

The University of Pennsylvania Economic & Fiscal Impact Report



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EXECUTIVE SUMMARY

The University of Pennsylvania leads Philadelphia's powerful non-profit sector, while driving development locally and globally. Penn plays a key economic role in the local and state economies. Penn is a preeminent institution of higher education (the "University") in the world as well as operates one of the nation's leading academic health care systems ("UPHS"). This report details the impacts of each component and the entities combined, which is denoted as "Penn" throughout the report.

As both a world-class research university and health care system, Penn makes notable contributions on a regional, national, and international level.

- Penn is the largest private employer in Philadelphia, the second largest private employer, and the fifth largest employer overall in the state.
- Penn's research program helps to make Philadelphia one of the nation's premier research centers.
- Penn's physical infrastructure investments are enormous, both on campus and in cooperation with private developers off campus and in the University City neighborhood.
- Penn's graduates increase the skill levels and productivity of the region's workforce, and thereby increase the efficiency and competitiveness of area companies and organizations.
- Penn's medical system promotes a healthy region by providing world-class patient care, education, and cutting-edge research.
- Penn's worldwide network of students and alumni is admired internationally and locally. Consequently, Penn is one of the region's largest higher education and medical care exporters, bringing money to the local economy from around the world.

Several categories of expenditures comprise Penn's direct spending in the region, including annual operations, capital investments, ancillary spending by students and visitors, and independent operations of Penn affiliated hotels and retail complexes. This spending leads to further indirect and induced spending as the money circulates throughout the local and state economies. To sustain its operations, Penn supports businesses locally in West Philadelphia, citywide, as well as throughout the 11-county (tri-state) Philadelphia metro area. Direct spending is on goods and services, salaries paid to faculty and staff, ancillary spending (by students and their families; their families, visitors attending conferences, seminars, or athletic events; hospital patients and families coming from outside the region to receive medical care, and visitors for other related activities), capital investments, and alumni productivity.

**Table ES-1
Economic Impacts (2005) (\$ Millions)**

Description	City of Philadelphia	11-County Region	State of Pennsylvania
Direct Expenditures	\$4,011	\$4,046	\$4,040
Indirect & Induced Expenditures	\$2,532	\$5,748	\$5,560
Total Output	\$6,543	\$9,794	\$9,600
Total Employment (Total Jobs)	62,973	95,787	100,954
Total Earnings (Total Wages)	\$2,752	\$3,898	\$3,904

Source: Econsult Corporation (2006)

**Table ES-2
Annual Fiscal (Tax) Impacts (\$ Millions)**

Tax Description	Fiscal Impact
State of Pennsylvania	\$236.7
City of Philadelphia	\$136.1
Total Annual Taxes	\$372.8

Source: Econsult Corporation (2006)

Summary of Penn's Impact

- Expenditures generate nearly \$9.6 billion in total economic activity for the state, \$9.8 billion for the 11-county region, \$6.5 billion for the city of Philadelphia, and over 100,000 total jobs statewide. Statewide economic impact is equivalent to over \$25 million per day.
- Capital investments, on average, total nearly \$314 million per year.
- Visitors spend an estimated \$14.5 million in the local region each year.
- Contributes over \$372 million in state and local tax revenue each year.
- Purchased nearly \$3.5 billion in goods and services from Pennsylvania suppliers in FY2005.
- Facilitated the launch of 56 new start-up companies between 2000-2005.
- Through increased productivity, University alumni are estimated to have contributed nearly \$485 million to the statewide economy.

The scale of Penn's impact is significant, making up nearly 3% of the \$200 billion Philadelphia economy (Gross Metropolitan Product 2003) and 2% of the \$470 billion Pennsylvania economy (Gross State Product 2004). Penn's impact is on par with that estimated for the Philadelphia International Airport (\$14.4 billion) and the region's tourism and hospitality industry (\$11.2 billion). It is also nearly double the size of that estimated for the region's music industry (\$4.9 billion). Finally, Penn's *annual* impact is nearly as much as the 10-year cumulative, potential impact estimated for the proposed Philadelphia Olympics 2016 (\$12.1 billion).



SECTION 1 INTRODUCTION

Founded by Benjamin Franklin in 1740 as one of the colonial colleges, the University of Pennsylvania has developed into one of the nation's leading comprehensive research universities, with a tradition of achievement by its distinguished faculty and highly motivated students. For more than two and a half centuries, the University of Pennsylvania has played a vital role in the State of Pennsylvania and the City of Philadelphia. Penn established the first medical school in the nation, the first hospital founded for bedside teaching, the first psychological clinic, the first collegiate school of business, the first full-scale archaeological excavation in the Near East, and the world's first large-scale, general-purpose, all-electronic digital computer. Innovation has led Penn to become a leader in numerous disciplines and studies.

Penn is currently comprised of 12 schools (4 undergraduate schools and 12 graduate and professional schools). Penn's schools include the School of Arts and Sciences, School of Engineering and Applied Sciences, School of Nursing, Wharton School, Annenberg School for Communication, School of Dental Medicine, Graduate School of Education, School of Design, Law School, School of Medicine, School of Social Policy & Practice, and School of Veterinary Medicine. Penn also offers lifelong learning programs for continuing education and houses more than 160 centers and institutes. The University's student population totals over 23,000, including both full-time and part-time students. There are approximately 10,000 full-time undergraduate students and 10,000 full-time graduate students enrolled at the University on an annual basis. The University is one of the nation's premier institutions of higher education as reflected in external rankings:

Table 1.1
Penn Programs and Rankings

School	Rank
University of Pennsylvania (overall)	4
Wharton School	3
Wharton School (Undergraduate Program)	1
School of Nursing	3
School of Medicine	4
Law School	7
Graduate School of Education	9

Source: U.S. News and World Report, 2005.

Recognized as a national leader in health care services, UPHS includes the Hospital of the University of Pennsylvania, Penn Presbyterian Medical Center, Pennsylvania Hospital, The Clinical Practices of the University of Pennsylvania, Clinical Care Associates, as well as suburban locations outside of the city but within the local region (in Radnor, PA and Cherry Hill, NJ). With primary physicians, specialists, home care and hospice services, rehabilitation services, continuing care, and local affiliations with other area hospitals, UPHS provides a wide range of high-quality medical services to the region.

With nearly 48,000 people living, learning, and working on Penn's 269-acre West Philadelphia campus, its sheer size and output make it a significant economic engine for the City of Philadelphia, and its economic impact is felt throughout the region¹ and the state.

This report provides estimates of Penn's economic impact on the economies of the City of Philadelphia, the 11-county (tri-state) Philadelphia metro area, and the State of Pennsylvania, for its operations of FY 2005. It combines the economic impacts of both the University and the Health System into one, denoted as "Penn" throughout the report.

This report is organized as follows:

- **Section 2** details estimates of the traditional economic impacts generated by the University, UPHS, and the combined total for Penn: spending, earnings, and employment,
- **Section 3** provides estimates of the annual fiscal (tax) impacts associated with these economic impacts,
- **Section 4** presents an estimate of the labor market productivity impacts associated with earning a Penn degree,
- **Section 5** lists additional qualitative and quantitative impacts of Penn on the city, region, and state, and
- **Section 6** summarizes conclusions.

¹ We estimate the impacts for the PA-NJ-DE-MD Metropolitan Statistical Area ("11-County Region") along with the city and the state. This region includes the following counties: New Castle County, DE; Cecil County, MD; Burlington County, NJ; Camden County, NJ; Gloucester County, NJ; Salem County, NJ; Bucks County, PA; Chester County, PA; Delaware County, PA; Montgomery County, PA, and Philadelphia County, PA.



SECTION 2 ENGINE OF ECONOMIC GROWTH

Penn, with its daily revenue and expenditures, is a major contributor to the region's economy, supporting local and statewide businesses. This direct spending in the local, regional, and state economies yields Penn's primary economic impact. As the largest private employer in Philadelphia, the second largest private employer and the fifth largest employer overall in the state, Penn adds substantial economic impact to the city, region, and state. Also, Penn's large payroll contributes to the local region as employee earnings are, in turn, spent on local purchases, further supporting local and statewide industries. Penn also engages in significant physical building and infrastructure capital spending each year. These capital expenditures are either for Penn facilities or support private development investment around its campus.

There are four distinct categories of annual direct expenditures, each of which will be explored in more detail:

1. Ongoing Operating Expenditures (University and Health System Spending)
2. Average Annual Capital Investments
3. Ancillary Spending (outside spending by visitors and students)
4. Independent Operations Expenditures (hotels & retail)

In addition to Penn's direct budget spending, students and visitors also spend money in the area that is not accounted for in financial statements. This additional spending injects more money into the local economy that is spent and re-spent, multiplying through regional and state industries. This ancillary spending is also a form of direct spending, and its impact is certainly attributable to Penn.

The estimation of Penn's economic and fiscal impacts is essentially a two-step process:

Step One

Compile Penn's *direct expenditures* for each of the four categories (direct spending of the University and UPHS including Penn's research activity and salaries and wages paid to the regular workforce, capital investments, ancillary spending by students and visitors, and spending on independent operations). These expenditures illustrate Penn's important roles as a purchaser, employer, research giant, economic development driver, and exporter. The ongoing operational spending budgets of the University and UPHS include spending on all services related to the ongoing student and professional operations for both institutions.² Penn's annual spending for

² Care is taken to avoid double counting, and we exclude any expenditure not made in the local economy, including, for example, interest payments and depreciation.

operations has a significant impact on local and state businesses, constituting a substantial portion of the Higher Education and Medical Services contribution to the local West Philadelphia community.

Step Two

Estimate the indirect and induced expenditures generated by direct spending inputs. These estimates are generated by the input-output model and are reported in terms of total economic output (or spending activity), earnings, and employment. The indirect and induced expenditure estimates in this report are derived by using the estimated direct expenditures as inputs into a standard regional input-output model developed by the U.S. Department of Commerce, Bureau of Economic Analysis, the Regional Input-Output Modeling System (RIMS II).³ These models generate “multipliers,” which represent the estimated times each dollar is spent within the economy.⁴

Section 2 will discuss the four distinct categories, then compile and summarize the information to arrive at the total economic impact.

1. Ongoing Operating Expenditures (University and Health System Spending)

The ongoing operational spending of the University totals nearly \$1.6 billion in spending for the city and state and includes, among many other components, budget spending on faculty and staff salaries, food services, general supplies, equipment, library services, telephone, parking, and all other services related to ongoing functions.⁵

Annual expenditures for UPHS include the spending on supplies for all health-care related operations, including employee salaries and wages. UPHS’s ongoing operational spending totals nearly \$1.9 billion in spending for Pennsylvania.⁶

As the leading employer in the region (Table 2.1), annual spending for wages and salaries makes up a significant portion of Penn’s ongoing expenditures.

