Evolving Workforces

Scoring Tech Talent 2022

NORTH AMERICAN REPORT

Tight Labor Market & Remote Working Have Changed Tech Talent Growth Patterns

CBRE RESEARCH JULY 2022



Decade-long U.S. tech talent employment growth continued in 2021 but shifted by industry, occupation and geography.

The U.S. added 136,000 tech talent jobs last year, bringing the national total to 5.5 million. The technology (110,300), life sciences (37,800) and financial services, insurance and real estate (18,900) industries added the most tech jobs, while the manufacturing (-58,800), transportation, warehousing and wholesale (-34,900) and telecommunications (-15,800) industries lost the most.

By occupation, 159,500 software developers and programmers—more than half of them in the tech industry and 27,900 tech managers were added in 2021. Computer support, database and systems jobs fell by 41,000 and technology and engineering-related by 10,300.

Geographically, Vancouver and Toronto had the largest tech talent workforce gains in 2021, both above Canada's 7% year-over-year national growth rate. In the U.S., San Diego, Portland and Los Angeles/Orange County had tech talent gains of more than 7,000 year-over-year. Washington, D.C. and New York saw overall tech talent employment decrease modestly due to declines in computer support, database and systems occupations offsetting gains in software developers and programmers.

Toronto and Seattle had the highest tech talent job growth since the pandemic began, adding 39,700 and 34,240 jobs, respectively, between 2019 and 2021. Washington, D.C. and Chicago both had about 2,500 fewer tech talent jobs over that period.



Most tech talent employers report that tight labor market conditions constrained their hiring plans and made remote work a more important offering to fill open roles. Twenty-two percent of the record 1.2 million tech talent job openings¹ in the U.S. for the 12 months ending April 2022 were remote work roles, according to labor data provider EMSI. Prior to the pandemic, annual tech talent job openings averaged 900,000 in 2018 and 2019, with only 4% of them for remote work. Nontech occupations had fewer remote work roles available as of April 2022: 14% for business and financial operations and 6% for office and administrative support.

There are economic headwinds that may impact tech talent hiring in the year ahead. Announced layoffs and hiring slowdowns and freezes by tech employers may, if sustained, loosen the tight labor market for tech talent. Employers generally have been reluctant to significantly reduce their tech talent teams, which often take years to build, and instead have confined layoffs to sales and administrative staff when necessary.

Longer term, tech will continue to grow from further technological advances and adoption. This Scoring Tech Talent report is intended to serve as a resource for decisionmaking and success in building tech talent teams to fulfill critical business and innovation objectives in the years ahead.

5.5M

total 2022 U.S. tech talent employment jobs, an increase of 136,000 from 2021.

+159K

U.S. software developer and programmer jobs added in 2021.



of the record 1.2M tech talent job openings in the U.S. in 2022 were remote work roles.

¹Computer and mathematical occupations

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Tech talent is a group of highly skilled workers in more than 20 technologyoriented occupations driving innovation across all industry sectors.

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A scorecard measuring 13 metrics to gauge the competitive advantages of markets and their ability to attract and grow tech talent pools determined the top 50 tech talent markets.

What defines a tech talent market?

Tech talent markets are characterized by high concentrations of college-educated workers, major universities producing tech graduates and large populations of young people.

25 How diverse are tech talent markets?

Diversity demographics are broken down by race/ethnicity, sex and geography for the tech talent workforce and college tech degree graduates. Each are compared with benchmark groups.

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Scoring Tech Talent is a comprehensive analysis of labor market conditions, cost and quality in North America for highly skilled tech workWers.

The top 50 markets in the U.S. and Canada were ranked according to their competitive advantages and appeal to both employers and tech talent employees.

Ten Latin America and 25 up-andcoming U.S. and Canada markets were also analyzed and ranked.

The analysis provides insight into the quality of tech workers, their demographics and diversity and how tech talent growth patterns are impacting cities and real estate markets.

Which are the highest- and lowest-cost markets to operate in?

Employee wages and office rent for a typical 500-person tech company using 75,000 sq. ft. of office space provide insight into annual operating costs for the top

Plotting a quality assessment against the average software developer salary by market reveals the distribution of quality and cost across the top 50 tech

Markets with high concentrations or clusters of growing tech talent employers have created economic growth and changed office market dynamics.

Lesser-known and underdeveloped markets could offer high-potential talent pools to employers seeking to expand their geographical reach, uncover opportunities

01 Key Takeaways



#Score

This year's top-ranked tech talent markets are the San Francisco Bay Area, Seattle, Toronto, Washington, D.C. and New York Metro. Markets that climbed the most in the rankings are Dallas/Ft. Worth, Philadelphia, South Florida and Milwaukee.



Jobs vs. Education

Toronto, Vancouver and Seattle created substantially more jobs than tech degree graduates, while New York Metro, Boston and Washington, D.C. produced more graduates than jobs. Tech talent job creation was compared with the number of tech degree graduates in each market to determine top job and education markets.

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Diversity

Tech talent across all industries was predominantly White, Asian and male relative to total employment and office-using employment. Hispanics, Blacks and females were underrepresented in both tech talent occupations and the tech industry. These underrepresented groups were also concentrated in the lower-wage brackets. Relative to an office-using employment benchmark, Tampa and Pittsburgh were the most diverse.

Underrepresented race/ethnic groups accounted for 24% of recent tech degree graduates and females accounted for 26% versus 30% and 60%, respectively, for all graduates.



\$Cost

The total annual labor and real estate cost for the typical 500-person tech company occupying 75,000 sq. ft. of office space ranged from \$32 million in Quebec City to \$69 million in the San Francisco Bay Area.

North America **Opportunity Markets**

Fostering talent development in lesser-known and underdeveloped markets could offer additional talent pools to employers seeking to expand their geographical reach, uncover opportunities and increase cost efficiency. These markets are spread across Canada, Latin America and the U.S. Midwest and South.

02 What is tech talent?

Highly skilled North American tech talent workers total 6.5 million and comprise more than 20 occupations, ranging from software developers who enable the devices we depend on to systems and data managers who ensure the functionality of our tech ecosystems.²

Although these positions are concentrated within the hightech industry, they are spread across all industry sectors (Figure 1). Through this occupational lens, a software developer who works for a financial services or health-care company is considered tech talent.

The 5.5 million tech talent workers in the U.S. and 1.0 million in Canada account for a respective 3.9% and 6.4% of each country's total workforce. This relatively small share of total employment has an outsized impact on real estate markets and the economy. The number of U.S. tech talent workers has increased by 631,000 or 12.8% over the past five years, substantially higher than the 1.2% national average for total employment. They are fueling innovation and adapting technology within nontraditional tech sectors to increase productivity and strengthen the national economy. FIGURE 1: Tech Talent Workforce by Industry (2021)

Core High-Tech*	
Prof. Scientific & Technical Services (Excluding High-Tech)	
FIRE**	
Other	Ê Ê Ê Ê Ê Ê 8.4%
Management of Companies & Enterprises	
Government	Ê Î Î Î Î Î Î Î Î Î Î Î Î Î Î Î Î Î Î Î
Education	Ê Ê Ê 4.4%
Transportation, Warehousing & Wholesale	Ê Ê Ê Ê 4.0%
Manufacturing (Excluding High-Tech)	Ê Î Î Î Î Î Î Î Î Î Î Î Î Î Î Î Î Î Î Î
Information (Excluding High-Tech)	<u><u><u></u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u></u>
Health Care	Ê Ê 2.5%

²Tech talent includes the following occupation categories: software developers and programmers; computer support, database and systems; technology- and engineering-related; and computer and information system managers.

*Includes computer software and services and computer product manufacturing; **Finance, Insurance and Real Estate. Source: U.S. Bureau of Labor Statistics, April 2022.





The number of U.S. tech talent workers has increased by 631,000 or 12.8% over the past five years, substantially higher than the 1.2% national average for total employment. o3 Which are the top-ranked tech talent markets?

Fifty of the largest markets by number of tech talent professionals in the U.S. and Canada were analyzed to create a scorecard ranking them comparatively (Figure 2).

The scorecard uses 13 metrics to measure each market's depth, vitality and attractiveness to companies seeking tech talent and to tech workers seeking employment. Each metric is weighted by its relative importance to job creation and innovation. Tech talent concentration metrics have the highest weights because they signify clustering of tech workers. Labor costs for tech talent are weighted more heavily than office rents because companies allocate more capital to labor than to real estate.

The top five markets were the same as last year: San Francisco Bay Area, Seattle, Toronto, Washington, D.C. and New York, with Toronto moving up one spot to #3. Markets that moved up most in rank were Dallas/Ft. Worth, Philadelphia, South Florida and Milwaukee (+4 spots), and Vancouver, Chicago, Pittsburgh, Orlando, Edmonton and Houston (+3 spots). Austin moved up one spot to the sixth position. Markets that moved down most in rank were Madison (-6 spots) and Raleigh-Durham and Quebec City (-5 spots).

As companies across all industries expand their technology services, there is high demand for tech talent in both large and small markets.



Major gateway markets dominate overall tech talent growth because of their size. These and other markets with tech talent labor pools of more than 50,000 workers are categorized as "large," while those below this threshold are categorized as "small" (Figure 3). Both large and small markets have their advantages: While large markets generally have a deeper pool of talent, small markets typically offer business and costof-living savings. Between 2016 and 2021, Toronto had the most tech talent growth (+88,900 jobs), followed by Seattle (45,560) and Vancouver (44,460).The highest percentage growth was 63% in Vancouver, 44% in Toronto and 43% in Quebec City. In the U.S., the Inland Empire, Seattle and Nashville grew the fastest on a percentage basis.

The top five markets were the same as last year: San Francisco Bay Area, Seattle, Toronto, Washington, D.C. and New York.

FIGURE 2: Tech Talent Scorecard Ranking

Click below to view the respective market page

Source: CBRE Research, CBRE Econometric Advisors, U.S. Bureau of Labor Statistics, Statistics Canada, Oxford Economics, The National Center of Education Statistics, National Science Foundation, Axiometrics, 2022.

Tech talent concentration—the percentage of total employment—is an influential factor in how "tech" the market is and in its growth potential. Tech talent comprises 11.6% of total employment in Ottawa and 11.4% in the San Francisco Bay Area—the highest concentrations and more than double the 50-market average of 5.6%. Toronto, Seattle and Canada's Waterloo Region round out the top five most concentrated tech markets, ranging from 9.6% to 10.3% of their total employment. This sizeable concentration of highly skilled workers offers an environment conducive to innovation.

Between 2016 and 2021, Toronto had the most tech talent growth (+88,900 jobs), followed by Seattle (+45,560) and Vancouver (+44,460).

Ottawa and the San Francisco Bay Area had the highest concentrations of tech talent, more than double the 50-market average of 5.6%.

FIGURE 3a: Tech Talent Workforce (2021)

Large Tech Talent Markets (>50,000 Workforce)

Market	Tech Talent Total	Percent Change
SF Bay Area	378,870	13%
New York Metro	344,520	3%
Toronto	289,700	44%
Washington, D.C.	259,310	6%
Los Angeles/Orange Co.	235,800	10%
Seattle	189,570	32%
Dallas/Ft. Worth	187,950	15%
Chicago	167,560	6%
Boston	166,450	2%
Montreal	148,900	27%
Atlanta	145,080	7%
Denver	117,620	23%
Philadelphia	115,450	7%
Vancouver	115,400	63%
Minneapolis/St. Paul	100,990	5%
Phoenix	99,600	18%
Houston	98,930	-2%
Detroit	93,770	5%
Austin	84,680	21%
Ottawa	81,200	22%
Baltimore	79,000	8%
San Diego	77,780	16%
Raleigh-Durham	69,050	11%
Portland	67,410	28%
South Florida	66,660	8%
Charlotte	61,950	22%
Salt Lake City	55,930	29%
St. Louis	53,910	2%
Kansas City	52,500	0%
Tampa	52,240	13%
Columbus	50,390	4%

*2016-2021; **2021 Source: U.S. Bureau of Labor Statistics (Metro) April 2022, Statistics Canada (Metro), 2021. Note: Canadian markets have been recalculated based on revisions to Statistics Canada definitions.

by Volume [*]	Concentration ^{**}
42,460	11.4%
8,880	4.0%
88,900	10.3%
13,920	8.8%
20,960	3.9%
45,560	9.9%
24,360	5.2%
9,800	4.0%
3,420	6.4%
31,200	8.6%
8,900	5.6%
21,810	6.7%
7,970	4.3%
44,460	9.1%
4,630	5.5%
15,410	4.7%
-2,190	3.4%
4,600	4.7%
14,450	7.9%
14,800	11.6%
5,550	6.3%
10,440	5.6%
6,750	7.3%
14,760	6.0%
4,690	2.6%
11,100	5.1%
12,570	5.5%
1,100	4.2%
90	5.2%
5,880	4.0%
1,770	4.4%



63%

Tech talent employment growth in Vancouver between 2016 and 2021, the highest of all 50 ranked markets.

11.6%

Tech talent share of total employment in Ottawa, the highest of all 50 ranked markets.

5.6%

Average tech talent share of total employment for all 50 markets.

