

Connect to Compete: How the University City-Center City innovation district can help Philadelphia excel globally and serve locally

May 2017



The Anne T. and Robert M. Bass Initiative
on Innovation and Placemaking

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Project background

In spring 2015, a group of 10 major Philadelphia institutions and firms—Comcast, Drexel University, the Children’s Hospital of Philadelphia, FMC, Independence Blue Cross, PECO, the University City Science Center, the University of Pennsylvania, the University of Pennsylvania Health System, and Vanguard—came together to support the Bass Initiative on Innovation and Placemaking at the Brookings Institution in undertaking an analysis of the emerging innovation district in University City and western Center City. Recognizing the extent to which this hub concentrates an outsized number of the region’s innovation assets, these leaders engaged Brookings to help them understand the area’s distinctive strengths and to identify opportunities for building on them in ways that advance the district’s innovation ecosystem and improve the competitive position of the Philadelphia region.

To this end, Brookings—with analytic help from Mass Economics in Cambridge, Mass.—conducted an extensive assessment (“audit”) of the innovation district. We examined numerous data sources to understand the district and region’s research expertise, industry strengths, and entrepreneurship outcomes, and, in conjunction with Project for Public Spaces in New York, undertook on-the-ground observational research to understand how and when district spaces are utilized. We conducted over 100 individual and small-group interviews, engaged with a project working group via monthly calls and meetings, and participated in several stakeholder meetings and workshops.

This document outlines the results of our audit, and makes recommendations that district leaders—working together with other private, public, and civic leaders in the city and region—can employ to build a more innovative, entrepreneurial, and inclusive innovation district in the years to come.

The Anne T. and Robert M. Bass Initiative on Innovation and Placemaking

The Anne T. and Robert M. Bass Initiative on Innovation and Placemaking is a collaboration between the Brookings Institution and Project for Public Spaces to support a city-driven and place-led world. Using research, on-the-ground projects, and analytic and policy tools, the initiative aims to catalyze a new form

of city building that fosters cross-disciplinary approaches to urban growth and development.

About the Centennial Scholar Initiative

The Centennial Scholar Initiative cultivates a new style of scholarship at Brookings, fostering work that is cross-program, inter-disciplinary, international, and intensely focused on impact. As the inaugural Brookings Centennial Scholar, Bruce Katz brings this type of integrated problem-solving to the issues arising from global urbanization and the challenges of a city-driven century. The goal is to inform and propel new patterns of urban growth, new forms of urban finance, and new norms of urban governance that are concrete, imaginative, integrated and, ultimately, transferable.

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Cover Image: An aerial view of University City and Center City. Photo credit: SHoP Architects/West 8.

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Executive Summary

Over the past century, the most successful global regions have been those that got in on the ground floor of paradigm-shifting technology platforms—from industrial technology in Detroit to semi-conductors in Silicon Valley. The ability to innovate and evolve influenced their ability to compete over time.

Today, this competition is rapidly intensifying and qualitatively changing.

Within the next decade, a new set of technologies—the Internet of Things, automation and robotics, genomics and personalized medicine, to name just a few—will become ubiquitous, impacting every product and service, disrupting every industry, and remaking our environments. As in the past, the cities at the forefront of these technologies will benefit dramatically, attracting the global capital and talent that will allow firms to grow and scale up within the region. This growth and investment will lead to more and better-paying jobs, higher gross metropolitan product, and increased revenues that can be reinvested in cities and their citizens.

The cities that will lead have yet to be determined. But we know that they will boast certain characteristics: stellar advanced research institutions; talented and diverse workers; a dynamic innovation ecosystem of firms, entrepreneurs, and intermediaries; and vibrant, quality places with a mix of uses and amenities. Perhaps most importantly, private, public, and civic leaders in these cities will collaborate to leverage these attributes in ways that grow and attract companies, talent, and quality jobs aligned with their special assets and advantages.

A city's ability or inclination to exploit its distinctive assets matters now more than ever. Federal and state government retrenchment and unpredictability are requiring cities to be masters of their own destiny—designing, financing, and delivering multi-sector initiatives on economic development issues that were once seen as the exclusive remit and responsibility of higher levels of government. In response, cities across the country are stepping up to unlock the latent capacity of public, private, and civic networks in creative new ways to foster research and technology development, transform their physical infrastructure, and grow the talent pipeline.

Fully embracing this “new localism” could give Philadelphia an opportunity to become an innovative, inclusive city worthy of its substantial size and strengths.

The Philadelphia metropolitan area—with over 2.8 million jobs—has a critical mass of assets that few places can rival. The region's “eds and meds” sector is arguably one of the strongest in the country, and research expertise in genetics, therapeutics, clinical trials, and health informatics—together with private-sector strength in pharmaceuticals and an influx of venture capital—have made it a leading life sciences hub. Its research capacity in engineering, automation technology, and computer science is expanding rapidly, while its high-tech and startup community continues to grow and develop. The city is also home to growing clusters of digital health, financial services, advanced manufacturing, and media firms.

These assets disproportionately concentrate in University City (UC) and western Center City (CC), areas that have for years been growing toward one another to create a globally relevant **innovation district**—a dense, dynamic engine of economic activity where research-oriented anchor institutions, high-growth firms, and tech and creative startups are embedded within a growing, amenity-rich residential and commercial environment. Hubs at the Navy Yard, N3rd (Nerd) Street, and Temple University, too, are emerging as enclaves of new and maturing firms.

Challenges

But for all these strengths—perhaps because of these strengths—Philadelphia leaders have been missing a sense of collective urgency to determine the position the region should play in the global economy and to fully leverage the power of the innovation district's institutional, corporate, and civic anchors to drive innovative firm and job growth. Indeed, these stakeholders are hampered by a number of innovation, inclusion, and place-related challenges that are holding them, and thus the region, back:

- **Innovation challenges:** The innovation district's concentration of global research leaders and numerous

innovation institutions and initiatives make it well-positioned to advance several new technology clusters. But industry presence in the district is low and spatial and programmatic connections within and among institutions and the private sector are weak. Meanwhile, the technology sector is growing, but the district is still short on serial entrepreneurs, talent, capital, and national prominence.

- **Inclusion challenges:** Though well-paying jobs exist in the district for workers with varying education and skill levels—over 55 percent of district jobs do not require a four-year degree—as yet the district’s growth and employment opportunities are not fully redounding to the benefit of its neighboring communities and their residents. Poverty rates in the three West Philadelphia zip codes that include and immediately surround the district are persistently above 40 percent and median household incomes are below \$20,000.
- **Place challenges:** A tight proximity envelope exists between Philadelphia’s downtown (Center City) and its university and medical hub (University City), the two major economic nodes that make up the innovation district. But while the district generally boasts good transit, walkability, and many high-quality places, underutilized parcels and a lack of activity along much of the Market Street corridor contribute to a dull and unfriendly environment in places, and impede connectivity between the two nodes.

In an era of hyper-globalization, massive technological change, and an increasing devolution of governmental and fiscal responsibility, **the time is now for Philadelphia leaders to capitalize on the potential of innovation district firms and institutions to serve as connectors of the regional innovation ecosystem and to collaboratively lead in developing structures, strategies, and investments that build on the region’s powerful research and innovation capacity; nurture the latent talent and potential of low-income and minority residents; and recognize and invest in the physical, cultural, and social identities and attributes that define and advance the innovation district and other innovative hubs.**

Recommendations

To this end, this report recommends that Philadelphia stakeholders establish an Innovation Council—a leadership group that possesses the influence and authority to bring diverse sets of innovation district and other key industry, public-sector, and civic stakeholders together around a common vision and narrative. Organized initially under the auspices of an existing organization, the council would serve as a steering entity whose primary charge would be to identify an initial set of strategies and initiatives for growing the regional innovation economy, and to identify the organizations best poised to lead each. It would also establish subcommittees that will focus on priority issues around which to develop new goals and efforts as needs and opportunities arise over time.

Based on our assessment of the innovation district’s strengths and weaknesses, we recommend that the council focus first on four multi-faceted strategies:

- **Design and implement a series of initiatives aimed at growing the city’s advanced industry clusters, starting with precision medicine.** The first area of focus should be a Precision Medicine Catalyst Initiative, a central organizing force that has the ability to pool resources and capture the full value of the region’s research and commercialization capacity in cell and gene therapy. The purpose of the initiative would be to both coordinate existing institutions that specialize in the cluster and to connect them with the city’s entrepreneurs and business support services, with the goal of developing regional expertise in the wrap-around services that the cluster will demand. If successful, the Precision Medicine Catalyst Initiative will serve as a kicking-off point for a new form of industry coordination around a specific technology, which could then be applied in other areas of regional strength.
- **Launch an Anchor Firm Entrepreneurship Initiative** that significantly leverages the resources of anchor technology firms to strengthen the region’s entrepreneurial ecosystem. The aim of the initiative would be to connect city startups with customers, support training and mentorship programs, increase access to capital, and help develop physical spaces in which startups can grow.

Elements of the initiative could include a first customer program, a new technology seed fund as well as greater support for existing regional funds, and a tech startup marketing and business attraction campaign, among others.

- **Coordinate and expand anchor-based skill-building, education, and procurement initiatives** with the goal of serving more residents more effectively, creating greater economic opportunity, and growing a more inclusive district where a diversity of people and ideas help create a more robust innovation ecosystem and a vibrant community. This approach should be multi-tiered and include increasing employment opportunities for local residents through an expanded West Philadelphia Skills Initiative; building the talent pipeline through a coordinated West Philadelphia Education Initiative; and growing local businesses by organizing joint demand among district anchors and firms for their goods and services.
- **Form a connected-corridor taskforce for University City–Center City** focused on forging a stronger connection between the region’s largest employment

hubs and, importantly, the major innovation assets within them. Led by University City District, Center City District, and the Schuylkill River Development Corporation, the taskforce should consist of other property owners and stakeholders along Market Street and the river. It should compile and coordinate the findings of existing land use studies and plans for Market Street, the river, and major redevelopment areas along each, and use the findings to create a vision and action plan that can guide private development and public investments toward making Market Street and the riverfront iconic, interconnected corridors.

In the end, Philadelphia’s chance of becoming a top-tier city—with all the attendant benefits that would bring—hinges not on the individual acts of any single institution or entity. Rather, it demands that the city’s innovators, entrepreneurs, higher education and hospital anchors, business leaders, and government put determined influence and serious resources behind aspirations that are larger than themselves, and commit to bold new attitudes and actions that will propel the city and region forward.



1. An aerial view of University City and Center City, photo credit: SHoP Architects/West 8; 2. Uneven development along Market Street between Center City and University City, photo credit: Erin Brookes; 3. The West Philadelphia Skills Initiative, a best practice in place-based workforce training programs. Photo credit: Ryan Collard; 4. A parklet in University City, photo credit: Ryan Collard.

Section 1: Introduction

The competition among the world's major cities is both rapidly intensifying and qualitatively changing.

The global economy has always given rise to winning cities, based on their access to natural resources, ease of transportation, and often a heavy dose of serendipity that puts inventive leaders in the right place at the right time. But over the past century, the biggest winners have been those that got in on the ground floor of technology platforms that have redefined the global economy—whether industrial centers like Detroit, finance centers like New York City and London, or information technology hubs like Silicon Valley and Boston. These technology platforms not only enabled these cities to establish preeminence in specific sectors but also to create broad employment opportunities in a wide range of supporting industries. The ability to innovate and evolve—or not—has influenced the staying power of these cities at the top of the global pyramid.

Today, a new set of technologies are poised to reshape both how and where we live and work. Technologies like the Internet of Things, automation and robotics, machine learning and new data analytics, genomics and precision medicine, and additive manufacturing are still in their infancy, existing primarily in university research labs and within high-end products. But within the next decade, they will become ubiquitous—like the Internet—impacting every product and service, disrupting every industry, and remaking our physical environments.

As in the past, the cities at the forefront of these economy-shaping technologies will benefit dramatically, attracting the global capital and talent that will allow firms to grow and scale up within the region. This growth and investment will in turn lead to more and better-paying jobs—with varying skill-level requirements and across multiple sectors of the economy—as well as higher gross metropolitan product and increased revenues that can be reinvested in education, workforce development, infrastructure, open-space and cultural amenities, and neighborhood revitalization.

The cities that will lead have yet to be determined. But we do know that they will boast certain characteristics:

- stellar advanced research institutions;
- a high concentration of talented and diverse workers;
- a dynamic ecosystem of firms, entrepreneurs, and intermediaries;
- accessible pools of risk capital;
- a global orientation; and
- vibrant, quality places with a mix of uses and amenities.

Perhaps most importantly, private, public, and civic leaders in these cities will collaborate to leverage these attributes in ways that grow and attract companies, talent, and quality jobs aligned with their regions' special assets and advantages.

