

# Assessing your innovation district: A how-to guide

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



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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.

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Over the past two decades, a confluence of changing market demands and demographic preferences have led to a revaluation of urban places—and a concomitant shift in the geography of the growing innovation economy. This evolution can be seen in the increased clustering—often around universities, medical centers, and other anchors—of firms, intermediaries, and innovative workers in dense urban enclaves or districts.<sup>1</sup> City—and increasingly suburban—stakeholders have taken notice; many are exploring ways to support this growth as a means of fostering job creation, economic opportunity, and revitalization in their communities.

This handbook is designed to guide leaders—planners, economic developers, anchor institutions, politicians, nonprofit organizations, investors, and others—through the first step in the process: assessing, or “auditing,” the assets that comprise their local innovation ecosystem. For some places, this means starting with a scan of the regional innovation economy to understand how and, importantly, *where* it is growing and concentrating. For others, it means analyzing an already identified innovation district, whether it is just emerging or has been developing for several years. In all cases, an audit is a prerequisite for informed decisionmaking by public, private, and institutional leaders. Such a scan will reveal how best to target resources toward innovative and inclusive economic development tailored to an area’s unique strengths and challenges.

### Why “Audit?”

As the old adage goes, you can’t know where you’re going until you know where you’ve been. But the past and future will look very different across the cities and regions that encompass innovation districts. While all innovation districts are similar in that they combine economic, place, and human capital assets, their starting points are unique, requiring leaders to design and deliver distinctive strategies. An innovation district in Los Angeles, for example, will be very different than one in Louisville—while some “aspirational districts” might not have the requisite base of assets from which to grow a robust innovation district at all.

With that in mind, there are five main reasons to audit an innovation ecosystem:

- To meticulously identify key areas of strength, weakness, and opportunity;
- To develop a collective vision and concrete goals for capitalizing on strengths and overcoming critical weaknesses that could be a drag on growth and development;
- To inform customized strategies for reaching goals. Audit findings can be used to guide complex, long-term approaches for solving problems or filling ecosystem gaps as well as to inspire “lighter, quicker, cheaper” programming, placemaking, and other efforts that can be undertaken immediately;

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- To set a baseline against which to measure year-over-year progress on strategy implementation and goal achievement; and
- To provide the empirical evidence on the opportunity and market potential needed to attract capital from both inside and outside the region. Over time, this information may be routinized across districts to allow peer-to-peer comparison as well as to advance the development of new investment tools and practices.

### Action from auditing

While auditing is an important initial step in advancing innovation district growth, the strategies stemming from the analysis are what truly drive change and impact. After working with Brookings and Project for Public Spaces to assess their respective innovation districts, stakeholders in these three cities have been using the findings to inform the development of new policies and programs:

Oklahoma City's innovation district is anchored by an academic medical center with deep specializations in areas of health and the life sciences. A regional audit of firm and university R&D also confirmed significant strengths in energy, geosciences, and engineering. Interviews with faculty and managers revealed that these areas rely on a number of the same technologies. To better connect the region's major industries—energy, health, and aerospace—the innovation district's leadership began organizing regional consortia around several of these cross-cutting technology platforms. The first brought together over fifty scientists, researchers, engineers, entrepreneurs, and inventors to present and discuss how imaging is used in their respective fields. Additional consortia are now planned with the end goal of developing new partnerships, research contracts, products, and even companies.

Philadelphia's innovation district—home to multiple world-class institutions—excels at a variety of advanced industry clusters. Although it accounts for only 1.1 percent of the city's land mass, 74 percent of the city's

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university research expenditures are within the district. The district also concentrates over 700 of NIH's R01 grants and outperforms the national average—in both quantity and quality of academic publications—in 23 of 68 medical and life science disciplines. Interviews with companies, university faculty, and innovation intermediary organizations revealed Philadelphia's particular expertise and potential in precision medicine. Leaders in Philadelphia have begun to organize themselves around a precision medicine catalyst initiative, focused on pooling resources to advance the region's significant research and commercialization capacity in this area.

The Oakland neighborhood of Pittsburgh is a naturally occurring innovation district that is home to two world-class research institutions—the University of Pittsburgh and Carnegie Mellon University (CMU)—dozens of startup companies, co-working spaces, and the University of Pittsburgh Medical Center (UPMC). Although it encompasses only about three percent of the city's land area, the Oakland district accounts for ten percent of the city's residents and 29 percent of jobs, and constitutes over one-third of the entire state of Pennsylvania's university research output. City leaders have recently come together to form a coalition called InnovatePGH that builds on both the innovation and placemaking strengths of the district. The new entity is using the district as the platform for a technology business attraction strategy, a district marketing and branding campaign, and a workforce training program designed to provide access to middle-skilled jobs in the district for low-income residents in surrounding neighborhoods.

### How to Audit

This guide outlines a five-part integrated framework for conducting an innovation ecosystem asset audit. Developed through research and on-the-ground observations on the key elements that constitute a healthy innovation ecosystem, the framework is centered around a set of key questions:

1. **Critical mass:** Where are your region's highest concentrations of innovation assets?
2. **Innovation capacity:** Is the district leveraging and aligning its distinctive advantages to grow and strengthen firms' innovation capacity?
3. **Diversity and inclusion:** Does the district have an inclusive, diverse, and opportunity-rich environment?
4. **Quality of place:** Does the district have physical and social assets that attract a diversity of firms and people, increase interactions, and accelerate innovation outcomes?
5. **Leadership:** Does the district have the leadership necessary to succeed?

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This handbook was developed under the assumption that it will be employed in numerous ways, by a diversity of stakeholders, for a variety of purposes. For this reason, it focuses more on outlining questions users might explore than on detailing specific methods to answer them.

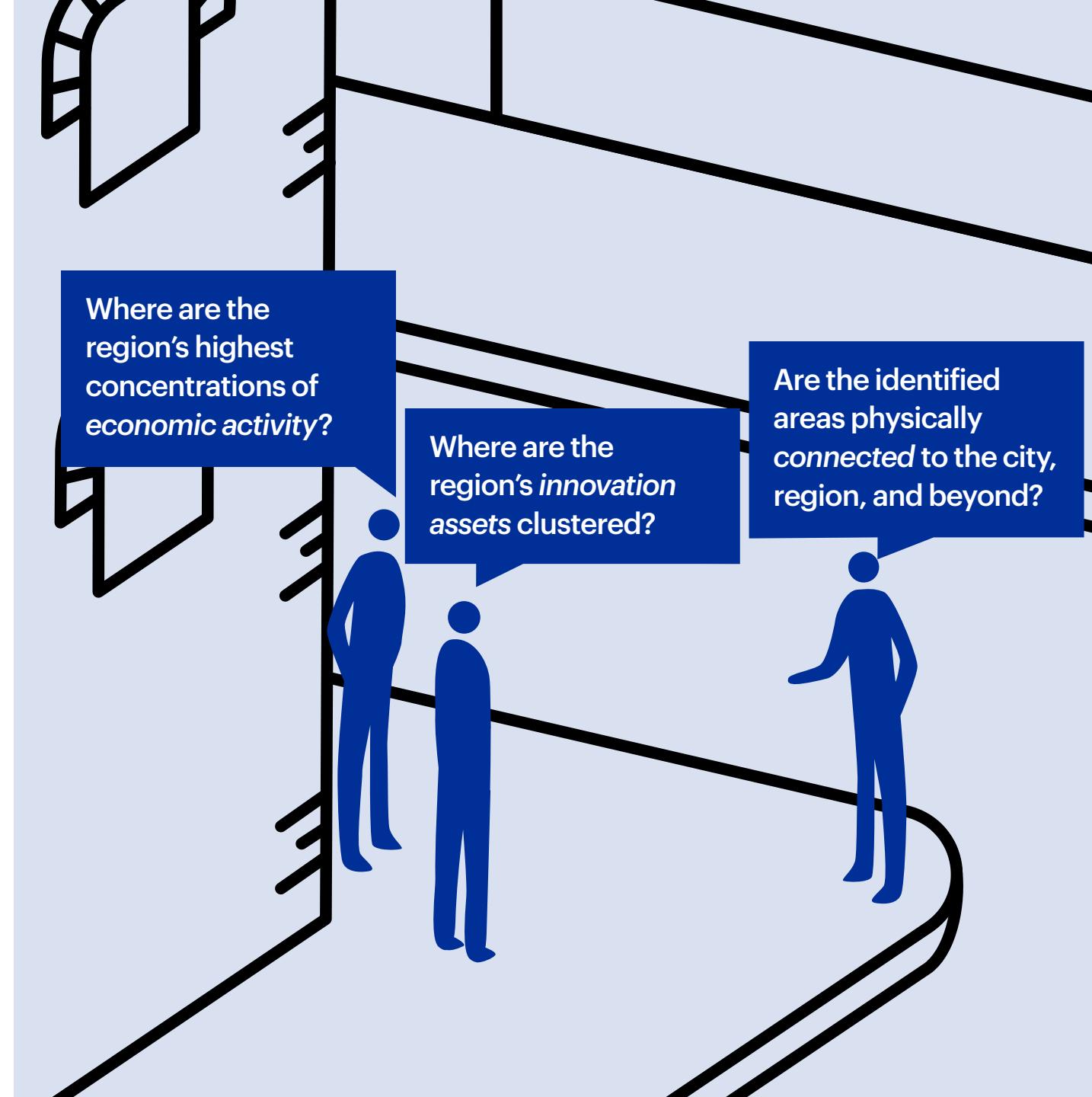
These framework elements are explored further in this guide. Separate sections describe the importance of each element to the creation of a healthy innovation ecosystem, suggesting the kinds of questions “auditors” will want to ask, and providing sample methods and data that can be used to answer them. The guide concludes with advice on the types of indicators that innovation district stakeholders might track to gauge their district’s success, along with suggestions for how additional measures might be utilized in the future to further fuel district growth and development.

## An audit requires quantitative and qualitative information gathering

Number crunching is essential but insufficient by itself for fully assessing an innovation ecosystem. Unveiling the attributes and advantages that undergird the innovation economy—as well as the frailties and cracks—requires a more personal, boots-on-the-ground, investigative approach. To “get under the hood,” auditors will need to interview a wide range of stakeholders to verify, explain, and offer context to quantitative findings; get the “inside story” on organizations’ policies and programs; and glean a cross section of perspectives on the opportunities and needs of the district as a whole. Qualitative interviews can complement the quantitative data sources; in some cases, interviews may be the only way to gather certain types of information.

In audits of innovation districts in Philadelphia, Oklahoma City, and Pittsburgh, the Brookings Institution and Project for Public Spaces conducted dozens of individual and small group interviews, occasionally going back to the same interviewees at different points in the process to gather additional information. Local actors conducting an audit may be able to be more strategic in who and how many people they interview based on their prior knowledge of the area and the time and resources available to them. But skimping on this critical part of the audit process will diminish the ability to fully and accurately unearth the district’s hidden gems (or skeletons) and lead to the development of a wrong—or at least incomplete—set of goals and strategies.

# Critical Mass



# Where are your region's highest concentrations of innovation assets?

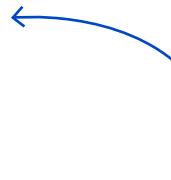
Some users of this handbook may be in the early stages of evaluating their innovation economy, taking inventory of their anchors, firms, and other assets to identify strong areas for growth and investment. Other users will be looking to apply the asset audit framework to an area already identified as an innovation district.

But calling a place an innovation district does not necessarily make it so.

In some cases, a well-established agglomeration of connected assets coupled with serious, coordinated leadership make it a credible claim, even if district development is still relatively young. In others, however, local governments, civic groups, developers, or business owners may have applied the tag to a project or area that lacks the minimum threshold of firms, startups, institutions, and talent from which to grow an innovation ecosystem.

Firms today need to be able to interact with researchers, inventors, and entrepreneurs, as well as with other firms, in order to define new products and identify new markets. While the isolated inventor in a garage remains the stereotype of an innovator, research shows that 47 percent of new product and process innovations occur through external partnerships. Density and proximity help facilitate this type of collaboration. While labor moves within a shed of approximately 40 miles, knowledge sharing occurs at a scale of less than 1 mile (Carlino & Kerr, 2014).

Labels aside, most regions will only be able to support one or, in larger places, possibly two robust innovation districts. Thus, local leaders need to look across their urban landscape to determine what area or areas have a **critical mass** of well-connected innovation assets from which a district can potentially grow and develop.



This type of analysis serves a few key purposes:

- In regions in which an innovation district has not yet been identified, it will help public officials, planners, and economic development experts know where and how their innovation economy is clustered across space, how these clusters align with existing infrastructure or physical/locational assets, and which areas are most ripe for strategic focus and investment.
- If local universities, businesses, nonprofits or other stakeholders have already identified a district, this analysis will help public leaders verify the development's employment, residential, and fiscal impact potential and encourage public support. Proof of potential will also help innovation district stakeholders make a more powerful "sell" to garner local investment as well as to attract firms, talent, and capital from outside the region.
- Finally, in regions with multiple constellations of economic activity—a few of which might be fertile for innovation district development—this analysis will help both regional leaders and district stakeholders better understand the kinds of sectors and industries that comprise each area. Understanding the spatial geography of the economy in this way is a first step toward undertaking deeper research on how hubs interrelate and where opportunities exist to forge stronger linkages.

# Questions to explore

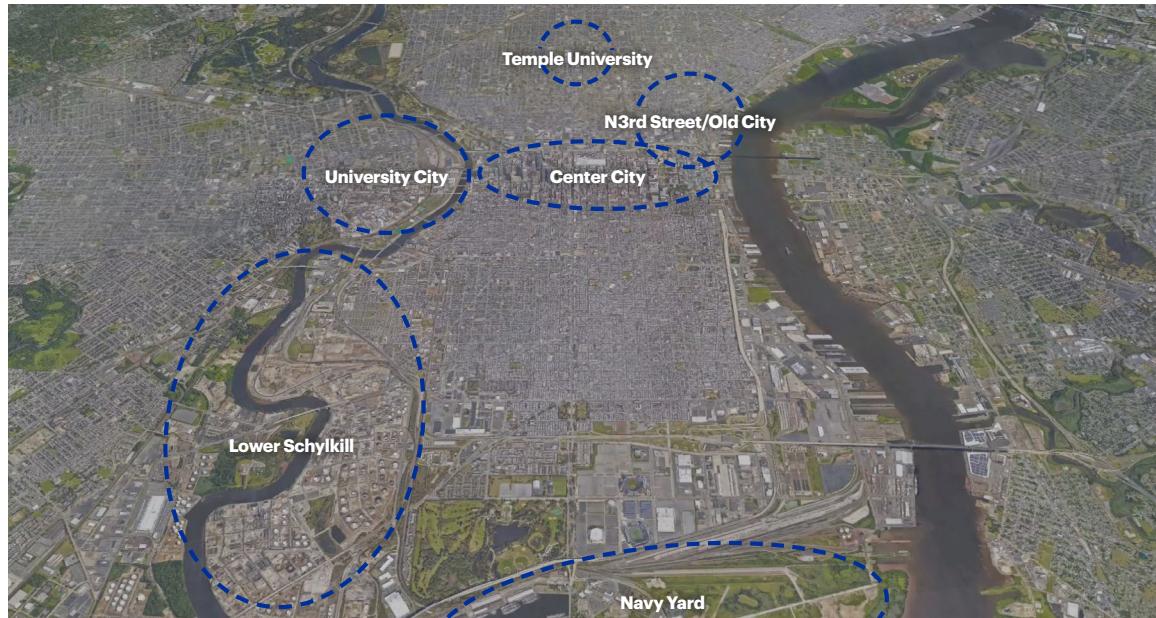
To identify—or validate—the geography with the strongest starting assets to develop an innovation district, local leaders should investigate three primary questions:

1. Where are the region's highest concentrations of economic activity?
2. Where are the region's innovation assets clustered?
3. Are the identified areas physically connected to the city, region, and beyond?

