly visible hub for Notre Dame's entrepreneurial ecosystem; and
- Companies started by Notre Dame faculty, staff, students and alumni.

## **Technology transfer at Notre Dame**

Like other research universities, Notre Dame maintains a formal process for moving the products of University research that may have commercial or other practical value from the lab to the marketplace. The University's Office of Technology Transfer is responsible for identifying new technologies that may have commercial potential, applies for patents, and connects with businesses (either established companies or new ventures) that might be interested in licensing these technologies for commercial use.

By several measures, the pace of technology transfer activity at Notre Dame has increased significantly between fiscal year 2007 and fiscal year 2014. As Table 12 shows:

- The number of inventions disclosed by Notre Dame faculty and researchers rose from 46 to 62;
- The number of new patent applications filed rose from 14 to 19;
- The number of patents awarded rose from 4 to 12; and
- The number of licensing agreements executed rose from 3 to 12.

**Table 12: Technology transfer activity at Notre Dame, FY 2007 – FY 2014 (gross licensing income in \$000s)**

	2007	2008	2009	2010	2011	2012	2013	2014
Gross licensing income	\$198.0	\$340.0	\$237.0	\$557.0	\$559.0	\$423.0	\$466.0	\$695.0
Invention disclosures	46	52	32	39	57	55	64	62
New patent applications filed	14	13	12	17	10	14	16	19
Patents issued	4	5	2	12	10	12	20	12
Licenses/options executed	3	4	7	7	6	10	6	12
Start-up companies formed	0	0	2	2	1	3	2	3

Several of the companies that have in recent years licensed technologies first developed at Notre Dame are located in South Bend. They include:

- **F Cubed LLC**, South Bend – founded in 2008, F Cubed has developed a “lab-on-a-chip” technology that can provide fast, on-site testing for the presence of E. coli and other harmful bacteria in drinking or recreational waters.
- **Indiana Integrated Circuits**, South Bend – IIC, founded in 2009, is using its patented chip interconnection and packaging technology, called Quilt Packaging, to greatly improve the performance of integrated circuits.
- **Emu Solutions**, South Bend – Emu’s “enhanced memory utility” technology is designed to provide much more efficient high-speed processing of “big data.” The company was founded in 2010.
- **Contect, Inc.**, South Bend – Contect, founded after winning Notre Dame’s 2013 McCloskey Business Plan Competition, is using its patented speech analysis technology to develop a mobile software app for concession screening.
- **Ionic Liquid Solutions, LLC**, South Bend – ILS is using its patented ionic liquid chemistry for commercial applications in heating, ventilation, air conditioning and refrigeration, electrodeposition, energy storage and waste heat recovery.
- **NanDio**, South Bend – founded in 2014, NanDio’s novel molecular diagnostic tool can be used to provide a rapid, low-cost test for HPV oral cancer at points of care, such as dentists’ offices.
- **Enlightened Diagnostics**, South Bend – founded in 2014, EnDx is developing technology that could improve the accuracy of cancer diagnoses by giving diagnosticians a three-dimensional view of biopsied tissue samples.

## Supporting the transition from the lab to the marketplace

University researchers often find that even the most promising new technologies need further work before they can be developed for commercial purposes, and before they can begin to attract outside investment. Notre Dame's ***Proof of Technology Demonstration Center*** was created in 2011 to help bridge this gap. The Center provides three or four grants each year (typically in the range of \$35,000 to \$100,000) to University researchers to build prototypes, perform additional testing, etc.

Established in 2010 through a \$1 million gift from 1<sup>st</sup> Source Bank, the annual ***1st Source Commercialization Award*** is presented to a Notre Dame faculty member (including those affiliated with the Indiana University School of Medicine – South Bend) who has succeeded (or is likely to succeed) in commercializing a new technology. In addition to the \$20,000 award, the 1<sup>st</sup> Source gift also funds an annual lecture series or symposium on technology commercialization, featuring experts in university technology transfer, commercialization and company formation.

