

Positioned for Growth: Advancing the Oklahoma City Innovation District

April 2017



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

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Project background

In spring 2015 seven major Oklahoma City institutions—the Greater Oklahoma City Chamber, the Presbyterian Health Foundation, the Oklahoma Health Center Foundation, the City of Oklahoma City, the Alliance for Economic Development of Oklahoma City, the Oklahoma Medical Research Foundation, and the University of Oklahoma—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 the Health Center and Automobile Alley area of the city. Recognizing the extent to which this hub concentrates a large number of the region's innovation assets, these leaders engaged Brookings and Project for Public Spaces (PPS) to help them understand the area's distinctive strengths and to identify the as-yet missed opportunities to build on them in ways that advance the district's innovation ecosystem and improve the competitive position of the Oklahoma City region.

To this end, Brookings and PPS—with analytic help from Mass Economics in Cambridge, Mass.—conducted an extensive, quantitative 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; undertook on-the-ground observational research to understand how and when district spaces were utilized; conducted a survey of Health Center students and employees to understand their commuting patterns and use of public spaces; and participated in several stakeholder meetings and workshops. We also engaged in task forces—on innovation, placemaking, and governance—that local stakeholders convened to discuss specific structures and strategies to leverage district assets and address key challenges.

This document outlines the results of our audit, and, building on the work of the task forces, makes several recommendations that district leaders—working together with other key private, public, and civic leaders in the city and region—can employ to build a more innovative, vibrant, 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: Aerial view of the Oklahoma City innovation district, with downtown Oklahoma City in the background.
Photo credit: Greater Oklahoma City Chamber.

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Executive Summary

In today's global economy, cities rise above international competitors—or not—based on their ability to innovate not within single industries—autos, steel, energy—but rather by finding new points of convergence across them.

The implications of this new competitive landscape for Oklahoma City are significant. Two of the region's largest economic clusters—energy and health care—are undergoing substantial disruption. The expansion of North American natural gas has opened the energy economy to new players. In health care, life science breakthroughs are coupling with information technology in areas like personalized medicine and health IT to redefine the care continuum, creating wide openings for technology and life science capitals like Austin, Texas; Boston; and San Francisco.

Yet as crosscutting technologies—from “big data” to sensing—expand the competitive playing field in industries critical to Oklahoma City, they also create unprecedented opportunity for the region to vault ahead of its peers.

This great leap will not happen spontaneously, however. To leverage advantages in health, energy, and other sectors, Oklahoma City's public and private leaders need to take action to improve joint industry-relevant research; grow, attract, and retain new technology companies; and ensure that the workforce is prepared for future jobs. They need to invest in creating dynamic, high-quality places where research institutions, firms, and talent concentrate and connect. And they need to nurture the talents and potential of low-income residents, who, if history is any lesson, might otherwise remain disconnected from the innovation economy's growth.

The Oklahoma City metropolitan area has long-standing industry strengths and assets on which to build a new convergence economy. The region dominates in oil and gas extraction, and it is becoming a global center for advanced energy technology, evidenced by the recent opening of the General Electric (GE) Global Research Oil & Gas Technology Center. Outside of energy, the region has economic strengths in aerospace engineering, led by Tinker Air Force

Base, Boeing, and Northrop Grumman, and in health care, driven by the University of Oklahoma Health Sciences Center (OUHSC), the Oklahoma Medical Research Foundation (OMRF), and a number of private-sector firms.

The new GE facility and these health care assets largely concentrate in Oklahoma City's emerging innovation district. Bounded roughly by Robinson and Lottie Avenues to the west and east and 4th and 13th Streets to the south and north, this 1.3-square-mile area encompasses both the Oklahoma Health Center and the vibrant commercial corridor of Automobile Alley. A significant center of job growth, the district reflects the shifting geography of the global economy and the emergence of dense hubs of economic activity where innovation, entrepreneurship, creativity, and placemaking intersect.

With the right investments, the Oklahoma City innovation district has the potential to become a major center of gravity for innovation and economic development in Oklahoma City.

Oklahoma City's innovation district is already a vital part of the region's innovation economy. Over 18,000 people work in the area, almost 5 percent of the city's total. Its cluster of medical and research institutions attracts three-quarters of the project dollars the state receives from the National Institutes of Health, and its improved commercialization outcomes, coupled with the presence of business support organizations like i2E, position it to become the region's hub of entrepreneurial activity. Furthermore, the district's proximity to downtown—which is home to several major energy company headquarters—and other areas of growth give it a powerful locational advantage. Though only about 1,200 people live within the district itself, the neighborhoods to the west and south, such as Bricktown and Deep Deuce, have enjoyed a noticeable uptick in housing values, development, and amenities.

Challenges

For all its strengths, however, the district has yet to tap its full potential, and it faces a number of challenges in terms of innovation, place, and inclusion:

Innovation challenges: A historically medical-centric area, the district has neither the density nor diversity of institutions, firms, startup companies, and innovation spaces that many of its peers possess. And while many of the area's health care and energy institutions and firms are physically close to one another, few organizing structures exist to strategically connect these industries—to one another and to other regional assets—around common technology platforms.

Place challenges: The district's car-centric physical layout and lack of gathering spaces hinder companies and workers from taking advantage of their proximity to interact, exchange ideas, and build collaborative networks. Meanwhile, limited walkability in and around the district makes the more amenity-rich areas nearby feel further away than they actually are. Such place-related drawbacks may impede the ability of district firms and institutions to attract talent.

Inclusion challenges: Though well-paying jobs exist in the district for workers with varying education and skill levels—roughly 55 percent of district jobs do not require a four-year degree—the low-income residents of neighboring communities remain largely disconnected from employment within the district.

Oklahoma City's innovation district concentrates innovation and technology assets that could propel the region into global prominence within a range of converging technologies, particularly those related to health and energy. But reaching this potential will require that district and Oklahoma City leaders address the area's challenges and collectively define and support a new vision and set of strategies to create a dynamic, inclusive hub of innovative and entrepreneurial activity.

Recommendations

To this end, this report recommends four multifaceted strategies around which innovation district anchor institutions, firms, and civic leaders should rally city and regional stakeholders to engage with their time, expertise, and resources:

1: Establish an Oklahoma Center for Energy and Health Collaboration that serves as the physical and programmatic umbrella for innovation and applied research within these and other sectors. The center would be a staged, multi-tiered initiative that supports the collaboration between prominent but currently disjointed economic clusters, beginning with energy and health care and eventually expanding to other clusters such as aerospace. The district should become the central hub of collaboration by *securing space for the new center and attracting strategic partners*, including corporate anchors, faculty from external universities, and entrepreneurs. The center *should also house a translational research and commercialization office* for crosscutting industry applications of research.

The new center would likely be initially funded and operated by the overarching governance structure of the district, but eventually—as regional energy companies and universities outside the district begin to partner with the center on translational research—a coalition of internal and external organizations should emerge to help set the center's agenda and direction.

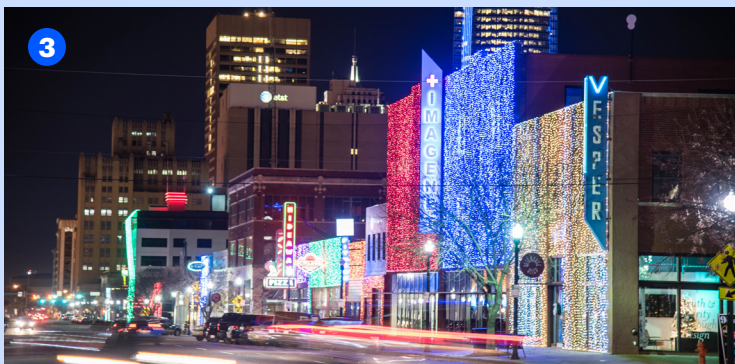
2: Implement a technology-based economic development and entrepreneurship effort within the innovation district specifically tasked with overseeing strategic business development, technology business attraction, marketing, and regional cluster development between entrepreneurs, small and medium-sized enterprises, and large firms. This new effort should partner closely with market-oriented entities in the district like i2E, which works with entrepreneurs, researchers, and companies to help them commercialize their technologies and grow new businesses. Finally, an innovation district seed fund and tailored accelerator would go a long way toward helping research entrepreneurs access early-stage capital for prototyping and market testing.

This effort likely does not require a new institution. Instead, existing organizations could coordinate and be tasked and resourced to focus on economic development and entrepreneurship activity within the district.

3: Create a denser, more active, and better-connected mixed-use urban environment in and around the innovation district, an essential complement to the actions recommended above to build a collaborative network among institutions and companies to spark innovation and firm development. To do so leaders should *undertake new land use and real estate development efforts* that will provide the types of commercial and residential uses, whether in new infill development or in existing buildings, that will lead to a more vibrant, sociable, and around-the-clock district environment; *implement new placemaking efforts* such as lectures, networking activities, food events and festivals, outdoor performances, recreational activities, health fairs, and opportunities for outdoor play; *strengthen connections between the Health Center and Automobile Alley* via new landscaping, lighting, and other pedestrian improvements on NE 10th and NE 13th Streets and on the bridges over Interstate 235, and by new development along 10th Street; *improve bike and pedestrian routes within the*

Health Center to allow for easier access between parking lots and workplaces and between workplaces and new destinations (such as programmed public spaces); and *make the innovation district more porous and connected to residential neighborhoods.*

4: Form a standing committee on diversity and inclusion charged with overseeing the design of strategies aimed at forging better economic, social, and physical connections between the innovation district and the underserved communities surrounding it. The committee would comprise and/or work more broadly with representatives from the district's institutional and private-sector stakeholders; education providers such as Oklahoma City Public Schools, local community colleges, and technology (CareerTech) centers; area workforce entities; and the nonprofit community, including neighborhood groups. The committee would focus on issue areas like *education, workforce development, entrepreneurship, and placemaking/neighborhood development; guide and oversee goal and strategy development; and serve as a liaison* between parties to facilitate alignment and coordination of efforts. The committee would also evaluate proposals and make funding recommendations.



1. Aerial view of the Oklahoma City innovation district, with downtown Oklahoma City in the background, photo credit: Greater Oklahoma City Chamber; 2. Wide streets—like NE 10th Street—reinforce the district's largely suburban development pattern, photo credit: PPS; 3. Automobile Alley is an amenity-driven corridor featuring restaurants, bars, coffee shops, and a coworking space, photo credit: Greater Oklahoma City Chamber; 4. Stakeholders have made significant investments to outdoor spaces in the district, such as Stanton L. Young Walk, photo credit: PPS.

Governance Structure

Finally—and as called for in the Oklahoma Regional Innovation District Project Plan—*district leaders need to establish a new type of governance entity* that gives voice to the district’s narrative, defines what the district should aspire to become, and works with other area stakeholders to determine what innovation, place, and inclusion strategies it needs to employ as a unified *place* so as to have maximum collective impact on the city and region.

Whether Oklahoma City stakeholders decide to create a new organization or repurpose an existing one, they have a chance to be trailblazers in establishing an entity that has a singular focus on the district and undertakes all the responsibilities that entails. Such an entity does not need an army of dedicated staff, but it must have:

- an executive director who understands the innovation ecosystem and has the ability to coordinate actors both within and outside of the district around defined goals and strategies;
- a leadership structure (a board or steering committee) with the influence and authority to rally critical stakeholders and guide district efforts;
- discrete committees (e.g., on diversity and inclusion) and standalone initiatives (e.g., the Oklahoma Center for Energy and Health Collaboration) that will develop and drive key strategies;
- the staff capacity needed to support and coordinate the board, committees, and initiatives; interact with district and non-district stakeholders (including regional industry leaders, local government, the Urban Renewal Authority, neighborhood organizations, etc.); develop, implement, and align district-wide programs, land use planning, and placemaking activities; and raise funds.

Most importantly, this entity requires a strong innovation team (or at minimum a high-level leader) that sits between institutions and can catalyze a shared vision that holds a strong value proposition for each individual actor. Fulfilling this role will require a scientific understanding of

the research portfolio and the ability to identify external partners, market opportunities, and funding opportunities.

Oklahoma City is poised to organize itself to be a fierce competitor in the innovation economy and to build a stronger regional economy as a result—if it has the vision and will to do so. The city has demonstrated its capacity to coalesce around bold ambitions before, rallying to build the Oklahoma City National Memorial and Museum, investing in its downtown, and passing multiple rounds of the Metropolitan Area Projects (MAPS) initiative to finance major redevelopment, infrastructure, and school improvements. It is again time to channel that collective spirit to grow a more inventive, entrepreneurial, and inclusive Oklahoma City economy.

Section 1: Introduction

Throughout the 20th century, urban areas tended to be defined by their big industries. Pittsburgh, for instance, was a steel town, San Jose was a semiconductor mecca, and Oklahoma City was an oil center. Today, cities rise above international competitors—or not—based on their ability to innovate not within single industries, but rather by finding points of technological convergence across them. Data analytics and “big data,” new materials, sensing and automation, genomics, and dozens of other technologies crosscut nearly every sector of the economy.

Today, the pressure to remain ahead of the curve in these technology platforms is altering the global competitive landscape of cities.

The implications for Oklahoma City are significant. Two of the region’s largest economic clusters—energy and health care—are undergoing substantial disruption and are particularly susceptible to competition from new, insurgent cities. Pittsburgh and Philadelphia, for example, are aligning existing strengths in automation, robotics, and advanced manufacturing to carve away pieces of the energy market in engineering services and high-value production around the natural gas boom.¹ Meanwhile, existing international energy centers like Calgary, Canada; Stavanger, Norway; and Houston are investing billions of dollars in research and workforce training.² In health care, life science breakthroughs are coupling with information technology (IT) in areas like personalized medicine to redefine the care continuum, creating wide openings for technology and life science capitals like Austin, Texas; Boston; and San Francisco.³ As Brookings

scholar Jonathan Rauch has written, “Health care is beginning to taste the disruptive culture of Silicon Valley, retailing, and many other American sectors.”⁴

While crosscutting technologies are expanding the competitive playing field in industries critical to Oklahoma City, they are also creating unprecedented opportunity. Given the deep bench of talent, innovative capacity, and public and private research in new technologies most relevant to its largest sectors, Oklahoma City is well-positioned to vault ahead of its peers.