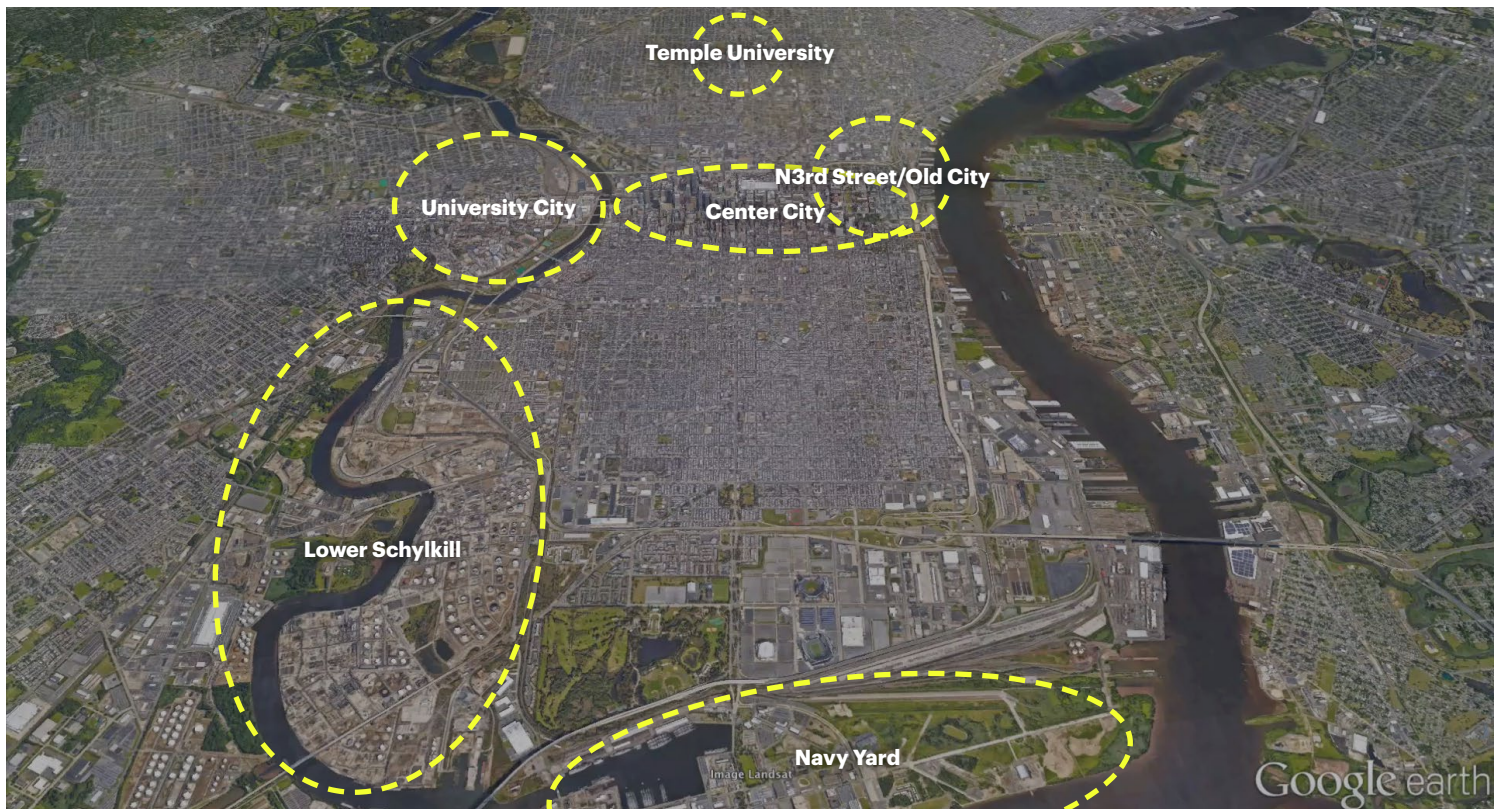
A city's ability and inclination to leverage its own strengths matters now more than ever. The global economy is becoming more competitive by the day while the country's economic mobility remains stagnant. Our elderly population is growing, as is the share of traditionally underserved minority groups. And the shifting nature of work is continuing to generate anxiety about who is and isn't prepared for today's jobs, bringing a host of economic and social challenges to families and communities. All the while, federal and state government retrenchment and unpredictability are leaving cities and regions to grapple with these issues largely on their own, requiring them to design, finance, and deliver multi-sector, multi-stakeholder initiatives on economic development issues that were once seen as the exclusive remit and responsibility of higher levels of government. In response,

cities across the country are stepping up to unlock the latent capacity of public, private, and civic networks in creative new ways:

- Private, civic, and philanthropic investors in Indianapolis, Pittsburgh, and St. Louis are making those cities global centers of technology-driven sectors like medical devices, robotics, and genomics by sharpening relationships between universities, companies, entrepreneurs, and business incubators.
- Broward County, Fla.; King County, Wash.; and San Antonio, Texas are generating hundreds of millions of dollars in local tax revenues dedicated to providing children with high-quality early education and other proven investments that will help them develop the next generation of talent.¹
- In this past election cycle, voters in Columbus, Ohio; Los Angeles; and Seattle approved \$180 billion in additional taxes to spur ambitious transit projects and more sustainable patterns of development.

In this same spirit, fully embracing this “new localism” could give Philadelphia an opportunity to become an innovative, inclusive city worthy of its substantial size and strengths.

The Philadelphia metropolitan area—with over 2.8 million jobs—has a critical mass of assets that few places can rival.² With four major research universities, several highly ranked liberal arts colleges, and a cluster of powerhouse medical centers, the region’s “eds and meds” sector is arguably one of the strongest in the country—and both produces and attracts a deep pool of talent.³ Longstanding research expertise in therapeutics, clinical trials, and health informatics, combined with private-sector strength in pharmaceuticals and an influx of venture capital, have made the city a leading life sciences hub. Over a decade ago, when the science was too early for the private sector, research institutions, specifically the University of Pennsylvania and the Children’s Hospital of Philadelphia, made large bets in early-stage genomics. Today, these investments have rightfully positioned Philadelphia as the birthplace of an entire new class of gene-based therapies and drugs that are redefining care delivery across the nation.



Philadelphia has several hubs of innovation throughout the city. Source: Google Earth.

Outside of medicine, the city is also home to growing clusters of digital health, financial services, advanced manufacturing, and media firms. Its research capacity in engineering, automation technology, and computer science is expanding rapidly. And its high-tech and startup community has quietly gained significant traction in recent years.

These assets disproportionately, though not exclusively, concentrate in University City (UC) and western Center City (CC), areas that have for years been growing toward one another to create a globally relevant **innovation district**—a dense, dynamic engine of economic activity where research-oriented anchor institutions, high-growth firms, and tech and creative startups are embedded within a growing, amenity-rich residential and commercial environment. Meanwhile, distinct hubs at the Navy Yard, N3rd (Nerd) Street, and Temple University are creating enclaves of new and maturing firms and additional opportunities to connect, diversify, and grow the city economy. Real estate data confirm the revitalization story told by the cranes in the skyline and the buzz of activity on the streets.

But for all these strengths—indeed, perhaps because of these strengths—Philadelphia leaders have seemed to be missing a sense of

collective urgency to determine the position the region should play in the global innovation economy and how to fully leverage the power of the city's university, medical, corporate, and civic anchors to attain it.

The lack of a cohesive vision exacts a severe opportunity cost that Philadelphia can ill afford to ignore. The sixth-largest metropolitan area in the country, Philadelphia ranks among the top 10 metros based on its total annual amount of public and academic research expenditures.⁴ But given its size, the region needs more from these resources than it is currently getting. In fact, the metro ranks behind many of its peers on key innovation and growth measures, including employment share in

advanced industries (51st), new firm creation (34th), and total patents (12th).⁵ Moreover, its economy is not working for large numbers of residents: the region's annual job growth is consistently below the national average, and at 26 percent the city bears the ugly distinction of having one the highest rates of poverty among the nation's large cities.⁶

Philadelphia leaders have seemed to be missing a sense of collective urgency to determine the position the region should play in the global innovation economy.

It doesn't have to be this way. In an era of technological change, and an increasing devolution of responsibility, the time is now for Philadelphia leaders to capitalize on the potential of innovation district firms and institutions to serve as connectors of the regional innovation ecosystem and to collaboratively lead in developing structures, strategies, and investments that:

- **build on the region's powerful research and innovation capacity** to develop new problem-solving technologies and techniques, and grow the job-creating businesses that will commercialize, make, and market them to the world;⁷
- **nurture the latent talent and potential of low-income and minority residents**—who, if history is any lesson, could otherwise remain disconnected from the city's growth hubs—and ensure that the innovation economy of the future includes people of varying backgrounds and perspectives;
- **recognize and invest in the physical, cultural, and social identities and attributes** that define the innovation district and other

innovative hubs; make them attractive to residents, firms, and workers; and strengthen the connections, interactions, and idea exchange both within and among them so as to have maximum impact on the city and region.

In short, Philadelphia has to step up its game, doing more with the assets it has and doing it smarter than it has had to before. And it needs to do so largely on its own steam. At one time, Pennsylvania's state government led the nation in state innovation strategies and funding, creating the Ben Franklin Technology Partners and Keystone Innovation Zones, and providing resources to support numerous entrepreneurship and cluster initiatives. Those days have passed: encumbered by entitlement obligations and beholden to the outsized interests and needs of aging rural and suburban communities, the commonwealth has significantly rolled back funding in almost all of its existing regional innovation programs. Meanwhile, likely federal scale-backs in research and development (R&D), urban housing and

economic development programs, and health care will disproportionately hurt cities like Philadelphia whose economies are principally built on their hospitals and research institutions, and which still struggle with deep economic and racial disparities.

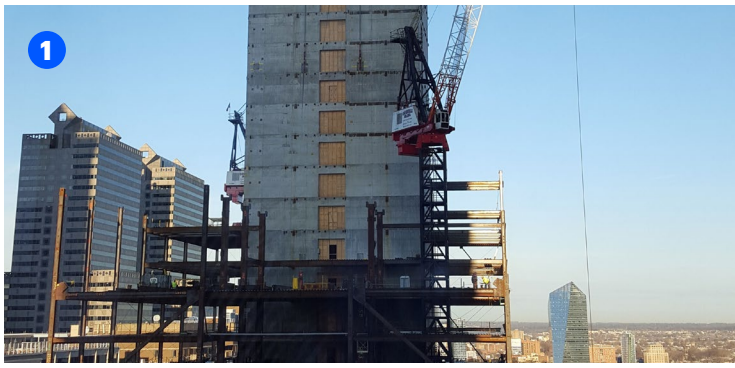
Philadelphia has to step up its game, doing more with the assets it has and doing it smarter than it has had to before.

In the end, then, it will be the collective will and effort of its leaders that determines whether Philadelphia can grow a more inventive, entrepreneurial economy that produces more jobs for more people and more money to invest in the city and its residents—or if it will be eclipsed by other cities that are more aggressively positioning themselves to lead in this new competitive environment.

Section 2: The University City–Center City innovation district

The spatial geography of the global economy is changing. Cities and metros in both the United States and abroad are witnessing the emergence of dense hubs of economic activity where innovation, entrepreneurship, creativity, and placemaking intersect. At the advanced research-led end of the economy, innovation districts are developing around anchors such as universities, medical centers, and large companies; along waterfronts; or in “urbanizing” suburban science parks.⁸ Strong in sectors such as biosciences, technologies, and creative industries, these districts cluster research institutions and R&D-intensive companies with startups, scale-ups, and business incubators. They also have good transit and walkability; a diversity of arts, culture, and other amenities; and a strong sense of place and community.

With its dense concentration of anchor and innovation assets, the innovation district—stretching from 17th Street to 43rd Street along the Market Street corridor, and south along the Schuylkill River to Grays Ferry—is arguably the single most critical hub, though by no means the only one, in Philadelphia’s innovation economy. This 1.5-square-mile area is home to the University of Pennsylvania (Penn), Penn Medicine, the Children’s Hospital of Philadelphia (CHOP), Drexel University, and the Wistar Institute, among other institutions, and large firms such as Comcast, PECO, Independence Blue Cross (IBX), FMC, and newly arrived Aramark. It boasts numerous innovation organizations and intermediaries such as the University City Science Center (UCSC)—the nation’s oldest and largest urban research park—Drexel Ventures, Benjamin’s Desk, and the new Pennovation Center. The area has over 104,000 jobs (16 percent of the city’s total) and is a regional job magnet, with over 44 percent of area workers commuting



1. The new Comcast Innovation and Technology Center is currently under construction, photo credit: Wikimedia Commons; 2. Pennovation Works—located in the Grey's Ferry neighborhood—is repurposing industrial land for innovation activities, photo credit: University of Pennsylvania; 3. Drexel's Schuylkill Yards—once fully built out in 20 years—will feature more than 5 million square feet of mixed-used space, photo credit: : SHoP Architects/West 8; 4. uCity Square will include nearly 4.5 million square feet of lab, office, residential, and retail space, photo credit: University City Science Center.

from 10 miles or more away.⁹ The district is also an increasingly desirable place to live, with the number of residents up 8 percent since 2000 (versus just over 1 percent in the city) to reach 29,000 today.¹⁰ All told, in a city where innovation can be found in multiple hubs, the highest concentration of innovation assets exists in a 10-block radius where western Center City and eastern University City merge.

Moreover, this district is set to continue its explosive growth for the next two decades. Several major projects are already underway. In Center City, Comcast's new tower is rapidly advancing skyward. Further west, Brandywine Realty Trust and Drexel are set to break ground on the Schuylkill Yards development in 2017, which when complete in roughly 20 years is envisioned to hold nearly 5 million new square feet of mixed-use space focused on connecting the private, public, and non-profit areas through innovation. And the uCity Square project—being co-developed by UCSC, Wexford Science and Technology, and Ventas—is anticipated to add more than 4.5 million new square feet of lab, office, residential, and retail space, including the 127,000-square-foot Cambridge Innovation Center, over the next 10 years. Finally, southward along the Schuylkill River

Penn's Pennovation Works development will repurpose 23 acres of fallow industrial land with new labs, offices, and production space for Penn-affiliated researchers, entrepreneurs, and industry partners to translate ideas and research into viable ventures.

