IMPACT THROUGH INNOVATION: HOW THE UNIVERSITY OF DELAWARE PRODUCES ECONOMIC AND SOCIAL VALUE AT THE LOCAL, STATEWIDE, AND MEGA-REGION LEVEL



FINAL REPORT August 20, 2018

FINAL REPORT SUBMITTED TO:
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EXECUTIVE SUMMARY

The University of Delaware (UD), a state-assisted, privately governed institution of higher education, is the largest university in Delaware. It is located in Newark, Delaware, with campuses in Dover, Wilmington, Lewes, and Georgetown. UD is dedicated to education, research, service, and innovation, and focused on strengthening partnerships that build on these core aspects of its mission. Through the course of fulfilling its mission, UD graduates scholars, serves its community, and develops life-changing research and innovations that produce a significant return on investment to the City of Newark and the State of Delaware.

The purpose of this report is to identify these unique characteristics, express them in economic and social impact terms and, where possible, quantify those impacts locally, statewide, and regionally. Broadly speaking, higher education is undergoing a period of disruption and increased scrutiny regarding the value of a college degree and the overall return on investment that these institutions yield in their local communities and to society at large. At the same time, higher education has never been more important to economic competitiveness, both locally and regionally. This report demonstrates the significant value proposition UD presents within its communities, the State of Delaware, and the broader region.

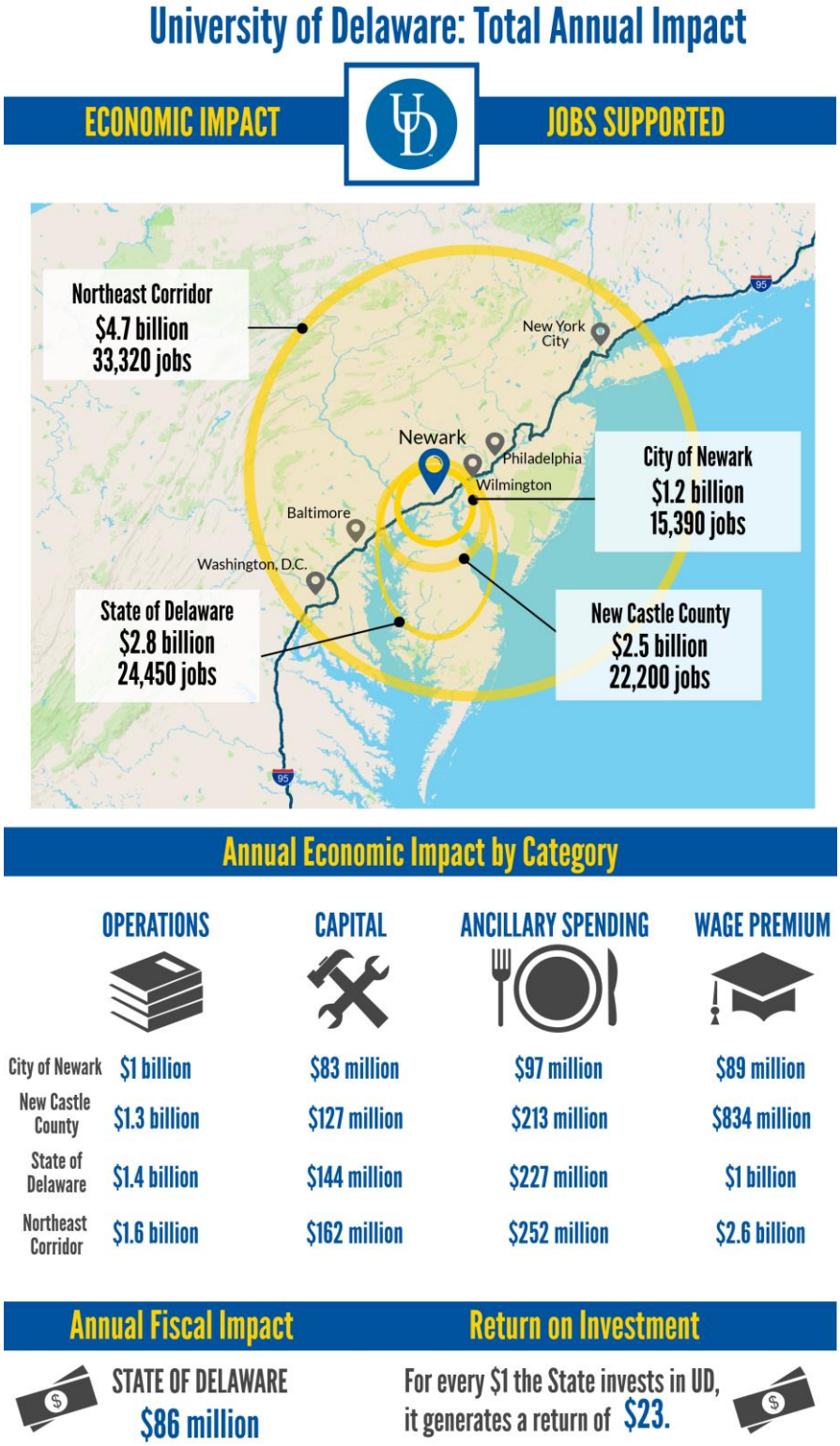
This report will estimate **the impact of the University of Delaware's annual operations, its capital investments, the student and visitor spending it attracts, and the additional earnings potential it confers on its graduates.** In addition to these economic benefits, the report will also highlight key areas of distinction, including but not limited to its local engagement, scholarship, innovative research, and entrepreneurial successes. These points of pride represent unique ways in which it both achieves those economic impacts and produces broader gains to society as a whole.

> ***"The University of Delaware is integral to the strength and resiliency of the region's economy, today and for many decades to come. The work of UD and our public and private partners is essential to the health, safety, education, and economic security of all Delawareans."***
>
> ***Dr. Dennis Assanis***
> ***President of the University of Delaware***



Within the State of Delaware, UD produces $2.8 billion a year in total economic impact, supports 24,450 jobs, and generates $86 million in State tax revenues. That impact means that **for every dollar the State invests in UD, the University produces $23 in economic activity within the state.**

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UD is Committed to Community Partnerships

An Amenity for Delaware Residents



The University of Delaware serves as an educational and cultural amenity for the surrounding community. Examples include annual events such as Ag Day, Coast Day, and Community Day; on-campus arts and culture opportunities that are accessible to the public; and educational programs such as the Osher Lifelong Learning Institute, which extend UD's educational mission to all Delawareans.

Civic Engagement and Service

In 2016, President Dennis Assanis committed the University to a Civic Action Plan to strengthen UD's identity as an engaged research university. And in 2017 alone, UD students participated in **250,000 hours of community service.**



Supporting and Investing in Delaware Communities

Demonstrating its collaborative spirit, UD's Community Engagement Initiative has committed to numerous community partnerships that bring opportunities for UD students and faculty to more fully engage with residents in Newark, Wilmington, and throughout the State of Delaware. Programs like the Wilmington Partnership, the Partnership for Public Education, the Partnership for Healthy Communities, and the Partnership for Arts and Culture identify meaningful ways for the UD community to intersect with community-based organizations and state agencies that aim to serve Delaware.



K-12 Education



Police & Fire



Investment in Infrastructure



Community Contributions

Community engagement at UD takes on a myriad of definitions, including being a collaborative partner with the community, engaging with local K-12 schools to offer educational opportunities and creating new programs for students to learn through service.

UD as an Innovation Engine

Expanding human knowledge and building an ecosystem dedicated to innovative and creative endeavors are at the core of UD's mission and values. The University's underlying principle to advance knowledge to improve society as a whole is exactly why UD continues to invest heavily in its research program, business incubation, and public-private partnerships.

Research at UD often connects to the everyday needs of Delaware residents—for example, leadership in agricultural research to support Delaware's agriculture industry, as well as research on aquaculture, biopharmaceuticals, climate change, and infectious diseases.

$213.5M
Research Budget

130
Patents Issued

465
Patent Disclosures

$13M
Venture Capital Funding

UD Alumni Entrepreneurs are Driving the Innovation Economy

UD has a long history of inspiring students to become innovators and entrepreneurs. That spirit of innovation results in significant returns for the University and the state economy.

For example, Robert Gore ('59) founded Gore-Tex in 1969. His company has generated over $2 billion in sales, and Gore has donated $18.5 million to the construction of Gore Hall.

A more recent example is Avkin, a healthcare simulation technology company that uses technology developed at UD and remains headquartered in New Castle County.

STAR Campus and the Future of Delaware's Economy



UD's Science, Technology, & Advanced Research (STAR) Campus is at the intersection of research, academics, and entrepreneurship. The co-location of numerous private companies at UD's STAR Campus allows for expansive collaboration among UD researchers and private firms, and clustering of innovation and talent at the site.

UD's role as a leader of innovation and entrepreneurship has produced, and will continue to produce, sizable gains to human knowledge with profound implications to society as a whole.

1.0 INTRODUCTION

1.1 PURPOSE OF REPORT

The University of Delaware (UD), a state-assisted, privately governed institution of higher education, is the largest university in Delaware. It is located in Newark, Delaware, with campuses in Dover, Wilmington, Lewes, and Georgetown. UD is dedicated to education, research, service, and innovation, and focused on strengthening partnerships that build on these core aspects of its mission. Through the course of fulfilling its mission, UD graduates scholars, serves its community, and develops life-changing research and innovations that produce a significant return on investment to the City of Newark, the State of Delaware, and the Northeast Corridor.

The purpose of this report is to identify these unique characteristics, express them in economic and social impact terms and, where possible, quantify those impacts locally, statewide, and regionally. Broadly speaking, higher education is undergoing a period of disruption and increased scrutiny regarding the value of a college degree and the overall return on investment that these institutions yield in their local communities and to society at large. At the same time, higher education has never been more important to economic competitiveness, both locally and regionally. This report demonstrates the significant value proposition UD offers to its communities, the State of Delaware, and the broader region.

This report will estimate **the impact of the University of Delaware's annual operations, its capital investments, the student and visitor spending it attracts, and the additional earnings potential it confers on its graduates.** In addition to these economic benefits, the report will also highlight key areas of distinction, including but not limited to its local engagement, scholarship, innovative research, and entrepreneurial successes. These points of pride represent unique ways in which it both achieves those economic impacts and produces broader gains to society as a whole.

1.2 ABOUT THE UNIVERSITY OF DELAWARE

One of the oldest universities in the nation, the University of Delaware traces its roots to 1743 when Reverend Francis Alison founded a small private school in New London, Pennsylvania. In 1833, what was then called Newark College was chartered as an institution of higher learning by the State of Delaware and later became Delaware College. The Women's College was opened in 1914 and joined Delaware College in 1921 to become the University of Delaware.

Today, UD has grown into a diverse community of 23,774 students and 4,493 full-time faculty and staff. UD offers three Associates', 149 Bachelors', 132 Masters', and 62 doctoral degree programs across its seven colleges. UD has a strong tradition of distinguished scholarship, research, teaching, and service that is grounded in a commitment to increasing and disseminating scientific, humanistic, and social knowledge for the benefit of the larger society. Its faculty includes internationally known authors, scientists, and artists. Campus life is enriched by acclaimed guest speakers, over 300 engaged student organizations that allow students to enrich their academic experience, and concerts and other arts and cultural activities that create an active campus life.

UD is classified as a research intensive university with very high research activity by the Carnegie Classification of Institutions of Higher Education. UD is also a land-grant, sea-grant and space-grant university, which is a part of its commitment to disseminate scientific, humanistic and social knowledge for the benefit of the larger society. Additionally, among the University's greatest strengths is its long and vibrant tradition of public service, and in 2015, UD received the Carnegie Community Engagement classification.

In June 2016, Dennis Assanis became the 28th president of the University of Delaware. Dr. Assanis is a distinguished educator with a wide range of academic leadership experience and a worldwide reputation as a scholar. President Assanis has articulated five strategic priorities for the University:

- Enhance the success of students,
- Build an environment inclusive excellence,
- Strengthen interdisciplinary and global programs,
- Foster a spirit of innovation and entrepreneurship, and
- Invest in the University's intellectual and physical capital.



Dr. Assanis' commitment to making UD a place of innovation that produces impact at the local, statewide, and mega-region level is reflected throughout this report

1.3 THE UNIVERSITY OF DELAWARE AS AN ECONOMIC ENGINE

Institutions of higher education are increasingly understood to be important parts of a region's economic competitiveness, drivers of economic growth, and generators of tax revenue. Although tax-exempt, because of a commitment to academic and social missions, their size and scope make them a major economic engine for their local, regional, and state economy and a significant tax revenue generator for state and local governments.

While any large-scale employer and purchaser will generate a significant volume of economic activity, all such activity is not alike. Universities are in many respects unique in their ability to enhance the economic competitiveness of regions well beyond their campus boundaries, as will be described in many ways throughout this report.

This report will demonstrate that the University of Delaware is a significant economic engine at a citywide, regional, and statewide level in the following ways:

- The University is a major **employer and purchaser of goods and services**, both of which support additional local economic activity;
- As an **initiator of long term capital investments on its campuses**, UD's major construction projects represent economic opportunity for the construction industry and related sectors, and counterbalance the negative effects associated with the cyclical nature of those markets;
- UD **attracts new spending into the region** through its students as well as a number of different kinds of visitors; and
- The University **attracts and retains talented graduates** within the local and state economy, thereby increasing the intellectual capital and household spending power within the region.

1.4 THE UNIVERSITY OF DELAWARE AS A MISSION-DRIVEN INSTITUTION

A central premise of this report is that UD is an economic driver for the City of Newark, the State of Delaware, and the entire Northeast region. And, at a time when the fight for economic activity, well-paying jobs, and tax revenues is especially fierce, it is particularly important for universities to express their significance as economic entities. It is equally important for universities to articulate that their economic impact comes from their role as institutions of instruction, research, and innovation.

Higher education is under particular scrutiny today. Some of that scrutiny comes from students and families questioning the value proposition of college at a time of rising tuition costs and uncertain job markets. Some of that scrutiny comes from the public sector—local, state, and

federal government—wondering what society is getting from universities that justifies their tax exempt status.

However, it can be argued that the role of higher education has never been more important. An increasingly knowledge-based economy requires a well-educated workforce to function, and individual regions rise and fall in competitiveness based on their ability to produce, attract, and retain skilled individuals. Furthermore, universities' unique role as mission-driven intellectual communities confers upon them **a particular responsibility and opportunity to make a difference at both a hyper-local level through service and engagement and a global level through scientific discovery and entrepreneurial innovation.**

UD is representative of this kind of institution, which stands ready to fulfill its role as a community of learners, doers, and difference-makers, for the benefit of its immediate surroundings as well as society as a whole. This commitment is reflected in how it lives out its motto, "knowledge is the light of the mind," and is articulated in five core values whose tangible manifestation is referenced throughout this report:

`

- Foster **academic freedom** among UD's community of scholars, students and visitors
- Cultivate an environment of **diversity and inclusion** to ensure economic opportunity for all Delawareans
- Drive **innovation** in education and research to address the biggest challenges of the time



UD faculty and students creating augmented reality system to help troops detect threats

- Build a **community** of respect and civility on campus
- Create and nurture partnerships in **service** to the public good

"Every student and every faculty member—in every field—can be an innovator and an entrepreneur. Some have started businesses; other created nonprofits to address a social challenge, or they figured out a new way to solve an old problem. Employers tell us all the time that they want people who can solve problems. That's innovation and entrepreneurship."

-Dr. Dennis Assanis, President of the University of Delaware

1.5 REPORT OVERVIEW

The sections of this report are organized to highlight the economic and societal impacts of the University of Delaware.

- **Section 2: Impact from Operations** reviews and quantifies the impact of UD's annual operations, including employment, procurement, the provision of educational services, community engagement, programs, and research and innovation initiatives.

- **Section 3: Impact from Capital Investments** reviews and quantifies the impact from UD's physical investments in construction, renovation, and large-scale maintenance.

- **Section 4: Impact from Student and Visitor Spending** describes its impact from ancillary spending (i.e. over and above UD's own spending) by students and visitors drawn into the region and contributing to the local economy.

- **Section 5: Impact from Wage Premium** describes and estimates the impact from additional household income and spending in the local economy attributable to UD's education and credentialing function and its role in cultivating a talented local workforce.

- **Section 6: Broader Societal Impact** explores the value of UD's reputation as a preeminent research university, with a breadth of scholarly pursuits, research activities and innovation-focused initiatives. UD's research and innovation engine generates further benefits to the region and State of Delaware by bolstering an innovation economy that goes beyond University-sponsored entrepreneurship.

- **Section 7: Local Community Engagement** highlights the many benefits conferred at a very local level by UD's presence in Newark and its other communities, as well as its service and engagement.

- **Section 8** concludes the report by summarizing the aggregate economic impact of UD's annual activity. It also describes the importance of this impact on multiple geographic levels, and articulates the University's return on investment for students, taxpayers, and society as a whole.

1.6 GEOGRAPHIES OF INTEREST

Because the University's impact is felt at various geographic levels the report shows impacts for different geographies (see Figure 1.1). The first three geographies relate to UD's impact within Delaware:

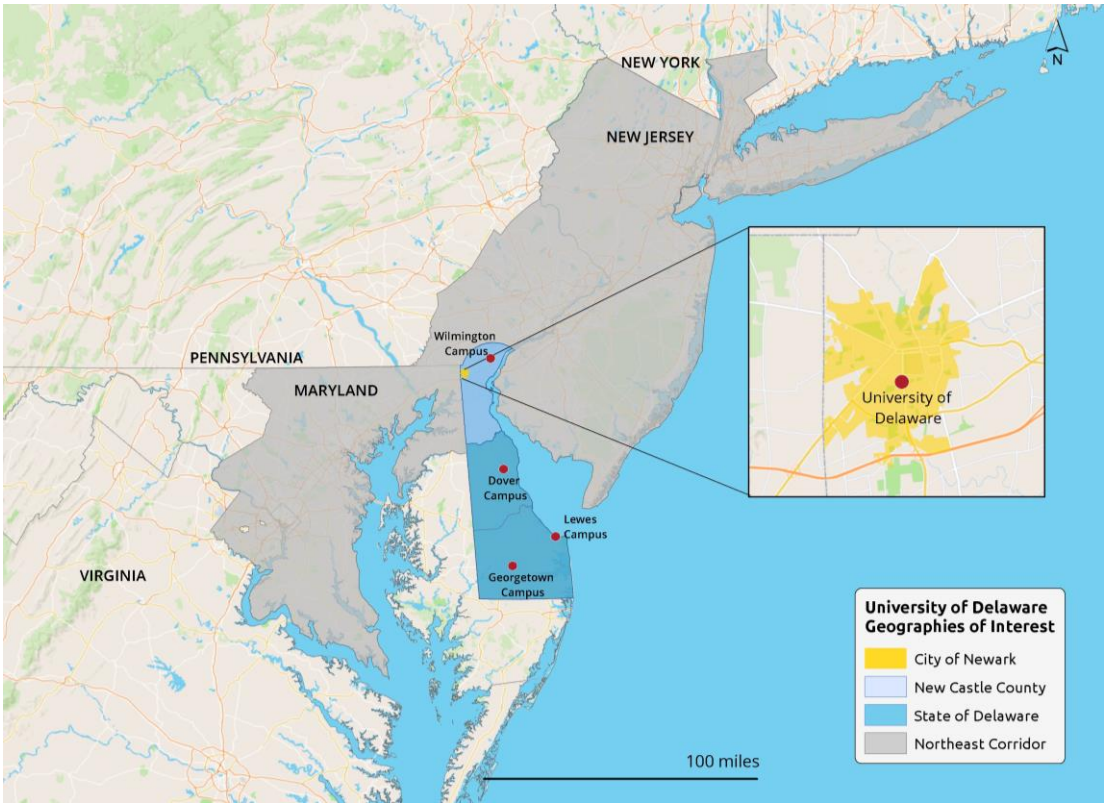
- The City of Newark

UD produces an economic imprint within the City of Newark and the State of Delaware, but also throughout the entire Northeast Corridor, which stretches to a region that contains 10% of the U.S. population.

- New Castle County
- The State of Delaware

From a regional perspective, the University of Delaware's central location on the East Coast—between both New York City, the financial center of the U.S., and Washington DC, the governmental and regulatory center of the U.S.—and the broad range of its students and alumni mean that **its impact is felt throughout the Northeast Corridor.** Therefore, this economic impact report also calculates UD's impact throughout the Northeast Corridor. For the purpose of this study the Northeast Corridor is defined as the State of Delaware, Southeastern Pennsylvania, the State of New Jersey, Washington D.C., and select counties in Maryland, New York, and Virginia, a region that encompasses a total population of 33.4 million or 10 percent of the total U.S. population.[1]

FIGURE 1.1 – GEOGRAPHIES OF INTEREST



Source: ArcGIS (2018), MapBox (2018)

[1] The select counties in New York are: Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk, and Westchester. Select counties in Pennsylvania are: Bucks, Chester, Delaware, Montgomery, and Philadelphia. Select counties in Maryland are: Anne Arundel, Baltimore, Baltimore City, Calvert, Carroll, Cecil, Charles, Harford, Howard, Kent, Montgomery, Prince George's, and St. Mary's. Select counties in Virginia are: Arlington, Alexandria, and Fairfax.

"As we collaborate across geography, skill sets and innovation networks, now is the time to think of "Greater Delaware" — a region encompassing Philadelphia and parts of Pennsylvania, New Jersey, Maryland, Washington, DC, and even a bit of New York."

-Dr. Dennis Assanis, President of the University of Delaware

UD may be a tax-exempt institution, but the considerable economic impact it produces every year yields meaningful tax revenue generation for the State of Delaware's government, and to a lesser degree the City of Newark and other local jurisdictions. Therefore, tax revenue generation from all economic impact categories is modeled for the State, and where applicable for individual municipal governments.

1.7 METHODOLOGY OVERVIEW

Econsult Solutions, Inc. (ESI) employs industry-standard economic modeling techniques to estimate direct economic activity generated by the University of Delaware and to translate that activity into total economic output, employment, and earnings, as well as tax revenue impact. The appendices to this report describe in detail the approach and methodology utilized.

UD provided data inputs on institutional activity, which were verified and supplemented with other public data sources and assumptions as needed. For each input, the most recent and appropriate available dataset is utilized (often but not always from FY 2017). In the case of capital investments, activity levels are averaged over multiple years to generate an appropriate assessment of typical annual activity. Therefore, the analysis should be understood to represent the current annualized level of activity for UD, rather than representing the impact for any specific fiscal year.[2]

Economic impacts are the sum of direct activity attributable to UD (either direct spending by the institution on operations and capital activity, spending by students and visitors it attracts, or spending by alumni attributable to the enhanced earning power conferred by their degrees) and the spillover impacts of that direct activity.[3] Within an interconnected economy, each dollar of direct expenditures generates multiple waves of spillover impacts through spending on goods and services purchased within a given region ("indirect impacts") as well as spending resulting from the labor income generated by the initial activity that ripples through the region ("induced impacts"). ESI uses IMPLAN modeling software to estimate indirect and induced impacts, and sums them with the direct activity to produce total economic impacts.[4]

[2] Appendix B provides further detail on the data collection process, approach and scope of this analysis.
[3] Appendix C & D provides a detailed description of the methodology utilized to define the direct activity attributable to UD in these categories.
[4] Appendix A provides a detailed description of the economic modeling approach utilized.

2.0 IMPACT FROM OPERATIONS

2.1 SECTION OVERVIEW

The University of Delaware supports significant economic activity throughout the state of Delaware, and the greater surrounding region. As a major anchor institution, UD directly procures large quantities of goods and services, supporting many local and regional vendors and businesses. The University also directly employs about 4,500 full-time faculty and staff, as well as about 10,000 part-time employees, who in turn recirculate some of their earnings in the local economy as household spending.

