



THE UNIVERSITY CITY SCIENCE CENTER:
**An Engine of Economic Growth
for Greater Philadelphia**

Prepared for the University City Science Center by the Economy League of Greater Philadelphia.





This report was prepared for The University City Science Center by the Economy League of Greater Philadelphia. The Science Center also thanks Select Greater Philadelphia for their assistance in compiling and interpreting data.



EXECUTIVE SUMMARY

Growing yesterday's industrial manufacturing economy demanded roads, bridges, and rail to move goods and finished products. Growing today's knowledge economy demands a new sort of infrastructure to bring together the ideas and people that drive innovation.

The Impact of Innovation

The University City Science Center has played this role in Philadelphia for nearly a half-century, accelerating technology commercialization and the market availability of life-enhancing scientific breakthroughs by bringing together innovations, scientists, entrepreneurs, funders, and business service providers into a gathering place.

Established in 1963, the Science Center was the first, and remains the largest, urban research park in the United States. Throughout its history, the Science Center has provided services that range from mentoring and business advice, to incubator space with fully-equipped laboratories and "plug 'n play" offices for entrepreneurs, to path-breaking programs designed to demonstrate, nurture, and sustain new technology businesses and bring their benefits to the region and the world.

This report focuses on the impact of the Science Center's incubation services on the Greater Philadelphia region's economy by looking at the companies and organizations that received incubator services and other early-stage businesses that received a ben-

efit from being located at the Science Center as they grew. For the purposes of this study, these "graduates" include organizations that received discrete incubator services and/or benefits from their location at the Science Center.

Creating Jobs

The Science Center's supportive capacity has helped to leverage Greater Philadelphia's world-renowned cluster of university and research institutions, spurring technology-based regional economic development. The organizations that have originated at, passed through, and received mentorship from the Science Center have created tens of thousands of jobs, hundreds of millions in earnings, and billions in output for the regional economy. Of the 350-plus graduate organizations referenced in this study, the 93 that remain in the region employ 15,512 people; the Science Center's 37 current incubator residents employ another 174. These highly skilled jobs command an average wage of \$89,000,¹ contributing \$22.0 million to the City of Philadelphia in wage taxes

and \$42.5 million to the Commonwealth of Pennsylvania in income taxes annually. In addition to taxes paid by employees, many of these organizations pay state and local business taxes. Each employee also supports an additional 1.68 jobs throughout the region due to indirect and induced economic demand.

Catalyzing Commercialization

And yet, economic impacts predicated on business incubation, while noteworthy, only tell part of the Science Center's story. Its presence and programs create capacity for innovation and collaboration, facilitating the transfer of new technologies into the marketplace. These services are critical to Greater Philadelphia's technology-driven life sciences sector, which accounts for 15 percent of the region's economy.

The region's robust life sciences activity is sustained by networks of support like the Science Center. (Indeed, organizations such as BioAdvance and Ben Franklin Technology Partners have also supported some Science Center incubator residents and graduates.) The 449 patents (72 percent in the life sciences) obtained by all Science Center-incubated and graduate organizations have strengthened connections between the region's mix of university research institutions, hospitals, and start-up organizations, reinforcing the innovation pipeline that creates new opportunities for economic growth.

Clearly, the Science Center has been on the front lines of Greater Philadelphia's economic development over the past half-century. Future growth will depend on the region's ability to build upon this foundation. The Science Center provides Greater Philadelphia with resources to thrive in a 21st century knowledge economy. Leveraging this asset will help to ensure that Greater Philadelphia sustains its economic momentum.

Summary of Impact of Science Center Business Incubation in Greater Philadelphia (2009)

Category of Economic Impact	Science Center-Incubated Organizations
Employment	
Direct	15,686
Total	42,021
Employment Multiplier	2.68
Labor Income (\$ millions)	
Direct	\$1,669.6
Total	\$3,218.0
Average Wage	\$89,204
Value Added (\$ millions)	
Direct	\$2,590.6
Total	\$4,976.4
Output (\$ millions)	
Direct	\$5,086.5
Total	\$9,384.6
Tax Revenues (\$ millions)	
City Wage Tax	\$22.0
State Income Tax	\$42.5

Source: Minnesota IMPLAN Group

¹ Source: Minnesota IMPLAN Group. Please see Appendix B for more information on methodology.

INTRODUCTION

The University City Science Center has catalyzed economic growth in Greater Philadelphia for nearly a half-century. Its commercialization and entrepreneurship programs have served as a melting pot for scientific ideas and a launching pad for burgeoning businesses, helping to leverage innovations emerging from Greater Philadelphia's world-class universities and research institutions. The hundreds of organizations that have received mentorship at its West Philadelphia campus have made a crucial contribution to the regional economy.



Business incubators create up to 20 times more jobs than traditional infrastructure projects, and they do so at a fraction of the cost.

Now, after decades of slow growth, Greater Philadelphia is poised for sustained economic momentum. As the oldest and largest urban research park in the United States, the Science Center's catalytic resources have already equipped the region with a powerful tool for rebuilding its economic base, creating thousands of jobs, millions in tax revenues, and billions in economic output.

And yet, building upon that foundation will require something more. Vibrant and competitive regional economies are supported by a strong and efficient innovation pipeline. The Science Center plays a unique role in this process. Strengthening its position as a complementary catalyst of new technologies will enhance its ability to drive new economic growth, helping to unleash the region's potential for a world-class future.

The Evolving Role of Research Parks

Since the Science Center was founded in 1963, hundreds of other research parks have been created

nationwide as a way to spur regional economic development. Initially, these parks were intended primarily as real estate development endeavors. Over time, however, they have emerged as collaborative, interdisciplinary centers for technology-based research and development. Today, research parks are increasingly viewed as key economic drivers, not only for their role in real estate development but also for their resources and activities that spur commercialization of new technologies.² This evolution in the role of research parks has called for a stronger emphasis on:

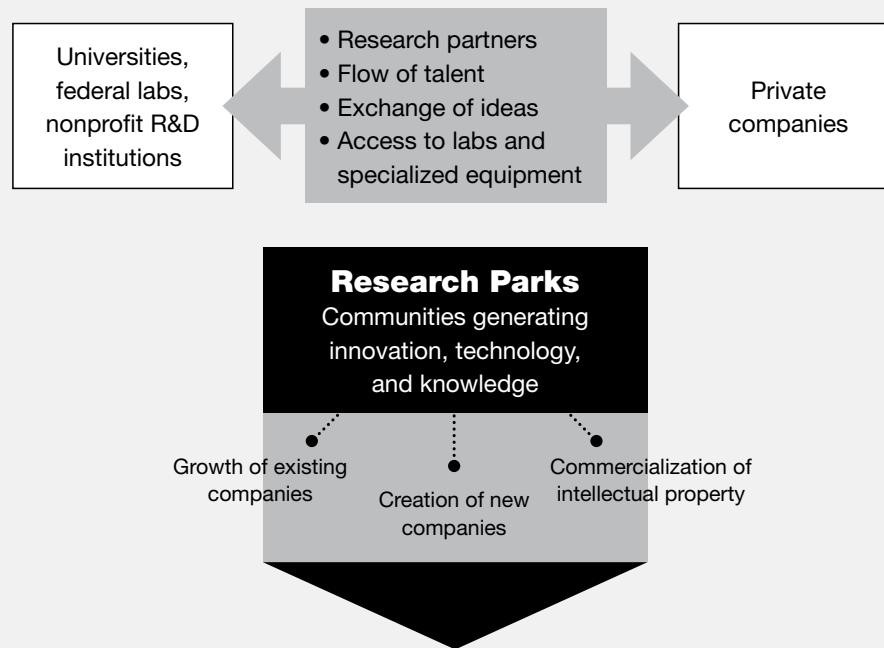
- Supporting business incubation and entrepreneurship;
- Targeting niche areas;
- Commitment to economic development;
- Access to a skilled workforce;
- Fostering university-industry relationships;
- Developing a regional and multi-institutional approach; and
- Technology transfer.

From an economic development perspective, investment in research parks has paid off. A recent study for the U.S. Department of Commerce Economic Development Administration found that business incubators create up to 20 times more jobs than traditional infrastructure projects, and they do so at a fraction of the cost: \$144 to \$216 for each incubator-related job, compared with \$2,920 to \$6,872 for construction-related jobs.³ In other words: research parks are a sound public investment.