Strengths and weaknesses of the innovation district

Given its outsized importance and impact, the innovation district provides an excellent window into what's working, and what's not, in Philadelphia's innovation ecosystem. More importantly, its standing provides district leaders with not only a stake in but a strong platform

for bringing regional stakeholders to the table to design and implement actionable strategies to create a more innovative, more inclusive Philadelphia economy. Indeed, the innovation district has serious strengths that, if more fully leveraged, could put Philadelphia on the global innovation map, with all the attendant benefits that would bring to the city and its residents. But it also has some real weaknesses that are keeping it from realizing that potential:

Philadelphia's innovation district peers

We selected several peer urban university anchor districts against which to compare the University City–Center City innovation district on certain measures:

- **Pittsburgh:** Spanning from the Uptown to Oakland neighborhoods, Pittsburgh's innovation district consists of multiple anchors: Carnegie Mellon University, the University of Pittsburgh and its Medical Center, and Duquesne University, among others. The area is roughly 1.7 square miles in size and home to over 85,000 jobs and 20,000 residents.
- **Kendall Square, Mass.:** Located in Cambridge, the Kendall Square innovation district is anchored by the Massachusetts Institute of Technology (MIT) and several major life sciences companies. The one-square-mile district currently has over 55,000 jobs and 12,000 residents.
- **Atlanta:** Situated north of the downtown, Atlanta's innovation district in Midtown is anchored by Georgia Tech and a host of corporate research centers, including Panasonic, AT&T, and Coca-Cola. The 1.2-square-mile district has roughly 65,000 jobs and 14,000 residents.

- The innovation district concentrates global leaders in health care and life sciences research, but the physical presence of industry is low and programmatic connections are weak.
- The technology sector is growing, but the area is still short on serial entrepreneurs, talent, capital, and national prominence.
- The innovation district and Philadelphia at large are replete with innovation institutions and initiatives, but they lack



Source: Google Earth.

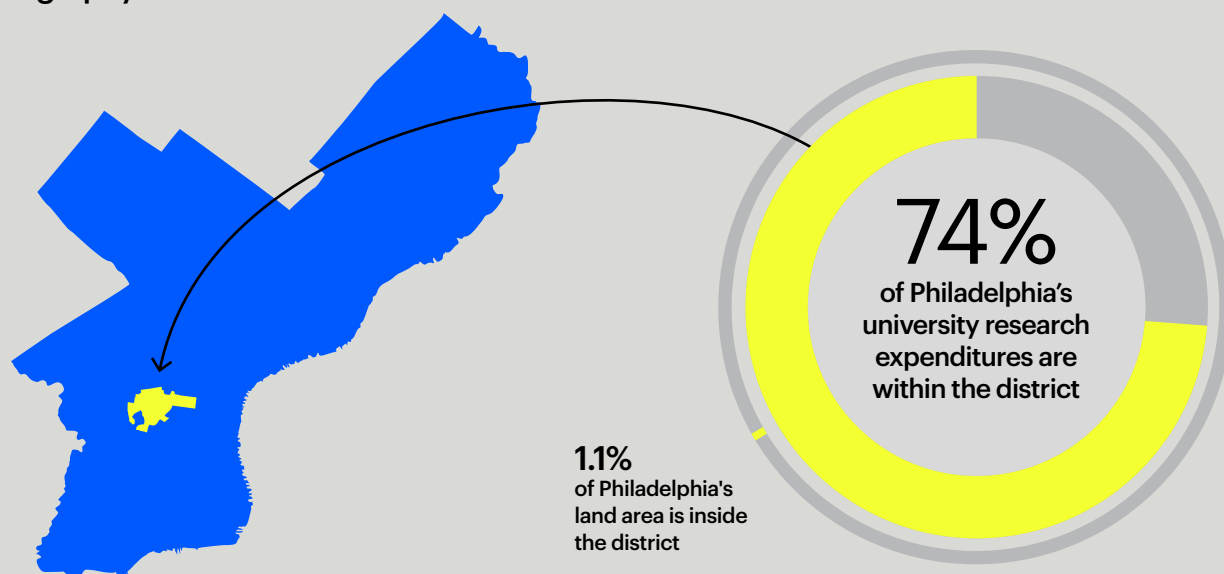
the structure and support needed to fully exploit regional potential in high-impact, next-generation clusters.

- The innovation district has experienced substantial job growth and revitalization in recent years, but surrounding neighborhood opportunity dynamics have been largely unaffected.
- The innovation district boasts good transit, walkability, and many high-quality places, but uneven development along Market Street impedes connectivity between its innovation nodes.

The innovation district concentrates global leaders in health care and life sciences research, but the physical presence of industry is low and programmatic connections are weak.

Few neighborhoods, let alone cities, house the number of universities, research labs, and academic medical centers of Philadelphia's innovation district. With over \$1 billion in federal research dollars

The district concentrates university research expenditures in a tight geography.



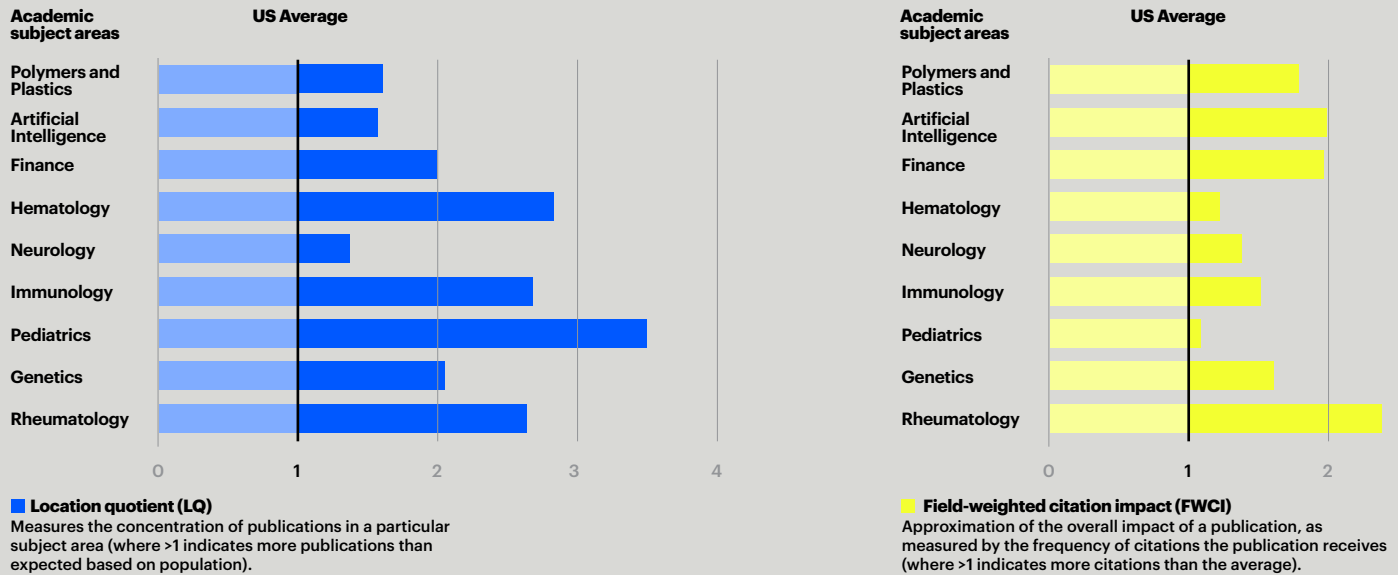
Source: Brookings's analysis of NSF data, 2015.

annually, the district has a higher concentration of public R&D than any other geography its size outside of Boston.¹¹ It also concentrates the lion's share of university research expenditures in the city, accounting for 74 percent of total funding.¹²

While the district's overall research capacity is exceptional, health care and life science research is truly global in scale and scope. Over \$680 million flows through the district from the National Institutes of Health (NIH), more than double that of any of its peer districts across the United States.¹³ Moreover, the district concentrates over 700 of NIH's R01 grants—the gold standard of life science research grants—and Penn, CHOP, and the University of the Sciences recently attracted a prized NIH Clinical and Translational Science Award.¹⁴ In terms of academic publications, the district outperforms the national average, in both quantity and quality of articles, in 23 of 68 medical and life science disciplines.¹⁵

Over the past decade, academic institutions in the district have increasingly defied their ivory tower reputations by creating connections with industry.¹⁶ For example, Penn President Amy Gutmann's Compact2020, created in 2013, engendered a new university philosophy by positioning Penn to better partner with

Health care and life sciences research are globally relevant, but the district also has significant research strengths in other areas.



Source: Elsevier, 2014.

industry. In 2015, 11.8 percent of research funding, twice the national average, came from industry—an impressive feat given that as recently as 2010 the university was below the national average.¹⁷ These investments and others stem from a growing number of “alliances”—long-term, high-value research partnerships—with firms like GSK and Bayer. In 2013, CHOP invested \$50 million in a life science startup, Spark Therapeutics, that has now attracted over \$230 million in capital.¹⁸ Finally, in 2005, Drexel University was one of 10 national universities to receive a revered Wallace H. Coulter Foundation grant based on its strength translating biomedical engineering research into market-based products.¹⁹

Though research institutions in the district are clearly moving in the right direction, the city remains significantly behind global peers like Boston, San Francisco, and Basel, Switzerland in terms of industry partnerships. These cities, and their respective innovation districts, are home to dense clusters of biotechnology startups, large pharmaceutical headquarters, corporate research centers, and highly concentrated urban research parks.

In Philadelphia, coordination between research anchors and firms is rapidly improving, but it is not yet at the level expected given

Philadelphia: Birthplace of gene therapy

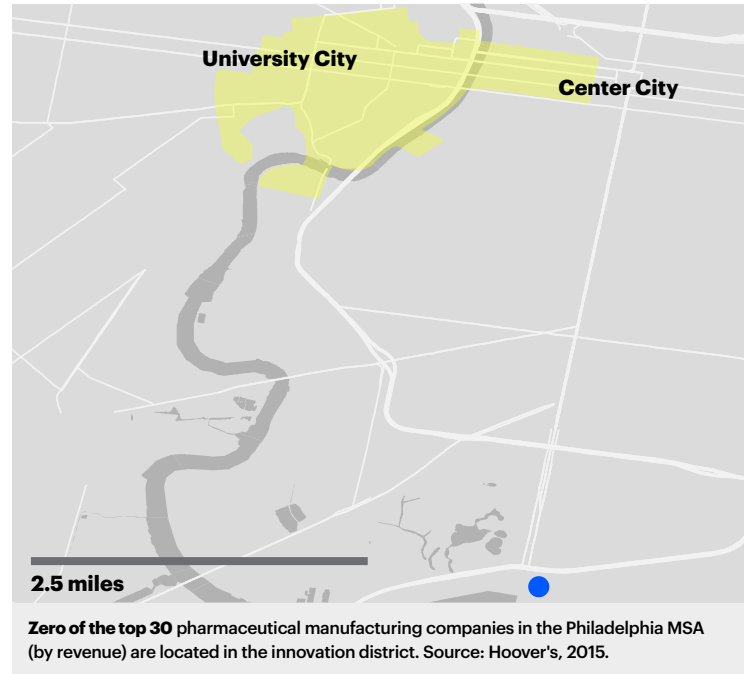
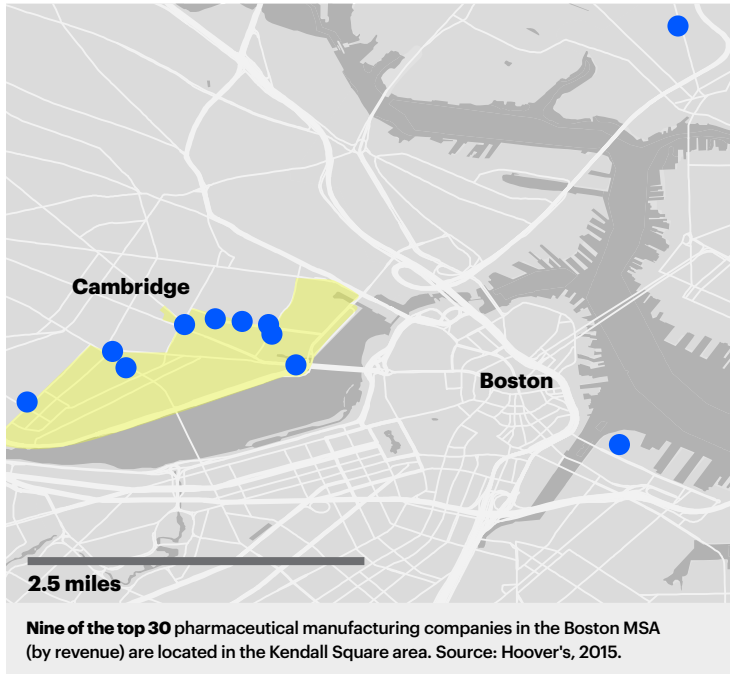
It seems as if every day a new scientific discovery in health care is poised to redefine the global care delivery system. It is easy to confuse legitimate breakthroughs with hyperbole, but some advances in medical technology will dramatically shift the way we receive care. In 2003, the Human Genome Project set the world on a new path of radically customized care based on the specific makeup of an individual's genes. Since then, thousands of papers, patents, and companies have been created under the broad rubric of genomics. But most life science experts agree that we have barely scratched the surface of the economic and human welfare opportunities of next-generation genomics. Perhaps the most influential and exciting application of gene sequencing is in immunology (the study of disease) and the new fields of cell and gene therapy (the ability to transplant normal genes into cells to replace missing or defective ones). The McKinsey Global Institute estimates that the clinical application of these scientific breakthroughs, within the next decade, could have a global market of over \$1 trillion.²⁰

By design, and luck, Philadelphia has been developing global expertise in these areas since the Human Genome Project was created. For example, over the last decade, CHOP's Center for Applied Genomics (CAG) has collected genetic samples from over 100,000 individuals and serves as one of the world's largest pediatric bio-repositories of DNA. As new genetic drugs get closer to market, the bio-repository is a global destination for drug companies seeking to test new drugs and new applications of existing therapies. As Dr. Hakon Hakonarson, Director of CAG, explains Philadelphia's position, "within gene editing, samples are the coin of the realm—we are able to identify new connections at the genetic level that have radical implications. We have work underway that shows how drugs we are developing for childhood ADHD could be used to address Alzheimer's. The market implications are astounding. Between Penn, CHOP, Temple, Jefferson, Wistar, and many others, few cities in the world have built the lab space, research enterprise, and scientific know-how in this area that Philadelphia has."

the importance of university R&D to pharmaceutical discovery. Spatial separation is part of the challenge. Unlike districts such as Kendall Square in Cambridge or Mission Bay in San Francisco, Philadelphia's life science cluster exists primarily in the suburbs.²¹ In fact, while nearly a third of the largest pharmaceutical companies in the Boston metropolitan area are within a mile of MIT, not one of Philadelphia's largest firms resides within the district.²² Regardless of why these firms originally located where they did, this lack of natural density means that universities and other intermediary institutions in the district and city need to work harder than their peers to create points of collaboration with the private sector.