³ See Appendix A.1 for more details on the model and the methodology employed for the economic impact analysis.

⁴ University and Health System expenditures are associated with an expenditure multiplier of 1.67 for Philadelphia and 2.39 for the State of Pennsylvania. The larger Pennsylvania economy captures some indirect and induced effects that occur in the state but outside the city, as reflected by a larger state average expenditure multiplier, compared to the smaller city multiplier.

⁵ Direct expenditures for operations and independent operations were provided by the University of Pennsylvania. University financials were gathered from the Statement of Activities: Consolidated Academic Component for the years ended June 2005 and 2004.

⁶ UPHS financials were gathered from the UPHS Combined Statements of Operations: Report on Audits of Combined Financial Statements and Combining Supplementary Data years ended June 30, 2005 and 2004.

Table 2.1
Leading Employers in the Philadelphia Region

Employers	# of Employees
1. University of Pennsylvania	24,750*
2. Jefferson Health System	14,317
3. MBNA	10,500
4. Merck & Co.	10,000
5. Du Pont	9,906
6. Christiana Health Care	9,500
7. Vanguard Group Inc.	8,000
8. Crozer-Keystone Health System	7,026
9. Tenet Health Systems	7,002
10. Prudential	6,568

Source: Select Greater Philadelphia. Philadelphia Business Journal Book of Lists, 2005, The Business Ledger of Delaware Book of Lists, 2005
**Number of employees (22,605) was revised based on information provided by the University of Pennsylvania.*

Ongoing expenditures for the University generate nearly \$3.8 billion in annual statewide economic activity (Table 2.2). In addition to the 13,025 direct employees of the University and including indirect and induced jobs, ongoing University expenditures and total output are estimated to generate nearly 42,000 jobs statewide.

In addition to the University impact, UPHS spending generates \$4.5 billion in economic activity for the State of Pennsylvania (Table 2.2). Adding to the direct employment of 11,725, UPHS spending and total output is estimated to generate over 46,000 total jobs for the state.

Combined, Penn's overall economic impact is estimated to be nearly \$8.3 billion for the State of Pennsylvania. In this category, Penn's impact on state employment extends well beyond those employed directly, generating (directly and indirectly) more than 88,000 total jobs and \$3.5 billion in earnings (Table 2.3).

Table 2.2
Estimated Economic Impacts of Penn Operations (\$ Millions)

	Direct Expenditures	Indirect & Induced Expenditures	Total Output
CITY OF PHILADELPHIA			
PENN	\$3,439.7	\$2,317.2	\$5,757.0
University	\$1,581.9	\$1,074.7	\$2,656.7
UPHS	\$1,857.8	\$1,242.5	\$3,100.3
11-COUNTY REGION			
PENN	\$3,450.5	\$5,077.3	\$8,527.8
University	\$1,592.7	\$2,338.7	\$3,931.4
UPHS	\$1,857.8	\$2,738.6	\$4,596.4
STATE OF PENNSYLVANIA			
PENN	\$3,450.5	\$4,805.5	\$8,256.0
University	\$1,592.7	\$2,198.2	\$3,790.9
UPHS	\$1,857.8	\$2,607.3	\$4,465.1

Source: Econsult Corporation (2006).

Note: Total Economic Output includes direct, indirect, and induced spending.

Table 2.3
Total Estimated Economic Impacts of Penn Operations: Earnings and Employment (\$ Millions)

	Total Employment	Total Earnings
CITY OF PHILADELPHIA		
PENN	57,647	\$2,597.8
11-COUNTY REGION		
PENN	84,570	\$3,509.8
STATE OF PENNSYLVANIA		
PENN	88,108	\$3,484.9

Source: Econsult Corporation (2006).

Note: Total Earnings includes direct, indirect, and induced earnings.

Total Employment includes direct, indirect, and induced employment.

2. Average Annual Capital Investments

The economic impacts on the regional and state economies stemming from construction activity at Penn are significant. Each year, both the University and UPHS make substantial capital investments supporting new infrastructure and significant renovation projects or expansions. Over the past decade, the University has completed numerous campus development and real estate projects designed to enhance community life. There are two facets of this construction activity: (1) construction and improvements of Penn's facilities and (2) Penn-supported private development, or leveraged construction, in surrounding University City.

Between FY1997 and FY2005, Penn's total capital project spending equaled approximately \$1.5 billion. Of that total, 49% was spent on new construction and 51% was spent for renovations and infrastructure improvements. In addition, Penn has attracted over \$300 million in private development since 2000.

For this analysis, Penn's construction activity over the past five years (direct Penn expenditures or private capital expenditures made for the use and benefit of Penn) was compiled to obtain an understanding of how total capital expenditures impact the region and state on an annual basis.⁷ Ongoing expenditures for the region and state are based on the annual average of construction spending over the period (FY2001-FY2005), as provided by Penn.

Included in Penn's commitment to enhancing the local region and promoting regional growth, Penn's capital investments extend outside the boundaries of University spending, contributing to local construction efforts. Several projects (planned and completed through 2005) have helped transform areas of West Philadelphia neighborhoods⁸ (Table 2.4). These projects include real estate development promoted to enhance the retail, residential, and educational communities of West Philadelphia.

Table 2.4
Summary of Select Real Estate Development (\$ Millions)

Project	Total Cost
Domus*	\$92
University Square (Sansom Common)	\$90
Translational Research Lab*	\$78
Left Bank*	\$55
Hamilton Village	\$46
University Avenue Garage	\$36
Penn-Alexander School*	\$25
World Café Live/WXPN*	\$16

Source: University of Pennsylvania. Real Estate Development Summary
**These project costs were funded in part, or in whole, with private or public monies.*

⁷ Annual construction expenditures for the University and UPHS were provided by Penn (FY2001-2005).

⁸ Real estate development summary provided by Penn. Planned and completed projects through 2005 also include, in addition to those listed in section 2, Chestnut Hall Joint Venture (\$9 million), 4200 Pine Condominiums* (\$8 million), Pine Arms (\$5 million), and Civic Center* (\$3 million). Not included in our quantitative analysis, but important to note, was also the planned real estate acquisition of the U.S. Post Office properties in 2007.

Annual construction activity for the University is estimated to generate nearly \$531 million in economic activity for the state. UPHS construction is estimated to provide an additional \$237 million (Table 2.5).

We estimate that direct construction spending for both the University and UPHS leads to a total economic impact of \$387.1 million in Philadelphia, \$665.8 million in the 11-County Region, and \$767.8 million in the State of Pennsylvania (Table 2.5).

The total economic output in Philadelphia includes \$74.7 million in total earnings and 1,828 total jobs, the 11-County impact includes \$202.5 million in total earnings and nearly 4,800 total jobs, and the state impact includes \$246.0 million in total earnings and 6,160 total jobs (Table 2.6).

Table 2.5
Estimated Economic Impacts of Construction Expenditures (\$ Millions)

	Direct Expenditures	Indirect & Induced Expenditures	Total Output
CITY OF PHILADELPHIA			
PENN	\$314.0	\$73.1	\$387.1
University	\$217.0	\$50.5	\$267.5
UPHS	\$97.0	\$22.6	\$119.6
11-COUNTY REGION			
PENN	\$314.0	\$351.8	\$665.8
University	\$217.0	\$222.5	\$439.5
UPHS	\$97.0	\$129.3	\$226.3
STATE OF PENNSYLVANIA			
PENN	\$314.0	\$453.8	\$767.8
University	\$217.0	\$313.6	\$530.6
UPHS	\$97.0	\$140.2	\$237.2

Source: Econsult Corporation (2006).

Note: Total Economic Output includes direct, indirect, and induced spending.

Table 2.6

Total Estimated Economic Impacts of Construction Expenditures: Earnings and Employment (\$ Millions)

	Total Employment	Total Earnings
CITY OF PHILADELPHIA		
PENN	1,828	\$74.7
11-COUNTY REGION		
PENN	4,795	\$202.5
STATE OF PENNSYLVANIA		
PENN	6,160	\$246.0

Source: Econsult Corporation (2006).

Note: Total Earnings includes direct, indirect, and induced earnings.
Total Employment includes direct, indirect, and induced employment.

These leveraged expenditures contribute to the overall impact of Penn’s construction activity in the local region and the state. Real estate development plays a significant role in creating a social, vibrant community, illustrating Penn’s presence in West Philadelphia as a benefit to quality of life.

3. Ancillary Spending (outside spending by visitors and students)

In addition to annual tuition and fees paid to the University, students also spend money on other day-to-day activities.⁹ Each year, thousands of students and visitors spend funds engaging in Philadelphia’s attractive shopping, dining, and entertainment opportunities. While in town for business or academic reasons, visitors attending events or activities offered by the University may choose to experience the highlights of the region including dining at local restaurants, shopping, or visiting one or many of the Philadelphia’s famous attractions. Student ancillary expenditures were estimated based on typical student spending (for undergraduate and graduate students) by student enrollment and residence status (Table 2.7).¹⁰ We applied conservative estimates of student spending (by category) to calculate Penn’s total student ancillary spending.

Similarly, UPHS brings outside spending as patients, families, and friends come to the city and state for health care services. Some of these activities are unaffiliated¹¹ with UPHS directly but related to its economic impact due to the location and types of services.

⁹ Students will inject new money into the region as they spend on items including local rent and utilities, transportation, personal items or local activities such as recreational dining, shopping, or entertainment.

¹⁰ Student enrollment and residence status (on-campus, off-campus, resident, and non-resident) were provided by Penn.

¹¹ Unaffiliated in this case means the dollars are not counted as Penn revenues. They are in addition to the ongoing expenditures.

Penn's annual direct expenditures include, for the purposes of our model, this ancillary spending, which represents additional money brought into the local and regional economies through visitor expenditures that include, among others, lodging, food, transportation, and recreation.

In addition to student expenditures, Penn hosts a variety of attractions and events each year that draw a large number of visitors and participants from outside regions and around the world, circulating more money into the local economy. Total visitor expenditures were estimated based on the total number of visitors¹² times traveler spending budget estimates for items including, but not limited to, lodging, recreation, shopping, and dining. Conservative estimates of UPHS visitors, patients, and families, were used, as was an estimate of outside spending per visitor, to determine the ancillary spending generated by UPHS.

The estimated direct ancillary spending of Penn generates total economic output of \$314.4 million in Philadelphia, \$486.2 million in the 11-County Region, and \$465.2 million in the State of Pennsylvania (Table 2.7) and enhances statewide employment by generating nearly \$140 million in earnings and approximately 5,469 jobs (Table 2.8).

