

THE GEORGE
WASHINGTON
UNIVERSITY



THE ECONOMIC IMPACT OF THE GEORGE WASHINGTON UNIVERSITY IN VIRGINIA AND ITS REGIONS



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EXECUTIVE SUMMARY

The George Washington University (GW) has longstanding ties with the Commonwealth of Virginia. The university started its first graduate center in Virginia in Hampton Roads more than 50 years ago. Since then, it has also established graduate education centers in both Alexandria and Arlington, Virginia. Since 1991, GW has invested a significant amount in Loudoun County (Ashburn) to establish its Virginia Science and Technology Campus (VSTC).¹ This study analyzes the economic and fiscal impact of the George Washington University and its Virginia campus and centers in the Commonwealth of Virginia, the Northern Virginia Metropolitan Statistical Area (MSA), and the Hampton Roads MSA.²

GW has a unique role in Virginia as an independent university heavily focused on research and graduate studies. Over the past two decades, GW has developed distinct programs of excellence in the Northern Virginia technology corridor, including research programs in cybersecurity, big data, and health sciences. GW's School of Nursing, established in 2010, is headquartered on the Virginia campus and will help address future nursing shortages in the health care field. The nursing school is growing rapidly and has become one of the largest nursing programs in Northern Virginia. It also serves students nationwide and internationally through a highly ranked online education program.

Chmura analyzed GW's impact from three primary angles. The first is university enterprise spending, which includes operational spending, research spending, and capital investment. In addition, Chmura assessed employee and student spending in Virginia and the Northern Virginia and Hampton Roads MSAs. The third angle focuses on other economic benefits to the community that are hard to quantify, yet very important. Chmura estimated the economic impact of GW using fiscal year (FY) 2014³ as a benchmark.

The study found GW's total economic impact in Virginia to be more than half a billion dollars in FY2014.



¹ All those campus and centers (Virginia Science and Technology Campus, Alexandria Graduate Education Center, Arlington Graduate Education Center, and Hampton Roads Center) are referred to as the Virginia campus and centers in this report. VSTC, Alexandria and Arlington centers are collectively referred to as GW's Northern Virginia campus and centers.

² The study areas in this report are defined as the Hampton Roads Metropolitan Statistical Area (MSA), the Northern Virginia MSA, and the state of Virginia.

³ Fiscal year 2014 is from July 1, 2013, to June 30, 2014.

The economic impact of GW in Virginia is summarized below (Table 1.1):

Table 1.1: GW Economic Impact Summary in Virginia (FY2014)

		DIRECT (\$MILLION)	TOTAL (\$MILLION)	LOCAL TAXES (\$MILLION)	STATE TAXES (\$MILLION)
VIRGINIA CAMPUS AND CENTERS	SPENDING	\$73.7	\$124.8	\$0.5	\$4.4
	EMPLOYMENT	1,642	2,000		
GW-OVERALL	SPENDING	\$304.4	\$530.3	\$1.9	\$21.5
	EMPLOYMENT	3,701	5,275		

NOTE: NUMBERS MAY NOT SUM DUE TO ROUNDING
Source: Chmura Economics & Analytics and IMPLAN Pro 2013

- The total economic impact (direct, indirect, and induced) of GW in the state of Virginia was estimated to have been \$530.3 million in FY2014, supporting 5,275 jobs in the state.
- Of all the economic impact components, the largest contributor to GW's economic impact in Virginia was employment spending, followed by student spending, operational spending, capital investment, and research spending.
- Six in 10 of all GW faculty and staff lived in Virginia in FY2014, with an average salary of \$55,685.
- GW's Virginia campus and centers altogether sustained an estimated total economic impact (direct, indirect, and induced) of \$124.8 million in FY2014 and supported 2,000 Virginia jobs for the year.
- GW also contributed \$21.5 million to the state government, and \$1.9 million to local governments in Virginia in FY2014.
- GW's Virginia campus and centers contributed \$4.4 million in state tax and \$0.5 million in local tax in FY2014.

The economic impact of GW in the Northern Virginia MSA is summarized below (Table 1.2):

Table 1.2: GW Economic Impact Summary in Northern Virginia MSA (FY2014)

		DIRECT (\$MILLION)	TOTAL (\$MILLION)	LOCAL TAXES (\$MILLION)	STATE TAXES (\$MILLION)
NORTHERN VIRGINIA CAMPUS AND CENTERS	SPENDING	\$63.3	\$99.9	\$0.4	\$3.9
	EMPLOYMENT	1,426	1,668		
GW-OVERALL	SPENDING	\$256.1	\$415.2	\$1.5	
	EMPLOYMENT	3,044	4,080		

NOTE: NUMBERS MAY NOT SUM DUE TO ROUNDING
Source: Chmura Economics & Analytics and IMPLAN Pro 2013

- The total economic impact (direct, indirect, and induced) of GW in Northern Virginia MSA was estimated to have been \$415.2 million in FY2014, supporting 4,080 jobs in the region.
- The largest contributors to GW's economic impact in the Northern Virginia MSA are employment spending, student spending, operational spending, capital investment, and research spending, in that order.
- GW also contributed \$1.5 million to all local governments in Northern Virginia in FY2014. GW's Northern Virginia campus and centers contributed \$3.9 million in state tax and \$0.4 million in local tax in FY2014.

The economic impact of GW in Hampton Roads MSA is summarized below (Table 1.3):**Table 1.3: GW Economic Impact Summary In Hampton Roads MSA**

		DIRECT (\$MILLION)	TOTAL (\$MILLION)	LOCAL TAXES (\$MILLION)	STATE TAXES (\$MILLION)
HAMPTON ROADS CENTER	SPENDING	\$2.9	\$4.7	\$63,115	\$155,138
	EMPLOYMENT	97	110		
GW-OVERALL	SPENDING	\$9.2	\$15.6	\$124,968	
	EMPLOYMENT	138	185		

NOTE: NUMBERS MAY NOT SUM DUE TO ROUNDING
Source: Chmura Economics & Analytics and IMPLAN Pro 2013

- The total economic impact (direct, indirect, and induced) of GW in Hampton Roads MSA was estimated to have been \$15.6 million in FY2014, supporting 185 jobs in the region.
- GW's Hampton Roads center sustained an estimated total impact (direct, indirect, and induced) of \$4.7 million in FY2014 and supported 110 jobs in the MSA.
- GW also contributed \$124,968 to all local governments in Hampton Roads MSA in FY2014. GW's Hampton Roads center contributed \$155,138 in state tax and \$63,115 in local tax in FY2014.

Outside of the quantified economic impact, the George Washington University makes significant contributions to both state and regional workforce development, and improves the quality of life in Virginia.

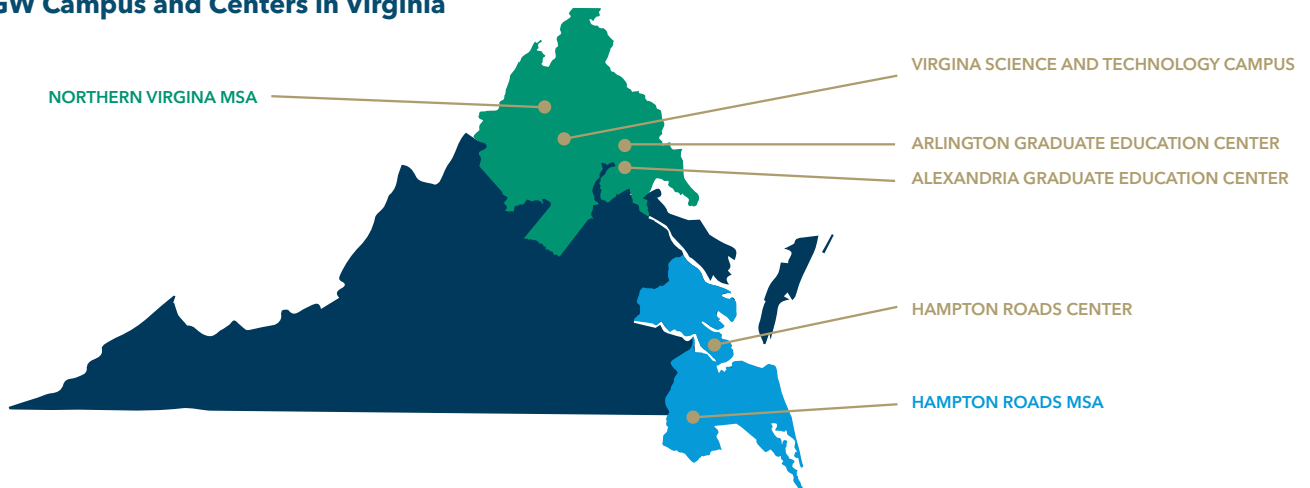
- GW's Virginia campus and center focus on research in the areas of big data, cybersecurity, and health care with 17 state-of-the-art research labs based in Ashburn. The research benefits businesses and residents in Virginia and beyond.
- GW is pioneering an innovative program to support veterans entering the health care workforce with a new accelerated Bachelor of Science in Nursing program.
- The growing presence of GW's School of Nursing in VSTC will help relieve predicted future nursing shortages in the region. Nursing students contribute thousands of hours volunteering time each year. Many nursing school alumni choose to live and work in Virginia, benefiting Virginia residents in need of health care.
- GW's Virginia campus and centers offer many unique academic programs, including the nation's first degree in art therapy to provide mental health services for victims of trauma (Alexandria). GW also partners with local businesses to offer education accessible to working adults. In addition, they offer mentoring and scholarship opportunities to local students, which increases diversity of the student body and regional workforce.
- According to GW's latest data, 50,370 of its alumni live in Virginia. Among them, 82 percent live in the Northern Virginia MSA, and 9.2 percent reside in the Hampton Roads MSA. Such an educated workforce can increase state and regional earnings in Virginia.
- GW has invested in Barcroft Park in Arlington for its baseball team. The park is also open to the public, benefiting local students and residents.

BACKGROUND

The George Washington University has longstanding ties to the Commonwealth of Virginia. It started its first Virginia graduate center in the Hampton Roads Region more than 50 years ago. Since then, GW also established graduate education centers in both Alexandria and Arlington, Virginia. Since 1991, it has invested a significant amount in Loudoun County through its Virginia Science and Technology Campus (Figure 2.1).

In addition to those campuses and centers physically located in Virginia, GW also contributes to Virginia's economy through many other channels. For example, many of its employees working at the D.C. campus call Virginia home, thus supporting Virginia businesses through their wages and salaries. In addition, due to the proximity of GW's D.C. campuses to Virginia, they utilize many Virginia firms to sustain operations. As a result, the university contributes to the Virginia economy in varied ways. GW also contributes to state and local governments via tax revenues from its operation, and employee and student spending in Virginia.

Figure 2.1: GW Campus and Centers in Virginia



To evaluate the contribution of the George Washington University to the economies of Virginia and the two MSAs, GW contracted with Chmura Economics & Analytics (Chmura) to conduct an economic impact study of the university based on FY2014 data. The study also addresses the economic impact of GW overall (including its campuses in D.C. and other operations outside Virginia) on the state of Virginia. The study also qualitatively discusses the impact of GW's impact in broadening education access and leading workforce development—especially the health care workforce—in Virginia.