Even with focused leadership, shifts in faculty culture and incentives to align with industry generally occur slowly at universities, and Philadelphia's innovation district universities are starting behind national leaders. Historically, Penn and other universities have maintained an arm's length relationship with industry, and they have lagged best practices in their technology transfer efforts. For example, while Penn has improved the intensity of its commercial output consistently over the last decade (defined as the number of patents, startups, licensing deals, and revenue per research dollar), it is still middling among peers. Between 2013 and 2015 among the top 20 largest universities with a medical school (appropriate peers to Penn), Penn ranked eighth in licensing deals, sixth in licensing income, and eighth in patents (though it ranked an impressive fourth in number of startups).²³ Moreover,

There is a strong clustering of pharmaceutical manufacturing companies around MIT in Kendall Square, but not in Philadelphia.



only 2.4 percent of Drexel's smaller research budget comes from industry partners.²⁴

A 2015 study by the Tufts Center for the Study of Drug Development found that nearly 80 percent of the most transformative new drug innovations over the last 25 years resulted from collaborations between industry and academic research.²⁵ And the importance of research partnerships between industry and universities will only increase as drug discovery becomes more complicated, increasing pressure on firms to improve R&D productivity.²⁶ Given this, the lack of alignment between the district's non-industry life sciences research strength and private-sector drug development and manufacturing in the region creates a serious barrier to innovation and economic growth.

The technology sector is growing, but the area is still short on serial entrepreneurs, talent, capital, and national prominence.

Philadelphia's technology sector has grown rapidly over the last decade: within the innovation district alone, technology-sector

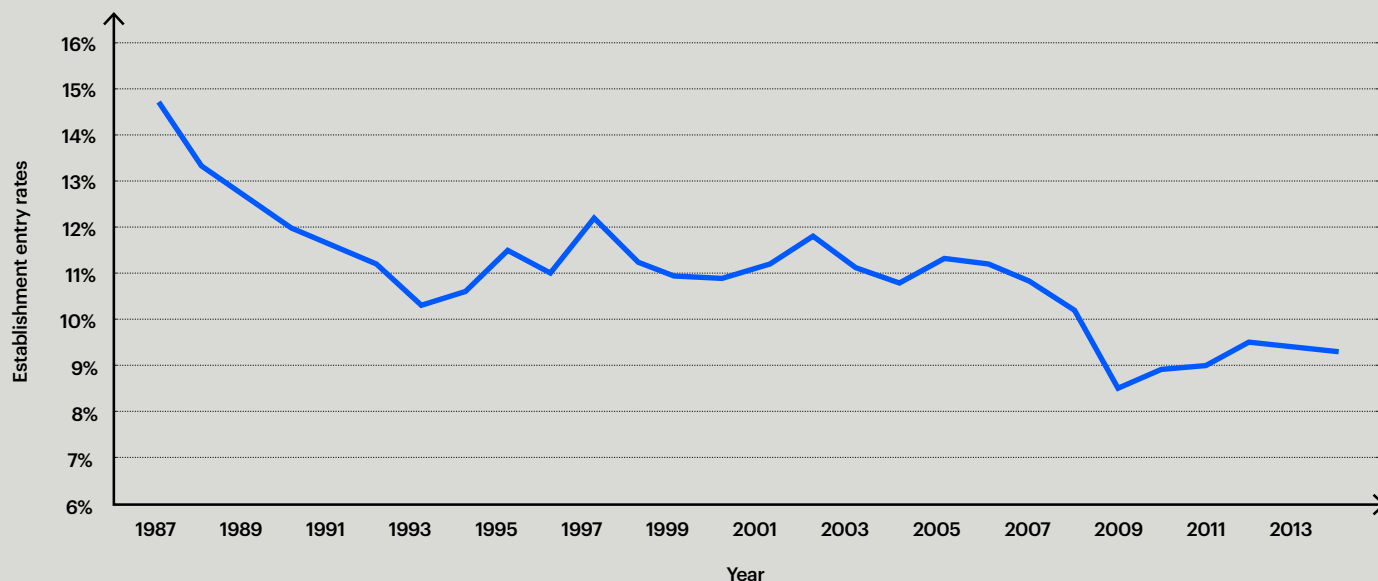
employment has grown by 77 percent since 2000.²⁷ A non-trivial share of this growth is attributable to Comcast, which is the city's largest technology company and the only technology company in the Fortune 100. Indeed, only Seattle, Dallas, and the San Francisco Bay Area headquarter larger tech firms. With Comcast's new technology tower being built, its influence on tech and entrepreneurial activity in the city is primed to expand. However, even after controlling for Comcast's growth, the district still increased the number of technology workers faster than the national average.²⁸

Outside of large companies or technology services firms, the city's startup environment is greatly improved from prior years. As one interviewee put it, "even a decade ago the tech scene in Philadelphia was non-existent. Today, we've got real capacity and a growing number of success stories."

The uptick of entrepreneurs has emerged in part due to concerted efforts by the public and private sectors. Numerous institutions and organizations such as Ben Franklin Technology Partners, DreamIt, UCSC, Philly StartUp Leaders, together with various university-based initiatives, have helped build Philadelphia's startups. For example, Drexel has created a \$10 million internal venture fund with Ben Franklin Technology Partners (which has created a similar program with Temple University).²⁹ In addition, UCSC has developed a number of other programs that support entrepreneurs, including Phase 1 Ventures, the Digital Health Accelerator, and the Port Business Incubator. The city government, too, has been a leader through its StartupPHL initiative, which has funded local entrepreneurs, connected them to larger businesses, and leveraged startups to solve social problems.³⁰

These organizations can uniquely promote greater collaboration and dialogue among the various stakeholders and help to align often-mismatched incentives and cultural differences between academia and industry. Their efforts in turn help create an environment that supports the successful flow of R&D from basic research through proof-of-concept projects and into product development and technology commercialization.

While entrepreneurship has been growing in the district and other parts of the city, new firm creation in the metro is below the national average and has declined over the past two decades.



Source: Bureau of Labor Statistics 2017 and authors' calculations.

Notwithstanding the growth in entrepreneurial support and the quality of startup activity within the innovation district and region, metropolitan-wide entrepreneurship figures are still lagging. For example, overall new firm creation (as a percent of total firms) is still below the national average and, as the above chart shows, has declined consistently over the last two decades. Moreover, many of these new companies are local-serving firms that do not support broad employment or growth. More worrying still is lackluster growth among Philadelphia's fastest-growing entrepreneurs. Only 1.5 percent of new firms in the metro area grew to employ at least 50 people over a five-year period, and the region ranks 21st among the 40 largest metropolitan areas for entrepreneurship growth.³¹ In 2016, Philadelphia had only three companies on Deloitte's Fast 500 list of the fastest-growing technology companies in the country, fewer than half the number of smaller regions like Atlanta and Denver.³²

High-growth, innovative firms in Philadelphia continue to face hurdles compared to the city's peers. The technology, life sciences, energy, and advanced manufacturing sectors, particularly, are hamstrung by capital constraints, a lack of mentorship opportunities, and limited collaboration across the city's many innovation hubs.

In terms of capital, the Philadelphia metro receives \$82 in venture capital per resident, compared to similarly sized cities like Dallas, Washington, DC, and Denver that receive \$101, \$133, and \$207 per resident, respectively. While the city ranks fourth and fifth nationally for drug discovery and pharmaceutical venture capital, respectively, technology investments are much lower.³³ At the same time, interviews suggest that access to mentors—even in the life sciences—is a substantial challenge in both the district and the wider region. This is in part due to a limited number of serial entrepreneurs re-investing time and energy in the city, while also reflecting a lack of mature technology companies acting as stewards of the industry and ecosystem—as funders, conveners, or reservoirs of mentors for young companies.

In sum, while growing in the innovation district and discrete hubs within the city, the overall level of entrepreneurial activity in the region is currently below that which is needed to drive employment growth, attract talent, and put Philadelphia on the map as a serious technology hub.

The innovation district and Philadelphia at large are replete with innovation institutions and initiatives, but they lack the structure and support needed to fully exploit regional potential in high-impact, next-generation clusters.

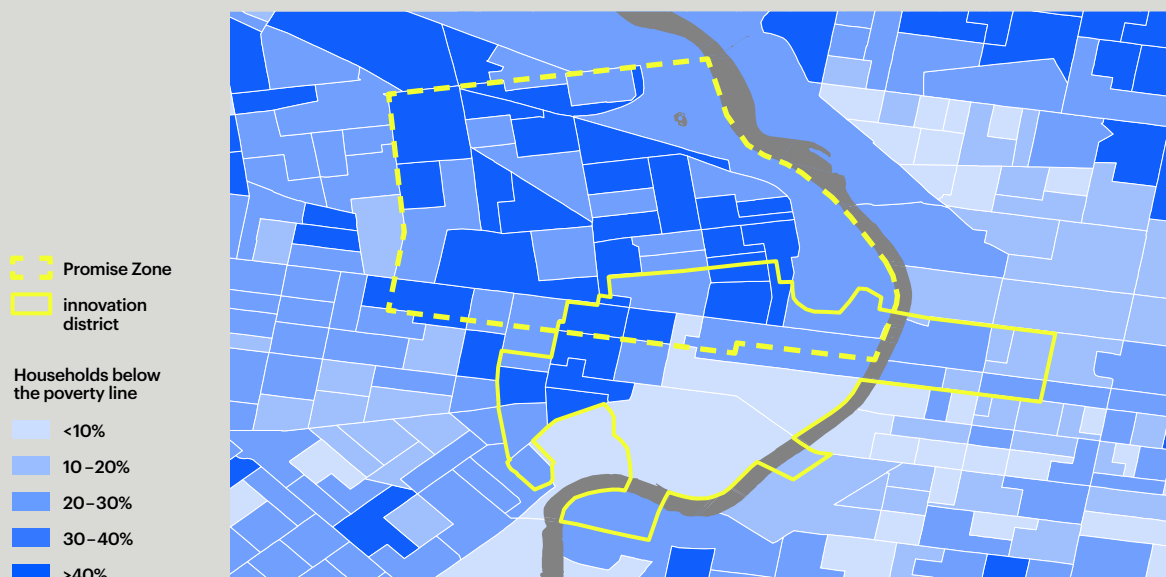
Philadelphia has no shortage of innovation institutions and initiatives, making it well-positioned to advance a number of new technology clusters such as digital health, cybersecurity, cell and gene therapy, and advanced materials. Examples of collaborative efforts around next-generation technologies abound: Ben Franklin Technology Partners, Safeguard Scientifics, and Independence Blue Cross's new fund for early-stage health information technology companies; UCSC's plans for uCity Square and its work advancing life science, technology, and digital health startups; the health care innovation collaborative around chronic diseases; and the \$75 million Advanced Functional Fabrics of America partnership between the Department of Defense, Drexel, Temple, and others.

Collaboration also exists around institutional support for research startups. For example, UCSC's QED Proof-of-Concept Program, established in 2009, is one of the nation's first multi-institutional proof-of-concept centers. QED brings together 21 of the region's major academic and health care institutions to translate research into commercial application. As of 2017, funded projects have secured over \$20 million in follow-on investment.

Yet while Philadelphia institutions have proved capable of episodically coming together around areas of competitive advantage, efforts have been small relative to the size of the region and its assets, and have lacked the structure and support needed to fully leverage growth opportunities in next-generation industries in which the region could potentially excel.

There are several reasons why Philadelphia has lagged behind. First, relationships between district research institutions and industry are weak, impeding the commercialization of new technologies and their integration into the marketplace. Second, the region's philanthropic community isn't invested enough in technology-based economic development. Comcast's Brian and Aileen Roberts' \$15 million donation to a new proton therapy center at Penn is an important exception, but for the most part the city's major corporations and philanthropies aren't funding innovation efforts like those in cities like Indianapolis and Cincinnati, putting Philadelphia at a significant disadvantage.³⁴ Finally, the region isn't doing enough to celebrate its successes and market itself as a global technology city. Select Greater Philadelphia has created a sturdy platform for regional marketing campaigns, but domestic and international firms and investors largely still view Philadelphia as a flyover city between New York and Washington, D.C.