Table 2.7
Estimated Economic Impacts of Ancillary Expenditures (\$ Millions)

	Direct Expenditures	Indirect & Induced Expenditures	Total Output
CITY OF PHILADELPHIA			
PENN	\$202.3	\$112.1	\$314.4
University	\$127.3	\$70.4	\$197.7
UPHS	\$75.0	\$41.7	\$116.7
11-COUNTY REGION			
PENN	\$226.5	\$259.7	\$486.2
University	\$151.5	\$173.7	\$325.2
UPHS	\$75.0	\$86.0	\$161.0
STATE OF PENNSYLVANIA			
PENN	\$220.9	\$244.3	\$465.2
University	\$145.9	\$160.2	\$306.1
UPHS	\$75.0	\$84.1	\$159.1

Source: Econsult Corporation (2006).

Note: Total Economic Output includes direct, indirect, and induced spending.

¹² Visitor counts estimated by the University of Pennsylvania. The estimate of visitor spending is based on a very conservative estimate of the total number of Penn visitors.

Table 2.8
Total Estimated Economic Impacts of Ancillary Expenditures: Earnings and Employment (\$ Millions)

	Total Employment	Total Earnings
CITY OF PHILADELPHIA		
PENN	2,785	\$62.2
11-COUNTY REGION		
PENN	5,304	\$150.6
STATE OF PENNSYLVANIA		
PENN	5,469	\$139.6

Source: Econsult Corporation (2006).

*Note: Total Earnings includes direct, indirect, and induced earnings.
 Total Employment includes direct, indirect, and induced employment.*

4. Independent Operations Expenditures (hotels & retail)

Each year, thousands of visitors come to the Penn campus to visit students, attend conferences or sporting events, and participate in seminars and workshops, while staying at nearby hotels. The expenditures of several independent operations (hotels and retail) make up the final component of the University's annual direct expenditures. These operations complement the University and its location in the West Philadelphia community. The primary independent operations include, among others:

- The Sheraton University City Hotel (36th St. and Chestnut St.)
- The Hilton Inn at Penn (36th St. and Sansom St.)
- The University Square retail complex (36th St. and Walnut St.), anchored by the Penn Bookstore

Independent operations expenditures are estimated to amount to \$54.8 million, and it is estimated that this direct spending generates a total economic output of \$84.3 million in Philadelphia, \$113.7 million in the 11-County Region, and \$111.3 million in the State of Pennsylvania (Table 2.9).

The \$84.3 million in total economic output in Philadelphia includes \$17.4 million in total earnings and 714 total jobs, while the \$113.7 million in the 11-County region includes \$35.2 million in total earnings and nearly 1,118 total jobs. The \$111.3 million in total economic output in the State of Pennsylvania includes \$33.2 million in total earnings and 1,217 total jobs (Table 2.10).

Table 2.9
Estimated Economic Impacts of Independent Operations Expenditures (\$ Millions)

	Direct Expenditures	Indirect & Induced Expenditures	Total Output
CITY OF PHILADELPHIA			
PENN	\$54.8	\$29.5	\$84.3
11-COUNTY REGION			
PENN	\$54.8	\$58.9	\$113.7
STATE OF PENNSYLVANIA			
PENN	\$54.8	\$56.5	\$111.3

Source: Econsult Corporation (2006).

Note: Total Economic Output includes direct, indirect, and induced spending.

Table 2.10
Total Estimated Economic Impacts of Independent Operations: Earnings and Employment (\$ Millions)

	Total Employment	Total Earnings
CITY OF PHILADELPHIA		
PENN	714	\$17.4
11-COUNTY REGION		
PENN	1,118	\$35.2
STATE OF PENNSYLVANIA		
PENN	1,217	\$33.2

Source: Econsult Corporation (2006).

*Note: Total Earnings includes direct, indirect, and induced earnings.
 Total Employment includes direct, indirect, and induced employment.*

Penn's Total Economic Impact

Penn's direct expenditures are estimated to generate \$6.5 billion in Philadelphia, \$9.8 billion for the region, and \$9.6 billion in economic activity for the state, annually. The statewide economic impact is equivalent to over \$25 million per day. For the State, the University generates \$4.7 billion (49%) of this activity, while UPHS accounts for just over half (nearly \$4.9 billion) (Tables 2.11). In addition to direct spending, Penn expenditures generate nearly \$2.5 billion in indirect and induced spending for the city, \$5.7 billion for the region, and \$5.6 billion for the state (Table 2.12). In total, Penn's employment impact (including direct, indirect, and induced employment) sum to 100,954 jobs for the State of Pennsylvania (Table 2.13) and total earnings sums to \$3.9 billion. Total earnings and employment make up the combined impact across all categories, including operations, capital investments, ancillary spending, and independent operations.

Table 2.11
Total Estimated Economic Impacts Attributable to Annual Expenditures of Penn (\$ Millions)

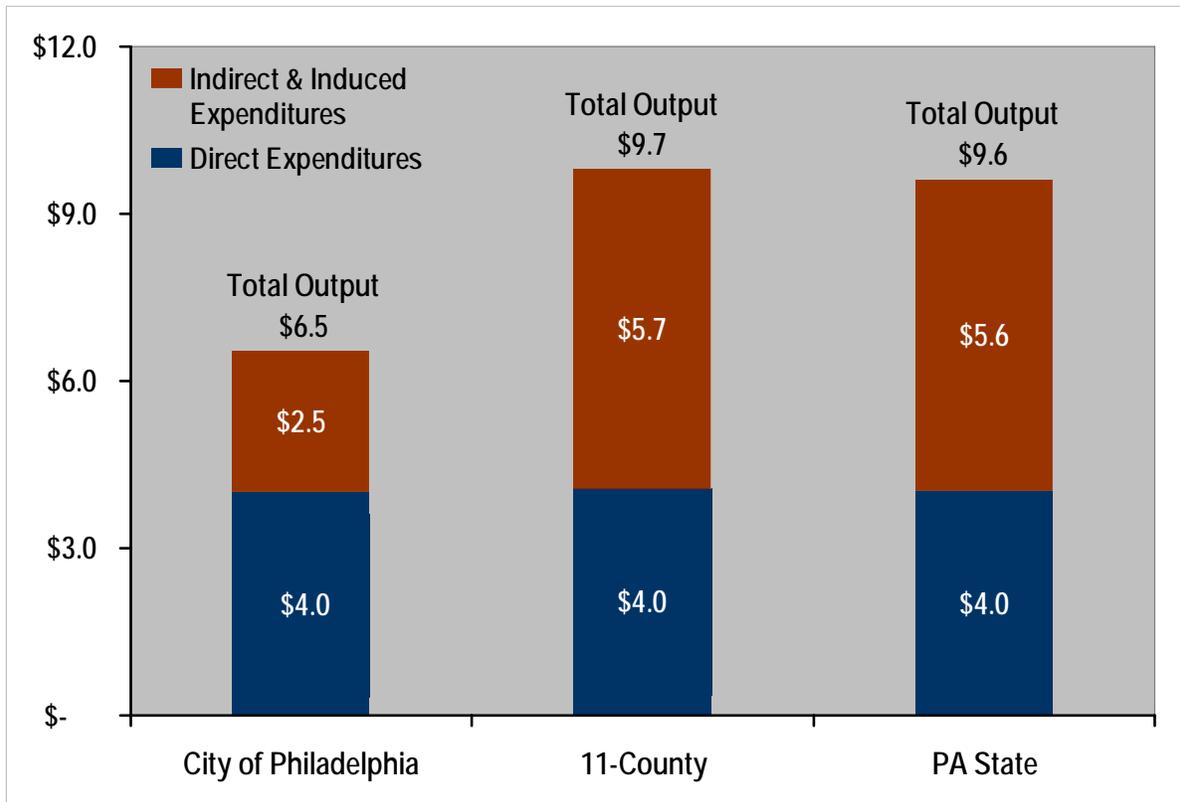
	Direct Expenditures	Indirect & Induced Expenditures	Total Output	Multiplier
CITY OF PHILADELPHIA				
PENN	\$4,010.8	\$2,532.0	\$6,542.8	1.63
University	\$1,981.0	\$1,225.2	\$3,206.2	1.62
UPHS	\$2,029.8	\$1,306.8	\$3,336.6	1.64
11-COUNTY REGION				
PENN	\$4,045.8	\$5,747.7	\$9,793.5	2.42
University	\$2,016.0	\$2,793.8	\$4,809.8	2.39
UPHS	\$2,029.8	\$2,953.9	\$4,983.7	2.46
STATE OF PENNSYLVANIA				
PENN	\$4,040.2	\$5,560.1	\$9,600.3	2.38
University	\$2,010.4	\$2,728.5	\$4,738.9	2.36
UPHS	\$2,029.8	\$2,831.6	\$4,861.4	2.40

Source: Econsult Corporation (2006).

Note: Total Economic Output includes direct, indirect, and induced spending.

Table 2.12

Direct & Indirect and Induced Expenditures Attributable to Annual Expenditures of Penn (\$ Billions)



Source: Econsult Corporation (2006).

Note: Total Economic Output includes direct, indirect, and induced spending and total earnings.

Table 2.13

Total Estimated Economic Impacts of Penn Expenditures: Earnings and Employment (\$ Millions)

	Total Employment	Total Earnings
CITY OF PHILADELPHIA		
PENN	62,973	\$2,752.0
11-COUNTY REGION		
PENN	95,787	\$3,898.1
STATE OF PENNSYLVANIA		
PENN	100,954	\$3,903.7

Source: Econsult Corporation (2006).

Note: Total Earnings includes direct, indirect, and induced earnings.

Total Employment includes direct, indirect, and induced employment.

This impact of the University alone ranks among the highest in comparison to other universities in Pennsylvania (Table 2.14). The \$9.6 billion total annual impact of Penn compares with the \$6.1 billion impact estimated for the entire Penn State System (2003 estimate that includes the health system)¹³.

Table 2.14

Statewide Economic Impacts of The University of Pennsylvania and Selected Area Universities in the State of Pennsylvania

Impact	The University of Pennsylvania*	Drexel University	Temple University	University of Pittsburgh**
Year	2005 (1)	2005 (1)	2004 (1)	2004 (2)
Economic Impact	\$4.8 Billion	\$1.6 Billion	\$3.1 Billion	\$1.3 Billion
Student Enrollment	23,305	17,656	30,612	27,190
Number of Employees	13,025	5,608	12,759	10,781

Source: (1) Econsult Corporation and (2) University studies from various sources and different time periods.¹⁴

*For comparison, this figure represents the University portion of the total Penn impact.