The purpose of this section is to describe and quantify the economic and tax revenue impact of UD's annual operations at a city, countywide, regional, and state level. The ongoing activity at UD represents a significant level of operating expenditures and payroll to its local employees, which supports jobs and businesses throughout the region. UD's operating expenditures, on salaries and wages as well as on goods and services, ripple through the local, regional, and state economy, supporting additional economic activity in a wide range of industry sectors. **In aggregate, UD operating expenditures generate $1.4 billion in economic impact and support over 16,100 jobs statewide.**[5]

2.2 DIRECT OPERATING EXPENDITURES

To understand the economic impact of UD's operational footprint, it is important to first note the driver of these operations—its student population. UD enrolls 23,774 students across five campuses across Delaware—Newark, Dover, Georgetown, Lewes, and Wilmington. In all, UD offers 149 undergraduate degrees and 194 graduate and doctoral degrees, with each campus specializing in particular areas that serve Delaware residents—such as affordable college attainment, free or low cost access to learning and professional resources, opportunities for cutting edge research, and ecosystems that support innovation and entrepreneurship.

TABLE 2.1 – UNIVERSITY OF DELAWARE STUDENT ENROLLMENT, FALL 2017

Category	Enrollment
Undergraduate (Full-Time)	18,948
Graduate	4,024
Professional & Continuing Studies	802
Total	**23,774**

Source: University of Delaware (2018)

[5] Throughout the report, unless otherwise indicated, job numbers are expressed in Full-Time Equivalent jobs.

The University of Delaware's education, research, and other academic enterprises generates sizeable operational spending, totaling $864 million in expenditures for FY 2017. Salaries and benefits totaled $619 million of those expenditures, supporting about 4,500 full-time and 10,000 part-time employees across five campuses.[6]

FIGURE 2.1 – UNIVERSITY OF DELAWARE CAMPUSES



Source: ArcGIS (2018)

[6] This includes a considerable number of non-full-time employees such as adjunct faculty members, part-time and seasonal employees, and work-study students. This is accounted for in the economic impact analysis, which reflects employment impact on a Full-Time Equivalent basis.

To determine the magnitude of the direct, indirect, and induced impact within these economies, it is first necessary to understand the level and composition of annual expenditures within each of these geographies, since economic impact depends largely on where expenditures occur. To do so, deductions must be made for budgetary items that do not result in expenditures within a given geography.

- Operations in Other Geographies: The University of Delaware has five campuses throughout the State of Delaware. While the core of UD's operations are in Newark, UD has direct economic impact associated with its other campuses. Each campus represents a portion of the economic product that UD directly contributes to each campus' local economy, and the economy of the State of Delaware.

TABLE 2.2 – UNIVERSITY OF DELAWARE DIRECT ECONOMIC OUTPUT BY CAMPUS

Campus	Direct Output ($M)
Dover	$3
Georgetown	$10
Lewes	$9
Newark	$836
Wilmington	$7
Total	**$864**

Source: University of Delaware (2018)

- Spending Outside of Geographies: Not all procurement that originates from a certain geography is spent with vendors located in that geography. Table 2.2 above represents the total direct economic impact that UD contributes throughout the Delaware economy. That direct impact is comprised in part of payments and wages that immediately leave the local economy. For example, an estimated 42 percent of spending on goods and services by UD is with non-Delaware vendors, and 28 percent of employee wages are paid to employees outside of Delaware. While the amount that is spent with Delaware vendors and employees living in Delaware has a multiplier effect within the state economy, the spending with non-Delaware vendors does not directly impact the Delaware economy and does not generate any additional economic effects.

- Depreciation and Financing Costs: UD's annual operating budget includes $91 million in depreciation and financing costs. Depreciation does not represent an actual outlay of funds, while financing costs are likely not spent within the local and state economy. Therefore, these amounts are excluded from the analysis.

TABLE 2.3 – SUMMARY OF UD ANNUAL OPERATING EXPENDITURES BY MODELED LOCAL IMPACT

Category	Included in Model	Amount ($M)
Salaries/Wages and Benefits	YES	$619
Supplies and general	YES	$245
Depreciation and Interest	NO	($91)

Source: University of Delaware (2018)

TABLE 2.4 – PROPORTION OF MODELED UD ANNUAL OPERATING EXPENDITURES BY GEOGRAPHY

Category	Share	Amount ($M)
Total Modelable Amount		**$864**
Total Modeled within New Castle County	**53%**	**$457**
Total Modeled within State of Delaware	**62%**	**$536**
Total Modeled within Northeast Corridor	**85%**	**$736**

Source: University of Delaware (2018), Econsult Solutions (2018)

2.3 ECONOMIC IMPACT FROM DIRECT OPERATING EXPENDITURES

Direct operations produce "spillover" effects at each geographic level, stimulating business activity and supporting higher employment across a variety of sectors. The total economic impact is the sum of the direct expenditures made by the University of Delaware, the indirect impacts that result from institutional spending on goods and services with vendors within each geography, and the induced impacts that result when UD employees spend their wages in local communities. Data provided by UD on the location of employees and institutional procurement are used to refine the calculations of spillover impacts in each geography.[7] Indirect and induced impacts grow at each successive level of geography, due both to more purchasing and recirculation activity happening within the larger geography and to a greater capture of downstream activity.[8]

The direct, indirect, and induced effects of this operating activity are estimated to generate on an annual basis (see Table 2.4):

- $1.0 billion in total output within the City of Newark, supporting 13,700 direct, indirect, and induced jobs and $645 million in earnings;

[7] See Appendix A for a detailed description of the economic modeling approach in this analysis, which uses IMPLAN modeling software.
[8] For example, University of Delaware purchasing and employees living in Kent and Sussex Counties contribute to the indirect and induced impacts for the State of Delaware, but not for New Castle County. In addition, University of Delaware purchasing and employees living in New Castle County create another wave of spillover effects into the other two counties in the state. Each of these effects contributes to the increased indirect and induced effects in each successive geography.

- $1.3 billion in total output within New Castle County, supporting 15,200 direct, indirect, and induced jobs and $727 million in earnings;

- $1.4 billion in total output within the State of Delaware, supporting 16,100 direct, indirect, and induced jobs and $765 million in earnings; and

- $1.6 billion in total output throughout the Northeast Corridor, supporting 17,000 direct, indirect, and induced jobs and $825 million in earnings.

TABLE 2.5 – ECONOMIC IMPACT FROM ANNUAL OPERATIONS

Category	City of Newark	New Castle County	State of Delaware	Northeast Corridor
Direct Output ($M)	$836	$843	$864	$864
Indirect and Induced Output ($M)	$168	$453	$561	$758
Total Output ($M)	**$1,004**	**$1,295**	**$1,424**	**$1,622**
Employment (FTE)[9]	**13,700**	**15,200**	**16,100**	**17,000**
Earnings ($M)	**$645**	**$727**	**$765**	**$825**

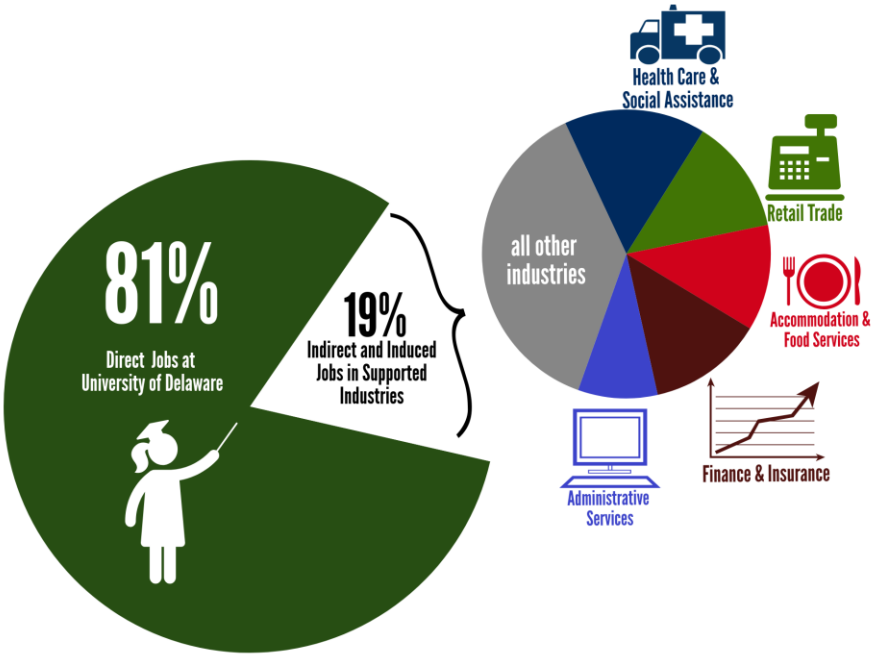
Source: University of Delaware (2018), IMPLAN (2015), Econsult Solutions (2018)

2.4 INDUSTRY DISTRIBUTION OF ECONOMIC IMPACT

The majority of statewide employment impact produced by UD comes from its own direct employment of faculty, administrators, and support staff. However, the multiplier effect of UD's operations reaches numerous other industries. Its spending on a wide range of goods and services supports a number of sectors throughout the state economy, and the salaries and wages it pays its employees get recirculated within the state economy in a wide range of spending categories. All told, 19 percent of the statewide employment impact from UD operations, or 3,500 Full-Time Equivalent jobs, is felt in industries besides higher education, such as health care, retail, and food/accommodations (see Figure 2.1).

[9] Employment includes direct, indirect, and induced Full-Time Equivalent jobs.

FIGURE 2.2 – INDUSTRY DISTRIBUTION OF EMPLOYMENT GENERATED BY UD'S OPERATIONS WITHIN THE STATE OF DELAWARE



Source: University of Delaware (2018), Econsult Solutions (2018), IMPLAN (2015), Piktochart (2018)

2.5 TAX IMPACT FROM DIRECT OPERATING EXPENDITURES

Although UD is a non-profit entity, the fiscal impacts generated by its operating activity are substantial. The operating activities increase Delaware's tax bases directly by employing faculty and staff members, which generates taxable income, and indirectly via spending by UD's vendors and employees.

It is estimated that impacts from UD operations generate about $25 million in personal income and business income tax revenues for the State of Delaware each year.

TABLE 2.6 – ESTIMATED ANNUAL TAX REVENUE IMPACT FROM UD OPERATIONS TO THE STATE OF DELAWARE

Tax Type	Impact ($M)
Income Tax	$14.3
Business Tax	$10.7
Total Tax Revenues	**$25.0**

Source: University of Delaware (2018), Econsult Solutions (2018), IMPLAN (2015), Delaware State CAFR (2016)

Impacts from UD's operations also grow various local tax bases by supporting taxable economic activity through procurement of goods and services and employment of people throughout the state. UD's positive local fiscal impact is particularly felt in the City of Newark, which is the host municipality for its main campus. To begin with, UD hires a significant number of working residents in the City, who enrich the local economy and pay (directly as homeowners or indirectly through rental payments) local property taxes to the City (and to various school districts). It is estimated that 30 percent of the people who live and work in the City of Newark are employees of UD.

More directly, a significant portion of the City of Newark's revenues are derived from the electric utility and water utility operating revenues, which in FY 2016 UD paid $17.4 million in total, which represents 27 percent of the City's electric utility revenue and 34 percent of the water utility revenue. In addition, to these utility costs, building permits, licenses and other assorted fees, the University provides direct financial contributions to the City of Newark through voluntary cash contributions as well as supporting strategic capital projects for the City and additional support for the Newark Police. These contributions represent UD's ongoing commitment to Newark and collaborative spirit that the University strives for with the community.

2.6 WHY THIS MATTERS

The University of Delaware is an indispensable asset to Newark, Delaware, and the region as a whole. UD is well known for its academic reputation, innovative research program, and commitment to service. These aspects of the institution play an essential role in the regional and state economies and can be felt throughout the entire Northeast Corridor.

20 of UD's Graduate Programs made the *U.S. News and World Report*'s List of the Best Graduate Programs.

UD is a strong, solid institution in economic terms. Other businesses and economic agents look to the University as a reliable source of activity. Because UD is an anchor institution committed to place, described further in Sections 6 and 7, members of the community surrounding campus know that the University is a stable and reliable presence, an important aspect for businesses that make decisions on location and expansion based on the strength of the local and regional economy. As the University of Delaware continues to grow in the coming years with the development of the Science, Technology, and Advanced Research (STAR) Campus and expansion of its faculty, the economic potential for businesses that surround UD's five campuses will only grow.

Furthermore, the impacts created by the University originate from outside of the regional economy at a much higher rate than an average business. UD attracts students from all over the world. Every dollar from a student outside of the region is an economic contribution that otherwise would likely never have come to the region. As a respected research institution, UD is also able to leverage outside funds from philanthropists, industry groups, government entities, and others to

import additional resources into Delaware to support its activities. Similar to tuition from out-of-state students, significant economic investment is brought into the region from these sources that, without the University of Delaware, would have never come to the region. Those funds then support local jobs and local tax bases, and strengthen an economic engine that draws even more activity to the state.

3.0 IMPACT FROM CAPITAL INVESTMENTS

3.1 SECTION OVERVIEW

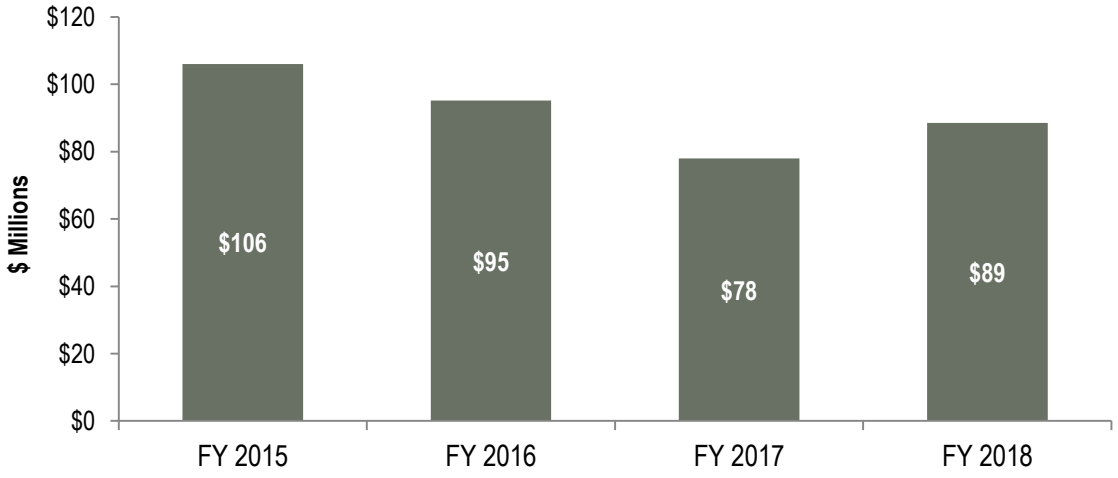
In addition to its annual operations, the University of Delaware expends significant resources on a wide range of capital investments. These investments ultimately attract students, faculty, and staff to campus, welcome alumni and visitors as a destination for athletic and other events, and drive groundbreaking research, innovation, and entrepreneurial pursuits with cutting edge facilities. Since 2007, UD has invested over $900 million in capital projects. These investments refresh, expand, and enhance the physical space where all of these activities take place, and as such are an integral part of UD's present and potential success.

These capital outlays also produce economic impact for the region, for they represent economic opportunities for the construction industry and related sectors. **This section finds that on average the annual statewide impact from capital investments by UD is $144 million, supporting 700 jobs and generating $3.4 million in State tax revenues.**

3.2 DIRECT CAPITAL INVESTMENTS

As Delaware's flagship state-assisted institution of higher education, the University of Delaware's investments in its campus infrastructure are important in building a community of scholars, research, and innovation that expands the state's talent pool. UD's recent strategic capital investments reflect a commitment to not only bolstering Delaware's human capital but also drawing more people and businesses to the region. As this section will demonstrate, these projects were developed keeping in mind UD's central mission of education as well as consideration for making these investments accessible to the community. UD's capital investments have been steady over the last few years with plans to increase in 2019 and 2020, due to further development of the Science, Technology, and Advanced Research (STAR) Campus at UD's main campus in Newark, and other capital projects such as upgraded teaching facilities and laboratories, a new residence hall, and an upgraded football stadium and new athletic center (Figure 3.1).

FIGURE 3.1 - UNIVERSITY OF DELAWARE'S CAPITAL EXPENSES FY 2015 – FY 2018[10]



Source: University of Delaware (2018)

For the purposes of this report, an annualized amount of capital investment made by UD is based on Fiscal Years 2015 to 2018 (see Table 3.1). This aggregates to $368 million over the four-year period, or $92 million per year.

3.3 ECONOMIC IMPACT DUE TO DIRECT CAPITAL INVESTMENTS



College of Health Sciences Complex at the STAR Campus

The University of Delaware's average annualized capital investment into developments within Delaware is $92 million. These project costs include hard construction costs of new on-and off-campus facilities, renovations, and state-of-good-repair expenses, equipment purchases, and the purchase and procurement of materials and services. These expenditures touch a wide range of manufacturers and professional service providers in addition to construction companies within the city and state. And, while these capital expenditures include capital projects for UD's main and STAR Campus, they also include the campuses in Wilmington, Lewes, Dover, and Georgetown.

[10] Capital expenditures are rounded to the nearest million. Expenditures are inflated to 2018 dollars.

As UD's largest campus in Newark receives a large sum of the investment, the University has invested in capital projects throughout the state.

TABLE 3.1 – ANNUAL CAPITAL INVESTMENTS MADE BY UNIVERSITY OF DELAWARE BY YEAR[11]

Fiscal Year	Capital Investments ($M in 2018$)
2015	$106
2016	$95
2017	$78
2018	$89
Four-Year Aggregate	**$368**
Annual Average	**$92**

Source: University of Delaware (2018)

In total, UD's $92 million in annual capital expenditure activity generates (see Table 3.2):

- $83 million in total annual output within the City of Newark, supporting 390 direct, indirect, and induced jobs and $26 million in earnings;
- $127 million in total annual output within New Castle County, supporting 600 direct, indirect, and induced jobs and $40 million in earnings;
- $144 million in total annual output within the State of Delaware, supporting 700 direct, indirect, and induced jobs and $45 million in earnings; and
- $162 million in total annual output within the Northeast Corridor, supporting 720 direct, indirect, and induced jobs and $60 million in earnings.

[11] Expenditures are inflated to 2018 dollars in order to calculate a four-year average for economic modeling purposes.

TABLE 3.2 – ANNUAL ECONOMIC IMPACT OF UNIVERSITY OF DELAWARE'S CAPITAL INVESTMENTS WITHIN CITY OF NEWARK, NEW CASTLE COUNTY, STATE OF DELAWARE, AND THE NORTHEAST CORRIDOR

Economic Impact	City of Newark	New Castle County	State of Delaware	Northeast Corridor
Direct Output ($M)	$67	$80	$90	$90
Indirect and Induced Output ($M)	$16	$47	$54	$72
Total Output ($M)	**$83**	**$127**	**$144**	**$162**
Employment (FTE)	**390**	**600**	**700**	**720**
Earnings ($M)	**$26**	**$40**	**$45**	**$60**

Source: University of Delaware (2018), Econsult Solutions (2018), IMPLAN (2015)

Science, Technology, and Advanced Research (STAR) Campus at UD's Newark Main Campus

The University of Delaware's 272 acre STAR Campus, a part of UD's Newark Main Campus, is a growing center of innovation that blends cutting-edge research, top-notch academics and thriving businesses in one location. The site housed the Chrysler auto company's Newark assembly facility, before closing in 2008. UD purchased the property to begin its transformation, bringing back jobs and capital investment to the site, as well as providing a skilled technologically savvy workforce to employers. STAR Campus utilizes UD's well-established public-private partnerships using innovative ownership, occupancy, and funding models, as well fully engaging diverse stakeholders. In 2015, the STAR Campus was a significant reason that Google named Newark as Delaware's top tech city, citing the connection between the private sector and the University. In 2018, the U.S. Treasury Department designated the STAR Campus as an Opportunity Zone, making development there eligible for federal tax incentives to help spur private-sector investments.



The STAR campus is already home to many private firms that are generating additional returns on UD's capital investment. Current tenants at the STAR campus include:

- SevOne, a performance computing company named by Forbes as one of America's Most Promising Companies

- Bloom Energy, occupying a 50 acre site, is a manufacturer of clean fuel-cell energy servers that provide power to Fortune 500 clients including Google, Wal-Mart, AT&T, and Coca-Cola

The STAR Campus is also home to partnerships between UD and public and private organizations. This allows for greater collaboration among UD researchers and private firms, as well as clustering of innovation and talent at the site. These partnerships include:

- DTP@STAR, an initiative of the Delaware Technology Park that provides a dozen startups with individual labs, shared spaces and business advisory services. The 10,000 square foot wet lab incubator helps small science-based businesses grow

- A test zero-emissions vehicle laboratory supported by the U.S. Department of Energy, the State of Delaware, NRG Energy, Honda, and BMW.

Also, UD's Health Sciences Complex of classrooms, research laboratories, and open-to-the-public care clinics are at the STAR Campus. Operating under the name STAR Health, UD's comprehensive clinics offer major health and prevention services.

Science, Technology, and Advanced Research (STAR) Campus, cont.

The STAR Campus is also becoming the center of the University's biopharmaceutical initiative. This includes UD's $156 million, 200,000 square foot Biopharmaceutical Innovation Building now under construction. The building will bring together faculty, researchers, students and technology in chemical engineering, chemistry, biological sciences and other fields to build a new industry in Delaware around this emerging science. The building, which is expected to open in 2020, will also become the headquarters of the National Institute for Innovation in Manufacturing Biopharmaceuticals (NIIMBL). Led by UD, this is a public-private partnership with 150 other institutions that is largely funded by the U.S. Department of Commerce. The initiative is expected to create thousands of jobs, from skilled technicians to PhD researchers.



Other STAR Campus projects in the pipeline include:

- The Tower at STAR, a 10-story facility that will house state-of-the art classrooms and labs along with high-tech commercial tenants. The Tower is expected to open in 2018, is owned by Delle Donne & Associates and will be largely occupied by UD's College of Health Sciences;

- Chemours Discovery Hub, a 312,000 square foot research and innovation center. UD students will benefit from research and internship opportunities with Chemours, and the company will work closely with UD's researchers and faculty to develop innovations. The Discovery Hub is expected to open in 2020.

Future projects that the University envisions for the STAR Campus include:

- A new hotel and conference center, which would be a working classroom and laboratory for students and faculty in UD's hospitality management programs;

- Housing, retail businesses, restaurants and parking for UD's graduate students, their families and other young professionals; and

- A testing and proving ground for driverless vehicles, to help solve challenges involving safety, infrastructure and public policy.

"The Discovery Hub at STAR Campus is more than just a building. It represents a partnership with an academic thought leader that is looking beyond today with an unwavering focus on the future and on the far-reaching impact of scientific discovery….The STAR Campus has the potential to become a vibrant, world-class research destination that attracts thousands of employees, researchers, students and businesses, all contributing to the economic development of the state."

-Mark Vergnano, President and CEO, The Chemours Company

3.4 ROLE IN PUBLIC PRIVATE PARTNERSHIPS THAT FURTHER DRIVE DEVELOPMENT

In addition to UD's capital investments, it is also important to recognize the private investments that UD has played a part in making possible in the local community. Because of its presence in Newark and its effectiveness in attracting talented students, UD's role in catalyzing additional development nearby can and should be recognized as an important capital impact. To be conservative, these amounts were not included when calculating impacts from UD's capital investments; nevertheless, they represent real inflows of dollars to initiate construction activity and stimulate the state economy.