But time is not on its side. Analysts predict that in many of these technologies geographic dominance will be defined within the next five to 10 years.⁵ For the city to be among the winning regions, Oklahoma City’s public and private leaders need to take action to improve joint industry-relevant research; grow, attract, and retain new technology companies; and ensure that the region’s workforce is prepared for future jobs. And they need to invest in creating dynamic, high-quality places where research institutions, firms, and talent concentrate and connect.

The Oklahoma City metropolitan area has long-standing industry strengths and assets on which to build a new convergence economy. The region dominates in oil and gas extraction, with 11 times the local employment one would expect given its population.⁶ This concentration is in large part due to the metro area’s cluster of global oil and gas headquarters, including Chesapeake Energy, Devon Energy, Continental Resources, and SandRidge Energy, among others. Far from “old economy” energy extraction, Oklahoma City is a global center for advanced energy technology, evidenced by the recent opening of the General Electric (GE) Global Research Oil & Gas Technology Center. The main campus of the University of Oklahoma (OU), in Norman, also has well-established research prowess in geosciences and engineering.

Outside of energy, the region has considerable economic strengths in aerospace engineering, led by Tinker Air Force Base, Boeing, and Northrop Grumman, and in health care, driven by the University of Oklahoma Health Sciences Center (OUHSC), the Oklahoma Medical

Research Foundation (OMRF), companies like COARE Biotechnology and Selexys, and several other institutions. These health care assets largely concentrate in Oklahoma City's emerging **innovation district**, which encompasses both the Oklahoma Health Center (which comprises OUHSC, OMRF, and other major health facilities) and the vibrant commercial corridor of Automobile Alley. Indeed, the district is the region's epicenter of medical research: Over three-quarters of the state's National Institutes of Health (NIH) dollars flow to the area, and

it is home to a comprehensive suite of professional and medical schools.⁷ Major players in the energy sector are also nearby: GE's new center is within the district, while Devon Energy, SandRidge Energy, and Continental Resources are just blocks away downtown.

The emerging innovation district has not yet tapped its full potential as a center of gravity for innovation and economic development.

Yet for all of these strengths, the emerging innovation district has not yet tapped its full potential as a center of gravity for innovation and economic development. While many of the area's health care and energy institutions and firms are physically close to one another, few organizing structures exist to strategically connect these industries—to one another and to other regional assets in Norman and elsewhere—around common technology platforms. Moreover, the district's car-centric physical layout and lack of gathering spaces hinder companies and workers from taking advantage of their proximity to interact, exchange ideas, and build collaborative networks. Such place-related drawbacks may also impede the ability of district firms and institutions to attract talent.⁸

Oklahoma City leaders have an opportunity to address these challenges and collectively define and support a new vision and set of strategies for the region that:

- build on its research and industry capacity to develop new crosscutting technologies that improve the competitiveness of existing and emerging industry clusters;
- create a dense, dynamic innovation district that is attractive to residents, firms, and workers; fosters social interaction within the district; and is connected with other innovation hubs in the region;

- nurture the talents and potential of nearby low-income residents who, if history is any lesson, might otherwise remain disconnected from the district, and ensure that the innovation economy of the future includes people of varying backgrounds and perspectives.

Peer cities with innovation districts anchored in health care

We selected four peer urban medical anchor districts against which to compare the Oklahoma City innovation district:

Birmingham

Located south of the downtown, Birmingham's emerging innovation district is anchored by the University of Alabama at Birmingham (UAB) campus and the UAB hospital. The district is roughly 1.5 square miles in size and is home to nearly 29,000 jobs and 5,200 residents.

Buffalo

Spanning much of the downtown and the Main Street corridor, the district is primarily anchored by the Buffalo Niagara Medical Campus, a not-for-profit umbrella organization that includes institutions such as the University at Buffalo and Buffalo General Hospital, among others. The area is about two square miles in size and is home to over 40,000 jobs and 12,800 residents.

Indianapolis

Situated northwest of downtown, the emerging district includes Indiana University—Purdue University Indianapolis and 16Tech, a major redevelopment project to feature 100,000 square feet of research and office space anchored by the Indiana Biosciences Research Institute. The 1.5-square-mile district currently has nearly 34,000 jobs and 4,200 residents.

Cortex/St. Louis

Positioned west of St. Louis' midtown, the Cortex/St. Louis district consists of several anchors: Cortex Innovation Community, a major redevelopment serving as a hub of the city's startup community; Washington University in St. Louis; St. Louis University Medical Campus; and Missouri Botanical Garden. Separated into two areas by Forest Park, the 1.4-square-mile district is home to almost 40,000 jobs and 10,000 residents.

In the end, the motivation and drive of Oklahoma City's leaders will be the biggest determinant of whether the city doubles down on its future or keeps riding on the coattails of its past. The city has demonstrated such will before, rallying to rebuild after the Alfred P. Murrah Federal Building bombing in 1995, and passing multiple rounds of its successful Metropolitan Area Projects (MAPS) initiative to finance major redevelopment, infrastructure, and school improvements.⁹ It is again time to channel that collective spirit to grow a more inventive, entrepreneurial, and inclusive Oklahoma City economy.

Section 2: The Oklahoma 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 firms, along waterfronts, or in urbanizing science parks.¹⁰ Strong in sectors such as the life sciences, technology and engineering, and creative industries, these districts cluster and connect research institutions and research-and-development-intensive companies with a rich entrepreneurial ecosystem of startups, venture capital firms, and co-working spaces. They also have good transit and walkability; a diversity of arts, culture, and other amenities; and a strong sense of place and community.

Located just northeast of downtown, Oklahoma City's emerging innovation district—bounded roughly by Robinson and Lottie Avenues to the west and east and NE 4th and 13th Streets to the south and north—is a vital part of the region's innovation economy. The 1.3-square-mile district comprises what are currently two distinct areas bisected by a major interstate highway. The Oklahoma Health Center concentrates the majority of the innovation and anchor assets, including the University of Oklahoma Health Sciences Center, the University of Oklahoma Medical Center, the University Research Park, the Oklahoma Medical Research Foundation, the business support organization i2E, the Oklahoma City Veterans Affairs (VA) Medical Center, and the Dean McGee Eye Institute. GE's Global Research Oil &



The district concentrates innovation assets in the Health Center and amenities in Automobile Alley. Source: Google Earth

Gas Technology Center opened in the Health Center area in 2016. Adjacent to the Health Center is Automobile Alley, an amenity-driven commercial corridor featuring coffee shops, boutiques, restaurants, and a co-working space.

The district and its surrounding neighborhoods are experiencing substantial growth. From 2004 to 2014 the number of jobs in the district increased by 27 percent to reach over 18,000—almost 5 percent of the city’s total.¹¹ And though only about 1,200 people live within the district’s boundaries, to the west and south the real estate market has been gaining momentum, with a noticeable uptick in housing values, development, and amenities in nearby neighborhoods such as Bricktown and Deep Deuce.¹²

From 2004 to 2014, the number of jobs in the district increased by 27 percent to reach over 18,000.

Given all this, the area is ideally situated to become a significant growth hub. The opportunity is potentially impeded by several obstacles, however.

With Tinker Air Force Base and Boeing southeast of the city and the University of Oklahoma’s main campus in Norman, Oklahoma City’s other innovation hubs are distributed throughout the region. This dispersal of activity—and more importantly a lack of strategic connections among major institutions

and firms, even when near one another—has left the region without a clear focal point for its innovation economy. At the same time, density, connectivity, and quality-of-place challenges within the district currently hamper its potential as a dynamic center of idea exchange, collaboration, and inclusion.

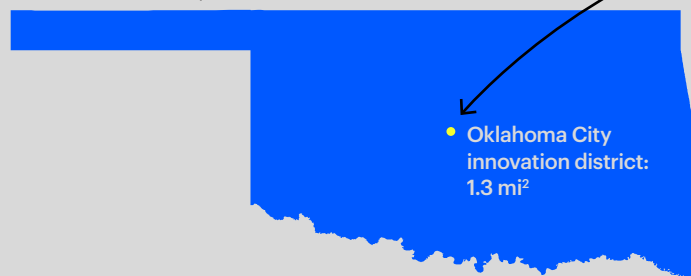
Strengths and weaknesses of the Oklahoma City innovation district

With serious strengths to leverage, as well as real weaknesses to overcome, Oklahoma City stakeholders have an impetus to coalesce around a new competitive vision for district growth and development that could make the district a more powerful source of economic energy for the city and region. Brookings and Project for Public Spaces' analysis of the district revealed some key characteristics that should underpin and inform that effort:

- The district has high levels of research capacity within medical technologies and clinical research, but lacks both density and diversity in its innovation activities.
- The district's proximity to major employment hubs, research facilities, and amenities gives it a powerful locational advantage, but it is not connected to broader regional industry clusters, particularly the energy sector.
- Improved commercialization and applied research and the presence of business support organizations like i2E position the district for entrepreneurial activity, but these strengths have not yet translated into a wellspring of startups.
- Stakeholders have invested in events, landscaping, and other improvements, but the Health Center area of the district lacks the density and mix of uses that innovative firms and talent increasingly desire.

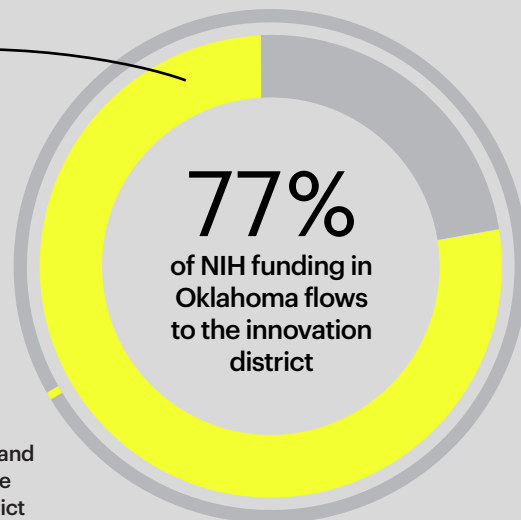
Over three quarters of Oklahoma's National Institutes of Health (NIH) investments flow to the innovation district

Oklahoma state: 69,960 mi²



• Oklahoma City
innovation district:
1.3 mi²

0.002%
of Oklahoma's land
area is inside the
innovation district



Source: Brookings's analysis of NIH data, 2017

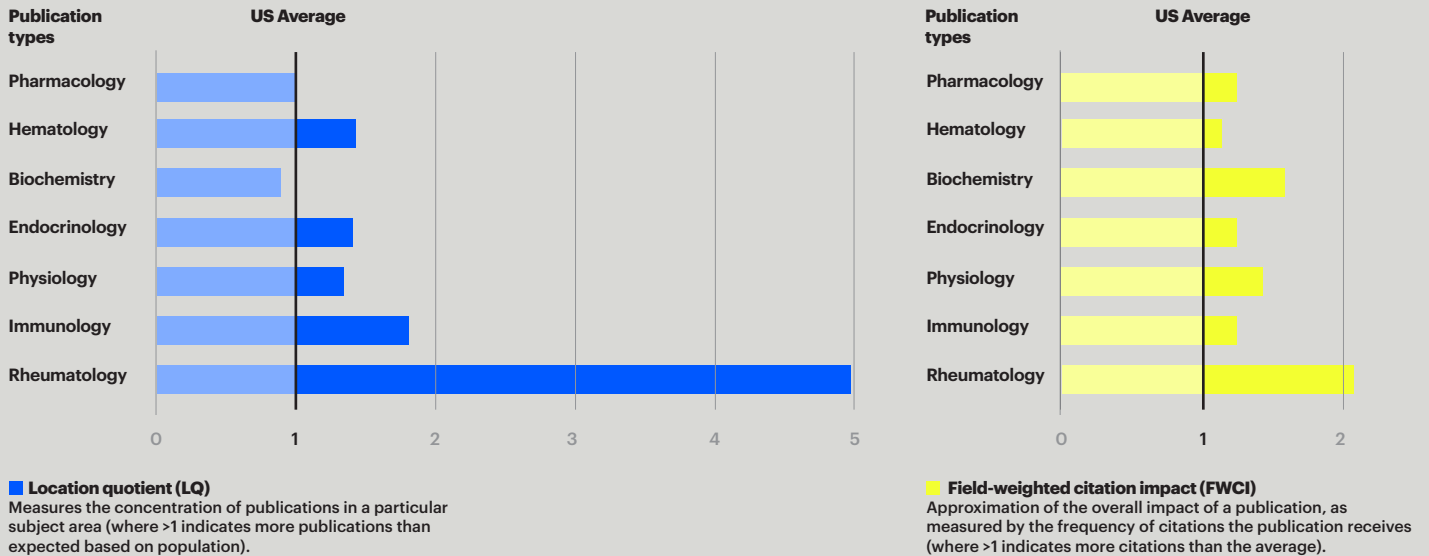
- The district is located near—and includes—lively, mixed-use neighborhoods, but the Health Center's insular nature and car-oriented development pattern limit walkability and separate it from surrounding communities.
- The district has experienced substantial economic activity over the past decade, but many nearby communities and residents are largely disconnected from it.

We examine these characteristics in turn.

The district has high levels of research capacity within medical technologies and clinical research, but lacks both density and diversity in its innovation activities.