THE REMAINDER OF THIS REPORT IS ORGANIZED AS FOLLOWS:

- **Section 3** explains the Chmura methodology in conducting economic and fiscal impact studies for an academic institution such as GW.
- **Section 4** analyzes the economic impact of GW and its Virginia campus and centers, including its operational, research, capital, employee, and student spending.
- **Section 5** presents the economic impact of GW and its Northern Virginia campus and centers in the Northern Virginia MSA.
- **Section 6** presents a summary of the economic impact of GW and its Hampton Roads center in the Hampton Roads MSA.
- **Section 7** discusses other impacts of GW, such as its impact on workforce development and providing educational opportunities to Virginia residents.

METHODOLOGY

While studies on the impacts of universities have been conducted around the country, the research methodologies have not been uniform. Some studies were narrowly focused while others have included broader and less quantifiable impacts. One common theme is that all of the studies reviewed by Chmura include the impact of university enterprise spending in fulfilling the mission of teaching and research, which are considered the core impacts of universities.

In addition to the impact from university enterprise spending, most studies also included spending impact by university employees and students. Some studies addressed other roles played by universities in the areas of research and technology progress, improvement of workforce development, and regional quality of life.

In this study, Chmura Economics & Analytics quantified the impact of GW and its Virginia campus and centers from the following aspects:

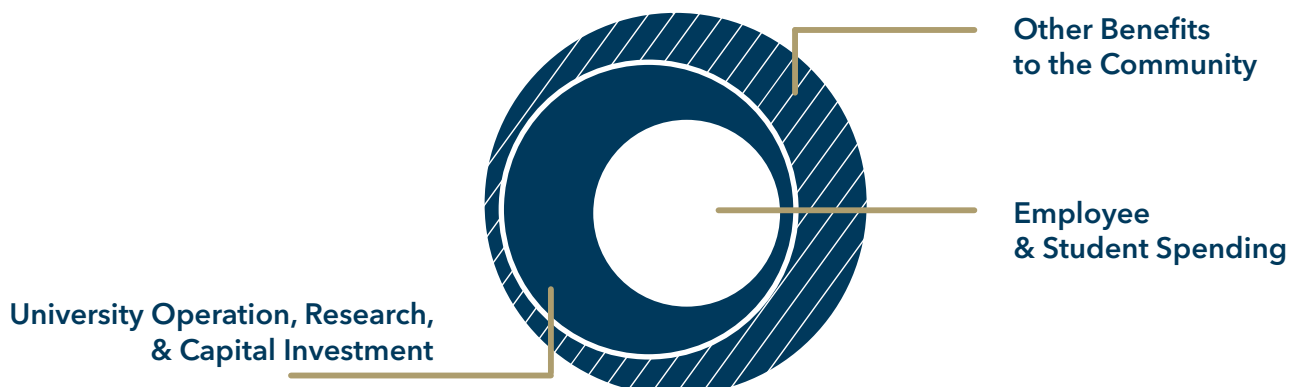
University enterprise spending. Each year, GW spends millions of dollars in Virginia and in both the Northern Virginia and Hampton Roads regions to procure goods and services to support its missions. This impact includes spending by GW and its Virginia campus and centers on daily operations and research spending. It also includes capital investment, but does not include total payroll; this is analyzed separately in the employee spending section.

University-associated spending including employee and student spending. Thousands of GW employees and students living in Virginia contribute to the state and local economy. While most undergraduate students live in D.C., a sizable number of graduate students live in Virginia and attend classes at the Virginia campus and centers.⁴

Other benefits of GW. Examples of those benefits include GW's impact on workforce development and providing educational opportunities to Virginia residents.

As shown in Figure 3.1, the direct economic impact of GW begins with its operations. Employee and student spending occur because of the university's presence in Virginia. A third layer of impact from GW is its contribution in other aspects of economic and workforce development.

Figure 3.1: Direct Economic Impact of GW

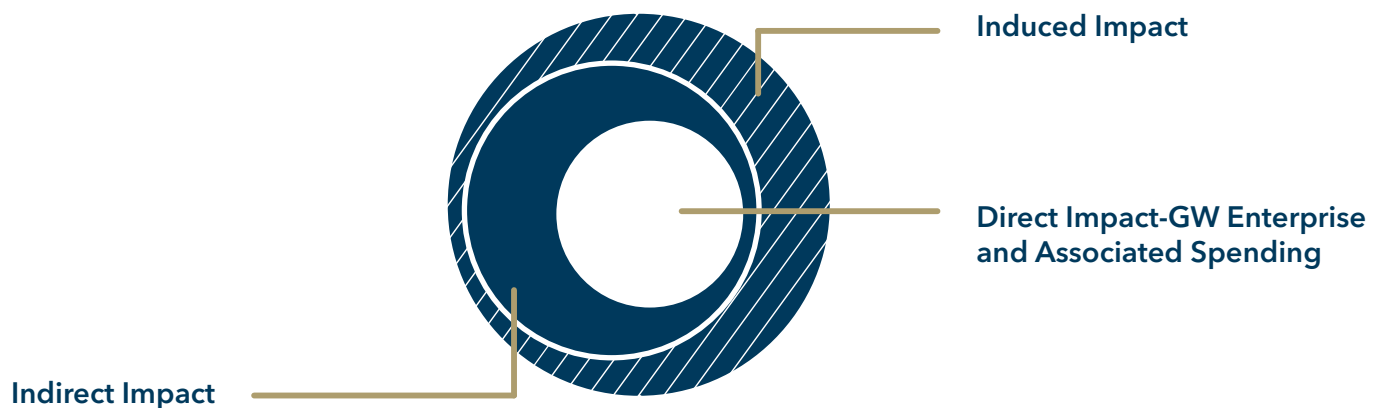


⁴ The estimate of university-associated spending is conservative, as it does not include GW's visitor spending in Virginia.

The three components outlined above constitute the direct economic impact of GW and its Virginia campus and centers on the study regions. The total economic impact of GW also includes economic ripple effects from the direct impact. Ripple effects, categorized as indirect and induced impacts (see Appendix 1 for definitions), measure the secondary benefits generated by GW operations and employee and student spending.⁵ These effects include benefits for the many local businesses supporting GW operations—referred to as indirect impact. They also include benefits for local businesses where university employees spend their income—termed induced impact.

The indirect and induced effects were estimated with IMPLAN Pro⁶ software after the direct impact was determined. Different business operations and employee and student spending items were input into the IMPLAN model sectors to estimate the indirect and induced impact for each sector. Those impacts were eventually aggregated to reach the estimates of the overall economic impact of GW. Figure 3.2 illustrates the economic impact framework.

Figure 3.2: Total Economic Impact Analysis



This study also estimates the fiscal benefit of GW and its Virginia campus and centers. GW is a nonprofit organization, so it is tax exempt in the District of Columbia. But it is not tax exempt in Virginia. As a result, it pays corporate income tax and property tax for its own operations. Additionally, significant fiscal benefits are derived from employee and student spending. In this report, Chmura uses the average local tax rate of localities in the Northern Virginia and Hampton Roads MSAs to estimate tax benefits to local governments. State tax revenue is primarily in the form of sales tax and individual income tax.

⁵ Ripple effects were estimated only for operations and employee and student spending.

⁶ *IMPLAN Professional* is an economic impact assessment modeling system developed by Minnesota IMPLAN Group that is often used by economists to build models that estimate the impact of economic changes on local economies.

ECONOMIC AND FISCAL IMPACT OF GW AND ITS VIRGINIA CAMPUS AND CENTERS IN VIRGINIA

This section first examines the quantifiable economic impact from enterprise spending by GW and its Virginia campus and centers (including operation, research, and capital investment). It also examines the impact of GW from associated spending by its employees and students. The distinction between these two sources of impact is that GW spending as an enterprise is directly made by GW, while associated spending is from people related to GW such as its employees and students.

4.1. Economic Impact of GW Enterprise Spending

As an enterprise, GW and its Virginia campus and centers spend a significant amount each year at Virginia businesses to purchase supplies and services necessary to support their daily operations and research efforts. In addition, GW also spends millions of dollars per year on research and capital improvement projects.

4.1.1. GW OPERATIONAL EXPENDITURES

GW operations include the functions of instruction and student services.⁷ To estimate the economic impact of operational expenditures by GW and its Virginia campus and centers in the state, the first step was to determine how much of the total expenditure was paid by GW to businesses located within Virginia.

Data provided by GW indicated that in FY2014, GW (all campuses) spent \$41.6 million in Virginia to maintain its operation. Of this, \$33.3 million was paid to businesses in the Northern Virginia MSA, and \$2.3 million was paid to businesses in the Hampton Roads MSA. GW data allowed Chmura to distribute spending into different categories such as utility, retail, and service businesses.

Table 4.1: GW Operational Expenditures in Virginia-FY2014

REGION	AMOUNT (\$MILLION)
Hampton Roads MSA	\$2.3
Northern Virginia MSA	\$33.3
Other Virginia Regions	\$6.0
TOTAL	\$41.6

Source: GW

For GW's Virginia campus and centers, data provided by GW indicated that total operational spending⁸ amounted to \$6.4 million in FY2014 (Table 4.2). It was estimated that \$6.3 million of this was spent in Virginia⁹.

⁷ Research and capital expenditure are analyzed separately.

⁸ This includes spending both inside and outside Virginia. Detailed spending records for Virginia campus and centers are not available.

⁹ Chmura used the IMPLAN model to estimate the percentage of spending occurring in Virginia.

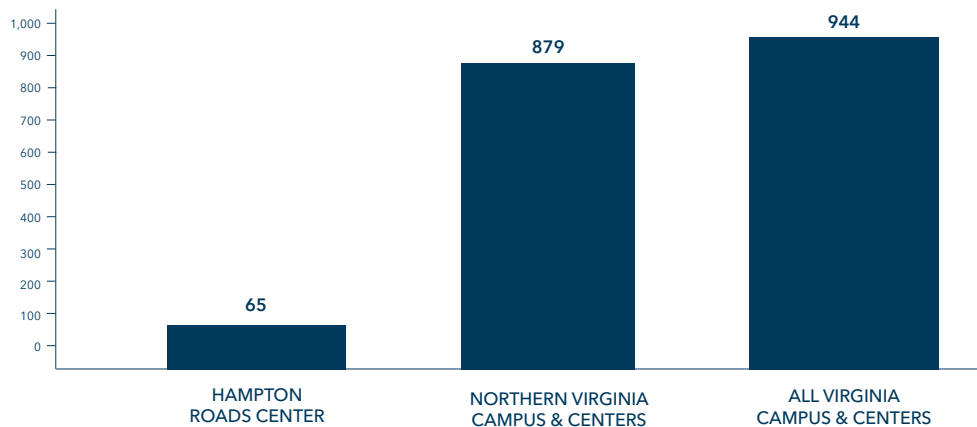
Table 4.2: GW Operational Spending

CAMPUS AND CENTERS	FY2012	FY2013	FY2014
VSTC	\$3.6	\$3.5	\$3.7
Arlington Center	\$0.9	\$1.1	\$1.1
Alexandria Center	\$1.1	\$1.3	\$1.3
Hampton Roads Center	\$0.3	\$0.3	\$0.3
TOTAL	\$6.0	\$6.1	\$6.4

Source: GW

As of FY2014, 994 GW employees were working in Virginia (Figure 4.1). Since the economic impact study estimated job creation based on the place of work, this number is considered direct employment of GW in Virginia.¹⁰ However, only 505 of them actually lived in Virginia in FY2014.