University of Pennsylvania student and faculty numbers were provided by the University for FY04. Economic impact in 2005 dollars.

**Impact for the University of Pittsburgh represents the regional impact in Western Pennsylvania only.

Penn’s total output, as a percentage of the annual gross product of the metro area and the state is significant. Very few entities represent such substantial portions of economies as large as the Philadelphia metro area and Pennsylvania. Penn’s impact of \$6.5 billion, estimated for the City of Philadelphia, represents nearly 3% of the \$201 billion Metro Gross Product (2003). The statewide impact of \$9.6 billion makes up nearly 2% of the \$468 billion Gross State Product (2003).

Penn’s impact is on par with that estimated for the Philadelphia International Airport (\$14.4 billion) and the region’s tourism and hospitality industry (\$11.2 billion). It is also nearly double the size of that estimated for the region’s music industry (\$4.9 billion). Penn’s *annual* impact is nearly as much as the potential economic impact (over 10 years) estimated for the proposed Philadelphia Olympics 2016 (\$12.1 billion).¹⁵

¹³ Penn State impact is not shown in the chart due to the fact that the chart represents a comparison across University impacts (not including health systems). However, the impact is noted as a comparison for the total Penn impact.

¹⁴ Student enrollment and employee numbers were obtained from the following sources: Temple University Factbook, University of Pennsylvania, Drexel University, University of Pittsburgh, and West Chester University.

¹⁵ Economic Impact Reports: Econsult Corporation (2005, 2004).



SECTION 3 PAYMENTS TO STATE & LOCAL GOVERNMENTS

Regional and state taxes generated by Penn's direct expenditures are a key measure of Penn's total estimated output. Penn's direct expenditures are estimated to generate nearly \$373 million in local and state taxes each year.

In order to carry out the fiscal impact analysis, a careful differentiation was made as to where the employees reside, as the tax rates differ by residency.¹⁶ Also, it is important to note that goods and services produced in the different counties of the region and state will generate different levels of business taxes. Adjusting for this difference involves accounting for different industrial structures and different commuting patterns between the region's component counties. Another important factor is that construction, goods and supplies for various University-related projects are exempt from sales taxes. Estimated annual city and state taxes, generated directly and indirectly by Penn, are detailed below (Tables 3.1 and 3.2).

Table 3.1
Annual Fiscal (Tax) Impacts - City of Philadelphia
(\$ Millions)

Tax Description	City Fiscal Impact
Wage and Earnings	\$107.9
Sales, Business Privilege	\$28.2
Total Annual Taxes	\$136.1

Source: Econsult Corporation (2006)

Table 3.2
Annual Fiscal (Tax) Impacts – State of Pennsylvania
(\$ Millions)

Tax Description	State Fiscal Impact
Personal Income	\$115.1
Sales and Use	\$91.8
Corporate Net Income	\$18.5
Capital Stock and Franchise	\$11.3
Total Annual Taxes	\$236.7

Source: Econsult Corporation (2006)

¹⁶ See Appendix A.2 for more details on the model and the methodology used for the fiscal impact analysis.



SECTION 4 EDUCATING TOMORROW'S WORKFORCE

Every year, the productivity of the regional economy is enhanced through contributions of Penn alumni. More than 70,000 Penn alumni residing in Pennsylvania contribute to the economy in a wide variety of occupations and professions. Penn's alumni include distinguished faculty in area schools, elected officials in local governments, small business owners, high-tech workers and entrepreneurs, medical providers, and health science professionals.

Penn's primary output, educated students, increases the productivity of the Philadelphia region and enhances the state's labor force. Consistent with national data for higher education graduates, Penn graduates are generally more productive than non-degree holders and, therefore, earn higher salaries.¹⁷ We can estimate a value for this increased productivity by examining the increased wages and salaries (wage premiums) earned by Penn graduates.¹⁸ Aggregated wage premiums represent an estimate of the value of University of Pennsylvania alumni contributions to the overall economies of the Philadelphia region and the state of Pennsylvania. The estimation of this wage premium involves several steps.

Step One

Calculate the difference between average salaries with and without various university degrees, based on U.S. Census Bureau data.¹⁹ The wage premium for the associate and bachelor's degree represents the differential earnings beyond high school graduate earnings, and the premium for master's, doctoral, and professional degree represent average earnings attributable to the various degrees earned above bachelor degree earnings.

Step Two

Identify the total number of Penn alumni by degree and by residence. It is assumed that a portion of the total alumni are retired or otherwise not employed, so the analysis is based on information for alumni graduating after 1960.

Step Three

Calculate the total wage premium. Multiply wage premiums by total number of alumni of working age, holding each degree, based on residence of alumni (Table 4.1).

¹⁷ College graduates also tend to benefit from a greater range of career options, increased job satisfaction, and a higher overall quality of life.

¹⁸ The wage premiums represent incremental premiums above a high school graduate, and also include a premium for graduating from Penn in particular.

¹⁹ "Table 9. Earnings in 2003 by Educational Attainment of Workers 18 Years and Over, by Age, Sex, Race Alone, And Hispanic Origin: 2004," Current Population Survey, March 2004, U.S. Bureau of the Census.

Step Four

Aggregate total wage premiums for Penn alumni for the region and state. To be conservative, it is assumed that 10% of the aggregate total wage premium is attributable to Penn, recognizing that in the absence of the University of Pennsylvania, the degree may have been obtained elsewhere (Table 4.2).

Table 4.1
Average Earnings in 2003 of All Workers, By Educational Attainment

Education	Average Annual Earnings	Wage Premium
High School Diploma	\$27,915	NA
Bachelor's Degree	\$51,206	\$23,291
Master's, Ph.D., Professional	\$88,732	\$37,526

Source: U.S. Census Bureau. Current Population Survey, March 2004.

*Due to data limitations, we used an annual earnings figure and wage premium representing the average of all three categories combined above a bachelor's degree.

Table 4.2
Total Penn Alumni, Total Wage Premium, and Total Wage Premium Attributable to The University of Pennsylvania by Degree, By Residence

Degree	Total Alumni	Total Wage Premium* (\$ Millions)	10% Attributable to Penn (\$ Millions)
Philadelphia Region (11-County)**			
Total	48,620	\$1,533	\$153.3
Undergraduate	20,493	\$478	\$47.8
Graduate**	28,127	\$1,055	\$105.5
State of PA			
Total	70,129	\$2,199	\$219.9
Undergraduate	30,392	\$708	\$70.8
Graduate**	39,737	\$1,491	\$149.1

Source: The University of Pennsylvania (2005).

*Numbers are rounded to the nearest million and may appear higher or lower due to rounding.

**Graduate counts represent the combined total of Master's, PhD, and Professional degrees earned.

***Due to data limitations, the region of analysis used for alumni may be slightly larger or smaller than the 11-county region used throughout the report.

Penn graduates joining the workforce are estimated to provide nearly \$485 million in economic activity for the State of Pennsylvania, including \$314.9 million in total earnings and over 13,000 jobs²⁰ (Table 4.3). Penn graduates also contribute to the regional and state economies and local workforce by increasing productivity, enhancing the overall competitiveness of the region, and often continuing the research efforts of the University in the community. The value of a Penn education is associated with an expenditure multiplier of 2.20 for the State of Pennsylvania and 2.25 for the 11-County Region.

The impacts noted here represent only a portion of the total impacts of Penn graduates, considering the quantitative impacts of spin-off research programs and new companies frequently started by Penn alumni (and the associated economic activity and employment needed to maintain these efforts). However, the impacts of wage premiums represent a significant contribution to the regional and state economies.

Table 4.3
Total Economic Impacts Attributable to Penn Alumni (\$ Millions and Number of Jobs)

	Direct Expenditures	Indirect & Induced Expenditures	Total Output	Multiplier	Total Employment	Total Earnings
11-COUNTY REGION	\$153.3	\$191.0	\$344.3	2.25	9,200	\$238.6
PA STATE	\$219.9	\$264.7	\$484.6	2.20	13,143	\$314.9

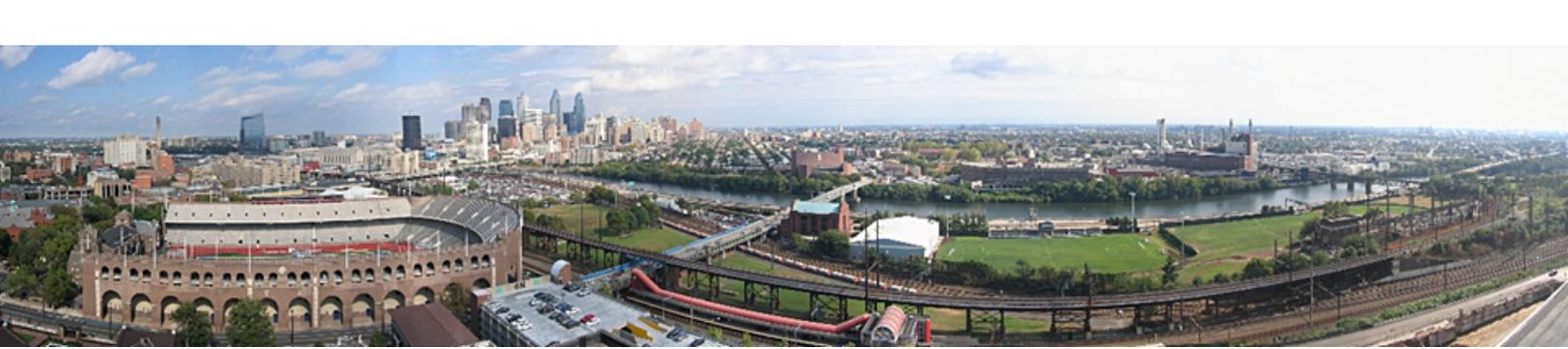
Source: Econsult Corporation (2006).

Note: Total Economic Output includes direct, indirect, and induced spending.

Total Earnings includes direct, indirect, and induced earnings.

Total Employment includes direct, indirect, and induced employment.

²⁰ This cannot be added to the annual impacts of ongoing operations due to the fact that these benefits do not recur on an annual basis. They are simply representative of impacts generated by a portion of the current, living alumni working population.



SECTION 5 PENN AS A LEADER

Penn's impact in Philadelphia is also measured in qualitative economic benefits including a diverse group of intangible impacts that represent the additional value to the area due to Penn's physical location.²¹ Because these specific economic benefits do not have clear market valuations, they are not included in the quantitative modeling exercise, but they are substantial and should be included in the overall economic benefits. These intangible impacts provide an indirect measure of the University's contributions to a positive quality of life and enhanced overall image for the region.

