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Organization Practice

Building the tech talent pipeline

By taking a data-driven approach, regions can pinpoint the strengths and gaps in their pool of tech talent and prioritize investments to boost competitiveness and collaboration.

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Amazon's search for its HQ2 location sparked fierce competition among US metropolitan areas, as their leaders viewed the headquarters as a game changer for economic development. However, the bidding process also shone a spotlight on the issues of talent development and retention—common challenges for metropolitan areas around the world.

While low interest rates have given companies easy access to money, a reliable pool of qualified workers has become the scarcer capital.[1] And if technology is now the growth engine for business, tech talent and the institutions that produce it are the fuel. Regions recognize that tech workers such as data analysts, web developers, engineers, and the like are a prerequisite for economic development. Yet few metropolitan areas understand the dynamic talent ecosystem—including skills, diversity, and mobility—and how to take coordinated action to move the needle.

When the HQ2 bid was announced, the Capital Region (which encompasses Baltimore; Richmond and northern Virginia; and Washington, DC) had already begun to implement programs to deepen its talent pool. The goal of these efforts was to ensure the region had enough workers with the right skills to satisfy the demand for tech talent across the private and public sectors. To better understand the talent landscape, McKinsey partnered with the Greater Washington Partnership to conduct in-depth research into the Capital Region and other top US metro areas (see sidebar, "About the research"). The result was unprecedented visibility into talent imbalances and common trends as well as new insights into how civic leaders can deal with them effectively.

The HQ2 bid accelerated the Capital Region's pursuit of a comprehensive talent effort, but metropolitan areas shouldn't wait for a similar trigger to act. Instead, they should mobilize stakeholders around a coordinated strategy. First, metro areas should evaluate supply imbalances for their tech talent pool. Next, they should prioritize the available tools based on their potential to address talent gaps. Leaders can—and must—convene partners from the government and academia to collaborate on efforts to produce, attract, and retain talented workers. The Capital Region's experience provides a valuable point of reference.

How the Capital Region compares with other regions

In the aftermath of the 2007–08 financial recession, the Capital Region struggled more than other metro areas to increase economic growth. Its leaders responded by developing initiatives aimed at jump-starting development while ensuring the economic benefits were shared by all residents. The potential of the HQ2 bid catalyzed the Capital Region to address some of its challenges, especially enhancing the tech talent pipeline.

Stakeholders recognized that improving the region's tech talent pool required a more detailed picture of its performance and composition. The first step was analyzing the region's overall talent pipeline compared with the leading US core-based statistics areas (CBSAs).[2] GWP's analysis confirmed the Capital Region is one of the top three employers of tech talent, trailing San Francisco and New York city but comfortably ahead of Los Angeles and Seattle (Exhibit 1).