² Battelle Technology Partnership Practice (2007) *Characteristics and Trends in North American Research Parks – 21st Century Directions*. Prepared in cooperation with the Association of University Research Parks. October. Available at: <http://www.battelle.org/ASSETS/286E374D8FE447D59A5431489670332B/univresearch.pdf>.

³ National Business Incubation Association (2009) Press Release: "Business Incubators Are Best Investment of Public Dollars, Study Says." January. Available at: http://www.nbia.org/resource_library/works/files/EDA_study_PR_FINAL.pdf.

The Research Park Concept



Source: Battelle Technology Partnership Practice

The Science Center's Impact

In Greater Philadelphia, the Science Center's commitment to commercialization and entrepreneurship maximizes the value of the region's high concentration of leading research institutions. Ultimately, the beneficiary of its presence is the regional economy.

Creating Jobs

The Science Center's most direct impact on the regional economy is job creation. During the course of its history, 350-plus organizations⁴ have been incubated on its campus utilizing office space, laboratory equipment, and flexible arrangements to ramp up their activity and help bring their products to market quickly and

efficiently. For many firms – particularly those in specialized fields, such as biotechnology – these resources are invaluable, because of the specialized equipment, facilities and resources the firms require.

Successful organizations ultimately outgrow their space, graduate from the incubators, and establish operations elsewhere. For this reason, the Science Center's economic impact is not solely measured by its own activity, but rather by its ability to grow new businesses that generate follow-on economic activity. In this regard,

⁴ University City Science Center (2009) SharePoint Database. "Plus" because company records date to 1968, while the Science Center actually started in 1963.

**Summary of the Impact of Science Center
Business Incubation in Greater Philadelphia (2009)**

Category	Graduate Organizations	Resident Incubator Organizations	Total of Science Center- Incubated Organizations
Employment			
Direct	15,512	174	15,686
Indirect	12,334	256	12,590
Induced	13,491	254	13,745
Total	41,337	684	42,021
Multiplier	2.66	3.93	2.68
% of Region	1.09%	0.02%	1.11%
Output (\$ millions)			
Direct	\$4,978.3	\$108.2	\$5,086.5
Total	\$9,188.1	\$196.5	\$9,384.6
% of Region	1.49%	0.03%	1.52%
Value Added (\$ millions)			
Direct	\$2,539.3	\$51.2	\$2,590.6
Total	\$4,877.0	\$99.4	\$4,976.4
% of Region	1.42%	0.03%	1.45%
Labor Income (\$ millions)			
Direct	\$1,642.8	\$26.7	\$1,669.6
Total	\$3,159.7	\$58.3	\$3,218.0
% of Region	1.07%	0.02%	1.09%

Notes: Please see Appendix B for more information on economic impact methodology.
Source: Minnesota IMPLAN Group. Numbers may not add up due to rounding.

the Science Center's full contribution to job creation is manifested by the 155 organizations that have originated at, passed through, and received mentorship from the Science Center and remain in business today.

This historic ongoing 45 percent organizational survival rate is an important measure of the Science Center's value. According to a Bureau of Labor Statistics (BLS) study of survival rates for new, single business establishments started in the U.S. between March 1998 and March 2002:⁵

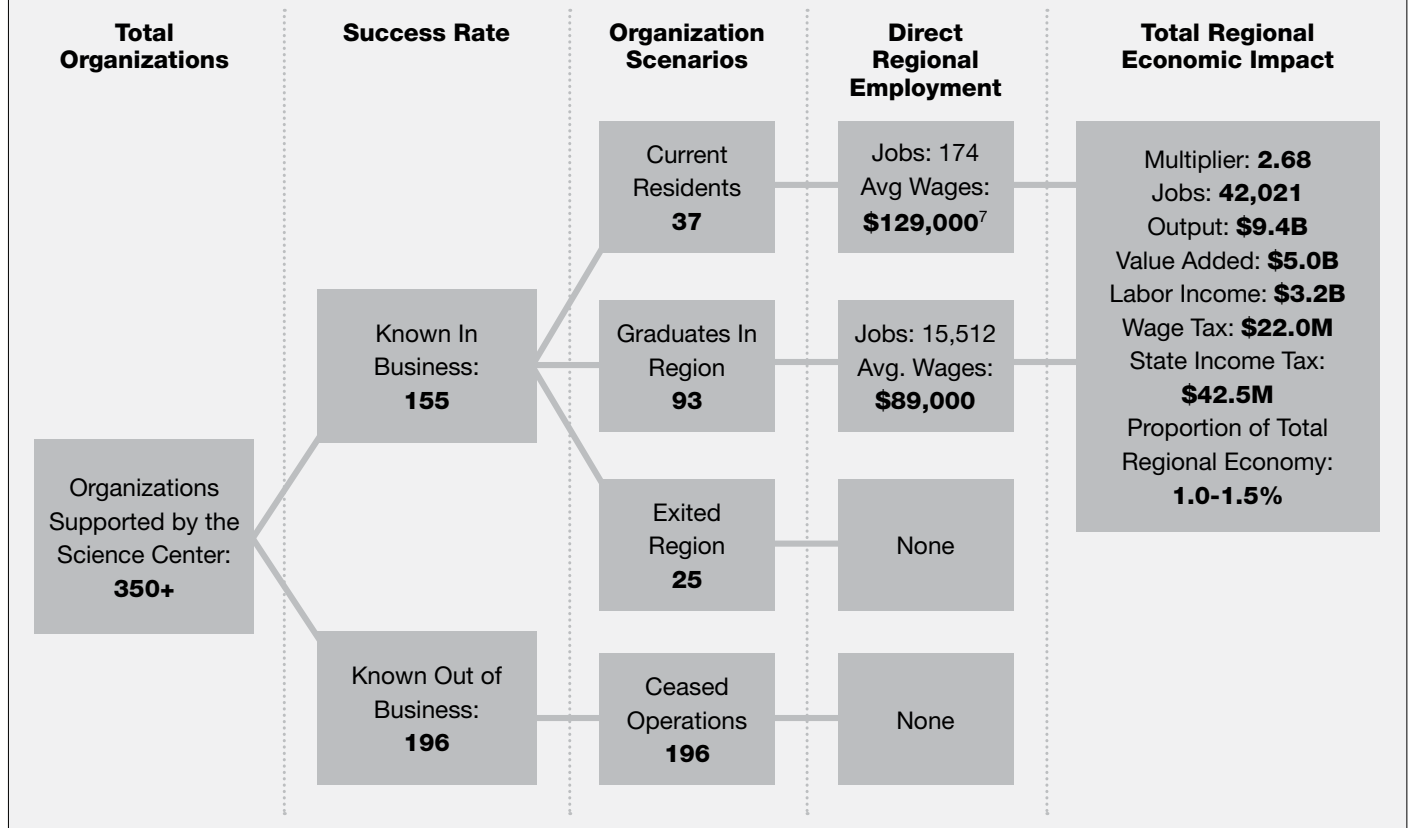
- Just 44.4 percent of all new organizations, across all sectors, were still operating after four years.
- Most new organizations fail within two years; thereafter, the failure rate declines much more slowly.
- The four-year survival rate did not vary widely across different industry sectors.
- Survival rates were similar to those found in prior studies – for example, a 1992 study⁶ found a four-year survival rate of 50 percent across all sectors.

In short, the Science Center's ongoing survival rate of 45 percent is almost identical to the four-year survival rate found by the BLS study and other studies. The maintenance of the four-year survival rate in organiza-

5 Knaup, Amy E. (2005) "Survival and Longevity in the Business Employment Dynamics Data." Published in the Bureau of Labor Statistics, Monthly Labor Review. Pp. 50-56. May. Available at: <<http://www.bls.gov/opub/mlr/2007/09/art1full.pdf>>. Notes: Survival rates were calculated as the percentage of the new businesses that were still operating one, two, three and four years after launch. It should be noted that this period included the recession in the U.S. economy from March 2001 to November 2001, which included the "dot.com" collapse, during which a large number of information technology (IT) companies failed. Therefore, the results of the BLS study are generally comparable to company survival rates under the current recessionary economic conditions.

6 Shane, Scott (2008) "Startup Failure Rates – the Real Numbers." April. Available at: <<http://smallbizxtrends.com/2008/04/startup-failure-rates.htm>>.

Tracing the Impact of Science Center Business Incubation



tional longevity over the Science Center's 46-year history is an impressive imprimatur of success.