The district concentrates a substantial portion of the city and state's health care research and development (R&D) assets. Three quarters of the entire state's NIH investments—a leading indicator of the strength of a region's academic and applied research in health care—flow to the district. The lion's share of NIH funding goes to OUHSC and OMRF

Publications in health care are a core research strength—in both output and quality—of district research institutions



Source: Elsevier, 2014

but also flow to public institutions like the Oklahoma City VA Medical Center as well as private firms such as Selexys Pharmaceuticals, COARE Biotechnology, and Charlesson.

OUHSC is one of only a few academic medical campuses in the country to house a comprehensive set of professional and medical schools, including colleges of dentistry, medicine, nursing, pharmacy, allied health, graduate studies, and public health.¹³ Given the interdisciplinary nature of health-related research, having these professional schools clustered in one location—often sharing faculty and funding—is a significant advantage to the region and provides an unprecedented opportunity to link clinical care and research to support commercial activity in the health fields.

Drug development is a particular academic strength within the district (across all institutions), and publications in cancer, rheumatology, diabetes, biochemistry, immunology, and hematology, among others, rank higher than any other subject matter in this geography.¹⁴ Federal funding reflects the district's substantial strengths in biomedical research, with almost \$25 million flowing to the district through NIH's Centers of Biomedical Research Excellence grants, which promote collaborative research centers in areas of disease research

excellence.¹⁵ The Stephenson Cancer Center represents a budding area of expertise—one that will be an economic asset for the entire state if it proceeds toward NIH designation as a National Cancer Center. Finally, the presence of GE's Global Research Oil & Gas Technology Center will substantially raise the district's competency in energy-related research, although most of the region's research strengths in geology and engineering remain outside the district.

While these strengths are pronounced, the district doesn't yet have the density of firms, universities, entrepreneurs, and intermediaries necessary to be an engine of growth for the region. Innovation is about spreading risk, and the interplay between numerous anchors and firms both within and across sectors allows for many shots before scoring a goal. This is because only a fraction of research will have commercial application, and only a handful of startups become significant and sustainable regional employers. The core challenge facing this historically medical-centric area is that it does not have either the density or diversity of anchors—public or private—needed to support robust regional economic activity.

While its strengths are pronounced, the district doesn't yet have the density necessary to be an engine of growth for the region.

While it is true the district has a significant share of the state's NIH investments and medical research, compared to its national peers research investments are actually low. For example, total R&D expenditures in the district are approximately \$255 million, considerably less than peer districts, such as Buffalo (approx. \$390 million), Birmingham (approx. \$445 million), Indianapolis (approx. \$1.14 billion), and St. Louis/Cortex (approx. \$750 million).¹⁶ On the other hand, over \$100 million of non-industry research occurs outside the district but within the metropolitan area.¹⁷ Unfortunately, the district's ability to create cross-disciplinary products in medical devices, clinical applications, energy, and health IT is hamstrung by the lack of non-medical research—particularly engineering, business, computer science, environmental science, weather and climate, and energy (discussed further below).

Not only is the district's academic and nonprofit research capacity comparatively lean, the district is not getting enough out of its private-sector actors. Because the University Research Park is located within

the district, several large life science companies are strategically located nearby. But these firms don't seem to be well-connected, either to each other or to the adjacent anchors. In fact, rarely were these firms even mentioned in Brookings's interviews as relevant anchors for the district. Outside of health care, GE's new research lab clearly is an unprecedented opportunity for the district, but without points of departure in energy research—through engineering, business, computer science, and other disciplines—the region risks underutilizing this new asset.

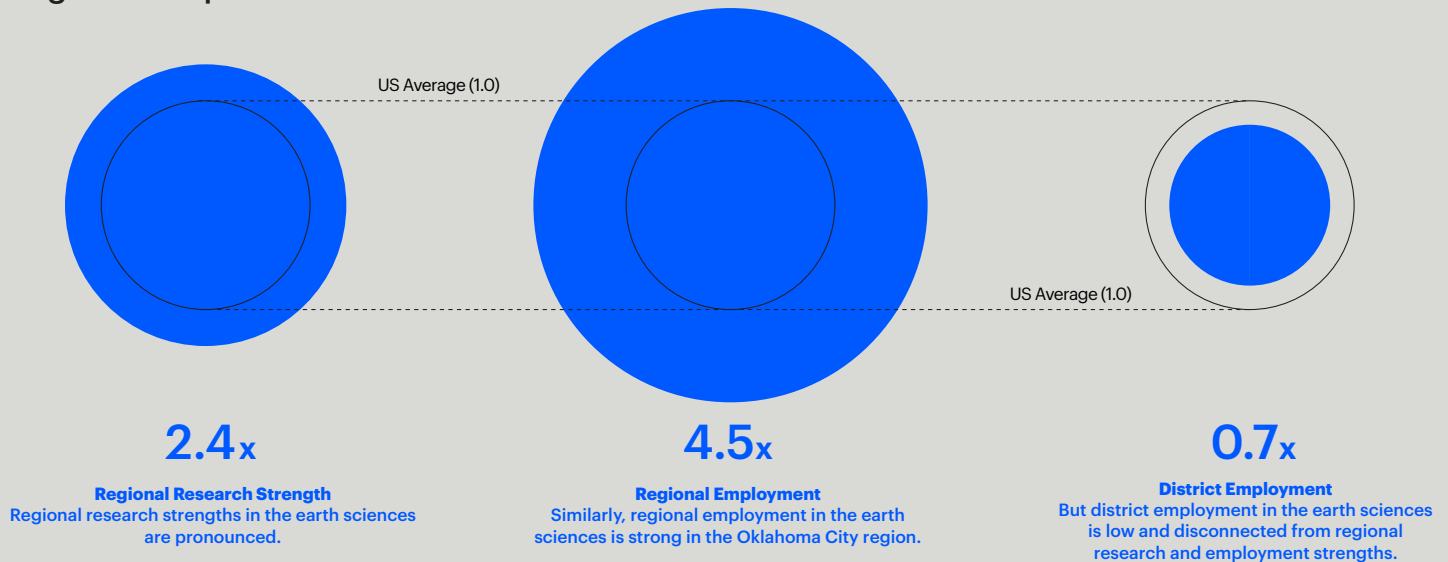
Finally, the district does not have strong intermediaries to link academic research, entrepreneurs, and larger corporate research centers through capital, mentorship, technology transfer, co-working spaces, and other activities. While the district (and region) is not completely for want of innovation intermediaries—i2E, Accele BioPharma, the Presbyterian Health Foundation, and others support the ecosystem by connecting institutions and filling strategic needs—the size and scope of their efforts and integration with other actors is not robust enough to consistently spin off new firms or promote commercialization at an order of magnitude sufficient to support regional economic growth and employment. As one interviewee put it, “we have great actors, but too few linkages undermine their collective potential.”

Research is the feedstock of an innovation-based economy. In order to reach the critical mass needed to promote regional economic growth, the Oklahoma City innovation district needs to forge greater partnerships between the existing anchors as well as consider strategies to attract new players.

The district's proximity to major employment hubs, research, and amenities gives it a powerful locational advantage, but it is not connected to broader regional industry clusters, particularly the energy sector.

While the Oklahoma City metropolitan area has several hubs of innovation, the emerging innovation district's central location is

While the region has notable research and employment strengths in the earth sciences, district employment is not yet tied to these regional competencies.



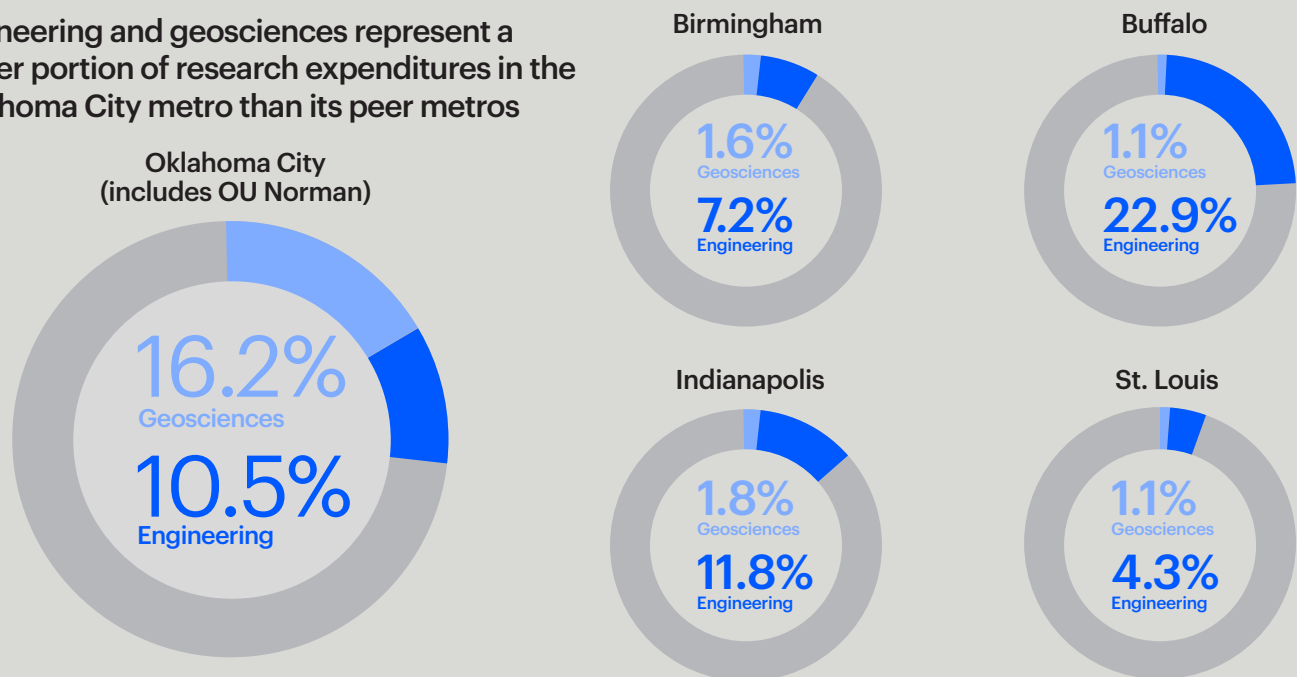
Source: Mass Economics' and Brookings's analysis of Elsevier (2014), NETS, BLS ZCBP (2013), QWI (2014) data

a clear competitive advantage. GE, Devon Energy, Continental Resources, OMRF, OUHSC, and four of the five largest pharmaceutical companies in the metro area are within walking distance of one another. The district's proximity to downtown, to the headquarters of several global firms, and to Bricktown, the Boathouse District, and other amenities creates the opportunity to bolster collaboration and attract talented workers, particularly within the technology and energy sectors. Amenity-rich Automobile Alley is an ideal location in which to increase the region's tech sector and entrepreneurial class. Moreover, the co-location of the research park and GE's technology center offers a rich opportunity to establish a stronger link between engineering, oil and gas, and medical technologies.

Still, the district has yet to take full advantage of the opportunity to connect institutional research with sectors that are responsible for the lion's share of regional employment.

First, the district's current research portfolio does not align with regional employment strengths. Regional employment numbers in both energy and earth sciences, for example, are the highest of any academic disciplines (two and four-and-a-half times as high as medicine, respectively).¹⁸ These are also disciplines in which OU

Engineering and geosciences represent a higher portion of research expenditures in the Oklahoma City metro than its peer metros



Source: Brookings's analysis of NSF data, 2015

Norman has nationally leading research capacity. Engineering and, particularly, geosciences represent more than a quarter of the region's R&D expenditures—more than any peers—but these areas of research are isolated on the Norman campus.¹⁹ In fact, based on the number and prestige of academic publications, physics and astronomy, energy, and environmental science are the strongest areas of research at Norman, but they have virtually no presence at OUHSC. Moreover, an analysis of patent citations and industry–university co-authored papers shows industry–academic collaboration in energy is low even for the research that does exist.²⁰

Second, the innovation district is a prime location in which to create synergies between the health care and energy sectors, but this potential remains untapped. The new GE technology center in the district creates new opportunities in oil and gas, but the lack of connections between public and other private research activity in energy, engineering, computer science, and life sciences is likely to dampen that potential. Research partnerships do exist but they remain largely ad hoc, at the researcher level, and are not sufficiently robust or cross institutional.²¹ Other academic institutions in the region that have research strengths in disciplines highly relevant to health and energy have not been leveraged in the district. For

example, several interviewees at large energy companies discussed the strength of Oklahoma State University in robotics and computer science and how bringing strategic elements of those programs from Stillwater to the district would be an important move to increase density of relevant research assets. Similarly, without the appropriate academic and private-sector support system in place, it will be difficult to fully take advantage of the new GE lab and other regional innovation strengths such as Boeing, Tinker Air Force Base, and the Tulsa medical device cluster.

Creating stronger linkages between existing research strengths in the district and at Norman and other area universities is low-hanging fruit and would help better connect the district to the regional economy.

Improved technology transfer programs, significant applied research, and entrepreneurship programming position the district for entrepreneurial activity, yet these strengths have not yet translated into a wellspring of new companies.

The University Research Park within the Oklahoma City innovation district provides a natural density of life science companies (many of

which have grown out of OUHSC and OMRF research) (see Box “Selexys Pharmaceuticals and the capacity to build startups”). Firms like Cytovance Biologics and Selexys are located within the district, and Allergy Laboratories (\$27 million in revenue) is located just south of it.²²

The Relocation of Anchors

Colleges and universities located outside of major city centers are beginning to recognize that they can achieve better commercial outcomes by co-locating near economic activity in urban areas. In many cases these institutions have moved strategic assets off their main campuses into the innovation districts of adjacent cities. Examples include Arizona State University’s Downtown Phoenix Initiative; the University of Illinois Urbana-Champaign’s engineering presence at the Chicago Innovation Exchange in Hyde Park; Duke’s entrepreneurial hub “The Bullpen” in downtown Durham; and Cornell’s Roosevelt Island Campus Project in New York City.