One major example is the public private partnership to reposition the Newark Regional Transportation Center. **The construction of the $50 million Newark Regional Transportation Center is a transformational step in the development of the STAR Campus as an exciting hub of research, innovation, and learning**, as well as serving as an anchor for the STAR Campus.[12]

The project was granted funding through the U.S. Department of Transportation's TIGER grant, a highly competitive program that funds innovative projects that are difficult or impossible to fund through other federal programs. The new station will facilitate increased future Amtrak train service, as well as the opportunity for additional SEPTA and MARC commuter rail services. Demonstrating UD's commitment to growth and development in the region, the University pledged $3 million as part of the funding commitment towards the TIGER grant, and helped conduct two station engineering studies before construction began on the Newark Regional Transportation Center.

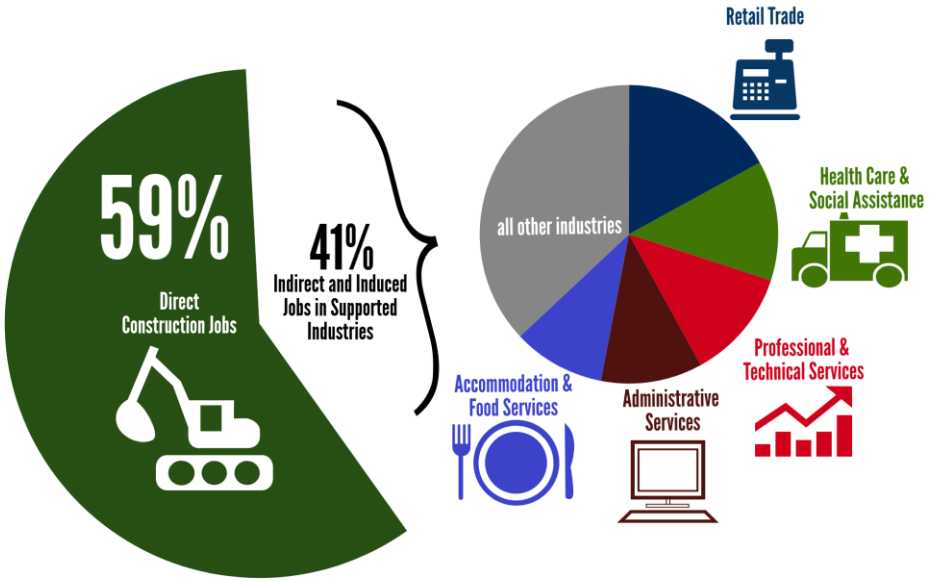
[12] Baker, Karl. *Delaware Online*, "State officials break ground on $50 million Newark train station." 17 July 2017.

3.5 INDUSTRY DISTRIBUTION OF ECONOMIC IMPACT

The economic impacts associated with UD's capital investments spread to industries far beyond the construction sector. While the construction industry is the largest individual beneficiary from these investments, other industries including retail trade, health care and social assistance, professional and technical services, administrative services, and the accommodation and food services industries also see significant benefits from the indirect (supply chain) and induced (labor income) impacts of the capital activity.

Figure 3.2 shows the proportion of the total employment impact associated with UD's capital investments that accrues in and beyond the construction industry within the state. Within the State of Delaware, approximately 41 percent of the employment supported by capital investments is in sectors outside of construction.

FIGURE 3.2 – INDUSTRY DISTRIBUTION OF EMPLOYMENT GENERATED BY UNIVERSITY OF DELAWARE'S CAPITAL INVESTMENT WITHIN THE STATE OF DELAWARE



Source: University of Delaware (2018), IMPLAN (2015), Econsult Solutions (2018), Piktochart (2018)

3.6 TAX IMPACT DUE TO DIRECT CAPITAL INVESTMENTS

The University of Delaware's capital investments are also a significant contributor of tax revenues to the State government. Direct capital investments help create construction jobs and support local construction companies and their suppliers, all of which generate income and business

taxes to Delaware. In aggregate, direct capital investments by UD generate $3.4 million in State of Delaware tax revenues (see Table 3.3).

TABLE 3.3 – ANNUAL TAX REVENUE IMPACT FROM UD CAPITAL INVESTMENTS TO THE STATE OF DELAWARE ($M)

Tax Type	Impact ($M)
Income Tax	$1.1
Business Tax	$2.3
Total Tax Revenue	**$3.4**

Source: University of Delaware (2018), Econsult Solutions (2018), IMPLAN (2015), Delaware State CAFR (2016)

3.7 WHY IMPACT FROM CAPITAL INVESTMENTS MATTERS

Beyond the impact from the University's annual operations, UD's capital investments generate additional impact at a local, statewide, and regional level. These investments represent a significant amount of economic opportunity for the local construction sector, but also support activity and employment in other supporting industries. While economic impact from construction is temporary in nature, these investments represent potential permanent boosts to the economy, since investing in the physical campus allows even greater educational, research, and entrepreneurial activity to take place.

Moreover, these capital expenditures represent investment in the shaping of Delaware's future potential for educational attainment, talent attraction, and innovation. Investments in economic infrastructure such as the STAR Campus are a differentiator for the area around Newark in the competition for human capital and future high-paying jobs. By enhancing the physical campus, UD is actively working to attract and engage students, faculty, and new businesses to Delaware, enabling the present impact and laying the groundwork for future growth.

It is important to note that UD is entering a period of significant growth in terms of construction and campus renovations. As those annual capital projects are anticipated to be more than double the current level of UD's development activity, the potential for future impact from capital investments is even larger.



Touring the STAR Tower are, left to right, UD President Dennis Assanis, Delaware Gov. John Carney, College of Health Sciences Dean Kathy Matt and UD Executive Vice President Alan Brangman

"We, as a state, have a responsibility and a partnership with the University of Delaware to make the University all that it can be. Increasingly, colleges and universities are important parts of local economies and state economies—more so, I think, than any other time in our history. They are job creators. We live clearly in a science- and technology-based economy where innovation is so important and, again back to the initial point, workforce is just so critical a part of that equation. You are that workforce, you are that future."

-John Carney, Governor of Delaware

4.0 IMPACT FROM STUDENT AND VISITOR SPENDING

4.1 SECTION OVERVIEW

Over and above its own spending on operating activities and capital investments, the University of Delaware attracts students and visitor spending into the regional economy that can be credited to the institution. The largest ancillary spending comes from UD students who, in addition to their on-campus spending, spend money off-campus, thereby supporting local retail, restaurants, and entertainment establishments. Of students enrolled at the University, 63 percent come from outside the State of Delaware, meaning that their spending is a net import for the local economy.

UD also draws a number of outside visitors to its campus thanks to major athletics events, conferences, alumni activities, and a host of other programs. In a very real sense, UD is one of the state's most productive tourist destinations, in terms of drawing in outside visitors and outside spending. Between students and visitors to campus, and accounting for the spillover effect of their spending rippling throughout the region, **it is estimated that this ancillary spending is responsible for over $227 million in economic impact, supporting approximately 1,750 jobs in Delaware.**

Unlike the previous sections, which represent spending by UD itself and therefore can be accounted for at a higher level of precision, these ancillary spending amounts are based on a combination of direct information from the University and assumptions anchored by research. Where possible, a conservative approach was taken to arrive at these estimates in order to avoid overstating these amounts.

4.2 ESTIMATED AGGREGATED ANNUAL STUDENT SPENDING

Students at the University of Delaware not only pay tuition but they also spend money on categories like transportation, room and board, supplies and books, and entertainment. Spending that takes place off campus and does not accrue directly to UD is considered "ancillary" for the purpose of this analysis, and from an impact standpoint must be accounted for above and beyond student spending on tuition, lodging, and other categories that accrue directly to UD and therefore is reflected in the operational footprint (described in Section 2). A large proportion of this ancillary spending takes place within Newark, and even more within Delaware. This spending is either:



UD students on Move-In Day

- New to the city and state, in the case of students from outside those geographies, or

- Retained spending, in that local students may well have attended a university outside those geographies (taking their spending power with them) in the absence of UD.

Base spending data comes from UD directly, which lists an approximate annual student budget for room, board, expenses, and transportation costs totaling $15,132 for on-campus and off-campus students, and $4,300 for commuter students. Conservative estimates were then made for the proportion of ancillary spending not directly captured by UD. For example, students who live in "on-campus" residences owned by UD pay rent directly to UD and that economic impact is therefore captured within the operating budget and not included as ancillary spending. The model captures the rent paid by students who live "off-campus" within Newark in non-UD housing but does not include the rent paid by commuter students. Commuting students would likely be paying the same rent or living in the same location regardless of their enrollment at UD. Therefore, the rent paid by commuting students cannot be attributed to UD and is excluded from the calculation. The model also includes additional food and other retail purchases made by commuter students (See Table 4.1).

TABLE 4.1 – ANCILLARY SPENDING OF UD STUDENTS BY STUDENT TYPE[13]

Student Type	Per Student Ancillary Spending	Aggregate Ancillary Spending ($M)
On-campus	$3,290	$15.8
Off-campus	$15,130	$131.2
Commuters	$6,460	$22.4
Total		**$169.4**

Source: University of Delaware (2018), Econsult Solutions (2018), IMPLAN (2015)

Further, the proportion of spending that takes place in Newark, New Castle County, the State of Delaware, and the Northeast Corridor was estimated for each spending category. The adjustment recognizes that not all spending takes place within the local geography, especially as consumer behavior has shifted, with millennials in particular increasingly shifting towards online shopping. It is estimated that UD's students generate approximately $169 million in ancillary spending each year, approximately $91 million of which is captured within the Newark economy, $151 million of which is captured within New Castle County, $160 million is captured within the State of Delaware, and $165 million is captured within the Northeast Corridor (see Table 4.2).

[13] This includes all spending made by these students that does not go directly to UD.

TABLE 4.2 – AGGREGATE ANCILLARY SPENDING OF UD'S STUDENTS BY GEOGRAPHY

Student Type	Number of Students	Spending within Newark ($M)	Spending within New Castle County ($M)	Spending within the State of Delaware ($M)	Spending within the Northeast Corridor ($M)
On-campus	6,898	$5.8	$3.4	$2.8	$2.1
Off-campus	10,940	$78.3	$45.0	$2.8	$2.8
Commuters	4,109	$6.8	$11.9	$3.2	$0.2
Total	**21,947**	**$90.9**	**$151.2**	**$160.0**	**$165.1**

Source: University of Delaware (2018), Econsult Solutions (2018)

4.3 ESTIMATED AGGREGATE ANNUAL VISITOR SPENDING

There is additional spending associated with visitors to campus. Throughout the academic year and over the summer, UD attracts thousands of visitors to its campus. These visitors come from all over the country and spend a significant amount within Newark each year, which helps support employment and generate tax revenues for the City of Newark and the State of Delaware. Thousands of alumni, parents, athletes, and fans come to campus for collegiate sporting events, cultural events, and programs hosted by UD.



UD Football Game

To accurately estimate aggregate visitor spending, it was necessary to develop spending profiles of the various types of visitors, recognizing that not all visitors have the same economic footprint. Based on reason for visit, duration of trip, distance traveled, event type, and visitor age, unique spending pattern behaviors were created. This visitor spending analysis accounts for the following visitor types:

- *Admitted Students* includes students and parents of students visiting UD's campus.
- *Athletic event spectators* include UD-related Varsity athletic events, which include lacrosse, football, basketball, volleyball, and hockey games.
- *Commencement visitors* include all family members and friends who attend the commencement ceremony.
- *Alumni visitors* are related to UD's annual Alumni weekend.
- *Move In visitors* include incoming freshman students and parents of these students moving in or out of UD.

- *Family Weekend visitors* are related to UD's annual Parents and Family weekend, which brings thousands of parents and family members of UD students to campus.

- *Conference visitors* are related to the numerous conferences hosted on UD's campus.

- *Ag Day attendees* is an annual tradition hosted by the College of Agriculture and Natural Resources, a community event that is open to the public.

- *External Athletic Events attendees* are non-UD related athletic events held on campus. These events include youth swim meets, basketball games, and other sporting events.

- *External events attendees* are non-UD related events held on UD's campus. These events include retreats and concerts.

- *High school graduation participants* are New Castle County's high schools' graduation ceremonies held on UD's campus.

- *Visitors to students* include other students, who come from out-of-town to spend a weekend in Newark, in addition to parents of students, who may come visit outside of UD-related family events.

Projected spending within each category was detailed by industry, and conservative estimates were then made for the proportion of this ancillary spending taking place within Newark, New Castle County, the State of Delaware, and the Northeast Corridor. As with the calculation of student spending, estimates reflect only ancillary spending not captured within UD's operating budget, and only the portion estimated to be captured within the geographies of interest. Note also that adjustments are made to exclude student attendance at various events and attractions, since student spending is separately accounted for within this analysis (Section 4.2).



UD Women's Basketball

In total, approximately, **749,000 visits were made to UD's campus in 2017,** and it is estimated that these visitors spent approximately $39.9 million within the City of Newark, $46.5 million within New Castle County, $47.5 million within the State of Delaware, and $48.2 million within the Northeast Corridor (see Table 4.3).

TABLE 4.3 – AGGREGATE ANNUAL SPENDING BY UD VISITORS

Visitor Type	Visitors	Spend per Visitor	Total Spend ($M)
Admitted Students' Campus Visits	54,674	$113.8	$6.2
Athletics Events Spectators	145,901	$102.7	$15.0
Commencement Attendees	11,200	$125.6	$1.4
Alumni Visitors	5,994	$113.8	$0.7
Move In/Out for First Year	6,459	$152.9	$1.0
Family Weekend Visitors	2,900	$125.6	$0.4
Conferences Visitors	50,000	$63.6	$3.2
Ag Day	8,000	$14.8	$0.1
External Athletic Events Attendees	36,230	$102.0	$3.7
External Events Attendees	232,425	$63.6	$14.8
High School Graduations Attendees	173,100	$7.4	$1.3
Visitors to Students	21,947	$76.2	$1.7
	748,830		**$49.5**
Within City of Newark ($M)			**$39.9**
Within New Castle County ($M)			**$46.5**
Within State of Delaware ($M)			**$47.5**
Within Northeast Corridor ($M)			**$48.2**

Source: University of Delaware (2018), Econsult Solutions (2018), U.S. General Services Administration (2018)

4.4 ECONOMIC IMPACT FROM STUDENT AND VISITOR SPENDING

Combined ancillary spending by students and visitors therefore yields about $130.8 million in spending within the City of Newark, $197.7 million within New Castle County, $207.5 million within the State of Delaware, and $213.3 million within the Northeast Corridor. However, an adjustment needs to account for the fact that some of that spending immediately leaves the region and therefore does not have multiplier effect within the regional economy. For example, a large proportion of retail spending goes to manufacturers and wholesalers, most of which are outside the region, and so the modeling approach used in this report conservatively includes only the retail margin (i.e. the difference between the purchase price for the retailer and the sales price for the customer). Based on this adjustment, the amount of spending included in our analysis is $91.2 million within the City of Newark, $137.8 million in New Castle County, $145.6 million within the State of Delaware, and $150.4 million within the Northeast Corridor (See Table 4.4).

UD students spend $160 million within the State of Delaware every year

TABLE 4.4 – AGGREGATE ANCILLARY SPENDING BY UD STUDENTS AND VISITORS BY GEOGRAPHY ($M)

Type	Spending within the City of Newark	Spending with New Castle County	Spending within the State of Delaware	Spending within the Northeast Corridor
Students	$90.9	$151.2	$160.0	$165.1
Visitors	$39.9	$46.5	$47.5	$48.2
Total	**$130.8**	**$197.7**	**$207.5**	**$213.3**
Minus Non-Modeled Amount	$39.6	$59.9	$61.9	$62.9
Modeled Amount	**$91.2**	**$137.8**	**$145.6**	**$150.4**

Source: University of Delaware (2018), Econsult Solutions (2018)

This influx of ancillary spending by students and visitors has a multiplier effect throughout the region, producing the following annual economic impacts (see Table 4.5):

- $97 million in total output within the City of Newark, supporting 800 direct, indirect, and induced jobs and $35 million in earnings;
- $213 million in total output within New Castle County, supporting 1,600 direct, indirect, and induced jobs and $53 million in earnings;
- $227 million in total output within the State of Delaware, supporting 1,750 direct, indirect, and induced jobs and $57 million in earnings; and
- $252 million in total output within the Northeast Corridor, supporting 1,800 direct, indirect, and induced jobs and $74 million in earnings.

TABLE 4.5 – ESTIMATED ANNUAL ECONOMIC IMPACT FROM UD STUDENT AND VISITOR SPENDING WITHIN THE CITY OF NEWARK, NEW CASTLE COUNTY, THE STATE OF DELAWARE, AND THE NORTHEAST CORRIDOR

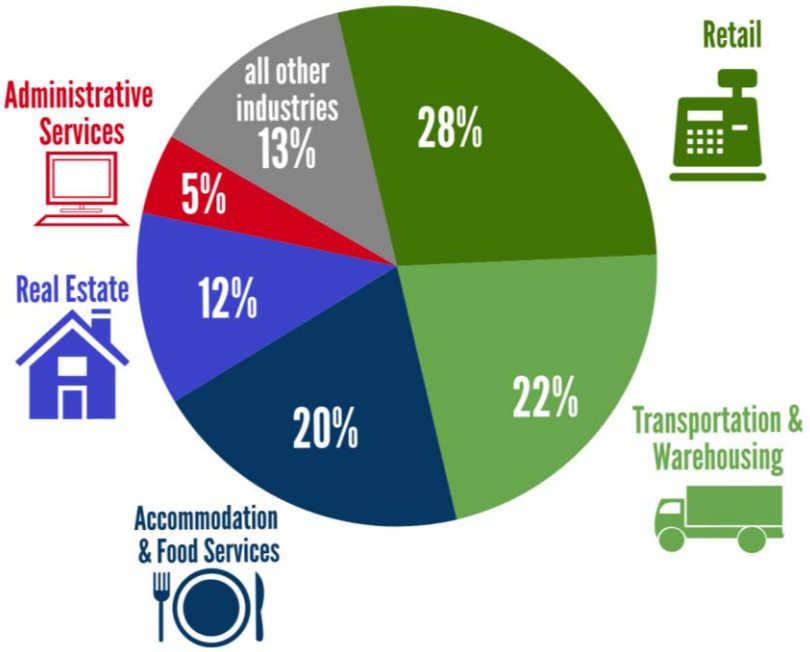
Economic Impact	City of Newark	New Castle County	State of Delaware	Northeast Corridor
Direct Output ($M)	$91	$138	$146	$150
Indirect and Induced Output ($M)	$6	$75	$81	$102
Total Output ($M)	**$97**	**$213**	**$227**	**$252**
Employment (FTE)	**800**	**1,600**	**1,750**	**1,800**
Earnings ($M)	**$35**	**$53**	**$57**	**$74**

Source: University of Delaware (2018), Econsult Solutions (2018), IMPLAN (2015)

4.5 INDUSTRY DISTRIBUTION OF ECONOMIC IMPACT

Spending by students and visitors directly impacts a number of industries, and in turn creates a multiplier effect that reaches additional industries. This influx of spending into Delaware supports jobs in a wide range of sectors statewide, particularly retail, transportation and warehousing, accommodation and food services, and real estate (see Figure 4.1). UD's presence draws in and retains students to the state, and attracts a great number of visitors to the state through its events. The impact of this ancillary spending supports a wide variety of jobs for local Delawareans in these industries.

FIGURE 4.1 – INDUSTRY DISTRIBUTION OF EMPLOYMENT IMPACT OF UD STUDENT AND VISITOR SPENDING WITHIN DELAWARE



Source: University of Delaware (2018), IMPLAN (2015), Econsult Solutions (2018), Piktochart (2018)

4.6 FISCAL IMPACT FROM STUDENT AND VISITOR SPENDING

Student and visitor spending also boosts various local and state tax bases, creating tax revenues for various government jurisdictions each year. It is estimated that the economic impact that results from UD student and visitor spending produces about $6.5 million in tax revenues for the State of Delaware government each year (see Table 4.6).

TABLE 4.6 – ESTIMATED ANNUAL TAX REVENUE IMPACT FROM UD STUDENT AND VISITOR ANCILLARY SPENDING TO THE STATE OF DELAWARE

Tax Type	Impact ($M)
Income Tax	$1.4
Business Tax	$4.6
Hotel Tax	$0.5
Total Tax Revenue	**$6.5**

Source: University of Delaware (2018), IMPLAN (2015), Econsult Solutions (2018), Delaware State CAFR (2016)

4.7 WHY IMPACT FROM STUDENT AND VISITOR SPENDING MATTERS

Ancillary spending is an important form of export for the region, often because it represents people from outside the region spending money in the region, to the benefit of local jobs and local tax bases. Importantly, ancillary spending helps to support low-margin businesses for whom the difference between survival and obsolescence is very narrow. In these cases, the injection of spending power from students and visitors to Newark businesses is critically important.

An estimated 749,000 visitors visit UD each year, and spend $48 million. Tourism is important to the region, being the 4th largest private employer in the state. Visitors to UD draw in outside spending and dollars to the state.

Furthermore, UD supports a diverse mix of neighborhood retail in terms of quantity and types that would likely not be supported in the absence of the University. And that mix of retail continues to grow as developers recognize the critical mass of UD students, faculty, and staff and adjacent economic activities that have aggregated around campus. As a result, local residents are privy to an amenity-rich environment that adds to the overall quality of life in the local community.



Future UD students take tour of campus

5.0 IMPACT FROM WAGE PREMIUM

5.1 SECTION OVERVIEW

The first two sections of this report covered the economic impact of UD's spending and the previous section discussed what others spend in connection with studying at or visiting UD. However, it is important to remember that the University of Delaware's core mission is to educate, credential, and prepare students for a lifetime of success. This has meaningful and immediate gains for UD graduates and for the regional economies they participate in after graduation by increasing their productivity and earning power. Therefore, this section quantifies the impact of UD's alumni on the local, county, state, and regional economy in the form of the higher earnings they are able to obtain as a result of the credential they received at UD.



2018Commencement

In aggregate, the additional earning potential means millions of dollars more circulating in the regional and state economy. The University has approximately **179,000 alumni** who now live all around the world; notably, many have stayed in Delaware and particularly in the Northeast Corridor, as well as in Newark itself. **The 35,950 graduates living and working in Delaware are estimated to earn over $1 billion more in income each year as a result of their University of Delaware education. This translates into an additional $1 billion in economic impact within the Delaware economy annually, supporting about 5,900 additional jobs throughout the state.**

5.2 CONCEPT BEHIND WAGE PREMIUM[14]

The link between educational attainment and earnings power is well-established, and a wage premium associated with additional education is often conceptualized and calculated from the perspective of the student, who can compare the costs associated with various educational (or non-educational) options with the expected return. This analysis utilizes this framework to estimate the gain not to the student, but rather to city and state economies. Additional earnings attributable to University of Delaware within these geographies are estimated and translated into

[14] See Appendix D – Wage Premium for methodology.

additional spending power within the local economy, which supports local employment and earnings.

Estimating the magnitude of wage premium impacts from UD on the volume of earnings and associated household spending within Newark, New Castle County, Delaware, and the Northeast Corridor therefore proceeds in three steps:

1. First, we estimate the volume of UD alumni in the workforce, detailed by educational attainment, and by geography.

2. Next, we estimate the annual wage premium associated with UD for each attainment level.

3. Finally, we combine these two calculations, multiplying the volume of alumni at each attainment level by the wage premium for that level to yield an estimate of the aggregate annual wage premium associate with UD.