The majority of these organizations have stayed in Greater Philadelphia: 93 reside in the 11-county tri-state region,⁸ and another 37 currently reside at the Science Center's three Port business incubators. (Please see Appendix C for a full listing of graduate and resident organizations in the region.) In other words, more than four of every five Science Center-incubated organizations that are still in business have stayed in

the region.

These organizations are a formidable economic force. The 93 graduate organizations remaining in the region

⁷ Source: Minnesota IMPLAN Group. Please see Appendix B for more detail on methodology.

⁸ Defined as Select Greater Philadelphia's 11-county region: in Pennsylvania: Bucks, Chester, Delaware, Montgomery, and Philadelphia; in New Jersey: Burlington, Camden, Gloucester, Mercer, and Salem; in Delaware: New Castle. See Appendix B for more detail on methodology.

Employment Multipliers for Selected Industry Sectors in Greater Philadelphia

Sector	Regional Employment Multiplier
Biotechnology	5.91
Commercial Construction	1.67
Custom Computer Programming Services	1.69
Eating and Drinking Establishments	1.28
Hospitals	1.75
Legal Services	1.86
Professional and Technical Services	2.08
Scientific R&D Services	2.13
Organic Chemical Manufacturing	8.10
Retail Electronics Stores	1.44
Software Publishing	3.28
Science Center	2.68

Source: Minnesota IMPLAN Group

9 Source: Minnesota IMPLAN Group. Please see Appendix B for more information on methodology.

10 Bureau of Labor Statistics (2003) *Employment Data*. Note: current average regional wage was generated by converting the \$52,410 average regional wage from 2007 to the first quarter 2009 equivalent using the Bureau of Labor Statistics "Employment Cost Index."

11 Battelle Technology Partnership Practice (2007) *Characteristics and Trends in North American Research Parks*.

12 Minnesota IMPLAN Group (2009) *Input/Output Model of the Greater Philadelphia Region*.

13 *ibid.*

employ 15,512 people. Current residents of the Port business incubators employ another 174. These are high-paying jobs, with an average wage above \$89,000⁹ as compared to the average regional salary of \$54,925.¹⁰ They also create an economic multiplier effect, driven by the purchases of materials and services ("indirect impacts") and by worker re-spending ("induced impacts").

In this respect, the Science Center has outperformed its peers. For each employee at a Science Center-incubated organization, another 1.68 indirect and induced jobs are created in the region, for a total increase in regional employment of 2.68 jobs. This employment multiplier compares well with a recently cited 2.57 employment multiplier at research parks nationwide.¹¹ Overall, graduate and resident incubator organizations support more than 40,000 regional jobs, or one percent of the entire regional workforce. Several thousand more jobs also have been created at organizations that have since left the region.¹²

Thanks to the relatively expensive purchase requirements and the capital-intensive nature of these organizations, their relative economic contribution is even greater than employment impacts would suggest. The \$9.4 billion in sales ("economic output") and \$5.0 billion in increased regional GDP ("value added") attributable to these organizations represent 1.5 percent of regional totals, a third greater than the organizations' proportion of regional employment.¹³

To put these results in perspective, it is important to understand the variance of employment multipliers across economic sectors. The multiplier of 2.68 for Science Center-incubated organizations is based on the number and employment totals in the different industries these organizations represent. The Science Center's graduate and resident organizations are largely concentrated in the life sciences (e.g., pharmaceutical

manufacturing, biotechnology, medical device manufacturing, and research and development services and activities), information technology, and professional and scientific services. In general, these sectors have higher-than-average employment multipliers, driving up the overall economic impact of Science Center-incubated organizations.

Also noteworthy is the contribution these organizations make through increased tax revenues. Approximately one-third (5,154) of employees at Science Center-incubated organizations work in the City of Philadelphia. These workers pay \$17.3 million in city

Wage Tax Contributions of Science Center-Incubated Organizations

Taxing Jurisdiction	Employees	Effective Tax Rate	Total Tax Revenues
City of Philadelphia Wage Tax			
Employees of city organizations	5,154	3.76%	\$17,286,879
Employees of suburban organizations	10,532	3.93%	\$4,762,966
			\$22,049,845
Pennsylvania State Income Tax			
All employees	15,686	3.04%	\$42,537,320

Notes: Tax revenues calculated based on an average wage of \$89,204; effective City Wage Tax rate for city employees reflects the city's share of residents; State income tax rate of 3.07 percent was slightly reduced to account for organizations operating within the region but outside of Pennsylvania. Please see Appendix B for more information on methodology.

Source: Economy League and Select Greater Philadelphia calculations, based on Minnesota IMPLAN Group modeling.

Geographic Distribution of Science Center-Incubated Organizations

County	Graduates	Jobs	Organizations With More than 100 Employees
Bucks (PA)	5	276	3-D Pharmaceuticals (253)
Chester (PA)	8	2,965	Bentley Systems (2,774); Morphotek (105)
Delaware (PA)	9	148	
Mercer (NJ)	3	191	Recording for the Blind & Dyslexic (180)
Montgomery (PA)	24	6,935	Centocor (3,000); SEI (2,300); CardioNet (475); Response Center (300); Strategic Management Group (248); Conversion Systems (199)
New Castle (DE)	2	17	
Philadelphia (PA)	42	4,980	Universal Business Services (2,674); Astrolabe Analytica (800); Hancock Health Plan (346); Data Core Systems (250); Monell Chemical Senses Center (154); Innaphase (118); Care Management Science Corporation (105)
Current Residents	37	174	
Total	130	15,686	

Notes: Please see Appendix C for full listing of Science Center graduate and resident incubator organizations in the region; some organizations listed have been acquired or merged with other organizations – please see Appendix B for methodology with regards to projections for current year employment.

Source: University City Science Center SharePoint data and Hoover's, Inc. database.

Location of Science Center Graduates

This map displays the locations of Science Center graduates across the Philadelphia region, including Bucks, Mercer, Montgomery, Chester, Delaware, Burlington, Camden, Gloucester, and New Castle. Graduates are marked with numbered dots (1-93). An inset map provides a detailed view of Center City, showing all Center City companies. A legend indicates that the dots represent Science Center Graduates. A scale bar shows distances up to 20 miles. The source is cited as ESRI & DVRPC.

All Center City companies are shown in the inset

Legend
● Science Center Graduates

Source: ESRI & DVRPC

resident and non-resident wage taxes each year. Of the remaining two-thirds working in the suburbs, approximately 13 percent live in the city and pay the resident rate. These workers contribute another \$4.7 million to city coffers, totaling \$22.0 million in annual Philadelphia City Wage Tax revenues. Virtually all of these employees also pay state income tax, contrib-

The geographic distribution of graduate organizations highlights the truly regional nature of the Science Center's impact. Two-thirds of graduate organization employment is located in suburban counties, spanning seven of the region's 11 counties – including each county of southeastern Pennsylvania, Mercer County in New Jersey and New Castle County in Delaware. Montgomery County alone accounts for more than 40 percent of Science Center-incubated employment.¹⁴

University City Science Center

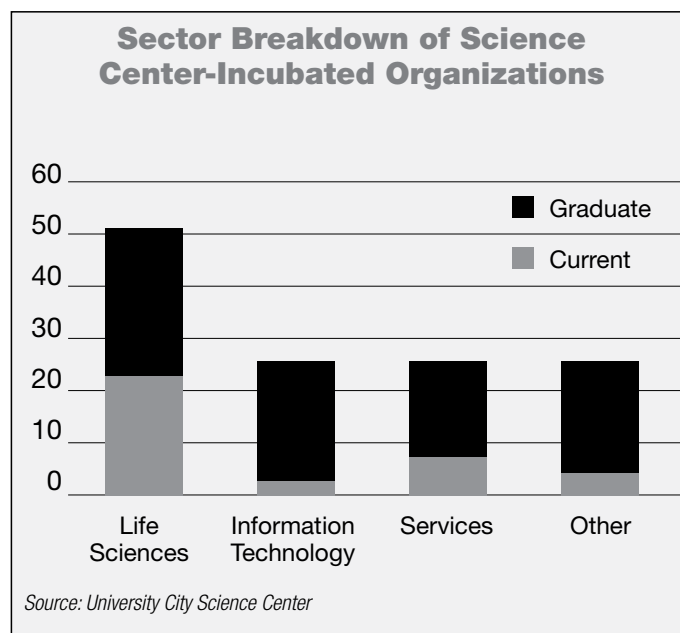
The Science Center is uniquely positioned to provide the region with critical capacity to capture the benefits of this new knowledge economy.