Poverty rates in surrounding communities are persistently high, as reinforced by the federally designated Promise Zone nearby.



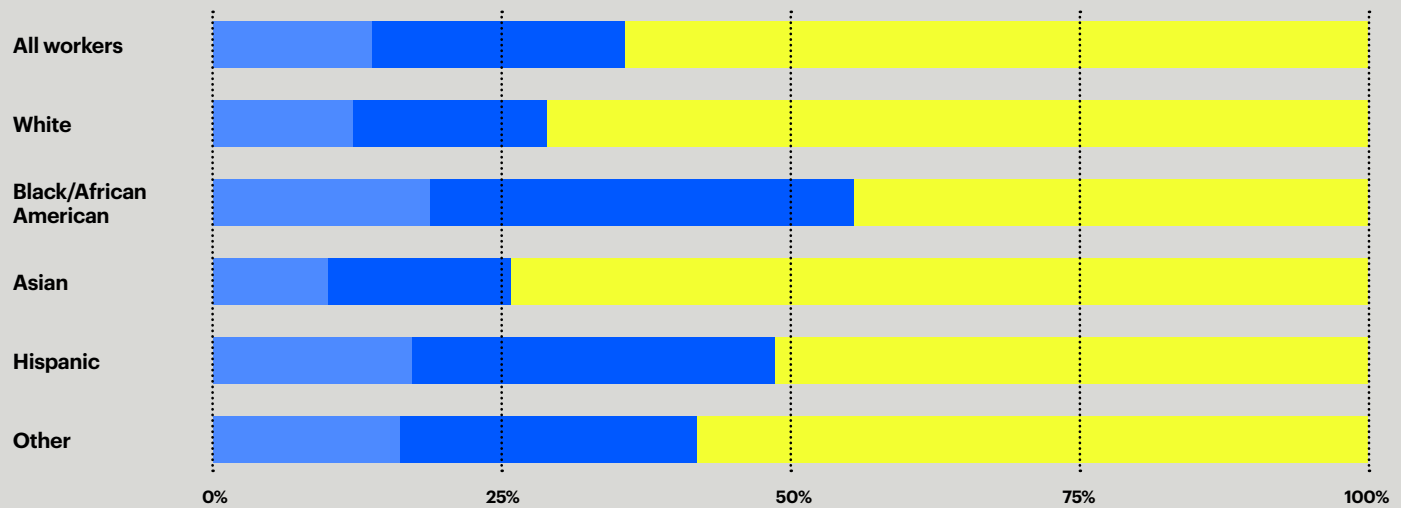
Source: U.S. Census Bureau, American Community Survey, 2011–2015

The innovation district has experienced substantial job growth and revitalization in recent years, but surrounding neighborhood opportunity dynamics have been largely unaffected.

As the innovation district continues to mature, so too do the number of potential employment opportunities for Philadelphians. In the 10 years between 2003 and 2013, the number of jobs in the innovation district increased by 20 percent to reach over 104,000, outpacing growth in the broader city.³⁵ Many of these jobs are in well-paying, middle-skill occupations: over 55 percent of the jobs in the district do not require a four-year degree, in occupations that include bookkeepers, paralegals, respiratory therapists, medical record technicians, and security guards.³⁶ As such, wages for most district employees are comparatively high, with over 65 percent of jobs in the district paying more than \$35,000 per year, the city's average per capita income.³⁷ As the economy of the district continues to flourish, many of these support positions will become increasingly important to the overall innovation ecosystem, and their numbers are likely to

Minority workers are disproportionately concentrated in lower-paying positions.

Monthly wages: ■ < \$1,251 ■ \$1,251–3,333 ■ > \$3,333



Source: Longitudinal Employer-Household Dynamics, 2013

grow as a result. These new firms and new jobs will, in turn, continue to help boost the city's tax base.

As yet, however, the district's growth and employment opportunities are not fully redounding to the benefit of its neighboring communities and their residents. Poverty rates in the three West Philadelphia zip codes that include and immediately surround the district (19104, 19139, and 19143) are persistently above 40 percent, median household incomes are below \$20,000, and the unemployment rate hovers around 15 percent, compared to about 7 percent in the city as a whole.³⁸ In 2014, the Mantua neighborhood adjacent to Drexel University and UCSC was designated as a federal Promise Zone by the Obama administration, further demonstrating these communities' entrenched challenges.³⁹

The racial disparities represented by these statistics are stark. While 70 percent of district residents are predominantly white or foreign-born (owing in part to the large number of international students), upwards of 70 percent of residents in the surrounding neighborhoods are black.⁴⁰ And within the district, far larger shares of black and Hispanic workers are concentrated in low-wage jobs than are their white counterparts. Indeed, 56 percent of African American workers

The district is well-connected both within its boundaries and to other parts of the city and Northeast corridor.

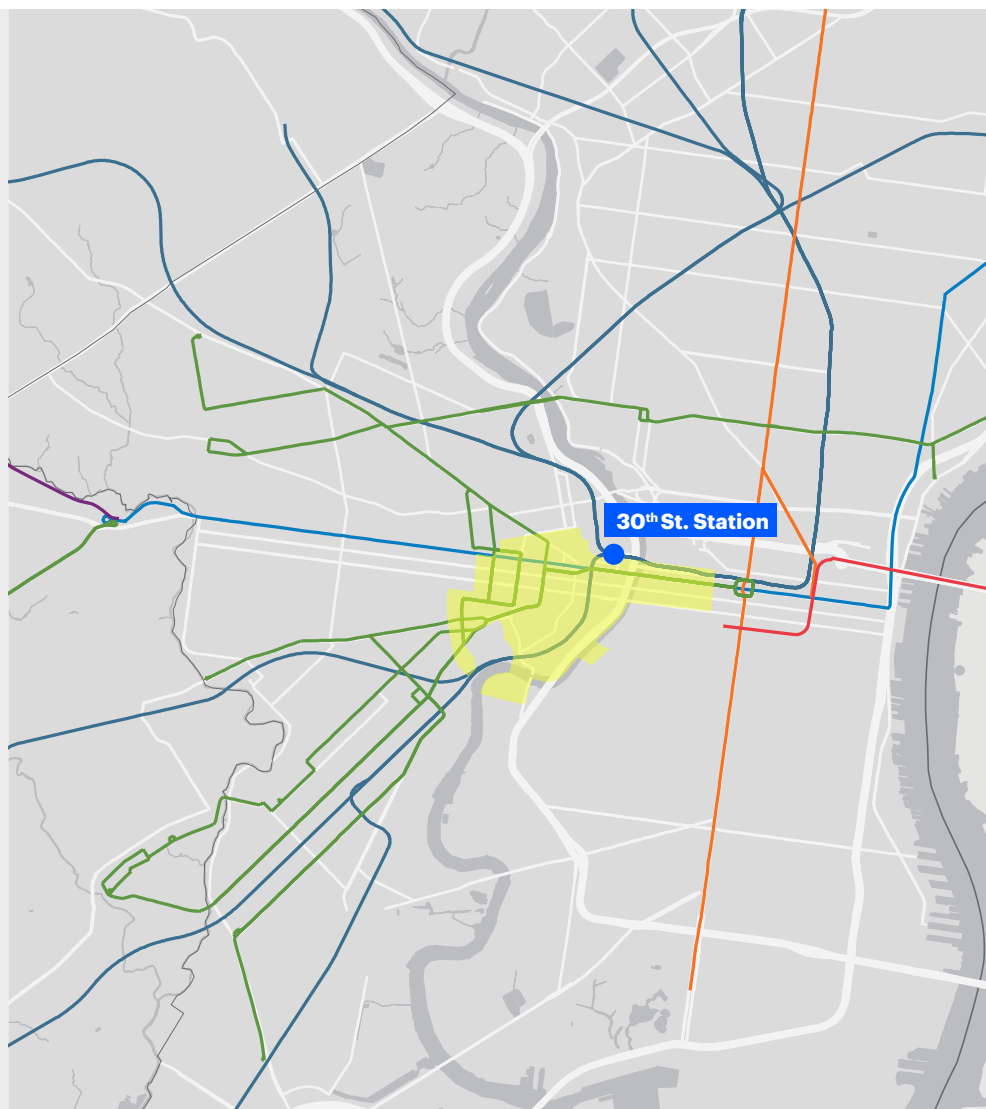
Amtrak Acela travel times:

Philadelphia — NYC:
1 hour and 8 minutes

Philadelphia — Baltimore:
1 hour and 1 minute

Philadelphia — DC:
1 hour and 27 minutes

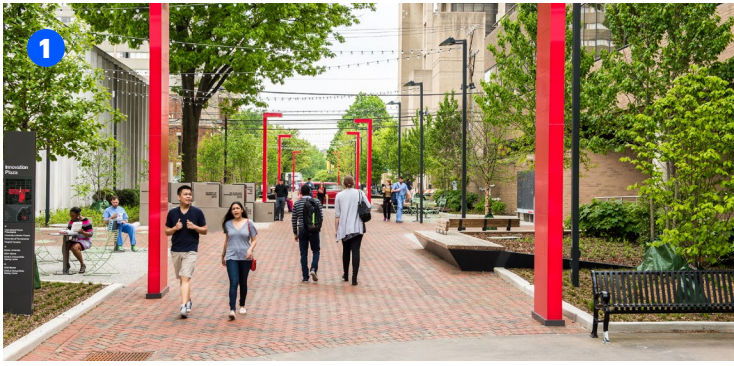
- Broad Street Line
- Market-Frankford Line
- Regional Rail
- Trolley Lines
- Norristown High Speed Line



Source: Amtrak, SEPTA.

and 49 percent of Hispanic workers make less than \$3,333 per month, compared to just 29 percent of white workers.⁴¹

The rapid growth of this area presents a genuine opportunity to alter this longstanding dynamic, an opportunity that will only be realized if local institutions and firms make doing so a central tenet of their hiring, purchasing, and other policies and practices. City leaders also need to make long-term investments in developing a strong talent pipeline to both fill and create innovation economy jobs in the decades to come.



1. Innovation Plaza, a pocket park located along 37th Street between Market and Chestnut Street, photo credit: University City Science Center; 2. Comcast Center Plaza, a programmed, outdoor plaza with seating located at 17th Street, photo credit: chrisinphilly5448 (via Flickr); 3. A parklet in University City, photo credit: Ryan Collerd; 4. University Square, a collection of amenities and outdoor seating located on 36th Street, photo credit: University of Pennsylvania.

The innovation district boasts good transit, walkability, and many high-quality places, but uneven development along Market Street impedes connectivity between its innovation nodes.

Unlike in many cities, a tight proximity envelope exists between Philadelphia’s downtown (Center City) and its university and medical hub (University City), two major economic nodes that together make up the innovation district.

On the whole, the district is a dense urban environment with the kind of enviable place assets and “physical bones” often lacking in anchor-based districts. The area boasts a density of amenities and high-quality gathering spaces, including several existing places (e.g., Quorum and the Microsoft Reactor at the Science Center) and planned ones (e.g., designated space within Comcast’s new building) specifically targeted to innovation-related activities and programming. It is generally highly walkable—with an average Walk Score of 95/100—and the architecture in large parts of the district is both visually interesting and supportive of pedestrian access and



Uneven development along Market Street impedes connectivity between Center City and University City. Photo credit: Erin Brookes.

interaction.⁴² The district is well-connected to other parts of the city (via the Market-Frankford subway line and multiple trolley and bus lines), to major cities along the Northeast corridor (via 30th Street Station, the third-busiest Amtrak station in the country), and to cities around the globe (via Philadelphia International Airport, just 20 minutes away).⁴³ Implementation of the visionary 30th Street Station District Plan will provide a vibrant new gateway to the city at the very heart of the innovation district.

Still, several areas in the district—primarily along the Market Street corridor east of the Schuylkill River—face physical challenges, largely stemming from the area’s industrial past and urban renewal legacy. The physical proximity between University City and Center City is undercut by underutilized parcels and a lack of activity along much of the corridor, contributing to an unfriendly pedestrian experience and generally dull environment. Moreover, transit, bike, and even automobile access is limited. There are trolley stations at 19th and 22nd Streets, but the absence of a stop along the Market-Frankford line hampers connections to the broader city. Bike lanes heading east along Market Street end at 34th Street, forcing the growing numbers of bicyclists heading downtown to either choose an alternative route or face an often hostile, car-dominated thoroughfare. And the street and

highway network around 30th Street Station, the Schuylkill Expressway, and Vine Street Expressway are complex and frequently jammed with traffic, exacerbating connectivity challenges. These issues not only heighten the lack of physical continuity between University City and Center City, but also represent, and contribute to, the current disconnect between the emerging innovation economies in both areas.

At the same time, recent redevelopment projects aimed at connecting destinations along the Schuylkill River to one another and the city—including those south and west of Center City—while very encouraging, are largely still nascent. Across the river, CHOP's recent expansion will add both clinical research and office space to the area, and the new Pennovation Center is already becoming an exciting new innovation space, with a unique combination of Fortune 500 companies, small startups, advanced university research labs, and coworking spaces. But while the vacant land surrounding it holds enormous potential, the legacy of urban renewal has left it disconnected from Penn's campus and the rest of University City such that the area feels far more distant than it actually is. Much time and thoughtful investment will be needed to build out the 10-year Pennovation Works Plan and to fully capitalize on the opportunities the area's un- and underutilized parcels represent for the district's larger innovation ecosystem.

Section 3: The path forward

Philadelphia's innovation district concentrates distinctive assets and capacities that could help the region become a trailblazer in several game-changing technologies, and do so in ways that provide broad value for Philadelphia and its citizens.