## Developing the next generation of entrepreneurs

Universities contribute to the development of new businesses by helping students acquire the knowledge and develop the skills they will need to succeed as entrepreneurs. Notre Dame offers its students a variety of opportunities to do so.

- The Mendoza College of Business offers an ***undergraduate major in entrepreneurship***, with required courses in areas such as new venture funding, innovation and design, business problem solving and social entrepreneurship, and a final-year business plan competition.
- Mendoza also offers an ***MBA concentration in entrepreneurship***, with advanced courses in areas such as launching new ventures, commercialization analytics, and fundamentals of venture capital financing.
- The ***Gigot Center for Entrepreneurship*** offers a wide range of programs and services for Mendoza students with an interest in this area. The Center's services include entrepreneurship training, mentoring and networking assistance for aspiring entrepreneurs.
- The Gigot Center also sponsors the annual ***McCloskey Business Plan Competition***, in which ventures that have not yet launched (or are in the earliest stages of launching) compete for \$300,000 in cash and in-kind prizes. Each participating team must be led by a Notre Dame student, alumnus or faculty member.

The competition begins during the fall semester with submission of initial business concepts, and along the way provides assistance in developing more detailed business plans. It concludes in April with a University venture fair and awarding of prizes.

In 2013-2014, 149 teams of aspiring Notre Dame entrepreneurs, with a total of 450 participants, took part in the McCloskey Business Plan Competition. The grand prize winner was NanDio (described above).

- In 2009, Notre Dame launched its **Engineering, Science and Technology Entrepreneurship Excellence Master's (ESTEEM)** program, an intensive one-year master's program for students with undergraduate degrees in science or engineering, with a strong focus on commercialization of new technologies. In fall 2014, 34 students were enrolled in the program.
- In 2013, the University announced creation of a \$3.5 million **Irish Innovation Fund**, which provides seed-stage investments in new ventures led by Notre Dame undergraduate or graduate students. Funds are awarded on a competitive basis, with competing proposals reviewed by ESTEEM students.

## Innovation Park at Notre Dame

In the fall of 2009, Notre Dame opened the first building planned for Innovation Park at Notre Dame (IP@ND), a 12-acre site located directly across from the University campus. The primary purpose of the 55,000 square-foot building is to serve as an accelerator for new businesses, including some that have roots at Notre Dame as well as others attracted by the advantages that proximity to the University offers. The building includes office, meeting and lab space, along with an "entrepreneurial greenhouse," shared space where University students can work on the development of new business ventures. Several Notre Dame programs, including ESTEEM, also have space in the building.

Since its opening in 2009, several start-up businesses have "graduated" from IP@ND. They include:

- **F Cubed LLC** (described previously), a start-up based on technology licensed from Notre Dame. In 2012, the company moved from IP@ND to Hillcrest Hall – the former St. Joseph's High School in South Bend, which was bought by the University in 2012.
- **Data Realty**, a firm that provides data center services to mid-sized companies. Data Realty's headquarters is in South Bend, and it is building a new 50,000 square-foot data center in Ignition Park – a business and technology park that is being developed by the City of South Bend on a 140-acre property that was once the site of Studebaker Corporation.

- **Nexus RV**, a direct-sale manufacturer of recreational vehicles. The company graduated from IP@ND in 2010 and is now located in Elkhart, Indiana.
- **Vennli**, a start-up company that provides businesses with a digital platform for creating and executing growth strategy. The company graduated from IP@ND in 2014 and is now located in South Bend.
- **CloverApps**, a start-up company founded by two Notre Dame faculty members that develops custom software solutions for use in mobile technologies and services in the areas of education, engineering, science, business and government. The company graduated from IP@ND in 2013 and is now located in South Bend.