**Methodological note:** Some regions might begin this process agnostic about existing hubs, and thus will use this “critical mass” analysis to identify hotspots of activity. Others might have already identified their strongest economic centers and want to compare them to see which has the greatest innovation potential based on the density of assets and/or particular locational advantages. The starting point and purpose will affect how these questions are used and the methods best suited to answer them.

# 1—Where are the region's highest concentrations of economic activity?

The purpose of this first step in the audit process is to identify existing employment—and possibly residential—hubs. These areas will have a higher-than-average concentration of activity relative to the surrounding city and/or region, and should be experiencing growth. Auditors should also look for areas with redevelopment potential based on the availability of inexpensive land, old buildings with potential for adaptive reuse, and underappreciated locational advantages such as good transit or waterfront access.



Map from Connect to compete: Philadelphia's University City-Center City innovation district. Philadelphia has several hubs of innovation throughout the city and region. Source: Google Earth.

## Critical mass

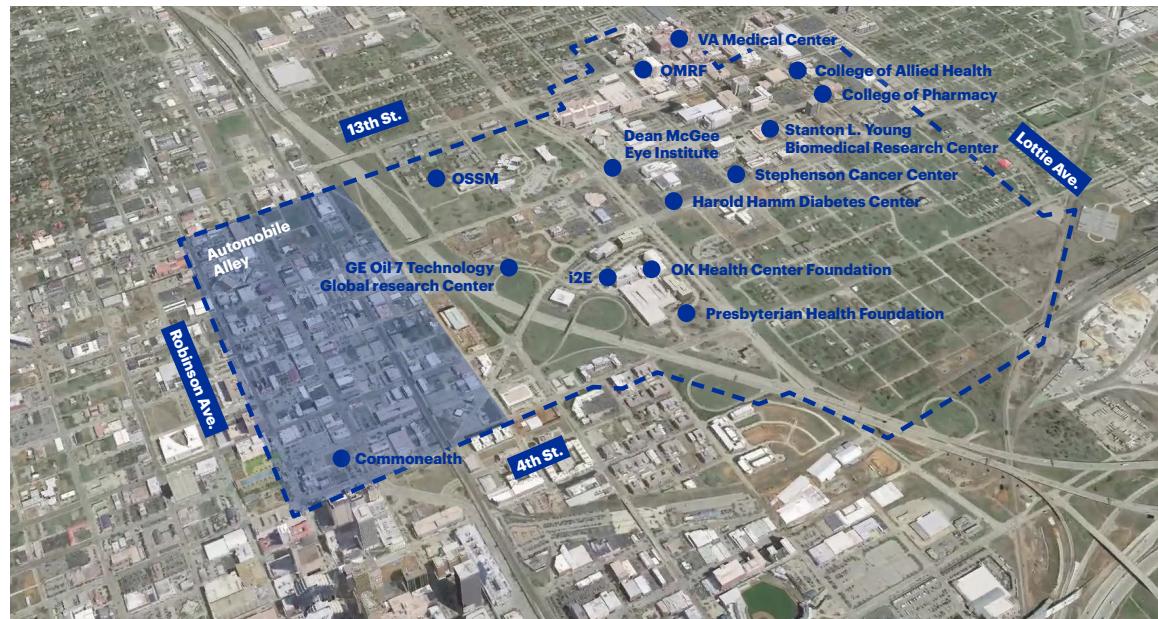
1— Where are the region's highest concentrations of economic activity?

What to look for:	How to measure it:*	Sample sources:
<b>Where are the highest employment densities in the region, and have these areas become relatively denser over time?</b>	<ul style="list-style-type: none"><li>Total number of jobs</li><li>Job growth over time</li><li>Jobs per square mile</li></ul>	<ul style="list-style-type: none"><li><a href="#">U.S. Census Bureau Longitudinal Employer-Household Dynamics (via OnTheMap)</a></li></ul>
<b>From where are workers commuting? Are certain areas in the region drawing from a wider geography than others?</b>	<ul style="list-style-type: none"><li>Jobs by distance categories (work census block to home census block)</li><li>Worker area of residence (e.g., by zip code)</li></ul>	<ul style="list-style-type: none"><li><a href="#">U.S. Census Bureau Longitudinal Employer-Household Dynamics (via OnTheMap)</a></li></ul>
<b>Where are the highest residential densities in the region, and have these areas become relatively denser over time?</b>	<ul style="list-style-type: none"><li>Total number of residents</li><li>Residential growth over time</li><li>Residents per square mile</li></ul>	<ul style="list-style-type: none"><li><a href="#">U.S. Census Bureau Decennial Census or American Community Survey</a></li></ul>
<b>Where are there concentrations of older buildings, vacant land, and other assets that can be transformed/adapted for higher economic purposes?</b>	<ul style="list-style-type: none"><li>Concentrations of underutilized areas</li><li>Addresses/location of un- and underutilized land and buildings</li></ul>	<ul style="list-style-type: none"><li><a href="#">U.S. Census Bureau Longitudinal Employer-Household Dynamics (via OnTheMap)</a></li><li><a href="#">U.S. Census Bureau Decennial Census or American Community Survey</a></li><li>Local land and building inventories/local knowledge</li></ul>

\*Note: Most of these publicly available data are available at the census block level, meaning the "block" is the unit of analysis. A locally sensitive decision should be made regarding appropriate geography. Proprietary data differs from source to source.

## 2 — Where are the region's innovation assets clustered?

Not all concentrations of economic activity have the potential to become a locus of the region's innovation economy. Local leaders must seek out those geographic areas that have the capacity to produce talented workers (e.g., university districts), grow and attract innovative firms, and drive new investment activity.



Map from Positioned for growth: Advancing the Oklahoma City innovation district. The Oklahoma City innovation district concentrates innovation assets in the Health Center and amenities in Automobile Alley. Source: Google Earth.

## Critical mass

### 2 — Where are the region's innovation assets clustered?

What to look for:	How to measure it:*	Sample sources:
<b>Where are the region's universities, medical centers, and large anchor companies located and/or clustered?</b>	<ul style="list-style-type: none"><li>Address of universities, hospitals, and anchor companies</li></ul>	<ul style="list-style-type: none"><li>Local knowledge/data</li><li>Google Maps</li><li><a href="#">National Center for Education Statistics (NCES) Integrated Postsecondary Education Data Systems (IPEDS)</a></li><li><a href="#">American Hospital Association</a></li><li><a href="#">Medicare.gov</a></li><li><a href="#">National Science Foundation (NSF) Higher Education Research and Development Survey (HERD)</a></li></ul>
<b>Where are the region's small- and mid-sized firms and startups located and/or clustered?</b>	<ul style="list-style-type: none"><li>Address of firms and/or establishments</li></ul>	<ul style="list-style-type: none"><li>Local knowledge/data</li><li>Proprietary firm-level data (e.g., Dun &amp; Bradstreet (Hoovers), National Establishment Time-Series Database, Infogroup (InfoUSA, ReferenceUSA), ESRI Business Analyst, etc.)</li></ul>

\*Note: Most of these publicly available data are available at the census block level, meaning the "block" is the unit of analysis. A locally sensitive decision should be made regarding appropriate geography. Proprietary data differs from source to source.

## Critical mass

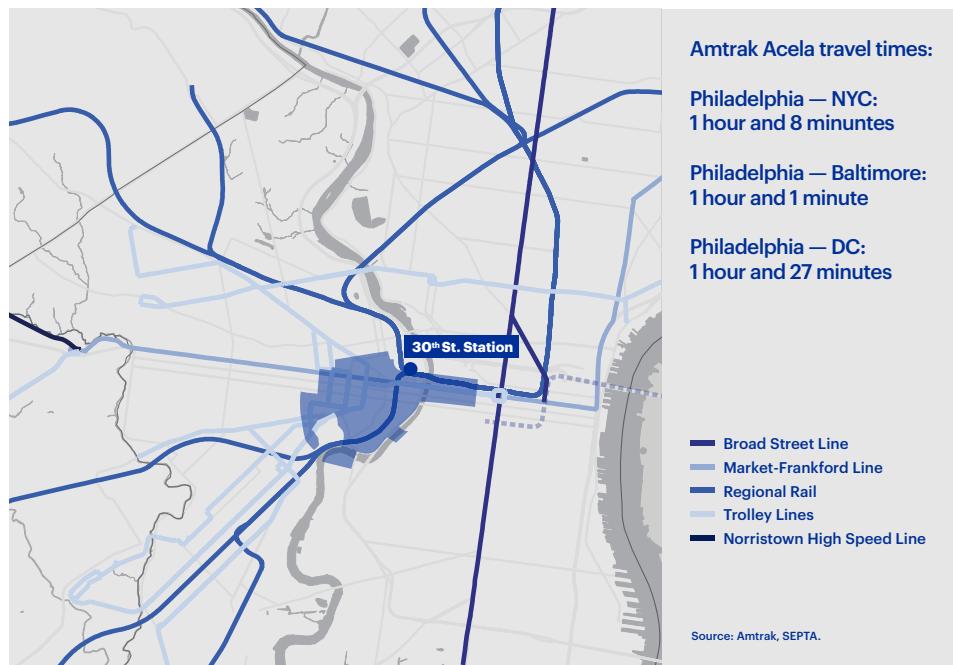
### 2 — Where are the region's innovation assets clustered?

What to look for:	How to measure it:*	Sample sources:
<b>What is the region's employment by industry sector? Where is there a concentration by sector?</b>	<ul style="list-style-type: none"><li>Employees per industry sector</li><li>Share of employees per industry sector</li><li>Concentrations of employees by sector (particularly "eds and meds")</li></ul>	<ul style="list-style-type: none"><li><a href="#">U.S. Census Bureau Longitudinal Employer-Household Dynamics (via OnTheMap)</a></li><li><a href="#">Bureau of Labor Statistics (BLS) Quarterly Census of Employment and Wages</a></li><li><a href="#">U.S. Census Bureau Decennial Census or American Community Survey</a></li><li>Proprietary firm-level data (e.g., Dun &amp; Bradstreet (Hoovers), National Establishment Time-Series Database, Infogroup (InfoUSA, ReferenceUSA), ESRI Business Analyst, etc.)</li></ul>
<b>Where are the region's innovation intermediaries (e.g., incubators, accelerators, coworking spaces, etc.) located and/or clustered?</b>	<ul style="list-style-type: none"><li>Address of intermediaries</li></ul>	<ul style="list-style-type: none"><li>Local knowledge/data (e.g., city or state maintained lists)</li><li>Third-party websites/lists (e.g., <a href="#">hackerspaces</a>, <a href="#">coworking spaces</a>, <a href="#">accelerators</a>)</li><li>Google Maps</li></ul>
<b>Where is there a concentration of talented workers?</b>	<ul style="list-style-type: none"><li>Percentage of workers with a BA degree or higher</li><li>Change in share of workers with BA degree over time</li></ul>	<ul style="list-style-type: none"><li><a href="#">U.S. Census Bureau Longitudinal Employer-Household Dynamics (via OnTheMap)</a></li></ul>

\*Note: Most of these publicly available data are available at the census block level, meaning the "block" is the unit of analysis. A locally sensitive decision should be made regarding appropriate geography. Proprietary data differs from source to source.

### 3 — Are the identified areas physically connected to the city, region, and beyond?

To grow and thrive, the institutions, firms, and other organizations that comprise an innovation district need to have easy access to other actors in the regional innovation ecosystem, and the ability to connect to domestic/global actors and markets efficiently. Being transit accessible to workers from throughout the region is also crucial. Such connectivity can be improved over time, but local leaders should be assessing existing capabilities as a baseline criterion of innovation district potential.



Map from Connect to compete: Philadelphia's University City-Center City innovation district. The district is well-connected both within its boundaries and to other parts of the city and Northeast corridor.

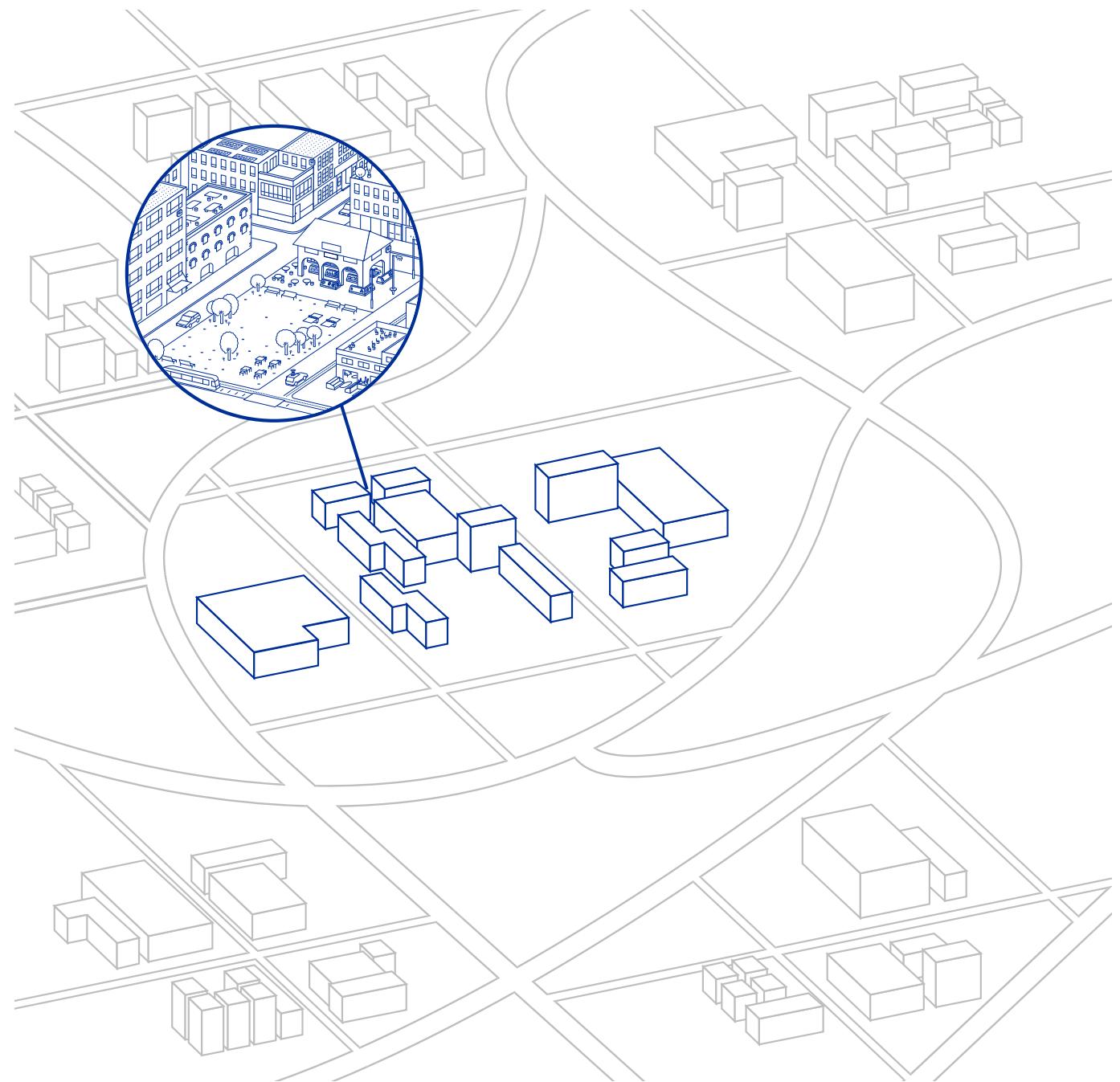
## Critical mass

3 — Are the identified areas physically connected to the city, region, and beyond?