But reaching this potential is unlikely to happen absent a more unified vision among leaders for what this district could be, not only for the people, institutions, and firms that compose it but for Philadelphia as a whole; agreement on the values that underpin those ambitions; and concerted, collaborative efforts to reach them. Importantly, such efforts will demand new types of organizational structures that bring key regional actors to the table to jointly develop and implement the kinds of strategies whose success demands a collective approach.

With these principles as a backdrop, we suggest here how anchor institution, corporate, and civic leaders can work together under a set of new collaborative structures. We then recommend four strategies around which this group of leaders should focus their early energies, expertise, and resources.

Organizing for success

If Philadelphia is to become a recognized hotbed of technology and entrepreneurship where dynamic, connected hubs generate both innovation and economic opportunity, then its leaders need to organize themselves to make it happen. To this end, innovation district anchor firms and institutions—together with other public, private, and civic stakeholders in the district and beyond—need to establish a new governance structure under which they unite around

a shared mission; give voice to a single, authentic narrative; and, as a starting point, go all in to design and support strategies that will have maximum collective impact on the city and region.

Principles for successful governance

For all their differences, the most successful governance structures operate as a network of leaders who collaborate around a shared set of aspirational goals and adhere to the same set of operating principles:

- **Metric-driven:** They have an accurate understanding of the area's starting position on economic, physical, and social dimensions, and clear, quantifiable targets against which to measure progress.
- **Task-focused:** They have a defined list of initiatives, strategies, and tasks, and these are structured such that ownership for each lies with varying groups of stakeholder organizations, allowing each to do what it does best.
- **Process-oriented:** They set milestones and timelines, hold regular board and committee meetings, and hire and manage staff as needed to accomplish goals.
- **Outward-facing:** They can speak with one voice about the narrative and mission to those both within and outside their community of focus—innovation district, city, region—and have the capacity to act as advocates and champions for their ideas, strategies, and successes.
- **Nimble and opportunistic:** They keep their finger on the pulse of local and national trends, pursue new activities when needs or opportunities become apparent, and make strategic and structural adjustments to accommodate change.
- **Funding conscious:** They understand the necessity for sustainable funding and together develop a financing model that frees leaders and staff to accomplish goals without distracting concern for the long-term viability of the enterprise.

No one right organizational model exists that can be uniformly co-opted—in Philadelphia or elsewhere—by an innovation district or other geography, or by any group of stakeholders coming together around a common aim.

Indeed, there are as many different models as there are initiatives or place-based entities, and each is driven by distinct motivations that generally determine its organizational composition (e.g., staff, subcommittees), powers, and financing structures. And these may in fact change over time as the role and ambitions of the entity evolve.

Currently no single entity in Philadelphia brings all the major innovation-based anchors, firms, and other organizations invoked in the recommendations below together on a regular basis, or has the structure, powers, geographic focus, and strategic expertise across the disparate yet connected issue areas. As such, we recommend that stakeholders establish an **Innovation Council**—a leadership group that possesses the influence and authority to bring diverse sets of innovation district and other key industry, public-sector, and civic stakeholders together to drive innovation, economic inclusion, and placemaking in the district and beyond. Organized initially under the auspices of an existing organization—such as the Chamber of Commerce for Greater Philadelphia or another entity with strong industry connections—the Innovation Council would serve as a steering entity

comprising 10 to 15 innovation district anchor, corporate, civic, and economic development leaders. The organization under which the council resides would be responsible for providing the staffing and other organizational support needed to help the council do its work, as well help nurture, procure funding for, and market individual initiatives within and outside of the region as appropriate.

The council's primary charge would be to identify an initial set of specific strategies and initiatives for growing the regional innovation economy, and work to identify the organizations best poised to lead each.

Stakeholders should establish an Innovation Council—a leadership group that possesses the influence and authority to drive innovation, economic inclusion, and placemaking in the district and beyond.

Each initiative would likely need a content-specific home. For example, developing a cluster around precision medicine would likely need to leverage the convening power and expertise of UCSC in coordination with several of the leading life science universities, labs, and medical centers such as Penn Medicine, Wistar, and others. However, a cluster strategy around advanced fabrics would be suited

for Drexel University, the Mid-Atlantic lead of the new national smart fabrics consortium. Placemaking and inclusion strategies would involve other lead organizations and actors.

Recommendations for making Philadelphia a world-class innovation city

As described in Section 2, Philadelphia has a deep bench of geographically concentrated institutional and corporate assets and several areas of globally significant research and industry strengths. Yet it also has several big challenges that appear to undermine the full potential of these assets and strengths to drive innovative economic growth and prosperity in the region. Informed by this understanding, the Innovation Council should consider an initial set of efforts and investments around which to coalesce varying groups of regional stakeholders. These steps are:

- 1. Design and implement a series of initiatives aimed at growing the city's advanced industry clusters, starting with precision medicine.**
- 2. Launch an Anchor Firm Entrepreneurship Initiative.**
- 3. Coordinate and expand anchor-based skill-building, education, and procurement initiatives.**
- 4. Establish a connected-corridor taskforce for University City–Center City.**

We detail each one here in turn.

1. Design and implement a series of initiatives aimed at growing the city's advanced industry clusters, starting with precision medicine

Given the diversity of the regional economy and its robust levels of R&D activity, Philadelphia has a strong potential “play” in a number of emerging technologies, ranging from life sciences to energy, chemicals, and new materials. And the region has no shortage of on-the-ground activities, institutions, and partnerships designed to build on these strengths.

These efforts have tended to occur between individual institutions, however, and have not been synchronized around a shared vision and set of goals that could put the region at the forefront of these technologies and help it capture the associated economic gains. For example, while some coordinated efforts around life science innovation do exist, none are of the scale or scope needed to create the cross-institutional bridges between basic and translational research needed to drive market activity. Moreover, few efforts are underway to position Philadelphia to capture the financial, regulatory, and other wrap-around services associated with the cluster.

Philadelphia has the critical mass of assets needed to improve its global position in the innovation economy and capture the firm and job growth that comes with it. But to do so, it needs to build on the potential of innovation district firms and institutions to better coordinate and connect the regional innovation ecosystem around the key clusters—beginning with precision medicine—in which it has clear competitive advantage.

Existing efforts to grow advanced industry clusters

A number of initiatives show that Philadelphia has the ability to refocus academic research toward market opportunities. As noted above, Pennovation Works is positioned to substantially improve Penn's already robust commercial activity. The Drexel Venture Innovation Fund—an up to \$10 million fund to help research entrepreneurs at the university access seed funding—is an innovative move to advance multiple proof-of-concept opportunities for faculty and staff. In addition, several successful public-private partnerships exist specifically focused on gene therapy, including the Novartis-Penn Center for Advanced Cellular Therapeutics and CHOP's investments in Spark Therapeutics.

Beyond the efforts of individual institutions, a number of intermediaries also promote the commercialization of technology. Both Ben Franklin Technology Partners and UCSC are globally recognized as best-in-class investors, mentors, and economic development partners for young technology companies. And the Chamber of Commerce's Health Care Innovation Collaborative has successfully brought together nine partner organizations (across insurance, care providers, and research) to address chronic disease.⁴⁴

While these are important endeavors in their own right, none are currently situated to develop and execute a regional strategy that could put Philadelphia at the center of rapidly growing advanced industry clusters. To translate research strengths into economic opportunity for the entire city, the scale and scope of activities must be dramatically expanded. First, they must extend beyond any individual institution and effectively lay the groundwork for public-private commercialization at the consortium level. Second, they

need sufficient funding and personnel expertise to incentivize partnerships and tap into the broader innovation ecosystem of which they are a part. Finally, they must be able to reach beyond the region to attract (even if temporarily) star researchers and firms to fill strategic gaps in the cluster. Existing institutions—which would vary depending on the cluster—could be positioned to take on these challenges, but they will need a specific charge, new partnerships, and substantial resources.

Recommendation

As its first order of business, the Innovation Council called for above needs to determine how the innovation district and its public, private, and university stakeholders can serve as a staging ground for a series of cluster initiatives that play off Philadelphia’s most powerful research and technical assets.

The Innovation Council should focus its initial efforts on creating a Precision Medicine Catalyst Initiative—a central organizing force that can pool resources and capture the full value of the region’s research and commercialization capacity in gene therapy.

Given the region’s public and private strengths in the life sciences, its broad clinical care capabilities, its large catchment of patients, and the depth of bio-specimens (which support future scientific discoveries), we recommend that the council focus its initial efforts on creating a *Precision Medicine Catalyst Initiative*—a central organizing force that has the ability to pool resources and capture the full value of the region’s research and commercialization capacity in gene therapy.

The purpose of the initiative would be to both coordinate existing institutions that specialize in the cluster and connect them with the city’s entrepreneurs and business support services—including law and business programs and industry partners in these areas—with the goal of developing regional expertise in the wrap-around services that the cluster will demand.

Existing organizations are likely well-positioned to lead a Precision Medicine Catalyst Initiative. For example, UCSC already uses a consortium model with broad multi-institutional leadership, participation, and support. It could also be assisted by the Chamber of Commerce of Greater Philadelphia’s Health Care Innovation Collaborative. As leaders, these organizations would be responsible

for aligning institutional and industry partners around a range of activities:

- **Appointing an executive director** and potentially other staff who have industry and research consortia experience and who understand the commercialization pathways of new cell and gene therapy techniques.
- **Convening regional stakeholders** to determine specific areas of gene therapy (delivery, diseases, etc.) that multiple organizations are working on and that need the support of more than one institution.
- **Seeking funding sources** that can be highly leveraged, building from Clinical and Translational Science Awards from NIH, membership dues, external funding from local philanthropy, etc. An initiative of this size, scope, and caliber would require roughly \$20 million in funding to develop joint research space and attract star faculty.
- **Creating a broad economic development platform** to build and attract the many auxiliary non-research business elements of personalized medicine, including finance, insurance, and workforce development.
- **Identifying opportunities for sharing** of clinical data, best practices, and other pre-competitive industry information.
- **Forming a research fellows program** that attracts from outside the region faculty with private-sector research grants, as well as external researchers who have contracts with Philadelphia-based firms, to partner with Philadelphia-based universities and medical schools.
- **Building an appointment process to attract star faculty** with entrepreneurship and industry interests at partnering institutions in the district.

- **Developing an intellectual property framework** as well as a joint research partnership template, similar to what has been developed by the Wistar Institute.⁴⁵

The Indiana Biosciences Research Institute

One of the best examples of an academic-industry consortium like that described here is the Indiana Biosciences Research Institute (IBRI). An initiative supported by BioCrossroads, IBRI serves as a connection between both academic and industry partners around metabolic disease and nutrition. Partners include life science companies such as Eli Lilly, Roche, Dow, and Cook Medical, plus academic institutions such as Indiana University, Purdue University, and Notre Dame. Research is both basic (i.e., largely pre-competitive) and applied, but the industry partners have developed an intellectual property (IP) framework to identify rules around shared IP. IBRI also coordinates with its industry partners to identify faculty working on industry-sponsored contracts and leverages firm partners to bring those researchers to member universities—increasing the collaboration between Indiana universities and firms.

Considerable resources have been invested in the effort. In 2012, Lilly committed \$7.5 million to establish the new institute, quickly followed by \$25 million from the state, matched by an additional \$25 million from the private and philanthropic sector.⁴⁶ Today, IBRI is capitalized at \$150 million from industry and philanthropy. As of 2015, it has supported over 350 life science entrepreneurs in Indiana and propelled the state's \$62 billion industry to second in the nation for life science exports.⁴⁷ The state has experienced a 22 percent increase in employment since 2001.⁴⁸

In 2015 the city of Indianapolis approved \$75 million in tax-incremented financing to develop 100,000 square feet of research and office space as part of 16Tech, the city's emerging innovation district.⁵⁰ IBRI will be the anchor tenant.

- **Creating a consortium of national and global research institutions** with complementary competencies to fill strategic gaps in the region's research capacity.

If successful, the Precision Medicine Catalyst Initiative should serve as a kicking-off point for a new form of industry coordination around a specific technology, which could then be applied in other areas of regional strength. Indeed, while gene therapy and precision medicine may represent Philadelphia's best bet for growing an advanced industry cluster, the city has many other technology growth opportunities that could be advanced through greater levels of institutional and industry coordination. First, within health care, there are clear areas of strength outside of—or adjacent to—gene therapy. For example, digital health is a cross-cutting platform that will impact all aspects of care delivery. With its number of insurance and care providers, Philadelphia has a clear opportunity to be a leader in this space, and is in fact already moving in that direction with a number of existing efforts. Next-generation energy is another growing cluster in the Philadelphia region. The expansion of natural gas exploration in the commonwealth positions Philadelphia well in chemicals, advanced manufacturing, and other downstream activities. Finally, the region has an opportunity to build on its existing prowess in new materials. Anchored by strengths in

the new advanced fabric manufacturing hub and connecting a cross-section of university research and firm activity across the country, “smart fabrics” should be explored as an emerging cluster.