The clustering of companies in the district is due in part to the strong translational research capacity and entrepreneurial support systems within many of its nonprofit institutions. For example, OMRF is a top nonprofit biomedical research institution that has spun off a number of successful drugs

and has several in its current pipeline, for which OMRF received over \$3 million in licensing income from in 2015. Over half of OMRF researchers have joint appointments with either OUHSC or the VA Medical Center, thereby increasing cross collaboration among the district's academic anchors.²³ OMRF has also funded and partnered with Accele BioPharma (and its venture fund Accele Venture Partners) to identify, finance, and manage early-stage life science companies. Robust clinical activity at the numerous medical institutions within the district provides researchers with access to patients, clinical data, and specialized equipment. Also located in the District, i2E—Oklahoma's premier, private, nonprofit corporation to invest in and support

Selexys Pharmaceuticals and the capacity to build startups

Selexys Pharmaceuticals, located within the district, is a biotechnology company focused on sickle cell disease. In late 2016 the company finalized a deal through which Novartis, the world's second-largest drug company, would acquire Selexys' sickle cell assets for an estimated \$665 million. The size of the deal is significant in its own right, but perhaps more important is the role district institutions played in making it happen. First, the scientific breakthroughs that culminated in the deal came from multi-decade, collaborative research at OUHSC, with which the company's leadership team and key researchers—including Dr. Richard Cummings, Dr. Rod McEver, and Dr. Scott Rollins—all either currently or have been affiliated. Second, a substantial share of early investment in the company came from local investors, including OU, the Presbyterian Health Foundation, and i2E. Through its investment funds, i2E has invested \$800,000 in the firm over the last decade.²⁶ Finally, prior to the sale of the sickle cell disease assets, Selexys spun off a new company, a move indicating that the district is beginning to create a culture of serial entrepreneurs.

Selexys is a clear example of the opportunity within the district, and greater Oklahoma City, to translate research into profitable companies through local investment that strengthens the entire region's capacity to build successful startups.

entrepreneurship—has invested \$33 million and assisted 676 Oklahoma entrepreneurs; it has received national awards from the Kauffman Foundation and the State Science & Technology Institute.²⁴ Finally, OU's full-time MBA and executive education programs at the Price College of Business have recently moved from Norman into the district, significantly increasing the opportunity to link business faculty, graduate students, and entrepreneurs with other academic researchers and existing firms in the research park.

The emerging entrepreneurial ecosystem in the district is yielding startup success. For example, in 2016 Novartis closed a deal to purchase district-based Selexys Pharmaceuticals for \$665 million (see the accompanying box).²⁵ The research and commercial outcomes represented a clear example of academic science translating into a company, supported through local investors and intermediaries like i2E and attracting follow-along funding from a global venture capital firm, MPM Ventures in Boston. Pure Protein, another district-based health startup, concluded a deal for over \$600 million with global pharmaceutical company AbbVie.



Automobile Alley is an amenity-driven corridor featuring restaurants, bars, coffee shops, and a coworking space. Photo credit: Greater Oklahoma City Chamber.

These examples suggest that the district is getting on the map for global pharmaceutical investments.

But while entrepreneurship is becoming more prominent in the district, commercialization and entrepreneurial activity is not yet a high enough priority. The result has been underperformance within both life sciences and the nascent technology sector.

While the university has made progress, traditional metrics for technology transfer at OUHSC are below those of its peers.²⁷ OUHSC commercialization metrics are below that of peer universities (defined as those with similar research expenditures and a medical school). On average, between 2013 and 2015, OUHSC received only \$1,037,811 in income from licensing technology it created, compared to the \$3 million average among its peers.²⁸

Unfortunately, data do not exist to comprehensively measure the technology transfer outcomes of the other anchors such as the VA Medical Center, but private sector interviews suggested the VA is not currently an active partner in commercialization. And interviews indicate that while strong linkages often exist between anchors at the research level, these activities are largely driven by a handful of “star

faculty” at the different institutions. The lack of commercialization activity is a district-wide problem that all the anchors, working in tandem, should address.

The region has a deep bench of management talent, but connections between the startup community and larger corporations are still nascent.

In any case, technology transfer metrics only go so far. A second critical piece of commercial activity is that of startups, an area in which the district is also traditionally weak. Between 2013 and 2015 the major research anchors in the district, together, created less than a half a dozen startups—significantly below the expected average, given their cumulative research spending.²⁹ The recent success of Selexys is clearly important but is not necessarily a leading indicator of a new trend. To be sure, creating startups that grow within drug discovery is difficult, but without strong links between the district and non-health care entrepreneurs (particularly software companies), broadening the base of startups to include devices, health IT, or energy analytics companies, for example, has proven to be difficult. The presence of i2E— which works with entrepreneurs, researchers, and companies to help them commercialize their technologies and grow new businesses—is a major advantage for the district in terms of interacting with the entrepreneur community, but i2E is something of an island. The district needs a much stronger support system for entrepreneurs from all industries.

This issue extends beyond the district. No hub for tech startups exists in Oklahoma City, and so the region lacks the needed critical mass to grow. Co-working spaces like Starspace46 west of downtown are important but need stronger connections to the district or its major institutions. Automobile Alley, with its amenities and density, is an ideal location for incubator space and tech startups, but the market has not produced such outcomes: The Broadway Avenue corridor remains a retail- and restaurant-driven neighborhood. While the city does have a number of technology-based meetup groups and other community-oriented activities in the sector, they are dispersed and do not achieve economies of scale.

Finally, the talent pipeline of research entrepreneurs and professional management is a concern. There is not the pool of research entrepreneurs one might expect given the robust life science research enterprise across the district's research institutions. In the tech industry, the lack of serial entrepreneurs and executive-level management talent limits access to expertise and mentorship for startups. The region as a whole has a deep bench of management talent, particularly in the energy sector, but connections between the startup community and larger corporations are still nascent.³⁰ This is reflected in regional metrics: While in past decades the Oklahoma City metro outperformed the U.S. average on establishment entry rates—a measure of new company formation—the metro now hovers around the national average.³¹

Stakeholders have invested in events, landscaping, and other improvements, but the Health Center area of the district lacks the density and mix of uses that innovative firms and talent increasingly desire.

One of the hallmarks of a successful innovation district is the possibility of serendipitous encounters among knowledge workers from a variety of business and academic sectors. In Kendall Square—MIT's innovation district in Cambridge, Mass.—the lobby of the Hyatt Hotel and several local coffee shops are filled with young entrepreneurs huddled around tables and computers, pitching ideas to each other. In Philadelphia's innovation district, the University of Pennsylvania, Drexel University, and the University City Science Center are all partnering with developers to build mixed-use developments to attract and retain new workers and residents and increase vitality in the area.

The more urban Automobile Alley area of the innovation district boasts a concentration of restaurants, boutiques, and other amenities that have the potential to become vibrant “third places” for tech and other innovation-economy workers. Meanwhile, across the highway Health Center stakeholders have been undertaking their own efforts to improve the vitality of what was originally designed—in the spirit



Wide streets—like NE 10th Street—reinforce the district's largely suburban development pattern. Photo credit: PPS.

of the times—with a low-density suburban office-park layout. OUHSC has invested in enhancing its campus, particularly Stanton L. Young Walk, with landscaping, water features, and comfortable seating. OU Physicians sponsors a lunchtime food truck and music event at the small public park at the corner of Phillips Street and Stanton L. Young Street. These events are a positive start and provide opportunities for employees to meet people from other institutions and create a stronger sense of community.

Still, the Health Center's suburban development pattern—dominated by siloed institutions that are physically removed from each other—does not promote mixing and mingling among those who work in the area. Despite the improvements noted above, people are rarely seen outdoors, and public spaces are seldom used for events or community gatherings. Short of occasional food events, little happens in these spaces on an everyday basis, and there is no unified effort to program them or indoor areas on campus, to encourage networking among all Health Center employees.

A significant constraint to adequate and consistent programming has been a singular focus on the highest and best use of space for support of health care, education, and research. The Health Center lies within



Stakeholders have made significant investments to outdoor spaces in the district, such as Stanton L. Young Walk. Photo credit: PPS.



The Bleu Garten, a beer garden and food truck park in Automobile Alley. Photo credit: PPS.

the Capitol-Medical Center Improvement and Zoning District, and its overseer, a state zoning commission, has only recently advanced a rule change to permit retail, restaurant, or residential uses. Currently, the area offers little in the way of cafes, bars, or restaurants that are open to the public. Most of the institutions contain cafeterias to cater to their employees, giving the employees little incentive to journey out of their buildings.

With its growing variety of research, academic, and clinical assets, and especially with the arrival of the GE research facility, there is a tremendous opportunity to spark innovation through cross-disciplinary professional and social interaction. District stakeholders are beginning to understand the importance of events that crosscut occupations and disciplines, whether the events are formal speaker series or informal meetups and happy hours, and are seeking ways to implement such programs.

The district is located near—and includes—lively, mixed-use neighborhoods, but the Health Center’s insular nature and car-oriented development pattern limit walkability and separate it from surrounding communities.

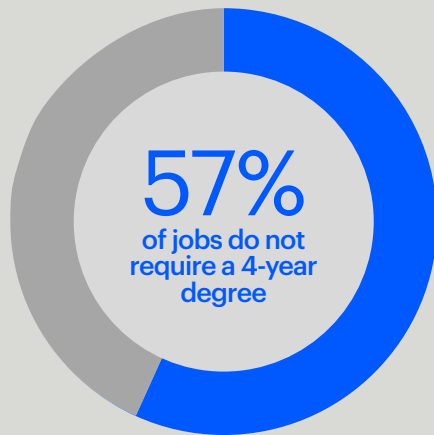
The innovation district is less than a mile away from the downtown and adjacent to Bricktown, among the most vibrant urban areas in Oklahoma City. Downtown is a regional center of economic activity, and both areas have recently seen a surge in residential construction and are attracting a young population that both lives and works there. Moreover, Automobile Alley is just a half mile away from the Health Center.

Despite this proximity, the Health Center is largely cut off from these vibrant neighborhoods by large streets and highways, making walking and biking difficult. Interstate 235, just to the west of the Health Center, facilitates vehicular access but forms a barrier to the downtown and Automobile Alley. A lack of development and dull streetscapes make these areas feel much further away than they actually are.

Low-income neighborhoods surrounding the Health Center, which could benefit from the proximity through employment and educational programs, are also isolated. A large parking lot for the medical campus separates the Health Center from the neighborhood east of Lottie Avenue, and NE 8th Street lacks consistent sidewalks and crosswalks to help link it to the area to the south. These streets and parking lots create effective barriers between the Health Center and its surrounding community. (The ramifications of this separation are discussed in more detail below.)

Within the Health Center itself, wide streets and surface parking lots—designed to foster ease of vehicular access, and especially emergency vehicles—diminish the incentive for workers to leave their buildings during the workday, which in turn limits the potential for informal interaction and networking. Project for Public Spaces’

Employment opportunities not requiring a 4-year degree are prevalent in the district



Source: Mass Economics analysis, BLS OED (2014)

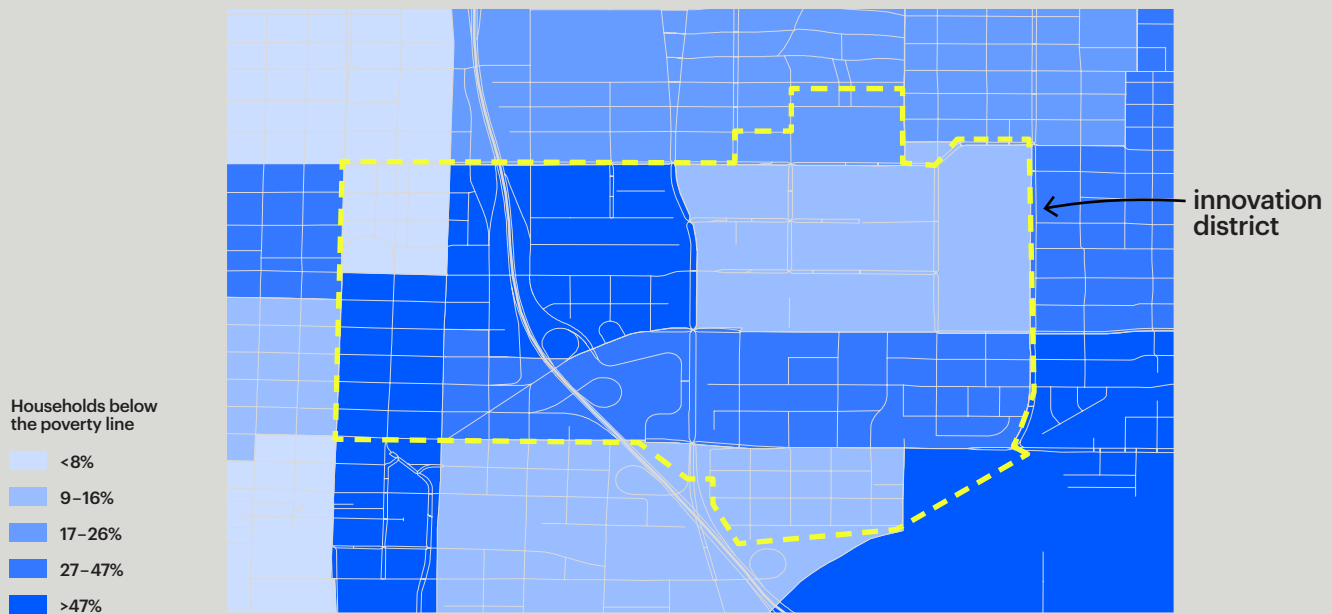
observations revealed steady, if not heavy, pedestrian traffic all day long in Automobile Alley, despite large volumes of vehicular traffic on Broadway; by contrast, researchers observed few pedestrians in the Health Center. Employees, hospital visitors, and students walk to and from their cars, but, as discussed above, there are few destinations within the Health Center that employees want to walk to. It is often easier to park in a structure adjacent to one's workplace, connected by a skywalk, and eat in the building's cafeteria, without ever going outside. And with large blocks and wide streets, and buildings set back from the streets, walking does not feel particularly easy or safe.