What to look for:	How to measure it:	Sample sources:
<b>Are the areas connected to domestic and international transit assets (rail and air)?</b>	<ul style="list-style-type: none"><li>Distance to transit assets (airports, major rail stations, etc.)</li></ul>	<ul style="list-style-type: none"><li>Local knowledge/data (e.g., public transit websites)</li><li><a href="#"><u>U.S. Department of Transportation (DOT) National Transportation Atlas Database</u></a></li><li><a href="#"><u>Transit Score</u></a></li></ul>
<b>Are the areas transit accessible to other parts of the region?</b>	<ul style="list-style-type: none"><li>Location of public transportation lines and/or stops</li></ul>	<ul style="list-style-type: none"><li>Local knowledge/transit maps/data</li><li><a href="#"><u>U.S. Department of Transportation (DOT) National Transportation Atlas Database</u></a></li></ul>
<b>Are there physical barriers present that limit access to surrounding areas?</b>	<ul style="list-style-type: none"><li>Presence of urban renewal scars such as major/impeding highways or waterways that inhibit connectivity and accessibility</li></ul>	<ul style="list-style-type: none"><li>Local knowledge and assessment</li><li><a href="#"><u>U.S. Department of Transportation (DOT) National Transportation Atlas Database</u></a></li></ul>

## Critical mass

In short, an existing or potential innovation district will be a robust economic activity hub with a density of innovation assets that are well-connected within the region and beyond it. The next step in the audit is a much deeper assessment of the innovation, inclusion, and place assets, advantages, and challenges on which a district's long-term success will ride.



# Innovation capacity



# Is the district leveraging and aligning its distinctive advantages to grow and strengthen firms' innovation capacity?

Classic examples of innovation economies—Cambridge, Mass., Silicon Valley, Tel Aviv—are well known throughout the world. But most regions will never look like these places—and should not aspire to do so. Rather, regions have substantially different innovation assets from one another, requiring leaders to employ unique strategies to leverage them. As such, they need to undertake a sober assessment of the legitimate strengths on which they can build, and determine tenable goals for the future.

Innovation is important to the United States (and by extension its many states, regions, cities, and neighborhoods) because it enables workers to produce new and improved goods and services for domestic and global markets. In a relatively high-wage economy like the United States, quality—not labor arbitrage, tax incentives, or other activities—enables workers to rise above global competitors. In fact, research and development alone accounts for one-sixth of productivity growth (Bureau of Economic Analysis, 2007).

In undertaking an innovation district audit, leaders should look to assess a district's capacity to translate ideas into new products and services that improve the quality of life for residents and workers of the city and region, and, potentially, have a positive impact on people and places across the globe. This innovation capacity can take many forms and originate from many places—from research hospitals that cure disease to engineering schools that reduce local emissions; from socially conscious startups that create new ways to educate children to smart city partnerships that deploy technology to help workers get to jobs.

A district's innovation capacity is critical to local economic development for several key reasons:

- Innovation represents a chief source of high-quality jobs. While economists will continue to debate the aggregate impact of new technology on future employment, we do know that the geographic effects so far have been uneven.<sup>2</sup> Regions that have a critical mass of the skilled workers and institutions needed to create and deploy new technologies are poised to be on the winning end of this global shake-up.
- Innovation drives economic growth via exports. While locally made and traded goods and services yield significant benefits to a community, wages cannot grow in the long run without bringing in resources from outside. However, competition among low-cost countries is too fierce for any region to grow by exporting low-value goods and services. Rather, urban economies in developed countries thrive—or not—based on their ability to bring cutting-edge products and services to global markets. McKinsey Global Institute estimates that a dozen next-generation technologies will soon leave the laboratory to represent one-third of global GDP.<sup>3</sup> Innovation districts sit at the heart of new invention and commercial activity and therefore are likely to be “first movers” in these new product categories.
- Innovation contributes to the tax base of a city and region. Companies and institutions that drive economic value may not directly solve many of the challenges—from homelessness to hunger—that concern local

## Innovation capacity

citizens. But without competitive firms exporting to global markets, communities would not have the tax base needed to enable the public sector to address these issues nor make the investments in education, infrastructure, parks, and other public goods required for a society to thrive.

- Finally, innovation provides an avenue to long-run prosperity. Economists, politicians, and the media focus heavily on monthly or even annual job and growth figures to define success or failure. But this short-term outlook targets business-cycle dynamics instead of the secular trends in a region's economy that represent its true competitive platform. Focusing on a district's innovation assets, as opposed to short-term business patterns, allows leaders to take the long view on the prosperity of their city and region.

# Questions to explore

**Methodological note:** Research labs, universities, and hospital systems at the heart of many innovation districts are not only often the focal points of R&D, but also have the resources, scale, and expertise to form public and private partnerships in order to experiment.

Much of this section thus offers guidance to innovation districts with public or private anchors, in large part because they represent the most common type of district; they are therefore also the districts that Brookings has studied the most. Non-anchor districts require highly specific and different metrics of success.

When analyzing their innovation economies, regional planners often focus too heavily on innovation inputs or innovation outputs—rather than examining both. For example, some studies look only at anchor institution research strengths (an input). Yet those strengths do not necessarily translate into economic prosperity in the community. Other studies focus only on the size and scope of technology startups, jobs, and investment (outputs). Without a keen understanding of inputs and outputs, and the connectivity between them, district leaders will not have a thorough enough understanding of their economies needed to design meaningful future interventions.

To assess their district's innovation capacity, local leaders should investigate five primary questions aimed at understanding an ecosystem's inputs, outputs, and levels of connectivity:

1. What are the region's innovation anchors and research strengths?
2. What are the advanced industry clusters within a district and region?
3. What are the connections between industry and non-industry anchors?
4. What are the commercial activities of anchors?
5. What is the size and scope of entrepreneurship?

# 1 — What are the region's innovation anchors and research strengths?

The strengths of major research universities, academic medical centers, and corporate anchors may appear obvious for urban economic development leaders, but they are often more nuanced than these leaders recognize. For anchor-based innovation districts, research is the feedstock to the innovation economy and must be deeply assessed and understood.

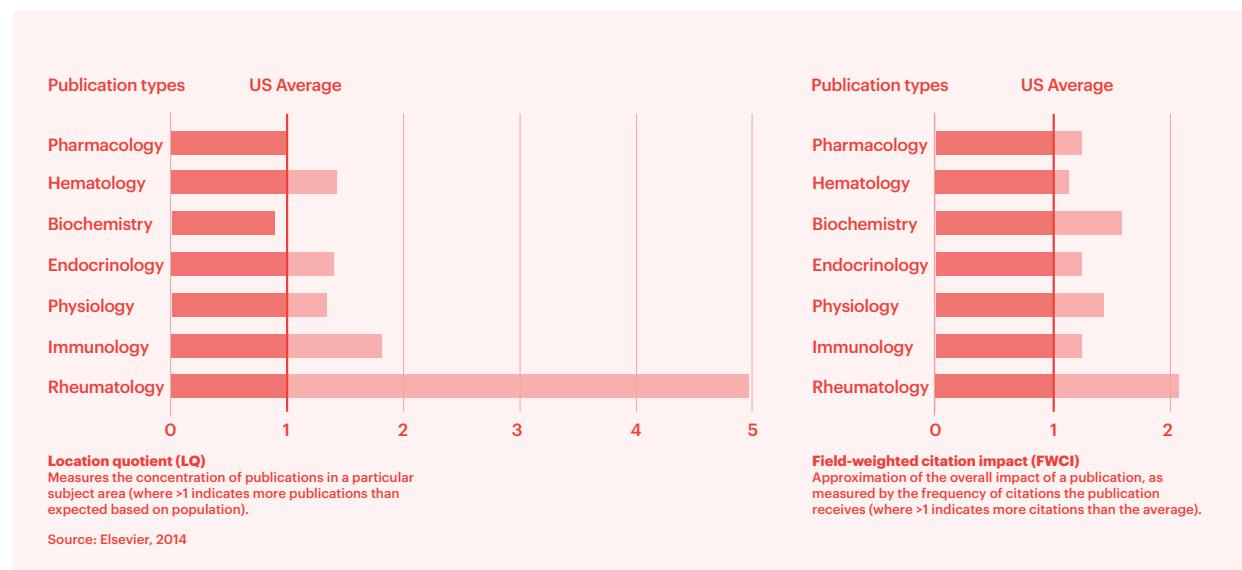


Chart from *Positioned for growth: Advancing the Oklahoma City innovation district*. Publications in health care are a core research strength—in both output and quality—of district research institutions.

## Innovation capacity

### 1— What are the region's innovation anchors and research strengths?

What to look for:	How to measure it:*	Sample sources:
<b>What non-industry institutions produce the most research within the district and region?</b>	<ul style="list-style-type: none"><li>• Federal R&amp;D funding</li><li>• STEM graduates and post-docs</li><li>• Academic publications</li><li>• Major academic departments</li><li>• University and department rankings</li><li>• Presence of not-for-profit research labs and research-based clinical care facilities</li></ul>	<ul style="list-style-type: none"><li>• <a href="#">National Science Foundation (NSF) Higher Education Research and Development Survey (HERD)</a></li><li>• <a href="#">National Science Foundation (NSF) Survey of Graduate Students and Postdoctorates in Science and Engineering</a></li><li>• <a href="#">National Science Foundation (NSF) WebCASPAR</a></li><li>• <a href="#">Small Business Administration (SBA) SBIR/STTR awards</a></li><li>• <a href="#">National Institutes of Health (NIH) RePORTER</a></li><li>• <a href="#">USA Spending.gov</a></li><li>• <a href="#">National Center for Education Statistics (NCES) Integrated Postsecondary Education Data System (IPEDS)</a></li><li>• Proprietary academic pub. datasets (e.g., Elsevier)</li><li>• <a href="#">U.S. News &amp; World Report</a></li></ul>

\*Note: Many of the innovation-related metrics are available at either the institutional level (e.g., universities, hospitals, firms) or the county/city/metro level. Finding district-level metrics is a challenge. Nonetheless, they can help stakeholders understand the broader trends within the region and how they relate to the district.

## Innovation capacity

### 1— What are the region's innovation anchors and research strengths?

What to look for:	How to measure it:*	Sample sources:
<b>What firms produce the most innovation in the district and region?</b>	<ul style="list-style-type: none"><li>• Patents by firm</li><li>• STEM and IT workers by industry</li><li>• Presence of corporate research centers</li><li>• Headquarter companies</li><li>• Industry-weighted R&amp;D expenditures</li><li>• Technology exports by industry</li></ul>	<ul style="list-style-type: none"><li>• <a href="#">United States Patent and Trademark Office</a></li><li>• <a href="#">Bureau of Labor Statistics (BLS) Occupational Employment Statistics (OES)</a></li><li>• <a href="#">National Science Foundation (NSF) Business R&amp;D and Innovation Survey</a></li><li>• <a href="#">Department of Commerce International Trade Administration</a></li></ul>
<b>What are the specific research strengths of anchor institutions?</b>	<ul style="list-style-type: none"><li>• Rankings of academic departments</li><li>• Presence of star faculty</li><li>• Location quotients of academic and industry patents, publications, and research funding by area</li><li>• Absolute R&amp;D funding by subject</li><li>• Research-specific centers (specifically those nationally designated)</li><li>• Presence of prestigious funding (e.g., NIH R01s)</li></ul>	<ul style="list-style-type: none"><li>• <a href="#">U.S. News &amp; World Report</a></li><li>• <a href="#">National Science Foundation (NSF) Higher Education Research and Development Survey (HERD)</a></li><li>• <a href="#">National Institutes of Health (NIH) RePORTER</a></li><li>• Proprietary academic publication datasets (e.g., Elsevier)</li></ul>

\*Note: Many of the innovation-related metrics are available at either the institutional level (e.g., universities, hospitals, firms) or the county/city/metro level. Finding district-level metrics is a challenge. Nonetheless, they can help stakeholders understand the broader trends within the region and how they relate to the district.

## 2 — What are the advanced industry clusters within a district and region?

Connecting research anchors to economic activity requires a clear view of high-tech industry at the district, city, and metropolitan scale. In order to make sound investments, leaders should also know where advanced industry growth opportunities exist in their region.

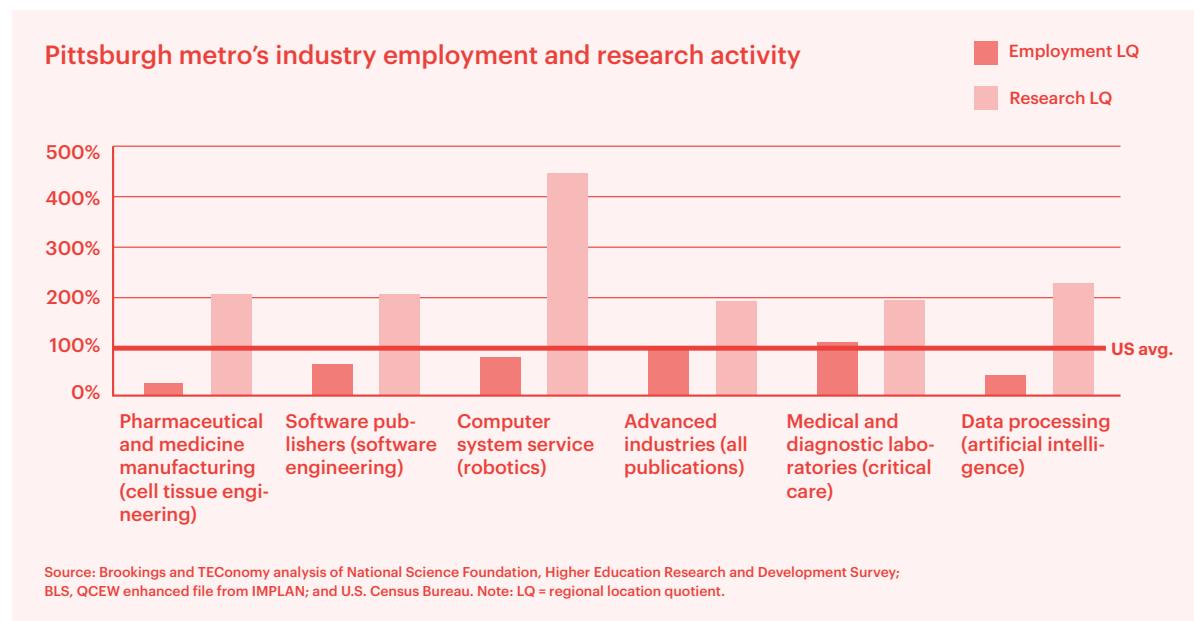


Chart from *Capturing the next economy: Pittsburgh's rise as a global innovation city*. The connection between research and industry strengths is weak in certain core competencies.

## Innovation capacity

### 2 — What are the advanced industry clusters within a district and region?

What to look for:	How to measure it:	Sample sources:
<b>What are the region's absolute advanced industry cluster strengths?</b>	<ul style="list-style-type: none"><li>Absolute number and dollar amount per cluster for jobs, output, and productivity</li></ul>	<ul style="list-style-type: none"><li>Bureau of Labor Statistics and proprietary aggregation companies (e.g., Moody's Analytics)</li></ul>
<b>What are the relative cluster strengths?</b>	<ul style="list-style-type: none"><li>Location quotients for jobs and output</li><li>Growth in all metrics</li><li>Geography of all metrics by district, city, county, and MSA</li></ul>	<ul style="list-style-type: none"><li>Bureau of Labor Statistics and proprietary aggregation companies (e.g., Moody's Analytics)</li></ul>
<b>What are the cluster opportunities?</b>	<ul style="list-style-type: none"><li>In-region supply chain purchases</li><li>Job multiplier figures per cluster and industry</li><li>National and global growth trends of cluster and industry</li><li>Connection between key advanced industries and adjacent industries</li></ul>	<ul style="list-style-type: none"><li><a href="#">Bureau of Economic Analysis (BEA) Regional Economic Accounts</a></li><li>Bureau of Labor Statistics and proprietary aggregation companies (e.g., Moody's Analytics)</li></ul>

## 3 — What are the connections between industry and non-industry anchors?

Once anchor institution strengths and broader advanced industry clusters are identified, auditors must then assess the connections between them.