2. Launch an Anchor Firm Entrepreneurship Initiative

Some experts interviewed for this report expressed worry that because Philadelphia has yet to produce its “PayPal millionaires,” it does not have the deep bench of technology investors, firms, and entrepreneurially minded philanthropies needed to support the ecosystem. While it is true the city has not seen the number of exits as Boston, Chicago, Seattle, and some of its other peers, it has a number of firms either within the technology sector or, more often, with substantial core competencies in information technology, such as digital health. Within the innovation district, Comcast represents the city’s largest technology company, but other companies play a role as well: the new digital health partnership between Ben Franklin Technology Partners, Safeguard Scientifics, and Independence Blue Cross is clear evidence of the broad spectrum of technology-engaged firms. Still, as region-wide statistics suggest, Philadelphia has not yet emerged as a national hub of entrepreneurship.⁵⁰

To improve the competitive position of Philadelphia’s technology ecosystem, entrepreneurs in the city and region need greater access to capital and specialized resources, stronger links to managerial talent, and better connections to customers from both within and outside the metro area. Establishing tighter relationships between entrepreneurs and district anchor firms such as Comcast, Independence Blue Cross, FMC, and others could help fill these gaps.

In many cities, anchor companies are already engaging in place-based efforts to support the startup ecosystem. For example, in Seattle, Amazon is investing in entrepreneur mentorship and coding training, offering access to its campus for user groups and events, and investing millions in the University of Washington to support computer science faculty. Other regional technology giants like

Microsoft have started accelerators and internal venture funds that have invested in Seattle technology companies. Anchor firms in Philadelphia can do much more to support local entrepreneurs, and, were they to do so, the city could become a global best practice of anchor-entrepreneurship collaboration.

Existing efforts to promote entrepreneurship

Philadelphia has numerous institutions and partnerships within its entrepreneurial ecosystem. Both Ben Franklin Technology Partners and UCSC are at the forefront of the region's startup capacity.⁵¹ And the University City Keystone Innovation Zone, Benjamin's Desk, Philly Startup Leaders, and other activities and organizations have been critical to the development of area startup activity.

Industry collaboration is also emerging as an important element within the city's entrepreneurship ecosystem. For example, in digital health, Ben Franklin Technology Partners, Independence Blue Cross, and Safeguard Scientifics have partnered on a \$6 million initiative to grow early-stage health care startups. And the new Advanced Functional Fabrics of America initiative points to an emerging industry collaborative presence in the Philadelphia region around advanced materials. Similarly, public-private partnerships exist within medical devices and fintech (technology for the financial sector). Finally, Comcast's 2016 acquisition of Philadelphia-based OneTwoSee, a sports technology startup, suggests how large firms can develop an ecosystem around them.

Given the capital constraints within the region, a number of local efforts are underway to increase seed funding. For its part, the city has begun to move in the right direction to develop a number of local funds. The StartupPHL fund, launched in 2012 and operated by First Round Capital, was one of the country's first city-based funds and is in the process of developing its second round of raising capital. And seed funding from Ben Franklin Technology Partners has been a reliable lifeline for over 1,500 local startups since its inception.⁵²

Private-sector leaders should create an Anchor Firm Entrepreneurship Initiative to improve the technology startup ecosystem.

Finally, Philadelphia's major technology anchors have begun to support entrepreneurship. Comcast's Catalyst Fund and its new Comcast Innovation Fund provide research grants in technology and have supported local firms through DreamIT and the company's new LIFT Labs for Entrepreneurs, an accelerator in partnership with TechStars. Comcast is following a path similar to the one followed by many of the largest technology firms in connecting with global entrepreneurial talent. But these efforts tend to be national and global in scope.

Philadelphia's technology startup ecosystem needs a sizeable and concerted effort from its anchor firms to invest in the future of the region's tech cluster.

How tech companies support their home cities

Technology companies around the United States are recognizing the value of locally grown startups and working hard to identify, support, and maintain the local entrepreneurial pipeline. While contributions to local schools and charities may be considered corporate social responsibility, aiding and abetting startups helps feed future innovation into these large firms.

For example, Amazon endows two professorships in the University of Washington's School of Computer Science and has created two \$1 million professorships in machine learning.⁵³ Similarly, Microsoft has donated \$10 million toward a new University of Washington computer science building. Microsoft Ventures, the company's internal venture fund, has invested in at least two Seattle-based firms (Zipwhip and Outreach). The company also has accepted several Seattle-based startups into Microsoft Accelerator. Google Ventures and Google News Labs have established Matter, a San Francisco-based accelerator for media companies, and Google's North American Tech Hub Network has created 10 co-working spaces around the country to support local entrepreneurs.

Recommendation

To improve the technology startup ecosystem, private-sector leaders in the innovation district should create an *Anchor Firm Entrepreneurship Initiative* that significantly leverages technology firm resources to connect startups with customers, support training and mentorship programs, increase access to capital, and help develop physical spaces in which startups can grow. Such a strategy likely does not require a new organization, but it does need high-level private-sector leadership to connect distributed efforts, fill institutional gaps, and expand existing successful models through partnership programs, physical space, and funding.

Elements of the strategy could include:

- **A first customer program** that connects regional tech entrepreneurs with large companies—and the national and international subsidiaries of those

companies—through consistent and coordinated engagement from firm leadership.

- **A new technology seed fund**, capitalized with resources from private-sector firms in the district, that would support Philadelphia technology companies within their respective technology domains. For example, just as Safeguard and Independence Blue Cross have created a joint funding initiative around digital health, Comcast and other tech firms could support such a fund around media, cybersecurity, and other activities. The fund would provide access to capital for local technology companies, but it also could attract global talent to the region. Investing firms should market and promote the startups in which they have invested. Because resources are backed by nationally known companies, these investments could help startups syndicate further rounds of capital.
- **Support for existing regional funds**, including the city's StartupPHL. District firms could lead private-sector efforts to ensure the success of broad-based funding vehicles that are tethered to the success of the region.
- **A tech startup marketing and business attraction campaign** to reach global investors, customers, and relocating startups. While there are a number of regional organizations, such as Select Greater Philadelphia, that could manage the marketing campaign, firms in the district could help by leveraging their global brand and by identifying potential targets for business attraction efforts.
- **Greater resources to support cross-institution activities** and create critical mass around numerous activities already underway within the city, including demo days and competitions. Anchor firms could also partner with universities to tap into former employees, alumni, and subsidiary firm networks to improve the base of mentorship and funding for Philadelphia startups.
- **Endowment of entrepreneurially focused professors in computer science and engineering** to improve the high-end pipeline of research startups within Philadelphia. Attracting star faculty in machine learning, artificial intelligence, and other industry-focused

areas is difficult for Philadelphia universities because the area does not yet have a reputation for university commercialization and spinoffs in these areas. An industry-endowed faculty member or members would substantially improve the position of the region in research-based startups.

3. Coordinate and expand anchor-based skill-building, education, and procurement initiatives

The innovation district has a high number of well-paying, middle-skill occupations and a concentration of institutions with strong hiring power and influence. But surrounding neighborhood opportunity dynamics have been largely unaffected, and poverty rates in West Philadelphia remain persistently high.

The close proximity of the innovation district and the struggling communities around it represents an immediate opportunity to link low-income residents to the economic growth and revitalization happening just blocks away. In fact, despite the discouraging statistics, more than a quarter of adults in these neighborhoods have some type of sub-baccalaureate training (whether an associate's degree, postsecondary certification, or some college).⁵⁴ Still, residents of these communities make up just 5 percent of the district's workforce even as unemployment rates remain high, indicating that a good share might meet the basic qualifications for many middle-skill jobs but are having trouble connecting to them.⁵⁵ Moreover, minority business ownership is not an overwhelming strength of the city—with the black business ownership rate half that of whites—and issues with minority union membership further complicate contracting and hiring processes.⁵⁶

These trends demonstrate a clear need for district stakeholders to immediately undertake more aggressive efforts to engage local residents in the growing economy while working together and with other city leaders to nurture a strong and diverse talent pipeline. Doing so is essential to the enduring success of district institutions and firms and of the city as a whole. In a nation with rapidly shifting



The West Philadelphia Skills Initiative is a best practice in place-based workforce training programs. Photo credit: Ryan Collierd.

demographics, the generation of new ideas and inventions will require developing and drawing on the talents of workers with a diversity of backgrounds, skills, and perspectives. Engaging the residents of West Philadelphia is a key place to start.

Existing efforts to promote diversity and opportunity

In addition to city-wide organizations and efforts like Philadelphia Works and the Anchor Procurement Initiative (conceived in the city's office of the controller), numerous firms and institutions in the innovation district have developed robust programs and initiatives aimed at both improving diversity within their organizations and better connecting nearby residents to their job and business opportunities. For example, in West Philadelphia, the Enterprise Center provides access to capital, capacity building, and business education to high-potential minority entrepreneurs. For their part, Comcast's Office of Inclusion and Diversity and supplier diversity initiative, PECO's Diverse Business Empowerment Program, Drexel's Office of University and Community Partnerships, and the University of Pennsylvania's renowned neighborhood redevelopment and local purchasing programs demonstrate clear—if not yet fully realized—commitments to diversity and inclusion values among district stakeholders.⁵⁷ Finally, much of the federally designated Promise Zone falls within the district's

boundaries, representing both the systemic challenges the area faces but also the collective efforts to address them.⁵⁸

More recently, the University City District has embarked on its own effort to directly connect local residents to employment opportunities in the district via the creation of the West Philadelphia Skills Initiative

(WPSI).⁵⁹ A place- and employer-based model, the WPSI works directly with employers to develop individualized curricula for occupations in which they struggle to retain workers, and then trains local residents to fill those positions. Focusing on a combination of soft skills, technical skills, and on-the-job training, the WPSI has been remarkably

District stakeholders should coordinate their existing workforce, education, and business development efforts to grow a more inclusive district.

successful in filling high-turnover positions with local residents. In the five years since the University City District launched the WPSI, 610 adults and youth have been impacted by its job training program, internships, and workshops, under a current budget of approximately \$650,000.⁶⁰ In 2015 the program connected 90 percent of its graduates to jobs.⁶¹

Recommendations

District stakeholders should coordinate their existing workforce, education, and business development efforts with the goal of serving more residents more effectively, creating greater economic opportunity, and growing a more inclusive district where a diversity of people and ideas help create a more robust innovation ecosystem and a vibrant community. This approach should be multi-tiered:

Increase employment opportunities in the innovation district for local residents through an expanded West Philadelphia Skills Initiative. The WPSI program is in high demand: over the last calendar year, 2,058 applicants applied for a total of 120 slots across eight cohorts and a variety of employer partners, indicating a strong market for expansion. However, due to the highly individualized nature of the employer-based cohorts, a certain number of positions must be available in order for the WPSI to initiate a new training cohort. The program currently serves single employers at a time, although it has the capacity to coordinate demand from institutions and firms in order

to develop training cohorts that serve multiple employers at once. To this end, the University City District and stakeholders should:

- **Form new institutional/firm partnerships** within both University City and Center City such that multiple employers jointly work with the WPSI to develop modules that train and vet cohorts for high-demand jobs. Stakeholders should explore building partnerships with corporations and institutions throughout the innovation district, and in doing so diversify the sectors and occupations for which residents from adjacent neighborhoods can be trained.
- **Organize and formalize an increased collective demand for positions** within and across institutions and firms by identifying high-demand positions with similar skill requirements. The WPSI's intensive focus on soft skills development—as well as the employer-driven nature of the program—allows them to train for a range of occupations.
- **Regularly conduct labor market analyses** to identify and align the supply and demand of occupations in existing and future growth sectors of the district's economy—including but not limited to tech and health care—and pinpoint occupations and sectors that have the potential to be filled by local neighborhood residents. Based on the analysis, employers should collectively assess and define job requirements for these positions, emphasizing skills over formal industry requirements where possible.

Build the talent pipeline through a coordinated West Philadelphia Education Initiative. Several K-14 educational efforts exist in the innovation district, but they are generally siloed from one another. For example, Drexel's Dornsife Center for Neighborhood Partnerships, the University of Pennsylvania's Netter Center for Community Partnerships, and UCSC's FirstHand STEAM education programs are each partnering with neighborhood schools to bring STEM education and other resources to an under-resourced school district. Yet there is currently no group coordinating these efforts, and the School District of Philadelphia is not in a position to provide that leadership.

Drexel's recent success in securing a Promise Neighborhood Grant

HopkinsLocal and economic opportunity in Baltimore

Launched in 2015 by the Johns Hopkins University and the Johns Hopkins Health System in Baltimore, the HopkinsLocal initiative is forging partnerships with local organizations and firms with the broad goal of fostering economic opportunity in the city. Through its “Build, Hire, and Buy” lens, the initiative focuses on increasing participation of local businesses in the construction process, expanding employment opportunities for city residents, and supporting Baltimore businesses (and encouraging non-Baltimore businesses) to employ, buy, and invest in the city. Johns Hopkins made notable progress in the first year of the initiative, including:

- increases in local hiring for targeted positions (from 30 percent to 43 percent of new hires);
- upticks in dollars spent locally (an increase of almost \$5 million);
- support for non-Baltimore vendors who plan to invest locally (two contracts with new vendors); and
- specific money set aside for minority- and women-owned businesses for design and construction projects (nearly 20 percent of all spending on design and construction).⁶²

Recognizing the institutions’ commitments to local communities, several Baltimore companies expressed interest in supporting the initiative through their own practices and economic inclusion goals. The resulting BLocal coalition—which includes 24 other organizations throughout the city—made a public commitment to increase local investments by nearly \$70 million in the coming three years.

The HopkinsLocal initiative and the BLocal coalition are specific examples of general themes: a strong institutional commitment and a coalition of actors help to build momentum to positively impact nearby distressed communities and the overall city economy.

for its work with seven schools presents a potential opportunity for the district anchors to develop a comprehensive academic-industry educational partnership. Coordinating existing programs can allow for better collaboration, increased efficiency, and stronger impacts, allowing each existing program to focus on its strengths while being complemented by other programs to stitch together a full suite of wrap-around services for youth in West Philadelphia.