Efforts are underway to enhance connectivity. OUHSC has made a number of pedestrian improvements to its campus to benefit its community, including the Stanton L. Young Walk and other paths and crosswalks that connect the school's buildings. Oklahoma City is preparing a new pedestrian and bicycle master plan (bikewalkokc) to help improve walking and biking. Now the city has the opportunity to create "complete streets" that promote walking, biking, and safe driving. If implemented with other land-use changes and placemaking activities, complete streets will improve vitality and provide more connectivity both to and within the district.³³

The district has experienced substantial job growth over the past decade, but many nearby communities and residents are largely disconnected from it.

In the decade between 2004 and 2014, the number of jobs in the district increased at a rate nearly twice that of the city (27 percent versus 16 percent).³⁴ Given the number of anchors and innovation assets, many of the area's 18,000-plus workers are both highly skilled and well-paid: More than one-third of district employees have at least a bachelor's degree,³⁵ and approximately 55 percent of jobs pay a higher wage, on average, than jobs in the Oklahoma City metro as a whole.³⁶

Poverty rates are high in and around the district



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

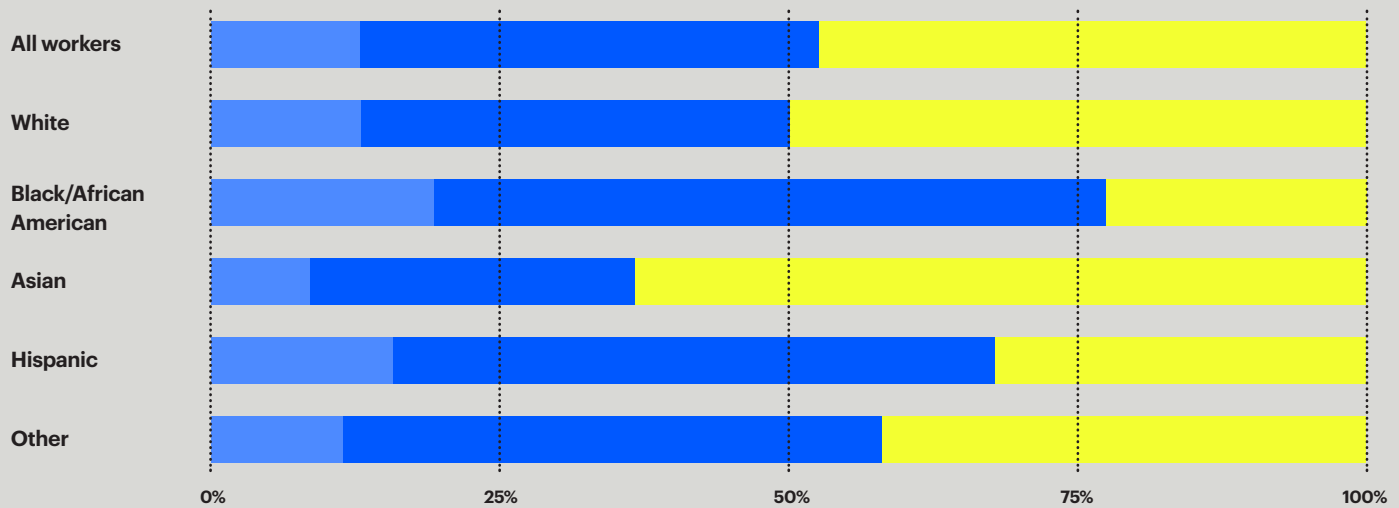
Despite the demand for high-skilled workers, employment opportunities exist in the district for workers with varying education and skill levels. In fact, roughly 55 percent of district jobs do not require a four-year degree, in occupations that include medical assistants, respiratory therapists, radiology technicians, and emergency medical technologists.³⁷ Due to the abundance of health care providers, there is a heavy concentration of “middle-skill” health care-related positions, or jobs that require either an associate’s or postsecondary non-degree award for entry. These occupations make up 20 percent of jobs in the district—compared to fewer than 10 percent in the metro area as a whole—and at \$48,000 a year on average, they pay 15 percent more than the average middle-skill job in the region.³⁸ As the district economy continues to grow, we can expect that many of these middle-skill support positions will become more prevalent.

Despite optimistic topline employment and wage numbers, the district’s growth and employment opportunities have yet to significantly affect neighboring communities and their residents.

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

Poverty rates in the neighborhoods to the north and east—roughly bounded by I-235 to the west, I-35 to the east, and NE 23rd Street to the north—are persistently above 45 percent.³⁹ Moreover, median household incomes are below \$25,000, compared to over \$50,000 for the region as a whole. Unemployment levels hover above 15 percent, nearly three times the metro rate.⁴⁰

Racial and educational disparities are stark. While more than 75 percent of workers in the district are white and nearly 70 percent have some type of postsecondary education, over 70 percent of residents in the surrounding communities are African American and more than half have only a high school diploma or less.⁴¹ Among district workers, 77 percent of African Americans and 83 percent of Hispanics are employed in positions paying less than \$3,333 per month, compared to just 50 percent of whites.⁴² Fewer than 300 of the roughly 7,500 residents older than 18 living in surrounding communities are employed within the district, suggesting a need to both better connect nearby residents to jobs for which they meet the qualifications and upskill those workers who do not.⁴³

These disparities are exacerbated by a difficult history of redevelopment and urban renewal in the area. In efforts undertaken

by the Urban Renewal Authority in the 1960s, significant portions of African American communities were razed and replaced with what is now much of the Health Center (and later, I-235). The legacy of these actions—both physically and socially—are still felt today. As noted above, surrounding neighborhoods are physically disconnected from the area, with superblocks, vast parking lots, and closed-off private structures replacing the former human-scale, walkable street grid. To the south of the Health Center, a vibrant commercial corridor along 4th Street was demolished and remains largely underutilized today. Residents have limited access to basic amenities such as grocery stores and open space. And the relationship between neighborhood groups and Health Center tenants has often been strained.

As the innovation district grows and develops, both its institutions and Oklahoma City have a real—and long overdue—opportunity to structurally change this dynamic via local hiring, procurement, neighborhood investment, and other strategies to promote economic and physical connectivity.

Section 3: The Path Forward

Oklahoma City's emerging innovation district concentrates innovation and technology assets that could propel the region into global prominence within a range of converging technologies, particularly those related to health and energy. But reaching this potential will require that district leaders take a more aggressive approach to bridging the gaps between industry, academia, and entrepreneurs. And it will need their creative, collaborative efforts to re-imagine the Health Center's 20th-century development pattern and create an animated, energetic place that fosters the intermixing of talented workers and forges stronger links to surrounding communities. However, establishing a world-class research district alone isn't enough. Creating a prosperous, inclusive district will also demand investments that help tear down the fences between the institutional anchors and low-income neighborhoods that have been detached from the district's economic opportunities.

To this end, the following recommendations represent four multifaceted strategies around which innovation district anchor institutions, firms, and civic leaders should rally varying groups of city and regional stakeholders to engage with their time, expertise, and resources:

- 1. Establish an Oklahoma Center for Energy and Health Collaboration.**
- 2. Implement a technology-based economic development and entrepreneurship effort within the innovation district.**

- 3. Create a denser, more active, and better-connected mixed-use urban environment in and around the innovation district.**
- 4. Form a standing committee on diversity and inclusion.**

With growth and a greater density of innovative companies, research institutions, and workers, the Oklahoma City innovation district will be poised to become a greater economic engine for the city and a more competitive player on the international stage.

Strategy 1: Establish an Oklahoma Center for Energy and Health Collaboration

A key value of innovation districts is that they leverage the research—and increasingly the commercialization—capacity of anchor institutions for region-wide economic growth. This leveraging occurs when companies, universities, and startups identify technology platforms and align them with the strategic needs of local advanced industry clusters. For example, basic science in genomics is the platform on which a host of new biological drugs rely; advances in machine learning support the Internet of Things in everything from home appliances to automobiles; and new computational methods manage both power plants and grocery store supply chains. Because no individual firm can capture all of the value of any one platform technology, innovation districts can provide a conduit for collaboration between the public and private sector.

Oklahoma City boasts a number of institutions and efforts that focus on research, industry development, and commercialization. Initiatives among universities and research labs like OU's Growth Fund and Technology Ventures at OMRF are improving the commercial pathways of health research. Indeed, OMRF has seen substantial success translating research into economic activity. For example, licensing income between 2014 and 2016 was nearly double that of the average research university, given its size.⁴⁴ OU and GE have a memorandum of understanding (MOU) that outlines shared goals and vision for joint research. The MOU is general and doesn't outline research contracting

specifics, but it's a step in the right direction. Finally the cluster of oil and gas firms and research centers within the metropolitan area—together with facilities like Tinker Air Force Base and the FAA

Academy—constitute a clear opportunity to integrate energy, health, aerospace, and other advanced industry clusters.

Public, private, and civic leaders should create an Oklahoma Center for Energy and Health Collaboration that serves as the physical and programmatic umbrella for innovation and applied research within these and other sectors.

While these efforts and institutions are important in their own right, none are currently positioned to identify and scale research and commercial activities that take advantage of the region's unique economic clusters. In order to better translate research and innovation into economic activity, the

city needs a comprehensive platform that links technology application in high-growth sectors. The district can be this connective hub.

Recommendation

Oklahoma City and the surrounding region have a number of advanced industry clusters that rely on technology generation to remain globally competitive and grow. Two clusters clearly stand out as regional strengths—energy and health care. However, the areas of research that support these sectors are also critical to other important clusters. For example, robotics, imaging, and data analytics are essential for health and energy, but are important to other sectors like agriculture and aerospace. Leaders in the district should see health and energy as the first move to create connections between other advanced industries.

To that end, public, private, and civic leaders should create an Oklahoma Center for Energy and Health Collaboration that serves as the physical and programmatic umbrella for innovation and applied research within these and other sectors. The goal of the center would be to create a powerful link between applied research and regional economic development that, over the next decade, positions Oklahoma City as the premier global destination for innovation at the intersection between energy and health care. The new center would likely be initially funded and operated by the overarching governance structure of the district (described in Section IV), but eventually—as

regional energy companies and universities outside the district begin to partner with the center on translational research—a coalition of internal and external organizations should emerge to help set the center’s agenda and direction.

The center would be a staged, multi-tiered initiative that supports the collaboration between prominent but currently disjointed economic clusters beginning with energy and health care, and eventually expanding to other clusters such as aerospace. Creating connections between these clusters requires stronger relationships between industry and academia, a coherent and robust economic development platform, and deeper support for the region’s startup pipeline.

Once fully developed, the center should serve as a highly collaborative initiative that combines physical and translational research infrastructure, expertise and staffing, seed funding, private-sector partnerships, and full-service commercialization assistance. Because the region already has numerous effective institutions, many of the activities called for may be operated by existing organizations. The innovation district should become the central hub of collaboration by securing space for the new center and attracting strategic partners—including corporate anchors, academic departments and faculty, and entrepreneurs. Several options to attract these groups exist, ranging from creating shared R&D space to designating “microlabs” and constructing a new building for joint programming and activity.⁴⁵ Initially, it may make sense to use existing or planned space (such as the new floor of OU’s MBA program). Eventually, new physical infrastructure will be needed in order to concentrate a critical mass of strategic partners.

The goal is not simply to build new buildings but to create greater density and collaboration between geographically distant but strategically aligned institutions, like OU Norman, Oklahoma State, Oklahoma City University, the University of Central Oklahoma, and other relevant public, university, and private institutions. Once areas of interdisciplinary activity are identified and funding secured, physical space could be built out to accommodate broader community activities such as workforce development as well as co-working wet and dry labs.

Second, the center should house a translational research and commercialization office for crosscutting industry applications of research. A translational research office focused on the intersection between energy and health would serve two purposes. First, it would be a center of excellence to bring together faculty from different institutions such as Norman, Tulsa, Stillwater, and beyond, and firms with shared strengths in identified crosscutting technologies. Joint private-sector applied research should also help attract star faculty and increase federal and private R&D funding in the district. Areas of translational research should emerge out of planned innovation symposiums (e.g., semi-annual conferences on crosscutting technologies such as imaging, data analytics, and new materials).

The office would also encourage institutions and actors within the district to come together to scale commercialization efforts. One way to do so would be to develop a district-wide commercialization concierge service that is fully funded and staffed. The service should work with existing technology transfer offices to adopt global best practices in technology transfer and work across the district to identify commercial pathways for district research. In this capacity, the translational research office would offer services including technology, legal and market reviews, proof-of-concept support, and commercialization strategies. It would also work closely with organizations like i2E to hand off both promising research and promising young companies to those institutions with greater capacity for startup support.

For implementation details of this recommendation, see the appendix.