IP@ND currently serves more than 20 client companies. They include tenants at Innovation Park, as well as some companies that utilize IP@ND services but are located elsewhere. Indiana Integrated Circuits, Emu Solutions and NanDio (described above) are all IP@ND tenants; other examples include:

- **Ionic Research Technologies**, founded in 2011 by a team of Notre Dame faculty members, specializes in the development of ionic liquids for use in a variety of energy-related applications.
- **Oak Financial Software**, founded by a University faculty member in 2012, provides a set of online products and services designed to improve Hispanic consumers' access to financial services.
- **Graham Allen Partners**, founded by a Notre Dame alumnus, invests in early-stage, high-growth technology businesses, providing funding, incubator and management services.
- **Aunalytics**, founded by a Notre Dame faculty member in 2012, provides data analytics and predictive modeling solutions for clients in the areas of financial services, retail and non-clinical healthcare.
- **CarexTech**, founded in 2011 by a Notre Dame alumna and Notre Dame faculty member, provides a communication and engagement platform that uses Software-as-a-Service (SaaS) cloud based solutions to help facilitate communication and engagement between families and staff of Assisted Living and Long Term Care facilities.
- **Mopi16**, founded in 2010, builds custom online learning and training solutions.

## Other companies with roots at Notre Dame

Formal licensing of University technologies and space, support and services provided by IP@ND are not the only mechanisms by which the intellectual and human capital developed at Notre Dame are translated into new businesses and new jobs. Faculty members, alumni and students have also contributed to the growth of the entrepreneurial economy, both in the South Bend area and beyond.

Companies founded by University faculty members or graduates have a long history in the region. Crowe Horwath LLP (an accounting firm founded in 1942) and Press Ganey (a consulting firm founded in 1985) both rank among the largest private employers in St. Joseph County; and Enzyme Research Laboratories and Omicron Biochemicals were pioneers in the development of the region's life sciences sector. Since 2000, however, the pace of entrepreneurial development appears to have accelerated. In addition to the examples cited above, companies in North Central Indiana founded by Notre Dame faculty, students or alumni include the following:

- **Better World Books**, located in Mishawaka, was started by three University graduates in 2003, based on a business plan that had won that year's McCloskey Business Plan Competition in the social venture category. The company accepts donated books and either sells them or ships them to countries and organizations that need them. In ten years, it has grown to become one of the largest on-line sellers of used books, with \$65 million in annual revenues and approximately 400 employees, including 170 in the South Bend area.
- **Scientific Methods, Inc.**, founded in 2003, conducts research in environmental microbiology. The firm is located in Granger and has approximately 7 employees.
- **Global Access Point**, founded in 2003 by a Notre Dame alumnus, provides high-speed telecommunication and digital services through its two carrier hotels. The company offers businesses low cost machine space, connectivity, data transport and other digital services including disaster recovery operations, network security, web hosting, and storage networking through its three off-site data centers and their Global Access Point Network, GAPNet, a regional Wide Area Network. The company has two data centers in South Bend and a third in Indianapolis and has approximately 7 employees.
- **EmNet**, founded in 2004 by two Notre Dame alumni, develops and designs water collection systems that use novel real time monitoring and real time data analysis and control tools for a wide variety of uses including maximizing wastewater capture, managing sewage overflow events and eliminating infiltration. The company is located in South Bend and has 13 employees.
- **Slipstream Projects**, founded in 2009, is focused on the design and development of an ultra-efficient, low-cost vehicular hybrid propulsion system that uses an alternative energy source (rather than lithium based batteries) that will improve the vehicle's energy efficiency

and reduce the vehicle's emissions (as well as reduce dependence on imported energy sources). The company is based in Mishawaka and has approximately 3 employees.

- ***American Green Technology***, founded in 2009, manufactures and supplies energy efficient AGT induction lighting through independent professional lighting representatives. The company is headquartered in South Bend and has approximately 35 employees.

## **Part Seven: Investing in and serving the community**

During the past decade, Notre Dame has broadened and deepened its commitment to the community that has been its home for more than 170 years, and that contributed much to making

the University the institution it is today. This part of the report highlights two dimensions of Notre Dame's engagement with the community:

- Its collaboration with the City of South Bend, community residents and organizations and others in revitalizing the City's Northeast Neighborhood, and in other community development initiatives; and
- Its relationships with community organizations and institutions that provide a wide range of services to local residents, and at the same time provide Notre Dame students with opportunities for community-based learning.