Talent market dynamics

While the region's top-line talent numbers were encouraging, leaders understood that high performance on specific talent metrics would have a much greater bearing on the region's competitiveness. Talent inflows and outflows provide a critical piece of the tech workforce puzzle. The analysis found that metro areas fall into one of three archetypes. Heavy importers are characterized by an imbalance between local demand and the volume of graduates produced by its institutions. On the other end of the scale, net exporters typically have a surplus of quality graduates—due to either abundant educational institutions or challenges with the local labor market. In the middle are talent traders, which compensate for any loss of graduates by attracting talent from other regions to keep up with rising demand.
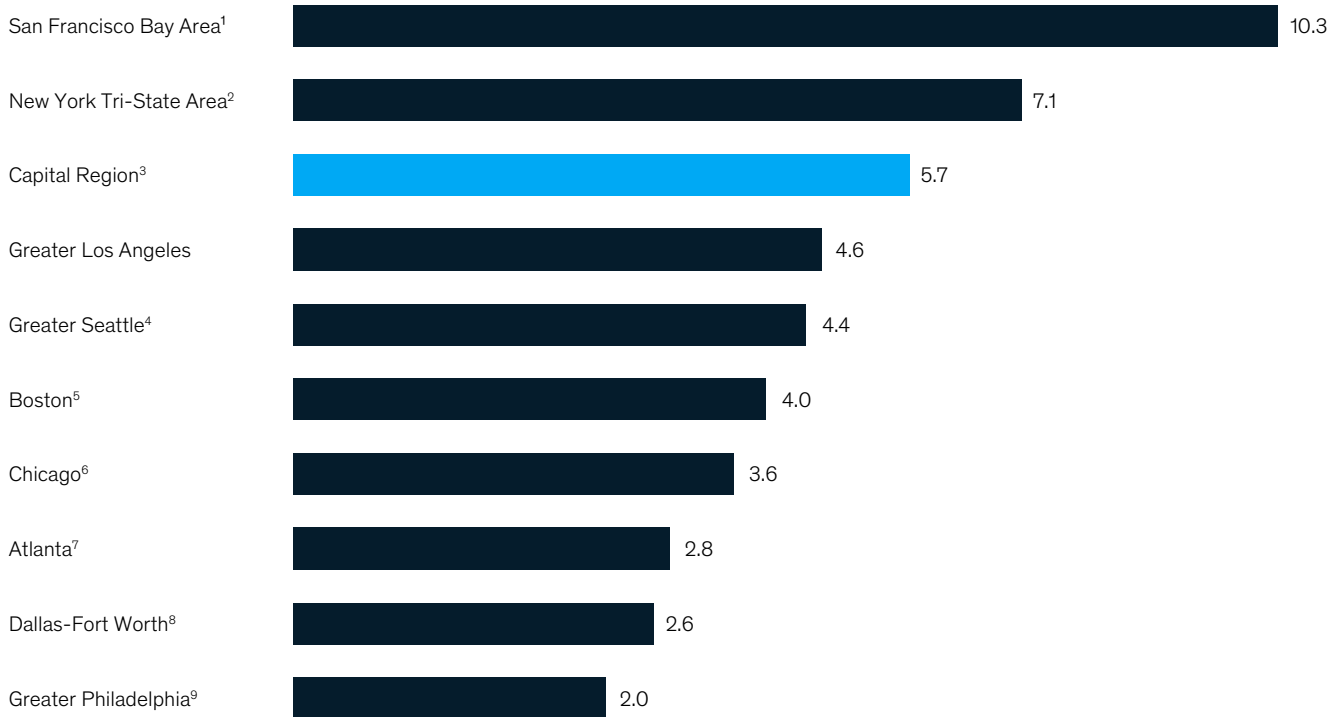
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[1] Mike Barriere, Miriam Owens, and Sarah Pobereskin, "Linking talent to value," *McKinsey Quarterly*, April 2018, McKinsey.com.
[2] A CBSA comprises one or more counties with an urban center of at least 10,000 people, plus surrounding counties from which residents commute to the urban center.

Exhibit 1

The Capital Region is one of the top employers of 2014–18 graduate tech talent.

Share of US tech workers in major core-based statistical areas, %

Region	Value
San Francisco Bay Area[1]	10.3
New York Tri-State Area[2]	7.1
Capital Region[3]	5.7
Greater Los Angeles	4.6
Greater Seattle[4]	4.4
Boston[5]	4.0
Chicago[6]	3.6
Atlanta[7]	2.8
Dallas-Fort Worth[8]	2.6
Greater Philadelphia[9]	2.0

[1] Comprises San Francisco-Oakland-Berkeley, CA and San Jose-Sunnyvale-Santa Clara, CA CBSAs.
[2] Comprises New York-Newark-New Jersey City and NY-NJ-PA.
[3] Comprises Baltimore, Richmond and northern Virginia, and Washington, DC.
[4] Comprises Seattle-Tacoma-Bellevue, Washington.
[5] Comprises Boston-Cambridge-Newton and MA-NH.
[6] Comprises Chicago-Naperville-Elgin and IL-IN-WI.
[7] Comprises Atlanta-Sandy Springs-Alpharetta, Georgia.
[8] Includes Arlington.
[9] Comprises Philadelphia-Camden-Wilmington and PA-NJ-DE-MD.

The analysis found that the Capital Region is a talent trader (Exhibit 2). Each year, its universities produce a robust number of graduates, with a significant portion relocating to the larger tech markets of San Francisco or New York. However, the region performed better on attraction and retention than expected—a result that had been obscured in previous research. Given its position, the Capital Region can fill specific talent gaps by attracting qualified workers from other parts of the United States and abroad.