This calculation relies primarily on data provided by UD, as well as government data where appropriate.

5.3 DIRECT WAGE PREMIUM

UD alumni can be found all across the Northeast Corridor, and many remain in Newark and New Castle County after graduating (Figure 5.1). Data provided by UD shows that of the more than 178,000 active members in the alumni database, about **4,190** live within the City of Newark, nearly **39,200** live in New Castle County, **49,572** live in the State of Delaware, and over **114,428** live in the Northeast Corridor.

Of those living within the state, it is assumed that 72 percent are currently employed (as opposed to retired, unemployed, or otherwise out of the workforce).[15] Applying this proportion evenly across geographies, it is estimated that approximately 83,050 alumni are currently employed within the Northeast Corridor, of which 3,050 live within the City of Newark, 25,500 live in the parts of New Castle County outside of the city, 7,400 live in the parts of the state outside of the county, and 47,100 in parts of the Northeast Corridor outside of the state (Table 5.1).[16]

[15] This assumption is based on the employment to population ratio reported by the U.S. Bureau of Labor Statistics for adults 25 or older with a college degree, which is 72.6 percent as of March 2018.

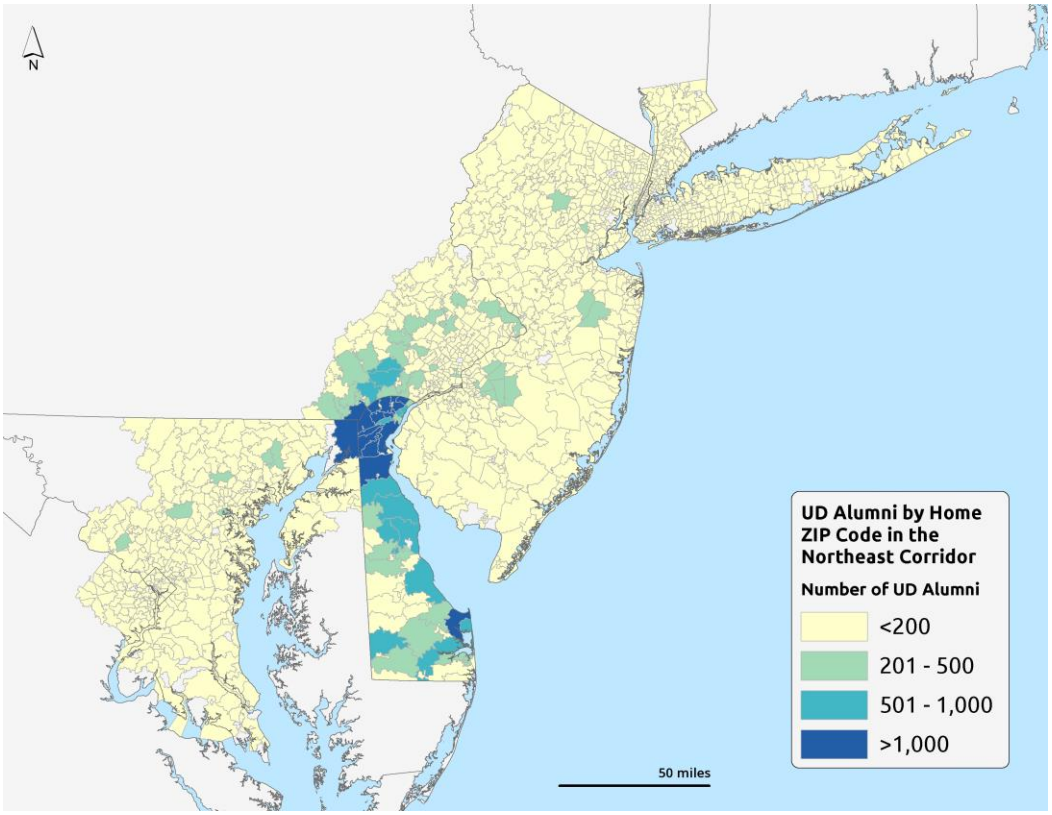
[16] To enhance the accuracy of the calculation in terms of its differentiation of different geographic levels, workers within the subsumed geographies are netted out of each successive calculator (i.e., Delaware reflects the remaining portion of the state outside of the Northeast Corridor). Full values for Delaware will therefore be the sum of all three columns.

TABLE 5.1 – GEOGRAPHIC DISTRIBUTION OF UNIVERSITY OF DELAWARE ALUMNI IN THE WORKFORCE

	City of Newark	New Castle County	State of Delaware	Northeast Corridor
Working Alumni with Associate's degree	150	1,450	1,850	4,250
Working Alumni with Bachelor's degree	2,200	20,500	25,800	59,500
Working Alumni with Advanced Degree	700	6,600	8,300	19,300
Est. Total Working Alumni	**3,050**	**28,550**	**35,950**	**83,050**

Source: University of Delaware (2018), Bureau of Labor Statistics (2018), Econsult Solutions (2018)

FIGURE 5.1 – GEOGRAPHIC DISTRIBUTION OF UD ALUMNI IN THE NORTHEAST CORRIDOR



Source: University of Delaware (2018), ArcGIS (2018)

WAGE PREMIUM OF ALUMNI DEGREE LEVELS

The aggregate increase in the earning potential within each geography can be estimated as a function of the increases in educational attainment of the workforce. Using data from the median salaries of all Delaware universities and

There are about 36,000 working UD alumni in the State of Delaware, who earn an aggregate $1 billion more per year because of the education and credential they received at UD.

colleges, as well as the American Community Survey's data on median earnings by educational attainment, the following median base salaries were determined for UD graduates by degree level: $46,798 for an associate's degree, $64,916 for a bachelor's degree, and $83,781 for an advanced degree.[17]

Based on a combination of federal data sources, the annual wage premium attributable to the increased educational attainment for UD alumni is estimated to be $15,800 for an associate's degree over a high school diploma, $27,500 for a bachelor's degree over an associate's degree, and an additional $31,900 for advanced degree over a bachelor's degree.

These premiums are applied to the volume of UD degree holders estimated to be working within each geography by degree level to arrive at an aggregate annual wage premium, which represents the additional household income generated by UD alumni as a result of the education and credential they received from UD. This aggregate annual wage premium is estimated to sum up $85.1 million within the City of Newark, $798 million in New Castle County, $1 billion in the State of Delaware, and $2.3 billion throughout the Northeast Corridor (see Table 5.2).

TABLE 5.2 – REGIONALLY INCLUSIVE AGGREGATE ANNUAL WAGE PREMIUM ASSOCIATED WITH UNIVERSITY OF DELAWARE ALUMNI IN THE WORKFORCE (IN $M)

Degree Level	City of Newark	New Castle County	State of Delaware	Northeast Corridor
Associate's	$2.4	$22.9	$28.8	$66.6
Bachelor's	$60.1	$563.1	$710.4	$1,639.8
Advanced	$22.6	$212.1	$267.5	$617.5
Total Working Alumni	**$85.1**	**$798.1**	**$1,006.7**	**$2,323.9**

Source: University of Delaware (2018), Bureau of Labor Statistics (2018), Econsult Solutions (2018)

5.4 ECONOMIC IMPACT FROM ANNUAL WAGE PREMIUM

The additional earning potential is great for students, but it is also a huge boon to the local economies they are a part of, because some of that additional household income is spent at various local vendors, supporting additional economic activity and employment. After accounting for savings rates, tax withholdings, and spending outside of the city, county, state, and region (i.e., less than 100 percent of the increased household income is spent locally), there is still a large amount of additional spending and spillover activity that generates the following economic impacts (see Table 5.3):

[17] See Appendix D– Wage Premium for additional detail on methodology.

- $89 million in total output within the City of Newark, supporting 500 direct, indirect, and induced jobs and $26 million in earnings;

- $834 million in total output within New Castle County, supporting 4,800 direct, indirect, and induced jobs and $246 million in earnings;

- $1.0 billion in total output within the State of Delaware, supporting 5,900 direct, indirect, and induced jobs and $294 million in earnings; and

- $2.6 billion in total output within the Northeast Corridor, supporting 13,800 direct, indirect, and induced jobs and $866 million in earnings.

TABLE 5.3 – ESTIMATED ANNUAL ECONOMIC IMPACT FROM UNIVERSITY OF DELAWARE AGGREGATE WAGE PREMIUM WITHIN THE CITY OF NEWARK, NEW CASTLE COUNTY, STATE OF DELAWARE, AND THE NORTHEAST CORRIDOR ECONOMIES

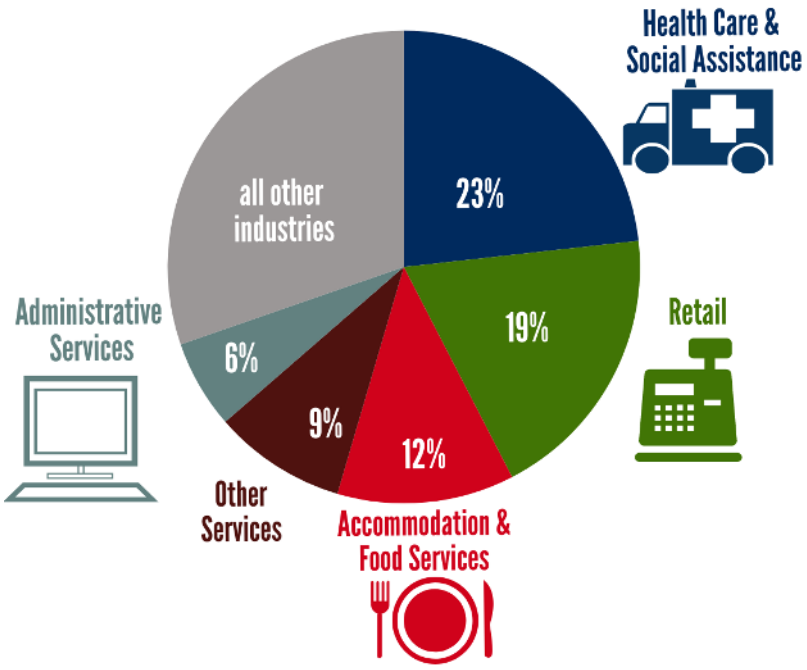
Impact Type	City of Newark	New Castle County	State of Delaware	Northeast Corridor
Direct Wage Premium ($M)	$85	$798	$1,007	$2,324
Total Impact ($M)	**$89**	**$834**	**$1,013**	**$2,648**
Employment Supported (FTE)	**500**	**4,800**	**5,900**	**13,800**
Earnings ($M)	**$26**	**$246**	**$294**	**$866**

Source: University of Delaware (2018), Econsult Solutions (2018), IMPLAN (2015)

5.5 INDUSTRY DISTRIBUTION OF ECONOMIC IMPACT

The proportion of additional household income from UD alumni that is spent back into the state economy supports a number of industries, befitting the types of expenditures that are typically made by a household from its earned income. Hence, a high number of jobs in sectors such as health care, retail, and food are supported by the higher aggregate household income enjoyed by UD alumni (Figure 5.1). UD alumni who remain in Delaware support the industries shown in the figure below. The additional household income due to their UD degree supports greater employment opportunities for local Delawareans.

FIGURE 5.2 – INDUSTRY DISTRIBUTION OF EMPLOYMENT IMPACT OF UNIVERSITY OF DELAWARE AGGREGATE WAGE PREMIUM WITHIN DELAWARE



Source: University of Delaware (2018), IMPLAN (2018), Econsult Solutions (2018), Piktochart (2018)

5.6 TAX REVENUE IMPACT FROM WAGE PREMIUM

In addition to the economic impacts, the City of Newark and the State of Delaware benefit from added taxes generated directly and indirectly from the wage premium associated with UD graduates. The higher wage paid to UD alumni represents a direct gain in terms of personal income tax, as well as indirectly from income and business taxes generated by graduate spending. Each year, $31.5 million in state income taxes are paid directly by UD alumni. In addition, $19.2 million is generated in state business taxes (Table 5.4). In other words, there is approximately $50.7 million in state tax revenues because of the aggregate wage premium enjoyed by UD alumni living and working in the State of Delaware.

TABLE 5.4 – ESTIMATED ANNUAL TAX REVENUE IMPACT FROM UNIVERSITY OF DELAWARE AGGREGATE WAGE PREMIUM TO STATE OF DELAWARE GOVERNMENT

Tax Type	Impact ($M)
Income Tax ($M)	$31.5
Business Tax ($M)	$19.2
Total Tax Revenue	**$50.7**

Source: University of Delaware (2018), Econsult Solutions (2018), Delaware State CAFR (2018), City of Newark CAFR (2018)

5.7 WHY WAGE PREMIUM MATTERS

UD's primary contribution to the local and state economy is by educating and credentialing students. This contribution is particularly significant because of the care it takes to be inclusive and accessible in enrolling students, and then comprehensive in supporting them through graduation.

UD is recognized for its leadership role in a number of academic disciplines. For example, *U.S. News* ranked its undergraduate program as 81st among more than 300 public, private and for-profit national universities evaluated. And the 2019 *U.S. News and World Reports Best Graduate School* rankings put 10 of the University of Delaware's graduate programs among the top 50 in the nation, and another 11 programs within the top 100. The list included 9 top ranked programs in engineering and 6 top ranked science programs, highlighting UD's expertise in STEM disciplines. In addition to these annual rankings, the *U.S. News* consistently ranks other programs as well, including UD's physical therapy graduate program, which was ranked first in 2017's edition.



TheraV, founded by Amira Idris ('15) during her time at UD, is a wearable vibration device to reduce phantom limb pain for amputees. Amira received a bachelor's degree in biomedical engineering, and a master's degree in entrepreneurship and design. TheraV's ELIX prototype was recently exhibited at the Amputee Coalition National Conference and has been distributed to 50 veterans following the completion of a successful crowd-funding campaign. The startup is located right in Newark—a recent example of a UD graduate creating economic benefit within the community through entrepreneurship.

That means that the education and credential students received at the University of Delaware allows them to participate more substantively in the economies they live and work in after graduation as their degrees are nationally recognized as valuable assets. This is reflected in part in higher salaries and wages, which are then spent back into local economies and produce significant economic and tax revenue impact.

The impact of a UD education is reflected in other ways which are not quantified in this section. For example, in some cases UD graduates not only make more money in their jobs, but are also creating jobs through their entrepreneurial ventures. They are also taking strategically important roles in the local and state economy, such as in highly technical federally funded research work. Thus, UD's contribution to this part of the local and state workforce is in supporting outside infusions of economic activity in the form of federal funds, as well as in attracting the larger constellation of private sector activity that seeks to be near this work. Given that more and more business activity is landing in places with high concentrations of technical labor, the University of Delaware's contribution of educated graduates is an increasingly important part of the state's future economic vibrancy. UD alumni are also very present throughout the globe improving the reputation for the University, as well as the State of Delaware. The success of these alumni allows for their continued financial support to the University which in turn supports Delaware jobs and taxes.

6.0 BROADER SOCIETAL IMPACT OF UD

6.1 SECTION OVERVIEW

The overall economic impact of UD can be seen as the sum of the economic impact from its operating activities and capital investments, as well as the benefit to the economy from student and other ancillary spending, plus the wage premium enjoyed by alumni. Each of these impact categories contributes significantly to regional economic activity and demonstrates how universities help create vibrant communities and a competitive region.

The purpose of this section, and the following section, is to elaborate on these themes further exploring the broader societal and community impacts that UD's economic activity supports. This section focuses on how research and innovation are an increasingly important aspect of regional competitiveness. The University of Delaware is a leader in this area, and marshals its academic assets and broad research expertise to advance human knowledge and to develop ideas and innovations that help Delawareans and the region in their everyday lives.

Under the leadership of President Assanis, UD has accelerated its research efforts in scale and reach through the formation of innovation ecosystems and strategic partnerships, with a renewed focus on diversity, inclusion, and collaboration. These efforts create a concentration of human capital and research infrastructure that creates a vibrant space for progress and innovation. This activity acts as a powerful magnet for additional human and financial capital, further strengthening the University of Delaware community, and improving the competitiveness of the region and state in which it is located. This section explores the qualitative, societal impacts that these aspects of the University have. Importantly, the interplay of research, scholarship, and innovation within a university setting initiate a virtuous cycle both within the University and throughout the region that spurs real life benefits to Delaware residents and beyond.



"The University of Delaware is a true hub of manufacturing innovation."

-Senator Chris Coons, Delaware

6.2 UNIVERSITIES AS INNOVATION HUBS AND THEIR ROLE IN A REGIONAL ECONOMY

In our modern knowledge economy, research universities have become important anchors in the innovation ecosystems that regions are using to attract human and financial capital. UD is a leader in that regard, having been classified by the Carnegie Foundation as a doctoral university with the highest research activity. As mentioned in Section 2, UD's ability to attract knowledge and talent, as well as to leverage public and private funding to create and innovate, is an invaluable and effective asset to the region and to society overall. As a state-assisted research university, UD is strategically positioned to establish important partnerships with industry leaders and the public sector—building Delaware's competitiveness in collaboration with the state's decision makers. These alliances go beyond the traditional funding of research projects. Strategic partnerships are designed to merge the discovery-led culture of the University with the innovation-driven environment of the private company. More broadly speaking, the University acts as an anchor institution, providing a long-term presence that drives economic growth and supports many of the innovations that give the region a competitive advantage.

The productivity of UD's research and innovation initiatives is inextricably connected to the health of the region: Delaware, and the greater region around it, grows and prospers through the strength of UD's linkages to other participants such as large corporations, the startup community, and public sector entities. In the past five years these initiatives have helped create or support hundreds of startups and other companies, generated hundreds of patents and inventions, and directly supported tens of thousands of jobs.

Expanding human knowledge and building an ecosystem dedicated to innovative and creative endeavors are at the core of UD's mission and values. The University's underlying principle that advancing knowledge will improve society as a whole is exactly why UD continues to invest heavily in its research programs, business incubation, and its public and private partnerships.

6.3 BUILDING A DIVERSE AND INCLUSIVE INTELLECTUAL COMMUNITY

A college degree is increasing in importance as a prerequisite to meaningful participation and gainful employment in today's knowledge-based economy. At the very same time, obtaining a college degree is seen as inaccessible and unaffordable to large swaths of potential participants. The U.S. cannot remain economically competitive and socially vibrant if such exclusion continues. Hence, efforts by universities to promote affordability and accessibility are essential not only to individual institutions' future viability, but also to the nation's future competitiveness.



President Assanis takes photo with students

Diversity matters for scholarship, research, and innovation because an institution cannot pursue

excellent academics and advance human knowledge if it fails to include entire groups of people based on skin color, country of origin, gender, or ability to pay. Understanding this and seeking to put into action its stated institutional goals of diversity and inclusion, UD has numerous initiatives in place to build an intellectual community that is inclusive and welcoming to all. The following describes a number of recent and innovative initiatives designed to make UD accessible and affordable to students, as they onramp into UD, as they continue to attend, and as they transition to post-college life.

"Our student population is becoming more diverse every year—more racial and ethnic minorities, more first-generation students, more students from low-income families, more international students. Every one of our students helps make this a vibrant and exciting community. So our opportunity is to lift all of them. We want every student to feel at home here and to succeed here. We're making progress, and we can always do better."

—Dr. Dennis Assanis, President of the University of Delaware

ACCESS TO A UD EDUCATION

The University has a total of 23,774 undergraduate and graduates. Of this, 8,890 are residents of the state and 2,555 are residents of New Castle County. In 2017, UD's first-year undergraduate enrollment exceeded its goal of 4,250 students with 4,306 first-year students, of which 1,402 were Delaware residents. This represents an increase of 15.3 percent from the previous year.[18]

To encourage and enable enrollment of Delaware residents, the University offers its **Commitment to Delawareans**. This program provides an academic roadmap for in-state students to follow in high school so they can be reasonably sure of admission to UD. It also provides significant need-based financial aid so that no in-state student will have to borrow more than 25 percent of the cost of a four-year education at UD. In Academic Year 2017, the University disbursed $23.9 million in grants and $12.1 million in scholarships to Delaware students.

[18] "Fall 2017 Undergraduate Enrollment Report," University of Delaware. October 2017

TABLE 6.1 – TOTAL FINANCIAL AID AWARDED TO RESIDENTS OF DELAWARE IN AY2017 (IN $M)

Type	Financial Aid
Grant	$23.9
Scholarship	$12.1
Total	**$36.1**

Source; University of Delaware (2018)

Associate in Arts Program

The Associate in the Arts Program (AAP) provides additional guidance and advisement to prepare some in-state students for the academic rigor of traditional University courses. The AAP offers UD courses taught by UD faculty at the Delaware Technical Community College campuses in Wilmington, Dover and Georgetown. Students pay substantially lower tuition—or no tuition, if they qualify for the states Student Excellence Equals Degrees (SEED) scholarship program—and earn their associate's degree before transitioning to the Newark campus to complete their Bachelor's degree. The AAP resembles a community college embedded within the broader UD organization. The students have the best of both worlds in terms of campus resources.



Alumni Spotlight: Associates in Arts Graduate

Nadisha Downs completed the Associates in Arts Program in 2015 before earning her bachelor's degree at UD's Newark campus and becoming a McNair Scholar and Summer Research All-Star with UD. Today, Downs is a housing/independent living case manager for emancipated foster-care youth at Wilmington's historic West End Neighborhood House. Acknowledging the AAP for her academic success, she said, "The Associate in Arts Program was an integral component of my academic journey. Without having experienced the many commitments, struggles, proud moments, and unconditional support of a few AAP professors/faculty in the program, I would not be the dedicated student and scholar that I am today."

Inclusive Excellence Plan

One of President Assanis' top priorities is creating a more diverse and inclusive campus community. In order to ensure continued progress, the University has introduced the Inclusive Excellence Plan which includes goals for improvements within culture and climate, graduate students, undergraduate students, academic programming, and faculty and staff. A range of actions to meet these goals have been initiated, including the following:

- Additional outreach to prospective students from underrepresented minority groups;

- Improvements to pre-college preparation programs;
- More robust advisement and guidance services to help students stay at UD and graduate on time;
- Revamped academic modules regarding diversity, inclusion and multiculturalism;
- Cluster hires of faculty members, especially from underrepresented minority groups;
- "Valuing Differences" training for all staff and creation of a hiring protocol for search committees;
- Creation of the position of Director for Student Diversity and Inclusion;
- Preliminary steps toward creation of a multicultural center on campus.