What to look for:	How to measure it:	Sample sources:
<b>What are the <i>formal</i> research connections between anchors?</b>	<ul style="list-style-type: none"><li>• Cross-discipline patents and patent citation</li><li>• Local or industry-specific sponsored research</li><li>• Joint publications</li><li>• Joint degrees</li></ul>	<ul style="list-style-type: none"><li>• Proprietary academic publication datasets (e.g., Elsevier)</li></ul>
<b>What are the <i>informal</i> connections between anchors?</b>	<ul style="list-style-type: none"><li>• Internships and student support</li><li>• Consistent hiring of recent graduates and staff</li><li>• Proximity of research centers</li></ul>	<ul style="list-style-type: none"><li>• Qualitative research and interviews with faculty, graduate students, etc.</li></ul>

## 4 — What are the commercial activities of anchors?

Research competitiveness is a necessary but insufficient condition for innovation districts to grow, export, and become globally competitive. Anchors must also have the right processes, incentives, and outcomes that facilitate the commercialization of research—in some, though not necessarily in all, areas. Finally, because academic institutions move slowly, change over time within technology transfer metrics is important, both in absolute terms and relative to their peers.

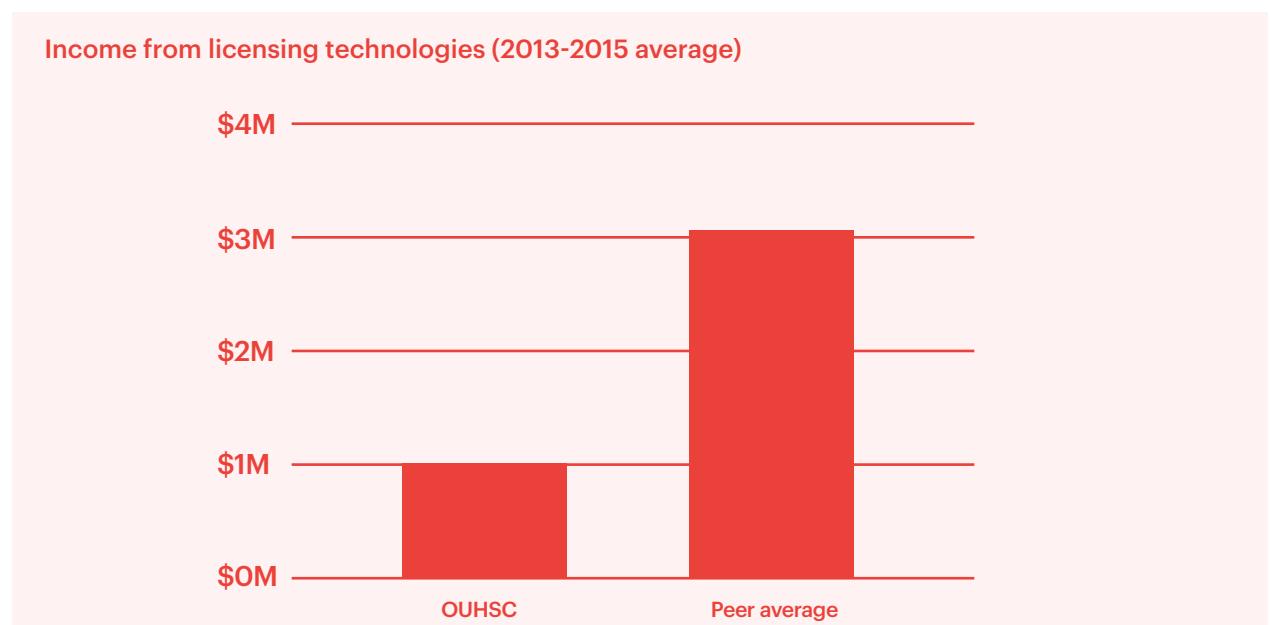


Chart from *Positioned for growth: Advancing the Oklahoma City innovation district*. Licensing income from the University of Oklahoma's Health Sciences Campus lags behind peers.

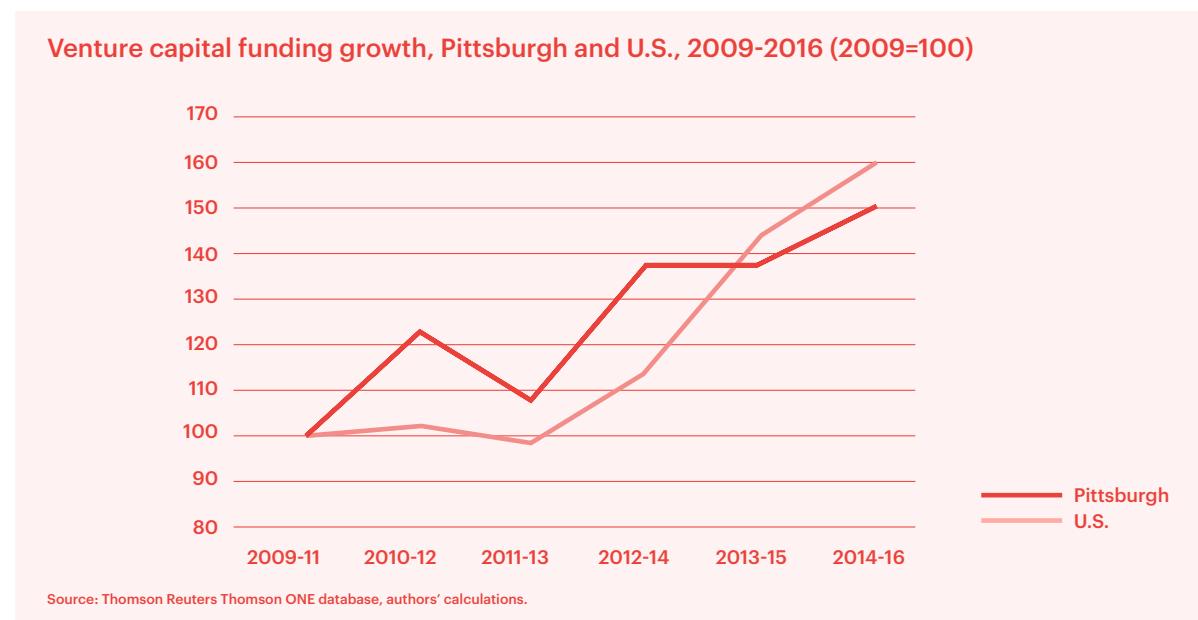
## Innovation capacity

### 4 — What are the commercial activities of anchors?

What to look for:	How to measure it:	Sample sources:
<b>How do research institutions perform on <i>formal</i> commercialization metrics?</b>	<ul style="list-style-type: none"><li>Absolute number of license agreements (deals and revenue), patents, invention disclosures, and startups by institution</li><li>The metrics above compared with appropriate peers and as a share of R&amp;D expenditures, number of students, and number of staff</li><li>Number of translational and applied research awards</li></ul>	<ul style="list-style-type: none"><li><a href="#">Association of University Technology Managers (AUTM) tech transfer data</a></li><li>Federal funding agencies (e.g., <a href="#">NIH RePORTER</a>, National Science Foundation, etc.)</li><li><a href="#">National Center for Education Statistics (NCES) Integrated Postsecondary Education Data System (IPEDS)</a></li><li><a href="#">Small Business Administration (SBA) SBIR/STTR awards</a></li></ul>
<b>How do research institutions perform on <i>informal</i> or qualitative commercialization metrics?</b>	<ul style="list-style-type: none"><li>Number and size of master agreements</li><li>Informal partnerships with industry (number and longevity)</li><li>Faculty on scientific boards</li><li>Local alumni spinoffs</li><li>Approach of tech transfer office (combative, reactive, or proactive)</li><li>Faculty-related spinoffs</li></ul>	<ul style="list-style-type: none"><li>Qualitative research and interviews with tech transfer offices, professors and faculty, etc.</li></ul>

## 5 — What is the size and scope of entrepreneurship?

Young, high-growth firms represent the lion's share of new jobs within cities.<sup>4</sup> They are also often the primary vehicle for translating academic research into market applications. However, it takes an entire ecosystem to support entrepreneurs. Too often leaders only look at total access to capital as the major constraint to high-growth startups, when in fact a variety of factors could be playing a role.



*Chart from Capturing the next economy: Pittsburgh's rise as a global innovation city. While venture capital funding has rebounded in recent years, overall funding growth has been lackluster.*

## Innovation capacity

### 5 — What is the size and scope of entrepreneurship?

What to look for:	How to measure it:	Sample sources:
<b>How many startups are there, in total and by sector?</b>	<ul style="list-style-type: none"><li>Number of new firms and growth over time</li><li>Number of new high-growth firms</li><li>Number of firms by sector</li><li>Number of jobs by firm age</li></ul>	<ul style="list-style-type: none"><li>Inc. 5000</li><li>The Kauffman Index</li><li>Bureau of Labor Statistics (BLS) Business Employment Dynamics</li><li>Private firm-level data sources (e.g., Dun &amp; Bradstreet)</li><li>U.S. Census Bureau Longitudinal Employer-Household Dynamics (via OnTheMap)</li></ul>
<b>What are the resources available to startups?</b>	<ul style="list-style-type: none"><li>Number of coworking spaces (including wet lab if relevant) and accelerator programs</li><li>Outcomes of accelerator programs</li><li>Total venture capital</li><li>Venture capital by technology category, compared to peer cities and growth over time</li><li>CEO and management-level recruitment and mentorship programming, including entrepreneurs-in-residence</li></ul>	<ul style="list-style-type: none"><li>Third-party websites/lists (e.g., <a href="#">hackerspaces</a>, <a href="#">coworking spaces</a>, <a href="#">accelerators</a>)</li><li>Venture capital aggregation data sources (e.g., Pitchbook)</li><li>Qualitative research and interviews with entrepreneurs, venture capital firms, startup community, etc.</li></ul>

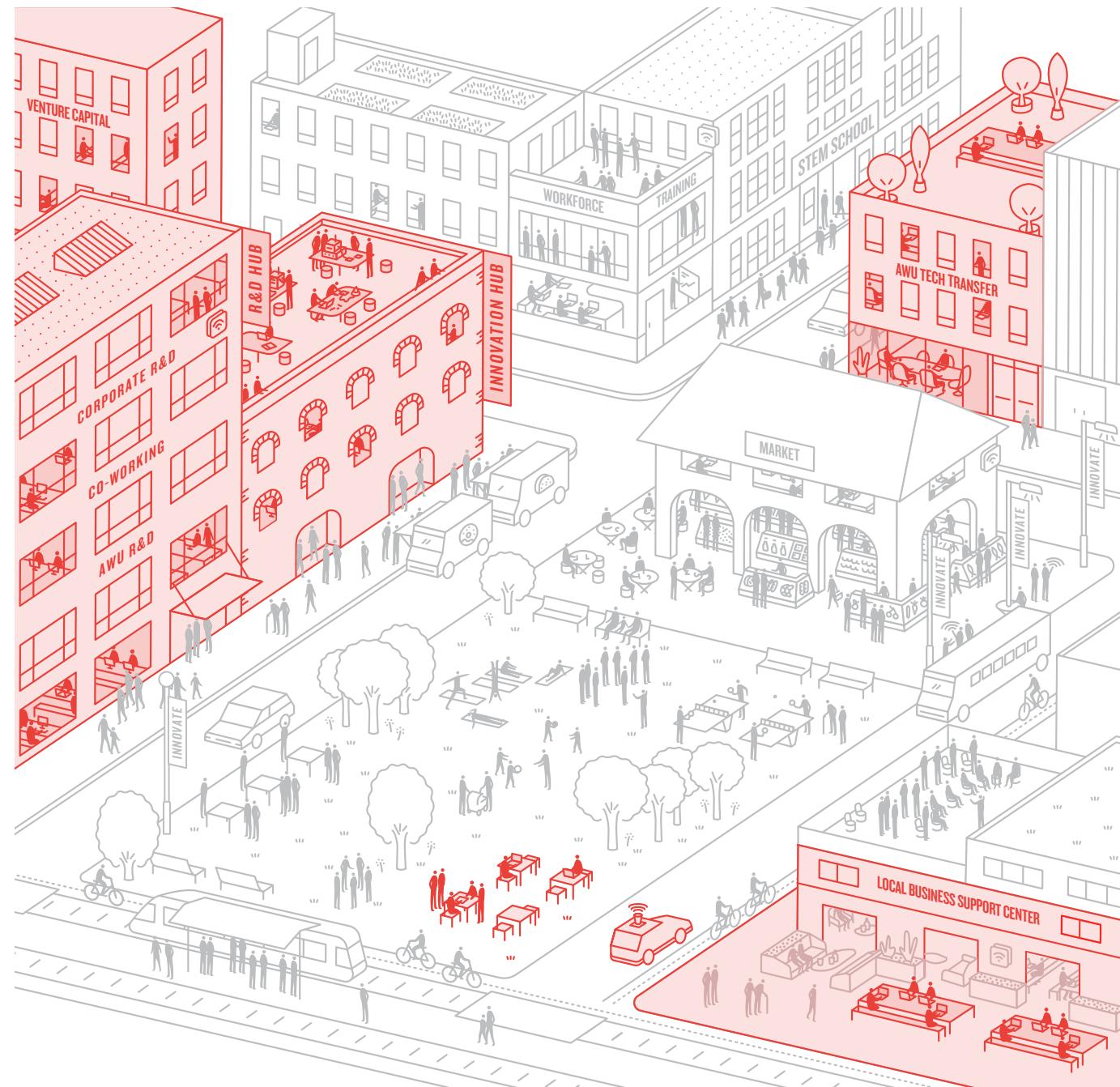
## Innovation capacity

### 5 — What is the size and scope of entrepreneurship?

What to look for:	How to measure it:	Sample sources:
<b>Does the region retain and grow startups?</b>	<ul style="list-style-type: none"><li>• Number and share of firms receiving external funding that relocate</li><li>• Funding drop-off of post-seed startups</li><li>• Regional ability to fund series A and beyond</li><li>• Number of local venture capital deals syndicated regionally, nationally, and globally</li><li>• Number of serial entrepreneurs</li><li>• Total IPOs and acquisitions, size of deals, and retention of founders</li></ul>	<ul style="list-style-type: none"><li>• Venture capital aggregation data sources (e.g., Pitchbook)</li><li>• Qualitative research and interviews with entrepreneurs, venture capital firms, startup community, etc.</li></ul>

## Innovation capacity

Innovation districts, as the name implies, are geographic focal points of research, which is then translated into new products and services. The five areas discussed above represent just some of the key questions public, private, and civic leaders should be asking in order to better understand the strengths and weaknesses of their anchors and entrepreneurial ecosystems. A city will rarely be able to quantify all of the variables discussed, but knowing the right questions—and tailoring them to the local context—will help district leaders conduct an analysis most appropriate for their needs.



# Diversity and inclusion



# Does the district have an inclusive, diverse, and opportunity-rich environment?

An inherently collaborative process, innovation relies on a diverse set of actors—defined by race, gender, age, or other characteristics—to generate new ideas and products for the market. Research demonstrates a positive relationship between diversity and innovation in a business setting. In fact, numerous studies show that teams with higher diversity actually outperform those that are more homogeneous on several innovation-related metrics (Diaz-Garcia et al., 2012; Nathan and Lee, 2015; Lorenzo et al., 2017).