Catalyzing Commercialization

Incubation-based impacts, while noteworthy, only tell part of the Science Center's story. The Science Center's very existence reflects the regional economy's shift from historical preeminence in industrial manufacturing to an economy built around its renowned cluster of education and healthcare institutions. Today, this reinvention has positioned the region to be a world-class exporter of a new product – knowledge – and to rebuild a robust economy around high-growth, high-technology industries.

Knowledge industries demand a new sort of infrastructure. Whereas Philadelphia's ports and railroads supported the development of its industrial manufacturing base in the 19th and early 20th centuries, 21st century growth requires streamlined mechanisms for leveraging the economic value of innovations. To sustain growth, it's not enough just to provide incubation services and create jobs. As a centralized, cross-sector, multi-institutional hub of resources for accelerating commercialization and promoting entrepreneurship, the Science Center is uniquely positioned to provide the region with critical capacity to capture the benefits of this new knowledge economy.

In this role, the Science Center offers substantial support and benefits, including:



- Advice, expertise, and services provided to nearby organizations (that may never actually lease space);
- Agglomeration effects generated when similar firms are located in close proximity;
- Creation of a local entrepreneurial culture;
- Expertise gained by serial entrepreneurs who, although their initial organizations may fail, use their expertise to start other organizations that become successful; and
- Philanthropic initiatives of successful entrepreneurs that benefit the community.

These services replenish the region's innovation pipeline, a self-reinforcing effect that creates new opportunities for additional economic growth.

Why is commercializing technology so important? Because the region has made big investments in high-technology industries that depend on it. In particular,

Patents Approved and Issued to Science Center-Incubated Organizations

Type of Organization	Patents Issued	Percent
Life Sciences	323	72%
Information Technology	84	19%
Services	20	4%
Other	22	5%
Total	449	100%

Notes: 60 graduate and resident incubator organizations have received patents.
Source: U.S. Patent and Trademark Office

Greater Philadelphia's life sciences sector accounts for one of every six jobs in the region and 15 percent of all economic activity, a presence built upon an interconnected mix of university research, hospitals, and technology start-up companies. A recent Milken Institute report¹⁵ ranked the region's life sciences cluster second in the U.S. (behind only Boston). Milken's explanation: "The Greater Philadelphia region is seeing the return on the investments they have made in their life sciences industry. The combined efforts of business, policy makers, academic institutions and entrepreneurs are shaping the region's future as a top location for economic growth and high-wage jobs."

Sustaining the connectivity of this cluster demands substantial public and private networks of support. The

Science Center is on the front lines of these industry-building efforts. Of Science Center-incubated organizations in existence, 42 percent are based in the life sciences,¹⁶ employing 4,807 in the region. Of course, that also means the Science Center supports organizations in other intellectual property-based sectors, such as information technology. Particularly in an economy where biotechnology firms are struggling to raise new capital, such sector-based diversification will benefit the Science Center and its ability to support cross-sector innovation.

But growing and sustaining the life sciences industry is a unique challenge. Innovations in the life sciences have long life cycles; early stage technologies can take many years to translate into marketable products. To commercialize these innovations, connective capacity is critical.

Patents are one indicator of an innovation pipeline's strength. Especially for intellectual property-driven fields like biotechnology, patents often are the launch pad for a start-up firm, attracting venture capital and securing licensing rights that enable participation in the innovation networks of other organizations. From a regional perspective, the more patents filed, the higher the level of innovation. This in turn leads to economic growth and more money invested in research and development.

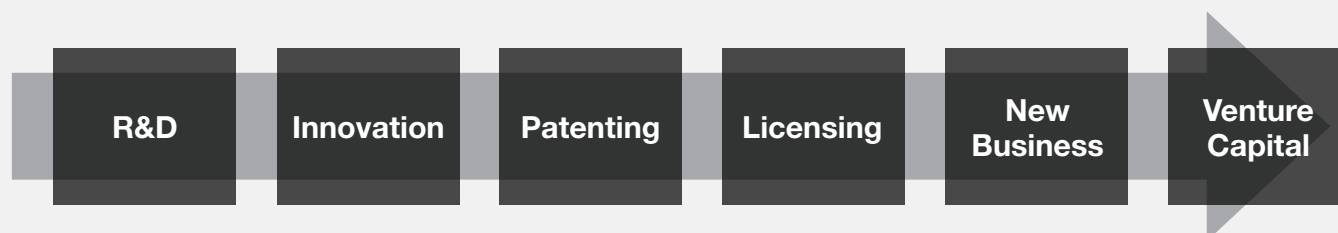
Based on this measure, Science Center-incubated life sciences organizations are doing their part: According to the U.S. Trademark and Patent Office, all graduates and residents have received 449 patents, 72 percent in the life sciences.

And yet, there is room for improvement. According to the Milken report: "Entrepreneurial endeavors are a particularly critical element in the Greater Philadelphia area, given its dependence on the cutting-edge re-

15 Milken Institute (2009) *The Greater Philadelphia Life Sciences Cluster: An Economic and Comparative Assessment*. May. Available at: <<http://www.milkeninstitute.org/publications/publications.taf?function=detail&ID=38801196&cat=resrep>>.

16 For the purposes of this analysis, life sciences are defined as IMPLAN 2001-2006 Sector 160 – Medicinal and botanical manufacturing – and IMPLAN 2007 Sector 133 – Pharmaceutical preparation manufacturing.

Components of the Technology Transfer and Commercialization Continuum¹⁷



search and innovations of the life sciences industry... It has yet to develop the entrepreneurial sophistication of such places as Greater San Francisco, San Diego, Boston, Greater Los Angeles, or Greater Raleigh-Durham.” In order to compete with these regions in the future, Greater Philadelphia will need to further strengthen its innovation pipeline and improve the performance of its small life sciences firms.

In other words, the region needs more of the Science Center. Fulfillment of its mission to strengthen the region’s culture of technology commercialization will help bridge a series of gaps that stand between innovation and investor. Two new Science Center programs – Quorum, a physical and virtual “clubhouse” for entrepreneurs, and QED, a proof of concept program – will help to build those bridges, catalyzing commercialization to serve as the foundation for new economic growth in Greater Philadelphia.

CONCLUSION: FOUNDATION FOR THE FUTURE

Just as industrial infrastructure transformed 19th and 20th century Philadelphia, so too can a robust

commercialization infrastructure now transform 21st century Philadelphia. The Science Center’s nearly half-century of service has already contributed tens of thousands of jobs, millions in tax revenues, and billions in output to the regional economy.

Now, the Science Center is in a unique position to build upon this foundation. Greater Philadelphia has the necessary assets for global competitiveness in the new knowledge economy. The ability to bring together these assets will be a key factor in driving economic growth. The Science Center’s synergistic resources make it a powerful engine for innovation-based economic development. Harnessing this power will ensure that Greater Philadelphia sustains its momentum and continues driving towards a world-class future. ■

17 CEO Council for Growth (2007) *Accelerating Technology Transfer in Greater Philadelphia: Identifying Opportunities to Connect Universities with Industry for Regional Economic Development*. October. Prepared by: Economy League of Greater Philadelphia. October. Available at: <<http://economyleague.org/node/93?f=publications/reports>>.

APPENDIX A: CASE STUDIES

The Science Center adds value to the region by improving the economic competitiveness of its resident organizations. The nature of its value and extent of its impact has varied for each firm. A look at three recent success stories underscores the importance of the Science Center's flexible approach to business incubation.

Integral Molecular

Ben Doranz, co-founder of Integral Molecular, is a classic entrepreneur. His story illustrates the Science Center's value in supporting a culture of entrepreneurship in Greater Philadelphia.

After finishing his undergraduate studies at Cornell University, Doranz came to Philadelphia. Between 1998 and 2000, he worked at the University of Pennsylvania's Center for Technology Transfer, where he learned the nuances of licensing and commercializing new technologies. He then took that experience to the Science Center, where he worked for more than a year at the Port of Technology business incubator. Among the companies Doranz helped to incubate was Morphotek, a biotechnology company, which now has over 100 employees.