FIGURE 4.1: NUMBER OF GW EMPLOYEES IN VIRGINIA CAMPUS AND CENTERS



Source: GW

Inputting operational spending data into the IMPLAN model, the total annual economic impact of operational expenditures by GW and its Virginia campus and centers in Virginia is summarized in Table 4.3.

- For FY2014, the total economic impact (direct, indirect, and induced) of GW's operational expenditures was estimated to have been \$76.2 million in Virginia, supporting 1,188 jobs.
- Of this, \$41.6 million was the estimated direct impact, which was expenditures paid by GW directly to businesses within Virginia.
- The direct employment impact is the number of people employed by GW who work in Virginia, which was 944 in FY2014.
- Indirect impact was estimated to have been \$16.3 million and 105 jobs in FY2014, benefiting other businesses within Virginia that supported GW operations.
- Induced impact was estimated to have been \$18.3 million and 139 jobs in the state for FY2014, mostly benefiting consumer-related businesses such as retail shops and restaurants.
- The total economic impact (direct, indirect, and induced) of GW's Virginia campus and centers was estimated to have been \$8.9 million, supporting 963 jobs in Virginia in FY2014.

¹⁰ Chmura counted jobs based on place of work. For example, all faculty and staff working at the Virginia campus and centers are considered Virginia jobs, even though they may not live in Virginia. Similarly, Virginia residents who work at GW's campuses in D.C. are not counted as Virginia jobs. However, their spending in Virginia is counted as economic impact in Virginia.

Table 4.3: Annual Economic Impact of Operational Expenditure (FY2014)

		DIRECT	INDIRECT	INDUCED	TOTAL
VIRGINIA CAMPUS AND CENTERS	SPENDING (\$MILLION)	\$6.3	\$1.3	\$1.3	\$8.9
	EMPLOYMENT	944	9	10	963
GW-OVERALL	SPENDING (\$MILLION)	\$41.6	\$16.3	\$18.3	\$76.2
	EMPLOYMENT	944	105	139	1,188

Source: Chmura Economics & Analytics and IMPLAN Pro 2013

4.1.2. GW RESEARCH SPENDING

The above operational expenditures do not include research spending by GW and its Virginia campus and centers. The George Washington University is a major research university, and significant research occurs at its Virginia campus and centers. The following are some highlights of the research in GW's Virginia campus and centers.

The Virginia Science and Technology Campus in Loudoun County focuses on research around big data, cybersecurity, energy, and health care. The campus is the home to the Computational Biology Institute (CBI), which is an interdisciplinary effort building on GW's strengths in life sciences and computational science. CBI focuses on computational and bioinformatics approaches to biological questions in the genomics era. The campus also houses the university's data center and Colonial One—a high-performance computing environment for advanced research with large data sets.

The campus is home to the largest shake table (earthquake simulator) on the East Coast. A cross-disciplinary team is currently using this simulator to understand what happens inside a nuclear reactor during an earthquake. Another GW research center is the conservation and collections research center (CCRC). The CCRC is a state-of-the-art support facility for the textile museum collections, GW's fine art collection, and the Albert H. Small Washingtoniana collection, comprising historic documents and maps related to the history of Washington, D.C. The campus also houses the Transportation Safety Research Lab focusing on driver behavior modeling.

Other Virginia centers are also undertaking important research efforts. The Hampton Roads Center recently won a \$3 million grant awarded by the U.S. Department of Energy to operate the Education Facilities Clearinghouse.

The above research centers and other research staff spend millions of dollars each year in Virginia. For the Virginia campus and centers, data from GW showed its research awards were estimated at \$5.0 million in FY2014 (Table 4.4). An estimated \$2.9 million of this was spent in Virginia¹¹. Research facilities outside the state also procure goods and services in Virginia. In FY2014, for example, total research spending of GW was \$180.6 million (Figure 4.2). It is assumed that 8.5 percent of research funding was spent in Virginia, which is the same percentage of in-state spending as GW's operational expenditure¹². Consequently, total research spending in Virginia for GW overall was estimated to have been \$15.4 million in FY2014.

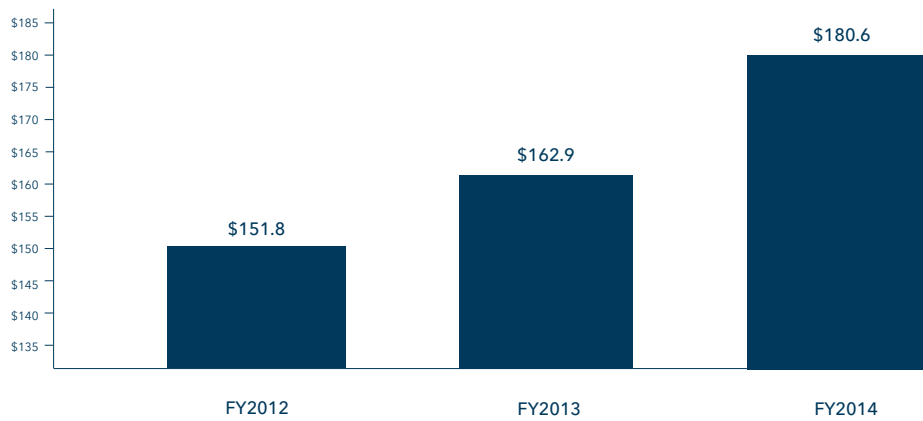
¹¹ Actual research spending is not exactly the same as research awards, as some funding is for multi-year research projects. Since the actual spending data are not available, this study uses research awards as an approximation for research spending. Though some research funding awarded in FY2014 will be spent in future years, some of the awards in earlier years were spent in FY2014. Actual research data provided by GW is on a calendar year basis. Chmura converted them to fiscal year bases. In addition, Chmura used the IMPLAN model to estimate the percentage of spending that occurs in Virginia.

¹² Estimated based on Virginia operational spending data provided by GW.

Table 4.4: GW Research Awards to Virginia Campus and Centers (\$Million)

	FY2012	FY2013	FY2014	FY2015 (PARTIAL)
Hampton Roads Center	\$0.2	\$0.2	\$0.2	\$0.1
Northern Virginia and Centers	\$8.5	\$6.2	\$4.2	\$2.7
Other Virginia	\$0.8	\$1.0	\$0.6	\$0.1
Total Virginia Campus and Centers	\$9.5	\$7.4	\$5.0	\$2.9

Source: GW

FIGURE 4.2: GW RESEARCH SPENDING - ALL CAMPUSES AND CENTERS (\$MILLION)

Source: GW

The total annual economic impact of the research expenditures of GW and its Virginia campus and centers in Virginia is summarized in Table 4.5. For FY2014, the economic impact (direct, indirect, and induced) was estimated to have been \$30.3 million and the addition of 175 jobs in Virginia. The total expenditure paid by GW researchers directly to businesses within Virginia (direct impact) was estimated at \$15.4 million. Direct impact also supported 72 jobs in Virginia in FY2014. Indirect impact was estimated at \$7.7 million and 47 jobs, benefiting other businesses within Virginia that supported GW research activities. Induced impact was estimated to have been \$7.2 million and 56 jobs in the state for FY2014. Of the research impact, total economic impact (direct, indirect, and induced) of GW's Virginia campus and centers was estimated to have been \$5.6 million in Virginia, supporting 33 jobs in FY2014.

Table 4.5: Annual Economic Impact of Research Spending (FY2014)

		DIRECT	INDIRECT	INDUCED	TOTAL
VIRGINIA CAMPUS AND CENTERS	SPENDING (\$MILLION)	\$2.9	\$1.4	\$1.4	\$5.6
	EMPLOYMENT	13	9	10	33
GW-OVERALL	SPENDING (\$MILLION)	\$15.4	\$7.7	\$7.2	\$30.3
	EMPLOYMENT	72	47	56	175

NOTE: NUMBERS MAY NOT SUM DUE TO ROUNDING
Source: Chmura Economics & Analytics and IMPLAN Pro 2013

4.1.3. GW CAPITAL INVESTMENT

From FY2012 to 2014, GW spent a total of \$30.4 million at its Virginia campus and centers, averaging \$10.1 million per year.¹³ Some of the main projects included in the above capital expenditures are a nursing lab expansion at the VSTC, and baseball facilities at Barcroft Park in Arlington for GW's baseball team. GW plans to continue investing in its Virginia campus and centers in the future, with the build-out of Discovery Hall at VSTC planned for 2015-2016.

University-wide, GW spent an average of \$159.1 million per year on capital investment projects from FY2012 to FY2014, with an estimated \$22.7 million¹⁴ spent at Virginia businesses.

The annual total economic impact (direct, indirect, and induced) of GW's capital expenditure was estimated to have been \$39.5 million, which supported 237 jobs in the state. Of this impact, \$22.7 million was the direct impact that created 116 jobs in the state from FY2012 to FY2014. Annual indirect impact was estimated to have been \$9.4 million and 62 jobs from FY2013 to FY2014, and annual induced impact was estimated to have been \$7.4 million and 59 jobs. Among those, the total annual economic impact (direct, indirect, and induced) of GW's Virginia campus and centers was estimated to have been \$17.5 million in Virginia, supporting 108 jobs from FY2012 to FY2014.

Table 4.6: Annual Economic Impact of Capital Spending (Average FY2012-FY2014)

		DIRECT	INDIRECT	INDUCED	TOTAL
VIRGINIA CAMPUS AND CENTERS	SPENDING (\$MILLION)	\$10.0	\$4.1	\$3.4	\$17.5
	EMPLOYMENT	54	28	27	108
GW-OVERALL	SPENDING (\$MILLION)	\$22.7	\$9.4	\$7.4	\$39.5
	EMPLOYMENT	116	62	59	237

NOTE: NUMBERS MAY NOT SUM DUE TO ROUNDING
Source: Chmura Economics & Analytics and IMPLAN Pro 2013

4.2. Economic Impact of GW-Associated Spending

This section examines the FY2014 economic impact of spending by two types of individuals associated with GW: employees and students. While not directly spent by GW as an enterprise, without GW, this economic activity would not have occurred in the state.

4.2.1. GW EMPLOYEE SPENDING

As of FY2014, all campuses and units of GW (inside and outside of Virginia) have over 6,000 faculty and staff members.¹⁵ Among those, 3,608 lived in Virginia (Table 4.7), with an average wage and salary of \$55,685. GW's Virginia campus and centers have 944 employees. In FY2014, 505 of them lived in Virginia, and had an average wage and salary of \$78,077.¹⁶

¹³ Since capital expenditure varies greatly by year, the annual average amount is used to represent the annual impact for FY2014.