A healthy innovation district comprises a diversity of people and provides economic opportunity for workers with a range of skills and education levels. These workers can come from around the region, or from nearby communities. Innovation districts—particularly those anchored by long-established universities or medical campuses—are often within or adjacent to areas of economic distress. These areas struggle with concentrated poverty, economic segregation, and racial inequality. Such proximity offers the opportunity to engage existing residents in economic growth, but it will not happen by accident. Rather, it is critical that leaders assess how the district fares on diversity and inclusion measures and develop intentional strategies to ensure that all residents benefit from, and are an integral part of, district development.

Doing so is critical to developing a healthy innovation ecosystem for several key reasons:

- U.S. demographics are shifting such that, by 2040, 13 states, 102 metros, and 602 counties will have majority nonwhite populations; indeed, many of these places already do.<sup>5</sup> Yet minorities continue to lag behind their white peers on a range of socioeconomic indicators and, along with women, are vastly underrepresented in the nation’s tech industries.<sup>6</sup> The country simply cannot afford to keep leaving vast segments of the

population disengaged from the innovation economy, nor leaving deep wells of talent untapped. Indeed, recent research asserts that if “women, minorities, and children from low-income families invented at the same rate as white men from high-income families, there would be four times as many inventors in America as there are today.”<sup>7</sup>

- Beyond the economic imperative, a moral imperative exists to increase the numbers of women and minorities in high-quality occupations with good career pathways. Long restricted in their ability to build wealth and move up the economic ladder—in large part due to discriminatory government policies and practices—the proximity of disenfranchised communities to innovation districts presents a genuine chance to aggressively break down long-standing racial barriers to quality education, employment opportunities, and business ownership.
- By making a clear and firm commitment to diversity and inclusion from the outset, district leaders can build the broad community and political support, involvement, and trust needed for district development to progress. This analysis is a key part of the process in that it provides all stakeholders with the information they need to create a powerful narrative around the challenges and opportunities facing many district communities, to reinforce the imperative and rationale for prioritizing inclusive growth, and to get ahead of affordability and other challenges that could arise as the district develops.

# Questions to explore

To assess an innovation district on diversity and inclusion measures—and inform strategies to improve them—asset auditors should investigate four central questions:

- 1. What are the district’s baseline measures of diversity? Where do disparities exist?**
- 2. Does the district provide equitable, broad opportunity for a range of workers?**
- 3. Are nearby neighborhoods—and their residents—connected to district growth?**
- 4. Do district actors have intentional policies and programs in place to increase diversity and opportunity?**

# 1 — What are the district's baseline measures of diversity? Where do disparities exist?

Local stakeholders need a baseline understanding of the district area's demographic composition and the extent and nature of racial and socioeconomic disparities. Stakeholders should assess both the district as well as its surrounding communities.

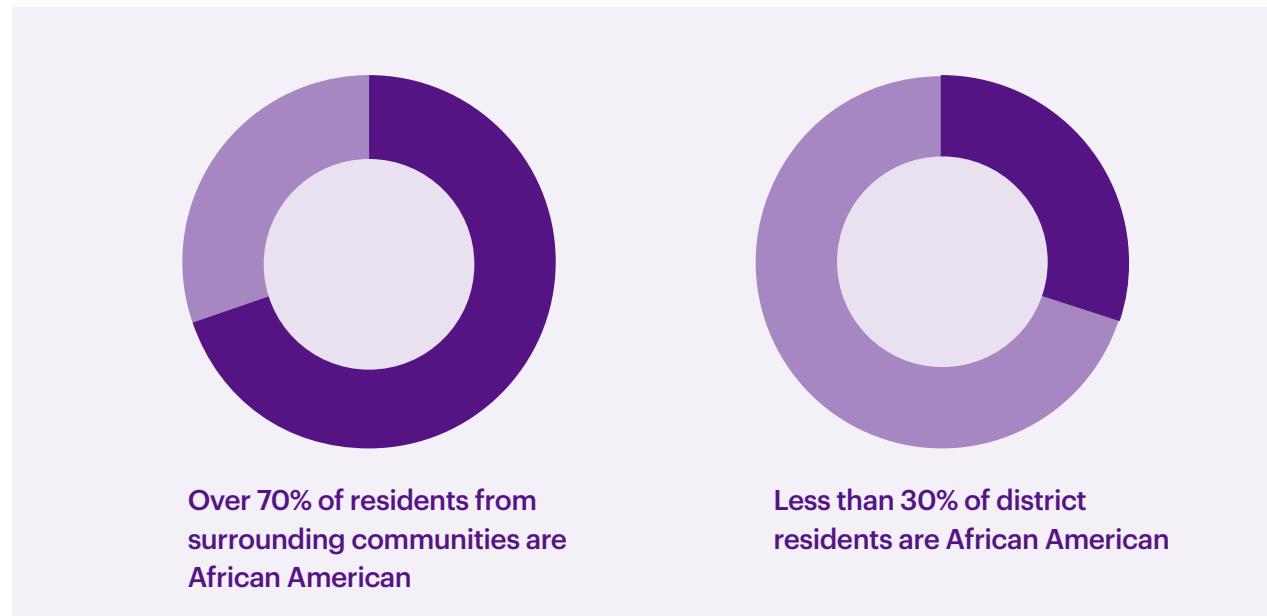


Chart from Connect to compete: Philadelphia's University City-Center City innovation district. There are stark racial disparities between the district and surrounding communities.

## Diversity and inclusion

1— What are the district's baseline measures of diversity? Where do disparities exist?

What to look for:	How to measure it:	Sample sources:
<b>How diverse are district workers, researchers, and/or students? Are significant disparities present?</b>	<ul style="list-style-type: none"><li>Workers by race/ethnicity and gender</li><li>Graduate students by race/ethnicity and gender</li><li>Doctorates by majors and by race/ethnicity and gender</li></ul>	<ul style="list-style-type: none"><li><a href="#">U.S. Census Bureau Longitudinal Employer-Household Dynamics (via OnTheMap)</a></li><li><a href="#">National Science Foundation (NSF) Survey of Graduate Students and Postdoctorates in Science and Engineering</a></li><li><a href="#">National Center for Education Statistics (NCES) Integrated Postsecondary Educational Data System (IPEDS)</a></li></ul>
<b>How diverse are district residents and residents of surrounding communities? Are significant disparities present?</b>	<ul style="list-style-type: none"><li>Residents by race/gender/foreign-born status</li></ul>	<ul style="list-style-type: none"><li><a href="#">U.S. Census Bureau Decennial Census or American Community Survey</a></li></ul>
<b>How diverse is the ownership of district businesses?</b>	<ul style="list-style-type: none"><li>Share of minority- and women-owned businesses</li></ul>	<ul style="list-style-type: none"><li><a href="#">U.S. Census Bureau Survey of Business Owners and Self-Employed Persons (SBO)</a></li></ul>

## 2 — Does the district provide equitable, broad opportunity for a range of workers?

Despite preconceived notions, innovation districts are not simply bastions for those with advanced STEM degrees.<sup>8</sup> Rather, they can be economic engines for the city and region that employ people across the educational spectrum. Asset auditors must therefore better understand the degree to which the district provides—or has the potential to provide—equitable, broad opportunity for workers with a range of credentials and skills.

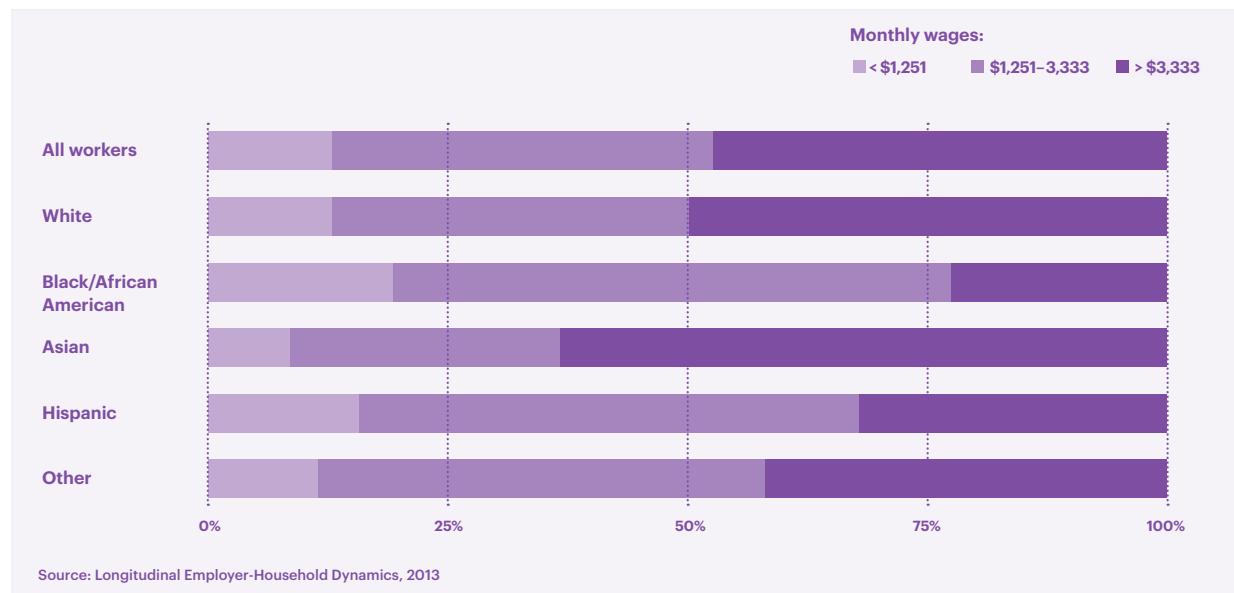


Chart from *Positioned for growth: Advancing the Oklahoma City innovation district*. Minority workers are disproportionately concentrated in lower-paying positions within the district.

## Diversity and inclusion

2— Does the district provide equitable, broad opportunity for a range of workers?

What to look for:	How to measure it:*	Sample sources:
<b>What are the entry requirements for occupations in the district?</b>	<ul style="list-style-type: none"><li>• Occupations by educational attainment required for entry</li><li>• Occupations by training/ previous work experience required for entry</li><li>• Percentage of jobs requiring less than a 4-year degree</li><li>• Percentage of jobs with minimal experience required for entry</li></ul>	<ul style="list-style-type: none"><li>• Bureau of Labor Statistics (BLS) Occupational Employment Statistics (OES)</li><li>• Websites and publications of local firms and anchor institutions</li></ul>
<b>Do well-paying and accessible occupations concentrate in the district?</b>	<ul style="list-style-type: none"><li>• Occupations by educational attainment required for entry and that pay higher-than-median wages</li><li>• Percentage of jobs requiring less than a 4-year degree that pay higher-than-median wages</li></ul>	<ul style="list-style-type: none"><li>• Bureau of Labor Statistics (BLS) Occupational Employment Statistics (OES)</li><li>• Websites and publications of local firms and anchor institutions</li></ul>
<b>Are there economic disparities by race?</b>	<ul style="list-style-type: none"><li>• Wages by race</li></ul>	<ul style="list-style-type: none"><li>• U.S. Census Bureau Longitudinal Employer-Household Dynamics (via OnTheMap)</li></ul>

## 3 — Are nearby neighborhoods—and their residents—connected to district growth?

Unlike in suburban business parks, jobs in innovation districts are often just a short walk from distressed neighborhoods. This co-location presents a unique opportunity to design place-based strategies that connect residents to economic opportunity, well-paying jobs, services, and amenities within the district.



Map from Connect to compete: Philadelphia's University City-Center City innovation district. Poverty rates in surrounding communities—many of which are part of the federally designated Promise Zone—are persistently high.

## Diversity and inclusion

3 — Are nearby neighborhoods—and their residents—connected to district growth?

What to look for:	How to measure it:	Sample sources:
<b>Are surrounding residents connected to the district?</b>	<ul style="list-style-type: none"><li>Percentage of district workforce from surrounding neighborhoods</li><li>Presence of physical barriers between district and neighborhoods</li></ul>	<ul style="list-style-type: none"><li><a href="#">U.S. Census Bureau Longitudinal Employer-Household Dynamics (via OnTheMap)</a></li><li>Local survey/knowledge</li></ul>
<b>What is the socioeconomic status of residents in surrounding communities?</b>	<ul style="list-style-type: none"><li>Poverty rate</li><li>Median household income</li><li>Educational attainment</li><li>Unemployment rate</li><li>Labor force participation rate</li></ul>	<ul style="list-style-type: none"><li><a href="#">U.S. Census Bureau Decennial Census or American Community Survey</a></li></ul>
<b>Are public spaces engaging and welcoming to a diversity of local residents? Are surrounding neighborhoods physically connected to district anchor institutions, firms, and amenities?</b>	<ul style="list-style-type: none"><li>Public space usage and perceptions</li><li>Presence of physical barriers between district and surrounding areas</li></ul>	<ul style="list-style-type: none"><li><a href="#">Power of 10</a> (community engagement tool to audit the strengths and weaknesses of a district's public places)</li><li>City-, region-, and state-maintained GIS websites</li></ul>

## 4 — Do district actors have intentional policies and programs in place to increase diversity and opportunity?

For innovation districts to advance on diversity and inclusion measures, local leaders will need to implement policies and programs that intentionally support and foster those principles. Given their outsized impact on hiring, buying, and building, anchor institutions—vital actors in most innovation districts—are opportune places to start. But district stakeholders will need to look beyond anchor-based initiatives and develop a variety of creative solutions tailored to their distinctive needs. Understanding what programs already exist, how effective they are, and where gaps remain is a critical first step in this process.

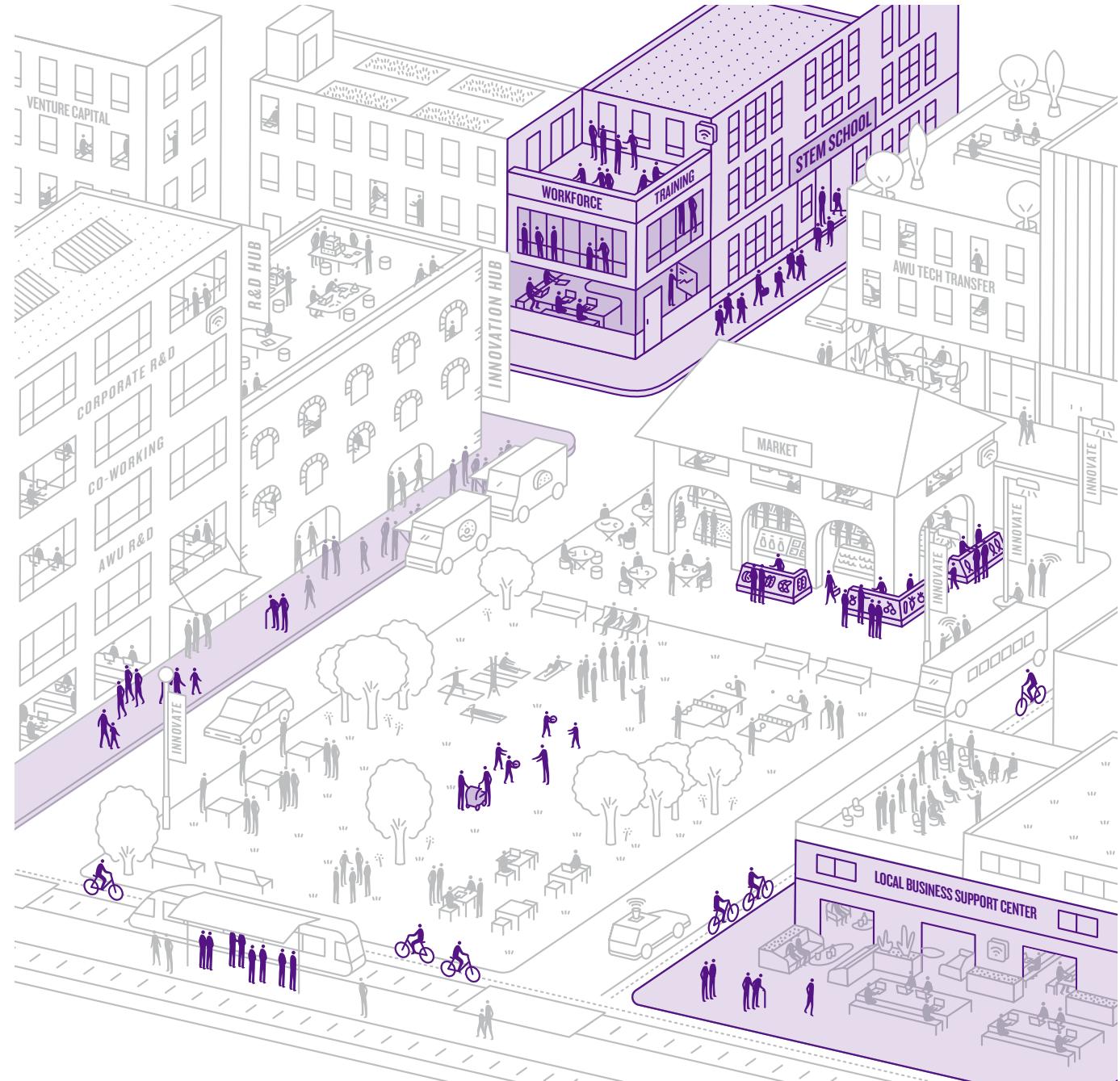
## Diversity and inclusion

4 — Do district actors have intentional policies and programs in place to increase diversity and opportunity?