Top urban areas tend to retain most of their tech talent, and the Capital Region is no different. However, the analysis revealed that performance among CBSAs varies widely (Exhibit 3). Seattle

ranked first and retained 67 percent of tech workers, and the Capital Region ranked third with 58 percent. By contrast, Atlanta sees around 63 percent of its tech workers *leave* its market for other regions. To some degree, almost all regions depend on talent exporters to supplement their homegrown talent. However, this strategy isn't without its risks—particularly if one of these CBSAs begins to invest more in its local ecosystem, likely driving up graduate retention rates.
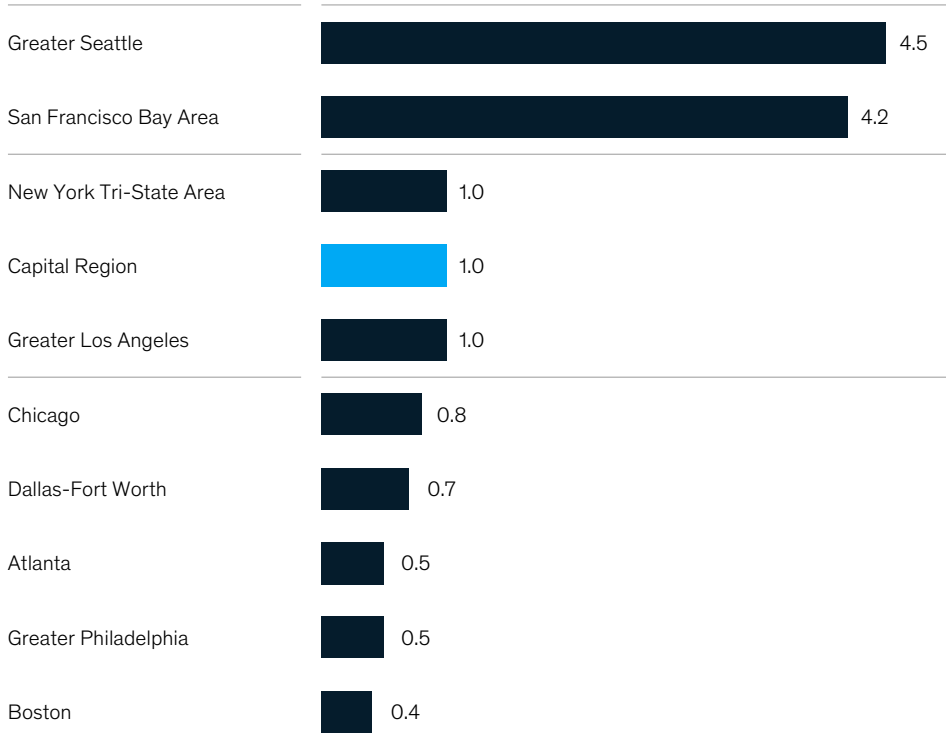
A granular look at tech skills
A skills-based assessment of talent provided regional leaders with additional insights. To start, the analysis tracked the Capital Region's performance on candidates with specific high-

Exhibit 2

The Capital Region is neutral on in- and outflows of tech talent.

Inflow to outflow ratio of US tech workers in major CBSAs,[1] %

		Three archetypes
Greater Seattle	4.5	**1** **Heavy importers:** Cities with sufficient levels of local graduates
San Francisco Bay Area	4.2	
New York Tri-State Area	1.0	**2** **Talent traders:** Cities with access to strong graduate populations who import as much talent as they export
Capital Region	1.0	
Greater Los Angeles	1.0	
Chicago	0.8	**3** **Net exporters:** Cities with access to strong graduate populations but fewer local opportunities
Dallas-Fort Worth	0.7	
Atlanta	0.5	
Greater Philadelphia	0.5	
Boston	0.4	

[1] Core-based statistical areas.

demand skills—such as artificial intelligence (AI), analytics, cloud, design, and information security—revealing variances that had strategic implications. For example, the Capital Region accounts for 12 percent of all US workers in information security, more than double its closest competitor, in large part because the local defense industry is a talent magnet for information security.