For example, the Penn School of Dental Medicine has recently assisted a Korean company in its relocation decision surrounding the construction and location of a new plant. As a result, a new dental implant manufacturing plant will be built in the Scranton area. While not directly benefiting the University, this partnership effort between Penn and the state resulted in new jobs and taxes for the region and state, with the prospect of the relocation of additional Asian manufacturing jobs to Pennsylvania over the next few years.

Beyond the magnitude of expenditure impact is also Penn's contribution to branding the city and state as a world-class hub of higher learning.

A Research Giant

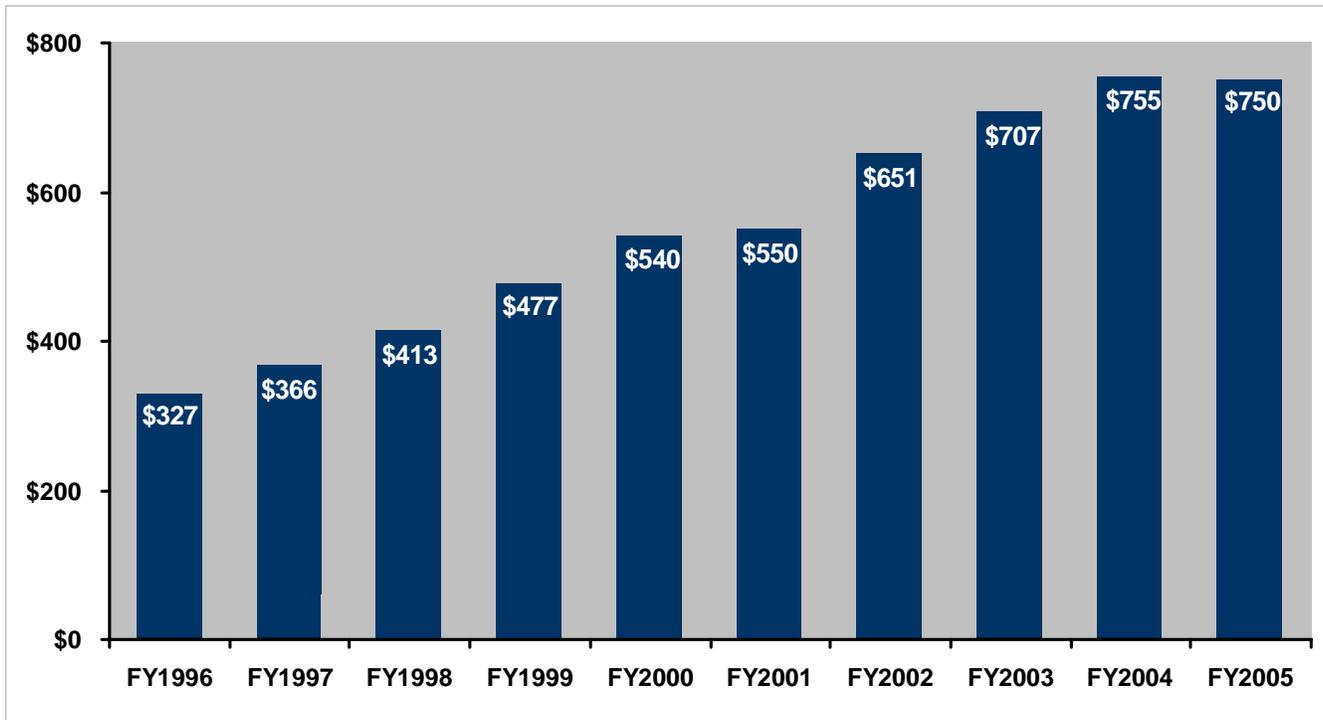
Penn is one of the nation's top research universities with more than \$700 million in annual research and development expenditures. Sponsored program activity provides more than 18% of Penn's total revenue, with total awards received reaching \$750 million. In general, the origination of Penn's sponsored programming funds is 80% federal government, 10% foundations, 5% corporations, and 5% other. Of total awards, \$465 million or 62% were received from the U.S. Department of Health and Human Services, primarily the National Institutes of Health (NIH), Penn's largest sponsor, for research, training fellowships and other programs. Forty-seven percent of all NIH dollars coming into Pennsylvania are the result of research conducted at Penn's School of Medicine. In federal FY2004, Penn's School of Medicine received \$393.6 million in total NIH support, ranking second in NIH funding among

²¹ The total economic output we calculate here represents only a portion of the total benefits of the University of Pennsylvania. Quantifying all benefits of the University would require significant subjective valuations, and this additional component is beyond the scope of this analysis. The benefits not estimated empirically are clearly positive, and their consideration, even if only as qualitative outcomes, are important to recognize. Econsult worked with Penn to enumerate, but not quantitatively determine, these intangible benefits accruing to the region and State of Pennsylvania.

academic centers in the United States. This includes \$364 million in NIH research awards and \$20 million in NIH training grants.

Over the past 10 years, Penn has seen significant growth in sponsored program funding. In FY1996, the University received \$327 million in sponsored research awards; over the decade the \$423 million increase represents an annualized growth rate of nearly 8.9%²² (Table 5.1).

Figure 5.1
Penn Sponsored Research Awards
FY1996-FY2005 (\$ Millions)



Source: The University of Pennsylvania.

In FY2004, NIH total awards to the School of Medicine (\$394 million) far exceeded all other local medical schools combined (\$230 million total combined for Drexel, Temple, Hershey, UMDNJ, and Jefferson). One result is that Philadelphia is a natural research hub attracting pharmaceutical and biotech companies. Penn research is making a tremendous impact on a wide variety of disciplines and is leading to innovations that improve overall quality of life. Research at Penn spreads across a wide range of disciplines including medicine, arts and sciences, dentistry, engineering, veterinary medicine, nursing, and business. Penn's research expenditures are included in the estimates of economic impacts, and they will continue to play an important role in the region's economy into the future.

²² All sponsored program research information provided by Penn. Financial Report 04-05.

Commercialization

Technology transfers bring university-developed technology and research results to the community and local market place. Penn is also widely known for its highly successful technology transfer program. The University has a strong track record for commercializing its intellectual property.

Consistent with Penn's goal to be a leader in regional economic growth, in FY2005, Penn's Center for Technology Transfer (CTT) managed 952 technology transactions, submitted 355 new technology disclosures, filed 450 patent applications, received 138 issued patents, and created nine new companies (most of which have been established in the Philadelphia area and contribute to regional economic growth) (Tables 5.2 and 5.3).

From FY2000-2005, CTT has facilitated 427 issued patents and the launch of 56 start-up companies.²³ In addition to the operational spending impacts in general, Penn's research efforts have a significant impact on the local West Philadelphia community, and the University is a key player in the Science Center (formally known as the University City Science Center) which houses more than 150 companies who thrive off regional assets and contribute to regional spending on a daily basis.

Penn as an employer: Faculty, staff, and indirectly generated employment

Penn is the largest private employer in Philadelphia, the second largest private employer in the state, and the fifth largest overall Pennsylvania employer. Penn injects hundreds of millions of dollars directly into the local and state economies through salaries and benefits paid to the regular workforce of the University and UPHS. Penn's expenditures and those of its employees generate a huge amount of indirect and induced employment. These indirect and induced jobs are found across the spectrum of industries, strengthening the entire state economy. Penn's employment impact is heavily represented in the "Knowledge-Industry" occupations, providing an important base for the region's and state's 21st century economy.

²³ All CTT information provided by the University of Pennsylvania.

Figure 5.2
Penn's Center for Technology Transfer

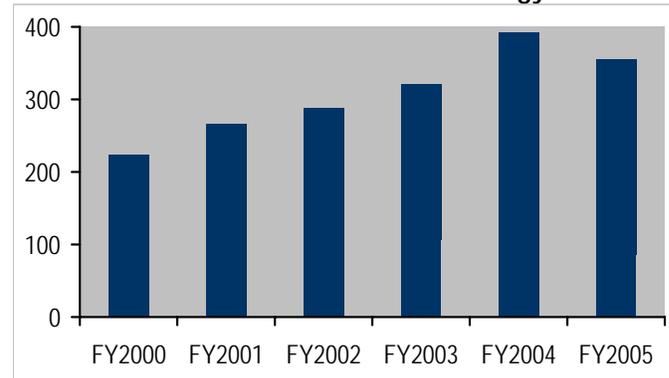
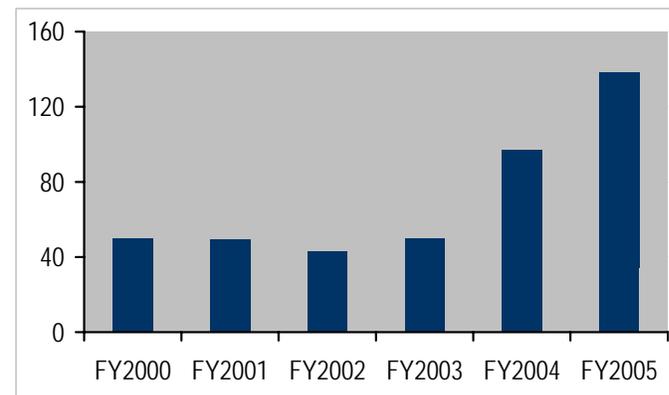


Figure 5.3
Penn's Center for Technology Transfer
Patents Issued, FY2000-FY2005



Source: The University of Pennsylvania.

One example is Penn's faculty, which is distinguished by the number of external recognitions, awards, and honors the members have received. Penn's faculty continues to rank among the top recipients of the prestigious *John Simon Guggenheim Fellowships*, having received 32 such awards since 1995. Also in recent years, seven Penn faculty members and two former faculty members have won *MacArthur Prizes*. Since 1995, six Penn faculty members have also been awarded the Nobel Prize in the areas of economics, chemistry, physics, and medicine.

One indicator of the caliber of faculty members is the volume of research support they attract to the University. In this fiscal year, Penn and various business corporations entered into \$45.2 million in contracts involving 600 research and development projects and faculty members from eight University schools. The goal of such endeavors is to strengthen the products and processes of the businesses and thereby improve their competitive strength in the marketplace.