Best practices

A number of programs and initiatives around the country could serve as good examples for various activities within the new center. On the physical development side, many innovation districts have built hubs to attract innovation activity, such as co-working spaces and startups, and to promote social interaction and networking. For example, with the support of the City of Boston, the developers of the South Boston Innovation District built District Hall, a multi-use building that houses a café for informal interaction, sponsors special events to encourage more formal meetups, and offers workspace for individuals and small startups. The facility is managed by the Venture Café Foundation, a nonprofit that also programs the Cambridge Innovation Center in Kendall Square and the Roxbury Innovation Center, which focuses on community entrepreneurship and economic development in a low-income neighborhood.⁴⁶

Other state and local programs have improved industry–university research and the commercialization of technology. The Maryland Industrial Partnerships (MIPS) Program provides matching funds to help Maryland firms pay for R&D at local universities. The program also serves as a broker between companies and universities,

many of which have never worked together and struggle through legal terms and conditions, intellectual property, and other agreements. According to the state’s own impact assessment, cumulative technology developed and commercialized through MIPS generated \$3 billion in product sales and supported 3,615 jobs in 2011.⁴⁷

Like MIPS, the Virginia Commonwealth Center for Advanced Manufacturing (CCAM) helps companies better use their R&D investments to partner with universities and non-private research facilities. However, CCAM has enabled firms to pool researchers around non-competitive technologies to work together and with other R&D centers. Based in Prince George County, CCAM partnered with five universities and 28 industry members including Rolls-Royce, Siemens, and Alcoa to create a 62,000-square-foot facility containing research labs, production space, and specialized equipment. CCAM’s collaborative agreements have even extended to foreign nations. For example, in 2015 it signed a \$5 million agreement with the Korean government.⁴⁸



District Hall houses a café, sponsors events, and offers workspaces. Photo credit: Bruce Martin.



Strategy 2: Implement a technology-based economic development and entrepreneurship effort within the innovation district

A new Oklahoma Center for Energy and Health Collaboration would serve as a beachhead for industry–research partnerships within important advanced industries. However, to develop an innovation economy in Oklahoma City, a host of activities are needed outside of the health and energy sectors. Information technology startups, for example, are emerging organically across Oklahoma City and need a stronger support system to flourish. Moreover, while applied research at the intersection of health and energy is an important step to improving economic outcomes in the district, research will not necessarily translate into economic activity in isolation. In addition to applied research and industry–research partnerships, the district needs mechanisms to aggregate demand and strategies to create, attract, and retain workers and companies.

While i2E and other organizations support entrepreneurship across the city and region, more explicit efforts are needed to broaden the entrepreneurship pipeline within the district and to connect research startups and firms to the broader regional economy. By doing so, the district could become the regional hub that connects the spokes. Creating a coordinated suite of programming, physical assets, and funding under a new collaborative effort would create a focal point for activity and a platform for technology-based economic development and entrepreneurship.

Recommendation

Without broader economic development goals, district activity runs the risk of generating technologies without an anchor to the region. The district needs staff and organizations specifically tasked with overseeing strategic business development (supporting OU in the research park), technology-business attraction, marketing, and regional cluster development between entrepreneurs, small and medium-sized enterprises, and large firms. To this end, creation of

the center for energy and health described above should coincide with a fully funded district effort for technology-based economic development and entrepreneurship that links activity within the district to the regional economy.

Creation of the Oklahoma Center for Health and Energy Collaboration should coincide with a fully funded district effort for technology-based economic development and entrepreneurship that links activity within the district to the regional economy.

New resources will be key. Though the district needs to promote research entrepreneurs within enabling technologies of the district's major economic clusters and bolster regional startup capacity in general, research partners will likely not be equipped to bring scientific concepts to market on their own. Rather, they need an industry-focused partner to identify market opportunities, recognize first customers, mentor inventors, and identify and attract external management to build young companies. Essentially, appropriate translational

research needs to be seamlessly handed off to a partner with greater capacity to commercialize through company formation. To do so, this new effort should serve as a conduit between market-oriented entities like OU's MBA program and i2E. Specific programs could include creating a tailored version of i2E's Venture Assessment Program for health and energy technologies or running an entrepreneurs-in-residence program that attracts seasoned entrepreneurs in the health and energy sectors. Finally, an innovation district seed fund and tailored accelerator would go a long way toward helping research entrepreneurs access early-stage capital for prototyping and market testing.

The district will never be home to all of Oklahoma City's high-quality startups, and therefore strategies are needed to ensure that district efforts link and support the region's capacity for entrepreneurship. Moreover, access to programming, support, seminars, and co-working space should be open to the broader community. As district leaders structure efforts around entrepreneurship and economic development, they should do so through the lens of the broader metropolitan area and region.

Unlike the Center for Energy and Health Collaboration, this effort likely does not require creating a new institution. Instead, existing

organizations could coordinate and be tasked and resourced to focus on economic development and entrepreneurship activity within the district.

For implementation details of this recommendation, see the appendix.

Best practices

To support entrepreneurship, several U.S. cities have created local funds and accelerators. For example, Drexel University has created a \$10 million seed fund, the Venture Innovation Fund, in partnership with Ben Franklin Technology Partners, the statewide startup initiative with local offices around the state. Also in Philadelphia, DreamIt Ventures is a venture capital firm and accelerator with programs focused on education tech and health tech, among others.

In Cleveland, the Global Cardiovascular Innovation Center (GCIC) leverages the strengths of the Cleveland Clinic and others to attract out-of-state cardiovascular companies seeking to commercialize new technologies. GCIC has helped attract 22 businesses to Ohio and has added over 1,000 jobs to the Ohio economy, plus its incubator facility

is supporting 44 companies with 63 commercialization funding awards granted.⁴⁹



DreamIt Ventures, located within the University City Science Center, is a venture capital firm and accelerator. Photo credit: University City Science Center.

Strategy 3: Create a denser, more active, and better-connected mixed-use urban environment in and around the innovation district

Recognizing that proximity and density spur innovation through informal knowledge exchange, increasing numbers of traditional research parks—like the Raleigh-Durham Research Triangle Park—are transforming their monoculture enclaves into vibrant mixed-use settings where workers can also live and socialize. Other innovation districts are actively improving their walkability and connectivity to decrease car dependence and encourage casual encounters. The Oklahoma City innovation district can learn from these examples and begin implementing what Project for Public Spaces refers to as “lighter, quicker, cheaper” placemaking interventions and programs that entice employees out of their buildings and encourage both intentional and chance interaction. At the same time, district leaders can plan for more intensive long-term changes that will densify and diversify the area’s uses and activities.

Efforts are already underway. The Placemaking Task Force has been seeking ways to encourage walking, biking, and activities that will build vitality in the district. The University Research Park’s recent addition of a health club and OU’s buildout of new MBA facilities, both adjacent to a large public food court, are a positive step forward for fostering collaboration. And the state’s zoning commission is amending the regulations for the Health Center to include a broader mix of land uses. Beyond the district, Oklahoma City has a number of significant placemaking successes that can serve as models. Downtown OKC, Inc. (DOKC), the nonprofit organization that manages and markets the downtown business improvement district, has created Bricktown Beach, an urban beach in an underutilized plaza next to the baseball stadium that attracts a diverse audience with its movie nights, live concerts, and volleyball tournaments. DOKC also created the Community Basketball Court, a free amenity in the heart of downtown that also hosts art interventions, food trucks, and community events. Better Block OKC, a local group of volunteers, is calling attention to the need for more walkable streets by creating a

number of pop-up “parklets,” temporary public spaces in underutilized parking spaces near the downtown. Further, Oklahoma City is actively seeking to create more walkable commercial neighborhoods by widening sidewalks, calming traffic, and improving crosswalks, as it did on several blocks of NW 16th Street, which has since become a pedestrian friendly retail and restaurant destination.

Moving forward, district and city leaders must invest more resources into transforming the streets and public spaces—both physically and via dynamic programming—in the district to create a more innovation-hospitable environment and an attractive destination that’s competitive with its peers nationwide.

Recommendation

Innovation district leaders should work closely with public-sector partners at the city and state level to create a denser, more active, and better-connected mixed-use environment in and around the

innovation district. Creating this environment will require land use changes, short- and long-term placemaking strategies, and improved connectivity to build a collaborative network among the institutions and companies to spark innovation and firm development:

District leaders should create a denser, more active, and better-connected mixed-use environment in and around the innovation district.

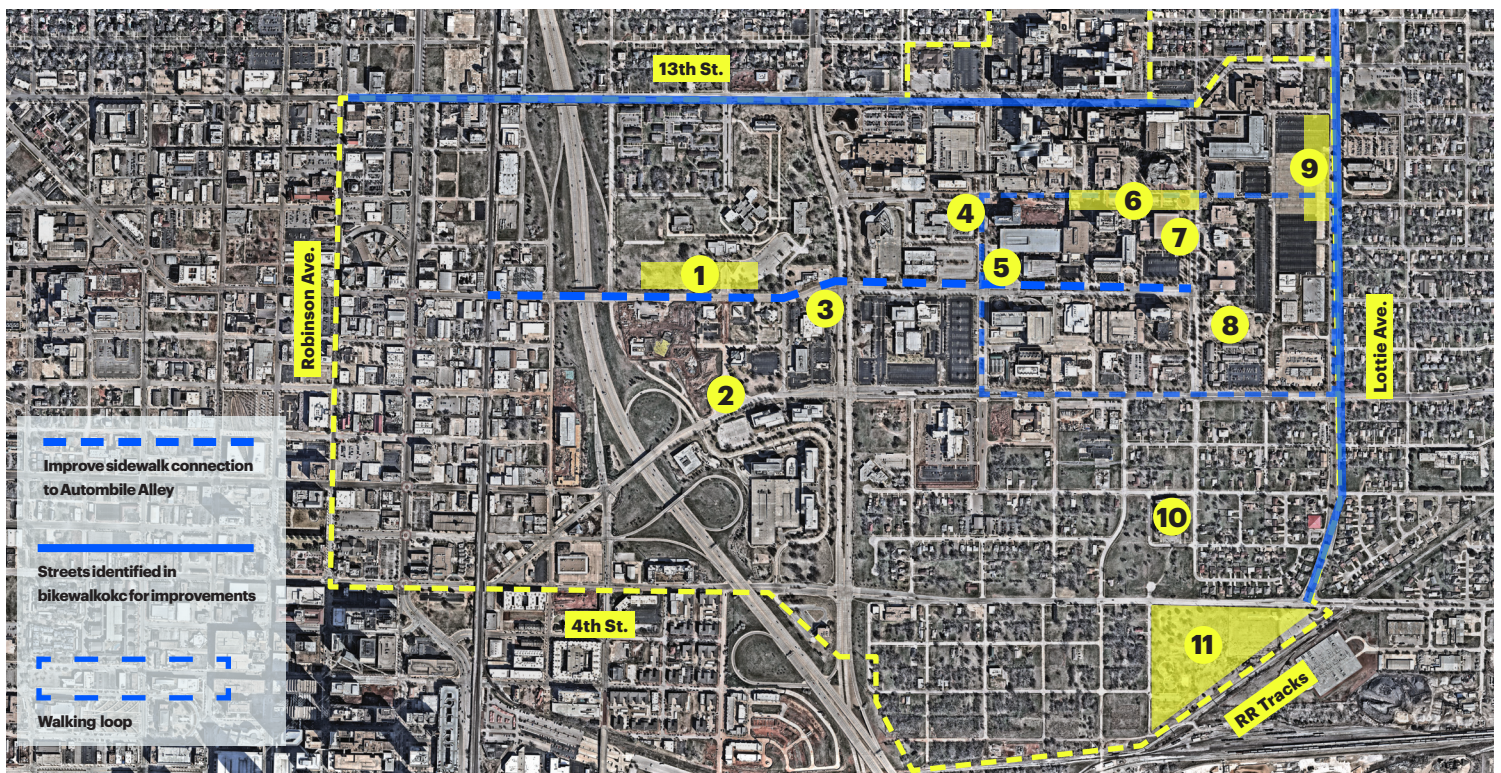
- **Undertake new land use and real estate development efforts.** The Oklahoma Health Center lies within the Capitol-Medical Center Improvement and Zoning District, which is overseen by the State of Oklahoma and not by the city. The state commission that oversees the district has historically understood that the limited-use zoning, a legacy of the 1960s, not only prevents mixed-use and residential development but also encourages suburban development patterns. The commission is supportive of the Oklahoma Health Center and recently revised the zoning for review by the state legislature and the governor by September 2017. From there it will be up to individual property owners, leaders within the Health Center, and leaders within Oklahoma City to seek development that will provide the types of commercial and residential uses, whether

in new infill development or in existing buildings, that will lead to a more vibrant, sociable, and around-the-clock environment.

To this end, innovation district and Oklahoma City leaders should encourage and recruit commercial and retail development that meets the commercial needs of both the district and the residential neighborhood and creates a lively center of activity. For example, a commercial cluster could be located on NE 8th or NE 4th Streets, or on Lottie Avenue at the intersection of the Health Center and residential neighborhoods. Furthermore, new multifamily residential development could provide market rate, workforce, and affordable housing, similar to the Page Woodson redevelopment, within or adjacent to the Health Center.⁵⁰

Particularly important is attracting new development that breaks out of the district's suburban, car-oriented patterns. Zoning should allow new construction or infill development to be built up to the street—known as zero lot line development—with active ground floor uses that encourage walking. Design guidelines should ensure that ground floors are transparent to put “eyes on the street,” in Jane Jacobs’ famous phrase, while allowing passersby a window into the innovative activities taking place within. Further, property owners should encourage new uses that make the area lively in the evenings and on weekends, which in turn would help pedestrians feel safer and more comfortable.

Even before new private development occurs, the district could build its own central hub to serve as its public front door, promote and market its activities, and host many of its crosscutting symposiums and gatherings. Other innovation districts call these centers “public innovation halls” and have found them to be key in recruiting new businesses and attracting people from outside the district. Like District Hall in Boston, such a center in the Oklahoma City innovation district, possibly connected to the new Center for Energy and Health Collaboration, could offer a café or restaurant that welcomes the public, a large space for events, and low-cost co-working space for startups.