At the same time, Doranz enrolled in the Wharton School of business at the University of Pennsylvania, where he majored in health care and entrepreneurship. In 2001, he entered two submissions to the Wharton Business Plan Competition. Both were finalists. One of them won.

Upon winning the competition, Doranz combined his finalist business plans into a single plan and created Integral Molecular, a platform-based biotechnology company to provide reagents and services to other biotechnology companies and scientists. But Integral was not flush with cash. There was no venture capital in the

near future – just an entrepreneur with a vision.

According to Doranz, only the Science Center could have incubated his company. Its facilities provided Integral with ready-to-go laboratory space and equipment that minimized start-up time, energy and, ultimately, cost. “There is a certain threshold level to build out your research. The Science Center lowered these barriers to entry. There was simply no other space in the city – or in the suburbs, for that matter – where we could actually start with two people and a minimal budget and form a research-based biotech company.”

For burgeoning companies, this kind of ready-to-go physical infrastructure can be a game-changer. Entrepreneurs place a premium on it. Without access to the Science Center's support, Integral would have needed several millions of dollars of capital to build out the basic infrastructure required to conduct biomedical research. So in 2001, Doranz made what he believed to be the logical choice: to incorporate his new company at the Science Center's Port business incubator.

Slowly but surely, Integral grew. Instead of raising venture capital as many biotechnology companies do, Integral sought out government grants for its research. In 2002, it found funding through the National Institutes of Health Small Business Innovation Research (SBIR) program. The SBIR grant allowed Integral to open laboratory space for its proof of concept work. Its volume of work gradually increased over the course of the next half-decade. During this time, Integral added two to three employees per year.

The Science Center supported this growth in a variety of ways. Its staff connected Integral with business essentials, including accountants, insurance agencies, and other support services. The physical presence of other entrepreneurs also allowed for advice and mentorship. According to Doranz, this co-location created

“What the Science Center does is remove the barriers for getting from Point A to Point Z. For us, they cleared a pathway to focus on what was most important to us, the thing that would make or break the company – the development of our technology.”

a sense of community that was invaluable for his young company. “The reality is that a lot of entrepreneurs don’t have as strong a background as they would like to run a company. Most need advisors and mentors to complement their skills. Advice from other entrepreneurs in the space was very valuable.”

Just as important for Integral was its co-location with University City’s other world-class research institutions. Proximity to the University of Pennsylvania, Drexel University, The Children’s Hospital of Philadelphia and The Wistar Institute, among others, allowed Integral to access “core facilities” for biomedical research – the type of equipment only the largest and wealthiest biomedical research organizations can afford. Integral made use of many of these facilities for a nominal fee.

Of course, also nearby is a world-class center of business – namely, Wharton, Doranz’s alma mater. Wharton produces some of the brightest and most ambitious entrepreneurs in the world. Integral made quick use of this network: “Because of the proximity, we hire two to three Wharton students each year as interns or part-time consultants,” said Doranz. “We also usually work with Wharton students through the Penn Biotech Group, a student organization where many of them (and other graduate students and post-docs) do consulting projects for companies like us.”

Eight years after its humble beginnings, Integral now sells its products to other biotechnology companies,

pharmaceutical firms, and other research institutions. With 20 employees, Doranz has a dilemma that any entrepreneur would love to have: Integral has outgrown its space at the Science Center’s incubator, and now must choose between building out a new space at the Science Center or relocating to an off-site office park.

According to Doranz, Integral’s calculations will be based on more than just rental prices. Location matters. “Roughly half of our employees have some affiliation with local universities. We are getting expertise from these universities that we might not otherwise get. We have student groups that perform consulting projects for us. Our advisors, including our co-founders, are at Penn, and we collaborate with an entire community of scientists.

“People understand the value of that. It’s not just a per-square-foot number.”

In the meantime, Integral will continue to benefit from the Science Center’s programs and services. They allow Doranz to focus on what’s most important: growing his company. “What the Science Center does is remove the barriers for getting from Point A to Point Z. For us, they cleared a pathway to focus on what was most important to us, the thing that would make or break the company – the development of our technology. We didn’t have to worry about copy machines, phone systems, electricity, or other necessities that you need to conduct business but don’t determine your success. We never saw the barriers. All we saw was the road.” ■

APPENDIX A: CASE STUDIES

BioRexis Pharmaceutical Corporation

In July 2002, BioRexis Co-Founder and CEO David King entered the Science Center with three other co-founders and an exciting new technology platform. Six months later, King's company had 12 employees and plans for a new headquarters. BioRexis' rapid growth in between illustrates the Science Center's unique value to budding entrepreneurial endeavors, and ultimately Greater Philadelphia's entire life sciences industry.

The post-September 11 period, stretching into 2002, was a particularly difficult time for biotechnology companies to raise capital. But David King knew he had exciting technologies, which included a new platform to develop protein and peptide drug candidates with

“The Science Center did an extraordinary job getting BioRexis off the ground.”

extended half-life, to reduce dosing frequency and improve efficacy. The platform could also potentially supplement complicated and expensive monoclonal antibodies with BioRexis' proprietary “Trans-bodies.”

In January 2002, King teamed with the company's scientific founder, Christopher Prior, and two other scientists to start circulating a business plan for their venture, to be called BioRexis, to the venture capital community. Despite prevailing economic conditions,

the technology piqued the interest of the venture capital community, although it took many months of meeting with potential investors before commitments were received. Finally, in July 2002, several venture firms invested more than \$8 million in initial “Series A” equity financing, and BioRexis was born.

But BioRexis needed a home. And fast.

King, an experienced executive at two previous life sciences companies, turned to the Science Center. According to King, the process took just a matter of weeks. “The people at the Science Center were incredibly user-friendly: they reserved lab space for us as we were completing our financing, which enabled us to enter the facility right after we closed our financing... The Science Center did an extraordinary job getting BioRexis off the ground.”

In fact, BioRexis closed its financing on a Monday, and moved into a small lab space on the fourth floor of the Science Center's business incubator at 3701 Market Street the following Wednesday. Using its lab and shared equipment available to all tenants in the incubator, BioRexis was able to produce its initial proteins within two weeks. Its ability to hit the ground running set the stage for a half-year of such rapid growth that BioRexis would ultimately outgrow its space at the Science Center.

During this period, BioRexis also had access to the Science Center's robust network of life sciences partners. According to King, these resources were invaluable to the budding company, which got “superb” support from the nearby Wistar Institute and the University of the Sciences in Philadelphia, a benefit King attributes to the Science Center's strategic location. The Science Center's “location near excellent university access was an important accelerator in our company's development,” he said.

BioRexis' rapid progress – five years from business plan to acquisition – illustrates one way that the Science Center helps to grow the regional economy.

While at the Science Center, BioRexis also secured a grant from the Commonwealth of Pennsylvania that helped it move into a 44,000-square-foot headquarters in Upper Merion Township, Montgomery County.

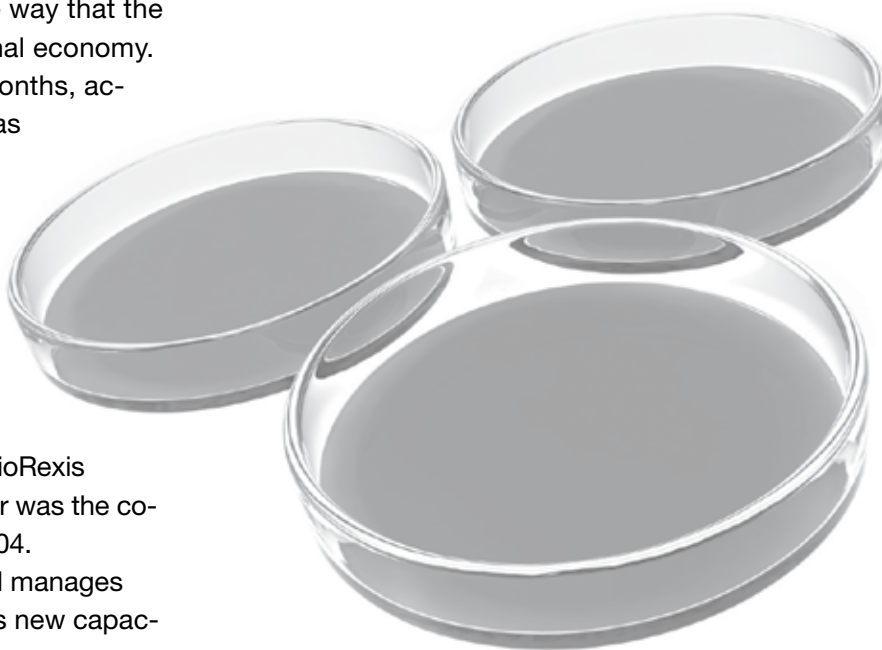
The company's growth continued. In March 2004, the company raised \$30 million in Series B financing from a group of venture capital firms. Then in February 2007, Pfizer, Inc., one of the country's largest pharmaceutical firms, purchased BioRexis to accelerate its own drug development.