FIGURE 3b: Tech Talent Workforce (2021)

Small Tech Talent Markets (<50,000 Workforce)

Market	Tech Talent Total	Percent Change [*]
Pittsburgh	43,910	2%
Sacramento	43,530	9%
Orlando	42,860	17%
Calgary	40,600	22%
Cleveland	40,540	25%
Indianapolis	40,120	13%
Cincinnati	38,650	5%
Nashville	36,110	29%
Quebec City	35,700	43%
Milwaukee	35,150	13%
San Antonio	32,760	5%
Edmonton	32,400	40%
Virginia Beach	29,040	3%
Richmond	26,870	5%
Hartford	26,190	5%
Inland Empire	25,000	39%
Madison	24,060	2%
Waterloo Region	24,000	8%
Jacksonville	22,110	16%

*2016-2021; **2021

Source: U.S. Bureau of Labor Statistics (Metro) April 2022, Statistics Canada (Metro), 2021. Note: Canadian markets have been recalculated based on revisions to Statistics Canada definitions.

by Volume [*]	Concentration ^{**}
960	4.2%
3,550	4.4%
6,180	3.7%
7,400	5.9%
8,200	4.2%
4,690	4.0%
1,790	3.8%
8,200	3.7%
10,700	9.0%
4,070	4.5%
1,500	3.3%
9,200	5.7%
950	4.1%
1,370	4.4%
1,200	4.8%
6,990	1.6%
480	6.4%
1,800	9.6%
3,090	3.2%

FIGURE 4a: Tech Talent Workforce by Industry (2021)

Large Tech Talent Markets (>50,000 Workforce)

Market	Tech Talent Total	%TT in Tech Industry	2nd Highest TT Industry
SF Bay Area	378,870	66.7%	FIRE (5.5%)
Seattle	189,570	62.7%	Prof Services (6.0%)
Raleigh-Durham	69,050	55.7%	FIRE (11.5%)
Portland	67,410	50.6%	Prof Services (6.9%)
Austin	84,680	49.9%	Prof Services (8.7%)
Salt Lake City	55,930	45.5%	FIRE (12.2%)
Atlanta	145,080	41.8%	FIRE (8.5%)
Washington, D.C.	259,310	41.1%	Govt (20.4%)
Boston	166,450	40.5%	Prof Services (13.0%)
Kansas City	52,500	40.2%	FIRE (12.5%)
Denver	117,620	38.1%	FIRE (9.9%)
San Diego	77,780	37.9%	Manuf (15.4%)
Los Angeles/Orange Co.	235,800	37.9%	Prof Services (9.6%)
Tampa	52,240	36.9%	FIRE (13.6%)
Houston	98,930	36.9%	Prof Services (13.9%)
Dallas/Ft. Worth	187,950	36.6%	FIRE (16.7%)
South Florida	66,660	35.0%	Education (11.2%)
Detroit	93,770	34.3%	Manuf (18.3%)
Phoenix	99,600	33.7%	FIRE (17.1%)
Philadelphia	115,450	33.2%	FIRE (16.3%)
Chicago	167,560	33.1%	FIRE (16.5%)
New York Metro	344,520	32.5%	FIRE (19.6%)
Baltimore	79,000	31.6%	Govt (23.2%)
Minneapolis/St. Paul	100,990	30.8%	FIRE (19.2%)
St. Louis	53,910	30.2%	FIRE (19.1%)
Charlotte	61,950	28.9%	FIRE (24.7%)
Columbus	50,390	26.3%	FIRE (24.0%)

Tech talent concentration by industry within markets is another influential factor for tech employers and tech cluster formation. While many technical skills are transferable across industries, specific industry experience can be a differentiator to enhance innovation. In the U.S., 41% of tech talent works within the tech industry. By market, this concentration varies considerably even though the tech industry was the largest tech talent employer in all 42 U.S. markets. The San Francisco Bay Area, Seattle and Raleigh-Durham had the highest concentrations of tech talent within the tech industry (Figure 4), while Columbus, Pittsburgh and Charlotte had the lowest.



Source: U.S. Bureau of Labor Statistics (Metro), CBRE Research and IPUMS, May 2022.

FIGURE 4b: Tech Talent Workforce by Industry (2021)

Small Tech Talent Markets (<50,000 Workforce)

Market	Tech Talent Total	%TT in Tech Industry	2nd Highest TT Industry
Madison	24,060	49.4%	Prof Services (7.2%)
Orlando	42,860	44.0%	Education (8.6%)
Cincinnati	38,650	41.4%	FIRE (12.1%)
San Antonio	32,760	38.2%	FIRE (16.9%)
Milwaukee	35,150	38.1%	FIRE (15.9%)
Jacksonville	22,110	34.6%	FIRE (23.4%)
Nashville	36,110	33.3%	Health (15.8%)
Cleveland	40,540	32.6%	FIRE (12.2%)
Inland Empire	25,000	32.5%	Govt (10.0%)
Sacramento	43,530	31.6%	Govt (28.6%)
Virginia Beach	29,040	30.3%	Govt (18.1%)
Richmond	26,870	30.2%	FIRE (14.5%)
Indianapolis	40,120	29.5%	Manuf (11.5%)
Hartford	26,190	29.1%	FIRE (28.2%)
Pittsburgh	43,910	27.0%	FIRE (16.8%)

Source: U.S. Bureau of Labor Statistics (Metro), CBRE Research and IPUMS, May 2022.

Certain markets had high concentrations of tech talent in non-tech industries, including finance, insurance and real estate in Hartford (28%), Charlotte (25%), Columbus (24%) and Jacksonville (23%) and government in Sacramento (29%), Baltimore (23%) and Washington, D.C. (20%). Other notable high concentrations were manufacturing in Detroit (18%) and San Diego (15%) and health care in Nashville (16%).



Software engineers are also highly concentrated in the tech industry and in certain markets. In the U.S., 54% of the software engineers work within the tech industry. Seattle (77%), San Francisco Bay Area (75%), Raleigh-Durham (72%), Portland (68%) and Austin (59%) are the most concentrated (Figure 5).

Software engineers are also highly concentrated in the tech industry and in certain markets. In the U.S., 54% of software engineers work within the tech industry. Seattle, San Francisco Bay Area and Raleigh-Durham are the most concentrated markets.

Seattle	$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$
SF Bay Area	$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$
Raleigh-Durham	$\overbrace{\langle / \rangle}$
Portland	$\fbox{\label{eq:constraint} (\label{eq:constraint} (eq:constrai$
Austin	$\fbox{\label{eq:constraint} (\label{eq:constraint} (eq:constrai$
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Inland Empire	$\begin{array}{c c} \hline \hline$
Salt Lake City	$\begin{array}{c c} \hline \hline$
Madison	$\fbox{\label{eq:constraint} (\label{eq:constraint} (eq:constrai$
U.S.	

FIGURE 5: Top 10 Markets for Software Engineers Employed in the Tech Industry (2020)

Source: U.S. Census, IPUMS and CBRE Research, May 2022.



04 What defines a tech talent market?

High educational attainment and higher concentrations of young people are two key elements that top tech talent markets share.

Forty-five of the top 50 tech talent markets have a metro-level educational attainment rate above their national averages of 32.9% in the U.S. and 31.5% in Canada. The top 10 markets have 43% or more of residents over 25 years old with at least a bachelor's degree (Figure 6). Washington, D.C and the San Francisco Bay Area have rates of 51% or more.

Education, particularly with a focus on technology,³ is best analyzed through degrees issued by higher educational institutions. Metro areas that produced the most tech graduates in 2020 with bachelor's or higher degrees were New York Metro, Los Angeles/Orange County, Boston, Washington, D.C. and the San Francisco Bay Area (Figure 7). Large tech talent markets dominate the top 10 degree-granting regions. Demand is high for tech-related classes and degrees, and tech-related degree completions have grown by 45% since 2016. Although these figures do not account for tech bootcamps or shorter certifications, they provide insight into which markets produce the most tech talent entering the labor pool each year.

FIGURE 6: Top 10 Markets for Educational Attainment (2020)

Educational Attainment Rate
51.7%
51.2%
48.9%
47.4%
47.1%
46.5%
46.0%
43.9%
43.6%
43.0%
32.9%
31.5%

Source: U.S. Census Bureau (Metro) and Environs Analytics, May 2022.

FIGURE 7: Top 10 Markets for Tech Degree Completions

Market	Tech Degree Completions (2020)	Growth (2015-2020)
New York Metro	21,354	53.2%
L.A./Orange Co.	14,504	46.0%
Boston	13,324	78.8%
Washington, D.C.	13,142	38.5%
SF Bay Area	9,920	33.4%
Atlanta	8,689	61.2%
Chicago	8,118	29.7%
Salt Lake City	7,220	93.3%
Dallas/Ft. Worth	7,009	50.6%
Toronto	6,931	54.1%

Source: The National Center for Education Statistics (Region), Canadian Universities, May 2022. Note: Bachelor's Degree or Higher.



of the top 50 tech talent markets have an educational attainment level above their national average.

Many graduates do not stay in the market where they earn their degree; they often migrate to markets that offer the most job opportunities or have the best pay. Analyzing tech-related graduation data and tech-related employment growth identifies tech talent flow through the difference between where workers are employed and where they were educated (Figure 8). Tech degrees cover the most recent five-year period available (2016-2020) and tech talent jobs added cover the period when most graduates would be counted in employment figures (2017-2021). Toronto, Vancouver and Seattle were the standout markets for tech talent job creation, adding 59,588, 30,419 and 24,587 more tech talent jobs than graduates. Other top tech talent job creators were Quebec City, Montreal, Ottawa and Portland. The top education markets—those with more tech degree graduates than tech talent jobs—were New York Metro, Boston, Washington, D.C, Los Angeles/ Orange County and Chicago.

³ Tech degree fields include computer engineering and information sciences; mathematics and statistics; electrical and electronics engineering; mechanical and industrial engineering; other engineering.



or more of residents over 25 years old in the top 10 tech markets have a bachelor's degree or higher.

45%

tech-related degree completion growth since 2016.



Demand is high for tech-related classes and degrees, and tech-related degree completions have grown by 45%

There were more tech degree graduates and fewer new tech talent jobs during the most recent five-year period (2017-2021) compared with the previous one (2016-2020) in the top 50 markets, resulting in a larger net supply of graduates. Thirty-seven markets posted a five-year graduate surplus in 2021 compared with 34 in 2020, suggesting tech talent hiring has expanded well beyond the top 50 markets given the still tight labor market conditions. This may be attributable to increased remote work opportunities.

The most coveted skill among tech employers is software engineering. In the past year, 159,500 new software engineering jobs were created in the U.S. versus 177,000 university graduates specializing in the field. This is a tight ratio, since not all graduates with software engineering degrees choose a tech talent occupation.

Another notable characteristic of tech talent markets is the number and concentration of Gen Z (20- to 24-year-olds) and millennials (25- to 39-year-olds) in the workforce. Millennials are the largest demographic cohort in the workforce but the younger Gen Z will fuel future growth (Figures 9 and 10).

The most coveted skill among tech employers is software engineering. In the past year, 159,500 new software engineering jobs were created in the U.S. versus 177,000 university graduates specializing in the field.

FIGURE 8: Where Are Talent Workers Coming From and Where Are They Headed?

Market	Tech Degrees*	Tech Jobs Added*	Jobs Minus Degrees	
Toronto	29,312	88,900	59,588	_
Vancouver	14,041	44,460	30,419	
Seattle	20,973	45,560	24,587	
Quebec City	2,318	10,700	8,382	
Montreal	23,919	31,200	7,281	
Ottawa	9,365	14,800	5,435	
Portland	11.146	14.760	3.614	
Calgary	3.852	7.400	3.548	
Nashville	4.819	8.200	3.381	
Edmonton	5.871	9.200	3.329	
Charlotte	8.048	11.100	3.052	
Jacksonville	2120	3,090	970	
Austin	13 771	14 450	679	Top Job Markets
Inland Empire	7 414	6990	-424	
Denver	22 581	21.810	-771	lop Education Markets
Indianapolis	5965	4 690	-1275	
Richmond	3669	1370	_2 200	
Tampa	8 5 9 7	5.880	_2 717	
Claveland	10.077	8 200	-2,717	
Milwaukaa	7619	6,200	-2,777	
San Antonio	6 117	4,070	-3,340	
San Antonio	0,117	1,500	-4,01/	
Sacramento	9,957	3,550	-6,407	
Hartford	8,445	1,200	-7,245	
	13,449	6,180	-7,269	
	10,016	1,790	-8,220	
SF Bay Area	49,551	42,460	-7,091	
Virginia Beach	8,185	950	-7,235	
Dallas/Ft. Worth	33,056	24,360	-8,696	
South Florida	13,500	4,690	-8,810	
St. Louis	10,345	1,100	-9,245	
Madison	9,987	480	-9,507	
Columbus	11,690	1,770	-9,920	
San Diego	21,286	10,440	-10,846	
Phoenix	26,380	15,410	-10,970	
Kansas City	11,208	90	-11,118	
Raleigh-Durham	19,468	6,750	-12,718	
Salt Lake City	26,036	12,570	-13,466	*Tech degrees cover the
Baltimore	19,062	5,550	-13,512	most recent five-year period
Waterloo Region, Canada	15,522	1,800	-13,722	available (2016-2020) and
Minneapolis/St. Paul	18,433	4,630	-13,803	tech jobs added cover
Houston	14,240	-2,190	-16,430	the time period reflecting
Philadelphia	30,106	7,970	-22,136	when most graduates would
Pittsburgh	25,300	960	-24,340	be counted in employment
Detroit	32,729	4,600	-28,129	figures (2017-2021).
Atlanta	37,922	8,900	-29,022	
Chicago	41,595	9,800	-31,795	Source: CBRF Research, U.S.
Los Angeles/Orange Co.	65,834	20,960	-44,874	Bureau of Labor Statistics
Washington, D.C.	59,581	13,920	-45,661	National Center for Education
Boston	54,609	3,420	-51,189	Statistics (Metro) Canadian
New York Metro	94,823	8,880	-85,943	Universities, 2022.

FIGURE 9: 20- to 24-Year-Old Population Change by Market, 2015-2020

Large Tech Talent Markets (>50,000 Workforce)

Market	% Change
Ottawa	9.5%
Toronto	8.5%
Vancouver	7.9%
Salt Lake City	7.4%
Raleigh-Durham	7.1%
Dallas/Ft. Worth	6.6%
Montreal	6.3%
Phoenix	4.5%
Charlotte	4.4%
Houston	3.8%
Atlanta	3.8%
Austin	2.9%
Boston	2.3%
Kansas City	2.0%
Denver	1.4%
Washington, D.C.	0.8%
Portland	0.7%
Tampa	0.2%
Minneapolis/St. Paul	0.1%
Seattle	-0.7%
Columbus	-1.3%
Detroit	-3.8%
SF Bay Area	-4.1%
Chicago	-4.7%
South Florida	-5.1%
St. Louis	-7.0%
Philadelphia	-8.4%
San Diego	-8.5%
Baltimore	-8.7%
Los Angeles/Orange Co.	-9.3%
New York Metro	-11.1%

Market % Change				
Waterloo Region, Canada	12.1%			
Edmonton	9.7%			
Calgary	9.3%			
Madison	6.7%			
Indianapolis	4.7%			
Quebec City	4.2%			
San Antonio	4.0%			
Hartford	1.9%			
Nashville	1.8%			
Cincinnati	1.1%			
Orlando	-0.5%			
Cleveland	-1.9%			
Inland Empire	-3.5%			
Jacksonville	-4.0%			
Milwaukee	-4.1%			
Sacramento	-6.0%			
Richmond	-7.1%			
Virginia Beach	-7.2%			
Pittsburgh	-8.6%			

Source: U.S. Census Bureau (Metro), Oxford Economics Canada (Metro), 2022.