In contrast, US workers with AI skills are flocking to the West Coast; San Francisco and Seattle are home to more than 40 percent of workers in this category (Exhibit 4). The Capital Region weighs in with just 4 percent of AI workers and is a net exporter, suggesting that workers believe they must relocate to pursue a career in AI-related fields.

Diversity and inclusion
As companies increasingly prioritize diversity and inclusion, a region's ability to supply a heterogeneous talent pool can differentiate it.

Improving representation of women has been a key priority for tech companies in particular. While the San Francisco Bay Area leads as the country's largest tech hub overall, it trails the Capital Region by share of women within its tech pool. The Capital Region also produces a larger share of female tech graduates than the market average for new grad pools compared with large importers such as Atlanta and Philadelphia, which skew toward males. The Capital Region is also a high performer on attracting and retaining female tech talent, while San Francisco and Seattle are stronger with male talent.

Metro areas that can gain even a slight advantage in diversity and inclusion can build momentum and attract better representation. And gaining the reputation as a welcoming destination for diverse groups can create a virtuous cycle for metro areas and increase their ability to attract better talent across the board.

What other urban areas can learn from the Capital Region

In our experience working with metro areas and studying trends on talent and the future of work, stakeholders should focus on three priorities to increase the impact of their tech talent strategy. These actions are applicable to all metro areas, but few have implemented and consistently managed all three.

1. Align talent strategy with economic vision
With talent as the scarcer of two capitals, regions need to develop a competitive strategy much as large organizations do. In addition, investments in building a reliable talent pipeline can often be a more powerful economic devel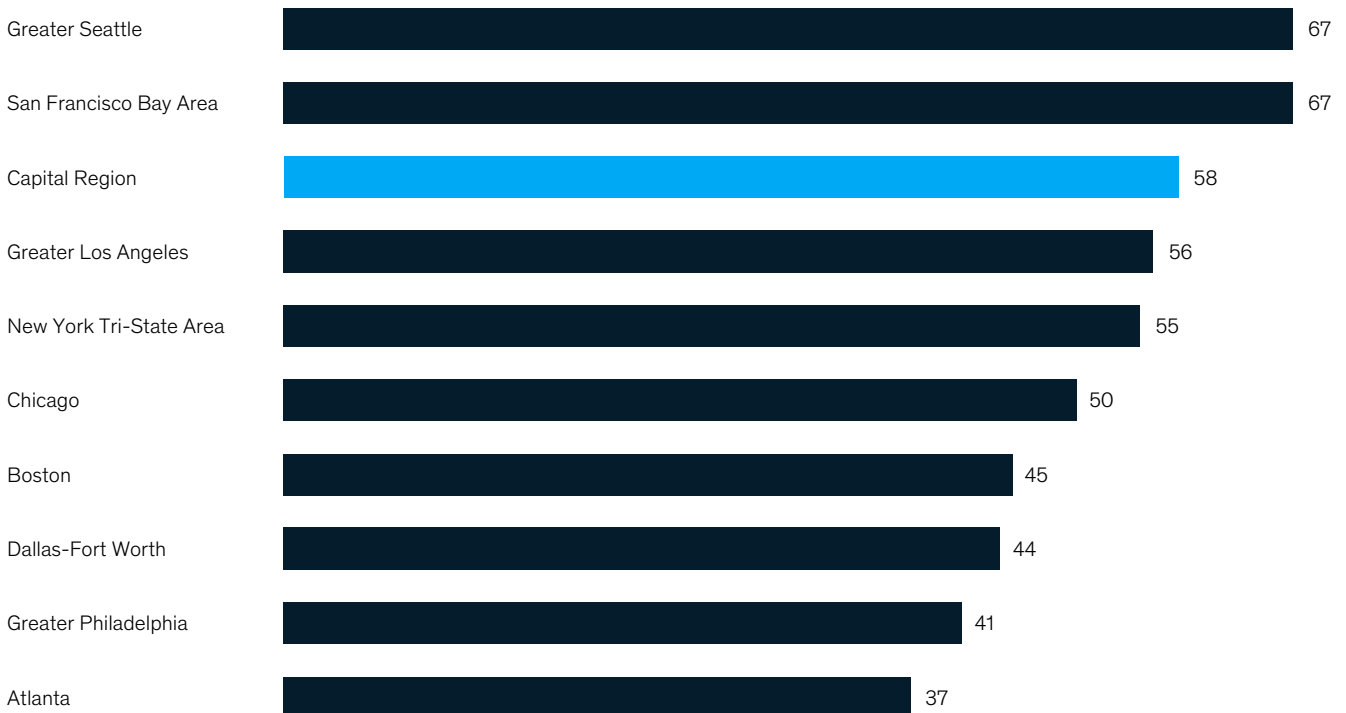opment tool in attracting economic investment than massive subsidies. If a region wants to build a certain type of economy—for example, advanced manufacturing—its leaders must think about how to create a distinctive value proposition compared with other regions. Stakeholders also need to understand which talent segments can strengthen the region and further its economic development strategy.