¹⁴ This number includes an average \$10.0 million Virginia spending on projects in Virginia.

¹⁵ IPED database from National Center for Educational Statistics (NCES).

¹⁶ Source: GW.

Table 4.7: GW Employee Residence

RESIDENCE	GW OVERALL	NORTHERN VIRGINIA CAMPUS AND CENTERS	HAMPTON ROADS CENTER
Hampton Roads	51	4	19
Northern Virginia	3,474	460	7
Other Virginia Areas	83	15	0
TOTAL VIRGINIA	3,608	479	26

Source: GW

Average wage and salary is adjusted to remove employee savings and investments, which results in an average disposable income of about 78 percent of the average wage and salary for GW employees.¹⁷ Nevertheless, not all take-home pay is spent where GW employees live. For an employee living in Virginia, the percentage of income he or she spends outside the state is considered leakage. The IMPLAN model estimates that the average consumer spending leakage is 10 percent for Virginia residents. As a result, for a GW employee living in Virginia, it is assumed that he or she spent \$39,377 in the state in FY2014. For a Virginia campus employee living in Virginia, he or she would have spent \$55,211 in Virginia in FY2014. By this method, total estimated direct employee spending in FY2014 is \$142.1 million for all GW employees living in Virginia, and \$27.9 million for its Virginia campus employees living in Virginia.

GW employee spending is distributed into different spending categories based on the latest Consumer Expenditure Survey (CES) produced by the Bureau of Labor Statistics. CES data indicate that the major spending items for households are food, housing, and transportation, among other spending categories.

The annual economic impact of GW employee spending in the state is summarized in Table 4.8. The total annual economic impact (direct, indirect, and induced) of GW employee spending was estimated to have been \$245.8 million in FY2014, which supported 2,281 jobs in the state. Of this spending, \$142.1 million and 1,558 jobs were associated with direct employee spending from their wages and salaries. Indirect impact was estimated at \$49.9 million in spending and 315 jobs in FY2014. Induced impact was estimated at \$53.8 million in spending that supported 408 jobs in FY2014. Among GW's overall impact, the total economic impact (direct, indirect, and induced) of employees of GW's Virginia campus and centers is estimated to have been \$48.2 million in Virginia, supporting 448 jobs in FY2014.

Table 4.8: Annual Economic Impact of Employee Spending (FY2014)

	DIRECT	INDIRECT	INDUCED	TOTAL
VIRGINIA CAMPUS AND CENTERS				
SPENDING (\$MILLION)	\$27.9	\$9.8	\$10.6	\$48.2
EMPLOYMENT	306	62	80	448
GW-OVERALL				
SPENDING (\$MILLION)	\$142.1	\$49.9	\$53.8	\$245.8
EMPLOYMENT	1,558	315	408	2,281

Source: Chmura Economics & Analytics and IMPLAN Pro 2013

¹⁷ The latest CES survey indicates a difference between annual expenditure and after-tax income of 21.6 percent.

4.2.2. GW STUDENT SPENDING

Total student population of GW in all its campuses was 25,264 as of fall 2013.¹⁸ There are two groups of students, and their spending directly contributes to the Virginia economy. The first group is students enrolled in GW's Virginia campus and centers, which is 2,091. It is assumed that all of them live in Virginia.¹⁹ For students enrolled at other campuses of GW, although the majority of them live in GW residence halls or private housing in D.C., there were 4,410 of them living in Virginia. When combining these two groups, it was estimated that total number of students living in Virginia was 6,501 in FY2014 (Table 4.9). The estimated living expense per student (excluding tuition and fees) was \$14,103 for the 2013-14 academic year.²⁰ The major spending items included room and board, books, and supplies. Accounting for spending leakage outside of Virginia, total student spending in Virginia was estimated to have been \$82.7 million for all GW students and \$26.6 million for the students from its Virginia campus and centers.

Table 4.9: GW Students By Residence

RESIDENCE	GW OVERALL	NORTHERN VIRGINIA CAMPUS AND CENTERS	HAMPTON ROADS CENTER
Hampton Roads	297	0	168
Northern Virginia	6,033	1,923	0
Other Virginia Areas	171	0	0
TOTAL VIRGINIA	6,501	1,923	168

Source: GW

The annual economic impact of GW student spending in the state is summarized in Table 4.10. The total annual economic impact (direct, indirect, and induced) of GW student spending was estimated to have been \$138.5 million in FY2014, which supported 1,394 jobs in the state. Of this spending, \$82.7 million and 1,012 jobs were associated with direct student spending. Indirect impact was estimated at \$29.0 million in spending and 180 jobs in FY2014. Induced impact was estimated at \$26.8 million in spending that supported 203 jobs in FY2014. Among the overall GW impact, the total economic impact (direct, indirect, and induced) of students at GW's Virginia campus and centers was estimated to have been \$44.5 million in Virginia, supporting 448 jobs in FY2014.

Table 4.10: Annual Economic Impact of Student Spending (FY2014)

		DIRECT	INDIRECT	INDUCED	TOTAL
VIRGINIA CAMPUS AND CENTERS	SPENDING (\$MILLION)	\$26.6	\$9.3	\$8.6	\$44.5
	EMPLOYMENT	325	58	65	448
GW-OVERALL	SPENDING (\$MILLION)	\$82.7	\$29.0	\$26.8	\$138.5
	EMPLOYMENT	1,012	180	203	1,394

Source: Chmura Economics & Analytics and IMPLAN Pro 2013

¹⁸ Source: National Center for Education Statistics, College Navigator.

¹⁹ No data were received on their residence.

²⁰ Source: National Center for Education Statistics, College Navigator

4.3. GW Economic Impact Summary in Virginia - FY2014

Table 4.12 sums up the economic impact of GW and its Virginia campus and centers in Virginia for FY2014, including operational expenditures, research expenditures, capital expenditures, employee spending, and student spending. The total estimated economic impact of GW (direct, indirect, and induced) was \$530.3 million in Virginia in FY2014. GW also supported 5,275 jobs in the state for the year.

Table 4.11: Annual Economic Impact of GW in Virginia (FY2014)

		DIRECT	INDIRECT	INDUCED	TOTAL
VIRGINIA CAMPUS AND CENTERS	SPENDING (\$MILLION)	\$73.7	\$26.0	\$25.2	\$124.8
	EMPLOYMENT	1,642	165	193	2,000
GW-OVERALL	SPENDING (\$MILLION)	\$304.4	\$112.3	\$113.6	\$530.3
	EMPLOYMENT	3,701	709	865	5,275

NOTE: NUMBERS MAY NOT SUM DUE TO ROUNDING
Source: Chmura Economics & Analytics and IMPLAN Pro 2013

For GW's Virginia campus and centers, the total estimated economic impact (direct, indirect, and induced) in Virginia was estimated to have been \$124.8 million in Virginia in FY2014, supporting 2,000 Virginia jobs for the year.

4.4. Fiscal Impact of GW

In addition to injecting millions of spending dollars into the state economy and creating thousands of jobs, GW also generates significant revenue for the state and local governments each year. For this study, only tax from the direct economic impact was estimated.²¹

Tax revenue resulting from GW operations come from individual income and property taxes. For all GW employees who are Virginia residents, their wages and salaries are subject to state individual income tax. Based on overall payroll data from GW, individual income tax in FY2014 was estimated at \$10.0 million from all GW employees living in Virginia, and \$2.0 million for Virginia campus employees living in Virginia.²²

Table 4.12: State and Local Tax Revenues (FY2014)

	Virginia Campus and Centers		GW Overall	
TAXES	LOCAL GOVERNMENTS	STATE GOVERNMENT	LOCAL GOVERNMENTS	STATE GOVERNMENT
Sales	\$248,127	\$1,066,945	\$1,011,921	\$4,351,261
Meal	\$135,913		\$469,954	
Admission	\$18,588		\$66,789	
BPOL	\$98,958		\$387,160	
Individual Income		\$3,019,027		\$15,778,486
Corporate Income		\$314,845		\$1,398,780
TOTAL	\$501,586	\$4,400,996	\$1,935,825	\$21,528,527

NOTE: BPOL STANDS FOR BUSINESS, PROFESSIONAL, AND OCCUPATIONAL LICENSE
Source: Chmura Economics & Analytics

²¹ This approach is recommended by Burchell and Listokin in *The Fiscal Impact Handbook*.

²² Those two numbers are part of \$15.8 million and \$3.0 million in Table 4.13, Row: Individual Income.

GW employee and student spending can generate significant tax revenue for state and local governments as well. The following five major taxes for local governments are estimated: sales tax; meals tax; admissions tax; and business, professional, and occupational licenses (BPOL) tax. On the state level, major tax revenue comes from sales, corporate, and individual income taxes.

Virginia's sales tax is 5.3 percent with 1 percent going to local governments and 4.3 percent going to the state government. To calculate sales tax revenue, the sales tax rates are applied to spending for retail, food services, and lodging sales. GW employee and student spending are estimated to have generated \$1.0 million in sales tax for local governments in the state in FY2014 (Table 4.12). In addition, the state government was estimated to have received \$4.4 million in sales tax revenue in FY2014. Sales tax from Virginia campus and centers were \$248,127 for local governments in Virginia, and \$1.1 million for the state government.

Employee and student spending in categories such as food services are subject to meals tax in many local Virginia jurisdictions. Using the state average meals tax rate, total meals tax for Virginia local governments are estimated at \$469,954 in FY2014 from spending by all GW employees and students, and \$135,913 for employees and students from Virginia campus and centers.

Other taxes such as admissions and BPOL tax are estimated in a similar fashion. Employee and student spending on recreation and entertainment in some localities are subject to admissions tax, while spending on many services items are subject to local BPOL tax. The total admissions tax for all Virginia local governments was estimated as \$66,789 in FY2014 from spending by GW overall, and \$18,588 for Virginia campus and centers. In addition, total BPOL tax for Virginia local governments was estimated as \$387,160 in FY2014 from GW overall, and \$98,958 for the Virginia campus and centers.

Together, for FY2014, GW's enterprise and associated spending contributed \$1.9 million in tax revenue to local governments in Virginia, and \$21.5 million to the state government. For GW's Virginia campus and centers, they contributed \$501,586 in tax revenue to local governments in Virginia, and \$4.4 million in tax revenue for the state government in FY2014.



ECONOMIC AND FISCAL IMPACT OF GW AND ITS NORTHERN VIRGINIA CAMPUS AND CENTERS IN THE NORTHERN VIRGINIA MSA

This section examines the quantifiable economic impact of GW and its Northern Virginia campus and centers in the Northern Virginia MSA. The analysis of the regional economic impact follows the same methodology used in the analysis of the statewide impact.