Moreover, such an initiative would allow corporations in the district to engage not merely out of a philanthropic aim, but also to consider their funding as investments that can strategically benefit their bottom lines. The goal would be for Comcast, FMC, Blue Cross, and other companies to hire more employees who are homegrown rather than have to recruit from Silicon Valley or Boston. Moreover, their investments will help yield improved public school options in or near the district that will help retain employees with young families.

Grow local businesses by organizing joint demand among district anchors and firms for local goods and services. Several anchors and firms in the district already prioritize local purchasing in their goods and services procurement policies. For example, the University of Pennsylvania’s much-lauded 1990s West Philadelphia Initiative included an emphasis on procurement in surrounding neighborhoods, and now the university spends over \$120 million in West Philadelphia alone (which is part of the nearly \$350 million spent in the city overall). Similarly, Drexel’s

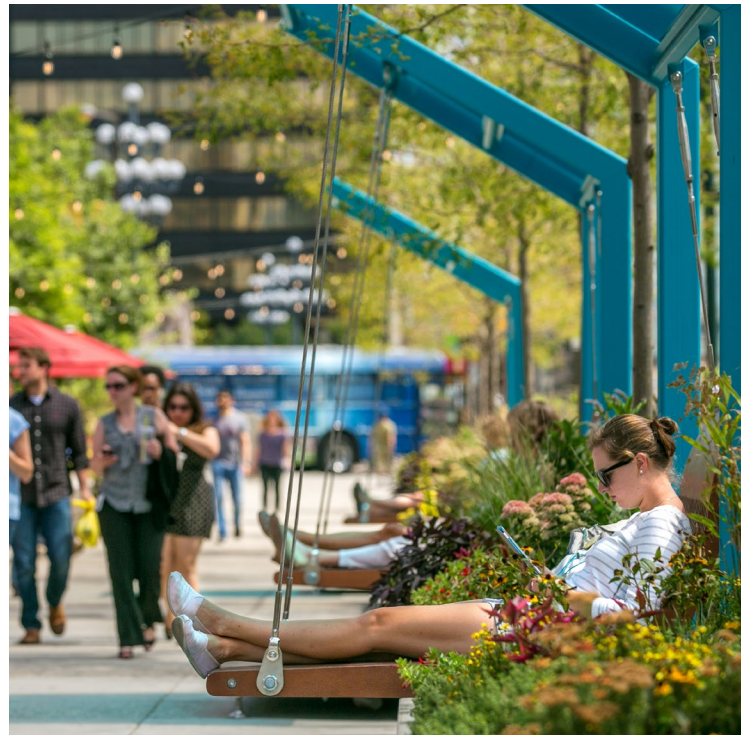
Office of University and Community Partnerships has collaborated with its Procurement Services department to analyze the university's procurement spending, reframe its supplier diversity program, and work to form an anchor alliance in West Philadelphia. Other anchors and firms have made individual efforts to purchase locally and/or from minority- or women-owned businesses.

The city's Anchor Procurement Initiative—which focuses on organizing joint demand from the city's many anchor institutions and developing new sources of supply through scaling and technical assistance—offers a potential opportunity for district stakeholders to collectively participate in a local procurement initiative and support Philadelphia businesses, and the jobs they create, in the process. The combined purchasing power of multiple anchor institutions not only increases the total dollar amount of goods and services purchased locally, but also simplifies and routinizes the process for firms to engage with multiple institutions. And this ensures that local firms have a steady stream of business, enabling them to scale and ultimately create jobs.

Further, the initiative should continue to make local purchasing a “mission critical” component of anchors' contracts with national integrator organizations—such as Aramark for food services—which would in turn help local suppliers connect to both institutional supply chains and national markets. Assisting firms to break into national markets will create further demand for their goods and services, which will ultimately require and create more local jobs.

4. Form a connected-corridor taskforce for University City–Center City

The Market Street corridor and Schuylkill River areas are undergoing rapid redevelopment. Comcast's towers at the east end of the district, Aramark's new headquarters along the river, Pennovation to the south, uCity Square and Schuylkill Yards in University City, the 30th Street Station District Plan, and a number of additional projects together are helping University City and Center City merge into a major regional



Several projects have been developed to better connect University City and Center City along Market Street, such as improvements to the Market Street bridge and the development of the Porch. Photo credit: Ben Tran.

center of economic activity. Moreover, these two areas already constitute a live-work zone where the majority of residents commute to work without a car.

Despite these trends, quality-of-place and infrastructure challenges persist. This is in part due to the fact that, while many private and civic stakeholders are actively making improvements in the area, a comprehensive, unified vision and plan for the full corridor does not yet exist, and efforts are thus largely ad hoc and driven by individual actors. As a result, the Market Street corridor provides a fairly tedious and sometimes hostile experience that does little to engage residents and workers and limits the strong sense of dynamism and connectivity between University City and Center City one ought to expect given the number of people living and working in the area. At the same time, recent redevelopment efforts along the Schuylkill River—led by the Schuylkill River Development Corporation and enhanced by private-sector actors—have improved connectivity and access, but the effort is still relatively nascent, and complicated infrastructure challenges remain.

Robust growth and development in University City and Center City

provide an opportunity for stakeholders to coordinate around making Market Street the central spine of the innovation district, and the river the natural artery from the district's heart to its southern edge.

Existing efforts to connect University City and Center City

City stakeholders have long identified and attempted to address physical infrastructure and quality-of-place weaknesses along the Market Street corridor and the Schuylkill River. Over 50 years ago, planners identified the need for infill development between Center City and University City and envisioned a single central business district spanning the Schuylkill River.⁶³

UCD, CCD, and SRDC should together form a dedicated taskforce focused on forging a stronger connection between the region's largest employment hubs and, importantly, the major innovation assets within them.

More recent efforts by Center City District (CCD), University City District (UCD), Amtrak, and the Schuylkill River Development Corporation (SRDC) have sought to strengthen connectivity between the two employment nodes and the river, with recommendations ranging from vehicular redirection and improved transit access to better lighting and the creation of linear parks.⁶⁴ Notable placemaking improvements have been made in the

area over the past several years—including the Schuylkill River Trail, the Schuylkill Banks Boardwalk, the Porch at 30th Street Station, and the new planters along the Market Street bridge, among others.

Recommendation

UCD, CCD, and SRDC should together form a dedicated taskforce focused on forging a stronger connection between the region's largest employment hubs and, importantly, the major innovation assets within them. The taskforce should consist of representatives from the three organizations, and include other key stakeholders along Market Street and the river such as Brandywine, Drexel, Comcast, Penn, SEPTA, Amtrak, CHOP, UCSC, Wexford, IBX, PECO, and other major property owners.

The first charge of the taskforce should be to review, compile, and coordinate the findings of all existing land use studies and plans for Market Street, the river, and major redevelopment areas along each. These would include, for example, the 30th Street Station District Plan,

the Schuylkill Yards plan, and other corridor studies.

This undertaking would have three purposes:

- **Identify areas of strength and vibrancy along Market Street**, as well as the un- and underdeveloped parcels that weaken the physical and economic connection between Center City and University City.
- **Determine the most viable options for improving transit and highway access**, as well as opportunities to better leverage and connect the nascent activity and development along the Schuylkill River.
- **Look for common goals and challenges** around which to garner unified support.

The findings from this analysis should then be used to inform a collective vision for making Market Street and the riverfront iconic, interconnected corridors in Philadelphia, and to develop an action plan that could guide both private development and public investment toward realizing that vision. The action plan should align with other existing plans and studies, and should outline potential strategies to:

- **Make the corridors more pedestrian friendly, accessible, attractive, and interesting.** CCD recently commissioned an architectural firm to assess opportunities, and it determined that development potential exists on the bridges connecting University City and Center City, and that there are good candidate parcels for infill development along the edges of the river.⁶⁵ Numerous un- and underutilized parcels also exist along Market Street itself that if thoughtfully redeveloped could significantly improve the street dynamic.
- **Develop infrastructure that enhances connectivity and safety for bicyclists along the entire corridor.** New infrastructure would both respond to and help foster the growth of cycling as a transportation option. Such infrastructure is also much easier

and cheaper to build in the short term than is a large-scale transit project.

- **Leverage the location of the 30th Street Station area and the new and improved public spaces at Schuylkill Yards and the Porch** to create a distinctive gateway to the emerging innovation district. Located adjacent to the country's third-busiest Amtrak station, the spaces should serve as the de facto welcome mat to the city and the innovation district.

Financing an innovation corridor

In the short term, taskforce members will need to raise and/or commit their own funds to conduct the initial analysis and develop the vision and action plan. Certain elements of the plan could be implemented by individual private and other stakeholders as part of existing and planned developments. But the taskforce will need to explore creative financing options for major infrastructure and other improvements that fall out of the purview of any single actor.

Looking to Denver's Union Station redevelopment as a best-practice example, stakeholders should consider federal infrastructure financing mechanisms such as the Railroad Rehabilitation & Improvement Financing (RRIF) Act and the Transportation Infrastructure Finance and Innovation Act (TIFIA) to finance improvements around 30th Street Station and new or enhanced transit infrastructure, respectively.⁶⁷ Expanded under the 2015 federal transportation bill, these financing mechanisms provide low-cost, flexible loans intended to promote district-based infrastructure development, and represent a new funding source available to be tapped by cities. Partnering with Amtrak and SEPTA would be a particular competitive advantage for Philadelphia for RRIF funding, as it is specifically designed to support improvements on major rail and freight corridors. RRIF is already a targeted funding source for the 30th Street Station District Plan, and Amtrak and SEPTA could consider expanding its scope for greater impact.⁶⁸

- **Explore options for unifying the landscape and public realm plans for the new developments at Schuylkill Yards and uCity Square**, with the goal of creating a stronger feeling of continuity between the two areas and the four blocks along Market Street that connect them.
- **Build on the city's plan for the lower Schuylkill River and improve the connectivity** between the fast-growing Grays Ferry community—home to Pennovation Works—and Center City and University City, which can be better connected by a river trail, lighting, street furniture, landscaping, and pedestrian access.

The plan should also examine the feasibility of longer-term, big ticket opportunities to enhance transit and improve highway access:

- An additional stop on the Market-Frankford subway line at or around 21st Street or the extension of the PATCO subway line to 21st Street have been suggested by several studies. CCD and Econsult Solutions conducted research on what new development may be induced by a

new transit stop, and found a potential fiscal impact in excess of \$130 million to the city.⁶⁶

- Separation of freight and passenger rail traffic on the Airport line would create a new higher-frequency transit connection between University City and Center City and open new park and ride opportunities to reduce auto trips to the two areas.
- Replacement of the SEPTA Trolley fleet is a “state of good repair” priority that would provide full accessibility to existing trolley stops in University City and Center City and faster and more reliable service.

Section 4: Conclusion

In many respects, Philadelphia is in an enviable position. Its major private and institutional anchors—by definition the enduring strongholds of the economy—are ever-evolving and advancing their roles in the city’s innovation ecosystem, while the tech and entrepreneurial community continues to mature and expand. Much of this activity is collecting and concentrating in the innovation district and other hubs—vibrant, growing areas in their own right and vital energy sources for the wider regional economy. There are new buildings on the skyline and new stories to tell about the exciting efforts underway within them. The wind is at the city’s back, and the market is starting to take notice.

But for all this, Philadelphia’s economic performance remains middling, and promising economic gains have still left some populations and communities behind. All these assets and efforts haven’t been enough to propel a region this big to first-tier status—one where cutting-edge ideas become globally significant solutions; where new firms, jobs, and investments grow as a result; and where people and neighborhoods are connected to, and themselves important drivers of, the city’s economic progress.

This report has argued that Philadelphia’s chance of becoming a top-tier city—with all the attendant firms, jobs, revenues, and innovations that status would bring to the city, region, and beyond—cannot hinge on the individual acts of Penn or Drexel, Comcast or CHOP, Ben Franklin Technology Partners or the Science Center, City Hall, or any other single entity. Rather, it demands that the city’s innovators, entrepreneurs, higher education and hospital anchors, business

leaders, and government put determined influence and serious resources behind aspirations that are larger than themselves.

Such a path demands an unprecedented commitment from all these groups, with the acknowledged risk that each of them already has many other worthy diversions and priorities into which it puts its time and resources. It is a commitment that builds on the city's core competencies, resources, and talents, and focuses on the challenges that hold it back. Most importantly, it is a commitment that requires Philadelphia to reject the status quo—the belief that current practices are capable of achieving desired outcomes and that big ambitions can't be accomplished—and instead embrace a conviction that new attitudes and behaviors can drive real change.

Indeed, the Economy League of Greater Philadelphia in 2012 identified the need for "collaborative leadership that invests time and resources in innovation-supporting activities."⁶⁹ Five years later, Philadelphia can no longer afford to wait.

Other cities are rising to this challenge. Given its assets and the progress it has already made, there is little reason Philadelphia should not lead the way.

Endnotes

1 Philadelphia is also using local tax revenue to support talent development. The recently implemented “soda tax” taxes sugar-sweetened beverages, and is expected to generate nearly \$100 million per year in order to fund three major initiatives: a major pre-K expansion, the establishment of 25 “community schools” that offer social and health services to nearby residents, and a major investment to the city’s parks, recreation centers, and libraries. See, for example, Jared Brey and Holly Otterbein, “The no-bullshit guide to the fight over the Philly soda tax,” *Philadelphia Magazine*, June 8, 2016, <http://www.phillymag.com/citified/2016/06/08/soda-tax-no-bullshit-guide/>.

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