FIGURE 10: 25- to 39-Year-Old Population Change by Market, 2015-2020

Large Tech Talent Markets (>50,000 Workforce)		Small Tech Talent Mark
Market	% Change	Market
Austin	17.8%	Waterloo Region, Canada
Seattle	17.3%	Orlando
Toronto	16.3%	San Antonio
Tampa	16.3%	Jacksonville
Ottawa	15.3%	Nashville
Vancouver	14.1%	Sacramento
Denver	14.1%	Inland Empire
Charlotte	13.9%	Richmond
Raleigh-Durham	13.3%	Indianapolis
Phoenix	12.5%	Virginia Beach
Columbus	11.3%	Edmonton
Portland	10.5%	Madison
Dallas/Ft. Worth	10.3%	Cincinnati
Houston	10.3%	Cleveland
Boston	8.8%	Pittsburgh
SF Bay Area	8.7%	Hartford
San Diego	8.6%	Calgary
Salt Lake City	8.4%	Milwaukee
Atlanta	8.1%	Quebec City
Detroit	7.9%	
Kansas City	7.3%	Source: U.S. Census Bureau (M
Minneapolis/St. Paul	7.2%	(Metro), 2022.
Montreal	6.5%	
Philadelphia	6.1%	
South Florida	5.8%	
Baltimore	5.5%	
Washington, D.C.	4.3%	
Los Angeles/Orange Co.	4.2%	
St. Louis	2.9%	
Chicago	0.2%	
New York Metro	-1.8%	

nt Markets (< 50,000 Workforce)

% Change	
20.0%	
18.4%	
16.5%	
14.1%	
13.0%	
10.5%	
8.8%	
8.1%	
8.0%	
7.8%	
7.8%	
7.4%	
7.4%	
4.7%	
4.2%	
3.9%	
3.6%	
3.5%	
2.3%	

Bureau (Metro), Oxford Economics Canada

Twenty tech markets have seen their millennial populations increase by more than 10% since 2015. Austin, Seattle, Toronto and Tampa grew the fastest of the large markets, all by 16% or more. Waterloo, Canada was the fastest growing market overall at 20%, followed by growth of more than 16% in two other small markets— Orlando and San Antonio. Waterloo, Canada was the only market with double-digit Gen Z population growth at 12.1%, followed by Edmonton, Ottawa and Calgary with 9% growth. Several large and highly concentrated university markets had declines in Gen Z population, including New York Metro, Los Angeles/Orange County, Baltimore, Pittsburgh and San Diego.

Austin, Seattle and Denver were the most concentrated millennial markets with about one-quarter of their population in this cohort, above the 20.5% U.S. national average (Figure 11). The highest concentration of Gen Z population was in Madison, Salt Lake City and Virginia Beach (Figure 12).



FIGURE 11: Top 10 Most Concentrated Markets for 25- to 39-Year-Olds (2020)

Market	Population Concentration
Austin	25.6%
Seattle	24.7%
Denver	24.1%
SF Bay Area	23.8%
San Diego	23.6%
Salt Lake City	23.2%
Portland	23.1%
Columbus	22.8%
Nashville	22.6%
Los Angeles/Orange Co.	22.6%

Source: U.S. Census Bureau (Metro) and Oxford Economics (Metro), 2022.

FIGURE 12: Top 10 Most Concentrated Markets for 20- to 24-Year-Olds (2020)

Market	Population Concentration
Madison	9.4%
Salt Lake City	8.9%
Virginia Beach	7.8%
San Diego	7.5%
Inland Empire	7.2%
Hartford	7.2%
Boston	7.1%
San Antonio	7.0%
Austin	6.9%
Los Angeles/Orange Co.	6.8%

Source: U.S. Census Bureau (Metro) and Oxford Economics (Metro), 2022.



Gen Zers and millennials account for 48.6% of the U.S. tech talent workforce across all industries compared with 39.8% for general office-using industries (Figure 13). tech talent working within the tech industry has an even higher concentration of those two generations at 54.9%. Older workers (age 55 and up) represented 30% of the labor force for all office-using industries compared with 15.7% of tech talent working within the tech industry.





of the U.S. tech talent workforce across all industries is made up of Gen Zers and millennials.

of the labor force for all office-using industries is made up of 55-yearolds or greater.

15.7%

of the tech talent labor force working within the tech industry is made of of 55-yearolds or greater.

FIGURE 13: U.S. Workforce by Age for Selected Industries (2020)

Total Tech Talent (All Industries)



Tech Talent (Tech Industry)



Office-Using Industries (Non-Tech Occupations)





Tech clusters with high concentrations of tech talent distinguish the top markets. These clusters typically form around preeminent universities that tend to invest the most in innovation and provide a steady flow of new talent for local companies. Tech clusters also form around leading companies that draw other companies to a region and support an innovative ecosystem that spawns new entrepreneurs and companies. Tech companies use these clusters for synergy and competition, thereby accelerating the innovation process. These companies in the core high-tech industry are heavily concentrated, with about half of their workers doing tech-related jobs (Figure 14). Consequently, tech talent clusters tend to form in markets with a strong concentration of high-tech companies.

Tech clusters with high concentrations of tech talent distinguish the top markets. These clusters typically form around preeminent universities that tend to invest the most in innovation and provide a steady flow of new talent for local companies



*Includes computer software and services and computer product manufacturing; **Excluding High-Tech. Source: U.S. Bureau of Labor Statistics, April 2022.

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05 How diverse are tech talent markets?

Tech talent diversity by race/ethnicity and sex has evolved slowly. Remote work and workforce analytics have created an opportunity to accelerate the process.

Strategic approaches to diverse team building can be enhanced by greater use of data and benchmarking analytics that identify where diverse talent is located and being developed. Our analysis details workforce race/ethnicity and sex by market, industry, job classification and income bracket, as well as college tech degree graduates' race/ethnicity and sex by market.

Industry Diversity

U.S. tech talent across all industries was little changed over the past five years and remains predominantly White, Asian and male relative to total employment and office-using employment.⁴ According to 2020 data from the U.S. Census Bureau, Hispanic, Black and other non-White and non-Asian groups and females were underrepresented (Figures 15 and 16). The tech industry, which accounts for 41% of tech talent in the U.S., had more underrepresentation than tech talent across all industries. When the overall tech industry workforce consisting of a 47% to 53% split between tech and non-tech occupations is considered, there are higher shares of underrepresented groups compared with tech occupations alone.

FIGURE 15: U.S. Workforce by Race/Ethnicity for Selected Industries, 2020

Tech Talent Workforce (All Industries)

58.2%	19.7%
-------	-------

Tech Talent Workforce (Tech Industry)

56.6%				25.3%
-------	--	--	--	-------

Tech Industry Workforce (All Occupations, Tech & Non-Tech)

57.5%	19.65
Office-Using Industry Workforce (Non-Tech Occupations)	
65.5%	
Total Workforce (All Industries and Occupations)	

59.2%		7.3%
Source: U.S. Census, IPUMS and CBRE Research, May 2022.	White	



⁴ Non-tech occupations in industries that heavily use office space for their operations including information, professional & business services and financial activities



Strategic approaches to diverse team building can be enhanced by greater use of data and benchmarking analytics that identify where diverse talent is located and being developed.

Female Diversity

Females were significantly underrepresented within tech talent occupations across all industries (Figure 16). Within the tech industry, females were more underrepresented in tech occupations at 21% compared with 24% across all industries. Females accounted for 33% of all occupations within the tech industry, below the 47% share for total employment and 52% share for office-using industries. Females within underrepresented race/ethnicity groups (Hispanic, Black and Other) had a higher share of jobs than White and Asian females in four of the five workforce categories, with tech talent within the tech industry being the exception. Black females had the highest share of jobs for all race/ethnicity groups and workforce categories.

21%

of female tech talent represented in the tech industry, compared with 24% across all industries.



female representation within all occupations in the tech industry.

52%

female representation in office-using industries.

FIGURE 16: U.S. Female Workforce for Selected Industries, 2020



Note: Office-using industries include information, financial activities and professional and business services (excluding tech industry within these categories) Source: U.S. Census, IPUMS and CBRE Research, May 2022.

Occupation Diversity

Segmenting tech talent occupations across all industries in two broad categories showed that there was a higher concentration of female workers within Computer Support, Database & Systems occupations at 28.5% than within Software Developers, Programmers & Engineers at 18.8% (Figure 17). By race/ethnicity within these same occupations, Black females were less underrepresented than Black males.





concentration of female workers within Computer Support, Database & Systems occupations.



female workers within Software Developers, Programmers & Engineers.

FIGURE 17: U.S. Tech Talent Occupation Category by Race/Ethnicity & Sex, 2020

Tech Talent Occupation Category	Share of Occupations	White	Asian	Hispanic	Black	Other	
Software Developers, Programmers & Engineers (42% of Jobs)							
Female	18.8%	47.1%	37.2%	6.4%	5.7%	3.6%	
Male	81.2%	57.9%	26.3%	7.9%	3.6%	4.3%	
Total (Female and Male)	100.0%	55.9%	28.3%	7.6%	4.0%	4.2%	
Computer Support, Database & Systems (58% of Jobs)							
Female	28.5%	55.9%	14.6%	11.7%	13.6%	4.3%	
Male	71.5%	61.6%	13.0%	11.9%	9.0%	4.5%	
Total (Female and Male)	100.0%	60.0%	13.5%	11.8%	10.3%	4.4%	
Total Tech Talent (100% of Jobs)							
Female	24.4%	53.0%	21.9%	10.0%	11.0%	4.1%	
Male	75.6%	59.9%	19.0%	10.1%	6.6%	4.4%	
Total (Female and Male)	100.0%	58.2%	19.7%	10.0%	7.7%	4.3%	

ech Talent Occupation Category	Share of Occupations	White	Asian	Hispanic	Black	Other	
oftware Developers, Programmers & Engineers (42% of Jobs)							
Female	18.8%	47.1%	37.2%	6.4%	5.7%	3.6%	
Male	81.2%	57.9%	26.3%	7.9%	3.6%	4.3%	
Total (Female and Male)	100.0%	55.9%	28.3%	7.6%	4.0%	4.2%	
Computer Support, Database & Systems (58% of Jobs)							
Female	28.5%	55.9%	14.6%	11.7%	13.6%	4.3%	
Male	71.5%	61.6%	13.0%	11.9%	9.0%	4.5%	
Total (Female and Male)	100.0%	60.0%	13.5%	11.8%	10.3%	4.4%	
otal Tech Talent (100% of Jobs)							
Female	24.4%	53.0%	21.9%	10.0%	11.0%	4.1%	
Male	75.6%	59.9%	19.0%	10.1%	6.6%	4.4%	
Total (Female and Male)	100.0%	58.2%	19.7%	10.0%	7.7%	4.3%	

Tech Talent Occupation Category	Share of Occupations	White	Asian	Hispanic	Black	Other	
Software Developers, Programmers & Engineers (42% of Jobs)	1						
Female	18.8%	47.1%	37.2%	6.4%	5.7%	3.6%	
Male	81.2%	57.9%	26.3%	7.9%	3.6%	4.3%	
Total (Female and Male)	100.0%	55.9%	28.3%	7.6%	4.0%	4.2%	
Computer Support, Database & Systems (58% of Jobs)							
Female	28.5%	55.9%	14.6%	11.7%	13.6%	4.3%	
Male	71.5%	61.6%	13.0%	11.9%	9.0%	4.5%	
Total (Female and Male)	100.0%	60.0%	13.5%	11.8%	10.3%	4.4%	
Total Tech Talent (100% of Jobs)							
Female	24.4%	53.0%	21.9%	10.0%	11.0%	4.1%	
Male	75.6%	59.9%	19.0%	10.1%	6.6%	4.4%	
Total (Female and Male)	100.0%	58.2%	19.7%	10.0%	7.7%	4.3%	

Source: U.S. Census, IPUMS and CBRE Research, May 2022.

Race/Ethnicity Share of Occupations by Sex

Income Diversity

U.S. tech talent across all industries segmented by annual wage bracket for race/ ethnicity and sex showed a higher concentration of underrepresented groups and females in the lower wage ranges. This data does not conclude unequal wages for these groups, only representation in each bracket. A more detailed job-by-job and person-by-person analysis would be required to make such a determination.

Black and Hispanic tech talent in 2020 was concentrated in the under \$100,000 wage bracket at 79.0% and 77.7%, respectively, compared with 49.5% for Asians and 67.5% for Whites (Figure 18). Female tech talent making less than \$100,000 accounted for 75.8% of their total, compared with 62.9% for males. There were similar concentrations by sex and race for those making less than \$100,000. Hispanic, Black and Other females had the highest concentration under \$100,000, all 81% or more. Asian males had the highest concentration in the \$150,000 or more wage bracket at 22.3%, compared with 13.2% for Whites, 8.0% for Hispanics and 6.7% for Blacks.

Black and Hispanic tech talent in 2020 was concentrated in the under \$100,000 wage bracket at 79.0% and 77.7%, respectively, compared with 49.5% for Asians and 67.5% for Whites.

FIGURE 18: U.S. Tech Talent Workforce by Race/Ethnicity and Income Range (2020)

All Racial/Ethnic Categories



The same data was compiled for software engineers, the highest tech talent growth category (Figure 19). In general, software engineers earned higher wages than tech talent overall. Other notable differences included 20.9% of males in the \$150,000 or more wage bracket, compared with 11.5% of females. Black and Hispanic females in the under \$100,000 wage bracket were about the same as Whites at 70%, compared with 50.7% for Asian females. Asian and White males had the highest concentration above \$150,000.





of males in the \$150k+ wage bracket, compared with 11.5% of females.



of Black, Hispanic and white females are in the under \$100k wage bracket.

of Asian females are in the under \$100k wage bracket.

50.7%

FIGURE 19: U.S. Software Engineers by Race/Ethnicity and Income Range (2020)



Market Diversity

Demographics should be benchmarked by the representative workforce within each market. For tech talent markets, there was variability in underrepresented race/ethnic groups and females when benchmarked by office-using industries. If the difference between tech talent and the office-using benchmark was a positive number, it means there was no underrepresentation using this metric.

For underrepresented race/ethnic groups, the most diverse large tech talent markets were Tampa, Boston and Salt Lake City, while the most diverse small tech talent markets were Pittsburgh, Jacksonville and Virginia Beach (Figure 20). The least diverse large markets were Los Angeles/Orange County, Houston and Austin, while the least diverse small markets were San Antonio, Inland Empire and Madison.

For underrepresented race/ethnic groups, the most diverse large tech talent markets were Tampa, Boston and Salt Lake City, while the most diverse small tech talent markets were Pittsburgh, Jacksonville and Virginia Beach.