5.1. Economic Impact of GW Enterprise Spending

5.1.1. GW OPERATIONAL EXPENDITURES

In FY2014, GW (all campuses) spent \$41.6 million in Virginia to maintain its operation. Of that amount, \$33.3 million was paid to businesses in the Northern Virginia MSA. For GW's Northern Virginia campus and centers, data provided by GW indicated that total operational spending amounted to \$6.1 million in FY2014. It is estimated that \$6.0 million of this was spent in the Northern Virginia MSA.²³

As of FY2014, 879 GW employees were working in the Northern Virginia campus and centers. This is considered direct employment of GW in the Northern Virginia MSA. Among those, 460 lived in the Northern Virginia MSA.

The total annual economic impact of operational expenditures by GW and its Northern Virginia campus and centers in the Northern Virginia MSA is summarized in Table 5.1. For FY2014, the total economic impact (direct, indirect, and induced) of GW operational expenditures was estimated to have been \$55.7 million, supporting 1,027 jobs in the MSA. Among GW's overall operational impact, the total economic impact (direct, indirect, and induced) of its Northern Virginia campus and centers was estimated to have been \$8.1 million in the Northern Virginia MSA, supporting 894 jobs.

Table 5.1: Annual Economic Impact of Operational Expenditures (FY2014)

	DIRECT	INDIRECT	INDUCED	TOTAL
NORTHERN VIRGINIA CAMPUS AND CENTERS				
SPENDING (\$MILLION)	\$6.0	\$1.0	\$1.1	\$8.1
EMPLOYMENT	879	7	8	894
GW-OVERALL				
SPENDING (\$MILLION)	\$33.3	\$10.1	\$12.3	\$55.7
EMPLOYMENT	879	61	87	1,027

NOTE: NUMBERS MAY NOT SUM DUE TO ROUNDING
Source: Chmura Economics & Analytics and IMPLAN Pro 2013

²³ Chmura used the IMPLAN model to estimate the percentage of spending that is in Northern Virginia.

5.1.2. GW RESEARCH SPENDING

Data from GW indicate that total university research spending was \$180.6 million in FY2014. It is assumed that 6.8 percent of research funding was spent in the Northern Virginia MSA, which is the same as the regional spending percentage of GW's operational expenditures.²⁴ Consequently, total research spending in Northern Virginia is estimated to be \$12.3 million in FY2014. For the Northern Virginia campus and centers, data from GW showed its research awards were estimated at \$4.2 million in FY2014.

The total annual economic impact of GW's research expenditures in the Northern Virginia MSA is summarized in Table 5.2. For FY2014, the economic impact (direct, indirect, and induced) was estimated to have been \$22.8 million and the addition of 119 jobs in the Northern Virginia MSA. Of the research impact, the total economic impact (direct, indirect, and induced) of GW's Northern Virginia campus and centers was estimated to have been \$4.4 million in the region, supporting 23 jobs in FY2014.

Table 5.2: Annual Economic Impact of Research Spending (FY2014)

	DIRECT	INDIRECT	INDUCED	TOTAL
NORTHERN VIRGINIA CAMPUS AND CENTERS				
SPENDING (\$MILLION)	\$2.4	\$1.1	\$1.0	\$4.4
EMPLOYMENT	10	6	7	23
GW-OVERALL				
SPENDING (\$MILLION)	\$12.3	\$5.5	\$5.0	\$22.8
EMPLOYMENT	53	30	36	119

NOTE: NUMBERS MAY NOT SUM DUE TO ROUNDING
Source: Chmura Economics & Analytics and IMPLAN Pro 2013

5.1.3. GW CAPITAL INVESTMENT

From FY2012 to FY2014, GW spent a total of \$30.4 million on its Northern Virginia campus and facilities, averaging \$10.1 million per year. University-wide, GW spent an average of \$159.1 million per year on capital investment projects from FY2012 to FY2014, with an estimated \$20.2 million being with Northern Virginia service and product providers.

The total annual economic impact (direct, indirect, and induced) of GW's capital expenditures was estimated to have been \$31.4 million, which supported 186 jobs in the Northern Virginia MSA. Among the overall capital expenditure impact, the total annual economic impact (direct, indirect, and induced) of GW's capital expenditure for projects in the Northern Virginia MSA was estimated to have been \$15.6 million, supporting 96 jobs from FY2012 to FY2014 in the MSA.

Table 5.3: Annual Economic Impact of Capital Spending (Average FY2012-2014)

	DIRECT	INDIRECT	INDUCED	TOTAL
NORTHERN VIRGINIA CAMPUS AND CENTERS				
SPENDING (\$MILLION)	\$10.0	\$2.8	\$2.8	\$15.6
EMPLOYMENT	54	20	22	96
GW-OVERALL				
SPENDING (\$MILLION)	\$20.2	\$5.7	\$5.5	\$31.4
EMPLOYMENT	103	39	43	186

NOTE: NUMBERS MAY NOT SUM DUE TO ROUNDING
Source: Chmura Economics & Analytics and IMPLAN Pro 2013

²⁴ Estimated based on Virginia operational spending data provided by GW and data from NCES.

5.2. Economic Impact of GW-Associated Spending in the Northern Virginia MSA

5.2.1. GW EMPLOYEE SPENDING

Among all GW employees, 3,474 lived in the Northern Virginia MSA in FY2014, with an average wage and salary of \$55,685. GW's Virginia campus and centers had 879 employees. There were 460 employees that lived in the Northern Virginia MSA in FY2014, with an average wage and salary of \$79,792.²⁵

Using the same methodology to adjust for employee savings, investment, as well as expenditure leakages, Chmura estimated that total direct employee spending for FY2014 is \$122.0 million for all GW employees living in the Northern Virginia MSA, and \$23.1 million for its employees employed by its Northern Virginia campus and centers living in the region.

The annual economic impact of GW employee spending in the Northern Virginia MSA is summarized in Table 5.4. The total annual economic impact (direct, indirect, and induced) of all GW employee spending was estimated to have been \$197.9 million in FY2014, which supported 1,708 jobs in the Northern Virginia MSA. Within this impact, the total economic impact (direct, indirect, and induced) of spending by the employees of GW's Northern Virginia campus and centers was estimated to have been \$37.5 million in the Northern Virginia MSA, supporting 324 jobs in FY2014.

Table 5.4: Annual Economic Impact of Employee Spending (FY2014)

	DIRECT	INDIRECT	INDUCED	TOTAL
NORTHERN VIRGINIA CAMPUS AND CENTERS				
SPENDING (\$MILLION)	\$23.1	\$6.9	\$7.5	\$37.5
EMPLOYMENT	231	40	53	324
GW-OVERALL				
SPENDING (\$MILLION)	\$122.0	\$36.4	\$39.5	\$197.9
EMPLOYMENT	1,219	209	280	1,708

Source: Chmura Economics & Analytics and IMPLAN Pro 2013

5.2.2. GW STUDENT SPENDING

Of all GW students, 6,033 of them lived in the Northern Virginia MSA in FY2014. Among those, 1,923 were students enrolled in Northern Virginia campus and centers. Using the same assumption on cost of attending and spending leakage, total student spending in the Northern Virginia MSA was estimated to be \$68.4 million for all GW students living in the Northern Virginia MSA and \$21.8 million for students enrolled in its Northern Virginia campus and centers.

The annual economic impact of GW student spending in the Northern Virginia MSA is summarized in Table 5.5. The total annual economic impact (direct, indirect, and induced) of GW student spending was estimated to have been \$107.5 million in FY2014, which supported 1,040 jobs in the MSA. Among this impact, the total economic impact (direct, indirect, and induced) of spending by students of GW's Northern Virginia campus and centers was estimated to have been \$34.3 million in the Northern Virginia MSA, supporting 331 jobs in FY2014.

Table 5.5: Annual Economic Impact of Student Spending (FY2014)

	DIRECT	INDIRECT	INDUCED	TOTAL
NORTHERN VIRGINIA CAMPUS AND CENTERS				
SPENDING (\$MILLION)	\$21.8	\$6.5	\$6.0	\$34.3
EMPLOYMENT	252	37	42	331
GW-OVERALL				
SPENDING (\$MILLION)	\$68.4	\$20.3	\$18.7	\$107.5
EMPLOYMENT	790	118	132	1,040

NOTE: NUMBERS MAY NOT SUM DUE TO ROUNDING
Source: Chmura Economics & Analytics and IMPLAN Pro 2013

²⁵ Source: GW.

5.3. GW Economic Impact Summary in the Northern Virginia MSA - FY2014

Table 5.6 sums up the economic impact of GW for FY2014, including operational expenditures, research expenditures, capital expenditures, employee spending, and student spending. The total estimated impact of GW (direct, indirect, and induced) was \$415.2 million in the Northern Virginia MSA in FY2014. GW also supported 4,080 jobs in the region for the year.

Table 5.6: Annual Economic Impact of GW in Northern Virginia

		DIRECT	INDIRECT	INDUCED	TOTAL
NORTHERN VIRGINIA CAMPUS AND CENTERS	SPENDING (\$MILLION)	\$63.3	\$18.3	\$18.3	\$99.9
	EMPLOYMENT	1,426	109	133	1,668
GW-OVERALL	SPENDING (\$MILLION)	\$256.1	\$78.1	\$80.9	\$415.2
	EMPLOYMENT	3,044	457	579	4,080

NOTE: NUMBERS MAY NOT SUM DUE TO ROUNDING
Source: Chmura Economics & Analytics and IMPLAN Pro 2013

For GW's Northern Virginia campus and centers, the total estimated impact (direct, indirect, and induced) of those campuses in Virginia was estimated to have been \$99.9 million in the region in FY2014, supporting 1,668 regional jobs for the year.

5.4. Fiscal Impact of GW in Northern Virginia MSA

Based on overall payroll data from GW, individual income tax for the state of Virginia was estimated at \$1.8 million for Northern Virginia campus employees living in Virginia.²⁶ GW employee and student spending generate significant tax revenue for state and local governments.

Table 5.7: State and Local Tax Revenues (FY2014)

	Northern Virginia Campus and Centers		GW Overall
TAXES	LOCAL GOVERNMENTS	STATE GOVERNMENT	LOCAL GOVERNMENTS
Sales	\$204,659	\$880,034	\$856,402
Meal	\$90,742		\$319,004
Admission	\$8,505		\$31,144
BPOL	\$82,322		\$320,862
Individual Income		\$2,812,065	
Corporate Income		\$252,006	
TOTAL	\$386,228	\$3,944,106	\$1,527,412

NOTE: BPOL STANDS FOR BUSINESS, PROFESSIONAL, AND OCCUPATIONAL LICENSE
Source: Chmura Economics & Analytics and IMPLAN Pro 2013

Together, for FY2014, GW's enterprise and associated spending contributed \$1.5 million in tax revenue to all local governments in the Northern Virginia MSA. GW's Northern Virginia campus and centers contributed \$386,228 in tax revenue to all local governments in the Northern Virginia MSA, and nearly \$4.0 million in tax revenue for the state government in FY2014.

²⁶ This number is part of \$2.8 million in Table 5.8, Row: Individual Income.