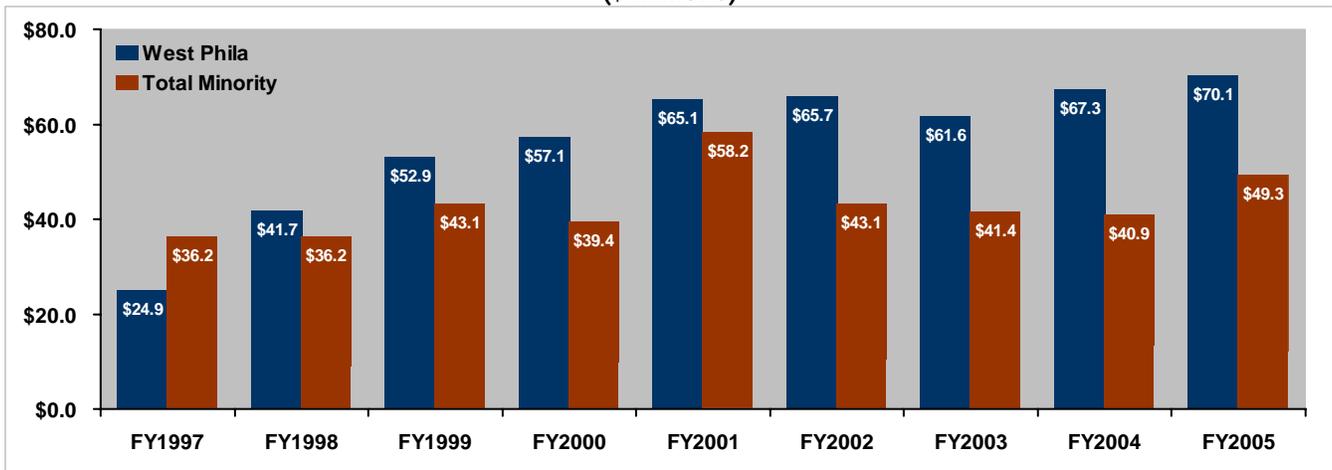
Penn and its Neighborhood: Economic Development and Inclusion

Penn's neighborhood initiatives support and promote civic engagement and participation with local leaders, residents, and business owners. Penn's spending on goods and services in West Philadelphia has increased 400 percent since 1995.²⁴

Penn's efforts include a commitment to purchase from local suppliers through its "*Buy West Philadelphia Initiative*." Penn supports local suppliers through purchases of goods and services, while also helping form business partnerships. Penn's 10-year purchasing total under the *Buy West Philadelphia Initiative* is \$544.8 million. Last fiscal year alone, Penn purchased more than \$70 million in goods and services from neighborhood businesses, with \$49 million going to minority vendors (Table 5.4). By helping its small-business partners acquire e-commerce capability, the University is empowering them to compete more effectively. Overall, on an annual basis, Penn makes purchases of goods and services from more than 9,000 vendors.

²⁴ West Philadelphia Initiative information obtained from the University of Pennsylvania website: Penn's West Philadelphia Initiative. For purposes of this section, purchasing data represents the University's contribution to Penn's economic inclusion efforts and are conservative estimates relative to the efforts of the University and UPHS combined.

Figure 5.4
Purchases Promoting the Utilization of Diverse Suppliers and Suppliers Located in West Philadelphia
 (\$ Millions)

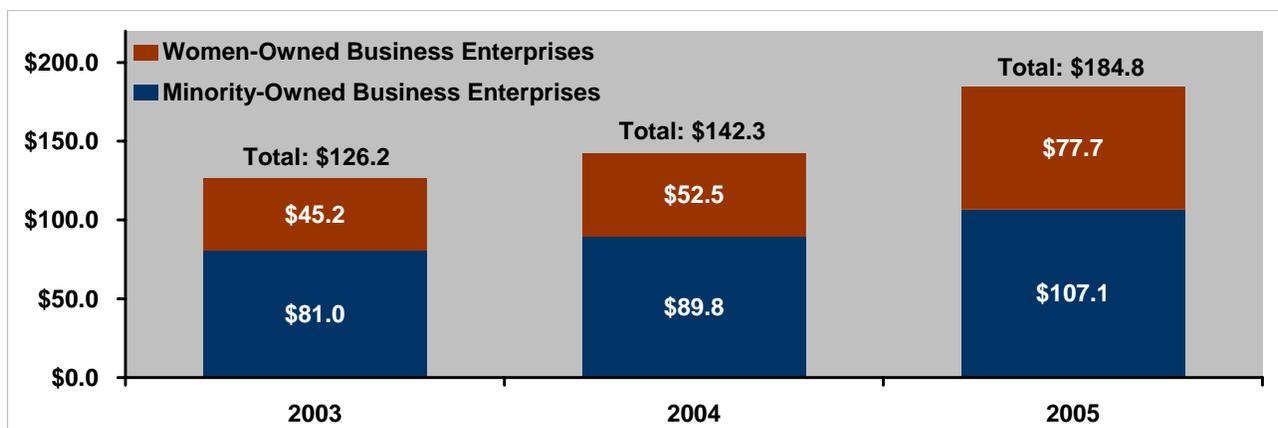


Source: The University of Pennsylvania.

Penn's construction activities also contribute to the local workforce by creating new jobs, which in turn increase local wages and tax revenues. For example, it is estimated that the construction of the Raymond and Ruth Perelman Center for Advanced Medicine will create more than 1,500 jobs with more than \$40 million in wages and benefits, as well as \$3 million in tax revenues.

Nearly a quarter of all Penn construction jobs have been minority and women workers, and 26% of all contracts have been awarded to minority and women-owned businesses, with a 46% increase over the past three years (Figure 5.5). Local residents have filled more than half the jobs created by Penn retail ventures.

Figure 5.5
Women-Owned and Minority-Owned Business Enterprise Construction Participation in West Philadelphia
 (\$ Millions)



Source: The University of Pennsylvania.

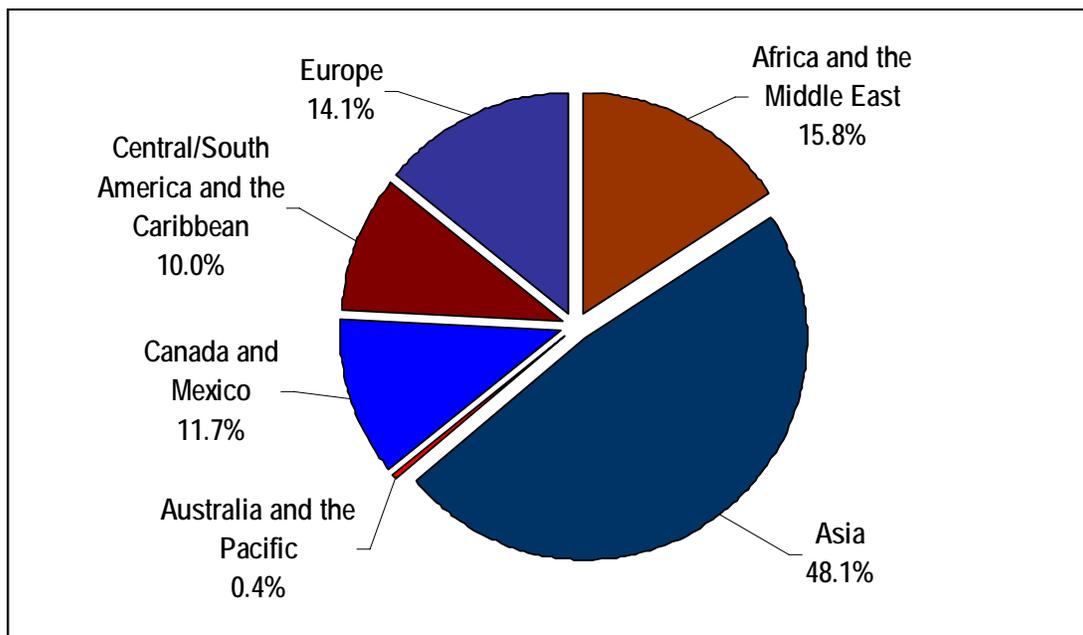
A Major Exporter

Penn is a significant exporter of educational and other professional services. The University has an international student population that contributes to the region's exposure and reputation while encouraging local diversity and involvement. This aligns directly with the city and state efforts to increase global networks.

Through Penn's international efforts, the region benefits from the attraction of international students, thus enriching the overall level of diversity within the region. In addition, Penn's distinguished faculty, many of whom possess national and international reputations, enhance the area's image through research publications, books, speeches, and government testimony.

Penn can be considered both a regional and international exporter by providing services to people outside of the region and outside of the nation, thus bringing in money from outside the region. Penn brings in approximately \$105 million in tuition and living expenses to the Philadelphia area.²⁵ Money is brought into the region through Penn's diverse faculty, student, and visitor population. For 2005, Penn had an estimated 1,111 visitor "scholars", an estimated 987 international undergraduate students, 1,078 international masters students, and 978 international doctoral students. International students make up more than thirteen percent of the first year class. Of the international students accepted to the Class of 2008, 15.8% were from Africa and the Middle East, 48.1% from Asia, 0.4% from Australia and the Pacific, 11.7% from Canada and Mexico, 10% from Central/South America and the Caribbean, and 14.1% from Europe (Figure 5.6).

Figure 5.6
International Student Residence: Class of 2008



Source: The University of Pennsylvania.

²⁵ This estimate of tuition and living expenses is already included in our overall analysis of direct spending.

Penn is highly successful at creating global networks and international relations. The Wharton School, in particular, has alumni residing on six continents spread across 140 countries. Wharton alumni stay connected through more than 80 alumni clubs and three annual Global Alumni Forums. Among other highly recognized achievements, Penn currently has:

- The fourth largest internationally diverse faculty
- The 12th largest international student body
- The fifth largest total visiting researchers
- 30 international centers
- Over 30 international alumni chapters

Community Relations

Penn serves as an important local community asset, with various schools, centers, administrative offices, and institutes providing numerous intangible benefits to the region. The schools and centers, including the Center for Community Partnerships, integrate community service with academic study to enhance student learning while addressing community needs. Community outreach programs include, among many others:

- Volunteers for Rebuilding Together
- Urban Nutrition Initiative
- University-Assisted Community Schools
- West Philadelphia Improvement Corps
- Penn Smiles: Outreach & Oral Health Initiative
- Say Yes to Education
- The Saturday Reading Cooperative
- Penn Advocates for the Homeless
- Police Athletic League (PAL)
- National Youth Sports Program
- West Philadelphia High School Summer Science Program

UPHS provides uncompensated care for vulnerable members of the community and serves as a regional anchor for programs that other hospitals abandon, whether due to their high malpractice risk, lack of profitability, or inability to appropriately staff. In fiscal year 2005, the Health System provided \$50 million in uncompensated health care services (charity care and bad debt) and subsidized another \$50 million of under-reimbursed care (largely Medicaid services). The Health System provides among the highest levels of uncompensated and under-compensated care of any provider in the Commonwealth.