BioRexis' rapid progress – five years from business plan to acquisition – illustrates one way that the Science Center helps to grow the regional economy. Although BioRexis only stayed for six months, according to King, that nascent period "was one of the most meaningful six months in our company's history. I am enormously grateful to the Science Center for what they did for our company."

Since the sale, King has joined Quaker BioVentures, a life sciences venture capital firm that operates out of the Cira Centre in Philadelphia, blocks away from the Science Center. In 2002, BioRexis was Quaker's first investment, and Quaker was the co-lead of BioRexis' principal financing in 2004.

As Venture Partner, King evaluates and manages deals with prospective companies. In this new capac-

ity, King sees the Science Center's value from the same vantage point that he observed when he was at BioRexis – as a key component of Greater Philadelphia's network of support for developing viable life sciences investments. "From Quaker BioVentures' perspective, the Science Center is an extremely useful resource for helping to grow young companies." King added, "I am particularly honored to have been asked to join the Science Center's board, as its mission is so important to our region's life sciences community." ■



APPENDIX A: CASE STUDIES

Centocor Ortho Biotech Inc.

Long before Centocor Ortho Biotech Inc., formerly Centocor, Inc., had established operations in Greater Philadelphia, it was a start-up at the University City Science Center. In the 30 years since its modest beginnings on Market Street in West Philadelphia, the company has grown into a very successful arm of a major multinational pharmaceutical company. Now a subsidiary of Johnson & Johnson, Centocor Ortho Biotech is one of the largest private employers in the region.

A far cry from its nascent days at the Science Center, where in 1979 Centocor, Inc. was founded by Michael Wall, an experienced serial entrepreneur, and Hilary Koprowski, who was director of The Wistar Institute in Philadelphia. Wall and Koprowski partnered with Hubert Schoemaker, a senior manager at Corning Biomedical; Vincent Zurawski, a junior faculty member at Harvard Medical School and Fellow at the Massachusetts General Hospital; and Carlo Croce, a professor and senior investigator at Wistar, to round out the founding team.

With limited resources, Centocor focused its initial efforts on product development. The founders used their scientific expertise and entrepreneurial instincts to craft a business plan that leveraged discoveries made elsewhere – in universities, government agencies, even private laboratories. Ultimately, this business plan made the Science Center a logical destination to set up shop. Access to nearby research, especially Koprowski's pioneering work at The Wistar Institute's budding hybridoma facility, was of great value to Centocor in supporting the company's founding premise

that monoclonal antibodies could be used to diagnose and treat a variety of illnesses. From a scientific perspective, the Science Center's proximity to the exciting research being done at Wistar was a competitive advantage.

The Science Center's flexibility also was an asset. According to Zurawski, the team was able to quickly secure a small space close to The Wistar Institute, which allowed the founders to test its business plan without expending precious resources. "Initially, while we were closing our first major financing we were not in a position to build our own laboratory space," said Zurawski. "The Science Center's ability to provide a small cubicle space close to Wistar and also shared laboratory space in the Connective Tissue Research Institute, which was also located in the Science Center and was provided by the director, Nicholas Kefalides, was very important for us." That accommodating environment, however small, gave Centocor all the room it needed to get off the ground.

More broadly, the Science Center's regional linkages – sandwiched between New York and Washington, DC – placed Centocor at the heart of a corridor rich with resources and teeming with life sciences and biotechnology activity. From a financial perspective, the late 1970s was an ideal time to start a biotechnology company. Scientific advancements had caught the eye of Wall Street investors, who were suddenly bullish on the industry's long-term growth potential. Philadelphia's geographic proximity to these markets exposed Centocor to eager venture capitalists and investors looking to get in on the action.

This strategic location set the stage for Centocor's growth. After just three years, Centocor had raised \$21 million in its initial public offering (IPO) and had

The Science Center's regional linkages – sandwiched between New York and Washington, DC – placed Centocor at the heart of a corridor rich with resources and teeming with life sciences and biotechnology activity.

introduced its first products, diagnostic tests for rabies, gastrointestinal and ovarian cancer. With 50 employees, the company also had outgrown its space and began looking to relocate. In 1982, Centocor moved into its new 15,000-square-foot Great Valley headquarters, where it would have the best of both worlds: affordable space to expand while remaining close to Wistar, its innovative research, and world-class scientists in University City.

As it turned out, Centocor was at the vanguard of a movement that would bring many more biotechnology companies to the Great Valley area. Liberty Property capitalized on the trend, investing in new office parks and infrastructure tailored to the demands of budding biotech companies, including a high-end conference center and hotel. These amenities fueled additional growth and solidified Great Valley's reputation as the place to be for biotechnology. Today, more than a dozen biotech companies are located within a half mile of Centocor's Research and Development Malvern site, attracting a highly skilled workforce and specialized life sciences vendors to the region. "This is an ability that many regions don't have," said former Centocor CEO David Holveck. And it's one that has made Greater Philadelphia a leading destination for a variety of life sciences firms.

Centocor continued to grow through the 1980s, but a major setback in the early 1990s put the company's

long-term viability in doubt. That is, until 1998 when Remicade® (infliximab) received approval from the U.S. Food and Drug Administration for commercial use. Remicade, a drug used to treat Crohn's disease was on track to become a blockbuster. A year later in 1999, Centocor was acquired by Johnson & Johnson for \$4.9 billion.

Since that time Remicade has received FDA approvals for the treatment of rheumatoid arthritis, ankylosing spondylitis, psoriatic arthritis, ulcerative colitis, pediatric Crohn's disease and plaque psoriasis. As a Johnson & Johnson subsidiary, Centocor was able to maintain its operational independence as a fully integrated biopharmaceutical and biotechnology company. At the same time, it suddenly had the ability to leverage the financial strength of a multibillion-dollar global corporation.

In 2008, Centocor joined forces with Ortho Biotech Products, Inc., another Johnson & Johnson subsidiary. Today, while its primary drug manufacturing plant remains in Malvern, Centocor Ortho Biotech's employees are dispersed across the region. With corporate headquarters in Horsham and satellite offices in Spring House, Chesterbrook and Radnor, the company is a ubiquitous force in the regional economy. Of course, it all started at the Science Center, where today efforts are being accelerated to incubate dozens more biotechnology companies – and, perhaps, the next Centocor. ■

APPENDIX B: METHODOLOGY FOR ECONOMIC IMPACT ANALYSIS

This report's economic impact analysis quantifies the aggregate, current (as of February 2009) economic impacts of organizations that: 1) received incubator services and/or were early stage organizations that received growth benefits from being located at the Science Center; and 2) are current residents of the Science Center's Port business incubator.

The first step was to create a list of all the organizations that had ever received incubator services and early-stage organizations that received a benefit from being located at the Science Center as they grew. Data was drawn from a variety of sources, dating to 1968. Current incubator resident and graduate organization information was gathered by Science Center staff. Once identified, the following information was determined for each firm:

- Its current address, including Zip Code;
- The year it exited the Science Center, if known;
- Its total employment when it exited the Science Center, if known;
- The primary type of good or service it produces, and its appropriate NAICS code, if known.

Organization location, employment, and current status were verified through the Hoover's database, or by direct contact. Maps were produced showing the current locations of the 93 graduate organizations with a presence in the 11-county tri-state region.¹⁸

There were six possible outcomes for a graduate organization as listed below. To determine the Sci-

ence Center's current regional economic impact, the methodology required the project team to first identify only those graduates currently present in the region. The outcomes that resulted in an individual graduate organization currently having employment in the region are shown below in bold:

- **It graduated, but remained at the Science Center as a non-incubator resident.**
- **It graduated and moved within the region and is still operating as the same corporate entity.**
- It graduated and moved within the region, but later ceased operations.
- **It graduated and moved within the region, was later purchased by (or merged with) another organization, and employment associated with the graduate stayed in the region.**
- It graduated and moved within the region, was later purchased by (or merged with) another organization, and employment associated with the graduate left the region.
- It graduated and left the region.