## **Revitalizing the Northeast Neighborhood**

In 2000, Notre Dame joined together with the City of South Bend, neighborhood residents and several other South Bend institutions to create the Northeast Neighborhood Revitalization Organization (NNRO). The mission of the new organization was to plan and coordinate the physical and economic revitalization of the Northeast Neighborhood – a once-thriving but slowly declining neighborhood that had not seen any major new investments in fifty years. The City and the institutional partners committed \$3 million in seed money to get the project under way.

The first tangible result of the revitalization effort was the Robinson Community Learning Center (described below), which opened in February 2001. Notre Dame covered the up-front cost of establishing the Center, and continues to help support its operations.

NNRO's board (comprised of seven representatives of the participating institutions and seven neighborhood residents) selected the South Bend Heritage Foundation to implement a plan for the area. After extensive consultation with local groups, a plan was developed that envisioned:

- Major infrastructure improvements, including the reconstruction of State Route 23;
- The development of a new mixed-use, commercial/residential district across from the Notre Dame campus, centered on Eddy Street;
- Several phases of residential development in adjoining areas; and
- In a later phase, the development of a second commercial district in the Five Points area.

Notre Dame played a key role in the earliest phases of development. The University acquired and cleared the property required to create the Eddy Street development area, and in 2007 chose Kite Realty Group to serve as the master developer. The University had also committed to the simultaneous development of Innovation Park at Notre Dame on a site adjacent to the Eddy Street area, thus providing additional momentum to the redevelopment process.

Through the University's partnership with Kite, the first phase of the \$215 million, 500,000 square-foot Eddy Street Commons – including ground floor retail and restaurants with offices and apartments above – was completed in September 2009. Fairfield Inn and Suites – a 119-room limited-service hotel – followed in June 2010. Since then, 128 condominium units have been sold, with 57 additional units and 16 town homes now being developed. Planning for a second hotel –

originally planned as part the project’s first phase but delayed as a result of the recession – is now under way.

The Eddy Street development has been a major success both for the community and for Notre Dame. Like the growth of Notre Dame itself, the construction of and development of new businesses at Eddy Street Commons helped mitigate the effects of the recession, and provided a foundation for continued growth. At the same time, Notre Dame benefits from the creation of a neighborhood environment that helps the University compete more effectively for talented faculty, staff and students.

More broadly, the Northeast Neighborhood Revitalization plan provided a framework for other investment as well, including State and City infrastructure investments, the development of a new home for the Indiana University School of Medicine – South Bend on East Angela Boulevard, the construction of Harper Hall, and new private investment in residential development. In 2013, the South Bend Heritage Foundation estimated that since the beginning of the revitalization effort, public, institutional and private investments in the neighborhood had totaled \$625 million.

**Figure 22: Map of the Northeast Neighborhood Redevelopment Zone**



## Other community investments

Notre Dame’s recent community investments are not limited to the Northeast Neighborhood. They also include:

- **Hillcrest Hall**, the former St. Joseph’s High School building, was acquired by the University in 2012. Part of the building is now the home of F Cubed LLC, a Notre Dame start-up company.
- **The Notre Dame Linked Experimental Ecosystem Facility (ND-LEEF)** is an environmental research and education facility being developed by Notre Dame on 28 previously-undeveloped acres within a County park, St. Patrick’s Park. In addition to its use by the University, ND-LEEF will be available for use by local schools and by the community as an environmental education center.
- **The Notre Dame Center for Arts and Culture** opened in the spring of 2013. The newly-renovated building includes space for an after-school program, art classes and other community programming, a contemporary art gallery, a new studio for Joseph Segura, a commercial printmaker, and offices for the University’s Office of Community Relations.

These and other University investments are continuing to provide valuable resources for the community.