ECONOMIC AND FISCAL IMPACT OF GW AND ITS HAMPTON ROADS CENTER IN THE HAMPTON ROADS MSA

Compared with the economic impact of GW in the Northern Virginia MSA, its impact in Hampton Roads MSA is relatively small. As a result, this section only presents a summary of economic and fiscal impacts in the region.²⁷

Table 6.1 sums up the economic impact of GW in the Hampton Roads MSA for FY2014, including operational expenditures, research expenditures, capital expenditures, employee spending, and student spending. The total estimated impact of GW (direct, indirect, and induced) was \$15.6 million in the Hampton Roads MSA in FY2014. GW also supported 185 jobs in the region for the year.

Table 6.1: GW Economic Impact Summary in Hampton Roads MSA

		DIRECT (\$MILLION)	INDIRECT (\$MILLION)	LOCAL TAX (\$)	STATE TAX (\$)
HAMPTON ROADS CENTER	SPENDING	\$2.9	\$4.7	\$63,115	\$155,138
	EMPLOYMENT	97	110		
GW-OVERALL	SPENDING	\$9.2	\$15.6	\$124,968	
	EMPLOYMENT	138	185		

NOTE: NUMBERS MAY NOT SUM DUE TO ROUNDING
Source: Chmura Economics & Analytics and IMPLAN Pro 2013

For GW's Hampton Roads center, the total estimated impact (direct, indirect, and induced) in the Hampton Roads MSA was estimated to have been \$4.7 million in the region in FY2014, supporting 110 regional jobs for the year.

For FY2014, GW's enterprise and associated spending contributed \$124,968 in tax revenue to all local governments in the Hampton Roads MSA. GW's Hampton Roads center contributed \$63,115 in tax revenue to all local governments in the Hampton Roads MSA, and \$155,138 in tax revenue for the state government in FY2014.

²⁷ Please see Appendix 2 for detailed impact of each component of operation, research, capital, employee and student spending

OTHER IMPACT IN VIRGINIA

Outside quantifiable economic and fiscal impacts of GW in Virginia, the university also benefits the state and its residents in other ways. This section analyzes its impact in workforce development, broadening education access, and improving quality of life in Virginia.

7.1. GW Alumni and Regional Workforce

One of the core missions of GW is to educate its students to be productive members of society. GW's contribution to the development of human capital in the Commonwealth of Virginia starts with the students it attracts and the education they receive. After leaving GW, a large number of these students choose to stay and work in Virginia—especially in the Northern Virginia region.

Based on the alumni database, GW makes a significant contribution to the state and regional workforce. The latest data from this database indicated that 50,370 of GW alumni live in Virginia in 2015. Among those, 82 percent of them (41,378) live in the Northern Virginia MSA. There are 4,629 alumni who live in the Hampton Roads MSA, with the rest living in other parts of Virginia.

Table 7.1: GW Alumni in Virginia-2015

REGION	NUMBER OF GW ALUMNI
Hampton Roads MSA	4,629
Northern Virginia MSA	41,378
Other Virginia Regions	4,363
TOTAL	50,370

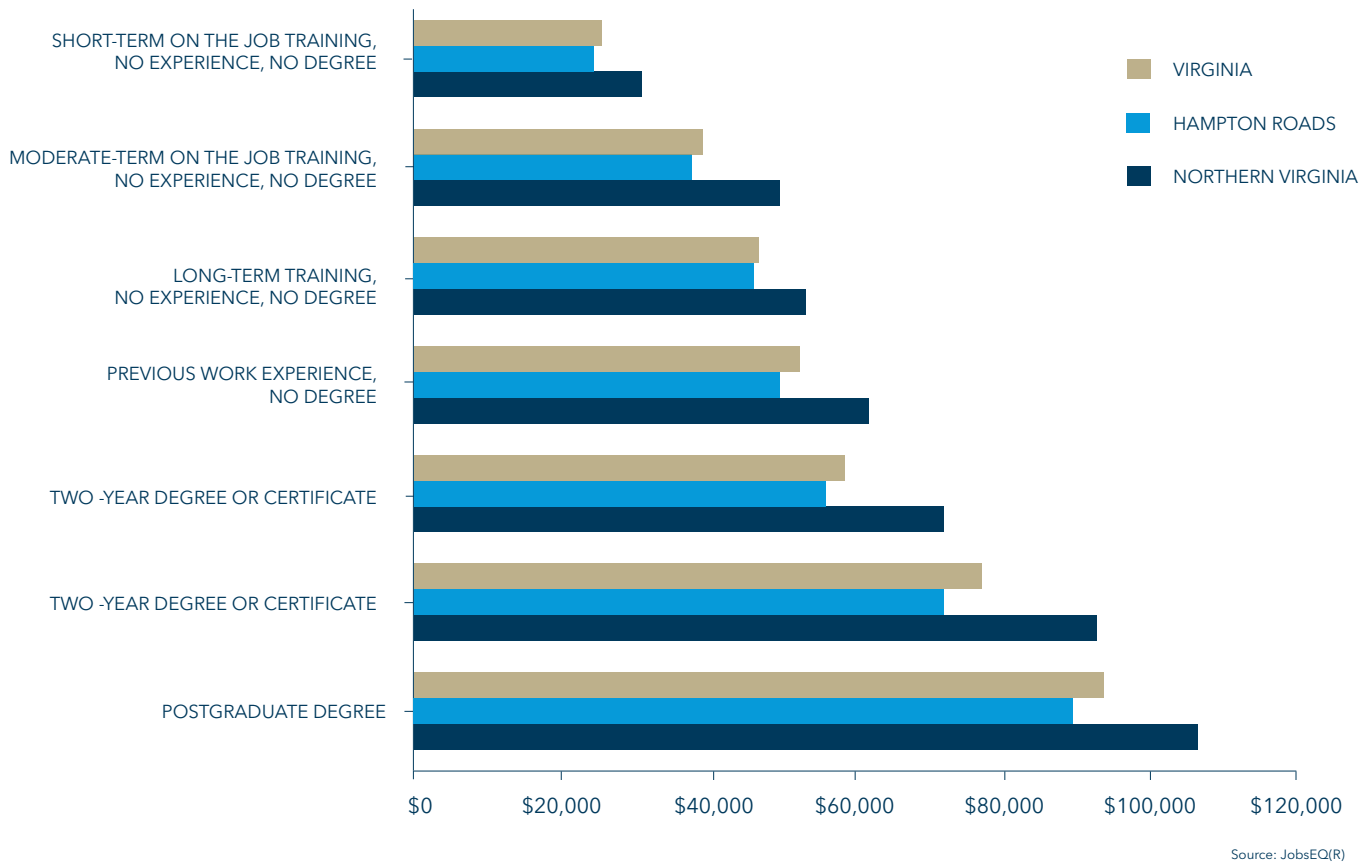
Source: GW

Based on the 2009-2013 American Community Survey, the total adult population (age 25 and above) with bachelor's degrees or higher in the Hampton Roads MSA, Northern Virginia MSA, and Virginia were 262,881, 839,745, and 1,644,851, respectively. Comparing these figures with the number of GW alumni living in these jurisdictions, GW educated approximately 2.0 percent of all college-educated adults in the Hampton Roads MSA, 4.9 percent in the Northern Virginia MSA, and 3.1 percent in Virginia. The high concentration of GW alumni in the Northern Virginia MSA underscores the significant role that GW is playing in developing the region's workforce.

The decisions of these GW alumni to pursue a career in Virginia can help the state increase the average educational attainment, skill level, and income of the region. Pinpointing the exact contribution of GW graduates is difficult because it is hard to determine what would occur if GW did not exist. Some students may attend other colleges in Virginia. Some may choose to attend out-of-state schools and stay there after graduation, resulting in "brain drain" for Virginia. Alternatively, some may choose not to pursue higher education. To simplify, Chmura illustrates the difference in wage and educational attainment if over 50,000 GW alumni chose to live elsewhere.

The latest data (fourth quarter of 2014) indicate that average annual wages in Hampton Roads MSA, Northern Virginia MSA, and Virginia were \$43,600, \$57,500, and \$47,000, respectively. Not surprisingly, higher educational attainment is associated with higher levels of income for Virginia workers (Figure 7.1). Comparing all workers with bachelor's degrees or higher to all workers with lower educational levels, the average annual wages of the former are more than double those of the latter for Hampton Roads MSA, Northern Virginia MSA, and the state.

FIGURE 7.1: AVERAGE ANNUAL WAGES BY EDUCATION/TRAINING (2014Q4)



GW alumni living in Virginia helped to improve the overall income level of the region. Hypothetically, if GW alumni were not in Virginia, it is estimated that average annual wages in the Northern Virginia MSA would fall from \$57,500 to \$57,000—a 0.9 percent drop. For the Hampton Roads MSA, the drop would be 0.3 percent. Statewide, not having GW alumni would result in a 0.5 percent decline in statewide average wages. Though those numbers seem to be modest, with the size of overall workforce in the state and those regions, the total amount of wealth loss could reach \$853 million per year for the state, \$644 million for the Northern Virginia MSA, and \$80 million for the Hampton Roads MSA.

7.2. GW and Education Access

GW's Virginia campus and centers play important roles in providing educational opportunities in Virginia. They offer some unique academic programs, and they also offer education for underserved as well as non-traditional students.

GW's Alexandria Center is the home of the Art Therapy Program, which is the oldest in the country. The students in this program work in internships across the region in schools, hospitals, veteran facilities, and clinics. The school counseling and art therapy programs operates a community counseling clinic for local residents. The clinic has two primary missions: to provide quality counseling services to clients, and to promote excellence in the training of master's and doctoral students through state-of-the-art clinical supervision.

The Alexandria Center is also home to the Center for Excellence in Public Leadership, which provides educational and training opportunities to federal, state, and local civil servants at the Center (e.g., USDA Leadership Institute). Its Strategic Public Relations program won PR Week's education program of the year for 2015. The Alexandria Partnership Fellowship awards free program tuition to one Alexandria resident per year on the condition that they provide community service to the city during their tenure at GW's Alexandria Center.

The Arlington Center is home to GW's Integrated Information, Science and Technology Program (IIST). Dr. Sara Hooshangi, director of IIST, has won a five-year, \$611,191 grant from the National Science Foundation for her project "Pathway for Adult-learners, Community College and Non-Traditional Students (PACTS)". The PACTS scholarship program will support cohorts of talented non-traditional students, community college graduates, and adult learners with financial need as they complete bachelor's degrees in IIST. The program aims to recruit and retain undergraduate transfer students and provide them with mentoring and targeted student support, including career advising, workshops and seminars, industry tours, and a chance to participate in service-learning courses. By enhancing the education, mentoring, and employment opportunities of such students, the program aims to create a STEM-heavy workforce that is more diverse and inclusive.

At the Hampton Roads Center, GW's School of Engineering and Applied Science has several contracts with the Newport News Shipyard, providing graduate education services to about 300 employees. In addition, the Hampton Roads Center's education program is an important training ground for educational leaders across the state. In fact, six of Virginia's county school superintendents are graduates of this center, including those of Henry, York, Greene, and Mathews counties, and the cities of Newport News and Staunton.