For the region's graduate organizations still operating as the same entities, current employment levels were obtained by contacting the firms, examining lists of top employers maintained by Select Greater Philadelphia, and by searching the Hoover's database. For the region's graduates no longer operating under their original names, the project team determined their employment for the year in which they were acquired, assumed that employment in the acquired firms had continued to grow at the same annual rate as had employment in the economic sectors to which they belonged, and extrapolated employment forward to the

¹⁸ Eleven counties of Greater Philadelphia – in Pennsylvania: Bucks, Chester, Delaware, Montgomery, and Philadelphia; in New Jersey: Burlington, Camden, Gloucester, Mercer, and Salem; in Delaware: New Castle.

present. In sum, this methodology produced direct employment for the region's 93 graduate organizations of 15,512 jobs. This figure was added to the 37 resident incubator organizations' 174 jobs, for an aggregate current direct employment of 15,686 jobs.

The total economic impacts of the Science Center graduate and current Port organizations were determined using the Minnesota IMPLAN Group's (MIG) IMPLAN input/output model for the 11-county Greater Philadelphia Region.

The IMPLAN model was created specifically for the Greater Philadelphia region study area by using the MIG's modeling software to adjust national input/output coefficients using 2007 employment, wage, and income estimates by economic sector for the 11 counties.

The study area data used in the IMPLAN model comes primarily from the following federal government sources: the Bureau of Economic Analysis, the Bureau of Labor Statistics, and the Bureau of the Census.

An IMPLAN model created for a regional economy like the Greater Philadelphia region produces economic multipliers for employment, income, output, and value added for individual economic sectors, with the size of each sector's multiplier determined by the structure of the local economy such as availability of local suppliers.

The total economic impacts were then determined by taking the current direct employment figures for each of the graduate and Port companies and assigning them to one of the 440 economic sectors contained in IMPLAN, and then running the model. The model results were used to derive the average annual salary per new direct job by adjusting the IMPLAN model's result for direct labor income (i.e., labor compensation consisting of wages and salaries, fringe benefits, and proprietors' income) to remove fringe benefits, converting the 2007

Average Wage Calculations

Category	Graduate Organizations	Resident Incubator Organizations	Total Impact of Science Center-Incubated Organizations
Labor Income (millions of \$)	\$1,576.1	\$26.7	\$1,602.9
Employment	15,512	174	15,686
Wage, salary, and proprietors' income as % of labor income	83.82%	83.82%	83.82%
Average wage per direct job	\$87,976	\$128,780	\$88,444

figures to 2009 dollars and then dividing by current direct employment.

This calculation yielded a figure of \$89,000 for the graduate companies and \$129,000 for the Port companies. These average wage levels are high because much of the direct employment occurs in two sectors that have above-average wage levels: Pharmaceutical Manufacturing and Custom Computer Programming Services.

It is also significant that the baseline data in IMPLAN for a region is derived from actual employment, income and output data from the sources noted above for the counties covered by the model. The high earnings level per employee for pharmaceutical manufacturing in the Greater Philadelphia region is consistent with the fact that this sector is a major part of the regional economy, is very productive (i.e., capital

APPENDIX B: METHODOLOGY FOR ECONOMIC IMPACT ANALYSIS (continued)

intensive with a high level of output and earnings per worker), and requires the use of highly educated scientific and technical workers who command well-above-average salaries. In addition, start-up companies in the pharmaceutical manufacturing sector are competing in a regional labor market and will therefore have to pay prevailing market-rate salaries to attract the skilled workers they need. Finally, about 19% of the labor income estimated by IMPLAN is proprietors' income; while the amount of money received by a self-employed person may seem high in gross terms, they generally pay all of their benefits out of this income.

The analysis then took the proportion of Science Center-related jobs to all Philadelphia city and suburban employees to determine an effective Philadelphia City Wage Tax rate. The analysis used U.S. Census Bureau "On the Map" 2006 Commuting Flows data to determine county-based proportionate share of employment. The same data was used to (slightly) adjust the effective rate for determining Pennsylvania state income tax revenues. ■

Wage Tax Calculations

% Persons Working in PA Suburbs Who Live in Philadelphia	12.9%
% Persons Working in Philadelphia Who Live Outside City Limits	40.4%
% Persons Working in Philadelphia Who Live in the PA Suburbs	27.6%
% Persons Working in Philadelphia Who Live Out of State	10.3%
% Employed Residents of Philadelphia Who Work Out of State	6.3%
% Employed Residents of PA Suburbs Who Work Out of State	8.7%

Current Philadelphia Wage Tax Rates:

City Residents	3.93%
Non-Residents	3.50%
Weighted Average Wage Tax	3.76%

APPENDIX C: LISTING OF SCIENCE CENTER GRADUATE AND RESIDENT INCUBATOR ORGANIZATIONS

Graduate Organizations in Greater Philadelphia (as of February 2009)

Map Key	Organization Name	Primary Activity	Entry Year	Exit Year	Employment at Entry	Current Employment	Current Zip Code	Current County
23	3-D Pharmaceuticals	Biotechnology	1993	1995	4	253	19067	Bucks
1	Actminds/Ci&T	Information technology services	2006	n/a	2	2	19103	Philadelphia
12	Aderans Research Institute	Biotechnology research	2002	2003	2	33	19104	Philadelphia
93	Advanced Plasmids	Biotechnology	n/a	n/a	n/a	1	19335	Chester
25	Apcot Corporation	Software/hardware	1983	1997	20	25	19102	Philadelphia
8	Applied Clinical Intelligence	Biotechnology	2002	2003	4	35	19004	Montgomery
22	Aqumen Biopharmaceuticals	Biotechnology	2005	2006	3	15	19801	New Castle
13	Astrolabe Analytica (now Thomson Reuters)	Bioinformatics	2002	2004	2	800	19104	Philadelphia
26	Bachem Bioscience, Inc.	Specialty chemicals	1987	1993	1	37	19406	Montgomery
86	Ben Franklin Technology Partners	High-tech economic development	1983	1999	3	30	19112	Philadelphia
27	Bentley Systems	Software development	1986	1986	2	2,774	19341	Chester
28	Biometric Imaging	Biomedical research	1994	2001	2	11	19106	Philadelphia
11	BioRexis	Biotechnology	2002	2002	8	15	19406	Montgomery
29	Biosyn Inc.	Biotechnology	1989	2001	2	18	19006	Montgomery
30	Campus Copy Center	Business services	1989	1991	1	23	19104	Philadelphia
10	CardioKine	Pharmaceutical manufacturing	2004	2005	3	17	19102	Philadelphia
91	CardioNet	Medical device manufacturing	n/a	n/a	n/a	475	19428	Montgomery

Graduate Organizations in Greater Philadelphia (cont.)

Map Key	Organization Name	Primary Activity	Entry Year	Exit Year	Employment at Entry	Current Employment	Current Zip Code	Current County
31	Care Management Science Corporation (CareScience Inc.)	Biotechnology	1993	n/a	1	105	19104	Philadelphia
32	Career Pro	Business services	1991	1994	2	3	19096	Montgomery
33	Center for Applied Research	Management consulting	1988	n/a	25	30	19103	Philadelphia
34	Centocor, Inc.	Biotechnology	1979	1982	2	3,000	19004	Montgomery
35	Chameleon Optics, Inc.	Information technology services	1988	n/a	2	2	19104	Philadelphia
21	Chaperone Technologies	Biotechnology	2003	2005	3	9	19087	Delaware
36	Ciemex-Wefa, Inc.	Economic forecasting	1986	1987	0	4	19022	Delaware
37	Citywide Improvement & Planning Agency	NFP consulting	1992	1993	2	2	19123	Philadelphia
18	Code Mantra	Information technology services	2002	2004	3	13	19462	Montgomery
38	Commision on Graduates of Foreign Nursing Schools	Industry association	1977	n/a	n/a	6	19104	Philadelphia
39	Community Accountants	NFP consulting	1988	1995	4	14	19129	Philadelphia
17	Concurrent Pharmaceuticals (renamed Vitae Pharmaceuticals)	Biotechnology	2002	2002	5	50	19034	Montgomery
90	Controlled Chemicals	Management consulting	n/a	n/a	n/a	4	18915	Montgomery
40	Conversion Systems	Business services	1974	1978	100	199	19044	Montgomery
41	Corporate Technology Ventures	Multimedia software	1993	n/a	2	5	19087	Chester
42	Cricket Software	Information technology services	1985	1987	3	4	08540	Mercer
43	Data Core Systems	Software development	1986	n/a	19	250	19103	Philadelphia
44	Design Science	Product design	1991	1995	4	10	19107	Philadelphia

Graduate Organizations in Greater Philadelphia (cont.)