What to look for:	How to measure it:	Sample sources:
<b>Do district stakeholders apply an equity or inclusion lens to decisionmaking across their organizations? Is their leadership diverse?</b>	<ul style="list-style-type: none"><li>Stated equity/inclusion goals and/or commitment</li></ul>	<ul style="list-style-type: none"><li>Websites and publications of local firms and anchor institutions</li><li>Qualitative research and interviews</li></ul>
<b>Do policies and programs exist to improve STEM education in nearby schools? Are district stakeholders engaged in these efforts?</b>	<ul style="list-style-type: none"><li>Support for local public schools</li><li>Internships, externships, summer programs, and/or mentorships to connect elementary, middle, and high school students to the district</li><li>Connections to community colleges and technical education programs</li></ul>	<ul style="list-style-type: none"><li>Websites and publications of local firms and anchor institutions</li><li>Qualitative research and interviews</li></ul>
<b>Do district stakeholders have policies and programs for local hiring and employment pathways?</b>	<ul style="list-style-type: none"><li>Local hiring initiatives and/or guarantees</li><li>Career pathway programs</li><li>Connections to community colleges and technical education programs</li></ul>	<ul style="list-style-type: none"><li>Websites and publications of local firms and anchor institutions</li><li>Qualitative research and interviews</li></ul>
<b>Do district stakeholders support local businesses via their procurement or other policies?</b>	<ul style="list-style-type: none"><li>Procurement policy targeting minorities, women, and/or local businesses</li><li>Technical and/or financial assistance for local businesses</li></ul>	<ul style="list-style-type: none"><li>Websites and publications of local firms and anchor institutions</li><li>Qualitative research and interviews</li></ul>

## Diversity and inclusion

A healthy innovation district will need to intentionally support a diversity of people, provide broad economic opportunity, and connect nearby communities to its growth. This analysis will help all district stakeholders understand the area's assets and limitations, which in turn can inform the design of appropriate and impactful policies and programs tailored to its unique needs.



# Quality of place



Is there sufficient *proximity and mixing* of people?



Does the district possess an adequate level of *internal connectivity*?

Does the public realm within the innovation district engage and serve a *diversity of users*?

Is the innovation district limited by *legacy burdens* that impede its ability to transform into a contemporary hotbed of innovation?

# Does the district have physical and social assets that attract a diversity of firms and people, increase interactions, and accelerate innovation outcomes?

Dense, walkable, and highly connected areas help nurture the increasingly collaborative and open culture of innovation. These include the kinds of spaces, in both the public and private realm, that bring together workers from a diversity of firms and institutions, in both formal and informal ways; increase face-to-face encounters (particularly important as innovation sectors often demand the exchange of complex, tacit knowledge among their workers); grow and strengthen social networks; and offer the kind of vibrant environments where people want to spend time. (Wagner and Watch, 2017).

A fundamental distinction of innovation districts is the physical landscape and its role in advancing an innovation ecosystem. In comparison, the vast majority of research and science parks—and regional innovation corridors like Silicon Valley—are spatially isolated, accessible only by car, and have placed little emphasis on the quality of life or on integrating work, housing, and recreation. These parks and corridors also reflect a research culture in which firms and scientists have a tendency to operate under “closed” innovation processes, with limited engagement between firms and other sources.



Innovation districts value **quality of place**—connectivity, proximity, and vibrant, inclusive public spaces—as central to their economic proposition. Indeed, many suburban research parks are now re-evaluating their model to incorporate placemaking principles and practices, such as exploring ways to retrofit existing spaces to facilitate formal and informal idea exchange and collaboration.

A high quality of place is essential to district development for several key reasons:

- Successful innovation districts have a variety of options for connecting people both to the district and *within* the district, including by transit, sidewalks, bike paths, balanced car infrastructure, and high-speed fiber. In the future, cities will deploy new technologies both to strengthen connectivity between people and firms and as a platform for future innovation. Innovation districts should be on the front lines of change in this process.
- The experience of proximity—or a physical concentration of firms, workers, and activities—is what differentiates a “buzzing” district from a boring one. At the same time, districts require a healthy mix of uses and activities, which can include institutional, residential, commercial, light manufacturing, cultural, retail, dining, and a range of “innovation spaces.” This is especially true on the ground floor of buildings where the private and public realms meet. “The magic is in the mix,” shared one district leader when reflecting on their current success.
- Public spaces, including streets, are vital to promoting social interaction and idea exchange. Thriving districts foster a well-connected public realm with a dense mixture of complementary uses and activities, comfortable amenities, and a welcoming, sociable atmosphere. This includes public destinations, like parks, squares, and publicly accessible innovation spaces, along with an active street life, which can collectively

transform bricks-and-mortar real estate into an innovation community.

- Healthy, inclusive innovation districts value the role of public processes in defining and shaping place-led strategies. Attracting, connecting, and empowering workers, residents, and firms requires an understanding of many intimate details that only they can provide. Local leaders are therefore wise to value the shaping of place as a community-based process as much as an *outcome*.

## Questions to explore

To identify the physical assets needed to create a magnetic place for firms, talent, and residents, local leaders should investigate four primary questions:

1. Does the district possess an adequate level of internal connectivity?
2. Is there sufficient proximity and mixing of people?
3. Is the innovation district limited by legacy burdens that impede its ability to transform into a contemporary hotbed of innovation?
4. Does the public realm within the innovation district engage and serve a diversity of users?

# 1 — Does the district possess an adequate level of internal connectivity?

As noted in the critical mass section, the institutions, firms, and other organizations that comprise an innovation district need to have easy access not only to other actors in the city and regional innovation ecosystem; they need to be able to connect efficiently with actors throughout the country and around the world. This connectivity principle is also true for people and firms *within* the district itself.



Map from *Positioned for growth: Advancing the Oklahoma City innovation district*. Interstate-235 bisects the Oklahoma City innovation district, hampering connectivity between Automobile Alley and the Health Sciences campus. Source: Google Earth.

## Quality of place

1— Does the district possess an adequate level of internal connectivity?

What to look for:	How to measure it:	Sample sources:
<b>Does a walkable street network internally connect the district (e.g., long, uninterrupted corridors rather than short, walkable blocks)?</b>	<ul style="list-style-type: none"><li>Frequency of intersections (allowing multiple choices of routes)</li><li>Continuity of street network (lack of dead ends, cul-de-sacs, and elbow turns)</li><li>Street network connectivity</li><li>Quality of street crossings (e.g., number of lanes, traffic speeds, frequency of crosswalks, presence of pedestrian-friendly traffic signs)</li></ul>	<ul style="list-style-type: none"><li>Pedestrian counts through the day (in person or time-lapse)</li><li><u>Walkscore</u> (measures the pedestrian experience through a range of criteria)</li><li>City/region/state GIS data repository or ESRI data for streets and sidewalk (e.g., street network density calculations)</li></ul>
<b>Do physical barriers limit access to parts of the district or its immediate surroundings?</b>	<ul style="list-style-type: none"><li>Presence of large infrastructure—such as highways, waterways, or railways—that inhibits connectivity and accessibility</li><li>Presence of large uses, such as gated developments or sports stadiums</li><li>Presence of large open spaces, such as parking lots, large parks, or vacant land</li></ul>	<ul style="list-style-type: none"><li>Local maps/GIS data</li><li>Street-level observations (in person or online)</li></ul>

## Quality of place

1— Does the district possess an adequate level of internal connectivity?

What to look for:	How to measure it:	Sample sources:
<b>Are streets designed to enhance pedestrian safety and comfort?</b>	<ul style="list-style-type: none"><li>Presence of sidewalks on both sides of the street</li><li>Number of pedestrian-car crashes and pedestrian-bike crashes</li><li>Presence of pedestrian amenities (e.g., places to sit, street canopy, lighting)</li><li>Safe pedestrian traffic speeds on “destination” streets (20–30 mph)</li></ul>	<ul style="list-style-type: none"><li>City transportation agency</li><li>Street-level observations (in person or online)</li></ul>
<b>Are there ample public destinations accessible by foot that make walking easy and enjoyable?</b>	<ul style="list-style-type: none"><li>Active ground floors of buildings (amenities, publicly accessible work and community spaces, retail, restaurants)</li><li>Design of ground floor of buildings (transparency of façade, frequency of entrances, limited setbacks)</li><li>Hours of operation for ground-floor uses and public spaces</li><li>Popularity of public destinations</li></ul>	<ul style="list-style-type: none"><li>Online business profiles and check-in data (e.g., <a href="#">Yelp</a>, <a href="#">Foursquare</a>, Google Maps)</li><li>Public space observations</li></ul>

## Quality of place

1— Does the district possess an adequate level of internal connectivity?

What to look for:	How to measure it:	Sample sources:
<b>Is there high-speed fiber across the district?</b>	<ul style="list-style-type: none"><li>The extent to which networks are free and accessible to workers, residents and visitors in key public spaces (parks, open spaces, all ground floors of buildings)</li></ul>	<ul style="list-style-type: none"><li>Data from government agencies (e.g., <a href="#">FCC broadband data</a>)</li></ul>

## 2—Is there sufficient proximity and mixing of people?

The power of proximity is a principle that underpins all successful innovation districts. Simply put, it means measuring the physical access to people and firms by steps rather than miles. An important aspect of proximity is also the mixing of uses—such as research spaces, housing, and amenities—as a way to organically activate the district during the day and well into the evening. This type of vitality is essential to attracting and retaining talent.



Photo from Connect to compete: Philadelphia's University City-Center City innovation district. University City has a variety of uses within a dense area, encouraging the mixing of people and ideas. Photo credit: University of Pennsylvania.

## Quality of place

### 2— Is there sufficient proximity and mixing of people?

What to look for:	How to measure it:	Sample sources:
<b>Does the district have sufficient employment and residential densities to create the potential for interactions between users?</b>	<ul style="list-style-type: none"><li>• Granular employment and residential densities and the extent to which they overlap</li><li>• Pedestrian counts on key streets throughout the day to assess the effects of density on the public realm</li><li>• Survey of workers, students, and residents about frequency of public realm uses, frequency of interactions outside their organizations, and frequency of social activities</li></ul>	<ul style="list-style-type: none"><li>• <a href="#">U.S. Census Bureau Longitudinal Employer-Household Dynamics (via OnTheMap)</a></li><li>• <a href="#">U.S. Census Bureau Decennial Census or American Community Survey</a></li><li>• Locally developed survey instruments</li><li>• Pedestrian counts and public space observations</li></ul>

## Quality of place

### 2— Is there sufficient proximity and mixing of people?

What to look for:	How to measure it:	Sample sources:
<b>Is the district able to create a mix of residential and commercial buildings, ground-floor activity, public markets, cultural amenities, neighborhood amenities, public spaces, and other uses that connect people to each other?*</b>	<ul style="list-style-type: none"><li>Comparison of current district build-out to zoning potential</li><li>Existence of zoning that allows a mix of uses</li><li>Regulations that allow for diverse public realm uses, such as vending, markets, outdoor dining, convenient event permitting, technology prototyping in public space, etc.</li><li>Regulations that preclude surface parking lots between streets and buildings</li><li>Regulations that reduce or remove minimum parking requirements</li></ul>	<ul style="list-style-type: none"><li>Local zoning codes/ordinances to determine mix and density</li><li><a href="#">Form-Based Codes Institute</a></li></ul>

\* Note: While land-use regulations cannot stimulate the emergence of an innovation district, they can set a crucial framework for development. Conversely, an outdated, inappropriate, or inflexible set of land-use regulations can seriously impair a district's ability to create a vibrant and integrated environment.

## Quality of place

### 2— Is there sufficient proximity and mixing of people?

What to look for:	How to measure it:	Sample sources:
<p><b>Are there a variety of publicly accessible places where people can meet, such as shops, cafés, bars, restaurants, maker spaces, lively parks and squares, cultural spaces, public spaces, and “third places”?</b></p>	<ul style="list-style-type: none"><li>• Mix of ground-floor uses</li><li>• Number and locations of public spaces</li></ul>	<ul style="list-style-type: none"><li>• <u>Power of 10</u> (community engagement tool to audit the strengths and weaknesses of a district’s public places)</li><li>• <u>The Storefront Index</u> (maps of storefronts in the 51 largest U.S. metro areas)</li><li>• Interview or survey of workers, residents, and students to identify popular social spaces and activities, as well as their desire for additional spaces and activities</li><li>• <u>Yelp</u> data</li></ul>
<p><b>Are there a variety of public and private innovation spaces, such as accelerators, innovation centers, coworking spaces, and public innovation halls (e.g., District Hall in Boston)?</b></p>	<ul style="list-style-type: none"><li>• Number of spaces</li><li>• Number of events</li><li>• Percentage of events open to the public</li></ul>	<ul style="list-style-type: none"><li>• Survey of key stakeholders to identify a range of innovation spaces</li><li>• User evaluation forms or third-party evaluation of programs and events to determine if quantity and quality is sufficient</li><li>• Third-party event lists (e.g., <u>Eventbrite</u>)</li></ul>

### 3 — Is the innovation district limited by legacy burdens that impede its ability to transform into a contemporary hotbed of innovation?

Cities have evolved through generations of investments by public and private actors. Many of these investments—roads and rail, large-scale manufacturing facilities, city-owned utility sites—were designed to enable or facilitate economic development in a different era. While these investments may have been appropriate at the time, the changing nature of the economy has transformed certain investments into legacy costs that now impede redevelopment.

Other legacy issues are related to the decentralization of population and employment. In some communities, ownership of parking lots, buildings, and land parcels is fragmented among small private entities, including individual families, who are unwilling to sell. This can leave an area pockmarked, making it difficult to create a connected district.

## Quality of place

3 — Is the innovation district limited by legacy burdens that impede its ability to transform into a contemporary hotbed of innovation?