FIGURE 20: Underrepresented Race/Ethnic Groups in U.S. Tech Talent Workforce by Market, 2020

MOST DIVERSE

La	rge Tech Talen	t Markets (> 50,000 V	/orkforce)	Small Tech Talent Markets (< 50,000 Workforce)				
Market	Difference*	Tech Talent % of Underrepresented Groups**	Office-Using % of Underrepresented Groups**	Market	Difference*	Tech Talent % of Underrepresented Groups**	Office-Using % of Underrepresented Groups**	
Tampa	2.4%	33.5%	31.1%	Pittsburgh	1.4%	12.8%	11.3%	
Boston	1.4%	16.1%	14.7%	Jacksonville	0.7%	33.2%	32.5%	
Salt Lake City	-3.4%	13.8%	17.1%	Virginia Beach	0.4%	36.8%	36.4%	
South Florida	-3.7%	60.1%	63.8%	Richmond	0.0%	28.3%	28.3%	
Seattle	-4.1%	12.9%	17.0%	Sacramento	-2.5%	26.6%	29.1%	

LEAST DIVERSE

Large Tech Talent Markets (> 50,000 Workforce)				Small Tech Talent Markets (< 50,000 Workforce)					
Market	Difference*	Tech Talent % of Underrepresented Groups**	Office-Using % of Underrepresented Groups**	Market	Difference*	Tech Talent % of Underrepresented Groups**	Office-Using % of Underrepresented Groups**		
L.A./Orange Co.	-14.3%	27.9%	42.2%	San Antonio	-16.4%	45.5%	61.9%		
Houston	-13.9%	30.8%	44.7%	Inland Empire	-13.7%	40.4%	54.1%		
Austin	-10.7%	21.1%	31.8%	Madison	-7.4%	6.6%	14.1%		
San Diego	-10.6%	20.6%	31.2%	Indianapolis	-6.0%	12.0%	18.0%		
Dallas/Ft. Worth	-10.3%	26.3%	36.6%	Orlando	-5.3%	36.5%	41.9%		

*Difference calculation: tech talent Share minus Office-Using Share Benchmark; **Hispanic, Black, Other Non-White/Non-Asian Source: U.S. Census, IPUMS and CBRE Research, May 2022.

For females, diversity was well below the office-using benchmark for all markets. The most diverse large tech talent markets were Washington, D.C., San Francisco Bay Area and Portland (Figure 21). The most diverse small markets were Madison, Sacramento and Jacksonville.



FIGURE 21: Females in U.S. Tech Talent Workforce by Market, 2020

MOST DIVERSE

Large Tech Talent Markets (> 50,000 Workforce)				Small Tech Talent Markets (< 50,000 Workforce)			
Market	Difference*	Tech Talent % of Females	Office-Using % of Females	Market	Difference*	Tech Talent % of Females	Office-Using % of Females
Washington, D.C.	-17.9%	31.4%	49.3%	Madison	-14.1%	33.2%	47.3%
SF Bay Area	-18.6%	25.1%	43.7%	Sacramento	-18.5%	32.6%	51.1%
Portland	-19.3%	28.0%	47.4%	Jacksonville	-21.6%	34.4%	56.0%
Detroit	-21.6%	27.7%	49.3%	Virginia Beach	-21.7%	31.7%	53.4%
Dallas/Ft. Worth	-21.8%	26.8%	48.6%	Orlando	-24.2%	25.9%	50.1%

LEAST DIVERSE

Tech Talent Office-Using Market Difference* % of Females % of Females Market
Cansas City -28.4% 23.4% 51.8% Clevela
A./Orange Co27.3% 22.8% 50.1% Milwau
alt Lake City -26.9% 18.1% 45.0% Hartford
outh Florida -26.7% 24.3% 51.0% Indiana
Baltimore -26.3% 23.5% 49.8% San Ani

*Difference calculation: tech talent Share minus Office-Using Share Benchmark. Source: U.S. Census, IPUMS and CBRE Research, May 2022.

aall Taab Talant Markets (< 50,000 Warkforce)

Tech Degree Graduate **Diversity & Current Enrollment**

The pipeline of recent tech degree graduates offers opportunities to build the next generation of talent and use analytics to measure success. These graduates, like the existing tech talent workforce, were predominantly White, Asian and male. Of the 339,000 U.S. tech degree graduates in 2020, 24.3% were from underrepresented race/ethnicity groups and 25.7% were female (Figure 22). Underrepresented race/ ethnicity groups accounted for 30.0% of total college graduates in 2020 and females accounted for 60.1%. Asian, Hispanic and other race/ethnicity groups have materially increased their shares of tech degrees since 2010, while the shares of Whites have declined, Blacks have remained about the same and females have increased slightly.

Compared with the existing tech talent workforce, the share of tech degree graduates from underrepresented groups (24.3%) exceeded existing workers (22.0%) as did female tech degree graduates (25.7%) compared with existing workers (24.4%).

For underrepresented race/ethnic groups, the most diverse markets for tech degree graduates were South Florida, San Antonio, Inland Empire, Houston and Orlando (Figure 23). The least diverse markets were Madison, Columbus, Cincinnati, Detroit and Raleigh-Durham.

For females, the most diverse markets for tech degree graduates were Pittsburgh, San Francisco Bay Area, Boston, Seattle and New York Metro. The least diverse markets were Salt Lake City, Orlando, San Antonio, Kansas City and Milwaukee.

The U.S. has a future tech degree graduate pipeline of about 1.2 million, according to the National Student Clearinghouse Research Center⁵ and estimates by CBRE Research for students enrolled in bachelor's or higher programs as of Fall 2021. While diversity breakdown for these students was not available, trends suggest they will represent greater tech talent workforce diversity than exists today.





Note: Total tech degree graduates and male/female breakdown includes U.S. resident and foreigners. Race/ethnicity breakdown excludes unknown races and foreigners. Source: IPEDS and CBRE Research, April 2022.

⁵ Overview: Fall 2021 Enrollment Estimates, National Student Clearinghouse Research Center

FIGURE 23: U.S. Tech Degree Graduate's Race/Ethnicity & Sex by Market, 2020 | Bachelor's Degree or Higher

Most Diverse (Highest % Underrepresented Groups*)

Market	Total Graduates	White	Asian	Underrepresented*	Hisp	Black	Other
South Florida	3,074	22.5%	6.6%	70.9%	53.2%	14.3%	3.4%
San Antonio	1,436	33.7%	7.8%	58.5%	46.4%	7.3%	5.3%
Inland Empire	1,674	23.7%	27.2%	49.1%	40.4%	3.6%	5.1%
Houston	2,887	29.5%	25.9%	44.7%	27.0%	14.4%	3.2%
Orlando	2,985	53.0%	10.5%	36.5%	24.2%	8.0%	4.4%

Most Diverse (Highest % Female)

Market	Total Graduates	Men	Women
Pittsburgh	5,455	66.1%	33.9%
SF Bay Area	9,920	67.7%	32.3%
Boston	13,324	68.3%	31.7%
Seattle	4,988	68.4%	31.6%
New York Metro	21,354	68.6%	31.4%

Least Diverse (Lowest % Underrepresented Groups*)

Market	Total Graduates	White	Asian	Underrepresented*	Hisp	Black	Other
Madison	2,437	78.3%	11.3%	10.5%	4.7%	1.1%	4.6%
Columbus	2,561	78.1%	11.4%	10.5%	4.3%	2.5%	3.7%
Cincinnati	2,271	83.3%	4.9%	11.8%	3.2%	5.4%	3.2%
Detroit	6,822	67.2%	19.2%	13.6%	5.6%	3.8%	4.2%
Raleigh-Durham	4,419	64.2%	20.3%	15.5%	5.1%	6.4%	4.0%

*Aggregate of Hispanic, Black, Other Non-White/Non-Asian

Note: Total tech degree graduates and male/female breakdown includes U.S. resident and foreigners. Race/ethnicity breakdown excludes unknown races and foreigners. Source: IPEDS and CBRE Research, April 2022.

Least Diverse (Highest % Male)

Market	Total Graduates	Men	Women
Salt Lake City	7,220	86.1%	13.9%
Orlando	2,985	83.1%	16.9%
San Antonio	1,436	80.8%	19.2%
Kansas City	867	79.6%	20.4%
Milwaukee	1,424	79.1%	20.9%



For females, the most diverse markets for tech degree graduates were Pittsburgh, San Francisco Bay Area, Boston, Seattle and New York Metro.

Tech Talent Diversity Progress

Greater diversity of the tech talent workforce should continue to slowly progress. Our review of U.S. Equal Employment Opportunity Commission diversity data and publicly released data from private tech companies confirms this. Changing the pace of workforce diversity is both a challenge and opportunity.

Technology will be critical to support a new hybrid approach to work, in which team members can work either in-person, remotely or from widely dispersed locations. Tech talent employers increased job postings that offer remote working arrangements to 22% for the 12 months ending in April 2022, up from only 6% in April 2020, according to EMSI data. This hybrid approach shows promise to expand tech talent recruitment across all markets and increase workforce diversity.

22%



Tech talent job postings that offer remote work for the year ending in April 2022. Tech talent job postings that offer remote work for the year ending in April 2020.


06 Which are the highestand lowest-cost markets to operate in?

Employee wages are the largest cost for tech companies.

Highly skilled and educated tech workers often command more than double the average non-tech salary. The San Francisco Bay Area ranked highest for average tech worker salary at \$140,000 per year, about \$18,000 more than the next highest market (Seattle). The average tech worker salary in 15 of the 50 top tech talent markets was at or above their respective national average (10 U.S. markets above the U.S. average and five Canadian markets above the Canadian average).

Office rent is the second-highest cost for most companies. Even as remote work becomes more common, companies understand the benefits of tech clustering and often place a higher value on specific submarkets and even specific streets convenient to tech talent. Manhattan has the highest average office rents, followed by the San Francisco Bay Area, Austin, Greater Los Angeles/Orange County and Seattle.

Combining wage and real estate costs provides insight into what a tech company might pay to operate in any of the top 50 tech talent markets. For this comparison, U.S. occupational averages were analyzed to determine the makeup of a typical 500-person tech company using 75,000 sq. ft. of office space.

FIGURE 24: Average U.S. Tech Company Occupation Pools



*Tech talent includes the following occupation categories: software developers and programmers; computer support, database and systems; technology and engineering related; and computer information system managers Source: U.S. Bureau of Labor Statistics (National), April 2022.

This occupational breakdown provides interesting insight into each market's relative costs (Figure 24).

Local market wages were applied to the various occupations to determine total annual wage costs by market, while local market rents were used to estimate the annual cost of renting a 75,000-sq.-ft. office to house 500 employees.⁶ The San Francisco Bay Area topped the list with the highest estimated annual cost at more than \$69 million, followed distantly by the other major tech markets of New York Metro, Seattle and Washington, D.C. (Figure 25). The lowest cost markets were all in Canada.

U.S. occupational averages were analyzed to determine the makeup of a typical 500-person tech company using 75,000 sq. ft. of office space.

⁵Overview: Fall 2021 Enrollment Estimates, National Student Clearinghouse Research Center.

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⁶ The COVID-19 outbreak may have lasting effects on office use and density with the rise of hybrid and remote working arrangements.



Office rent is the secondhighest cost for most companies. Many of them understand the benefits of tech clustering and often place a higher value on specific submarkets and even specific streets convenient to tech talent.

	Rent Cost (Avg Rent x 75,000 SF)	Tech Talent Wages (Avg Wage x 235 People)	Support Non-Tech Wages (Avg Wage x 199 People)	Management Wage (Avg Wage x 66 People)	Total
SF Bay Area	\$5,206,149	\$32,878,133	\$16,399,910	\$14,734,830	\$69,219,022
New York Metro	\$5,808,443	\$27,644,699	\$13,714,003	\$13,384,800	\$60,551,944
Seattle	\$3,194,250	\$28,750,167	\$13,851,523	\$12,223,860	\$58,019,799
Washington, D.C.	\$3,124,500	\$26,753,706	\$14,542,903	\$11,712,360	\$56,133,469
Boston	\$3,168,000	\$26,342,628	\$13,372,185	\$11,352,660	\$54,235,473
San Diego	\$2,833,769	\$25,055,016	\$12,001,293	\$11,464,200	\$51,354,278
Los Angeles/Orange Co.	\$3,220,428	\$24,616,355	\$11,841,354	\$11,557,590	\$51,235,727
Denver	\$2,384,177	\$23,874,385	\$12,939,473	\$11,229,240	\$50,427,276
Sacramento	\$1,890,000	\$25,100,751	\$11,757,270	\$10,784,400	\$49,532,420
Baltimore	\$1,776,000	\$25,537,112	\$11,734,582	\$10,198,980	\$49,246,674
Austin	\$3,383,285	\$23,031,470	\$11,090,937	\$10,522,380	\$48,028,072
Chicago	\$2,686,133	\$23,444,339	\$11,379,764	\$10,376,520	\$47,886,756
Raleigh-Durham	\$2,293,500	\$23,660,535	\$11,781,384	\$10,135,290	\$47,870,709
Hartford	\$2,593,500	\$23,698,857	\$11,478,195	\$10,063,020	\$47,833,572
Minneapolis/St. Paul	\$2,092,554	\$23,088,124	\$12,051,152	\$10,498,620	\$47,730,450
Atlanta	\$2,211,000	\$23,691,812	\$11,018,383	\$10,723,020	\$47,644,215
Dallas/Ft. Worth	\$2,052,750	\$24,330,039	\$10,728,445	\$10,494,660	\$47,605,894
Portland	\$2,397,000	\$23,608,846	\$11,611,794	\$9,665,700	\$47,283,340
Philadelphia	\$2,161,170	\$22,988,150	\$11,363,347	\$10,695,300	\$47,207,967
Charlotte	\$2,420,257	\$23,235,626	\$10,910,268	\$10,621,380	\$47,187,531
Houston	\$2,358,846	\$22,963,020	\$10,654,234	\$10,478,160	\$46,454,260
Phoenix	\$2,150,250	\$22,627,881	\$10,384,875	\$10,425,360	\$45,588,366
Richmond	\$1,515,750	\$22,203,780	\$10,788,051	\$10,668,900	\$45,176,481
Inland Empire	\$1,755,000	\$22,303,341	\$10,418,517	\$10,049,160	\$44,526,019
South Florida	\$3,063,593	\$21,139,651	\$9,807,135	\$9,286,860	\$43,297,240

FIGURE 25: Estimated One-Year Company Costs by Market (500 Employees; 75,000 Sq. Ft. of Office Space)

Source: U.S. Bureau of Labor Statistics, April 2022, Canada Statistics April 2022, CBRE Research (Metro), Q4 2021.