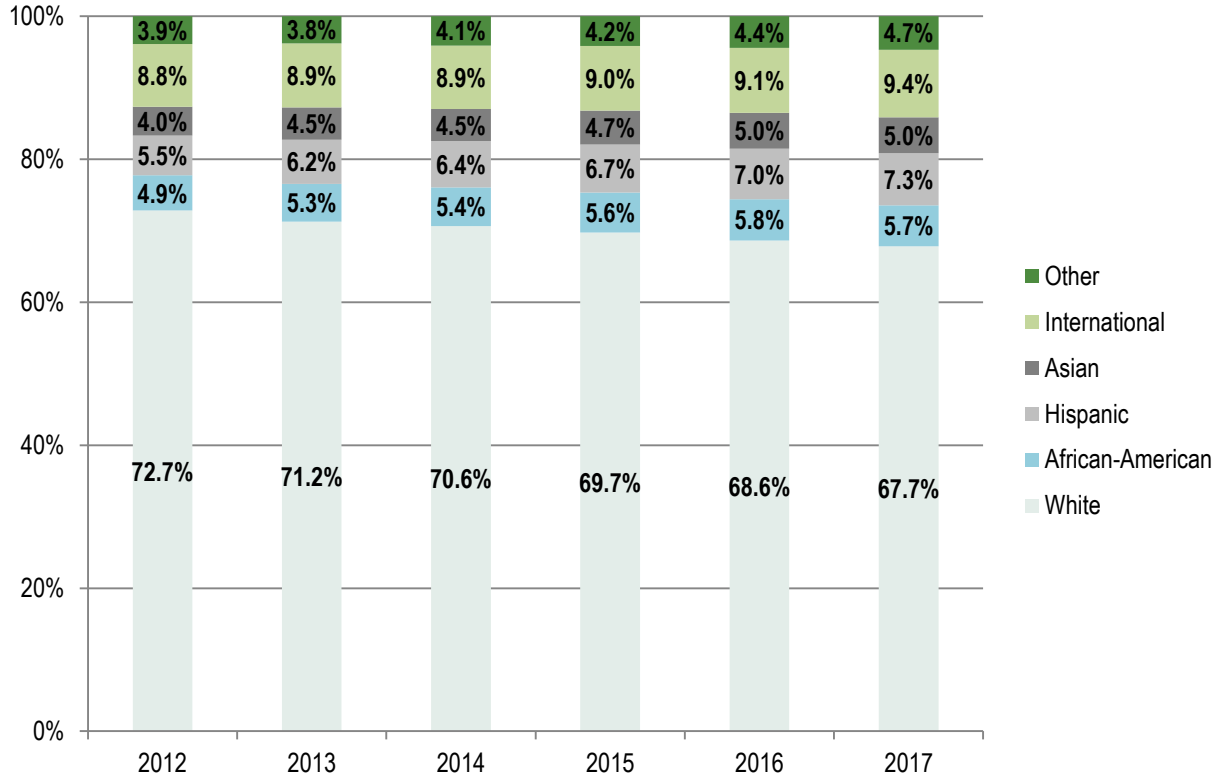
UD's commitment to diversity has not gone unnoticed; in 2017, the University was presented the 2017 Higher Education Excellence in Diversity (HEED) Award from *INSIGHT Into Diversity* magazine, the oldest and largest diversity-focused publication in higher education. The magazine highlighted UD's specific strengths and areas of progress such as: scholarships and community-based partnerships focused on attracting underrepresented and first-generation undergraduate and graduate students; new resources dedicated to the recruitment, retention and advancement of a diverse faculty; and trainings, courses and mentoring programs to bolster hiring and retention of underrepresented employees.



Classroom for Associate in Arts Program

The University of Delaware is also aware of the needed support by students of first generation families. For that, it has begun to establish programs to ensure the success of these students such as a student-registered organization for the sole purpose of creating a support network for first generation students and the Student Support Services Program (SSSP). SSSP offers UD undergraduate students with academic assistance and advising, personal counseling and cultural enrichment activities. Students eligible for this program are first generation, from a low-income family, or have a physical and/or learning disability.

FIGURE 6.1 – STUDENT PRIMARY RACE/ETHNICITY BREAKDOWN FALL 2012 THROUGH FALL 2017[19]

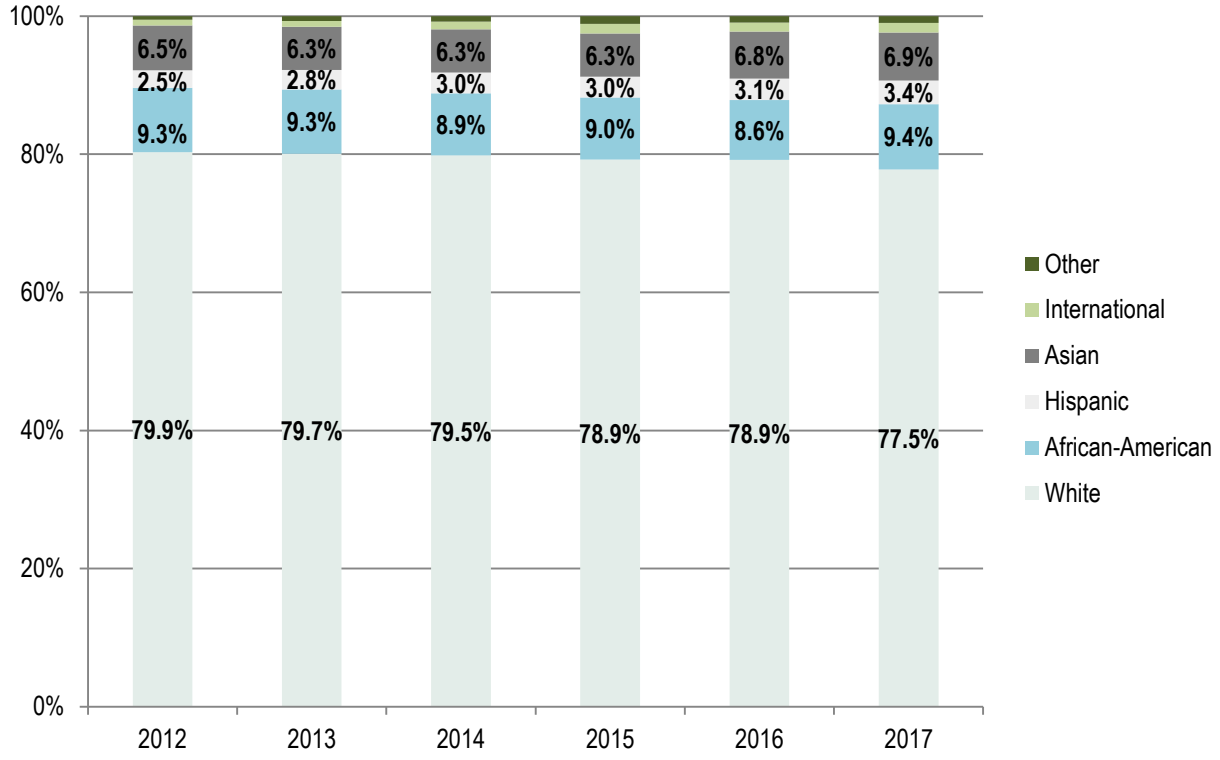


Source: University of Delaware (2017)

All of these steps being taken by the University demonstrate UD's commitment to building an inclusive learning environment that is prepared to address the diversity of needs and academic interests of its students, faculty and staff. UD's core values include being a welcoming place for all—a value that requires mindful engagement with Newark, Delaware, and the region. UD's emphasis on inclusion and recent steps to expand upon that value is an important step in expanding the University's impact and in broadening the knowledge of its own intellectual community.

[19] Student body includes the following programs: Associate in Arts, Graduate, Newark Undergraduates, and Professional and Continuing Studies. Other includes Native Hawaiian or Other Pacific Islander, Two or More Races, Non-Specific, and Unknown.

FIGURE 6.2– UD FACULTY AND STAFF PRIMARY RACE/ETHNICITY BREAKDOWN FALL 2012 THROUGH FALL 2017[20]



Source: University of Delaware (2017)

6.4 RESEARCH FOOTPRINT

Innovation and research are essential to the University of Delaware's mission, with a focus on research that is meaningful to residents of Delaware. Research dollars attracted by UD represent a significant import to the Newark and Delaware economies, as these investments in scholarship and innovation bring significant resources to UD's campuses that otherwise would be deployed elsewhere. UD's research enterprise in Newark and at satellites across the state support and encourage innovation in areas that are impactful to Delaware residents and the world. In addition, UD engages in the State's efforts to promote innovation and research within Delaware,



Exhibit at the Hugh R. Sharp Campus

[20] Other includes Native Hawaiian or Other Pacific Islander, Two or More Races, Non-Specific, and Unknown.

such as the Research and Development Tax Credit and Angel Investor Tax Credit for businesses that remain in Delaware. UD's presence as a research intensive university contributes to the synergy of research and innovation within the state.

Because of UD's strong presence as a research center, it is able to leverage partnerships with government organizations, industry leaders, and other parties to direct funds and focus efforts to support incredible research opportunities. The respect and recognition of the University as a research institution is what allows its research profile to be so diverse and impactful. **In the past five years, externally sponsored programs at UD have totaled over $200 million each year (see Figure 6.3).**

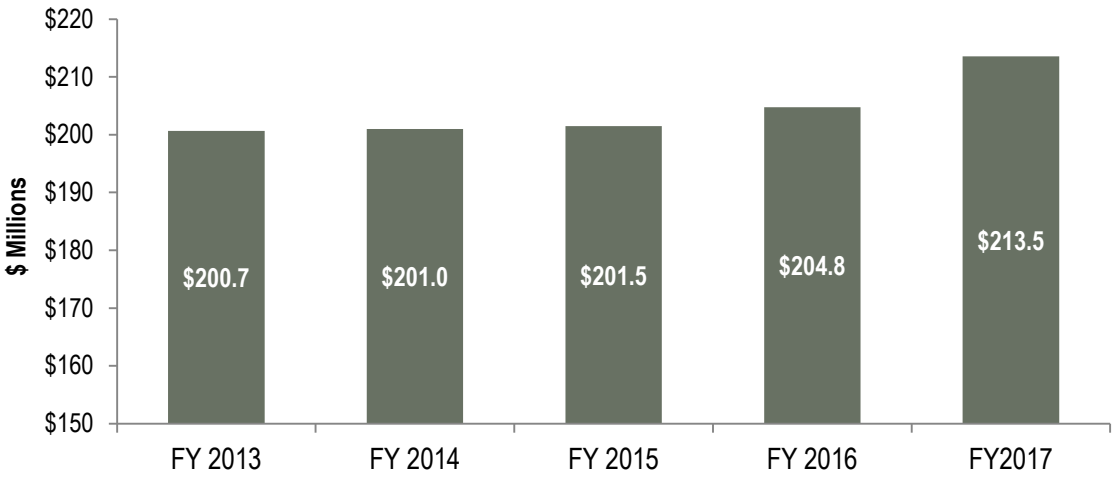


FIGURE 6.3 – EXPENDITURES FOR EXTERNALLY SPONSORED ACTIVITIES FY 2013-FY 2017

Source: University of Delaware (2017)

As the University's research footprint has steadily grown over the last five years it has been able to advance understanding in areas of critical importance to Delawareans. As a land, sea, and space grant institution, some of UD's greatest research programs are strategically focused in research questions that will improve Delaware and support the greater good, such as aquaculture and agriculture research, health sciences, engineering, and biotechnology. The successes of these research activities are often thanks to partnerships and programs with federal and state entities, and peer institutions, as well as the private sector. **Hence, UD's research efforts not only draw dollars into the state but also deploy those funds to solve problems of critical importance to the state's economic competitiveness, ecological vitality, and overall quality of life.**



"Here in Delaware, we have a vibrant research community, thanks to the University and its commitment to partnering with the public and private sectors to push innovation further."

-Senator Tom Carper, Delaware

UD's research program takes place throughout the state, addressing challenges and research questions that are impactful on the lives of Delawareans as well as the world. For instance, UD's Avian Biosciences Center has contributed to the understanding and ability to respond to disease outbreaks in food supplies around the world. The Center for Drug and Health Studies has conducted numerous studies on opioid abuse in Delaware. And the Disaster Research Center helps communities prepare for the significant social ramifications of natural disasters. The College of Earth, Ocean, and Environment is involved in large-scale study of ocean oil spills to understand how they spread, and improve forecasting and response to these events. **UD's $213.5 million research budget in 2017 spanned numerous departments and disciplines (see Table 6.2).**

TABLE 6.2 – FY 2017 EXTERNALLY SPONSORED RESEARCH ACTIVITY BY COLLEGE/UNIT[21]

College / Unit	Total Research Funding ($M)
Agriculture & Natural Resources	$28.4
Arts & Sciences	$41.4
Business & Economics	$6.1
Earth, Ocean, & Environment	$17.4
Education & Human Development	$26.1
Engineering	$46.4
Health Sciences	$23.9
Delaware Biotechnology Institute	$2.0
Institute of Energy Conversion	$1.1
Catalysis Center for Energy Innovation	$3.6
Delaware Environmental Institute	$6.5
Institute for Global Studies	$1.1
Small Business & Technology Development Center	$1.7
The National Institute for Innovation in Manufacturing Biopharmaceuticals	$1.4
Other	$6.7
Total Externally Sponsored Activities	**$213.5**

Source: University of Delaware (2018)

Research at the University of Delaware, and the applications of that research, represents a significant amount of economic product. It is important to understand, however, that the impact of that product is not confined to the magnitude of the spending. While this activity contributed to the spending, jobs, and earnings explored in Section 2, economic impacts from research are vast and difficult to quantify. Each advance in human understanding improves countless other functions throughout industry and society.

As an example: the improvements to responses in disease outbreaks mentioned above might lead to more efficient transfer or storage of food products. Or it might help alleviate economic burden on areas struggling to maintain access to safe food supplies. Or it might, most foundationally, improve the quality of life for the people who benefit from that research. Effects of this nature multiply throughout the economy. The example above could translate to system-wide increase in the economic product of transportation systems, economic improvement of entire geographic regions, and the value of many lives improved and saved, all through the research and propagation of greater knowledge.

[21] Due to rounding, totals may not sum correctly

Nutrient Management Certification Program

The University of Delaware Cooperative Extension offers initial nutrient management certification training in Dover and Georgetown. Statewide training sessions are led by UD Cooperative Extension, with oversight by the Delaware Nutrient Management Commission and the Delaware Department of Agriculture. The certification program leverages cutting-edge applied research and is unique among Chesapeake Bay states in that farmers and landscape professionals receive comprehensive nutrient management education on the following: water quality, fertilizer and manure management, animal mortality management, soil testing and plant analysis, and plant selection.



Since 2001, UD Cooperative Extension has certified more than 2,750 individuals at four certification levels (nutrient generator, private nutrient handler, commercial nutrient handler and nutrient consultant). The 140 private nutrient handlers certified between 2013 and 2016 indicated that they make nutrient management decisions on 36,303 acres of cropland in Delaware (8.3 percent of Delaware's 439,157 acres of total cropland).



"Few groups represent Delaware and its diverse interests as well as the University of Delaware has with its impactful research initiatives. The University showcased cutting-edge research spanning across many different industries, including health, education, energy, defense, the humanities, and the environment."

-Congresswoman Lisa Blunt Rochester (DE At-large)

UD Oyster Research

Delaware is the only coastal state in the U.S. that does not have an active oyster aquaculture fishery. Since 2014, the Center for Experimental & Applied Economics and the College of Agriculture and Natural Resources have been working collaboratively with national and statewide institutions to examine consumer preferences for oysters and support the proposed Delaware oyster aquaculture initiative. UD researchers based at the Hugh R. Sharp Campus in Lewes have been researching the best ways to market oysters and promote sustainable oyster aquaculture in Delaware that will benefit the Delaware economy.

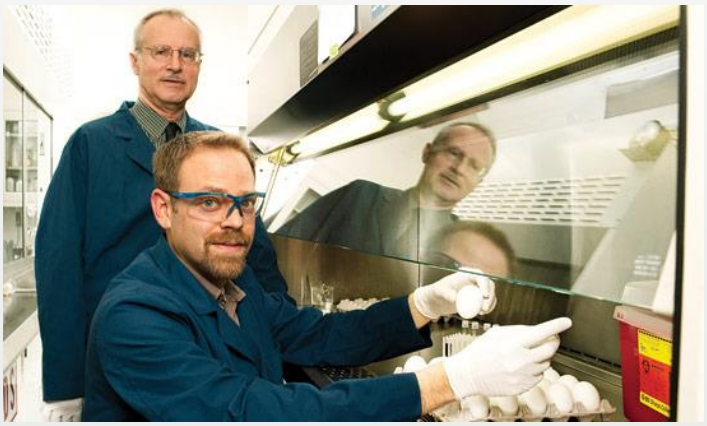


"We are all extremely excited to see oyster aquaculture come to our state, because oysters have the potential to be both good for the economy and good for the environment and it is somewhat rare that you see these two things go hand in hand."

– Sunny Jardine, Assistant Professor of Marine Science and Policy
College of Earth, Ocean, and Environment

Avian Biosciences Center

The health and safety of food is a vitally important aspect of life around the world. To that end, the University of Delaware's Avian Biosciences Center is dedicated to the prevention, control, and surveillance of avian diseases in poultry production. The Avian Biosciences Center takes a multifaceted approach to improving the quality and reliability of poultry production including the direct research of disease diagnostics and vaccinations, development of population surveillance methods, and the education and training of all steps in the poultry production chain. The Avian Biosciences Center applies these efforts everywhere, from partnerships with local producers and researchers, to providing assistance and guidance internationally.



"Our scientists and our veterinarians can observe what's going on in the field with any particular type of disease condition and reflect that very efficiently to researchers and others who can help develop mitigating ways of controlling disease through outreach and extension. That is very powerful and has kept us directly connected to the industry."

– Jack Gelb, Director of the Avian Biosciences Center

THE BIDEN INSTITUTE: CONNECTING ACADEMIC RESEARCH TO PUBLIC POLICY

The Biden Institute at the School of Public Policy and Administration is a new research and policy center focused on developing public policy solutions on issues ranging from economic reform and environmental sustainability to civil rights, criminal justice, women's rights and more. These problems are centered on UD alumnus and founding chair Vice President Joe Biden's two guiding principles: economic opportunity and social justice. Through its commitment to



Joe Biden and UD President Dennis Assanis

promoting civic engagement and policy solutions, the Biden Institute focuses on outreach to the UD student body and the rest of the world both through campaigns and public forums. The "Make It Count" campaign focuses on increasing voter registration and non-partisan civic engagement across the University and State of Delaware. In order to do this, the Biden Institute and the "Make It Count" campaign partnered with Democracy Works to bring TurboVote to the University. This allows students to have easy access to register to vote as well as reminders when it is time to vote.

The Biden Institute also provides a forum for policy discussions. Scholars will be invited to the UD campus to discuss ideas and policy solutions focusing on the future of work, education and training, the role of innovation, budget priorities, and modernizing infrastructure.

6.5 INTELLECTUAL PROPERTY

UD's research activities do not take place in a vacuum but rather are the starting point to the development of new technologies and businesses. Because of UD's strong presence as a research center, it is able to leverage partnerships with government organizations, industry leaders, and other parties to direct funds and focus efforts to support incredible research opportunities as articulated in the previous section. In addition to creating jobs for research staff and support personnel, UD's research enterprise contributes to new product development and technology commercialization. These returns on research through advanced knowledge and technology transfer in turn bring new jobs and businesses to the region.

The University's role in technology transfer—the process of advancing the intellectual output of researchers, faculty, and students from an academic concept into the marketplace—is essential to transforming groundbreaking research into meaningful innovations that improve people's lives and generate return on investment. UD's Office of Economic Innovation and Partnerships (OEIP) dedicates substantial resources in order to provide commercialization advice and services to members of the University's community interested in starting a company to commercialize UD intellectual property. Among them are assessments of patentability and analysis. The University leverages a staff of technical experts, business experts, and patent lawyers and agents to provide these services. **Since 2009 UD research and the ensuing work of the OEIP has generated 465 invention disclosures, more than 130 patents issued, and 58 licenses executed.**

Technology transfer is valuable beyond the marketability of new ideas and technologies developed by UD researchers—oftentimes, the idea becomes a new business. Data provided by the University reports that **26 startups have resulted from licensing of UD technology. And in recent years, UD startups have received more than $13 million in venture capital funding.** That number does not include the number of businesses started or supported through additional University of Delaware-connected entities such as the Small Business Development Center (SBDC) and the Delaware Technology Park (DTP), which will be discussed in the following subsection. This type of activity is important for Newark and Delaware because it represents a

rich ecosystem of fellow entrepreneurs and innovators being drawn to the area to be within proximity of a knowledge and innovation engine like the University of Delaware.

6.6 COMMERCIALIZATION AND ENTREPRENEURSHIP

The transformation of academic research from a patented idea and then into a successful business does not happen in isolation. Instead, it is a university's dedication to place, cultivating centers for innovators and entrepreneurs to gather and collaborate that produce the next successful startups. An ecosystem of research and scholarship, combined with nurturing concepts developed in the lab through technology transfer, leads to the commercialization of intellectual property; the intense focus that a university's resources offers thus catalyze entrepreneurial pursuits that produce breakthroughs that can save lives and new business ideas that can change the world. Commercialization of university-based research also plays a crucial part in creating new jobs and companies, attracting venture funding and human capital, and improving the region's economic competitiveness.



The University of Delaware serves as a catalyst for bringing many new ideas to market in that regard, providing unique spaces for current researchers and aspiring entrepreneurs to test out ideas and learn from experienced professionals throughout the state. And at the heart of all of UD's entrepreneurial activities are public-private partnerships. The University, through the OEIP, recognizes that leveraging the corporate expertise of private businesses, connecting with the talented faculty and students of higher education institutions throughout the state, and collaborating with public agencies will bring the greatest returns on investment to Delaware's research and innovation activities. **This emphasis on partnerships is representative of UD's core mission and values and has informed all of the ways that the University supports its faculty, staff and students to become entrepreneurs regardless of their training and discipline.**

The University of Delaware is dedicated to fostering and supporting businesses in its immediate community, the State of Delaware, and the University's greater region. Helping students, alumni, and community members turn innovative ideas into strong successful businesses improves the community's economic health, and helps the University continue to support more businesses and entrepreneurs. The University has established multiple campuses and sites for businesses to locate and benefit from shared resources, connections, and support. Often, these campuses focus on innovative scientific or technological entrepreneurial endeavors. Each initiative from UD supports the competitiveness and economic vitality of the community and the region (Table 6.3).

TABLE 6.3 – BUSINESS AND EMPLOYMENT IMPACTS FROM UNIVERSITY OF DELAWARE INCUBATOR AND PARTNERSHIP PROGRAMS

	SBDC	TTC	DTP	DTP @STAR	Spin In
Years of Impact	2017	2009-2017	2000-2017	2017	2015-2017
Companies Started	42	26	100	14	4
Capital Raised ($M)	$16	$19	$1,050	$30	-
Jobs Created/Retained	878	-	16,000	75	11

Source: The University of Delaware

SMALL BUSINESS DEVELOPMENT CENTER (SBDC)

The Small Business Development Center (SBDC) is an excellent example of UD's ability to improve the social and economic health of its community by leveraging local, regional, and national partnerships and assets. The SBDC is supported through agreement between the University of Delaware, the State of Delaware, and the U.S. Small Business Administration. The SBDC is a comprehensive business advisory service dedicated to helping new and growing businesses reach their true potential. Through the SBDC's efforts, many innovative businesses succeed and create lasting significant value in the community and local economy. In 2017, the SBDC helped start 42 new businesses, create 239 new jobs, and retain 639 existing jobs.

The SBDC works with many kinds of businesses, and with the Technology Transfer Center to help the transformation of patents into viable businesses. The impacts that the SBDC helps generate are spread throughout various industries, and are often seen at the forefront of innovation in those industries. In addition to private sector and entrepreneurial businesses, the SBDC is also home to the Procurement Technical Assistance Center (PTAC), which helps businesses work with various levels of government and is the only such program in the State of Delaware. In 2017, PTAC helped its clients receive over 600 government bids, corresponding to $117 million in contract value. This is another way in which UD expertise and resources are leveraged in helping Delaware bring in additional money to the State.

TECHNOLOGY TRANSFER CENTER (TTC)

The University of Delaware has generated and holds a number of patents and intellectual property (IP) assets. To create the greatest good possible from these assets, UD works to market and commercialize these assets. UD's Technology Transfer Center (TTC) works to facilitate this process, working with faculty, staff, students, and innovators associated with the University to assist with invention disclosure, patent issuance, and patent protection. The University leverages its scale and experience to absorb some of the more arduous aspects of these processes so that the creative minds at UD can continue to invent.