The School of Nursing's LIFE (Living Independently for Elders) program provides nearly 300 West Philadelphia seniors with comprehensive nursing and medical care, rehabilitation, social services, and an array of recreational activities. LIFE saves the state 15% to 20% in Medicaid reimbursement costs.

A World-Class Health System

The University of Pennsylvania Health System (UPHS) provides qualitative benefits that extend well beyond the expenditure impacts described above. UPHS is the largest health system in Philadelphia with the largest number of physicians, employees, and total patient visits (over 2 million annually). UPHS was created in 1993 and includes three hospitals-- the Hospital of the University of Pennsylvania (HUP), Penn Presbyterian Medical Center, and Pennsylvania Hospital; a faculty practice plan--Clinical Practices of the University of Pennsylvania (CPUP); a primary-care provider network--Clinical Care Associates; two multi-specialty satellite facilities--Penn Medicine at Radnor, PA and Penn Medicine at Cherry Hill, NJ; and home health care, hospice, and long-term care.

Regional and statewide economic impacts of the health system are included in the overall analysis of the impacts of Penn on the local region and state. However, the achievements and recognitions of UPHS are significant and include the following:²⁶

- The Hospital of the University of Pennsylvania (HUP) was recognized as one of the best hospitals in America by *U.S. News and World Report*.
- HUP was cited for excellence in 13 specialties, including, among others, Heart and Heart Surgery and Neurology and Neuroscience.
- Penn's School of Medicine was named a Breast Cancer Center of Excellence by the *Department of Defense Breast Cancer Research Program*.

Hospital of The University of Pennsylvania Profile

- 695 licensed patient beds
- 1,727 physicians
- 35,518 adult admissions
- 1,065,065 outpatient visits
- 52,500 Emergency Room visits
- 3,776 births
- 16 interconnected buildings; 2,000,000 square feet
- Nation's first teaching hospital
- Ranked as one of the "Best Hospitals in America" by *U.S. News & World Report*

Pennsylvania Hospital Profile

- 515 licensed beds
- 869 physicians
- 22,404 patient admissions
- 166,017 outpatient visits
- 26,572 Emergency Room visits
- 4,672 births (the largest number in Philadelphia)
- 19 buildings: 1,200,000 square feet
- Ranked 7th in the nation in *AARP – Modern Maturity*

Penn Presbyterian Medical Center Profile

- 344 licensed beds
- 826 physicians
- 14,252 patient admissions
- 235,332 outpatient visits
- 30,165 Emergency Room visits
- 13 buildings: 1,000,000 gross square feet

²⁶ UPHS information and awards and recognitions obtained from the UPHS website: *About UPHS*.

- HUP, recognized for reaching out to the community's physicians and health care organizations in an effort to make their services accessible to all, is one of only a few dozen in the nation to earn the "Hospital of Choice" Award for 2005 by *The American Alliance of Healthcare Providers*.
- The Abramson Cancer Center is one of a select group of cancer centers in the country awarded the prestigious designation of Comprehensive Cancer Center by the *National Cancer Institute*.

Penn's Contributions: Select Examples

The Wharton School

Since 1980, the Wharton School has provided leadership to the Pennsylvania Small Business Development Centers, a consortium of 16 colleges and universities throughout the state. The Wharton Small Business Development Center (WSBDC) provides consulting services to entrepreneurs as well as educational workshops to provide the information and management development assistance they need to start and grow their firms. The Wharton SBDC is strongly committed to helping small businesses in the Philadelphia area. Last year, the program provided over 18,000 hours of consulting to 660 entrepreneurs in the Greater Philadelphia Region. The Wharton SBDC has supported the growth of over 20,000 small businesses in the past decade. For example:

- Union Packaging in Delaware County has become a leading certified Minority Business Enterprise supplier to several of the largest US multinationals. The company, founded in 1999, now has annual revenues of over \$20 million and over 80 employees.
- The president of William A Schmidt and Sons in Chester County developed and implemented a new marketing strategy for chocolate manufacturing equipment in 2003 based on consultation with Wharton SBDC students. Over the next three years, revenues from confectionary machinery went from \$0.9 million to \$3.2 million with 2005 sales revenues projected to reach \$5 million.
- Elite Bicycles opened in Philadelphia in 2001. The fast-growing company supplies custom bikes for cycling enthusiasts and professional athletes in the US and Europe. In 2004, the Wharton SBDC aided the company in developing internal financing systems to support its rapid growth.

The SBDC program has a very significant economic impact for the region. The latest impact study shows that in 2004, as a result of SBDC assistance, 3,363 new businesses were opened and 8,537 new jobs were created. The aggregate impact was estimated to be even greater. Since 1990, the SBDC has helped Pennsylvania entrepreneurs start over 15,000 new businesses, create over 87,000 new jobs, obtain over \$1.5 billion in start up and expansion capital, expand sales by \$6.8 billion, expand export sales by \$1.0 billion, obtain over \$1.7 billion in government contracts, and generate more than \$632 million in new tax revenue. As a result, the rate of return on the public funding invested in this program is estimated to be \$9 to \$1.

The School of Medicine

The School of Medicine continues to work at the forefront of biomedical science to develop innovative discoveries and to translate these therapies to improved health care delivery and outcome. The School of Medicine is ranked #2 in the nation for receipt of (National Institutes of Health) NIH funds and ranked #4 in the nation in *U.S. News and World Report's* most recent ranking of top research-oriented medical schools.

The research strengths of the School of Medicine attract outstanding biomedical students and significant research support to the state. Approximately 56 percent of the school's fully employed faculty members are principal investigators on sponsored research grants. In collaboration with the School of Engineering and Applied Science and other scientists on campus, The School of Medicine continues to be one of the nation's major centers of biomedical research and a pioneer in the development of new technologies.

The School of Medicine remains committed to educating a diverse group of the nation's most talented medical students. The School of Medicine also continues to be committed to increasing the number of physicians from traditionally underrepresented groups in academic and clinical medicine. Through the Office for Diversity and Community Outreach for Undergraduate Medical Education, the school not only recruits potential applicants for admission and facilitates applications, but also offers counseling to aid in retention of enrolled students. In addition, the school has a federally funded Center for Diversity in Health Education and Research and serves as a national resource for promoting intellectual, racial, social, and cultural diversity among academic physicians.

The School of Medicine has made a strong commitment to its neighborhood, the city of Philadelphia, and the Commonwealth. Each year, medical students participate in community service programs. As of August 2005, there were 94 student-run programs, 21 of which are focused on improving the health of the Philadelphia community. These programs help the most talented students broaden their education and develop skills to work effectively across cultures and social classes, while enhancing services to the residents of Pennsylvania. The services offered to the community include HIV and AIDS prevention education, health services to the homeless, home care for the elderly, substance abuse prevention education, health screenings, and preventive care education.

The School of Veterinary Medicine

Agriculture is the foundation of Pennsylvania's economy. The School of Veterinary Medicine and its fundamental emphasis on food animal health, productivity, and economics provide continuing benefits to the state. Embodied in the school's mission are traditional and innovative roles providing health care and protection of Pennsylvania's food and fiber producing animals, as well as wildlife, companion, sporting, laboratory, zoo, and aquatic animals.

- The School is developing spatial models of foot-and mouth disease transmission as well as the transmission of other diseases affecting agriculture in Pennsylvania, which have been used successfully by the state Department of Agriculture to halt the spread of avian influenza and save tens of millions of dollars for the state's poultry industry.
- The School employs veterinarians, PhD's, veterinary nurses (animal health technicians), laboratory technicians, secretaries, receptionists, farm workers and business administrators, among others. The total

payroll dollars supported by the school is equal to \$33 million in Philadelphia and \$17 million at New Bolton Center. The school's two hospitals treat more than 35,000 patients a year, 28,000 at the Matthew Ryan Veterinary Hospital in Philadelphia and 7,000 at the Widener Hospital at the New Bolton Center. The Veterinary Hospital in Philadelphia generates over \$16 million in revenues and the Widener Hospital generates over \$7 million.

- The School's 650-acre rural campus, New Bolton Center, is located in the rich farming area in Chester County where 25 percent of the dairy cattle, 50 percent of hogs and pigs, 58 percent of the layer chickens and 57 percent of broiler chickens in the state are located. Livestock cash receipts from this region account for 33 percent or \$809 million of the total \$2.5 billion for the state, according to Pennsylvania's Agricultural Statistical Service. The New Bolton Center campus is now a full partner with the state Department of Agriculture's Summerdale Laboratory and Pennsylvania State University College of Agricultural Sciences in providing large animal and poultry diagnostic services to the state's producers and veterinarians.
- In conjunction with production systems practitioners, the School's Center for Animal Health and Productivity provides health management services for animal populations and conducts field investigations of the herd and flock problems that pose a threat to the economic productivity of animal agriculture.

School of Dental Medicine

The University's School of Dental Medicine is a unique resource to the Commonwealth and its residents. The school has extensive outreach programs to the West Philadelphia community, the state, and beyond that provide the highest quality dental care to the underserved. The School of Dental Medicine also serves as an important resource for many employed low-income individuals who do not have adequate dental insurance.

- Last year Penn provided more than \$2 million in uncompensated or under compensated care for more than 11,100 new patients who otherwise would not have access to dental services.
- Penn Smiles, the ongoing initiative to serve the needs of underserved children, continues to involve all Penn Dental students. A specially equipped van brings dental care to the children who receive diagnostic, preventive, and treatment services. Each dental student also donates at least 70 hours of community service through such activities as oral health examinations at homeless shelters and preventive dentistry instruction at local schools.
- This year the school began a special program to give free dental care to children under the age of 10 who otherwise would have no access to care. More than 350 additional children were treated in this program.

Penn's Graduate School of Education (GSE)

GSE contributes directly to the improvement of education in the state through extensive applied research and professional academic programs, as indicated below:

- In an ongoing collaboration with the City of Philadelphia, the Kids' Integrated Database System (KIDS) links data from a number of municipal agencies, providing the foundation for a variety of research projects designed to enhance understanding of the education, health, and welfare needs of more than 250,000 Philadelphia children.

- In partnership with two major urban universities and four urban school districts (including Philadelphia), MetroMath Center for Learning and Teaching develops research-based solutions that ensure urban children attain essential mathematical skills.
- GSE is the external evaluator for a state-funded accelerated teaching certification program aimed at increasing the supply of certified teachers in critical shortage subject areas to teach in low-income, urban districts in Pennsylvania.
- GSE is currently implementing a multi-million dollar initiative with the state Department of Education to provide literacy and numeracy training/coaching and leadership-building capacity in districts across Pennsylvania.
- To help address the workforce development challenges facing the state, Penn GSE is forming a partnership with Economics Pennsylvania to provide support to both adults and students through teacher training.
- Since 2001, the centerpiece of Penn GSE's local community outreach program has been the Penn Alexander School, a university-assisted PreK-8 public school in West Philadelphia. Building on its commitment to the Philadelphia public schools, Penn GSE is currently working with the Philadelphia School Reform Commission on the development of a new magnet high school, the curriculum of which will focus on international studies. Penn GSE is collaborating with the Asia Society (serving as an intermediary for the Bill and Melinda Gates Foundation) to plan the curriculum, which will be designed to integrate international perspectives throughout the educational program.