## **Serving the community**

Notre Dame is a Catholic university with a deep commitment to being “a force for good in the world.” Closely intertwined with this commitment is the University’s view of community-based learning as an important dimension of undergraduate education. From both these perspectives, engagement with the community – locally, nationally and globally – thus appears to be written into the University’s DNA.

The scale, scope and impact of community engagement at Notre Dame are not easy to capture in a brief report. We will focus here on a few aspects of this engagement:

- Community-based learning and community service programs;
- The Robinson Community Learning Center; and
- Community engagement beyond the South Bend area.

### ***Community-based learning and community service***

Community-based learning (CBL) and community-based research courses offer students an opportunity to learn about a topic they are studying while providing services to or in other ways directly engaging with a local community. At Notre Dame, the number of courses offering opportunities for community-based learning has increased steadily in recent years – from 80 in 2005-2006 to 196 in 2013-2014. Enrollment in these courses during the 2013-2014 academic year totaled 3,338 – 27.5 percent of all Notre Dame students.

Students also engage in community service work on a volunteer basis, without any formal connection to their academic work. During the 2013-2014 academic year, Notre Dame estimates that more than 4,830 students performed more than 348,300 hours of volunteer community service. In addition to these student volunteers, Notre Dame estimates that more than 340 faculty members and other University employees were responsible for projects that generated 410,400 hours of volunteer community service in 2013-2014 – some as volunteers, and some as part of their work for the University.

Together, Notre Dame faculty members, staff and students thus performed more than 758,740 hours of work in and with the local community in 2013-2014.

***The Center for Social Concerns (CSC)***, established in 1983, serves as a focal point for both community-based learning and community service at Notre Dame. It assists faculty members in developing community-based learning courses and in conducting community-based research, helps students connect with community service programs and helps community organizations get access to University resources.

CSC maintains ongoing formal relationships with seven local partner organizations that help connect the University to communities in the South Bend area. Each of these organizations has a full-time Community-Based Learning Coordinator, partially funded by Notre Dame to oversee the work of students in CBL courses and manage relationships with faculty members, and to oversee student volunteers as well. The seven organizations are:

- Boys and Girls Club of St. Joseph County, South Bend
- Center for the Homeless, South Bend
- Imani Unidad, South Bend, a program that provides HIV/STD and substance abuse prevention, education and advocacy
- La Casa de Amistad, a community center serving the Hispanic community in South Bend
- LOGAN Center, South Bend, a program that provides services and resources for disable children and adults and their families
- The Robinson Community Learning Center, South Bend (described below)
- St Joseph's Regional Medical Center Community Outreach, Mishawaka

In addition to these core organizations, CSC maintains working relationships with more than fifty other organizations that provide community-based learning and volunteer service opportunities for University students.

### ***The Robinson Community Learning Center***

Among the partner organizations cited above, the Robinson Community Learning Center (RCLC) is unique in that (as noted above) it was established by Notre Dame, and continues to operate as a division of the University's Office of Public Affairs. The Center's director and its full-time staff are University employees, and each year, the University funds a portion of the Center's operating budget. Notre Dame is also by far the largest source of the volunteers who staff many of the Center's programs.

Other sources of support for RCLC in fiscal year 2014 included state and federal funds, foundation grants, donations from companies and individuals, and income from use of the Center's parking area for Notre Dame game-day parking. The Center's programs have also been greatly strengthened by a grant of AmeriCorps funds that in fiscal year 2014 supported 26 AmeriCorps workers.

While the Center is administratively part of the University, its programs operate under the guidance of a program advisory board whose members include Notre Dame faculty members and students, representatives from RCLC partner organizations and community residents. Programs offered by the center serve a broad spectrum of neighborhood residents, from pre-school children to older adults. Notable programs offered during the 2013-2014 academic year included:

- ***Talk with Your Baby***, an early learning program for parents and very young children;
- Classes in ***English as a New Language***, for pre-school children and for adults;
- After-school and evening tutoring, at RCLC and at three partner sites;
- Music and photography classes;
- An award-winning ***Lego Robotics Program*** for middle-school students;
- An ***Advanced Skills and Entrepreneurship*** program for high school students, developed in collaboration with the Gigot Center for Entrepreneurship at Notre Dame, offered at RCLC and at three local high schools;
- ***Take Ten***, a violence prevention and conflict resolution program offered at RCLC, 17 local schools, and other locations such as Boys and Girls Clubs and the Center for the Homeless; and
- Book club, computer training, craft and exercise programs for older adults.