Faculty Spotlight: UD Faculty Found Technology Startup



A clinical nurse specialist in the University of Delaware's Nursing Resource Simulation Center, Amy Cowperthwait founded Avkin, wearable technology that simulates medically complex learning experiences on patient actors. Avkin is one of OEIP's growing number of success stories. Avkin has seven devices either on the market, in final testing, or in various stages of development. All have emerged from UD engineering students' senior design projects.

DELAWARE TECHNOLOGY PARK (DTP)

DTP is a partnership between UD, the State of Delaware, and the private sector which is a non-profit research park which provides development-stage life science, information technology, advanced materials, and renewable energy companies with access to the resources and connections needed to drive and accelerate their economic success. After 25 years, DTP has grown from a corn field to a 40-acre research park governed by a non-profit Board including UD, State, and private sector. Since its inception, there has been $300 million invested in the Park and an additional $300 million given to DTP through grants and other organizations. The Park is also responsible for helping to create more than 16,000 new jobs in the area. The five buildings house 50 companies and institutes that were born in DTP.



Delaware Technology Park



DTP@STAR Ribbon Cutting

DTP@STAR

Delaware Technology Park opened a facility on the University of Delaware's 272-acre STAR Campus in 2016 with a wet lab incubator called DTP@STAR. It offers flexible, state-of-the-art incubation space and access to the resources development-stage companies need to drive and accelerate their economic success. Fit out funding was enabled by a State loan of $3 million and EDA grant of $0.5 million. Throughout 2017, DTP@STAR saw the creation of 14 companies, $30 million of capital acquired, and 75 jobs created. The Lab also won 5 Small Business Innovation Research (SBIR) program awards. SBIR is a highly competitive awards-based program that allows small businesses to explore their technological potential and provide the incentive to profit from its commercialization.

Faculty Spotlight: UD Faculty Co-founder of STF Technology



Chemical and biomolecular professor, Norman Wagner, founded STF Technologies with UD 2003 alumnus Richard Dombrowski. STF develops flexible materials that can withstand impact, including needle-resistant surgical gloves and advanced space suits. The company holds its offices in the DTP@STAR wet lab.

SPIN IN

The "Spin In" program connects the University's undergraduate students with startups, businesses, and entrepreneurs from the community so that those students can apply their passion and education to real-life innovative business situations. This synergistic endeavor benefits all parties involved, and the community at large as well. Startups and entrepreneurs get to utilize new talent and fresh minds to find solutions to complex challenges. Students in the program experience first-hand

what entrepreneurship is, and come away with an understanding of how their studies truly apply to the real world. The work undertaken in Spin In often comes to fruition with successful businesses, products, and contributions to the regional economy.



Delaware Innovation Space

DELAWARE INNOVATION SPACE INC.

UD has also established Delaware Innovation Space Inc. in partnership with the State of Delaware and DuPont. Located in Wilmington at DuPont's Experimental Station campus, the space provides business incubation services and 100,000 square feet of labs and facilities for science-oriented entrepreneurs and startups. As of February 2018, the Delaware Innovation Space Inc. is more than two-thirds occupied and supports more than 170 jobs.

HORN ENTREPRENEURSHIP

Horn Entrepreneurship offers students lessons through evidence-based best practices and instructions from successful entrepreneurs. The results from this personalized approach are prepared students ready to adapt, thrive and lead in entrepreneurial roles with established companies, social ventures and startups. One of the centerpieces of Horn's programs is the Venture Development Center, which supports a wide variety of entrepreneurial and startup opportunities. These are unparalleled opportunities for students to let their ideas and innovations come to fruition.



The Inspiration Wall at the Venture Development Center

- Hen Hatch – Students, alumni, faculty, and staff are invited to develop and present startup concepts and present them in competition for startup funding. The program also provides a variety of workshops to give participants additional guidance on the entrepreneurial process. Beyond the competition itself, Hen Hatch provides visibility for the ventures and ideas of the UD community, and connects that community with assets and capital.

- Blue Hen Proof of Concept (BH-POC) – the BHPOC program was launched in 2017 to provide support and funding during the early stages of commercialization for entrepreneurs and inventors in the UD community. The program contains three major tracts: Student Prototyping, Faculty and Graduate Student Proof of Concept, and the

Postdoctoral Innovation Fellowship. Each tract is formulated to best aid its target, and synergizes with other UD programs and funds.

- National Science Foundation Innovation Corps Sites Program (NSF I-Corps) – the I-Corps at UD is supported through the cooperation of UD and the National Science Foundation. The program provides workshops, training, and grants for students and researchers to assess commercial viability for their ideas and innovations.

- Startup Village – The Startup Village, housed in the Venture Development Center (VDC) comprises a group of entrepreneurs, professionals, and industry experts providing consultation to UD innovators. The Startup Village provides free one-on-one appointments for UD entrepreneurs.

- Summer Founders – The Summer Founders program is a "pre-accelerator" program to help student ventures with early stage development. The 12 week summer program selects a small number of student ventures for an intensive series of mentoring, educational sessions and consultation.

Alumni Spotlight: UD Grads Founding New Business in Delaware



As students in 2012, students Mac Nagaswami and Greg Star launched Carvertise—a place where regular people could turn their vehicles into mobile billboards for brands eager to find a marketing edge. Since securing $200,000 in seed funding from UD's 17&43 Awards, Carvertise has 160,000 drivers and projected earnings of $2.5 million for 2018. While the startup has reach in 48 U.S. states, it has made its home in downtown Wilmington.

6.7 WHY THIS MATTERS

Innovation drives all advancement of human knowledge. Thus, society depends on innovation hubs, where human capital and research infrastructure can be concentrated in location and in focus to drive scientific discovery and entrepreneurial ingenuity. UD's staunch commitment to

being such a hub has produced and will continue to produce sizable gains in human knowledge, with profound implications to society as a whole.

The import of this hub of innovation assets, the related input of resources it draws, and the outputs it generates also have significant implications for the state. This is because regions compete in our modern knowledge economy by drawing in human and financial capital and by producing intellectual property and commercializable outcomes. This is what produces high-paying jobs, staves off obsolescence, and makes a region a great place to start, grow, stay, or relocate to.

This section has gone beyond the standard economic impact categories for a research university to emphasize the broader role UD plays in being an innovation engine, and the ways in which its collaborations with a wide range of partners has created a rich ecosystem of activity that produces results that drive the state economy, serve local communities, and advance society. **As it continues to fulfill its role as a generator of impact through innovation, UD will not only be responsible for a large and growing amount of statewide economic activity today, but position the state to be a vibrant economic contributor tomorrow.**

7.0 UD'S LOCAL COMMUNITY IMPACT

7.1 SECTION OVERVIEW



UD Engineering students volunteer with Newark Bike Project

The previous section built upon the four sections preceding it, which articulated the University of Delaware's economic impact from operations, capital investments, student and visitor spending, and alumni wage premium, by speaking to the broader societal gains produced by UD's presence and the effect of UD's work on the region's economic competitiveness. Producing gains to society and making the state of Delaware more economically competitive is an important part of the fulfillment of UD's institutional mission. This section speaks to another important aspect of UD living out its institutional values, which is engaging with and serving the local communities in which its campuses are located in ways that are mutually beneficial. As with the previous section about impact from innovation, UD's work in producing community benefits is accounted for in the economic impact calculations spelled out in previous sections, but warrants its own coverage because of the profound ways that that impact is greater than that which can be quantified.

UD's benefit to its immediate surrounding community comes in part from the fact that its economic footprint translates into employment for local residents and opportunities for local businesses. But its benefit is also to strengthen the community through service projects, the provision of municipal services and infrastructure, research and initiatives benefitting local agencies and industries, and public outreach throughout the state. By going forth into its surrounding community, through a wide range of community service and service learning initiatives, and by welcoming its surrounding community onto campus to enjoy numerous desirable resources, the University is fulfilling its institutional mission to strengthen the surrounding region.

7.2 UD VALUES IN ACTION

Institutions of higher education are anchored to the communities in which they reside. They have an innate responsibility to engage with the region in which they are based, and offer support and knowledge to encourage growth and development within the area. No longer are universities able to focus solely on their own progress, but must recognize the role that their community needs them to fulfill for advance progress. Said another way, **universities are realizing their need to pivot from intentionally detaching themselves from their surrounding environs in order to accomplish their academic objectives to intentionally engaging with their immediate neighbors in order for their academic efforts to be relevant and impactful.**

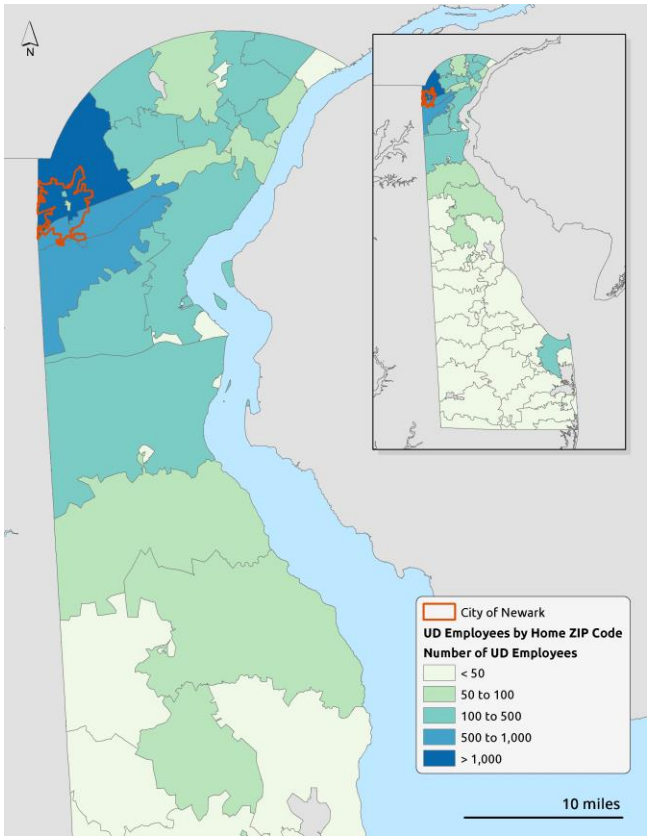
Through the University's motto, "Knowledge is the light of the mind," UD weaves its values throughout the institution by addressing academic freedom, diversity and inclusion, innovation, community, and service. Therefore, one of the University's most essential components is its dedication to the community and the services it provides both to the City of Newark and the State of Delaware. UD is committed to applying the institution's ingrained commitment of service to benefit the city, state and the Northeast Corridor. Through partnerships with government, industry and the community, the University is able to enhance their outreach and give an effective push towards economic and civic development. This creates a strong university-community partnership through a plethora of community-serving resources, volunteer opportunities for faculty and students, and active support for local businesses.

7.3 LOCALIZED ECONOMIC IMPACT

An important contribution the University of Delaware can and does make to its local community is ensuring that the economic opportunities represented by its annual operations are made available to local residents (in the form of employment opportunities) and local merchants (in the form of procurement opportunities). The University's presence in Newark and other local communities throughout the state yields an economic impact that is also localized, as employees spend earnings locally and as goods and services procured by UD represent additional economic activity and employment for local vendors. That results in overall economic impact increases, both because of the higher direct amount of operating activity and because of the larger area in which spillover effects can occur.

The University's commitment to local hiring and procurement reflects an understanding of the power of an institution's economic footprint as a mechanism for inclusive opportunity. Local hiring ensures that tax dollars are invested back into the local economy. The University of Delaware's FY2017 employment data shows that 31 percent of all part-time employees and about 40 percent of all full-time employees live within Newark and New Castle County.

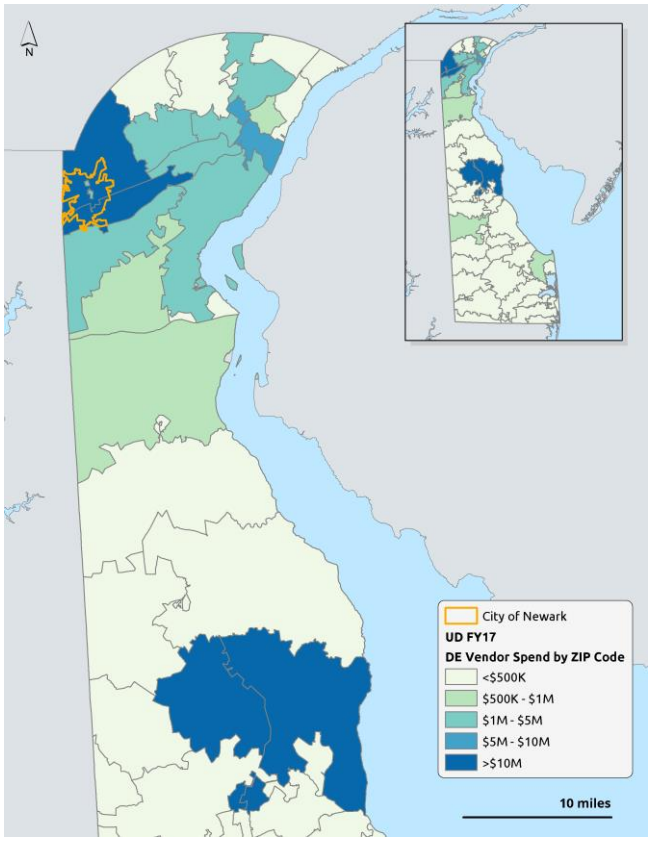
FIGURE 7.1 – UD EMPLOYEES BY ZIP CODE IN DELAWARE



Source: University of Delaware (2018)

In addition to the University being a major source of employment for the local community, the University also contributes to the area through its connections with local businesses. Vendor data from FY2017 shows about 25 percent of the University's total procurement went to vendors located in the City of Newark. The University also makes an effort to direct resources in under-represented categories when possible, spending $15.2 million in the last year on minority and women businesses and $19 million on small business enterprises (Table 7.1).

FIGURE 7.2 – VENDOR SPENDING BY ZIP CODE IN DELAWARE



Source: University of Delaware (2018)

TABLE 7.1- SUPPLIER DIVERSITY PROGRAM - TOTAL SUPPLIER SPEND FY 2017-2018 ($M)[22]

MBE	WBE	SBE	VBE	Total
$3.93	$12.35	$19.01	$1.21	$32.57

Source:** University **of Delaware

7.4 PROVIDERS OF PUBLIC SERVICES

As tax exempt entities, universities often face opposition from those who consider it wrong that large institutions are consuming public services without seeming to contribute their fair share of taxes to pay for them. As observed in the previous sections, the University of Delaware may be tax exempt but it is still tax generating, as its operations and other ancillary activities generate economic returns that yield significant tax revenues to local and state government. In this sub-section, we explore the ways UD is its own provider of services normally borne by the public sector, minimizing the expenditure burden on local governments and in some cases

[22] Columns don't sum because suppliers may be represented in more than one diversity program category.

supplementing Newark's municipal services as a gesture of neighborly collaboration. In these ways, UD is behaving as an anchor institution should, tending to many of its own public service needs to minimize its burden on local government, and investing real resources to provide critical services to its surrounding community in order to improve those areas and strengthen existing partnerships.

In areas such as public safety, snow removal, street repairs and emergency medical services, the University renders many of its own services within its campus. Some of these include police services, emergency snow removal support, as well as covering the cost of light post installations on main public streets and intersections such as Main Street and Delaware Avenue.

PUBLIC SAFETY

Of utmost importance to the University is ensuring a safe environment for students, faculty, staff, and visitors on and off campus. Like many institutions of higher education, UD maintains its own police force. The UDPD includes a patrol division, K-9 unit, bicycle patrol and SWAT team. The Community Resource Unit also assists other law enforcement agencies within the state such as the Delaware State Police, the Governor's Task Force, New Castle County Police, Mobile Enforcement Teams, U.S. Marshals Task Force, Joint Terrorism Task Force and Probation & Parole Safe Streets.



UD Police Force

In addition, UD works closely with local authorities to provide public safety throughout Newark and other host communities. UD participates in joint trainings with the Newark PD and Delaware state police. UDPD's LiveSafe app allows users to submit tips to law officials by texting a picture and video, live chat with UD Police, quick access to emergency phone numbers that initiate location tracking when dialed, a comprehensive safety map that pinpoints incidents on or near campus, and peer-to-peer location monitoring with a concurrent group chat feature called SafeWalk. UD also funds and runs ambulances both on and off campus to reduce the amount of calls received by the City.

AETNA HOSE, HOOK AND LADDER SUPPORT

Fire and emergency medical services are also important public safety functions that are typically provided by local municipalities. Here again, UD invests real resources to alleviate the burden it imposes upon the City of Newark and to work with local authorities to ensure a safe setting for all. The University of Delaware is in a partnership with local fire departments and has launched a course for its students to become EMT volunteers in the local community. Each year between 10 and 12 students volunteer with this company. The ultimate goal for this program is to encourage students interested in the medical field to become local EMT volunteers in the community. The University is devoted to this partnership and donates $45,000 a year to Aetna Hose, Hook and Ladder Support.

CHARLES EMERSON BRIDGE

The Charles Emerson Bridge construction was canceled after running short on funding; however, plans for the pedestrian/bicycle bridge were revived after the University of Delaware made a substantial pledge to the long-planned project. With the help of donations from the government and the University, the City of Newark was able to build a safe bridge for the community to use as a connecting path between Kershaw Park and the new Curtis Mill Park. [23]



Artist rendering of proposed pedestrian/bicycle bridge

STAR HEALTH

Through the launch of STAR Health, the University of Delaware demonstrates commitment to the community by offering comprehensive health clinics to the public. All under one roof, patients have access to the Nurse Managed Primary Care Center (NMPCC), Delaware Physical Therapy Clinic, and the Speech-Language-Hearing Clinic. At NMPCC, patients 13 and older have access to services such as complete physicals, adult immunizations, women's health examinations,

[23] Shannon, Josh. "Newark City Council revives bridge project after new funding sources emerge." *Newark Post Online,* 19 Sept 2017. Accessed 25 July 2018.

illness treatment, injury care, and chronic illness management. NMPCC also offers nutrition counseling, health coaching, exercise counseling, and other prevention wellness services. Other clinics within NMPCC include a Parkinson's disease clinic as well as the new concussion clinic. To emphasize its commitment to community, the STAR Health Nurse Managed Primary Care Center offers discounted rates to patients without insurance that range from $75-$100 depending on the services provided.

The Physical Therapy Clinic – linked to the nation's number one physical therapy graduate program, as ranked by *U.S. News and World Report* – its patients a unique environment where physical therapists, students, and researchers work together for optimal treatments. Patients from all over the region come to the clinic for treatments concerning sports and orthopedic injuries such as neck and back injuries, shoulder and knee injuries, and patients with arthritis, as well as patients with neurological injuries and older adults.

The Speech-Language-Hearing Clinic serves children and adults suspected of having communication disorders such as articulation, voice, motor speech disorders, swallowing disorders, cognitive-communication, and oral and written language. Once seen and evaluated on their speech and language behavior, those diagnosed with impairments are then able to receive individual or small group treatment services. Opened in 2015, this clinic is a major asset for the Newark community, especially since UD's related graduate training program is the first in the state, working to address the shortage of speech pathologists in Delaware.

7.5 CAMPUS AS AN AMENITY

In addition to reaching into its surrounding community to engage and commit, the University of Delaware works to welcome the surrounding community onto its campus, where it can partake of many of the same resources available to students and staff. Its campus has thus become a package of amenities that improve the quality of life for local residents. Maintenance of park space and library resources, as well as provision of cultural and community programming, are often significant expenditure outlays made by local governments for the benefit of their citizens, and **this sub-section highlights several ways UD invests significant resources to freely offer those highly desired quality of life amenities on campus.**

GREEN SPACE

Expansive green space throughout campus is a significant amenity that UD provides to the surrounding community. A noteworthy example is the 12 diverse gardens covering 15 acres of the campus. The College of Agriculture and Natural Resources has collected a diverse variety of plants and garden styles to offer beauty, respite, and horticultural interest. Free of charge during all



UD Botanic Gardens

seasons of the year, the gardens provide exclusive views to the community of the seasonal highlights.

University of Delaware Morris Library

As an academic institution, the ability to contribute to the state of public education is of particular importance and resonance. The University of Delaware's Morris Library is open to the community 100 hours per week. The Library provides electronic access to the complete Web, the online catalog DELCAT Discovery, more than 360 Library Databases, and over 37,000 current journals and newspapers via full-text databases and electronic journals. The library is also open for tours and orientation to local schools.

It also offers a unique Special Collections section. The section includes rare books of art, history and literature, and valuable examples of fine bookmaking and lithography. It is home to rarities such as copies of the Emancipation Proclamation and the 13th Amendment, signed by Abraham Lincoln; manuscripts and correspondence from Ernest Hemingway, Kurt Vonnegut, Tennessee Williams and others; rare materials on alchemy that draw Harry Potter fans to UD; the first edition of Isaac Newton's *Principia*; and more than 9,500 items of Victorian literature and art form the Mark Samuels Lasner collection.

Roselle Center for the Arts

The University of Delaware is also home to many talented performers. Members of the community are able to enjoy many performances by the Residence Ensemble Players (REP) for a low cost at the **Roselle Center for the Arts.** This performing arts and educational facility has two theaters, the Wilhelmina Press Thompson Theatre and the Studio Theatre, with ample opportunities to enjoy a large variety of performances. With an average of six shows a year, the REP produces a wide range of classic, modern, and contemporary plays.



Roselle Center for the Arts' Thompson Theatre

Osher Lifelong Learning Institute

The UD Division of Professional and Continuing Services offer a unique opportunity for adults 50 and over to engage with UD's academic resources at the Dover, Lewes and Wilmington campuses. Moreover, admitted students, who are Delaware residents and 60 years of age or older are able to take credit courses on a space-available basis with no tuition charges.

Campus Events Open to the Public

As a neighbor and member of the Newark community, the University of Delaware offers its campus to host many events for the community's entertainment that are either free of charge or affordably priced.

Ag Day is an annual tradition hosted by the College of Agriculture and Natural Resources. Members of the community are encouraged to come and enjoy a day of music, exhibitors, great food, and fun for all ages. Visitors can experience everything from livestock exhibits, 4-H arts and crafts, hayride farm tours, and much more all free of charge.

The City of Newark's annual fall festival, **Community Day**, is also held at UD. Community Day is a family-friendly event that hosts almost 300 vendors and several stages for music and performances. The day offers fine art, homemade crafts, and community information booths by local businesses and organizations. UD also offers the campus to be used for 4th of July fireworks, the Halloween Parade, Winterfest, Spring Concert Series and Newark's Youth's Got Talent. All of these events are held on University grounds with no fee to its organizers for using the land.



Newark Community Day



Annual Coast Day at the Lewes Campus

Coast Day is sponsored by the College of Earth, Ocean and Environment and by the Delaware Sea Grant College Program. The day is held at the University of Delaware's Lewes Campus and celebrates marine science and seafood. With free admission, those in attendance get to explore research ships, enjoy close-up encounters with marine life, sit in on panel discussions about marine life conservation, compete for prizes, and eat fresh cooked seafood.

Athletic Events

Since 1889, the University of Delaware has been rich with its tradition of athletics. With a wide variety of sporting events, members of the community are able to attend games at either a low cost or free of charge. To encourage the community to get involved, the Blue Hens host their annual Fandemonium, a day full of free entertainment that includes games, inflatable interactive activities for all ages, music, food sampling, giveaways, and more as they cheer on the Blue Hens' football, softball, and baseball teams.



Alumni Spotlight

Over a four-decade career and a childhood growing up in Delaware, **Vest Johnson** has established himself as a fixture not only within Delaware but in UD Athletics. After graduating from the University of Delaware, he joined the Athletics Department, ultimately serving as associate director of the Bob Carpenter Center (BCC). During Johnson's time managing events at the BCC, the Center has served not only the University, but also the surrounding community, as a host for special events, concerts, and festivals.