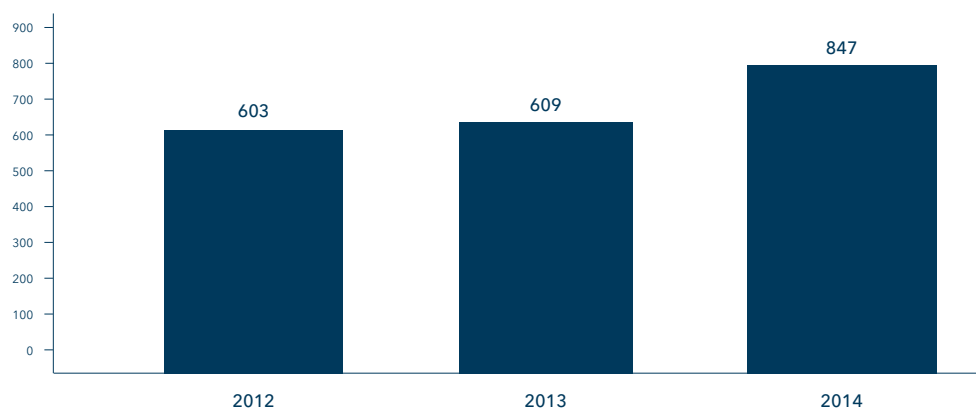
7.3. School of Nursing and Nursing Shortage

This section provides an in-depth analysis of GW's School of Nursing (SON), and its effect on both training health care workers and relieving nursing shortages in the region.

GW's School of Nursing has a significant presence in Northern Virginia, and is experiencing rapid growth. Though the nursing school is located at both GW's Foggy Bottom campus in D.C. and the VSTC, it is the only GW school that is headquartered in Virginia. In addition, all future program expansion of SON is expected to occur in the VSTC.

As Figure 7.2 shows, SON enrollment has expanded significantly in recent years. In 2012 and 2013, the total student enrollment in SON was a little over 600. That number has increased by more than 30 percent to 847 in 2014. The School of Nursing offers a wide range of nursing degrees, ranging from nursing certificates, Bachelor of Science in Nursing (BSN), to master's and doctoral degrees. Among those, the most growth occurred in the Master of Science in Nursing (MSN) and Doctoral of Nursing Practice (DNP) programs. The number of MSN students increased from 312 in 2013 to 429 in 2014. The number of DNP students increased from 133 in 2013 to 165 in 2014.

FIGURE 7.2: NUMBER OF STUDENTS IN GW'S SCHOOL OF NURSING, 2012-2014



Source: GW

SON contributes to Virginia communities through the volunteer activities of its students. As Table 7.2 shows, the number of volunteer sites, participating students, and volunteer hours increased significantly. In 2014, 611 students volunteered 28,026 hours of their time in various health facilities in Virginia, averaging 45 hours per student. As SON is expected to expand in the future, it is actively seeking more volunteer sites, benefiting both its students and more Virginia communities.

Table 7.2: SON Students Volunteer Activities

YEAR	NUMBER OF SITES	NUMBER STUDENTS	VOLUNTEER HOURS
2012	15	457	19,550
2013	20	563	23,682
2014	29	611	28,026

Source: GW

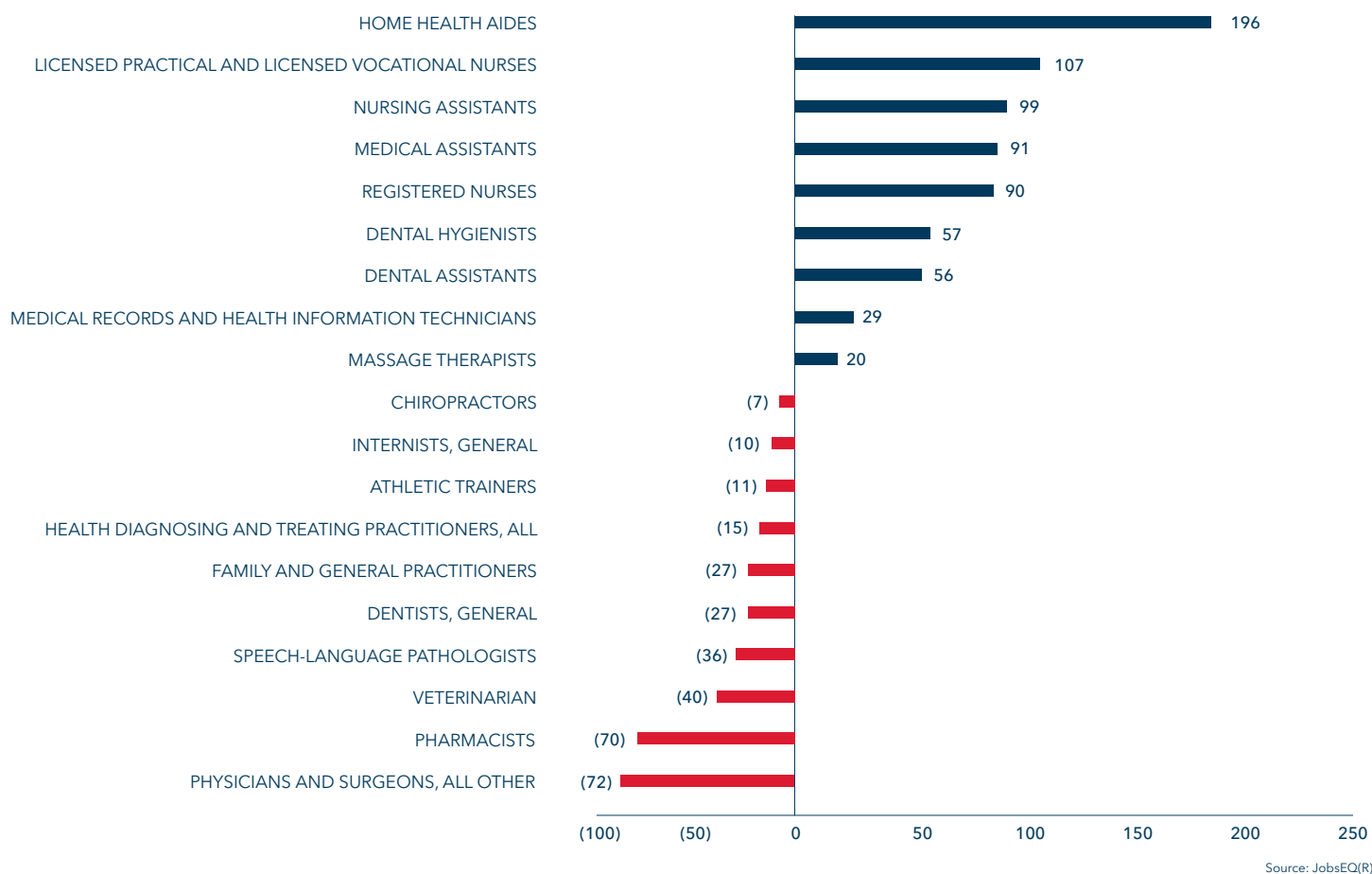
A large number of SON alumni also live and work in Virginia. Based on data from 2012 to 2014, of all graduates during those three years, 106 alumni live in Virginia, and many of them also work in Virginia's hospitals and for health care providers.

Nursing is one occupation that will experience shortages in the future. Occupation gaps indicate the overall imbalance between future labor demand and the supply of workers for a particular occupation. A negative gap indicates a labor surplus, while a positive gap indicates a shortage; the gaps are measured by the annual average number of workers for the region.

Figure 7.3 examines the gaps among health care occupations in the Northern Virginia MSA. The largest shortage is projected for home health aides with a shortage of 196 workers per year in the next 10 years. The top five health care occupations with the largest annual shortages were licensed practical and licensed vocational nurses (107 workers); nursing assistants (99); medical assistants (91); and registered nurses (90).



**FIGURE 7.3: ANNUAL OCCUPATION GAPS IN THE HEALTH CARE WORKFORCE
IN THE NORTHERN VIRGINIA MSA, 2014-2024**



Since there are shortages of both RNs and LPNs, GW's nursing program will help relieve these shortages in the Northern Virginia MSA. Each year, GW SON graduates hundreds of students with nursing certificates, bachelor's, and advanced degrees. As a result, both the significant presence and rapid growth of GW's School of Nursing in Northern Virginia will help alleviate the region's nursing shortage. This will benefit Virginia residents as a low degree of nursing shortage implies better patient care. In addition, the School of Nursing in Northern Virginia provides an excellent opportunity for current nurses to receive additional training and advance their careers.

GW's SON also pioneered innovative programs to meet the future challenges of the nursing workforce. In 2014, SON received a three-year, \$1 million grant from the U.S. Health Resources and Services Administration (HRSA) to develop a Bachelor of Science in Nursing for veterans (VBSN). The VBSN Initiative is designed to support veterans in their transition to the professional workforce, while addressing the growing demand for health care services, especially primary care, throughout our nation. Many veterans without BSN degrees possess valuable skills and training that position them well for entry into nursing careers.²⁸ This program takes only 15 months (four semesters) to complete. A SON academic advisor will work with service members to translate military service to academic credits, enabling veterans to complete the program faster. The VBSN program launched in spring 2015 and enrollment is expected to triple in one year.

28 Source: <http://nursing.gwu.edu/hrsa-grant-funds-development-veterans-bsn>, and <http://nursing.gwu.edu/veterans-bachelor-science-nursing-bsn>



7.4. GW Baseball Team in Arlington

Since 1993, GW's baseball team has been playing at Barcroft Park in Arlington, Virginia.²⁹ Playing in Arlington has generated many economic and social benefits to the local community.

Over the years, GW has made facility improvements to Barcroft Park. The most recent investment by GW in Barcroft Park amounted to \$3.0 million in 2012. This was fully paid by GW to install a new press box, concession area, dugouts, bullpens, and stadium seating. Under a new 20-year agreement, GW will pay all upgrade costs while splitting annual maintenance costs 25 percent/75 percent with Arlington County. The split reflects the agreement that GW will have access to the field for 25 percent of available hours while the county will be able to provide public access to the field for 75 percent of available hours.³⁰

The facility upgrade and maintenance conducted by GW will benefit the local economy, as local contractors will be hired to work on the baseball and softball fields. In addition, playing in Arlington will also benefit other local businesses such as restaurants, gas stations, and retail shops. The baseball team can bring in fans, home and visiting teams, as well as visitors to the Northern Virginia region. They will patronize those local businesses, supporting local economies.

Outside the economic benefit, Barcroft Park is open to the public, and local students and residents have access to a state-of-the-art baseball facility. GW's investment created a valuable asset that the whole community will enjoy for years to come.

²⁹ Source: <http://gwtoday.gwu.edu/gw-dedicates-tucker-field-barcroft-park>

³⁰ Source: <http://www.arlnow.com/2011/09/21/board-approves-new-barcroft-park-baseball-field/>

APPENDIX 1: IMPACT STUDY GLOSSARY

IMPLAN Professional is an economic impact assessment modeling system. It allows the user to build economic models to estimate the impact of economic changes in states, counties, or communities. It was created in the 1970s by the Forestry Service and is widely used by economists to estimate the impact of specific event on the overall economy.