Through these programs, RCLC served 4,270 South Bend area children, youth and adults during the 2013-2014 academic year. Beyond the local community, the Center also reached more than 1,500 participants in Take Ten programs offered elsewhere in Indiana, in Chicago and in other communities.

Along with the funding made available by Notre Dame and other partners, the Center's work in fiscal year 2014 was made possible by the participation of nearly 400 volunteers, many of whom were affiliated with Notre Dame.

### ***Serving national and global communities***

As Notre Dame has grown from a regional to a national and now a global university, its commitment to service has expanded as well. We cite here just a few examples of how Notre Dame uses its intellectual and human resources to serve communities throughout the U.S. and in other countries.

- The ***Alliance for Catholic Education***, founded at Notre Dame in 1993, works to strengthen and sustain Catholic elementary and secondary schools in the U.S. and in several other countries. Its "foundational program" is ACE Teaching Fellows; the program

allows participants to earn a master's degree in education from Notre Dame at no cost through a combination of intensive summer studies on the Notre Dame campus and two years of teaching experience in an "under-resourced" Catholic school. The program currently has about 180 participants each year (about half of whom are Notre Dame graduates) working in 100 Catholic schools in 30 U.S. cities.

Other ACE programs include leadership training for Catholic school principals, a one-year certificate program for teachers of English as a New Language, assistance for Catholic schools in marketing and fund-raising, and an intensive three-year STEM teaching fellows program that is planned to launch in the summer of 2015. Across all its programs, ACE is currently engaged with approximately 200 schools throughout the U.S.

Since the late 1990's, ACE has also been bringing its services to Catholic school systems outside the U.S. It is currently active in teacher training in Ireland and Chile; and for the past few years has been working closely with the Ministry of Education in Haiti to improve the quality of the nation's Catholic schools.

- Drawing on the University's strengths in research on poverty, Notre Dame's **Lab for Economic Opportunities** is working with Catholic Charity organizations in a number of U.S. cities to improve the design and strengthen the delivery of programs aimed at reducing poverty in the U.S. and alleviating its effects.
- Each year, the Center for Social Concerns' **International Summer Service Learning (ISSL)** program provides funding for students to undertake community-based learning projects at sites outside the U.S. Since its founding, the program has grown both in scale and popularity. Starting from 8 students in the summer of 1998, the program grew to 53 students in the summer of 2014.

**Figure 23: Map of Notre Dame's Alliance for Catholic Education (ACE) U.S. locations**



## Beyond graduation: Notre Dame alumni serving the community

Some Notre Dame students' commitment to community service extends beyond graduation. The University's annual survey of graduating seniors found that 8.1 percent of all 2014 graduates – about 158 graduates – committed to at least one year of some type of full-time service program.<sup>11</sup> Areas of post-graduate service typically include youth services, community organizing, teaching programs (such as the Alliance for Catholic Education and Teach for America), health care, environmental work and human rights.

Other alumni also participate in community service programs. Each year, under the Notre Dame Alumni Association's **Hesburgh Month of Service** program, local alumni clubs organize hundreds of local service projects. Recent examples have included working with Habitat for Humanity, community clean-up after severe storms and tornados, working in local homeless shelters, and packaging food for distribution in Haiti.

Among the University's newest partnership initiatives is the post-graduate service program, **enFocus**. A non-profit organization established in 2012, enFocus aims to strengthen both the South Bend community and the local economy by providing opportunities for graduates of the ESTEEM program (described in Part Six) to stay and work in South Bend.