Map Key	Organization Name	Primary Activity	Entry Year	Exit Year	Employment at Entry	Current Employment	Current Zip Code	Current County
9	DLC Solutions	Information technology services	n/a	n/a	n/a	7	19107	Philadelphia
45	Econsult	Economic consulting	1982	n/a	0	33	19104	Philadelphia
92	ESCO	Medical laboratory	n/a	n/a	n/a	5	19040	Montgomery
46	Exocell	Diabetes research	1986	n/a	5	2	19103	Philadelphia
2	Expense Watch (Harrington Software)	Information technology services	2001	2002	0	25	19428	Montgomery
47	False Memory Syndrome Foundation	NFP psychiatric research	1992	2000	2	3	19103	Philadelphia
3	First Flavor	Business consulting	2005	2006	1	10	19004	Montgomery
48	Foreign Policy Research Institute	NFP research	1969	1988	10	50	19102	Philadelphia
49	Geewax Terker & Co.	Financial software	1982	1984	2	20	19317	Chester
50	Genovo, Inc.	Biotechnology	1995	1996	1	22	19079	Delaware
15	Gentis	Biotechnology	2004	2008	2	8	19087	Delaware
51	Hancock Health Plan	Health insurance services	1986	1996	0	346	19103	Philadelphia
52	Health Sciences Libraries Consortium	Information services provider	1986	n/a	3	14	19104	Philadelphia
53	Human Designed Systems (Neoware)	Computer software	1976	1990	5	60	19406	Montgomery
19	Infonale	Computer consulting services	2002	2004	4	11	19382	Chester
54	Innaphase	Pharmaceutical	1998	1999	2	118	19102	Philadelphia
55	Intellicomm	Software development	1993	n/a	1	13	19406	Montgomery
56	Intelligence at Large	Software development	1991	1997	12	13	19428	Montgomery
57	Intelligent Micro Systems	Software development	1986	1991	2	7	19072	Montgomery
24	International Health Products	Biomedical research	1989	2003	2	2	19810	New Castle

Graduate Organizations in Greater Philadelphia (cont.)

Map Key	Organization Name	Primary Activity	Entry Year	Exit Year	Employment at Entry	Current Employment	Current Zip Code	Current County
58	Intersciences Development Associates	Biomedical R&D	1985	1995	1	3	19144	Philadelphia
59	Interspec	Information technology services	1983	1984	3	4	19020	Bucks
60	J L R Communications	Business services	1988	n/a	1	1	19118	Philadelphia
61	KGL Inc.	Skin studies	1974	n/a	1	20	19008	Delaware
20	Kibow Biotech	Biotechnology	1998	2005	1	12	19073	Delaware
62	Lucy Peters of Philadelphia, Inc.	Biomedical	1984	1991	4	5	19102	Philadelphia
63	Medical Data Systems	Software development	1985	1985	1	7	19087	Delaware
64	Monell Chemical Senses Center	Biomedical	1969	n/a	25	154	19104	Philadelphia
7	Morphotek	Pharmaceutical manufacturing	2000	2001	5	105	19341	Chester
65	National Diabetes Research Institute	NFP research group (biomed)	1980	1983	2	40	19104	Philadelphia
14	Neurodiagnostic Devices	Biotechnology services	2005	n/a	1	3	19104	Philadelphia
66	Novaflora	Biotechnology	1994	n/a	1	10	19390	Chester
89	Osiris	Business services	n/a	n/a	n/a	10	19104	Philadelphia
4	Pay Quik	Customized business software	2000	2003	2	63	19004	Montgomery
87	Phila. Association for Clinical Trials	Biomedical services	1981	1989	0	7	08540	Mercer
67	Photonics, Inc.	Materials research	1992	n/a	1	8	19125	Philadelphia
68	Physicians for Social Responsibility	NFP membership organization	1991	1994	2	8	19130	Philadelphia
6	Poly Medix	Pharmaceutical manufacturing	2003	2006	6	16	19087	Delaware
69	Portfolio Associates	Consulting	1971	1980	9	12	19106	Philadelphia
70	Radiation Management Corporation	Biomedical	1969	1986	13	5	19135	Philadelphia

Graduate Organizations in Greater Philadelphia (cont.)

Map Key	Organization Name	Primary Activity	Entry Year	Exit Year	Employment at Entry	Current Employment	Current Zip Code	Current County
71	Reality Technologies	Software development	1986	1993	15	19	19104	Philadelphia
88	Recording for the Blind & Dyslexic	Science education	1988	1993	4	180	08540	Mercer
72	Response Center (TRC Holdings, Inc.)	Market research	1987	1995	150	300	19034	Montgomery
73	SEI (Simulated Environments Inc.)	Information systems	1969	1977	4	2,300	19456	Montgomery
74	Strategic Management Group, Inc.	Computer-based training	1981	n/a	3	248	19428	Montgomery
75	Syngetics, Inc.	Software provider	1998	1998	1	2	19121	Philadelphia
76	The Palmer Group	Mergers & acquisitions	1990	n/a	1	3	19104	Philadelphia
77	The Scientist	Science publication	1986	n/a	24	30	19106	Philadelphia
78	Thompson Institute	Technology training	1982	2003	35	50	19104	Philadelphia
79	U.S. Japan Institute	NFP economic research	1983	2001	1	14	19047	Bucks
80	UGM Medical Systems Inc.	Biomedical instrument manufacturing	1988	n/a	5	4	19020	Bucks
81	Uni-Coll Corporation	Computer services	1969	1994	30	39	19087	Chester
82	Universal Building Services, Inc.	Environmental technology	1969	1974	12	2,674	19107	Philadelphia
5	Vascu Lab Technologies	Information technology services	2005	n/a	2	1	18901	Bucks
16	VGX Pharmaceuticals	Biotechnology	2003	2005	2	40	19422	Montgomery
83	Vintek, Inc.	Software development	1992	1997	2	20	19103	Philadelphia
84	Vision Training Associates	Biomedical research	1990	n/a	0	2	19035	Montgomery
85	WEFA (Now IHS Global Insight)	Economic forecasting	1978	1987	10	50	19022	Delaware

Resident Incubator Organizations *(as of January 2009)*

Organization Name	Primary Activity	Current Employment	Organization Name	Primary Activity	Current Employment
Allin Consulting	Service	3	Japan Tech Group	Other	2
AlumiFuel Power Inc.	Advanced materials	5	Jenrin Discovery	Biotechnology	1
Avid Radiopharmaceuticals, Inc.	Biotechnology	38	Kayentis, Inc.	Other	4
Biomedical Research and Education Foundation (BREF)	Other	3	MCA Global	Biotechnology	3
BioNanomatrix, Inc.	Biotechnology	22	N-Side LLC USA	Biotechnology	1
Calder Server Systems	Service	3	NDRI	Biotechnology	3
Charlesworth Group (USA)	Other	4	National University of Singapore (NUS)	Other	1
Cira	Biotechnology	1	Opulus	Biotechnology	1
Daedalus Innovations LLC	Biotechnology	3	PKPD	Biotechnology	1
Dilks Consulting, Inc.	Service	3	Pulsar Informatics, Inc.	Biotechnology	9
ERAI	Other	1	R&D Green Materials	Biotechnology	1
ERYTech Pharma	Biotechnology	2	Sensigen	Biotechnology	2
Follica, Inc.	Biotechnology	3	Sunstone BioSciences, Inc.	Biotechnology	9
H&T	Information technology	2	TapinkO	Service	4
IDIS	Service	0	University City Keystone Innovation Zone	Service	2
Innova Materials	Biotechnology	2	USBiogistics	Biotechnology	4
Integral Molecular	Biotechnology	18	Vector Biolabs	Biotechnology	5
Integromics, Inc.	Biotechnology	3	Vuzit	Information technology	2
Invisible Sentinel	Biotechnology	3	Total Employment		174