What to look for:	How to measure it:	Sample sources:
<b>Do zoning codes separate uses, such as housing, commercial, and light manufacturing, from each other? Are key uses, including residential, prohibited in the area?</b>	<ul style="list-style-type: none"><li>Zoning uses and categories that separate or segregate uses from each other; language that prohibits uses and activities now desired in an innovation district</li></ul>	<ul style="list-style-type: none"><li>Local zoning ordinance/codes/maps</li><li>Comprehensive planning documents</li></ul>
<b>Are there abandoned or significantly underused buildings from earlier economies that cannot be re-adapted for the new economy?*</b>	<ul style="list-style-type: none"><li>Buildings that cannot be retrofitted or adapted for future uses given safety, stability, or excessive financial burden</li></ul>	<ul style="list-style-type: none"><li>Locally developed survey instruments to interview local actors</li><li>Qualitative research and interviews with city planners, city historians, and historic presentation experts</li></ul>
<b>Does the presence of highways, raised highways or railway tracks, unused railway lines, and similar infrastructure hinder redevelopment and/or the ability to strengthen connections and networks?</b>	<ul style="list-style-type: none"><li>A distinctive variation in vacancy rates, land rents, activity, or the condition of development when comparing both sides of such infrastructure</li><li>A segregation of economic and social networking activities</li></ul>	<ul style="list-style-type: none"><li>Local survey to assess vacancy/abandon rates (if city government or an area nonprofit has not conducted one already)</li><li>Qualitative research and interviews with government officials (economic development, planning)</li></ul>

\* Note: While land-use regulations cannot stimulate the emergence of an innovation district, they can set a crucial framework for development. Conversely, an outdated, inappropriate, or inflexible set of land-use regulations can seriously impair a district's ability to create a vibrant and integrated environment.

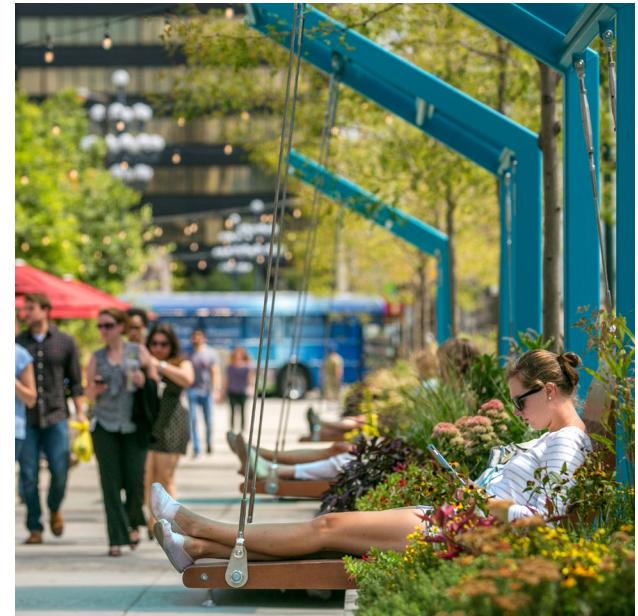
## Quality of place

3 — Is the innovation district limited by legacy burdens that impede its ability to transform into a contemporary hotbed of innovation?

What to look for:	How to measure it:	Sample sources:
<p><b>Are property owners (including city or state governments) retaining properties that are undercutting the advancement of an innovation district (e.g., a site for transferring waste, a car storage facility)?</b></p>	<ul style="list-style-type: none"><li>• Uses that hinder density, proximity, connectivity, and a mix of uses</li></ul>	<ul style="list-style-type: none"><li>• Property survey</li><li>• City, state, and other government agencies to obtain ownership records</li></ul>

## 4 — Does the public realm within the innovation district engage and serve a diversity of users?

Innovation districts must value public spaces as another platform for strengthening new and existing networks, holding meetings, and even testing innovation prototypes. These spaces are also areas where residents, families, visitors, and workers can productively engage and mix. How to do this well is less about finding a star architecture firm and more about engaging users and the broader community to shape and activate spaces.



Photos from Connect to compete: Philadelphia's University City-Center City innovation district. Many public spaces in Philadelphia are programmed and engage a variety of users throughout the day.

## Quality of place

4 — Does the public realm within the innovation district engage and serve a diversity of users?

What to look for:	How to measure it:	Sample sources:
<b>Are public destinations located, designed, and programmed in a way that serves a diversity of users, including residents, workers, and others?*</b>	<ul style="list-style-type: none"><li>• Data on public space usage, including number of users throughout the day, locations of public spaces, and types of activities taking place in the spaces, etc.</li><li>• User demographics</li></ul>	<ul style="list-style-type: none"><li>• Public space observations</li><li>• Interviews and surveys with public space users and potential users</li></ul>
<b>Are activities and programs happening in public spaces that contribute to innovation and inclusion outcomes?*</b>	<ul style="list-style-type: none"><li>• Evaluation of special programs and activities in public spaces</li></ul>	<ul style="list-style-type: none"><li>• User evaluation forms or third-party evaluation of programs and events to determine if quantity and quality is sufficient</li><li>• Interviews with public space managers and decisionmakers</li><li>• Power of 10</li><li>• Public space observations</li></ul>

\* Note: Programs targeting the district's key economic actors (e.g., advanced industry workers) are important if local leaders move forward with a district strategy.

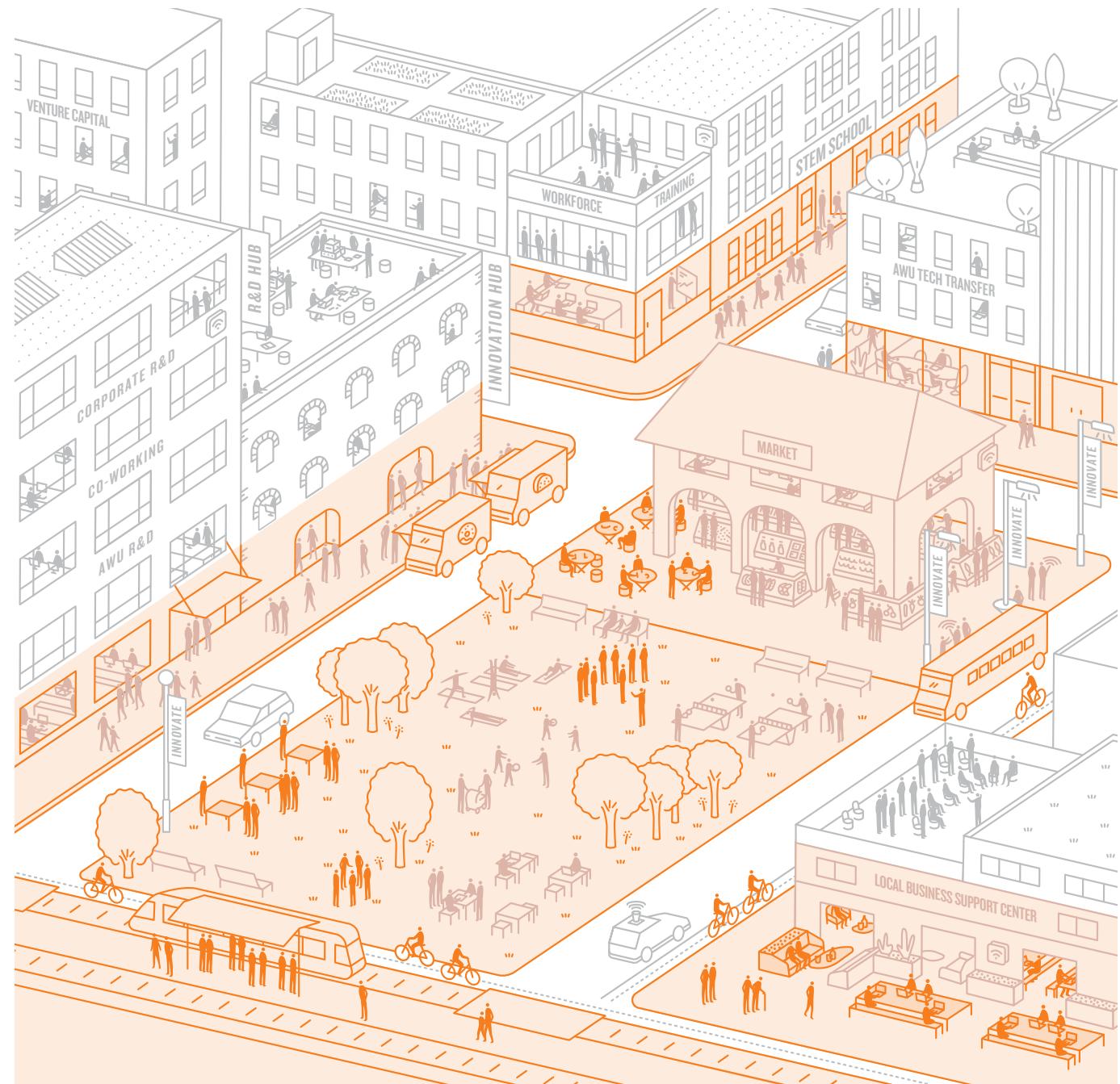
## Quality of place

4 — Does the public realm within the innovation district engage and serve a diversity of users?

What to look for:	How to measure it:	Sample sources:
<b>Does the district have a process in place to meaningfully engage workers, residents, and other local stakeholders in the design, planning, and management of public spaces?</b>	<ul style="list-style-type: none"><li>Evaluation of public processes for city planning, development review, public space design and management, and district management</li></ul>	<ul style="list-style-type: none"><li>Evaluation of public processes, including existing policies and procedures, attendance, demographics, perceptions, and outcomes</li><li>Interviews and/or surveys with key stakeholders administering public processes</li><li>Interviews and/or surveys with students, residents, and workers on perceptions, experiences, and desires related to public processes</li></ul>

## Quality of place

Creating quality places requires a holistic perspective—not just looking at infrastructure or evaluating zoning codes but understanding the extent to which the physical landscape is strengthening networks and relationships and enticing people from a diversity of backgrounds to mix and mingle. It requires playing the role of anthropologist as much as any other discipline. The process of uncovering place assets should be as exciting as it is revealing.



# Leadership

“

Are district leaders informally collaborating and organizing themselves around a set of shared interests and goals?

Have leaders established a more formalized governance structure—when necessary—to guide district development?

Are institutional, firm, and nonprofit leaders innovating within their own organizations in ways that help advance the district?



# Does the district have the leadership necessary to succeed?

District leaders can play different but synergistic roles in driving a new culture of collaborative work. They can:

*Serve as a champion*

Be a visible leader who offers a call to action—a vision—for how the burgeoning district can become stronger and more competitive, and consistently reinforces and promotes that vision in their work.

*Play a convening role*

Gather and mobilize local actors, including relevant institutions outside the district, to develop and drive a new set of priorities and activities.

*Act as a catalyst*

Bring forth new resources and investments that incentivize an agenda of collaboration and demonstrate a commitment to district development that others might follow.

This audit guide has positioned local actors to assess the strengths and weaknesses of the economic, physical, and human capital assets within their districts. However, regardless of those strengths, burgeoning innovation districts will not reach their full potential without **capable leadership**.

In examining established innovation districts, Brookings has found that leaders of key organizations—anchor research institutions, nonprofits, intermediaries, and/or private firms—are together the cornerstones of sustained, strategic efforts to drive change.

Leadership—and the structure of leadership—matters to district development for several key reasons:

- A successful district is made up of individual organizations that are constantly evolving to embrace new ideas and practices that improve their operations and outcomes—and ultimately have a positive impact on the district, and the broader city and region. Strong organizational leadership is the determining factor in that process; without it, a given firm, institution, or nonprofit is less likely to innovate and may eschew engagement in new district-level efforts or activities that threaten their status quo.

- Unlike cities or even states, innovation district leadership is not driven by a natural political process (e.g., election of a mayor or city council), and only sometimes emerges through an existing business or civic organization. Indeed, district leadership often develops organically, with individuals or informal coalitions of leaders stepping up to mobilize other stakeholders to define a common vision and set of goals for achieving specific economic and social outcomes. The initial success or failure of a district will depend upon the strength and influence of its early leaders, and the structures they establish to meaningfully engage stakeholders during the key first phases of district development.
- Leadership structures may be formal or informal, and will vary from district to district depending on their needs and ambitions. But for a district to grow, an organized group of leaders needs to drive the process, getting and keeping a diverse set of stakeholders actively involved in the real work of innovation district development. This work includes identifying district assets, streamlining innovation pipelines within and across institutions and firms, championing policies and programs that advance equity and diversity, harnessing the financial resources needed to fund strategic initiatives, and ultimately supporting a place-governance model that sustains the vision over the long haul (even as individual leaders or groups of leaders come and go).

# Questions to explore

To identify the leadership potential of actors within an innovation district, auditors will want to review how district firms and institutions are advancing innovation, placemaking, and diversity and inclusion, both within and beyond their own walls. They should also assess the missions and capacities of existing civic and intermediary organizations with an eye toward the potential role they might play in the longer-term governance of the district. To this end, an audit should seek to answer three primary questions:

1. Are institutional, firm, and nonprofit leaders innovating within their own organizations in ways that help advance the district?
2. Are district leaders informally collaborating and organizing themselves around a set of shared interests and goals?
3. Have leaders established a more formalized governance structure—when necessary—to guide district development?

# 1—Are institutional, firm, and nonprofit leaders innovating within their own organizations in ways that help advance the district?

To support a growing innovation district, leaders within individual firms and organizations should be implementing internal policies and practices that advance innovation, inclusion, and quality of place—being vanguards of change that others might follow.

## Leadership

1— Are institutional, firm, and nonprofit leaders innovating within their own organizations in ways that help advance the district?

What to look for:	How to measure it:	Sample sources:
<p><b>Do institutions, companies, and not-for-profit organizations have policies and programs in place to:</b></p> <ul style="list-style-type: none"><li>• <b>Support innovation and entrepreneurship?</b></li><li>• <b>Promote diversity and inclusion?</b></li><li>• <b>Enhance connectivity and quality of place?</b></li></ul>	<ul style="list-style-type: none"><li>• Tenure, promotion, and other incentives that reward faculty and researchers for creating companies or mentoring entrepreneurs</li><li>• Provision of well-designed, low-cost space for entrepreneur and community programming</li><li>• Support for regional training programs, including partnerships with local schools and community colleges</li><li>• Formal commitments to organizational diversity and racial equity</li><li>• Policies and programs to train and hire local workers</li><li>• Procurement policies that support local and/or minority- or women-owned businesses</li><li>• Funding and other supports for district-level placemaking, programming, or other activities and initiatives</li></ul>	<ul style="list-style-type: none"><li>• Organizational websites and strategic plans</li><li>• Interviews with key stakeholders (e.g. research directors and faculty, hiring managers, procurement officers, facilities managers, etc.)</li></ul>

## 2 — Are district leaders informally collaborating and organizing themselves around a set of shared interests and goals?

Innovation district leadership must extend beyond individual organizations, but it can take many different forms that evolve over time. Indeed, district “governance”—particularly in the early stages of district development—is often informal and driven by a coalition of the willing. Informal structures can be nimble, allowing district leaders to achieve “quick wins” that spur momentum for larger, more transformative efforts.

## Leadership

2 — Are district leaders informally collaborating and organizing themselves around a set of shared interests and goals?