	Rent Cost (Avg Rent x 75,000 SF)	Tech Talent Wages (Avg Wage x 235 People)	Support Non-Tech Wages (Avg Wage x 199 People)	Management Wage (Avg Wage x 66 People)	Total
San Antonio	\$1,797,750	\$21,962,524	\$9,784,155	\$9,636,000	\$43,180,429
Orlando	\$1,944,840	\$21,238,742	\$9,922,019	\$9,892,080	\$42,997,680
Tampa	\$2,317,103	\$20,961,497	\$9,921,738	\$9,758,760	\$42,959,099
Columbus	\$1,549,936	\$21,790,823	\$9,790,512	\$9,665,700	\$42,796,971
Virginia Beach	\$1,531,500	\$21,217,040	\$10,074,558	\$9,712,560	\$42,535,658
Pittsburgh	\$1,725,000	\$20,863,061	\$10,255,476	\$9,620,820	\$42,464,357
Detroit	\$1,463,250	\$20,819,059	\$10,846,025	\$9,335,370	\$42,463,704
Cleveland	\$1,403,250	\$21,014,557	\$10,366,026	\$9,644,580	\$42,428,413
Cincinnati	\$1,439,250	\$20,700,571	\$10,455,240	\$9,782,520	\$42,377,581
St. Louis	\$1,644,750	\$20,902,163	\$10,393,899	\$9,431,400	\$42,372,213
Salt Lake City	\$1,893,767	\$21,174,728	\$9,909,341	\$9,333,060	\$42,310,896
Madison	\$1,528,500	\$20,627,126	\$10,763,775	\$9,339,000	\$42,258,401
Milwaukee	\$1,514,168	\$20,207,461	\$10,580,675	\$9,918,480	\$42,220,784
Kansas City	\$1,578,160	\$20,243,854	\$10,629,581	\$9,222,840	\$41,674,435
Jacksonville	\$1,664,485	\$20,645,067	\$9,706,622	\$9,197,100	\$41,213,274
Nashville	\$2,150,250	\$20,260,907	\$9,528,130	\$9,005,040	\$40,944,327
Indianapolis	\$1,590,000	\$19,699,181	\$10,497,709	\$8,718,600	\$40,505,489
Waterloo Region, Canada*	\$2,004,000	\$18,381,629	\$9,739,132	\$5,863,591	\$35,988,352
Ottawa*	\$1,988,528	\$17,093,655	\$10,691,359	\$6,187,972	\$35,961,513
Calgary*	\$1,698,789	\$16,546,572	\$10,993,918	\$6,545,443	\$35,784,722
Vancouver*	\$3,078,691	\$16,747,869	\$9,436,573	\$6,242,403	\$35,505,536
Edmonton*	\$1,929,064	\$16,493,416	\$10,160,488	\$6,885,830	\$35,468,798
Toronto*	\$2,682,268	\$16,120,961	\$9,710,052	\$6,219,984	\$34,733,265
Montreal*	\$2,110,370	\$15,509,397	\$9,201,764	\$5,811,314	\$32,632,845
Quebec City*	\$1,518,650	\$14,935,645	\$9,568,517	\$6,085,522	\$32,108,334

FIGURE 25: Estimated One-Year Company Costs by Market (500 Employees; 75,000 Sq. Ft. of Office Space) (continued)

*in US\$

Source: U.S. Bureau of Labor Statistics, April 2022, Canada Statistics April 2022, CBRE Research (Metro), Q4 2021.



o7 How is tech talent quality vs. cost measured?

Assessing the quality of a labor market is difficult because no standard metrics exist.

Since salaries are the largest expense for most companies seeking tech talent, the quality of that tech talent is becoming one of their most important considerations. Figure 26 plots a quality assessment for software engineers against their average salary by market to illustrate this trade-off across the top 50 tech talent markets.

Software engineer quality was measured by the number and concentration of software engineers with three or more years of experience and who graduated from one of the top 25 computer science programs in North America, including the top five in Canada, as determined by U.S. News & World Report. The highest-cost markets (San Francisco Bay Area and Seattle) also have the highest concentration of quality software engineers. Nevertheless, moderate, high and very high concentrations of quality software engineers are available in relatively low-cost markets, providing a range of options. Due in part to exchange rates, Edmonton, Toronto, Vancouver and Waterloo in Canada provide the best value when it comes to cost and quality, followed by Madison, Pittsburgh and Detroit in the U.S.

Since salaries are the largest expense for most companies seeking tech talent, the quality of that tech talent is becoming one of their most important considerations.



*Concentration of software engineers/developers with 3+ years of experience that have earned degrees from the Top 25 Computer Information Science programs in U.S. and Top 5 in Canada as rated by U.S. News relative to total software engineers/developers. **Data in US\$.

Source: U.S. Bureau of Labor Statistics, April 2022, Canada Statistics April 2022, U.S. News & World Report, CBRE Labor Analytics, CBRE Research, 2022. Note: LinkedIn Disclaimer: LinkedIn Talent Insights data is derived by aggregating profile data voluntarily submitted by LinkedInmembers. As such, LinkedIn cannot guarantee the accuracy of LinkedIn Talent Insights data. 08 How does tech talent impact commercial real estate?

U.S. tech talent growth, primarily in the high-tech industry, has totaled 631,000 jobs over the past five years and been the top driver of U.S. office leasing activity during that time.

While the high-tech industry's share of major leasing activity⁷ nationwide fell to 17% in 2020 from a high of 21% in 2019, it rebounded to 21% in 2021 and accounted for the most activity of any industry. Many tech talent markets, especially those with high concentrations or clusters of tech companies, had seen rising rents and declining vacancies prior to the pandemic. All 50 markets have rents above levels established five years ago and seven markets have lower vacancy rates than in 2016. Compared with pre-pandemic Q1 2020, rents in New York, San Francisco Bay Area and Philadelphia were at least 3% lower in Q4 2021. Austin, Vancouver, Hartford, Houston, Tampa and Waterloo, Canada saw rents grow by 20% or more over the same period.

Tech talent has also impacted office markets through work-from-home and return-to-office policies. A tight labor market has led tech employers to offer more accommodative working arrangements that have slowed the return to office progress across all industries in many tech-concentrated markets. This has generally delayed office market occupancy and rent growth.

21%

high-tech industry's share of major leasing activity in 2021.

3%+

lower rents in New York, San Francisco Bay Area and Philadelphia than pre-pandemic Q1 2020. growth of rents in Austin, Vancouver, Hartford, Houston, Tampa and Waterloo, Canada..

20%

FIGURE 27: Office Asking Rent By Market (Q4 2021)

Market	Annual Gross Direct Asking Rent Per SF (US\$)	Vacancy Rate	Market	Annual Gross Direct Asking Rent Per SF (US\$)	Vacan Rate
New York Metro	\$77.45	14.0%	Dallas/Ft. Worth	\$27.37	25.3%
SF Bay Area	\$69.42	15.5%	Waterloo Region, Canada	\$26.72	14.0%
Austin	\$45.11	20.7%	Ottawa	\$26.51	8.6%
L.A,/Orange Co.	\$42.94	16.0%	Orlando	\$25.93	13.7%
Seattle	\$42.59	16.5%	Edmonton	\$25.72	21.6%
Boston	\$42.24	14.4%	Salt Lake City	\$25.25	15.7%
Washington, D.C.	\$41.66	19.1%	Sacramento	\$25.20	13.4%
Vancouver	\$41.05	7.0%	San Antonio	\$23.97	16.79
South Florida	\$40.85	17.9%	Baltimore	\$23.68	16.89
San Diego	\$37.78	13.3%	Inland Empire	\$23.40	10.25
Chicago	\$35.82	22.5%	Pittsburgh	\$23.00	16.85
Toronto	\$35.76	13.9%	Calgary	\$22.65	30.49
Hartford	\$34.58	23.7%	Jacksonville	\$22.19	21.75
Charlotte	\$32.27	16.4%	St. Louis	\$21.93	13.25
Portland	\$31.96	19.4%	Indianapolis	\$21.20	19.0%
Denver	\$31.79	18.9%	Kansas City	\$21.04	14.22
Houston	\$31.45	24.8%	Columbus	\$20.67	19.5%
Tampa	\$30.89	18.2%	Virginia Beach	\$20.42	10.6%
Raleigh-Durham	\$30.58	11.1%	Madison	\$20.38	8.49
Atlanta	\$29.48	22.6%	Quebec City	\$20.25	9.5%
Philadelphia	\$28.82	19.4%	Richmond	\$20.21	9.8%
Nashville	\$28.67	18.3%	Milwaukee	\$20.19	14.49
Phoenix	\$28.67	19.8%	Detroit	\$19.51	16.2%
Montreal	\$28.14	15.0%	Cincinnati	\$19.19	18.9%
Minneapolis/St. Paul	\$27.90	21.1%	Cleveland	\$18.71	14.8%

⁷ Includes transactions 10,000 sq. ft. or larger each quarter for the 50+ markets tracked by CBRE Research.

Note: New York represents Manhattan only, all others are metro area. Source: CBRE Research (Office Market), Q4 2021. The in-migration of talent to these tech markets also has a sizeable impact on residential real estate. Apartment costs have increased in all markets and New York Metro remains the most expensive. Five markets saw average rent increases of 40% or more between 2016 and 2021, led by Phoenix at 59% (Figure 28). Comparing the annual average apartment rent with the annual average techworker salary shows that tech salaries generally can cover the cost of living in even the most expensive markets (Figure 29), based on the affordability standard of 30% of income to housing.

The pandemic has changed real estate market dynamics across North America. How we use office space going forward and where we choose to live is unlikely to revert to pre-pandemic patterns. Technology's importance in society and to real estate utilization has been accelerated and disrupted. This will create new opportunities for both real estate occupiers and investors in tech talent markets.



FIGURE 28: Average Monthly Apartment Rent by Market (Q4 2021)

Market	Avg Monthly Apartment Rent (US\$)	Apt Rent 5 Yr. Growth	Market	Avg Monthly Apartment Rent (US\$)	Apt Rent 5 Yr. Growth
New York Metro	\$3,140	7%	Jacksonville	\$1,422	43%
SF Bay Area	\$2,776	1%	Dallas/Ft. Worth	\$1,411	22%
L.A,/Orange Co.	\$2,554	16%	Minneapolis/St. Paul	\$1,399	12%
Boston	\$2,444	16%	Richmond	\$1,333	31%
San Diego	\$2,406	28%	Virginia Beach	\$1,329	28%
South Florida	\$2,115	30%	Milwaukee	\$1,301	15%
Inland Empire	\$2,016	43%	Pittsburgh	\$1,280	13%
Seattle	\$2,013	22%	Madison	\$1,236	10%
Washington, D.C.	\$1,893	9%	Houston	\$1,231	14%
Sacramento	\$1,860	41%	Toronto	\$1,213	27%
Denver	\$1,769	23%	Vancouver	\$1,195	26%
Chicago	\$1,660	8%	San Antonio	\$1,161	19%
Tampa	\$1,635	42%	Detroit	\$1,153	21%
Portland	\$1,628	20%	Columbus	\$1,134	22%
Phoenix	\$1,605	59%	Cincinnati	\$1,116	19%
Atlanta	\$1,586	37%	St. Louis	\$1,109	17%
Philadelphia	\$1,584	17%	Kansas City	\$1,100	16%
Orlando	\$1,574	35%	Ottawa	\$1,090	31%
Austin	\$1,560	26%	Indianapolis	\$1,071	27%
Baltimore	\$1,553	20%	Cleveland	\$1,064	15%
Hartford	\$1,539	19%	Waterloo Region, Canada	\$1,016	30%
Nashville	\$1,479	24%	Calgary	\$950	7%
Salt Lake City	\$1,477	36%	Edmonton	\$900	4%
Charlotte	\$1,430	32%	Quebec City	\$711	17%
Raleigh-Durham	\$1,429	33%	Montreal	\$710	20%

Note: New York represents Manhattan only, all others are metro area. Source: CBRE Econometric Advisors, Axiometrics, CMHC, Q4 2021.

FIGURE 29: Tech Wage To Apartment Rent Ratio (US\$)

Market	Annualized Apartment Rent (2021)	Average Annual Tech Wage (2021)	Rent-To-Tech Wage Ratio
New York Metro	\$37,686	\$117,637	32.0%
Los Angeles/Orange Co.	\$30,653	\$104,750	29.3%
South Florida	\$25,374	\$89,956	28.2%
San Diego	\$28,872	\$106,617	27.1%
Boston	\$29,333	\$112,096	26.2%
Inland Empire	\$24,192	\$94,908	25.5%
SF Bay Area	\$33,316	\$139,907	23.8%
Tampa	\$19,620	\$89,198	22.0%
Toronto	\$14,560	\$68,600	21.2%
Orlando	\$18,888	\$90,378	20.9%
Sacramento	\$22,320	\$106,812	20.9%
Denver	\$21,229	\$101,593	20.9%
Nashville	\$17,748	\$86,217	20.6%
Vancouver	\$14,337	\$71,268	20.1%
Chicago	\$19,920	\$99,763	20.0%
Washington, D.C.	\$22,716	\$113,846	20.0%
Phoenix	\$19,260	\$96,289	20.0%
Seattle	\$24,156	\$122,341	19.7%
Salt Lake City	\$17,720	\$90,105	19.7%
Portland	\$19,536	\$100,463	19.4%
Philadelphia	\$19,008	\$97,822	19.4%
Jacksonville	\$17,064	\$87,851	19.4%
Austin	\$18,720	\$98,006	19.1%
Atlanta	\$19,032	\$100,816	18.9%
Milwaukee	\$15,612	\$85,989	18.2%



Market	Annua I
Hartford	
Ottawa	
Virginia Beach	
Charlotte	
Pittsburgh	
Baltimore	
Minneapolis/St. Paul	
Raleigh-Durham	
Richmond	
Madison	
Dallas/Ft. Worth	
Calgary	
Detroit	
Waterloo Region, Canada	
Edmonton	
Indianapolis	
Kansas City	
Cincinnati	
Houston	
St. Louis	
San Antonio	
Columbus	
Cleveland	
Quebec City	
Montreal	

Note: New York represents Manhattan only, all others are metro area. Source: CBRE Econometric Advisors, Axiometrics, CMHC, Q4 2021.

lized Apartment Rent (2021)	Average Annual Tech Wage (2021)	Rent-To-Tech Wage Ratio
\$18,468	\$100,846	18.3%
\$13,077	\$72,739	18.0%
\$15,948	\$90,285	17.7%
\$17,160	\$98,875	17.4%
\$15,360	\$88,779	17.3%
\$18,636	\$108,669	17.1%
\$16,788	\$98,247	17.1%
\$17,148	\$100,683	17.0%
\$15,996	\$94,484	16.9%
\$14,832	\$87,775	16.9%
\$16,932	\$103,532	16.4%
\$11,398	\$70,411	16.2%
\$13,836	\$88,592	15.6%
\$12,191	\$78,220	15.6%
\$10,801	\$70,185	15.4%
\$12,852	\$83,826	15.3%
\$13,200	\$86,144	15.3%
\$13,392	\$88,088	15.2%
\$14,772	\$97,715	15.1%
\$13,308	\$88,945	15.0%
\$13,932	\$93,458	14.9%
\$13,608	\$92,727	14.7%
\$12,768	\$89,424	14.3%
\$8,535	\$63,556	13.4%
\$8,516	\$65,997	12.9%

09 Where else is tech talent headed?

The rising importance of technology in business and society has caused a global expansion of tech talent labor pools and implementation of more distributed labor strategies by tech talent employers seeking innovation potential and efficiency.