Placemaking and connectivity opportunities. 1) OSSM parking lot and grounds; 2) Stiles Circle Park; 3) Oklahoma Blood Institute parking lot; 4) Sacred Valley Park; 5) Rader Park; 6) Stanton L. Young Walk; 7) Robert M. Bird Health Science Library auditorium and patio; 8) Intramural field and picnic pavilion; 9) OUHSC Lottie Ave. parking lot; 10) Page Woodson School auditorium; 11) Washington Park. Source: PPS, Google Earth

- Implement new placemaking efforts.** Building off the suggestions of participants in the Placemaking Workshop held in February 2016, the Placemaking Task Force has identified a number of publicly or privately owned spaces that, with the support of their owners, could be ideal locations for programming and activities that encourage interaction among district workers, foster the engagement of neighborhood residents, and ultimately enliven the Health Center (see map). Such programming might include lectures, networking activities, food events and festivals (e.g. OneOKC), outdoor performances, recreational activities, health fairs, and opportunities for outdoor play.⁵¹ For example, the soccer field on Stonewall Street could host sports events and tournaments among corporate, university, or neighborhood teams. A large food-truck rally, following the model of the now-annual H&8th Night Market, could be held on a street or in a parking lot at the Health Center.
- Improve connections to Automobile Alley.** A number of options are available to tighten the connection between the Health Center and Automobile Alley. Large, expensive schemes to cap I-235 with parkland or elaborate new bridges, while visionary, are not



The Bricktown Beach is an example of a lighter, quicker, cheaper intervention. Photo credit: PPS.

necessary in the short-term to bridge the gap. The connection could be strengthened by pedestrian improvements that make NE 10th Street, NE 13th Street, and the bridges over I-235 more comfortable and interesting to walk upon, and by new development along NE 10th Street that shortens the perceived distance.

The city is preparing plans for new sidewalks and streetscape improvements on NE 10th Street, which will help to enhance the pedestrian experience leading to I-235. Additional landscaping, new lighting, and interesting and colorful railings on the bridge would encourage walking, while shade trees for hot days and translucent barriers that block wind would also make the walk more comfortable. Oklahoma City leadership should also work to fund the extension of the new streetcar to the Oklahoma Health Center.

Additional zero lot line development on the Oklahoma School for Science and Math property on NE 10th Street and on the site of a large electrical transformer that is being decommissioned at NE 10th Street and Oklahoma Avenue would start to knit the neighborhoods together and perceptually reduce the distance to cover.

- **Improve bike and pedestrian routes within the Health Center for employees and for recreational use.** Strengthening walking networks within the Health Center that connect destinations (where there are destinations) will encourage local employees and residents to walk, rather than drive. The city planning department is recommending new sidewalks on NE 8th and NE 10th Streets between Lottie Avenue and Lincoln Boulevard. As these streets serve as pedestrian barriers within the Health Center, this effort could reduce the number of travel lanes and calm fast-moving traffic while creating “complete streets” that promote walking, biking, and safe driving.⁵²

In the short term, stakeholders should identify and enhance walking routes within the Health Center to allow for easy access between parking lots and workplaces and between workplaces and new destinations (such as programmed public spaces). Attractive paving, safer mid-block crossings, special lighting, wayfinding, and even public art could enhance the new routes. Greenways with enticing trails for recreational walking could be developed along wide corridors.

- **Make the innovation district more porous and connected to residential neighborhoods, especially at Lottie Avenue and NE 8th Street.** In order to promote inclusion of local residents in the jobs, educational opportunities, and other programs that could be offered by the Health Center, stakeholders should work to reduce the physical barriers separating the neighborhoods. Community residents should be involved in the planning efforts, but initial ideas of the Placemaking Task Force include the creation of walking paths between the Health Center and surrounding communities; narrowing of the roadways that now act as barriers by adding protected bike lanes and wider sidewalks; and new programming that engages residents, or even a new park or playground, in the parking lot on Lottie Avenue.⁵³

Best practices

Innovation districts around the country are working to create opportunities that bring workers from different sectors together in ways that further collaboration and cross-fertilization, as well as engage the larger community.

For example, the management of the Raleigh-Durham Research Triangle Park (RTP) in North Carolina, a 7,000-acre research park that has served as a powerful economic engine and job generator in the region, has turned an underutilized and outmoded office building into a multi-use innovation magnet called the “Frontier.”⁵⁴ With low-cost office space for small businesses, cafes and bars for lunchtime and after-work socializing, and special events that attract a broad cross-section of employees and the public, the Frontier has attracted many young entrepreneurs to RTP who otherwise would either be shut out by high rents or have no reason to come.

In the Wake Forest Innovation Quarter in Winston-Salem, N.C., managers are investing in a range of placemaking efforts. Its 1.6-acre Bailey Park hosts outdoor concerts, yoga classes, outdoor movies, and lunchtime food truck events. And neighborhood organizations have been

invited to use the park for a variety of formal and informal community events, such as Juneteenth, a family festival celebrating black culture and achievement held on a day commemorating the ending of slavery in the United States.⁵⁵ The Innovation Quarter also sponsors myriad health-related events for the public, such as 5K walk/runs and bike races.

Finally, the Cultural Trail in Indianapolis is an example of a new walking and biking trail that has linked key cultural destinations within the city and encouraged recreational walking and biking. Managed by a nonprofit and built using funds from a collaborative of institutions including the city and the Central Indiana Community Foundation, among others, the trail has encouraged significant new development in the area.⁵⁶



1. Frontier Atrium; 2 & 3. Wake Forest Innovation Quartier Bailey Park; 4. Winston Salem Cycling 2015; photo credit: Lindsey Yarborough, Wexford Science+Technology.

Short-term actions to improve vitality in the innovation district

The Placemaking Task Force identified a number of initiatives that could be undertaken right away to begin to activate the innovation district, create opportunities for interaction and networking, and involve the neighborhoods.

Increase food truck activity in the spring. OU Physicians is already hosting lunchtime food trucks at the Sacred Valley Park on Wednesdays in late summer and fall. This program could be expanded to include more days and additional entertainment, and it could move to a larger area if it outgrows the space.

Plan networking events or a speaker series with meetups/gatherings beginning in February. The Oklahoma Blood Institute hosted a “Mind Meld” event in February 2017—a “speed-dating” event for employees from different research and clinical facilities—and will continue to offer it on a quarterly basis.

Make improvements to a public space on campus to make it more welcoming, visible, and comfortable. An early win could be to open up the Sacred Valley Park and add amenities, or create a gathering space in Rader Park.

Plan an event that promotes walking and experiments with routes in the innovation district. Sisters in Motion, a national nonprofit with a strong local branch, has expressed interest in organizing a walking event to help jumpstart interest in walking paths that link the Health Center and the surrounding neighborhoods. A safe route could be temporarily carved out of NE 10th or NE 8th Street with traffic cones. The Student Government Association of the OUHSC is also planning a 5K running path around the campus that could be used for community running events.

Introduce programs at Washington Park and at Page Woodson School that could evolve into a community center program. With the completion of the renovation of the Page Woodson auditorium, events, speaker series, or performances could be planned to bring the Health Center employees together with residents. Likewise, activities could be planned to test out a variety of uses at Washington Park, even before the improvements are completed.

Collaborate with the innovation task force on an event. The Placemaking Task Force could partner immediately with the innovation task force in the planning of an event that integrates a cross-disciplinary symposium for Health Center employees with a community program (indoors or outdoors) that is educational and/or arts oriented.

Strategy 4: Form a standing committee on diversity and inclusion

Innovation districts promote new technologies, entrepreneurship, and new firms while increasing the number and range of jobs in anchors and other firms. As such, these areas have a powerful platform for creating broad-based economic opportunity, particularly for nearby neighborhoods that still struggle with poverty and disinvestment. But growth alone it is not enough: Ensuring that district opportunities redound to the benefit of low-income communities requires intentional efforts to connect residents via workforce, business development, and placemaking efforts and initiatives.

The Oklahoma City innovation district—and particularly the Health Center—has a substantial number of well-paying, middle-skill occupations and a concentration of institutions with both hiring power and broader community influence. Still, while neighborhood residents may connect to the Health Center hospitals and clinics for their health care needs—in fact, the University of Oklahoma Medical Center provides the largest volume of uncompensated and Medicaid services in Oklahoma City—nearby residents currently have little

engagement with the Health Center campus.⁵⁷ Only a fraction of residents work there, and it has few amenities or programs that would invite them into the area. Likewise, district workers don't themselves engage in the community: A very limited number of retail and food establishments exist for them to patronize, and there are currently no structured educational, mentoring, cultural, or other programs that would encourage or facilitate interaction.

The innovation district has a substantial number of well-paying, middle-skill occupations and a concentration of institutions with both hiring power and broader community influence.

The close geographic proximity of the district and the struggling communities around it have long represented a possibility to establish stronger ties between the two areas. Such connections will bring mutual benefits to residents and the district alike. Indeed, a healthy innovation economy needs the leadership, talent, and perspectives of diverse groups of people to generate and produce new ideas and to break down long-standing structural barriers to ownership and advancement that

have helped create existing inequities, particularly for minorities. New interest and efforts to grow and develop a more inclusive innovation district present a fresh chance to change the status quo.

Recommendation

Innovation district and community stakeholders should form a standing diversity and inclusion committee charged with overseeing the design of strategies aimed at forging better economic, social, and physical connections between the innovation district and the underserved communities surrounding it. Such a committee would encompass the committee for Enhanced Education and Skills Training (Education Committee) called for in the Oklahoma Regional Innovation District Project Plan (Project Plan) (see box below), and

would operate under the auspices of the new innovation district governance entity described in Section IV. It would comprise—and/or work more broadly with, per the Project Plan requirements—representatives from the district’s institutional and private-sector stakeholders; education providers such as Oklahoma City Public Schools, local community colleges, and technology (CareerTech) centers; area workforce entities; the nonprofit community, including neighborhood groups; and additional organizations as appropriate.

District leaders should form a standing diversity and inclusion committee charged with overseeing the design of strategies aimed at forging better economic, social, and physical connections between the innovation district and the underserved communities surrounding it.

The committee should work with local entities to develop strategies in the areas of education, workforce development, entrepreneurship, and placemaking/neighborhood development. It would help convene stakeholders and organize subcommittees and/or working groups in key issue areas; guide and oversee goal and strategy development; and serve as a liaison between parties to facilitate alignment and coordination of efforts. The committee would also evaluate proposals and make funding recommendations in accordance with the Project Plan. Issue areas should include:

- **Education.** The long-term success of the district will require that its institutions and firms have access to a diverse pool of talented workers. Growing, attracting, and retaining such a pipeline is a

regional imperative that demands the long-term commitment of many actors. But the committee's purview should be focused

Regional universities and innovation districts

Elite universities often dominate the headlines in terms of economic impact to their cities, but other regional schools are beginning to recognize the value and importance of being located in urban cores. The University of Central Oklahoma (UCO), for example, now offers courses in downtown Oklahoma City in a range of subjects as part of their "UCO Downtown" program in an effort to better connect and prepare their graduates for careers in regional economic strengths. Given the close proximity of UCO Downtown to Oklahoma City's innovation district, further opportunities for strategic connections exist. First, while the district is primarily a medical hub with an abundance of health care occupations, many wrap-around occupations and services for the health care and oil and gas industries are also present. In fact, over one-third of jobs that require postsecondary education in the district are not health care positions, but instead range from computer scientists to accountants to lawyers. Though OUHSC's academic offerings primarily prepare graduates for careers in the medical field (and OU's recently moved full-time MBA program for business), UCO's diverse programs include Professional Science, Public Administration, and Business Analytics masters programs (among many undergraduate programs) that offer a chance to connect graduates to these wrap-around occupations within the district. Second, UCO's demonstrated success as a pipeline for talent to the regional economy can be leveraged for the district. In any given semester, over two thirds of students enrolled at UCO originate from the Oklahoma City Metropolitan Area; the majority of these students, as well as students from other universities, will be employed in Oklahoma five years after graduation. Taken together, these represent an example of a possible addition to the district's current talent development and academic offerings. UCO is a specific example of a general theme: To align the innovation district with the regional economy, the district should serve as a coordinating ground for a number of workforce and educational institutions.

particularly on strategies for increasing the number of students from traditionally underserved communities—including those immediately surrounding the district—who are adequately prepared for and exposed to district employment opportunities. Such strategies might include partnerships with district employers and CareerTech centers to develop targeted curricula; afterschool and summer science, technology, engineering, and math (STEM) classes; internship and pre-apprenticeship programs; and mentoring initiatives. For example, the Metro Technology Center (Metro Tech) offers classes particularly focusing on math and technology literacy for adults and high school students to prepare them for the job market. Metro Tech could partner with OUHSC or other institutions to bring these programs to the district.

- **Workforce development.** The district currently employs approximately 18,000 workers in jobs spanning a range of occupations and skill levels. The committee should convene employers and service providers to design employer-based workforce training programs specifically targeted toward linking neighborhood residents to those opportunities. Training providers would work with employers to identify high-demand, high-turnover occupations and design training modules to prepare un- and underemployed residents directly for those positions. By focusing seriously—though not necessarily exclusively—on surrounding communities, residents gain better access to nearby jobs,

reducing their commute times, lowering attrition, and knitting stronger connections between the community and the district, particularly the Health Center campus.

- **Entrepreneurship and business development.** Innovation district institutions together purchase millions of dollars in goods and services each year. These institutions can help support the growth of Oklahoma City manufacturing and service firms—and the jobs they create—by organizing joint demand for local goods and services. The committee should work with district institutions and the city to develop a local procurement initiative, the first tasks of which would be to undertake a rigorous analysis of both institutional demand and local firm capacity, as well as conduct an inventory of local business support programs that could help firms better respond to institutional demand. Based on that analysis, district institutions and firms should reevaluate their procurement practices and where possible organize joint demand to facilitate local purchasing, with a particular focus on minority- and woman-owned firms. Institutions should also work with city and other partners to help build the capacity of firms to be able to meet institutions' purchasing needs.
- **Placemaking and community building.** As described earlier, the district could help engage surrounding neighborhoods by sponsoring programs and activities—jointly developed with the community—that draw families and individuals to the area, and by developing better physical connections that facilitate and encourage pedestrian and bike access. At the same time, the committee could begin working with local stakeholders to develop activities and programs—perhaps at the redeveloped Page Woodson School—that could draw district employees into the neighborhood as participants or volunteers. Over the longer term, the committee should work closely with local stakeholders to explore the possibility of building a community center that could house the educational, workforce, and business development programming described above, in addition to recreational activities that would serve local residents.