SECTION 6 CONCLUSION

The University of Pennsylvania and Health System fuel economic activity and regional growth, estimated at nearly \$9.6 billion annually. As one of the region's key educational institutions, Penn provides high-quality education to thousands of students from across the globe. In addition, Penn promotes national exposure, regional diversity, and workforce productivity.

The University of Pennsylvania Health System provides additional economic activity through health care services that support a healthy and productive region and state. The Penn Health System supplies qualified physicians, enhances the regional health care workforce, promotes extended medical research opportunities, and encourages healthy living throughout local neighborhoods.

The University's reputation in academics, health care and research continues to grow. Penn achieved an impressive fourth place standing in the *U.S. News and World Report* ranking of America's Best Colleges and Universities. The same publication placed four Penn schools-the Wharton School, School of Medicine, Law School, and Graduate School of Education- in the Top Ten list of Best Graduate Schools. For the ninth consecutive year, the Hospital of the University of Pennsylvania was named to the elite Honor Roll of American Hospitals. Moving up a notch, Penn School of Medicine ranked second in funding which is a reflection of Penn's renowned research capabilities.

Balancing the growth of the campus with community needs, Penn and the West Philadelphia community are engaged in a mutual effort to enhance the vibrant campus and neighborhoods. The planned expansion of the campus to the east, utilizing the recently acquired postal lands, plus the ground-breaking for the Center for Advanced Medicine on the site of the former Convention Center are two monumental capital initiatives that will strengthen Penn's links with the city and region and position Penn to become a premier global research university for the 21st century.

- Penn serves as an important local community asset, providing numerous intangible benefits to the region through community outreach programs and initiatives of both the University and the Health System.
- Penn provides education programs designed to contribute to the region's "Knowledge Industry" base by supplying skilled workers to the region, enhancing the economy through increased productivity.

- Penn's research and development efforts also enhance the regional image, promote regional discovery and innovation, and bring university-developed technology and research results to the community and local market place.
- Penn's international student population contributes to the region's exposure and reputation, while encouraging local diversity and involvement.

Through civic and community involvement, knowledge industry contributions, research and development efforts, and international exposure, Penn provides numerous intangible benefits that must be recognized in the overall impact of the University and Health System on the region and state.

Higher education is an investment that provides enormous returns for businesses, government, and society as a whole. Beyond economic and fiscal benefits, citizens enjoy an overall enhanced quality of life as a result of Penn's physical presence and local involvement.

Clearly, the University of Pennsylvania is a significant economic driver for the region and state and will continue to provide the necessary fuel for continued economic growth and regional success well into the future.

- Penn's ongoing spending is estimated to generate nearly \$9.6 billion in total economic activity for the state, nearly \$9.8 billion for the 11-county region, and \$6.5 billion for the city. The statewide economic impact is equivalent to more than \$25 million per day.
- Penn's expenditures also generate significant employment, adding to the existing direct workforce of 24,750, and generating over 100,000 total jobs statewide.
- In 2005, Penn purchased nearly \$3.5 billion in goods and services from Pennsylvania suppliers.
- Penn capital investments, on average, total nearly \$314 million per year.
- Penn visitors spend an estimated \$14.5 million in the local region each year.
- Penn contributes over \$372 million in state and local tax revenue each year.
- Between 2000-2005, Penn created 56 new companies, many of which were established in the local region.
- With over 70,000 alumni residing in Pennsylvania, the University is estimated to have contributed nearly \$485 million to the statewide economy through the increased productivity of a Penn degree.



APPENDIX A: MODELS & METHODOLOGY

Regional/State Input-Output Models

The regional economic impact estimates in this report are based on a standard regional input-output model developed by the U.S. Department of Commerce, Bureau of Economic Analysis. This model, the Regional Input-Output Modeling System (RIMS II), is a standard and widely used tool for estimating regional economic impacts. The results generated from the RIMS II are widely recognized as reasonable and plausible in cases where the data utilized as the input to the model is accurate and based on reasonable assumptions. This section describes the basic concepts that underlie RIMS II.

In general, if the demand for the output of an industry (sales) in a given region increases by \$1 million, total regional output increases by \$1 million. This increase in output is referred to as the direct expenditure effect. However, the economic impact on the region of the \$1 million increase in demand does not stop with the direct expenditure effect. Regional firms will also be called upon to increase their production to meet the needs of the industry where the initial increase in demand occurs. Further, other suppliers must also increase production to meet the needs of the group of initial supplier firms to the industry. This increase in expenditures by regional suppliers is considered the indirect economic impact of the initial \$1 million in sales, and is classified as indirect expenditures of the total economic impact.

The total economic impact of the \$1 million in sales includes one additional element, the induced impact. All economic activity (expenditures), whether direct or indirect, that results from the initial increase in demand of \$1 million, requires workers, and these workers must be paid for their labor. This means that part of the direct and indirect expenditures is actually in the form of wages and salaries paid to workers in the various affected industries. These wages and salaries will in turn be spent in part on goods and services produced locally in the region. This spending is another part of the regional economic impacts referred to as “induced” impacts and is classified as induced expenditures.

The initial direct expenditures are input into the RIMS II model. The model then produces a calculation of the total indirect and induced expenditures within the regional economy that results from these direct expenditures. This total effect, or total economic output, is the sum of the direct, indirect, and induced expenditures. The RIMS II model also estimates the proportion of direct, indirect, and induced expenditures that are the earnings of workers in the households in the region. Finally, the RIMS II model calculates total expenditure impacts that occur within each

industrial sector, and translates this estimate into an estimate of the total number of full-time and part-time jobs within each industry required to produce this output.

Direct expenditures can be input into the RIMS II model in two different ways. If the entity under study “fits” a single NAICS code, all direct spending by the entity is placed in the RIMS II industry that corresponds to the North American Industry Classification System (NAICS) code. Second, if detailed component expenditures are known, we can use the “bill-of-goods” method, which matches spending categories with NAICS codes and corresponding RIMS II industries.

The RIMS II model is based on regional multipliers, which are summary measures of economic impacts generated from changes in direct expenditures, earnings, or employment. Multipliers show the overall impact to a regional economy resulting from a change in demand in a particular industry. Multipliers can vary widely by region. Multipliers are higher for regions with a diverse industry mix. Industries that buy most of their materials from outside the state or region tend to have lower multipliers. Multipliers tend to be higher for industries located in larger areas because more of the spending by the industry stays within the area.

Multipliers may be Type I or Type II. In Type I models, the input-output model classifies households as part of final demand rather than part of the region’s productive economy. Income received as earnings is considered a leakage, and household re-spending does not contribute to the multiplier effect. In Type II models, the household sector is included in the interrelated processes of all sectors of the economy and household re-spending contributes to the multiplier effect. Type II multipliers were used in this analysis. Type II multipliers are typically used when the change in final demand (direct expenditure) is known and the goal is to estimate the total (direct, indirect, and induced) change in production in a region that results from a given change in final demand.

For each of 471 detailed industrial sectors, the RIMS II model generates five types of multipliers for regional areas or states: three “final-demand” multipliers and two “direct-effect” multipliers. Final-demand multipliers indicate the impact of changes in final demand for the output of a particular regional industry on total regional output, earnings, or employment. Direct-effect multipliers indicate the impact of changes in regional earnings or employment within a particular industry on total employment or earnings within a region.

Final-demand output multipliers indicate the level of total regional output (direct, indirect and induced expenditures) that results from an increase in direct expenditures for a good produced by a particular regional industry. For example, if an industry in a particular region is said to have a final demand output multiplier of 2, this tells us that a \$1 increase in final demand for the good produced by that industry results in a \$2 increase in total output or expenditures within the regional economy. Direct-effect earnings multipliers indicate the impact of an increase in final demand for the good of a particular regional industry on the total earned income (wages and salaries) of households within the region. Direct-effect earnings multipliers indicate the increase in total regional employment that results from a \$1 million increase in final demand for the good produced by a particular regional industry. Direct-effect earnings multipliers indicate the impact of a \$1 change in earnings within a particular regional industry on total earnings in all industries within a region. Direct-effect employment multipliers indicate the impact of a change in employment in a particular regional industry on total employment in all industries within a region.

Fiscal Impact Model

The economic activity estimated to result from an economic development project would result in additional tax revenue for state and local government in the region where that economic activity occurs. Econsult's Fiscal Impact Model is designed to estimate this level of additional tax revenue based on the estimates of economic impact produced by the RIMS II model.

The RIMS II model provides estimates of direct, indirect, and induced expenditures, earnings, and employment within a county, metropolitan area, or state. Econsult combines the output of the RIMS II model with U.S. Census Bureau County Business Patterns data to produce estimates of the distribution of additional employment and earnings by county within a region or state. In addition, U.S. Census Bureau "Journey to Work" data on commuting flows from the 2000 Census are utilized to estimate income earned by residents of each county within a region. For models of the Philadelphia region, the Fiscal Impact Model also estimates income earned within the City of Philadelphia by suburban residents. These estimates form the basis of estimates of tax revenues from local income taxes in Pennsylvania as well as Pennsylvania and New Jersey state individual income taxes.

Pennsylvania state business and sales taxes are estimated based on the most recent data on average sales tax base per employee by major industry, as contained in publications from the Pennsylvania Department of Revenue. Estimates of New Jersey state business and sales tax revenue are based on the statewide average sales and business tax base per employee. For both states, the RIMS II model produces estimates of additional employment by industry. These estimates, combined with estimates of the average business and sales tax base per employee, and current and projected future tax rates, produce the estimates of additional annual state business and sales tax revenue.

For the current study, the fiscal impact estimates take into account estimated additional revenue from the following major tax sources:

- Local earned income taxes in Pennsylvania (counties other than Philadelphia, if applicable)
- Philadelphia Wage and Earnings Tax
- Philadelphia Sales Tax
- Philadelphia Business Privilege Tax
- Pennsylvania State Sales Taxes
- Pennsylvania State Individual Income Taxes
- Pennsylvania Corporate Net Income Tax
- Pennsylvania Capital Stock and Franchise Tax