Each summer, a group of ESTEEM graduates are selected to serve as enFocus fellows; ten were chosen in 2014. In exchange for a \$36,000 stipend plus a \$4,000 housing allowance, the fellows

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<sup>11</sup> University of Notre Dame Career Center, *First Destination 2014*

commit to staying in South Bend for a year, working on projects for local public agencies, organizations or businesses. The fellows live together and work as a team, with each fellow taking the lead on one project. Sponsors of enFocus projects have included the City of South Bend, the South Bend School Corporation, Beacon Health Systems, TRANSPO and several local businesses.

EnFocus team members spend 70 percent of their time working on these sponsored projects, and 30 percent on other projects that they develop themselves, aimed at addressing a specific need or opportunity in the community. South Bend Mayor Pete Buttigieg has characterized the work of enFocus team members as “a kind of human seed capital.”<sup>12</sup>

In 2014, enFocus was awarded a grant of \$3 million from the Lilly Endowment. These funds will allow the organization to build on its existing program, and to provide internships to students from South Bend-area colleges and universities.

Through enFocus, Notre Dame and its partners are seeking to develop new products and services that can have immediate, tangible benefits for the sponsoring organizations and for the community, in terms of reduced costs, greater efficiency, greater profitability and improved quality of life. And perhaps even more important in the long run, they hope to show that through a program of active engagement with local organizations and companies, the University, the City and the community can induce more talented graduates to stay in the area, and to participate in the rebuilding of its economy.

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<sup>12</sup> *South Bend Tribune*, July 8 2012.

## **Part Eight: Building the future at Notre Dame**

As great as Notre Dame's impact has been – in the South Bend area, nationally and increasingly around the world – it could for several reasons be even greater in the future.

### **A growing research enterprise**

Between fiscal years 2001 and 2014, research spending at Notre Dame grew by 360.1 percent, from \$39.6 to \$182.2 million – a compound annual growth rate of 12.5 percent. The growth of research funding has had a direct impact on the local economy, in terms of increased hiring of faculty members, other researchers and support staff, and increased enrollment of graduate students who also spend money locally. Longer-term, a growing research enterprise also helps produce the new knowledge that can lead to the development of new products and services, new businesses and new jobs.

The growth of Notre Dame's research enterprise during the next ten years may not match its growth during the past ten, but it should grow nevertheless. The University is particularly strong in several fields that are likely to remain priority areas for both the federal government and for industry, such as nanoelectronics, energy, climate change and infectious diseases.

In December 2013, Notre Dame announced plans to create 80 new faculty positions, to be filled by scholars in fields such as chemical and molecular engineering, stem cell research, quantum field theory, economics and data science. When added to an already-strong foundation of talent, technology and teamwork, these new faculty members will enable the University to compete even more effectively for federal, philanthropic and industry research funding.

### **The impact of increased enrollment**

As noted in Part Four, enrollment at Notre Dame increased by more than 390 students between the fall of 2008 and the fall of 2013. In the near term, this means increased student spending in the South Bend area. Even more important in the long run, it will over time increase the total number of graduates produced by the University – and thus the University's contribution to the region's (and the nation's) college-educated workforce.

The potential impact of increased enrollment is particularly evident, given that (as noted previously) the increase has been concentrated among engineering, science and business students, and in new programs such as ESTEEM that are directly related to economic development.

## **Increased support for innovation and entrepreneurship**

Translation of new knowledge into new products and services, new businesses and new jobs requires more than a strong research base. It also requires development and maintenance of an environment that supports that process of translation.