Latin America's Top 10 Markets

Latin America has long been an important source of tech talent in North America, initially focused on manufacturing and business services. During the most recent economic growth cycle, Latin America's tech talent has increasingly focused on software development and innovation. This has attracted many multinational technology companies to the region, as well as further developed Latin America's own technology industry.

During the most recent economic growth cycle, Latin America's tech talent has increasingly focused on software development and innovation



Over the past five years, Latin America's tech talent workforce has grown about twice as fast as that of the U.S. While costs have risen with rapid growth, average wages in Latin America remain about 34% of those in the U.S. The three largest Latin American tech talent markets are Sao Paulo, Mexico City and Santiago, while the fastest growing by far is Monterrey.

Real estate costs are also relatively low, making Latin America an even more attractive option for tech talent employers.



FIGURE 30 Latin America's Top 10 Markets

	Tech Emplo	Talent oyment ¹	Tech Avg Annual	Talent Wage (US\$)²	Software Avg Annua	Developer Wage (US\$)²	Tech D Comple		Office Rent p Annual Avg	er Sq. Ft. (US\$) Asking Rate³	Office Vacancy Rate		
Market, Country	2021 Jobs	5-Yr Growth⁵	2021 Wage	5-Yr Growth⁵	2021 Wage	5-Yr Growth⁵	2021 Degrees	5-Yr Growth	Q4 2021	5-Yr Growth⁵	Q4 2021	Q4 2021	5-Yr Growth⁵
Sao Paulo, Brazil	223,311	9%	\$55,145	120%	\$56,654	107%	14,701	15%	\$36.20	29%	22%	\$706	24%
Mexico City, Mexico	187,074	26%	\$29,924	26%	\$36,773	18%	19,407	5%	\$25.01	-9%	24%	\$1,184	28%
Santiago, Chile	149,285	27%	\$41,538	10%	\$47,943	22%	6,384	56%	\$22.25	-6%	10%	\$856	15%
Buenos Aires, Argentina	101,465	32%	\$21,627	231%	\$34,411	261%	4400	9%	\$26.09	-9%	14%	\$924	-41%
Bogota, Colombia	90,341	29%	\$15,463	27%	\$27,345	15%	6,813	84%	\$23.60	10%	13%	\$804	18%
San Jose, Costa Rica	53,817	42%	\$21,956	25%	\$39,061	30%	2700	36%	\$20.91	-3%	12%	\$756	8%
Guadalajara, Mexico	45,000	45%	\$25,159	26%	\$42,463	22%	5,438	27%	\$22.89	4%	22%	\$792	28%
Monterrey, Mexico	30,000	69%	\$30,254	22%	\$37,077	17%	3195	12%	\$20.60	-18%	21%	\$866	28%
Campinas, Brazil	18,115	38%	\$41,255	114%	\$50,495	103%	2,740	12%	\$11.01	-38%	20%	\$322	24%
Panama City, Panama	17,247	5%	\$24,454	7%	\$27,912	2%	1,191	22%	\$17.84	-31%	26%	\$975	2%
Latin America, 10-Market Avg	915,654	26%	\$35,052	70%	\$42,779	69%	66,969	24%	\$22.64	-3%	18%	\$818	12%
U.S. Overall, Avg	5,544,710	13%	\$102,374	12%	\$108,166	9%	338,883	27%	\$36.84	16%	17%	\$1,950	17%

¹ Jobs related to the development, operation, monitoring and support of the digitized information transmission processes.

²Based on 2021 annual average exchange rates.

³Submarkets where tech firms are predominently located.

⁴Submarkets where tech employees predominently live.

⁵Local currency.

Santiago, Chile

Bogota, Colombia

Campinas, Brazil

São Paulo,Brazil

Buenos Aires, Argentina

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The three largest Latin American tech talent markets are Sao Paulo, Mexico City and Santiago, while the fastest growing by far is Monterrey.

North America's Next 25

Fostering talent development in lesser-known and underdeveloped U.S. and Canadian markets could offer additional talent pools to employers seeking to expand their geographical reach and uncover opportunities. These 25 smaller markets represent potential and in the U.S. are concentrated in the Midwest and South. They have been separately ranked from the top 50 markets according to their relative strength.

These 25 smaller markets represent potential and in the U.S. are concentrated in the Midwest and South. They have been separately ranked from the top 50 markets according to their relative strength.



Scoring Tech Talent 2022

FIGURE 31: The Next 25 Markets (continued)

	Market	Total Tech Employment (2021)	Total Tech Growth (5 yrs)	Total Tech Wages (2021)	Total Tech Wage Growth (5 yrs)	Software Developer Wage (2021)	Software Developer Wage Growth (5 yrs)	Tech Talent De Graduates (20
1	Huntsville	22,510	15%	\$94,417	10%	\$107,228	11.3%	1,134
2	Dayton	18,460	23%	\$85,180	5%	\$84,263	1.9%	1,960
3	Colorado Springs	18,670	10%	\$95,880	6%	\$107,033	8.1%	1,555
4	Omaha	22,670	9%	\$86,180	11%	\$72,998	10.5%	863
5	Albany	18,200	-4%	\$93,600	11%	\$91,003	11.6%	1,869
6	Providence	18,380	0%	\$101,385	10%	\$105,192	17.2%	734
7	Rochester	18,480	-14%	\$88,400	13%	\$88,469	7.1%	7,220
8	Stamford	15,060	50%	\$113,947	24%	\$108,578	11.7%	374
9	Halifax*	14,800	-41%	\$60,339	13%	\$63,911	16.2%	1,026
10	London*	13,700	99%	\$60,064	3%	\$62,360	29.0%	972
11	Trenton	12,530	-1%	\$109,046	14%	\$113,043	18.8%	686
12	Winnipeg*	19,900	36%	\$60,694	8%	\$59,126	7.8%	588
13	Tucson	15,940	28%	\$82,733	10%	\$100,784	84.3%	1,270
14	Des Moines	18,690	37%	\$90,940	16%	\$86,612	7.6%	1,600
15	Honolulu	12,200	18%	\$90,379	11%	\$104,452	38.3%	659
16	Buffalo	13,780	-3%	\$85,974	13%	\$83,252	9.4%	640
17	Palm Bay	14,310	13%	\$88,703	5%	\$104,042	10.5%	850
18	Louisville	16,960	9%	\$83,329	12%	\$86,842	13.8%	94
19	Las Vegas	18,100	11%	\$84,381	6%	\$87,540	3.9%	2,681
20	Charleston	12,390	7%	\$94,420	23%	\$103,376	36.2%	298
21	Oklahoma City	21,520	10%	\$81,591	12%	\$80,203	7.2%	538
22	Boise	12,370	18%	\$82,265	18%	\$88,865	52.1%	479
23	Albuquerque	13,910	7%	\$87,853	17%	\$94,694	14.6%	298
24	Birmingham	15,940	3%	\$86,606	7%	\$90,106	9.3%	513
25	Harrisburg	12,520	-6%	\$85,623	13%	\$89,528	19.4%	2,076

*data in US\$

Note: Markets were separately ranked according to their relative strength based on eight of the 13 metrics used for the top 50. Source: U.S. Bureau of Labor Statistics (Metro), Statistics Canada (Metro), April 2022.



10 Appendix I: Local Market Profiles

Local Market Profiles

Full Report Data Summary

#1 SF Bay Area

Employment Breakdown

	Employed*	5-Yr Growth**	Avg Wage*	5-Yr Growth*
Total Tech Occupations	378,870	12.6%	\$139,907	15.8%
Software Developers & Programmers	182,300	19.4%	\$156,222	22.4%
Computer Support, Database & Systems	113,050	3.6%	\$134,432	38.6%
Computer & Information Systems Managers	45,620	76.9%	\$219,750	15.4%
Technology Engineering-Related	37,900	-22.3%	\$111,164	-3.9%
Total Non-Tech Occupations	364,050	-5.7%	\$82,412	25.6%
Sales	56,860	-10.0%	\$117,796	27.4%
Administrative & Office Support	176,340	-22.5%	\$55,351	20.5%
Business Operations & Finance	84,230	5.9%	\$106,094	8.6%
Marketing	46,620	10.6%	\$98,823	22.8%

*2021; ** 2016-2021; Source: U.S. Bureau of Labor Statistics (Metro Area), April 2022.

Top 5 Industries Employing Tech Talent (2020)

6	7%	6

6% 5%

FIRE**

4%

Core High-Tech*

Manufacturing*** Transport, Warehouse & Wholesale

3%

59.2%

Austin

*Includes computer software and services and computer product manufacturing; **Finance, Insurance, Real Estate; ***Excl high-tech. Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Top 5 Most Concentrated U.S. Markets for Software Engineers Employed in the Tech Industry (2020)*

Prof'l Services***



74.6% SF Bay Area

Raleigh-Durham Portland

68.0%

SF Bay Area: 74.6%

*% of total software engineers across all industries; Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Workforce Diversity



Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022

Talent Pipeline & Diversity

Degree Completions (2020)	Total	Growth 2016-20	Male	Female
Computer Engineering	6,596	34%	68%	32%
Math/Statistics	1,524	49%	62%	38%
Other Tech Engineering	1,800	12%	72%	28%
Totals	9,920	31%	68%	32%

Degree Completions (2020)	Total	White	Asian	Hispanic	Black	Other
Computer Engineering	6,596	26%	56%	10%	2%	6%
Math/Statistics	1,524	34%	44%	14%	2%	7%
Other Tech Engineering	1,800	37%	34%	19%	4%	7%
Totals	9,920	30%	49%	13%	2%	6%

Source: The National Center for Education Statistics (Region), 2021

Office Rent & Vacancy Trends



\$6

Average Apartment Rent (2021)

\$2.776

Per unit/month

5-year growth

1.4%

Population Trends

Age Group



Source: U.S. Census Bureau (Metro), 2022.

Score: 85.52



Rent-to-Tech Wage Ratio*

*Ratio of annualized apartment rent (2021) to average annual wage for tech talent occupations (2021) Source: Bureau of Labor Statistics April 2022, CBRE Research (Metro) and Axiometrics (Metro) Q4 2021.

Twenty-somethings grew by 10,393 (1.7%) and thirty-somethings grew by 66,110 (9.7%) since 2015.

#2 Seattle

Employment Breakdown

	Employed*	5-Yr Growth**	Avg Wage*	5-Yr Growth*
Total Tech Occupations	189,570	31.6%	\$122,341	9.0%
Software Developers & Programmers	113,550	54.7%	\$140,889	13.2%
Computer Support, Database & Systems	52,880	7.9%	\$115,902	33.0%
Computer & Information Systems Managers	11,220	10.4%	\$185,210	19.6%
Technology Engineering-Related	11,920	4.2%	\$100,486	-2.5%
Total Non-Tech Occupations	224,900	0.3%	\$69,606	31.7%
Sales	22,570	17.6%	\$109,358	53.9%
Administrative & Office Support	128,940	-8.7%	\$49,257	22.9%
Business Operations & Finance	46,660	9.1%	\$94,635	26.0%
Marketing	26,730	27.9%	\$90,507	17.6%

6%

Manufacturing***

Workforce Diversity



Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022

Talent Pipeline & Diversity

3%

FIRE**

59.2%

Austin

4%

.0%

Information***

Degree Completions (2020)	Total	Growth 2016-20	Male	Female
Computer Engineering	3,491	76%	68%	32%
Math/Statistics	647	11%	61%	39%
Other Tech Engineering	850	22%	74%	26%
Totals	4,988	53%	68%	32%

Degree Completions (2020)	Total	White	Asian	Hispanic	Black	Othe
Computer Engineering	3,491	48%	34%	6%	5%	7%
Math/Statistics	647	65%	22%	6%	1%	6%
Other Tech Engineering	850	59%	24%	7%	3%	8%
Totals	4,988	52%	31%	6%	4%	7%

Office Rent & Vacancy Trends



3	\$5
k	

Average Apartment Rent (2021)

\$2.013

Per unit/month

*Ratio of annualized apartment rent (2021) to average annual wage for tech talent occupations (2021) Source: Bureau of Labor Statistics April 2022, CBRE Research (Metro) and Axiometrics (Metro) Q4 2021.

Population Trends

Age Group



Source: The National Center for Education Statistics (Region), 2021.

Top 5 Most Concentrated U.S. Markets for Software	
*Includes computer software and services and computer product manufacturing; **Finance, Insurance, Real Estate; ***Excl high-t Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.	tech.

Top 5 Industries Employing Tech Talent (2020)

Top 5 Most Concentrated U.S. Markets for Software Engineers Employed in the Tech Industry (2020)*

	/		•	7	0
S	Sea	ttl	е		

63%

Core High-Tech*

74.6% SF Bay Area

*2021; ** 2016-2021; Source: U.S. Bureau of Labor Statistics (Metro Area), April 2022.

6%

Prof'l Services***

68 Raleigh-Durham Portland

Seattle: 77.1%

*% of total software engineers across all industries; Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.







5-year growth



#3 Toronto

Employment Breakdown

	Employed*	5-Yr Growth**	Avg Wage*	5-Yr Growth*
Total Tech Occupations	289,700	44.3%	\$88,254	7.4%
Software Developers & Programmers	109,200	98.5%	\$92,518	8.9%
Computer Support, Database & Systems	133,600	42.3%	\$81,390	8.1%
Computer & Information Systems Managers	19,000	-26.1%	\$121,243	17.0%
Technology Engineering-Related	27,900	6.5%	\$81,848	2.6%
Total Non-Tech Occupations	514,100	16.8%	\$62,774	13.3%
Sales	72,700	8.5%	\$58,843	10.2%
Administrative & Office Support	205,200	22.8%	\$47,944	14.9%
Business Operations & Finance	159,800	7.0%	\$78,312	15.5%
Marketing	76,400	34.5%	\$73,840	12.7%

Workforce Diversity (by Sex), 2021



Total Workforce (All Industries and Occupations)



*2021, **2016-2021, 1In C\$; Source: Statistics Canada (Metro Area), April 2022.