7.6 PARTICIPATION IN IN COMMUNITY SERVING EFFORTS

As an anchor institution, the University of Delaware is committed not only to serve the community but also to engage in mutually beneficial partnerships in the local community to enhance the region's quality of life. The University invests heavily within the community through volunteer activities, service learning, and a wide range of educational and financial contributions that reflect its institutional values and a stated commitment to measurable impact. Reciprocity in partnerships and redoubled efforts to improve communication and understanding around common interests have improved the University's ability to strategically engage diverse stakeholders that call the region their home. Sustainable Newark and Downtown Newark Partnership are two particularly illustrative examples of UD leveraging its physical presence, commitment to place, and institutional resources to partner with local entities to enrich their shared community.

SUSTAINABLE NEWARK

Sustainable Newark is a broad, long-term and integrated community sustainability plan. The goal of Sustainable Newark is to provide feasible benchmarks and strategies to achieve Newark's vision of being a "sustainable community". UD is a partner of the project and UD's Sustainability Officer is a member of the steering committee.

DOWNTOWN NEWARK PARTNERSHIP

The Downtown Newark Partnership is a public-private partnership dedicated to the aesthetic, economic, cultural and social enhancement of downtown Newark. The Partnership has created a unique environment in which the City of Newark, businesses, residential communities, and the University of Delaware can work together toward a common goal: the ongoing enhancement of downtown Newark with mutual benefits. The University of Delaware makes annual contributions to the Partnership and provides free event space for annual events.

7.7 DIRECT SERVICE TO THE COMMUNITY

In 2017, 14,000 UD students performed 250,000 hours of community service.

Another way the University of Delaware demonstrates its leadership as an anchor institution in Delaware is by developing ways to deploy its institutional resources to serve and connect with its immediate community. In 2017 alone, the University's community service hours totaled 250,000 hours spent by 14,000 UD students. This is a fulfilment of its institutional mission and of President Assanis's focus on UD as a public-serving university. The University's sustained community engagement efforts have earned it the Carnegie Community Engagement Classification and a place on the President's Higher Education Community Service Honor Roll. Through its partnerships and programs, UD is able to make resources available to the community both on campus and in the local neighborhoods.

THE CIVIC ACTION PLAN

Established in February 2016, the Civic Action Plan projects the strategic vision for strengthening the University of Delaware's identity as an engaged research University. The four designated staff members hold responsibility for implementing the Plan, while calling upon members from across the University to join the Campus Compact Council in order to write the Civic Action Plan. This offers an opportunity to develop partnerships throughout the campus that strengthen engaged scholarship for the faculty, staff, and students. Deans of all seven colleges have already produced statements expressing the connection between community engagement and the colleges' mission and priorities. The pursued actions of the Plan are within the areas of institutional capacity, faculty and staff scholarship, student opportunities, community engagement partnerships, and strengthening UD's local and global impact.



Student Spotlight: Students Show Support for Local Community Organizations

Save your energy for when it counts—that's a trick **Marissa Snyder** picked up during her three years of participating in UDance, which raises money for families fighting childhood cancer. Through UDance, student organizations raise money and sponsor a child through the Andrew McDonough B+ Foundation. The Marathon began a decade ago and raised just $8,000. The total has grown steadily since then, and in 2018, UDance raised $2.02 million.

Community Engagement Ambassadors Program

As a student-led program, Community Engagement Ambassadors help to educate their peers about community service as well as connect students to volunteer opportunities. The students chosen for the program are essential in helping expand the outreach of the Community Engagement Initiative by recruiting students.

Partnership for Healthy Communities



UD students write inspiring messages for young students

Partnership for Healthy Communities (PHC) was launched in October 2017 with the mission of mobilizing UD's research, educational, and public service capacities to improve the health and wellbeing of Delaware residents and others across the nation, particularly those living in communities characterized by social and economic disadvantage. To do this, PHC fosters partnerships with community-based organizations, state and local agencies and communities themselves. The Healthcare Theater is one of their initiatives to improve service capacities. Theatre students are trained to portray patients and family members so that health sciences students can practice both technical and interpersonal skills in a safe environment without compromising quality of care.

Partnership with Habitat for Humanity



Habitat for Humanity in Sussex County

Through an initiative spearheaded in Spring 2018, the Office for International Students and Scholars began a new service learning initiative to focusing on service projects for both undergraduate and graduate students at UD. Through this initiative, the University partnered with Habitat for Humanity, allowing students to work alongside local residents from Sussex County to help build safe and affordable houses for families in need.

Partnership for Public Education

Launched in November 2016, the Partnership for Public Education's (PPE) mission is to bring together members of UD and the broader Delaware educational community to identify shared needs and opportunities and to facilitate the exchange of knowledge and resources for the betterment of Delaware public education. PPE will mobilize interdisciplinary research, educational and public service capacities to provide sustained assistance to Delaware schools with low-income and other at-risk students. In order to fulfill this initiative, PPE has identified 109 partnerships. For example, the College of Education and Human Development has partnered with Christiana High School and Stubbs Elementary School in order to improve K-2 literacy instruction,

integrate educational technology to support instructional and administrative activities, develop a system of support for positive behavior and mental health, promote community involvement in the school, and place UD teacher candidates in field experiences supervised by UD field instructors and Stubbs' clinical educators.

Partnership for Arts & Culture

Launched in 2018, the Partnership for Arts and Culture (PAC) operates in a coordinated and complimentary manner with other departments, institutes and centers across the university, and within the greater community. PAC supports the development of new partnerships, strengthens existing partnerships and serves as a repository/ resource for artistic and cultural collaborations with a specific focus on global understanding and social change.

Citizen Monitoring Program

At the University of Delaware Lewes campus, students are able to participate in the Citizen Monitoring Program. The program is made up of dedicated volunteers who take water samples on a regular basis along Delaware's coastal watershed to measure a broad range of important water quality characteristics. This data is then given to scientists and resource managers to understand a clearer picture of the estuary's health and trend the information needed to understand and manage the ecosystem.



Citizen Monitoring Program

Partner4CS

Partner4CS was initiated by the University of Delaware in 2012 to create partnerships throughout the State of Delaware to address the goals of national computer science programs, CS10K and Computing in the Core. The goal is to increase participation in computer science among K-12 teachers and students. Aspects of the program include offering an annual paid Professional Development Summer Workshop during the summer for K-12 teachers interested in assimilating computer science into their curricula, as well as organizing an annual Summit CS Education in Delaware.

Upward Bound and Upward Bound Math/Science

Under the federal TRIO program, the University of Delaware offers both the classic Upward Bound (UB) and Upward Bound Math/Science (UBMS) programs to serve local high school students who are potentially the first in their families to attend college or are from low-income families with the potential to pursue and complete a baccalaureate degree. Many students

involved in the program come from Christiana, McKean, Glasgow, or Newark high schools. UB and UBMS help prepare and guide these students through the college application process by offering a summer on campus college experience and assisting the students plan for college during the academic year. Other benefits to the program include SAT and college application fee waivers, special scholarships, workshop attendance incentives, and weekly stipends throughout the summer program.

Sea Grant College Program

The College of Earth, Ocean, and Environment and the Sea Grant College Program offer a multitude of free or low-cost K-12 resources to teachers who are looking for information and curriculum materials on earth, ocean, and environmental sciences. The Sea Grant offers programs such as the NOAA Teacher at Sea Program that allows teachers to experience working at sea with world-renowned NOAA scientists as well as annual conferences. They also offer students opportunities such as essay contests, Boy Scout oceanography merit badges, and the Chesapeake Bay Bowl science competition. Almost 11,000 K-12 students are reached annually.

7.8 WHY THIS MATTERS

The University of Delaware devotes a number of resources to participate in meaningful partnerships with its community—in Newark and across its campuses in Wilmington, Lewes, Dover, and Georgetown. Community engagement at UD takes on a myriad of definitions, including being a good neighbor by opening campus to the community, offering educational opportunities to local residents, and creating new programs for students to engage in service. In addition, UD provides public services such as police and public safety to campus, ensuring that campus operations do not absorb municipal resources from the City of Newark's surrounding communities. The University also offers access to recreation space, facilities, athletic and educational programs. These actions taken together **demonstrate UD is an engaged institution, committed to a place and its well-being, and eager to connect aspects of its mission to the needs of the local and regional community.**

8.0 CONCLUSION

8.1 TOTAL ECONOMIC IMPACT

The University of Delaware's aggregate economic impact derives from direct, indirect, and induced effects in four mutually exclusive categories of economic activity directly attributable to the institution:

1. *Annual Operations,* including the broad base of employment, procurement, and administration activities that comprise the daily activities of the institution. These impacts are estimated at $1.42 billion annually within the state of Delaware.

2. *Capital Investments*, including the large-scale construction and renovation of academic facilities. These impacts are estimated at $144 million annually within the state.

3. *Student and Visitor Spending,* reflecting off-campus expenditures by students and visitors drawn to the area by UD that support the local hospitality, food and retail industries. These impacts are estimated at $227 million annually within Delaware.

4. *Wage Premium*, reflecting the incremental earning and spending power of the local workforce attributable to the educational activities of UD. These impacts are estimated at $1.01 billion annually within the state.

In the aggregate, the University of Delaware generates an annual economic impact of approximately $2.81 billion within the state, supporting nearly 24,500 jobs and $1.16 billion in earnings (see Table 8.3). **That impact means that for every dollar the State invests in UD, the University produces $23 in economic activity within the state.**[24] $1.27 billion of that impact takes place within Newark, supporting 15,390 jobs and $733 million in earnings (see Table 8.1). Importantly, UD's impact is felt throughout the Northeast Corridor, largely through the economic contributions of alumni located in New York City, Philadelphia, Washington, and other major cities. Within the Northeast Corridor, UD is responsible for an annual economic impact of $4.68 billion, supporting almost 33,320 jobs (see Table 8.4).

TABLE 8.1 – AGGREGATE ANNUAL ECONOMIC IMPACT OF UD ON THE NEWARK ECONOMY

Impact Type	Operations	Capital Investments	Student/Visitor Spending	Alumni Wage Premium	Total
Output ($M)	$1,004	$83	$97	$89	**$1,273**
Employment Supported (FTE)	13,700	390	800	500	**15,390**
Earnings ($M)	$645	$26	$35	$26	**$733**

[24] These numbers are based off of the FY 2017 Financial Statement.

TABLE 8.2 – AGGREGATE ANNUAL ECONOMIC IMPACT OF UD ON THE NEW CASTLE COUNTY

Impact Type	Operations	Capital Investments	Student/Visitor Spending	Alumni Wage Premium	Total
Output ($M)	$1,295	$127	$213	$834	**$2,469**
Employment Supported (FTE)	15,200	600	1,600	4,800	**22,200**
Earnings ($M)	$727	$40	$53	$246	**$1,066**

TABLE 8.3 – AGGREGATE ANNUAL ECONOMIC IMPACT OF UD ON THE DELAWARE ECONOMY

Impact Type	Operations	Capital Investments	Student/Visitor Spending	Alumni Wage Premium	Total
Output ($M)	$1,424	$144	$227	$1,013	**$2,808**
Employment Supported (FTE)	16,100	700	1,750	5,900	**24,450**
Earnings ($M)	$765	$45	$57	$294	**$1,161**

TABLE 8.4 – AGGREGATE ANNUAL ECONOMIC IMPACT OF UD ON THE NORTHEAST CORRIDOR ECONOMY

Impact Type	Operations	Capital Investments	Student/Visitor Spending	Alumni Wage Premium	Total
Output ($M)	$1,622	$162	$252	$2,648	**$4,684**
Employment Supported (FTE)	17,000	720	1,800	13,800	**33,320**
Earnings ($M)	$825	$60	$74	$866	**$1,825**

8.2 THE UNIVERSITY OF DELAWARE VALUE PROPOSITION



UD Newark Campus

An important takeaway from this report is how UD produces substantial economic returns as a result of its expenditure and employment, the tax revenue impacts from its annual operations, the wage premium enjoyed by graduates who stay in the region, its capital investments, and ancillary spending by students and visitors. While UD is an important economic engine for Newark, Delaware, and the Northeast Corridor, it is important to recognize how UD's mission inspires its operational footprint and indeed drives the University's economic impacts.

As an institution of higher education, UD's core mission is to spread knowledge and intellectual curiosity throughout its communities; this mission is further articulated through five core values: academic freedom, diversity and inclusion, innovation, community, and service. It is through this lens of community and service that the University of Delaware has established a commitment to its local and regional communities, engaging in meaningful partnerships to enhance the education, scholarship and research of its own campus community while working collaboratively with public and private partners to inspire change and drive innovation that will enhance the quality of life of Delawareans and the broader world.



Students participate in the Science and Engineering Leadership Initiative



UD welcomes the community for Coast Day

The unique dynamic of UD's partnerships with Delaware and its residents for advancing knowledge and innovation within the state is what makes the University of Delaware's economic impacts not only possible but also meaningful. At a time when cities and regions need their institutions of higher education to step up and become inclusive places that educate, innovate, and serve, UD is rising to the challenge. UD's longstanding investments in broad-ranging partnerships, educational opportunities, and innovation infrastructure demonstrate an institutional commitment to the City of Newark and the State of Delaware that has long been a part of the University's core mission and values.

UD's value proposition has never been greater or more needed. Through its operating footprint, its capital investments, the student and visitor spending it draws in, and the wage premium it confers upon its alumni, UD is producing significant economic impact and supporting employment within its host communities, for the state of Delaware, and throughout the Northeast Corridor. But more important than the impacts UD is producing for today is the potential for good that UD is building for tomorrow: **strong communities in Newark and other municipalities where UD has a campus presence, an economically competitive and commercially resilient Delaware anchored by scientific discoveries and entrepreneurial ventures birthed at UD, and an entire Northeast Corridor mega-region fueled by the contributions of UD alumni in a wide range of disciplines.** UD's value proposition—to produce impact through a community of innovators whose work produces benefit at a local, statewide, and mega-region level—is clearly defined and is being fulfilled.

APPENDIX A – IMPACT METHODOLOGY

This section describes the methodology used to estimate the full range of economic activity, tax revenue generation, and social impact associated with the University of Delaware direct economic activity. Economic impact estimates are generated by utilizing standard input-output models to translate an initial amount of direct economic activity into the total amount of economic activity that it supports. This includes multiple waves of spillover impacts generated by spending on goods and services and by spending of labor income by employees. The description that follows reviews the scope of that analysis and describes the basic methodologies, tools and concepts utilized to quantify the economic, fiscal and social impact of UD (see Appendix C for additional detail).

ADDITIVE VS. ILLUSTRATIVE

While a variety of impacts associated with the University of Delaware's activities are analyzed and described within this report, care has been given to understanding which impacts are unique and therefore sum to the total economic and tax revenue impact figures documented in the conclusion of the report.

- Methodologies used to estimate impacts in Sections 2, 3, 4, and 5 (University Operations, Capital Investments, Student and Visitor Ancillary Spending, and Wage Premium, respectively) are chosen to ensure that these impacts are mutually exclusive and therefore additive. For example, Section 4 only includes spending by students and visitors that is "ancillary" (i.e. not accruing to UD through categories like on campus room and board), and therefore are not reflected as part of the operations quantified in Section 2.

- Impacts described in Sections 6 and 7 (Broader Societal Impact and Local Community Engagement) largely stem from programs and efforts originating within UD's operating budget. Therefore, these impacts cannot be added to impacts from operations calculated in Section 2 without some degree of double counting. These sections therefore focus on the qualitative implications of the University's activity and are illustrative of different ways UD produces a local or global social impact.

GENERATING THE COUNTERFACTUAL ("COMPARED TO WHAT?")

It is important for an economic impact study of this type to clearly define the counterfactual scenario against which the economic impact of the institution is being measured. Differing conceptual and methodological approaches to which impacts are appropriately attributable to universities can yield wide variation in reported results, yet these assumptions too often remain implicit rather than explicit within the study methodology.

Broadly, economic impact reports can estimate the magnitude of either the total gross impact of an institution (or project, policy, etc.) or its net impact. In a gross impact analysis, overall impact amounts are determined for an institution without regard to what activity would have otherwise taken place in the geography absent that institution. A net impact analysis develops a counterfactual scenario which attempts to estimate activity levels that would have occurred in place of the institution in question, and nets those activity levels out of the total institutional impact.

This analysis, like most standard economic impact analyses, broadly utilizes a gross impact approach. This methodology is appropriate in part because alternative development paths are largely speculative. For example, simulating alternative uses for UD's campus or the alternative development of the Newark regional economy since the institution's founding would produce a wide range of results that could not be reliably compared to the known activity level of the University. Indeed, it is unknown whether level of activity "replacing" the University would represent a net positive or negative for the local economy. While University activity may "crowd out" activity in other sectors (particularly with respect to the physical footprint of the campus), knowledge activity also generates significant spillovers into the broader regional economy, and the human and intellectual capital effects of premier research institutions are major business attractors.

In addition, this analysis employs a counterfactual in which the University of Delaware does not exist, rather than a scenario in which the identical activities are somehow transported to a different geography, or one in which other universities increase their activity levels by a commensurate amount to absorb this lost activity. Thus, the benefits to employees and students of the university are not understood to be simply shifted in their geographic scope, but representative of an overall increase in level of activity in the educational sector due to the existence of UD.[25] Further, from a geographic standpoint, benefits are not confined to those residents that would have been within the geographic boundaries absent of the University, but rather reflect the role of the institution in drawing activity into the region, which includes the importation of new students, faculty, administrators and researchers who would likely reside and work elsewhere absent the University.

[25] Note that while specific University of Delaware students, faculty and administrators would more than likely find alternative universities absent UD, that shift would in turn "bump" students or employees from those universities to another university, and so on throughout the educational sector, until eventually a set of current students and employees were underserved due to the overall decrease in the size and activity of the sector.

APPENDIX B – ECONOMIC AND FISCAL IMPACT MODELS

Economic impact estimates are generated by estimating the initial amount of direct activity occurring within each geography of interest (as detailed in Appendix C), and then using input-output models to translate this direct economic activity into the total amount of economic activity that it supports. Expenditures within a given geography give rise to "spillover" impacts when those dollars are recirculated to suppliers and to employees within the local and state economy. In so doing, they also support additional employment and earnings, and generate tax revenue for local governments and for the State of Delaware.

ESI has constructed an input-output model of the regional and state economy using IMPLAN software to estimate the total impact of these expenditures. The detail that follows explains briefly the theory behind input-output modeling, the mechanics of utilizing it to estimate economic and employment impacts, and the fiscal model utilized to estimate tax revenue impacts to local and state government from the University of Delaware's economic activity.

INPUT-OUTPUT THEORY

In an inter-connected economy, every dollar spent generates two spillover impacts:

- First, some proportion of the amount of the expenditure that goes to the purchase of goods and services gets circulated back into an economy when those goods and services are purchased from local vendors. This represents what is called the "indirect effect," and reflects the fact that local purchases of goods and services support local vendors, who in turn create business-to-business transactions when they purchase from their own set of vendors.

- Second, some amount of the proportion of that expenditure that goes to labor income gets circulated back into an economy when those employees spend some of their earnings on various goods and services. This represents what is called the "induced effect," and reflects the fact that some of those goods and services will be purchased from local vendors, further stimulating a local economy.

The role of input-output models is to determine the linkages across industries in order to model out the magnitude and composition of the spillover impacts to all industries of a dollar spent in any one industry. The total economic impact of University of Delaware is the sum of its own direct economic footprint, plus the indirect and induced effects generated by that direct footprint (see Figure 2.2).

INPUT, OUTPUT, AND FISCAL MODEL MECHANICS

To model the impacts resulting from the direct expenditures generated by University of Delaware, ESI developed a customized economic impact model using the IMPLAN input/output modeling

system. IMPLAN represents an industry standard approach to assess the economic and job creation impacts of economic development projects, the creation of new businesses, and public policy changes.[26]

These economic impacts in turn produce one-time or ongoing increases in various tax bases, which yield temporary or permanent increases in various tax revenues. While higher education institutions are non-profit and are typically exempt from some local tax types, the economic activity and employment generated by them produces increases across a number of tax bases and therefore produces tax revenues for the jurisdictions within which they are located.

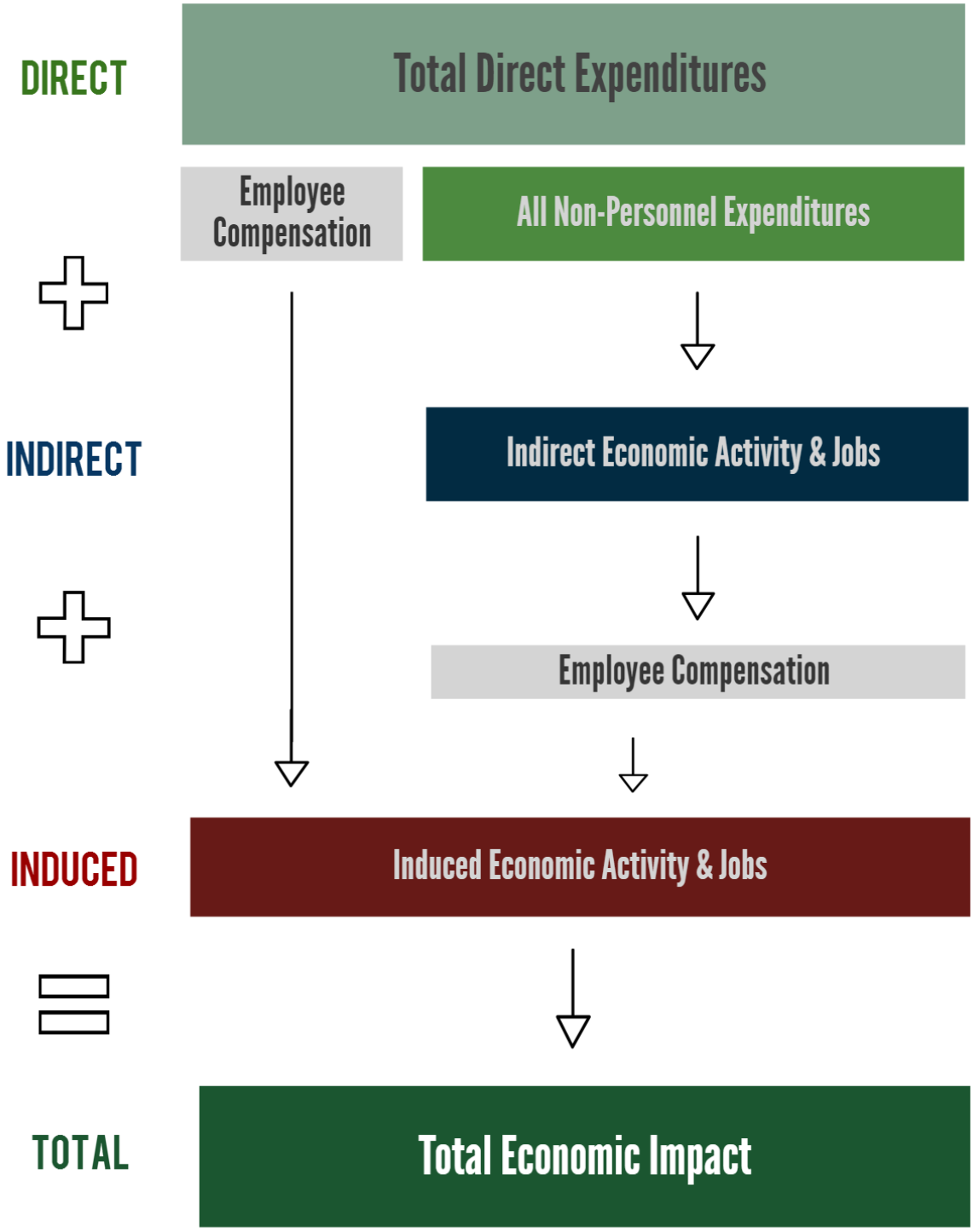
To estimate these increases, ESI has created a custom fiscal impact model to translate total economic impacts into their commensurate tax revenue gains. Output from the IMPLAN model determines its impact on the relevant tax types and tax bases associated with the jurisdictions in which revenue impacts reside. These include income, sales, and business taxes at the state level, which are modeled in this report, as well as relevant taxes for various local jurisdictions, which are not modeled in this report because they are of smaller amounts.