What to look for:	How to measure it:	Sample sources:
<b>Have coalitions of organizations and/or firms emerged that are successfully driving the early phases of district development?</b>	<ul style="list-style-type: none"><li>• Clear goal-setting structures that outline benchmarks for success or failure and establish task-driven timelines</li><li>• Presence of a diverse set of stakeholders, each of which brings something unique to the table to tackle challenges individual organizations cannot address on their own—from the development of shared innovation spaces, for example, to district-wide marketing and branding activities</li><li>• Articulation of a collective district vision, and a set of actionable goals and strategies</li></ul>	<ul style="list-style-type: none"><li>• Interviews with district leaders and stakeholders</li></ul>

### 3 — Have leaders established a more formalized governance structure—when necessary—to guide district development?

When districts need long-term, consistent funding and decisionmaking authority, sometimes the only option is to create a new organization dedicated to district development. However, before doing so, district leaders should undertake a scan of existing organizations to determine if any are willing and able—or potentially able—to take on the job. Many cities have a large number of legacy institutions with overlapping or outdated missions. For this reason, districts that determine a need for a formal governance structure may find that restructuring an existing organization is preferable to establishing something new.

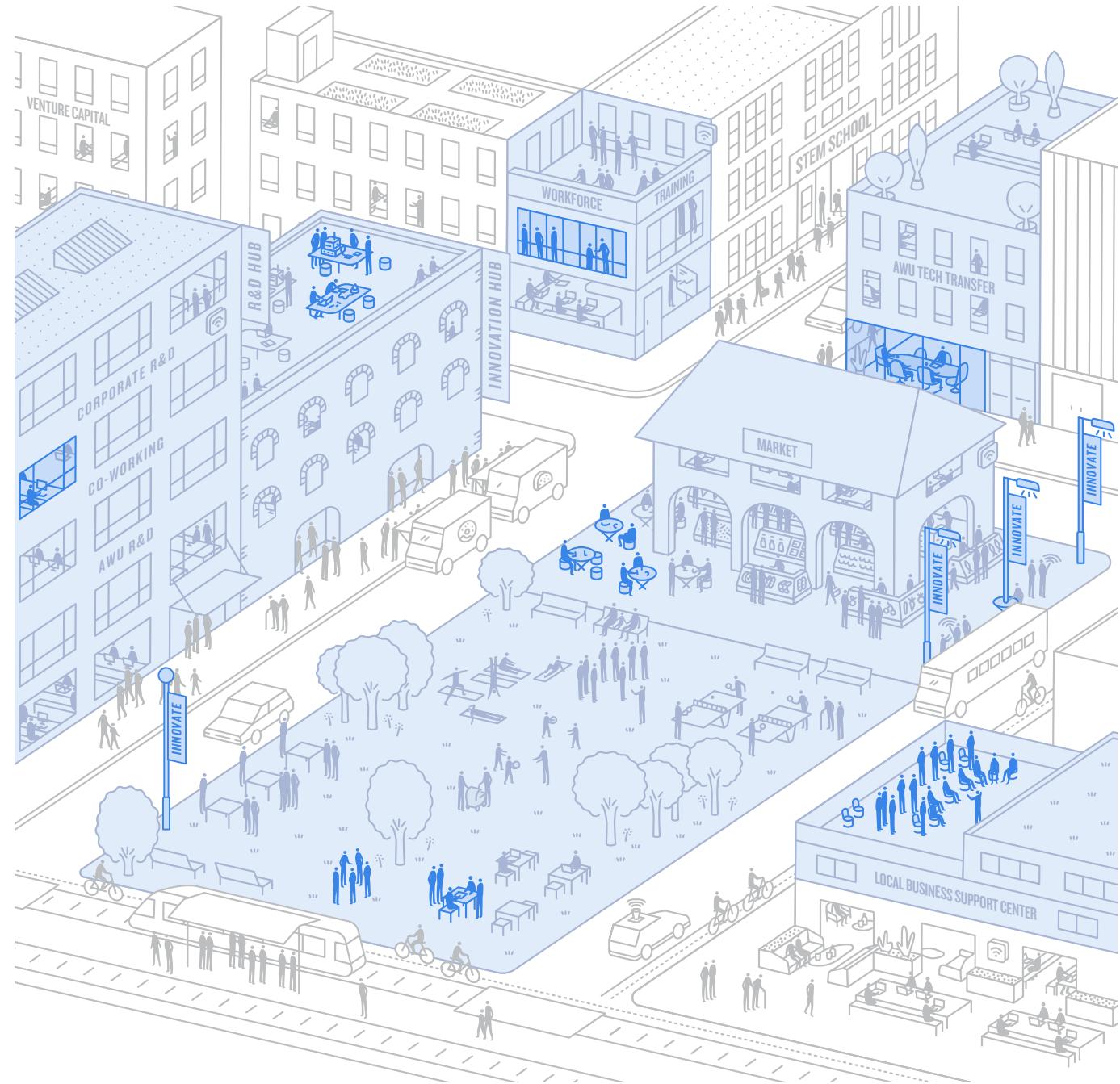
## Leadership

3 — Have leaders established a more formalized governance structure—when necessary—to guide district development?

What to look for:	How to measure it:	Sample sources:
<b>Are any existing organizations in the area well-positioned to be a formal governance entity for the district?</b>	<ul style="list-style-type: none"><li>• A geographic focus that generally aligns with that of the innovation district</li><li>• A mission that aligns with that of the innovation district</li><li>• A willingness by the organization's leadership and board to undertake new/additional roles, responsibilities, and activities</li><li>• Sound financial and organizational capacity</li><li>• A diverse board that comprises a mix of nonprofits, universities, firms, developers, political leaders, residents and other key district stakeholders</li><li>• The ability to take on a wide range of tasks to improve the innovation ecosystem, advance economic inclusion, and enhance the district's physical realm.</li></ul>	<ul style="list-style-type: none"><li>• Organizational websites and reports</li><li>• Interviews with organizational leadership and board members</li></ul>
<b>Could any existing organizations be restructured to become a formal governance entity for the district?</b>		
<b>What values, capacities, powers, and responsibilities would a new organization need to successfully govern the district?</b>		

## Leadership

District leaders can play a variety of roles in fostering a new culture of collaboration and collective impact, whether by serving as champions of a district vision, conveners that mobilize stakeholders to engage, or catalysts of action. While leadership structures will vary, districts can't succeed unless leaders of key organizations make a shared, sustained commitment to drive change.



## Tracking progress over time

In assessing opportunities for innovation district development, leaders should be attentive to developing trends. Given demographic shifts and preferences, not to mention the changing needs and demands of innovative firms and institutions, the ripest geographies have most likely been outpacing growth in their surrounding communities.

Local leaders using this handbook may build on that organic development, or consider how to do so, via strategic innovation, placemaking, and inclusion-related policies, programs, and investments. The initial asset audit becomes an essential information baseline for assessing success over time.

Some indicators are easier to track than others, given the availability of data and the ease of using and interpreting it. And this may vary from city to city depending on the kinds of data that are locally collected, and the research capacity available to conduct ongoing analyses. Local stakeholders undertaking the initial audit should establish a group of 10 to 12 bellwether indicators to follow at established future intervals. These may include but are not limited to:

1. Has the number of workers and firms increased over time?
2. Has the number of residents increased?
3. Have real estate values increased?

- 4. Has the size and number of firms increased, both overall and in targeted sectors?**
- 5. Has the volume of venture capital increased?**
- 6. Has racial and gender diversity of workers and residents improved? In specific occupations?**
- 7. Have nearby, low-income residents connected to district growth via jobs and/or business opportunities? Has the district caused unwelcome real estate pressures on nearby residents?**
- 8. Are new programs in place to improve diversity? How are they performing?**
- 9. Is the district increasingly walkable, bikeable, and transit accessible?**
- 10. Have governance structures been created or adjusted in response to district development?**

## Conclusion

In the end, this guide should be considered as advice more than edict, and a work in progress rather than the final word. No two places will use this document the same way, and we expect that the process itself will evolve over time to consider new measures, and be undertaken in novel and innovative ways by new groups of stakeholders working within districts and across them. As they do, communities will hopefully learn from each other in a virtuous feedback loop that gets sharper and more effective at every turn.

Happy auditing!

Join the conversation about auditing #InnovationDistricts on  
[Twitter](#), [Facebook](#), and [LinkedIn](#)

## Acknowledgments

Jennifer Vey, senior fellow at the Brookings Institution, is the lead author of this handbook. Contributing authors are Scott Andes (fellow), Jason Hachadorian (research analyst), and Julie Wagner (nonresident senior fellow) at Brookings, and Nate Storring (senior program associate) at PPS.

We are greatly appreciative of Teresa Lynch and Thom Goff at Mass Economics for their intellectual guidance and analytic experience throughout our exploration of innovation districts. Closer to home, we would like to thank Bruce Katz for his sage guidance and comments on the development of the audit, and Kelly Cofrancisco for input and assistance on communications and outreach. Susan Kellam and Richard Walker provided invaluable editing and feedback, and MTWTF helped us think through and implement the design of the handbook. Finally, we'd like to express our gratitude to the dozens of people who gave their time to be interviewed as part of our Oklahoma City, Philadelphia, and Pittsburgh research endeavors and as members of the U.S. Conference of Mayors Metro Economies working group.

Support for this work was generously funded by Anne T. and Robert M. Bass.

The views expressed in this report are those of its authors and do not represent the views of the donors, their officers, or employers.

## Endnotes

<sup>1</sup> Bruce Katz and Julie Wagner, “The Rise of Innovation Districts” (Washington: Brookings, 2014),  
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<sup>2</sup> See, for example, Mark Muro, Sifan Liu, Jacob Whiton, and Siddharth Kulkarni, “Digitalization and the American Workforce” (Washington: Brookings, 2017).  
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<sup>5</sup> Sarah Treuhaft, Angela Glover Blackwell, and Manuel Pastor, “America’s tomorrow: Equity is the superior growth model” (Oakland, Calif.: PolicyLink, 2011),  
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<sup>7</sup> Alex Bell, Raj Chetty, Xavier Jaravel, Neviana Petkova, and John Van Reenen, “Who becomes an inventor in America? The importance of exposure to innovation” (2017),  
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<sup>8</sup> For example, our analysis of the innovation districts in Philadelphia and Oklahoma City revealed that more than 55 percent of jobs did not require a four-year degree, in occupations that included bookkeepers, paralegals, respiratory therapists, medical record technicians, and security guards. There exists in both districts a particular concentration of middle-skill jobs—ones that require some type of postsecondary education but not a four-year degree—that pay above the median city wage. This reflects a genuine opportunity for district stakeholders to connect surrounding communities to these well-paying, middle-skill positions—but efforts must be intentional (Vey et al., 2017).

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## Public data sources (United States):

### Bureau of Economic Analysis:

- [Regional Economic Accounts](#)

### Bureau of Labor Statistics:

- [Business Employment Dynamics](#)
- [Occupational Employment Statistics](#)
- [Quarterly Census of Employment and Wages](#)

### Census Bureau:

- [American Community Survey](#)
- [Decennial Census](#)
- [Longitudinal Employer-Household Dynamics](#)
- [Survey of Business Owners and Self-Employed Persons](#)

### Department of Commerce:

- [International Trade Administration](#)

### Department of Transportation:

- [National Transportation Atlas Database](#)

### Medicare:

- [Hospital General Information](#)

### National Center for Education Statistics:

- [Integrated Postsecondary Education Data System](#)

### National Institutes of Health:

- [Research Portfolio Online Reporting Tools \(RePORT\)](#)

### National Science Foundation:

- [Business R&D and Innovation Survey](#)
- [Higher Education Research and Development Survey](#)
- [Survey of Graduate Students and Postdoctorates in Science and Engineering](#)
- [WebCASPAR](#)

### Patent and Trademark Office:

- [Patent database](#)

### Small Business Administration:

- [SBIR/STTR awards database](#)
- [USA Spending.gov](#)

# Resources

## Critical Mass

- Where Jobs Locate Matters: A report from the Fund for Our Economic Future detailing the importance of the geography of jobs (and job hubs) and why this matters for regional economic development.
- Dag Detter and Stefan Fölster, The Public Wealth of Cities: How to Unlock Hidden Assets to Boost Growth and Prosperity (Washington, DC: Brookings Institution Press, 2017): A book discussing the concept of how publicly owned assets can drive economic growth in cities.

## Innovation Capacity

- How Firms Learn: Industry specific strategies for urban economies: Brookings research paper that discusses how firms innovate and where innovation comes from. It also includes a set of best practice policies for urban innovation.
- Going local: Connecting the National Labs to their regions to maximize innovation and growth: Brookings research paper that argues that, in order to improve the impact of national labs, DOE and Congress should better connect them to their respective regional strengths.
- National Research Council. 2013. *Best Practices in State and Regional Innovation Initiatives: Competing in the 21st Century*. Washington, DC: The National Academies Press: A textbook focusing on a series of case study regional- and state-wide initiatives to drive innovative growth and employment.
- A resource guide for technology-based economic development: A resource guide from SSTI focused on assisting economic development professionals in their efforts to transition to technology-based economies.
- Making sense of clusters: Regional competitiveness and economic development: A Brookings research paper focused on cluster strategies and best practices in regional and local economic development.
- Trends in tech-based economic development: Local, state, and federal action in 2013: An SSTI research and trends report focused on local technology based economic development.

## Diversity and Inclusion

- All-In Cities: A collection of best practice strategies, policies, and toolkits from PolicyLink to build equitable cities for all.
- Democracy Collaborative's Anchor Dashboard and Hospitals Aligned for Healthy Communities Toolkit: A series of reports, toolkits, and best practices for anchor institutions focused on community wealth building and local economic development.

## Resources

- Brookings Metropolitan Policy program: Building inclusive cities: Framing paper and lessons learned from on-the-ground work with cities committing to inclusive growth.
- Forward Cities: Policy Toolkit: A policy toolkit and set of case studies for mayors across the United States to commit to and bring inclusive growth to their cities.

### Quality of Place

- Public Life Tools: A collection of tools for observing public space, from mapping public space usage to intercept surveys. These kinds of exercises are the backbone of understanding how the public realm works.
- William H. Whyte, *The Social Life of Small Urban Spaces* (New York, NY: Project for Public Spaces, 1985): Book on the observation of public space, including many tools, examples and rules of thumb.
- Cities Safer by Design: A global guide to help cities understand the extent to which street design is creating a safe environment for pedestrians and bicyclists.
- Little Town, Layered Ecosystem: A Case Study of Chattanooga: A review of how one city jumpstarted their innovation ecosystem through a fiber-optic network
- Innovation Spaces: The New Design of Work: Brookings research paper that identifies how broader economic trends, such as the increasingly collaborative nature of innovation, is influencing the design of innovation spaces such as accelerators, innovation centers and co-working spaces.
- Project for Public Spaces, How to Turn a Place Around: The definitive manual on “placemaking”—the community-driven design and management of public space.
- Jan Gehl, *Cities for People* (Washington, D.C.: Island Press, 2010): A collection of tools and methods for observing and remaking public spaces based on the work of urban designer Jan Gehl.
- Eight principles of innovation districts: Principles related to public spaces.
- Foot traffic ahead: Ranking walkable urbanism in America’s largest metros: Identifies key indicators of walkable urbanism, ranking the top 30 metropolitan regions in the United States.
- The city at eye level: Lessons for street plinths: A program, an open-source learning network, and a book aimed at creating great streets through the combination of active ground floors and broader placemaking using a people-centered approach.

## Leadership

- [Designing contracts for university spin-offs](#): A research paper on best practices in designing academic spin-off contracts between universities, researchers, and venture capitalists.
- [Changing the academic culture: Valuing patents and commercialization toward tenure and career advancement](#): An opinion piece arguing to restructure the tenure process to value commercialization and patenting.
- [Airbus and UC3M rocketing the Spanish aeronautic industry](#): A case study detailing a joint agreement between a university and the local aerospace industry.
- [Advancing the anchor mission of healthcare](#): A guidebook from the Democracy Collaborative highlighting the anchor mission philosophy and a group of institutions with leaders who have adopted this model for their organizations.
- Central Indiana Corporate Partnership (see, for example, chapter five in [The New Localism: How cities can thrive in the age of populism](#))

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