Top 5 Industries Employing Tech Talent (2021)

43%	25%	7%	7%	5%
Core High-Tech*	FIRE**	Manufacturing***	Prof'l Services***	Government

*Includes computer software and services and computer product manufacturing; **Finance, Insurance, Real Estate; ***Excl high-tech. Source: Statistics Canada (Metro), and CBRE Research, April 2022.

Talent Pipeline & Diversity

Degree Completions (2020)	Total	Growth 2016-20	Male	Female
Computer Engineering	2,531	78%	76%	24%
Math/Statistics	2,799	16%	80%	20%
Other Tech Engineering	1,550	133%	53%	48%
Totals	6,880	53%	72%	28%

Source: Various Canadian Ministries of Education (Region), 2021.

Total Workforce by Race/Ethnicity



Office Rent & Vacancy Trends



8	\$321
	Tal

Average Apartment Rent (2021)



Per unit/month*

*In US\$ (\$1,561 in C\$); **Ratio of annualized apartment rent (2021) to average annual wage for tech talent occupations (2021) Source: Statistics Canada, April 2022, CMHC (Metro), Q4 2021

Population Trends

Twenty-somethings grew by 129,626 (14.7%) and thirty-somethings grew by 135,728 (15.6%) since 2015.





Score: 68.93





5-year growth

[#]4 Washington, D.C.

Employment Breakdown

	Employed*	5-Yr Growth**	Avg Wage*	5-Yr Growth*
Total Tech Occupations	259,310	5.7%	\$113,846	5.0%
Software Developers & Programmers	90,980	21.6%	\$127,892	13.6%
Computer Support, Database & Systems	134,000	-2.0%	\$113,148	13.7%
Computer & Information Systems Managers	17,620	0.0%	\$177,460	7.5%
Technology Engineering-Related	16,710	-5.1%	\$101,926	-1.5%
Total Non-Tech Occupations	358,030	-10.8%	\$73,080	17.1%
Sales	34,370	-8.9%	\$110,923	23.2%
Administrative & Office Support	179,750	-18.1%	\$49,901	21.0%
Business Operations & Finance	95,820	-0.8%	\$95,165	6.5%
Marketing	48,090	1.3%	\$88,667	6.3%

*2021; ** 2016-2021; Source: U.S. Bureau of Labor Statistics (Metro Area), April 2022.

Top 5 Industries Employing Tech Talent (2020)

41%	20%	15%	6%	3%
Core High-Tech*	Government	Prof'l Services***	FIRE**	Educatio

*Includes computer software and services and computer product manufacturing; **Finance, Insurance, Real Estate; ***Excl high-tech. Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Top 5 Most Concentrated U.S. Markets for Software Engineers Employed in the Tech Industry (2020)*

10 Seattle

14 SF Bay Area

68.0% Raleigh-Durham Portland

59.2%

Austin

Washington, D.C.: 48.8%

*% of total software engineers across all industries; Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Workforce Diversity



Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022

Talent Pipeline & Diversity

Degree Completions (2020)	Total	Growth 2016-20	Male	Female
Computer Engineering	10,514	26%	73%	27%
Math/Statistics	1,009	31%	56%	44%
Other Tech Engineering	1,619	17%	78%	22%
Totals	13,142	25%	72%	28%

Degree Completions (2020)	Total	White	Asian	Hispanic	Black	Other
Computer Engineering	10,514	43%	18%	10%	24%	5%
Math/Statistics	1,009	58%	18%	10%	8%	6%
Other Tech Engineering	1,619	65%	15%	9%	9%	3%
Totals	13,142	47%	17%	10%	21%	5%

Source: The National Center for Education Statistics (Region), 2021.



	\$53

\$1.893

Per unit/month

*Ratio of annualized apartment rent (2021) to average annual wage for tech talent occupations (2021) Source: Bureau of Labor Statistics April 2022, CBRE Research (Metro) and Axiometrics (Metro) Q4 2021.

Population Trends

Twenty-somethings grew by 1,982 (0.2%) and thirty-somethings grew by 59,145 (6.6%) since 2015.

Age Group



Score: 67.88



5-year growth

#5 New York Metro

Employment Breakdown

	Employed*	5-Yr Growth**	Avg Wage*	5-Yr Growth*
Total Tech Occupations	344,520	2.6%	\$117,637	10.9%
Software Developers & Programmers	148,090	12.9%	\$124,752	17.7%
Computer Support, Database & Systems	139,940	-6.6%	\$116,039	26.4%
Computer & Information Systems Managers	37,530	16.8%	\$202,800	11.5%
Technology Engineering-Related	18,960	-15.8%	\$93,451	0.8%
Total Non-Tech Occupations	1,121,270	-12.6%	\$68,915	20.1%
Sales	106,980	-8.0%	\$109,755	28.8%
Administrative & Office Support	649,830	-20.7%	\$47,280	20.3%
Business Operations & Finance	245,400	2.3%	\$100,785	2.8%
Marketing	119,060	11.5%	\$84,610	13.6%

*2021; ** 2016-2021; Source: U.S. Bureau of Labor Statistics (Metro Area), April 2022.

Top 5 Industries Employing Tech Talent (2020)

32%	20%	11%	6%	6%
Core High-Tech*	FIRE**	Prof'l Services***	Education	Information***

*Includes computer software and services and computer product manufacturing; **Finance, Insurance, Real Estate; ***Excl high-tech. Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Top 5 Most Concentrated U.S. Markets for Software Engineers Employed in the Tech Industry (2020)*

70 Seattle SF Bay Area

14.6% Raleigh-Durham

68 Portland

.0%

59.2%

Austin

New York Metro: 41.8%

*% of total software engineers across all industries; Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Workforce Diversity



Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022

Talent Pipeline & Diversity

Degree Completions (2020)	Total	Growth 2016-20	Male	Female
Computer Engineering	14,586	47%	70%	30%
Math/Statistics	3,861	21%	57%	43%
Other Tech Engineering	2,907	6%	77%	23%
Totals	21,354	35%	69%	31%

Degree Completions (2020)	Total	White	Asian	Hispanic	Black	Other
Computer Engineering	14,586	34%	36%	16%	11%	3%
Math/Statistics	3,861	45%	29%	16%	7%	3%
Other Tech Engineering	2,907	53%	25%	14%	5%	3%
Totals	21,354	39%	33%	16%	9%	3%

Source: The National Center for Education Statistics (Region), 2021



\$551
Та

Average Apartment Rent (2021)

\$3.140

Per unit/month

*Ratio of annualized apartment rent (2021) to average annual wage for tech talent occupations (2021) Source: Bureau of Labor Statistics April 2022, CBRE Research (Metro) and Axiometrics (Metro) Q4 2021.

Population Trends

Age Group



Score: 67.08



5-year growth

7.3%



[#]6 Austin

Employment Breakdown

	Employed*	5-Yr Growth**	Avg Wage*	5-Yr Growth*
Total Tech Occupations	84,680	20.6%	\$98,006	8.0%
Software Developers & Programmers	31,940	24.5%	\$104,850	7.6%
Computer Support, Database & Systems	37,400	17.2%	\$101,021	27.8%
Computer & Information Systems Managers	6,930	128.7%	\$159,430	3.4%
Technology Engineering-Related	8,410	-12.8%	\$86,639	-5.9%
Total Non-Tech Occupations	149,130	-5.3%	\$55,733	7.7%
Sales	18,800	-25.9%	\$85,710	2.2%
Administrative & Office Support	91,770	-4.5%	\$41,711	18.0%
Business Operations & Finance	26,480	7.9%	\$77,620	7.1%
Marketing	12,080	5.6%	\$67,630	-8.6%

*2021; ** 2016-2021; Source: U.S. Bureau of Labor Statistics (Metro Area), April 2022.

Top 5 Industries Employing Tech Talent (2020)

50%	9%	7%	6%	6%
Core High-Tech*	Prof'l Services***	FIRE**	Education	Governme

*Includes computer software and services and computer product manufacturing; **Finance, Insurance, Real Estate; ***Excl high-tech. Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Top 5 Most Concentrated U.S. Markets for Software Engineers Employed in the Tech Industry (2020)*

70 Seattle

74.6%

68 Raleigh-Durham Portland

.0%

59.2%

Austin

Austin: 59.29

SF Bay Area

*% of total software engineers across all industries; Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Workforce Diversity



Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022

Talent Pipeline & Diversity

Degree Completions (2020)	Total	Growth 2016-20	Male	Female
Computer Engineering	1,875	26%	76%	24%
Math/Statistics	537	19%	63%	37%
Other Tech Engineering	642	10%	75%	25%
Totals	3,054	21%	73%	27%

Degree Completions (2020)	Total	White	Asian	Hispanic	Black	Other
Computer Engineering	1,875	44%	29%	19%	5%	4%
Math/Statistics	537	46%	28%	21%	2%	3%
Other Tech Engineering	642	53%	20%	20%	4%	3%
Totals	3,054	46%	27%	20%	4%	4%

Office Rent & Vacancy Trends



:11	\$4
nk	

Average Apartment Rent (2021)

\$1.560

Per unit/month

*Ratio of annualized apartment rent (2021) to average annual wage for tech talent occupations (2021) Source: Bureau of Labor Statistics April 2022, CBRE Research (Metro) and Axiometrics (Metro) Q4 2021.

Population Trends

Age Group



Source: The National Center for Education Statistics (Region), 2021.

60 CBRE RESEARCH







5-year growth



Boston

Employment Breakdown

	Employed*	5-Yr Growth**	Avg Wage*	5-Yr Growth
Total Tech Occupations	166,450	2.1%	\$112,096	8.2%
Software Developers & Programmers	74,370	8.0%	\$122,022	11.8%
Computer Support, Database & Systems	54,740	-5.3%	\$113,307	30.3%
Computer & Information Systems Managers	19,180	33.3%	\$172,010	11.2%
Technology Engineering-Related	15,490	-29.4%	\$90,059	-6.7%
Total Non-Tech Occupations	305,090	-3.3%	\$67,197	17.0%
Sales	36,710	60.0%	\$98,800	-3.6%
Administrative & Office Support	170,810	-13.7%	\$49,157	19.0%
Business Operations & Finance	69,230	4.0%	\$90,065	9.4%
Marketing	28,340	0.6%	\$79,127	5.0%

*2021; ** 2016-2021; Source: U.S. Bureau of Labor Statistics (Metro Area), April 2022.

Top 5 Industries Employing Tech Talent (2020)

40%	13%	12%	8%	6%
Core High-Tech*	Prof'l Services***	FIRE**	Manufacturing***	Education

*Includes computer software and services and computer product manufacturing; **Finance, Insurance, Real Estate; ***Excl high-tech. Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Top 5 Most Concentrated U.S. Markets for Software Engineers Employed in the Tech Industry (2020)*

70 Seattle

74.6% SF Bay Area

68 .0% Raleigh-Durham Portland

59.2%

Austin

Boston: 53.2%

*% of total software engineers across all industries; Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Workforce Diversity



Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022

Talent Pipeline & Diversity

Degree Completions (2020)	Total	Gro	wth 2016-20	Male		Female
Computer Engineering	8,310		71%	70%		30%
Math/Statistics	1,825		30%	57%		43%
Other Tech Engineering	3,189		32%	71%		29%
Totals	13,324		54%	68%		32%
Degree Completions (2020)	Total	White	Asian	Hispanic	Black	Oth

Degree Completions (2020)	Total	White	Asian	Hispanic	Black	Other
Computer Engineering	8,310	54%	27%	9%	5%	5%
Math/Statistics	1,825	58%	26%	7%	4%	4%
Other Tech Engineering	3,189	67%	15%	9%	4%	6%
Totals	13,324	58%	24%	9%	5%	5%

Office Rent & Vacancy Trends



5	\$
k	

Average Apartment Rent (2021)

\$2.444

Per unit/month

*Ratio of annualized apartment rent (2021) to average annual wage for tech talent occupations (2021) Source: Bureau of Labor Statistics April 2022, CBRE Research (Metro) and Axiometrics (Metro) Q4 2021.

Population Trends



Source: The National Center for Education Statistics (Region), 2021.

Score: 62.38





5-year growth



Vancouver 8

Employment Breakdown

	Employed*	5-Yr Growth**	Avg Wage*	5-Yr Growth**
Total Tech Occupations	115,400	62.7%	\$91,686	17.1%
Software Developers & Programmers	52,600	85.8%	\$97,885	24.4%
Computer Support, Database & Systems	42,600	73.7%	\$81,432	5.9%
Computer & Information Systems Managers	7,800	24.0%	\$121,680	28.0%
Technology Engineering-Related	12,400	1.3%	\$81,619	20.6%
Total Non-Tech Occupations	211,700	16.3%	\$61,006	16.3%
Sales	30,300	0.7%	\$56,846	1.3%
Administrative & Office Support	90,800	5.7%	\$50,482	14.3%
Business Operations & Finance	48,600	5.9%	\$76,190	23.0%
Marketing	42,000	107.9%	\$69,181	13.6%

Workforce Diversity (by Sex), 2021



Total Workforce (All Industries and Occupations)



*2021, **2016-2021, 1In C\$; Source: Statistics Canada (Metro Area), April 2022.

Top 5 Industries Employing Tech Talent (2021)

45%	21%	9%	8%	6%
Core High-Tech*	FIRE**	Retail	Prof'l Services***	Information***

*Includes computer software and services and computer product manufacturing; **Finance, Insurance, Real Estate; ***Excl high-tech. Source: Statistics Canada (Metro), and CBRE Research, April 2022.

Talent Pipeline & Diversity

Degree Completions (2020)	Total	Growth 2016-20	Male	Female
Computer Engineering	1,679	79%	67%	33%
Math/Statistics	508	95%	52%	48%
Other Tech Engineering	1,128	9%	76%	24%
Totals	3,315	48%	69%	31%

Source: Various Canadian Ministries of Education (Region), 2021.