TAX REVENUE IMPACTS

The direct, indirect and induced economic output from the University of Delaware's activity produce increases in various tax bases, which in turn lead to increased tax revenue collections for local governments and for the state. While IMPLAN produces estimates of these tax revenue amounts, ESI's does not utilize these results directly. Instead, we utilize a custom fiscal model that relies on the known relationships between various types of economic activity and tax collections (i.e. effective tax rates) to translate the increases in activity estimates by IMPLAN into attendant tax revenue results for the City of Newark and State of Delaware.

[26] IMPLAN is one of several popular choices for regional input-output modeling. Each system has its own nuances in establishing proper location coefficients. IMPLAN uses a location quotient to determine its regional purchase coefficient (RPC). This represents the proportion of demand for a good that is filled locally; this assessment helps determine the multiplier for the localized region. Additionally, IMPLAN also accounts for inter-institutional transfers (e.g. firms to households, households to the government) through its Social Account Matrix (SAM) multipliers. IMPLAN takes the multipliers and divides them into 440 industry categories in accordance to the North American Industrial Classification System (NAICS) codes.

FIGURE 2.2 – ECONOMIC IMPACT METHODOLOGY



Source: IMPLAN (2015), Econsult Solutions (2017), Piktochart (2017)

APPENDIX C – ANCILLARY SPENDING

C.1 ANCILLARY STUDENT SPENDING

The first step to calculate ancillary student spending is to define total annual student spending by category. Base spending data is provided by University of Delaware, which lists an approximate annual student budget for room, board, expenses, and transportation costs totaling $15,132 to $16,432 for on-campus and commuter students and $15,132 for off-campus students (see Table C.1 and Table C.2). For the purposes of this analysis, the three types of students can be defined as follows:

- On-campus students: Students who live in UD-operated housing on campus and typically eat the campus dining hall using the meal plan

- Off campus students: Students who live in apartments or houses and pay rent to landlords not affiliated with UD

- Commuter students: Students who attend UD part-time or full-time and live wither with their parents at home or within the region. It is conservatively assumed that any rent paid by these commuter students is either non-existent (if they are living with their parents) or not attributable to UD as they would likely be paying the same rent or living in the same location regardless of their enrollment at UD.

It is necessary, however, to account for the proportion of this spending that is captured by UD itself. Since the revenue generated by the institution is ultimately reflected in UD's operating budget, impacts from this spending are represented in the calculations of UD's annual operating impact detailed in Section 2 of this report. This spending must therefore be excluded from student spending estimates, which reflect only ancillary spending not captured by UD, and may therefore be added to the operating impacts from Section 2. Room and board expenses for on-campus students are assumed to primarily accrue to UD, as is a portion of other expenses by on-campus and off-campus students to reflect the UD-operated retail options likes the UD bookstore and dining facilities. As such, we have made conservative estimates for ancillary student spending by on-campus, off-campus, and commuter students which we then apply to the student financial aid office's academic year budget to produce annual ancillary spending estimates for on-campus, off-campus, and commuter students (see Table C.1 and Table C.2).

TABLE C.1 – ANNUAL ANCILLARY SPENDING ESTIMATES FOR ON-CAMPUS AND COMMUTER STUDENTS

		On-campus Students		Commuter	
Spending Category	**On-campus/ Commuter Spending per academic year**	**% Spent outside of UD**	**Average amount Spent Outside UD**	**% Spent outside of UD and attributable to UD**	**Average amount Spent Outside of UD**
Rent	$7,462	0%	$0	0%	$0
Food	$4,870	10%	$487	50%	$2,662
Transportation (On-campus)	$800	100%	$800	-	-
Transportation (Commuter)	$2,300	-	-	100%	$2,300
Retail	$1,000	100%	$1,000	50%	$500
Total per student (On-campus/Commuter)	**$15,132 / $16,432**		**$3,287**		**$6,462**

Source: University of Delaware (2018), Econsult Solutions (2018)

TABLE C.2 – ANNUAL SPENDING ESTIMATE FOR OFF-CAMPUS STUDENTS

		Off-campus Students	
Spending Category	**Off-campus Spending per academic year**	**% Spent outside of UD**	**Average amount Spent Outside UD**
Rent	$7,008	100%	$7,008
Food	$5,324	100%	$5,324
Transportation	$800	100%	$800
Retail	$2,000	100%	$2,000
Total per student	**$15,132**		**$15,132**

Source: University of Delaware (2018), Econsult Solutions (2018)

These per student spending estimates equate to over $169.4 million in ancillary student spending, $15.8 million of which is spent by on-campus students, $131.2 million of which is spent by off-campus students, and $22.5 million of which is spent by the 4,109 commuter students (see Table C.3).

TABLE C.3 – ESTIMATED AGGREGATE ANCILLARY STUDENT SPENDING BY STUDENT TYPE

Students	On-Campus	Off-Campus	Commuter	Total
Students	6,898	10,940	4,109	**21,947**
Rent	$0.0	$53.3	$0.0	$53.3
Food	$3.4	$58.2	$10.9	$72.5
Transportation	$5.5	$8.8	$9.5	$23.7
Retail	$6.9	$10.9	$2.1	$19.9
Total	**$15.8**	**$131.2**	**$22.5**	**$169.4**

Source: University of Delaware (2018), Econsult Solutions (2018)

Next, we have estimated the proportion of that ancillary spending which takes place within the City of Newark, New Castle County, the State of Delaware, and the Northeast Corridor by expenditure category. We have made adjustments to the amounts captured within each geography to reflect several realities. First, research indicates that some portion of retail shopping by millennials occurs online and thus is not captured locally (except a certain amount spent at the campus online store).[27] Additionally, a portion of transportation spending is likely to take place outside of the local geography as students visit friends and families in other locations.

[27] "Who are the Millennial Shoppers? And What do they Really Want?" *Accenture Outlook*, https://www.accenture.com/us-en/insight-outlook-who-are-millennial-shoppers-what-do-they-really-want-retail.

TABLE C.4 – ESTIMATED ANCILLARY STUDENT SPENDING CAPTURED WITHIN EACH GEOGRAPHY

On-Campus	City of Newark	New Castle County	State of Delaware	Northeast Corridor
Rent	N/A	N/A	N/A	N/A
Food	75%	10%	5%	0%
Transportation	10%	30%	35%	25%
Retail	40%	20%	10%	10%
Off-Campus	**City of Newark**	**New Castle County**	**State of Delaware**	**Northeast Corridor**
Rent	80%	20%	0%	0%
Food	50%	50%	0%	0%
Transportation	25%	35%	20%	20%
Retail	40%	20%	10%	10%
Commuter	**City of Newark**	**New Castle County**	**State of Delaware**	**Northeast Corridor**
Rent	N/A	N/A	N/A	N/A
Food	50%	40%	10%	0%
Transportation	5%	75%	20%	0%
Retail	40%	20%	10%	10%

Source: University of Delaware (2018), Econsult Solutions (2018)

These proportions can be applied to the category specific spending estimates developed in Table C.3, and the known distribution of on-campus, off-campus, and commuter students that attend UD. In total, the students spend annually $91 million within the City of Newark, $151 million within New Castle County, $160 million within the State of Delaware, and $165 million within the Northeast Corridor (see Table C.5).

TABLE C.5 – AGGREGATE ANCILLARY SPENDING BY UD STUDENTS BY GEOGRAPHY

Student Type	# of Students	Spending within the City of Newark ($M)	Spending within New Castle County ($M)	Spending within the State of Delaware ($M)	Spending within the Northeast Corridor ($M)
On-campus	6,898	$5.8	$9.2	$12.0	$14.1
Off-campus	10,940	$78.3	$123.3	$126.2	$129.0
Commuters	4,109	$6.8	$18.6	$21.8	$22.0
Total	**21,947**	**$90.9**	**$151.1**	**$160.0**	**$165.1**

Source: University of Delaware (2018), Econsult Solutions (2018)

C.2 ANCILLARY VISITOR SPENDING

Calculating ancillary visitor spending requires an estimation of the volume and type of visitors attracted to campus for various reasons, and the application of spending profiles to each of those visitor types.

Spending profiles were developed by visit type to reflect that visitor spending patterns vary based on point of origin (local vs. out of town), reason for visit, and other factors. Unique spending patterns were estimated for each visitor type using available proxy data on national travel trends and local hotel rates. Where no proxy data is available, conservative assumptions are utilized. Table C.6 below shows spending estimates by trip type by category. Note that student spending associated with events is excluded, since student spending is estimated separately.

TABLE C.6 – SPENDING PROFILES BY VISITOR TYPE

Visitor Type	Hotel Rate	Food	Other Retail	Transportation	Total
Local	$0	$0	$0	$0	**$0**
Out of Town Day Trip	$0	$41	$10	$23	**$74**
Out of Town Overnight Trip	$100	$59	$10	$23	**$192**

Source: General Services Administration (2010), Kayak.com (2018)

All spending within Table C.6 is estimated to take place within Delaware, and then each category is further reduced by geography (see Table C.7).

TABLE C.7 – ESTIMATED ANCILLARY VISITOR SPENDING CAPTURED WITHIN EACH EXCLUSIVE GEOGRAPHY[28]

	Out of Town Day Trip			
Location of Spend	**Hotel**	**Food**	**Other Retail**	**Transportation**
City of Newark	0%	90%	80%	50%
New Castle County	0%	10%	20%	40%
State of Delaware	0%	0%	0%	5%
Northeast Corridor	0%	0%	0%	5%
	Out of Town Overnight Trip			
Location of Spend	**Hotel**	**Food**	**Other Retail**	**Transportation**
City of Newark	95%	90%	80%	30%
New Castle County	5%	10%	20%	20%
State of Delaware	0%	0%	0%	20%
Northeast Corridor	0%	0%	0%	10%

These local ancillary spending profiles were then attributed to estimated attendance by visit type as described in the section that follows to produce estimates of visitor spending by category and geography.

Throughout the academic year and over the summer, UD attracts thousands of visitors to its campus. These visitors come from all over the country and spend a significant amount within the region each year which helps support employment and generate tax revenues for the state of Delaware. Thousands of alumni, parents, athletes, fans, and conference attendees come to campus for collegiate sporting events, cultural events, and programs hosted by UD.

To accurately estimate aggregate visitor spending, it is necessary to match spending profiles of the various types of visitors, recognizing that not all visitors have the same economic footprint. Based on reason for visit, duration of trip, distance traveled, event type, and visitor age, unique spending pattern behaviors were created.

In total, approximately 748,830 visits are made to UD's campus each year and it is estimated that these visitors spent approximately $49.4 million in aggregate, $47.5 million of which is spent within Delaware. Of that $47.5 million, $46.5 million is spent in New Castle County and $39.9 million is spent within the City of Newark (see Table C.8).

[28] The columns sum up to 100 percent to show distribution of spending by the exclusive and respective geographies.

TABLE C.8 – AGGREGATE VISITOR SPENDING BY VISITOR TYPE

Visitor Type	Visitors	Spend per Visitor	Total Spend ($M)
Admitted Students' Campus Visits	54,674	$113.8	$6.2
Athletics Events	145,901	$102.7	$15.0
Commencement Attendees	11,200	$125.6	$1.4
Alumni Visitors	5,994	$113.8	$0.7
Move In Out for First Year	6,459	$152.9	$1.0
Family Weekend Visitors	2,900	$125.6	$0.4
Conferences Visitors	50,000	$63.6	$3.2
Ag Day	8,000	$14.8	$0.1
External Athletic Events Attendees	36,230	$102.0	$3.7
External Events Attendees	232,425	$63.6	$14.8
High School Graduations Attendees	173,100	$7.4	$1.3
Visitors to Students	21,947	$76.2	$1.7
	748,830	**$65.9**	**$49.5**
Within City of Newark ($M)			**$39.9**
Within New Castle County ($M)			**$46.5**
Within State of Delaware ($M)			**$47.5**
Within Northeast Corridor ($M)			**$48.2**

Source: University of Delaware (2018), Econsult Solutions (2018), U.S. General Services Administration (2018)

APPENDIX D – WAGE PREMIUM

D.1 OVERVIEW

While University of Delaware significantly impacts the local, county, statewide, and mega region through its direct expenditures and through students and visitors it draws into the local economy, it is important to recognize the core mission of the institution in educating students. This primary function, in addition to helping foster a more enlightened society, has a significant economic component as well, increasing the productivity and earning power of the workforce.

The relationship between educational attainment and earnings power is well-established, and a "wage premium" associated with additional education is often conceptualized and calculated from the perspective of the student, who can compare the costs associated with various educational (or non-educational) options with the expected return. This analysis utilizes the framework to estimate the gain not to the student, but rather to the local, county, statewide, and mega region economy. Additional earnings by alumni in the workforce attributable to University of Delaware are estimated and translated into additional household spending, which in turn supports further employment and earnings.

D.2 MODELING INCREASED EARNINGS ATTRIBUTABLE TO EDUCATION

Academic research and government data demonstrate a clear return to educational attainment in the form of advanced earnings potential. Census Bureau data documents a linear relationship between median wages and educational attainment, with each additional level of schooling yielding increased average earnings. Returns to education are also impacted by the specific university that a student attends, due to variance in both institutional quality and fields of study. Institutions of higher education vary widely in selectively, curricular rigor and reputation. These qualitative factors are also reflected in the earnings potential of graduates above and beyond the level of degree they attain.

The modeling approach undertaken in this calculation conforms to the gross impact approach set forth in Section 2 and utilized throughout the report. Since a gross analysis does not include a counterfactual in which impacts are replaced through market forces in the absence of the institution, the increases in education are additive to national earnings, reflecting a market-based valuation of enhanced productivity. However, within this framework, the population and level of benefit to the economy is not the full salary of UD alumni in the workforce, but rather the incremental wages associated with their educational attainment and skills/knowledge wage premium from their UD degree. A portion of these additional earnings (after accounting for taxes, savings, etc.) results in additional household spending which circulates throughout the economy, generating indirect and induced impact and supporting employment and earnings.

Modeling is undertaken in a three-step approach in the sections that follow:

- Section D.3 estimates the volume of UD alumni the workforce, by educational attainment level;
- Section D.4 estimates the annual wage premium associated with UD for each of those attainment levels;
- Section D.5 combines these two calculations, multiplying the volume of alumni at each attainment level by the wage premium for that level to yield an estimate of the aggregate annual wage premium associated with UD.

This calculation relies primarily on data from UD, as well as national government data where appropriate.

D.3 ESTIMATING UD ALUMNI WITHIN THE WORKFORCE

The presence of UD has a significant impact on the composition, educational attainment and skill level of the local workforce. Post-graduation location decisions are impacted by educational experience, with a clear correlation between locations during and after schooling. From a regional workforce standpoint, UD alumni living and working within Newark, New Castle County, Delaware, and the Northeast Corridor are either imported to those geographies (in the case of students originating from around the nation and the world) or retained within those geographies (in the case of students originating within those geographies who are retained due to the presence of UD).

Graduates retained within the local workforce enhance local earnings potential in multiple ways. First, academic research and governmental data indicate a clear return to educational attainment in the form of advanced earnings potential. Census Bureau data documents a linear relationship between median wages and educational attainment, with each additional level of yielding increased average earnings. Academic studies have explored this phenomenon from the perspective of an individual student evaluating the returns to investments in additional schooling in terms of their expected lifetime financial position. However, these educational attainment gains accrue not only to the student, but to the region in which they are employed. Increased earnings enjoyed as a result of schooling are a market-based representation of the additional productivity associated with those workers, and ultimately result in additional household spending within the local economy on other goods and services.

UD provided detailed information for its alumni by ZIP Code. It is necessary to estimate the proportion of alumni within each geography that are actively employed (and therefore generate an annual wage premium). National data from the Bureau of Labor Statistics indicates that the

national employment rate for degree holders who are age 25 and older is 72.6 percent as of March 2018.[29]

Applying these proportions across degree levels yields an estimate of nearly 120,194 employed UD alumni in the U.S., some of whom live in Newark, New Castle County, Delaware, and the Northeast Corridor (see Table D.1).

TABLE D.1 – ESTIMATED UD ALUMNI WITHIN THE U.S. WORKFORCE

Input	Value	Associate's Degree	Bachelor's Degree	Advanced Degree	Total Alumni
Active UD Alumni in the U.S.	165,557				
(x) Proportion by Highest Degree		5%	72%	23%	
(=) Active Alumni by Degree Type		8,352	118,665	38,540	**165,557**
(x) Employment Rate	72.6%				
(=) Est. Alumni in U.S. Workforce		6,063	86,151	27,980	**120,194**
(x) Percent Living in Newark	3%	154	2,181	708	**3,043**
(x) Percent Living in New Castle County	24%	1,439	20,448	6,641	**28,528**
(x) Percent Living in Delaware	30%	1,816	25,796	8,378	**35,989**
(x) Percent Living in Northeast Corridor	69%	4,191	59,545	19,339	**83,075**

Source: University of Delaware (2018), Bureau of Labor Statistics (2018), Econsult Solutions (2018)

D.4 IMPACT OF UD ON ALUMNI EARNINGS

Next, it is necessary to estimate the impact of this educational attainment on annual earnings for the UD alumni estimated to be within the workforce.

Median earnings by education level within Delaware can be derived from the American Community Survey, which illustrates the progression in median income by highest level of educational attainment from approximately $30,916 per year for a high school graduate to approximately $66,916 for an advanced degree holder. However, the calculation must account for potential differences in earnings between UD degree holders and the average degree holder in the state. To do so, longitudinal data from the federal Department of Education for University of Delaware is compared to all four year institutions in Delaware. This data source, part of the "College Scorecard" released publicly by the Department of Education, reports earnings by institution based on unique tracking of tax fillings of students who applied for student loans ten

[29] This proportion is itself comprised of a labor force participation rate of approximately 73.5 percent and an unemployment rate of approximately 2.1 percent. Thus, the vast majority non-working alumni are anticipated to be out of the labor force, rather than actively seeking unemployment but unable to find it.

years after they enter school.[30] Median ten-year earnings for UD is $55,100, or 125.2 percent of the median ten-year earnings for all four year institutions of $44,009. Therefore, within this analysis, median earnings for UD graduates at each educational attainment level are conservatively scaled to 125.2 percent of median statewide earnings for that degree level.

As described in Section D.2 above, this analysis assumes that the population and employment level would remain fixed with or without the presence of UD, and that the supply of graduates from alternative four-year high education institutions would remain fixed as well. In this scenario, the absence of UD would result in a substantial loss in the educational attainment level, and accordingly the productivity, of the workforce in each geography. In order to absorb this loss (while maintaining a fixed employment level), specifically jobs held by UD alumni with associate's degrees are assumed to be absorbed by workers with high school degrees, and jobs held by alumni with advanced degrees are assumed to be absorbed by workers with bachelor's degrees.[31]

Combining estimated earnings by educational level and the assumptions described above about the absorption of employment opportunities absent UD generates an estimate annual wage premium by degree level associated with UD. This premium is calculated as the net difference between estimated earnings for one less level of attainment.[32] This calculation results in an annual wage premium of $15,882 for UD associate's degrees (relative to high school degree holders), $27,538 for UD bachelor's degree holders (relative to associate's degree holders), and $31,932 for UD advanced degree holders (relative to bachelor's degree holders) (see Table D.2).

[30] This comparison is a proxy for earnings differentials between alumni of UD and non-UD alumni. Notably, it tracks only those students who applied for federal loans, it includes earnings for graduates and non-graduates, and it tracks earnings only at a single point in time (10 years after graduation) rather than throughout a career cycle. However, it is a federal data source that is comprehensive in its coverage of institutions, and its basis in IRS records is far sounder than data sources based on self-reported data. Further this analysis does not use this source to define median earnings (which would be problematic due to the caveats listed above) but rather to estimate the proportional differences between UD and non-UD alumni. Since data weaknesses apply to both groups, the comparison is "apples to apples" and represents a reasonable proxy for this purpose.

[31] Note that this "filtering" process may in practice involve a long sequence of steps, where a highly skilled position held by an alumnus with an advanced degree is first replaced with a slightly less skilled advanced degree holder, whose position is then replaced by a slightly less skilled advanced degree holder, until a position currently held by a worker with an advanced degree is replaced by a worker with a bachelor's degree, and so on. This process is also made possible by the ready availability of workers with high school degrees (for whom the unemployment rate is significantly elevated) and the open enrollment practices of many community colleges or non-selective four year institutions, which suggest that the supply of these workers is likely relatively unconstrained.

[32] Note that this calculation is from the perspective of the national economy, not from the perspective of any individual alumnus. Absent UD, it is likely that the majority of UD alumni would have attained the same level of degree from an alternate institution. However, in doing so, they would have replaced a different student currently at that institution. Ultimately, given a fixed supply of alternative institutions, the reduction of educational attainment applies to the economy (and society) broadly, rather than for any particular student.

TABLE D.2 – ESTIMATED EARNINGS BY EDUCATIONAL ATTAINMENT

Highest Education Level	Delaware Median Earnings	UD Est. (125.2%)	Estimated Wage Premium
High School Graduate / GED	$30,916		
Associate's Degree	$37,378	$46,798	$15,882
Bachelor's Degree	$51,849	$64,915	$27,538
Advanced Degree	$66,916	$83,778	$31,932

Source: American Community Survey Five-Year Estimates (2016), College Scorecard Database (2018), Econsult Solutions (2018)

D.5 AGGREGATE EARNINGS IMPACT FROM UD WAGE PREMIUM

The aggregate annual earnings impact from this wage premium can be derived by multiplying the number of alumni in the workforce at each degree level (as estimated in Section D.1) by the annual wage premium associated with that degree level (as estimated in Section D.2). In aggregate, the educational attainment increase for UD alumni in the workforce results in an aggregate annual wage premium of $1 billion in the state each year, with the bulk of that premium ($710 million) attributable to bachelor degree holders (see Table D.3).

TABLE D.3 – AGGREGATE ANNUAL WAGE PREMIUM ASSOCIATED WITH UD ($M)

Degree Level	City of Newark	New Castle County	State of Delaware	Northeast Corridor
Associate's	$2	$23	$29	$67
Bachelor's	$60	$563	$710	$1,640
Advanced	$23	$212	$268	$618
Total Working Alumni	$85	$798	$1,007	$2,325

Source: Econsult Solutions (2018)

APPENDIX E – ABOUT ECONSULT SOLUTIONS, INC.

This report was produced by Econsult Solutions, Inc. ("ESI"). ESI is a Philadelphia-based economic consulting firm that provides businesses and public policy makers with economic consulting services in urban economics, real estate economics, transportation, public infrastructure, development, public policy and finance, community and neighborhood development, planning, as well as expert witness services for litigation support. Its principals are nationally recognized experts in urban development, real estate, government and public policy, planning, transportation, non-profit management, business strategy and administration, as well as litigation and commercial damages. Staff members have outstanding professional and academic credentials, including active positions at the university level, wide experience at the highest levels of the public policy process and extensive consulting experience.