Notre Dame has done much during the past ten years to create this type of “entrepreneurial ecosystem.” Its most visible manifestation has been the development of Innovation Park at Notre Dame, where the first building, which opened in 2009, has become in many ways the heart of that ecosystem. Other recent initiatives have included:

- Funding a program of financial support for translational research – the additional R&D work that faculty members often need to undertake in order to move promising new technologies to a stage where they can begin to attract private investment;
- Creation of the ESTEEM program, a master’s degree in technology entrepreneurship that has attracted talented students from South Bend, from around the U.S. and from other countries;
- Establishment of the Irish Innovation Fund – a program that on a competitive basis provides seed money investments in new ventures proposed by Notre Dame students;
- The Irish Entrepreneurs Network, a network of approximately 400 alumni and other friends of Notre Dame – including entrepreneurs, investors and others with an interest in the development of new businesses – who can provide invaluable information, advice, mentoring and business connections to the University’s aspiring entrepreneurs.

Over the next decade, the impact of these initiatives will be compounded, as more faculty members engage in the work needed to bring new technologies from the lab to the marketplace, as year after year more aspiring entrepreneurs graduate from the ESTEEM program, as more students get help in launching new businesses and as more start-ups like Data Realty and F Cubed “graduate” from IP@ND.

At the same time, the University is likely to undertake further investments in the development of South Bend’s entrepreneurial ecosystem. Planning is now under way, for example, for the next phase of development at Innovation Park.

## **Investments on and off the University campus**

Notre Dame will also contribute to the vitality of the South Bend area economy through its continued investment in construction and renovation of University facilities. From fiscal year 2015 through fiscal year 2017, Notre Dame anticipates spending a total of \$712 million on construction

– an average of \$237.3 million each year. Major projects already under way or on the drawing board include:

- The Campus Crossroads Project (described in Part Two);
- Relocation and realignment of Douglas Road, a project that will improve both the flow of traffic and pedestrian safety, and at the same time create new walking and bike trails along the northern perimeter of the campus;
- The first phase of McCourtney Hall, a new, 220,000 square-foot multi-disciplinary research building;
- A new building for the social sciences and for international studies;
- A new building for the School of Architecture;
- A multi-year renovation of campus libraries; and
- As noted above, the next phase of development at Innovation Park.

An investment of \$712 million over this three-year period would mean that between fiscal years 2009 and 2017, the University will have invested nearly \$1.3 billion in construction and renovation of University facilities. In addition to creating jobs for South Bend area residents and business opportunities for local contractors, these investments strengthen Notre Dame’s capacity to fulfill its mission, by enhancing its ability to attract talented students, faculty members and other researchers to its South Bend campus, by providing the space needed to support a growing research enterprise and by expanding its capacity to accommodate growing numbers of visitors to South Bend.

In addition to the investments it funds directly, Notre Dame’s partnership with the City, other local institutions and local community organizations will continue to attract new private investments to the Northeast Neighborhood. New investments during this period could include a new full-service hotel, additional residential development in the Eddy Street area and the Triangle district, and development of a new commercial district centered on the Five Points intersection. These developments will provide new jobs and new housing opportunities for South Bend residents – and will help both the University and the City retain and attract the talented people that both need in order to thrive.

## **A more global University**

Over time, Notre Dame has evolved from a regional to a national university – and especially in this century, into a university with a truly global reach. This evolution is likely to continue in the years ahead.

During the next ten years, the University will be expanding the network of institutions outside the U.S. with which it regularly collaborates, and deepening its relationships with several of them. The number of Notre Dame students who spend time outside the U.S. studying, conducting research, participating in service projects or working as interns will continue to increase, as will the number of international students studying on the South Bend campus.

The increasingly global character (and global visibility) of the University can benefit the local economy in several ways.

- By attracting scholars and students from around the world, Notre Dame helps make South Bend a more international city.
- By undertaking leading-edge research on topics of global significance, Notre Dame is laying the groundwork for creation of new businesses that – even though they start out small – have the potential to serve global markets, and to have a global impact.
- By providing opportunities to live, study and work in other countries, the University helps prepare its students – some of whom will stay in the South Bend area after graduation – for a world in which virtually every community, every business and every individual will be operating in a global context.

Notre Dame's experience shows that a university that strives to be a force for good in the world can also be a force for growth in its local community – and at the same time, that the University's capacity to do good in the wider world is directly affected by the strength and vitality of the community that has been its home for more than 170 years.