Best practices

Programs focused on engaging and preparing underserved youth in and for STEM careers and STEAM careers (which include the arts) have proliferated over the last decade, with a variety of institutions and organizations offering work-based learning opportunities. For example, the FirstHand program—run out of the University City Science Center, a Philadelphia-based incubator—engages local, predominantly low-income students in hands-on experience through interactive experiments and projects, as well as via mentoring from Science Center resident companies.⁵⁸ Tanner Connections, a program initiated by Tanner Health Systems in western Georgia, targets students in the “academic middle” (those with minor disciplinary or behavioral issues) and places them in both clinical and non-clinical internships and mentorships in order to expose them to the wide range of occupations available in the health care system.⁵⁹ And in Baltimore, the University of Maryland-Baltimore CURE Scholars Program collaborates with three city schools to prepares sixth- to 12th-grade students for research and health care careers at the university and other health institutions in the region.⁶⁰

Workforce development programs, housed within the public sector and/or nonprofit organizations, exist in all U.S. cities, though their success varies widely. In addition to more traditional, typically regional workforce development programs, new anchor-based models of workforce development have begun to emerge as a way to tap the vast hiring power of universities and hospitals. The University Hospitals Cleveland Medical Center, for example, focuses on linking local residents to jobs and then career ladders within the institution.⁶¹ The recently launched HopkinsLocal initiative at Johns Hopkins University in Baltimore is forging partnerships with local organizations and firms with the goal of increasing the number of locally hired workers.⁶² Finally, the West Philadelphia Skills Initiative, coordinated by University City District (UCD), works directly with employer partners to identify high-turnover positions and matches and trains local residents to fill these middle-skill jobs based on employer needs.⁶³

Local anchor procurement programs—a relatively recent trend in economic development—look to harness and localize anchors’ significant procurement budgets to grow jobs and businesses in surrounding communities. The Chicago Anchors for a Strong Economy, for example, is a collective of Chicago anchors that serves as a matchmaker between Chicago-area businesses and anchors that are looking to localize their economic impact via spending.⁶⁴ The Evergreen Cooperatives, based in Cleveland, are a set of worker-owned businesses from a defined neighborhood that supply nearby anchors with a variety of goods and services, including laundry and produce.⁶⁵ The University of Pennsylvania, too, has a long-standing local and diverse supplier program that supports local and minority-owned businesses, particularly in West Philadelphia, via purchasing and technical assistance.



The Evergreen Cooperatives are a set of worker-owned businesses that supply nearby anchors and employ local residents. Photo credit: John Kuntz/The Plain Dealer.

Tax increment financing and the Project Plan

As part of an update to the Oklahoma Health Center Economic Development Project Plan, the Oklahoma City Council approved in December 2016 a revised tax increment financing (TIF) district and plan—the Oklahoma Regional Innovation District Project Plan—encompassing much of the Health Center area. The purpose of the amended Project Plan is to provide a legal and financial framework for developing an innovation district, to assist in achieving the goals of the original economic development plan for the area, and to support the implementation of the Harrison-Walnut Urban Renewal Plan. Revenues from the TIF will support four broad categories:

Innovation: financing, construction, and leasing of incubator, accelerator, and multi-use facilities to enhance economic growth in the area;

Placemaking: financing, construction, and operation of public spaces and parking facilities, and enhancement of pedestrian and vehicular access;

Neighborhood making: financing, construction, and development of supporting residential and commercial activities, and installation of public infrastructure;

Enhanced education: constructing and financing of education, skills training, internship, and workforce development programs.

At the time of this writing, stakeholders of the innovation district are determining the type and structure of the governance organization—as called for in the Project Plan—that will lead the implementation of district-related activities, including the TIF document.

Section 4: Organizing For Success

Oklahoma City is at an important pivot point. Endowed with substantial assets—particularly in health and energy—for a city of its size, the region is pleasant and affordable, and it possesses a collegial, collaborative culture that leaders in many larger regions would envy. Still, the region is largely off the radar of global investors and off the map of talent looking for bigger, job-rich metropolises in which to live and work.

If the innovation district is to become the center of gravity and driver of Oklahoma City's innovation district, then its leaders need to organize themselves toward that goal.

This dynamic is beginning to change, evidenced by the city's job growth over the past decade and the emergence of its innovation district and environs as hubs of economic activity. But if the innovation district is to become the center of gravity and driver of Oklahoma City's innovation economy—a vibrant hotspot where diverse groups of people, from varied industries and with different backgrounds and skills, can converge and connect—then its leaders need to organize themselves toward that goal.

To this end—and as called for in the Oklahoma Regional Innovation District Project Plan—district leaders need to establish a new type of governance entity that gives voice to the district's narrative, defines what it should aspire to become, and works with other area stakeholders to determine what innovation, place, and inclusion strategies it needs to employ as a unified *place* so as to have maximum collective impact on the city and region.

No one model exists that can be uniformly co-opted by innovation districts or other defined geographies seeking to establish a new or repurpose an old governance organization. Indeed, there are as many different models as there are place-based entities, and each is driven by distinct motivations that generally determine its organizational composition (e.g., staff, committees), powers, and financing structures. And these may in fact change over time as the role and ambitions of the organization evolve.

For all their differences, though, the most successful governance structures operate as a network of leaders who collaborate around a shared set of goals and adhere to the same basic set of 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 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—partner with other organizations around common goals, and 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 single entity in Oklahoma City is perfectly positioned to take on the mantle of governing the emerging innovation district. The Oklahoma Health Center Foundation coordinates its member institutions and oversees the campus master plan with the goal of positioning the Health Center as driver of economic development for the region, yet it doesn't currently have the structure, powers, comprehensive geographic focus, and/or strategic expertise across each of the disparate yet connected issue areas described above. In fact, few if any place-based entities do. While hundreds of such organizations exist across the country, most focus predominantly on placemaking and safety; some have ventured into workforce training and business development; few currently have remit of coordinating and driving a localized innovation ecosystem.

Whether Oklahoma stakeholders decide to create a new organization or repurpose an existing one, they have a chance to be trailblazers in establishing an entity that has a singular focus on the district and undertakes all the responsibilities that entails. Such an entity does not need an army of dedicated staff, but it must have:

- an executive director who understands the innovation ecosystem and has the ability to coordinate actors both within and outside of the district around defined goals and strategies;
- a leadership structure (a board or steering committee) with the influence and authority to rally critical stakeholders and guide district efforts;
- discrete committees (e.g., on diversity and inclusion) and stand-alone initiatives (e.g., the Oklahoma Center for Energy and Health Collaboration) that will develop and drive key strategies;
- the staff capacity necessary to support and coordinate the board, committees, and initiatives; interact with district and non-district stakeholders (including regional industry leaders, local government, the Urban Renewal Authority, neighborhood organizations,

etc.); develop, implement, and align district-wide programs, land use planning, and placemaking activities; and raise funds.

The broad governance structure of the district will need to meet many obligations, including guidance of the implementation of TIF objectives, placemaking and programming activities, and real estate development, among others. However, the most rigorous governance responsibility will be to manage the district's innovation priorities. Coordination within R&D and innovation is difficult in general and particularly so when coordinating the work of universities, labs, and the private sector, all of which have unique and different processes and incentives. A team (or at minimum a high-level leader) is needed that sits between institutions and can catalyze a shared vision that holds a strong value proposition for each individual actor. This ability will require a scientific understanding of the research portfolio and the ability to identify external partners and market opportunities. Finally, governance around the innovation priorities will need substantial add-on funding beyond what the initial stakeholder group can provide. As such, the new entity will need to have the ability to navigate federal resources and develop matching funds or industry-sponsored research contracts.

Section 5: Conclusion

Oklahoma City is poised to organize itself to become a fierce competitor in the innovation economy and to build a stronger regional economy as a result.

Indeed, the city has demonstrated its will and capacity to coalesce around bold ambitions before, with spectacular results. A breathtaking Oklahoma City National Memorial and Museum, an award-winning public park, and a revitalized downtown are clear evidence of how collective action can have tangible results and provide attendant benefits to a city's economy. Investing in the creation of a dense, dynamic innovation district should be the city's new mandate.

The potential is crystal clear. So too must be the vision.

Appendix: Implementation of the innovation recommendations

The implementation of the new Center for Energy and Health Collaboration and the technology-based economic and entrepreneurship effort should be developed in clear stages over the next decade. Some activities can happen in the near term with limited resources, while others will require significant capital, private partnerships, and longer-term planning.

The four pillars—**physical assets, translational research, economic development, and entrepreneurial support**—should be structured in parallel under the rubric of one comprehensive district-wide strategy. What follows is a template for the sequencing of specific actions in each of the four categories.

Pillar 1: Physical assets for innovation

- \$ Create a master plan for the innovation district that overlays with programming and real estate development.
- \$ Identify existing space for joint research with OU Norman or external researchers and other collaborative programming.
- \$\$ Construct “microlabs” to house external partners.
- \$\$\$ Build a public innovation district center, similar to the innovation hub on the University of Oklahoma’s Norman campus, that would host community-wide activities, promote the district, and increase its pull throughout the region.
- \$\$\$ Build a globally significant “research bench” that serves as a testbed for translational research between private and public research within energy and health.

Pillar 2: Translational research

- \$ Hold regional symposiums that bring together academic and industry researchers around applied research opportunities that intersect health, energy, and aerospace.
- \$ Drawing from the outcomes of the symposiums, create an academic-industry consortium among local and national partners around particular technological themes to codify research partnerships and funding opportunities.
- \$\$ Establish and sign a common intellectual property and/or research partnership agreement among consortium members.
- \$\$ Create a district-wide commercialization concierge service that is fully funded and staffed. The service should work with existing technology transfer offices to adopt global best practices in technology transfer and work across the district to identify commercial pathways for district research.
- \$\$\$ Develop a matching fund involving industry, academia, and philanthropy to underwrite industry-relevant, applied research.
- \$\$\$ Create a global Energy and Health Center of Excellence to house translational research, attract star faculty, and bring in state, federal, and private resources.

Pillar 3: Economic development

- \$ Establish an Office of Technology-Based Economic and Entrepreneur Development within the district to link research and other district activities to the broader regional economy. The office could be run through an existing organization like OU's Center for the Creation of Economic Wealth, OCAST, or a new joint entity.
- \$\$ Hire or appoint a full-time staff member to oversee economic development activities within the district and consider appointing a deputy director of translational research.
- \$ Create a district-wide marketing strategy to brand the district and develop a business attraction strategy that seeks firms that are aligned with technology assets. Business attraction efforts should be aligned with the University Research Park.

Pillar 4: Entrepreneurship support

Instead of operating a second entrepreneurship organization, district efforts could be operated by i2E:

- \$ Tailor i2E's Venture Assessment Program specifically around district entrepreneurs or regional startups within health, energy, and adjacent clusters.
- \$ Create an industry-entrepreneurs seminar series.
- \$ Develop a clinical entrepreneurs initiative between OU's MBA program and health practitioners.
- \$\$ Establish a district-wide entrepreneurs-in-residence program and/or an executive program that offers startups access to seasoned executives.
- \$\$\$ Create an innovation district seed fund from private, public, and philanthropic capital to address early-stage capital needs of district startups and young companies in health, energy, and adjacent clusters.
- \$\$\$ Form a health and energy angel investors network that leverages the region's high-net-worth individuals with experience in oil and gas to support young companies in bridging technologies.

Endnotes

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- 23 Brookings's personal communication with Dr. Stephen Prescott, President of OMRF, February 2017.
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50 The \$25 million project—located within the innovation district—will transform the 1910s era school into affordable housing and possible community center. See, for example, Brianna Bailey, “Renovations are bringing Oklahoma City’s Page Woodson school back to life,” *The Oklahoman*, July 24, 2016, <http://newsok.com/article/5510862>.

51 A festival celebrating the Northeast Oklahoma City neighborhoods. See, for example, “Northeast Renaissance held at Douglass High School,” *The Oklahoman*, May 3, 2016, <http://newsok.com/article/5495481>.

52 In addition, the city’s forthcoming bikewalkokc plan has identified NE 13th Street and Lottie Avenue as the two best commuting routes from surrounding neighborhoods into the Health Center, and the city is targeting them

for protected bike lanes and sidewalk improvements. Connections to existing and future multi-use trails (such as the Katy Trail, a rail-trail that begins at Washington Park) could also encourage bike commuting.

53 Representatives of the Central Northeast Neighborhood Coalition, a group that represents the adjacent communities, have played an active role on the Placemaking Task Force. Specific ideas include: (1) create walking paths through the large parking lot at the east end of the Health Center that belongs to the University of Oklahoma Health Sciences Center; for example, the Stanton L. Young walk could continue across Stonewall Street and the parking lot to cross Lottie Avenue and link up with NE 11th Street; (2) reduce the number of travel lanes on Lottie Avenue and replace them with protected bike lanes and wider sidewalks; add crosswalks at the key intersections; (3) reduce the number of travel lanes on NE 8th Street and replace them with bike lanes and new sidewalks; (4) program activities in the OU Health Sciences Center parking lot in the short term and in the long term carve out a park or playground that could serve the neighborhood and the Health Center employees.

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57 See, for example, Adam Wisneski, “Is your hospital losing money?” *Oklahoma Watch*, October 23, 2015, <http://oklahomawatch.org/2013/10/25/is-your-local-hospital-making-or-losing-money/>.

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