The Capital Region prioritized two goals: establishing itself as a leader in both innovation ecosystems and local talent development. Like many regions, leaders in the Capital Region understood they would have to import talent to meet projected demand and keep pace with the evolving workforce needs of its employers. They also recognized that emphasizing talent attraction and retention could augment its longer-term efforts.

Exhibit 3

While top regions retain most of their 2014–18 graduate talent, performance varies significantly.

US tech workers retained in major CBSAs, %

Region	%
Greater Seattle	67
San Francisco Bay Area	67
Capital Region	58
Greater Los Angeles	56
New York Tri-State Area	55
Chicago	50
Boston	45
Dallas-Fort Worth	44
Greater Philadelphia	41
Atlanta	37

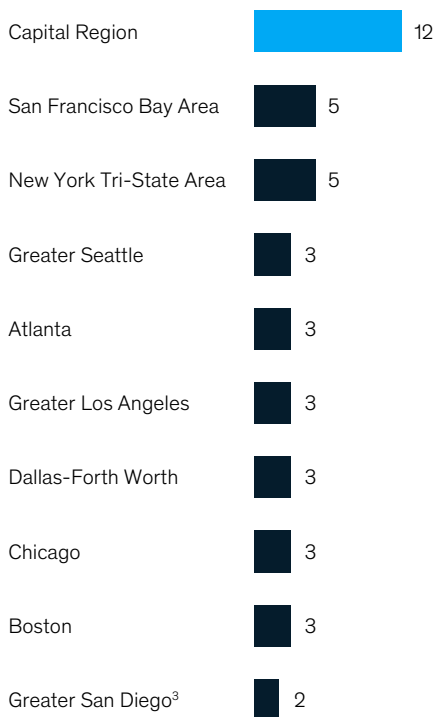## 2. Adopt a data-driven approach to assess tech talent imbalances

In a world with so much information on capabilities, metro areas must take a data-driven approach to evaluating performance, identifying issues, and guiding strategy. Such analysis can shed light on a region's strengths and talent gaps in unprecedented detail, identifying where to attract diverse talent from, what goals are realistic, and how to track progress. And objective insights from analytics can help create visibility—a critical advantage when seeking to gain consensus from the diverse set of stakeholders involved in talent development, attraction, and retention.

As a starting point, leaders should use granular data to assess their strengths and opportunities compared with other metro areas and define aspirations accordingly. This research can also be used to track progress on specific metrics where transparency helps generate commitment to change and action. Companies are already using these approaches to understand how they can take differentiated action at the level of a talent pool or even a university to ensure they are effectively sourcing talent. Yet many metro areas lack the data and analytics capabilities and systematic focus on the talent pipeline to support the ecosystem
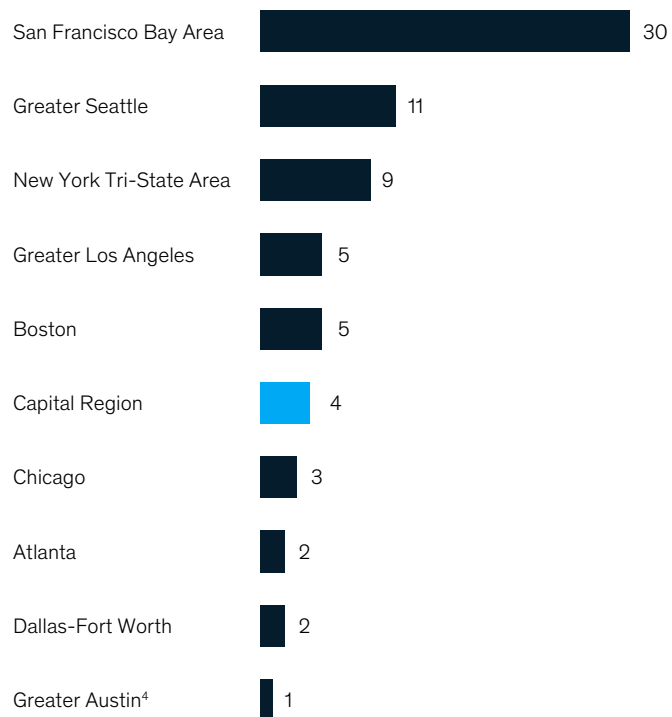
Exhibit 4