Input-Output Analysis—an examination of business-business and business-consumer economic relationships capturing all monetary transactions in a given period, allowing one to calculate the effects of a change in an economic activity on the entire economy (impact analysis).

Direct Impact—economic activity generated by a project or operation. For construction, this represents activity of the contractor; for operations, this represents activity by tenants of the property.

Overhead—construction inputs not provided by the contractor.

Indirect Impact—secondary economic activity that is generated by a project or operation. An example might be a new office building generating demand for parking garages.

Induced (Household) Impact—economic activity generated by household income resulting from the direct and indirect impact.

Multiplier—the cumulative impacts of a unit change in economic activity on the entire economy.

APPENDIX 2: ECONOMIC AND FISCAL IMPACT OF GW AND ITS HAMPTON ROADS CENTER IN THE HAMPTON ROADS MSA

This section examines the quantifiable economic impact of GW and its Hampton Roads center in the Hampton Roads MSA. The analysis of the regional economic impact follows the same methodology used in the analysis of the statewide impact.

A2.1. Economic Impact of GW Enterprise Spending

A2.1.1. GW OPERATIONAL EXPENDITURES

Data provided by GW indicated that in FY2014, GW (all campuses) spent \$2.3 million in the Hampton Roads MSA for its operations. For GW's Hampton Roads center, data provided by GW indicated that total operational spending amounted to \$0.3 million in FY2014. As of FY2014, 65 GW employees were working at the Hampton Roads center.

The total annual economic impact of operational expenditures by GW and its Hampton Roads center in the Hampton Roads MSA is summarized in Table 6.1. For FY2014, the total economic impact (direct, indirect, and induced) of overall GW operational expenditures was estimated to have been \$4.1 million in the region, supporting 79 jobs. Of this, the total economic impact (direct, indirect, and induced) of GW's Hampton Roads center was estimated to have been \$0.4 million in the MSA, supporting 66 jobs.

Table A2.1: Annual Economic Impact of Operational Expenditures (FY2014)

		DIRECT	INDIRECT	INDUCED	TOTAL
HAMPTON ROADS CENTER	SPENDING (\$MILLION)	\$0.3	\$0.1	\$0.0	\$0.4
	EMPLOYMENT	65	0	0	66
GW-OVERALL	SPENDING (\$MILLION)	\$2.3	\$0.9	\$0.9	\$4.1
	EMPLOYMENT	65	6	7	79

NOTE: NUMBERS MAY NOT SUM DUE TO ROUNDING
Source: Chmura Economics & Analytics and IMPLAN Pro 2013

A2.1.2. GW RESEARCH SPENDING

Data from GW indicate that total university research spending was \$180.6 million in FY2014. It is assumed that 0.5 percent of research funding was spent in the Hampton Roads MSA, which is the same percentage of regional spending as the GW operational expenditures.³¹ Consequently, total research spending in Virginia was estimated to be \$0.9 million in FY2014. For GW's Hampton Roads center, data from GW showed its research awards were estimated at \$0.2 million in FY2014.

The total annual economic impact of GW research expenditures in the Hampton Roads MSA is summarized in Table 6.2. For FY2014, the economic impact (direct, indirect, and induced) was estimated to have been \$1.6 million and the addition of 10 jobs in the Hampton Roads MSA. Among the research impact, the total economic impact (direct, indirect, and induced) of GW's Hampton Roads center was estimated to have been \$0.1 million in the region, supporting one job in FY2014.

31 Estimated based on Virginia operational spending data provided by GW and data from NCES.

Table A2.2: Annual Economic Impact of Research Spending (FY2014)

		DIRECT	INDIRECT	INDUCED	TOTAL
HAMPTON ROADS CENTER	SPENDING (\$MILLION)	\$0.1	\$0.0	\$0.0	\$0.1
	EMPLOYMENT	0	0	0	1
GW-OVERALL	SPENDING (\$MILLION)	\$0.9	\$0.4	\$0.3	\$1.6
	EMPLOYMENT	4	3	3	10

NOTE: NUMBERS MAY NOT SUM DUE TO ROUNDING
Source: Chmura Economics & Analytics and IMPLAN Pro 2013

A2.1.3. GW CAPITAL INVESTMENT

From FY2012 to FY2014, there was no direct capital investment in GW's Hampton Roads center. University-wide, GW spent an average of \$159.1 million per year on capital investment projects from FY2012 to FY2014, with an estimated \$0.8 million spent with businesses located in the Hampton Roads MSA.

The annual total economic impact (direct, indirect, and induced) of GW's capital expenditures was estimated to have been \$1.2 million which supported 7 jobs in the Hampton Roads MSA. There is no impact from capital investment by GW's Hampton Roads center.

Table A2.3: Annual Economic Impact of Capital Spending (Average FY2012-2014)

		DIRECT	INDIRECT	INDUCED	TOTAL
HAMPTON ROADS CENTER	SPENDING (\$MILLION)	\$0.0	\$0.0	\$0.0	\$0.0
	EMPLOYMENT	0	0	0	0
GW-OVERALL	SPENDING (\$MILLION)	\$0.8	\$0.2	\$0.2	\$1.2
	EMPLOYMENT	4	2	2	7

NOTE: NUMBERS MAY NOT SUM DUE TO ROUNDING
Source: Chmura Economics & Analytics and IMPLAN Pro 2013

A2.2. Economic Impact of GW-Associated Spending

A2.2.1. GW EMPLOYEE SPENDING

Among all GW employees, 51 lived in the Hampton Roads MSA in FY2014, with an average wage and salary of \$55,685. GW's Hampton Roads center had 65 employees in FY2014. There were 19 employees who lived in the Hampton Roads MSA in FY2014, with an average wage and salary of \$49,919.³²

Using the same methodology to adjust for employee savings, investment, as well as expenditure leakages, Chmura estimated that total direct employee spending for FY2014 was \$1.8 million for all GW employees living in the Hampton Roads MSA, and \$0.6 million for its Hampton Roads center employees living in the region.

The total annual economic impact of GW employee spending in the Hampton Roads MSA is summarized in Table 6.4. The total annual economic impact (direct, indirect, and induced) of GW employee spending was estimated to have been \$3.1 million in FY2014, which supported 30 jobs in the Hampton Roads MSA. Of this, the total economic impact (direct, indirect, and induced) of spending by employees at GW's Hampton Roads center was estimated to have been \$1.0 million in the Hampton Roads MSA, supporting 10 jobs in FY2014.

³² Source: GW

Table A2.4: Annual Economic Impact of Employee Spending (FY2014)

		DIRECT	INDIRECT	INDUCED	TOTAL
HAMPTON ROADS CENTER	SPENDING (\$MILLION)	\$0.6	\$0.2	\$0.2	\$1.0
	EMPLOYMENT	7	1	2	10
GW-OVERALL	SPENDING (\$MILLION)	\$1.8	\$0.6	\$0.6	\$3.1
	EMPLOYMENT	21	4	5	30

NOTE: NUMBERS MAY NOT SUM DUE TO ROUNDING
Source: Chmura Economics & Analytics and IMPLAN Pro 2013

A2.2.2. GW STUDENT SPENDING

Of all GW students, 297 of them lived in the Hampton Roads MSA in FY2014. Among those, 168 were students enrolled at the Hampton Roads center. Using the same assumption on cost of attending and spending leakage, total student spending in the Hampton Roads MSA was estimated to be \$3.5 million for all GW students living in the Hampton Roads MSA and \$2.0 million for its Hampton Roads center students.

The annual economic impact of GW student spending in the Hampton Roads MSA is summarized in Table 6.5. The total annual economic impact (direct, indirect, and induced) of all GW student spending was estimated to have been \$5.6 million in FY2014, which supported 59 jobs in the MSA. Of this, the total economic impact (direct, indirect, and induced) of spending by students at GW's Hampton Roads center was estimated to have been \$3.2 million in the Hampton Roads MSA, supporting 33 jobs in FY2014.

Table A2.5: Annual Economic Impact of Student Spending (FY2014)

		DIRECT	INDIRECT	INDUCED	TOTAL
HAMPTON ROADS CENTER	SPENDING (\$MILLION)	\$2.0	\$0.6	\$0.6	\$3.2
	EMPLOYMENT	24	4	5	33
GW-OVERALL	SPENDING (\$MILLION)	\$3.5	\$1.1	\$1.0	\$5.6
	EMPLOYMENT	43	8	8	59

NOTE: NUMBERS MAY NOT SUM DUE TO ROUNDING
Source: Chmura Economics & Analytics and IMPLAN Pro 2013

A2.3. GW Economic Impact Summary in the Hampton Roads MSA - FY2014

Table 6.6 sums up the economic impact of GW in the Hampton Roads MSA for FY2014, including operational expenditures, research expenditures, capital expenditures, employee spending, and student spending. The total estimated impact of GW (direct, indirect, and induced) was \$15.6 million in the Hampton Roads MSA in FY2014. GW also supported 185 jobs in the region for the year.

For GW's Hampton Roads center, the total estimated impact (direct, indirect, and induced) in the Hampton Roads MSA was estimated to have been \$4.7 million in the region in FY2014, supporting 110 regional jobs for the year.

Table A2.6: Annual Economic Impact of GW in Hampton Roads MSA

		DIRECT	INDIRECT	INDUCED	TOTAL
HAMPTON ROADS CENTER	SPENDING (\$MILLION)	\$2.9	\$0.9	\$0.8	\$4.7
	EMPLOYMENT	97	6	7	110
GW-OVERALL	SPENDING (\$MILLION)	\$9.2	\$3.3	\$3.0	\$15.6
	EMPLOYMENT	138	23	25	185

NOTE: NUMBERS MAY NOT SUM DUE TO ROUNDING
Source: Chmura Economics & Analytics and IMPLAN Pro 2013

A2.4. Fiscal Impact of GW

For FY2014, GW's enterprise and associated spending contributed \$124,968 in tax revenue to all local governments in the Hampton Roads MSA. GW's Hampton Roads center contributed \$63,115 in tax revenue to all local governments in the Hampton Roads MSA, and \$155,138 in tax revenue for the state government in FY2014.

Table A2.7: State and Local Tax Revenue (FY2014)

	Hampton Roads Center		GW Overall
	LOCAL GOVERNMENTS	STATE GOVERNMENT	LOCAL GOVERNMENTS
Sales	\$12,007	\$51,629	\$24,494
Meal	\$36,244		\$66,738
Lodging	\$0		\$0
Admission	\$8,806		\$16,518
BPOL	\$6,058		\$17,217
Individual Income		\$86,932	
Corporate Income		\$16,577	
TOTAL	\$63,115	\$155,138	\$124,968

NOTE: BPOL STANDS FOR BUSINESS, PROFESSIONAL, AND OCCUPATIONAL LICENSE
Source: Chmura Economics & Analytics and IMPLAN Pro 2013