The Capital Region is a clear leader in graduates with information security capabilities but trails in share of AI talent.

Share of US tech workers with info-security[1] capabilities, %

Region	%
Capital Region	12
San Francisco Bay Area	5
New York Tri-State Area	5
Greater Seattle	3
Atlanta	3
Greater Los Angeles	3
Dallas-Forth Worth	3
Chicago	3
Boston	3
Greater San Diego[3]	2

Share of US tech workers with AI[2] capabilities, %

Region	%
San Francisco Bay Area	30
Greater Seattle	11
New York Tri-State Area	9
Greater Los Angeles	5
Boston	5
Capital Region	4
Chicago	3
Atlanta	2
Dallas-Fort Worth	2
Greater Austin[4]	1

[1] Info-security skills considered are network security, computer security, information security, information security management, and cybersecurity.
[2] Machine-learning or analytics skills considered are artificial intelligence, deep learning, neural networks, and artificial neural networks.
[3] Comprises San Diego-Chula VIsta-Carlsbad.
[4] Comprises Austin-Round Rock-Georgetown.

About the research

McKinsey partnered with the Greater Washington Partnership to evaluate the Capital Region's pipeline of tech talent. Where existing research typically focused on high-level trends, this project sought to gain greater visibility into the region's performance on four specific metrics for tech talent—share of the workforce, share of graduates, talent inflow, and graduate retention—compared with other top US metro areas.

The team drew on 50 sources to collect data from more than five million public professional online profiles. It then used the Occupational Information Network's taxonomy to highlight specific skills in tech fields for the data pulls. Algorithms were written to clean data based on such information as education, certifications, and specific skills from the profiles. The analysis focused on people in technology roles, a departure from other research that typically examines degrees and fields of study. The research sample included the top 32 core-based statistical areas (CBSAs), defined by the US Census Bureau as inclusive of communities with residents who commute to or from the central counties for each metric and skill category.

One notable source of iteration was defining a metropolitan area to properly account for all relevant activity—for example, whether a university not located within geographic boundaries but supplying talent for a nearby city should it be considered part of the ecosystem. The team settled on CBSAs as the most accurate lens for assessing a metropolitan area's economic activity and its tech talent pipeline.

3. Spur collaboration across academia and the public and private sectors

Many metropolitan areas have pursued partnerships between industry and academia. However, the importance of tech talent means they must elevate their efforts and take a long-term (rather than an ad-hoc) approach to talent development. This effort requires collaborating across multiple universities and companies to achieve the scale required to enhance the tech talent pipeline. It also calls for a robust, dynamic dialogue between universities and corporations on the skills graduates must have to succeed in future jobs.

The GWP's Capital CoLAB, for example, fosters collaboration and innovation by offering three specialist credentials—generalist, digital add-on, and cyber. The impetus for the CoLAB was to bring together the demand and supply sides of the talent equation, creating a better connection between workforce needs and curricula. By addressing talent challenges at this level of stakeholder engagement, the consortium is positioned to develop education programs at scale. Such efforts also ensure that the Capital Region's initiatives are aligned with public investments in education.

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The competition for tech talent will only become fiercer in the years ahead, and metro areas will need to deploy every tool at their disposal to secure the workers they need to support economic investment. A talent strategy informed by data and analytics can bring much needed clarity and enable stakeholders to home in on supply and demand imbalances. With this insight in hand, metro areas can allocate funding more effectively and better orchestrate the efforts of public and private organizations.

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