Total Workforce by Race/Ethnicity



Office Rent & Vacancy Trends



6	\$32N
	Tale

Average Apartment Rent (2021)



25.7%

Per unit/month*

*In US\$ (\$1,537 in C\$); **Ratio of annualized apartment rent (2021) to average annual wage for tech talent occupations (2021) Source: Statistics Canada, April 2022, CMHC (Metro), Q4 2021

Population Trends

Twenty-somethings grew by 33,255 (8.7%) and thirty-somethings grew by 62,234 (16.8%) since 2015.



Score: 62.19





5-year growth

#9 Dallas/Ft. Worth

Employment Breakdown

	Employed*	5-Yr Growth**	Avg Wage*	5-Yr Growth*
Total Tech Occupations	187,950	14.9%	\$103,532	12.6%
Software Developers & Programmers	66,740	33.0%	\$111,024	9.2%
Computer Support, Database & Systems	87,580	3.3%	\$104,177	24.8%
Computer & Information Systems Managers	15,980	94.4%	\$159,010	1.4%
Technology Engineering-Related	17,650	-13.5%	\$84,941	10.3%
Total Non-Tech Occupations	444,820	-6.5%	\$53,912	10.0%
Sales	50,250	-6.3%	\$85,408	19.0%
Administrative & Office Support	291,590	-9.6%	\$41,513	13.1%
Business Operations & Finance	75,970	0.4%	\$76,565	-2.1%
Marketing	27,010	12.9%	\$65,453	-8.9%

*2021; ** 2016-2021; Source: U.S. Bureau of Labor Statistics (Metro Area), April 2022.

Top 5 Industries Employing Tech Talent (2020)

37%	17%	8%	7%	6%
Core High-Tech*	FIRE**	Manufacturing ***	Prof'l Services***	Information

*Includes computer software and services and computer product manufacturing; **Finance, Insurance, Real Estate; ***Excl high-tech. Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Top 5 Most Concentrated U.S. Markets for Software Engineers Employed in the Tech Industry (2020)*

10 Seattle SF Bay Area

14.6% Raleigh-Durham

68 Portland

.0%

59.2%

Austin

Dallas/Ft. Worth: 46.1%

*% of total software engineers across all industries; Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Workforce Diversity



Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022

Talent Pipeline & Diversity

Degree Completions (2020)	Total	Growth 2016-20	Male	Female
Computer Engineering	4,815	19%	72%	28%
Math/Statistics	861	93%	60%	40%
Other Tech Engineering	1,333	12%	84%	16%
Totals	7,009	23%	73%	27%

Degree Completions (2020)	Total	White	Asian	Hispanic	Black	Othe
Computer Engineering	4,815	41%	31%	15%	8%	4%
Math/Statistics	861	56%	14%	20%	5%	5%
Other Tech Engineering	1,333	53%	13%	22%	7%	4%
Totals	7,009	46%	25%	17%	7%	4%

Source: The National Center for Education Statistics (Region), 2021

Office Rent & Vacancy Trends



17	\$4
k	

Average Apartment Rent (2021)

\$1.411

Per unit/month

*Ratio of annualized apartment rent (2021) to average annual wage for tech talent occupations (2021) Source: Bureau of Labor Statistics April 2022, CBRE Research (Metro) and Axiometrics (Metro) Q4 2021.

Population Trends



Source: U.S. Census Bureau (Metro), 2022.

CBRE RESEARCH 63

Score: 58.57





5-year growth

Rent-to-Tech Wage Ratio*

Twenty-somethings grew by 89,519 (9.4%) and thirty-somethings grew by 94,384 (9.5%) since 2015.

[#]10 Denver

Employment Breakdown

	Employed*	5-Yr Growth**	Avg Wage*	5-Yr Growth*
Total Tech Occupations	117,620	22.8%	\$101,593	2.8%
Software Developers & Programmers	44,890	29.6%	\$112,628	4.2%
Computer Support, Database & Systems	49,890	15.1%	\$107,168	22.9%
Computer & Information Systems Managers	7,920	56.2%	\$178,025	9.5%
Technology Engineering-Related	14,920	54.6%	\$88,544	0.9%
Total Non-Tech Occupations	208,660	-2.8%	\$67,296	22.0%
Sales	31,870	11.5%	\$102,169	25.9%
Administrative & Office Support	102,320	-17.2%	\$45,586	17.4%
Business Operations & Finance	50,140	11.8%	\$85,362	9.9%
Marketing	24,330	37.6%	\$75,693	7.8%

*2021; ** 2016-2021; Source: U.S. Bureau of Labor Statistics (Metro Area), April 2022.

Top 5 Industries Employing Tech Talent (2020)

38%	10%	9%	8%	8%
Core High-Tech*	FIRE**	Manufacturing ***	Information***	Prof'l Services***

*Includes computer software and services and computer product manufacturing; **Finance, Insurance, Real Estate; ***Excl high-tech. Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Top 5 Most Concentrated U.S. Markets for Software Engineers Employed in the Tech Industry (2020)*



74.6%

.0% 68 Raleigh-Durham Portland

59.2%

Austin

Denver: 47.9

SF Bay Area

*% of total software engineers across all industries; Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Workforce Diversity



Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022

Talent Pipeline & Diversity

Degree Completions (2020)	Total	Growth 2016-20	Male	Female
Computer Engineering	2,425	38%	75%	25%
Math/Statistics	444	26%	68%	32%
Other Tech Engineering	1,483	38%	79%	21%
Totals	4,352	37%	76%	24%

Degree Completions (2020)	Total	White	Asian	Hispanic	Black	Other
Computer Engineering	2,425	66%	12%	11%	6%	5%
Math/Statistics	444	78%	9%	10%	1%	2%
Other Tech Engineering	1,483	78%	4%	11%	1%	6%
Totals	4,352	72%	9%	11%	4%	5%

Source: The National Center for Education Statistics (Region), 2021.

Office Rent & Vacancy Trends



#8	\$
ank	

\$1.769

Per unit/month

5-year growth

*Ratio of annualized apartment rent (2021) to average annual wage for tech talent occupations (2021)

Population Trends

Twenty-somethings grew by 3,240 (5.9%) and thirty-somethings grew by 2,334 (5.9%) since 2015.



64 CBRE RESEARCH

Score: 57.53





Rent-to-Tech Wage Ratio*

Source: Bureau of Labor Statistics April 2022, CBRE Research (Metro) and Axiometrics (Metro) Q4 2021.

#11 Atlanta

Employment Breakdown

	Employed*	5-Yr Growth**	Avg Wage*	5-Yr Growth*
Total Tech Occupations	145,080	6.5%	\$100,816	9.9%
Software Developers & Programmers	50,290	13.5%	\$111,728	14.7%
Computer Support, Database & Systems	71,700	6.2%	\$99,591	20.7%
Computer & Information Systems Managers	12,560	0.9%	\$162,470	16.2%
Technology Engineering-Related	10,530	8.2%	\$81,963	2.7%
Total Non-Tech Occupations	328,530	-2.7%	\$55,369	14.8%
Sales	33,960	-9.2%	\$88,113	22.3%
Administrative & Office Support	206,190	-4.9%	\$41,220	15.5%
Business Operations & Finance	64,140	9.0%	\$79,157	7.5%
Marketing	24,240	-1.5%	\$66,903	8.8%

*2021; ** 2016-2021; Source: U.S. Bureau of Labor Statistics (Metro Area), April 2022.

Top 5 Industries Employing Tech Talent (2020)

7% 42% 8% 8% Prof'l Services*** Manufacturing *** Core High-Tech* FIRE** Transport, Warehouse & Wholesale

*Includes computer software and services and computer product manufacturing; **Finance, Insurance, Real Estate; ***Excl high-tech. Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Top 5 Most Concentrated U.S. Markets for Software Engineers Employed in the Tech Industry (2020)*

70 Seattle

74.6% SF Bay Area

Raleigh-Durham Portland

68

.0%

59.2%

Austin

Atlanta: 54.2%

*% of total software engineers across all industries; Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Workforce Diversity



Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022

Talent Pipeline & Diversity

Degree Completions (2020)	Total	Growth 2016-20	Male	Female
Computer Engineering	5,794	71%	77%	23%
Math/Statistics	623	39%	56%	44%
Other Tech Engineering	2,272	19%	75%	25%
Totals	8,689	51%	75%	25%

Degree Completions (2020)	Total	White	Asian	Hispanic	Black	Othe
Computer Engineering	5,794	44%	28%	8%	16%	4%
Math/Statistics	623	46%	22%	7%	21%	4%
Other Tech Engineering	2,272	61%	17%	9%	8%	5%
Totals	8,689	49%	24%	8%	14%	4%

Source: The National Center for Education Statistics (Region), 2021.

Office Rent & Vacancy Trends



#16	\$4
ank	

\$1.586

Per unit/month

5-year growth

*Ratio of annualized apartment rent (2021) to average annual wage for tech talent occupations (2021) Source: Bureau of Labor Statistics April 2022, CBRE Research (Metro) and Axiometrics (Metro) Q4 2021.

Population Trends



Source: U.S. Census Bureau (Metro), 2022.

65 CBRE RESEARCH

Score: 57.16







#12 Los Angeles/Orange County

59.2%

Austin

Employment Breakdown

	Employed*	5-Yr Growth**	Avg Wage*	5-Yr Growth*
Total Tech Occupations	235,800	9.8%	\$104,750	8.3%
Software Developers & Programmers	90,130	16.2%	\$108,306	5.4%
Computer Support, Database & Systems	93,340	3.1%	\$101,255	22.7%
Computer & Information Systems Managers	24,990	73.2%	\$169,470	12.1%
Technology Engineering-Related	27,340	-15.4%	\$93,956	-3.7%
Total Non-Tech Occupations	651,870	-13.4%	\$59,504	16.2%
Sales	58,230	-24.8%	\$90,220	23.2%
Administrative & Office Support	410,600	-17.2%	\$46,281	19.8%
Business Operations & Finance	120,190	1.3%	\$83,823	4.1%
Marketing	62,850	3.7%	\$70,928	3.3%

*2021; ** 2016-2021; Source: U.S. Bureau of Labor Statistics (Metro Area), April 2022.

Top 5 Industries Employing Tech Talent (2020)

38%	10%	9%	7%	7%
Core High-Tech*	Prof'l Services***	Manufacturing ***	FIRE**	Education

*Includes computer software and services and computer product manufacturing; **Finance, Insurance, Real Estate; ***Excl high-tech. Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Top 5 Most Concentrated U.S. Markets for Software Engineers Employed in the Tech Industry (2020)*



Los Angeles/Orange County: 50.4%

*% of total software engineers across all industries; Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Workforce Diversity



Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022

Talent Pipeline & Diversity

Degree Completions (2020)	Total	Grow	th 2016-20	Male		Female
Computer Engineering	8,557		28%	76%		24%
Math/Statistics	2,576		38%	58%		42%
Other Tech Engineering	3,371		13%	79%		21%
Totals	14,504		26%	74%		26%
Degree Completions (2020)	Total	White	Asian	Hispanic	Black	Other
Computer Engineering	8,557	26%	43%	24%	2%	6%

Computer Engineering	8,557	26%	43%	24%	2%	6%
Math/Statistics	2,576	33%	33%	26%	2%	5%
Other Tech Engineering	3,371	35%	26%	31%	2%	6%
Totals	14,504	30%	36%	26%	2%	6%

Source: The National Center for Education Statistics (Region), 2021

Office Rent & Vacancy Trends



¥7	
ank	

S2.554

Per unit/month

5-year growth

*Ratio of annualized apartment rent (2021) to average annual wage for tech talent occupations (2021) Source: Bureau of Labor Statistics April 2022, CBRE Research (Metro) and Axiometrics (Metro) Q4 2021.

Population Trends



CBRE RESEARCH 66

Score: 57.12

15.6%



Rent-to-Tech Wage Ratio*



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#13 Ottawa

Employment Breakdown

	Employed*	5-Yr Growth**	Avg Wage*	5-Yr Growth**
Total Tech Occupations	81,200	22.3%	\$93,579	10.9%
Software Developers & Programmers	27,800	24.7%	\$95,846	10.5%
Computer Support, Database & Systems	35,300	12.8%	\$84,510	7.5%
Computer & Information Systems Managers	8,800	100.0%	\$120,619	4.1%
Technology Engineering-Related	9,300	10.7%	\$95,576	14.7%
Total Non-Tech Occupations	104,300	1.7%	\$69,118	18.3%
Sales	9,500	-18.1%	\$62,691	6.7%
Administrative & Office Support	38,300	-0.8%	\$51,730	18.0%
Business Operations & Finance	39,800	5.3%	\$82,514	18.5%
Marketing	16,700	14.4%	\$80,787	19.5%

Workforce Diversity (by Sex), 2021



Total Workforce (All Industries and Occupations)



*2021, **2016-2021, 1In C\$; Source: Statistics Canada (Metro Area), April 2022.

Top 5 Industries Employing Tech Talent (2021)



*Includes computer software and services and computer product manufacturing; **Finance, Insurance, Real Estate; ***Excl high-tech. Source: Statistics Canada (Metro), and CBRE Research, April 2022.

Talent Pipeline & Diversity

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Degree Completions (2020)	Total	Growth 2016-20	Male	Female	
Computer Engineering	939	131%	80%	20%	2
Math/Statistics	1,237	32%	78%	22%	1
Other Tech Engineering	183	83%	58%	42%	
Totals	2,359	63%	77%	23%	

Source: Various Canadian Ministries of Education (Region), 2021.

Total Workforce by Race/Ethnicity





	\$3	41
		Tale

Average Apartment Rent (2021)



Per unit/month*

*In US\$ (\$1,402 in C\$); **Ratio of annualized apartment rent (2021) to average annual wage for tech talent occupations (2021) Source: Statistics Canada, April 2022, CMHC (Metro), Q4 2021

Population Trends



Score: 55.51









[#]14 Baltimore

Employment Breakdown

	Employed*	5-Yr Growth**	Avg Wage*	5-Yr Growth*
Total Tech Occupations	79,000	7.6%	\$108,669	10.5%
Software Developers & Programmers	23,800	18.9%	\$122,311	22.0%
Computer Support, Database & Systems	41,500	4.9%	\$108,724	16.8%
Computer & Information Systems Managers	5,780	32.0%	\$154,530	8.3%
Technology Engineering-Related	7,920	9.6%	\$92,095	-4.1%
Total Non-Tech Occupations	140,860	-19.4%	\$58,968	18.6%
Sales	14,960	-22.6%	\$100,935	33.3%
Administrative & Office Support	90,780	-20.9%	\$43,666	17.5%
Business Operations & Finance	26,860	-16.0%	\$85,145	11.9%
Marketing	8,260	-5.3%	\$66,007	8.9%

*2021; ** 2016-2021; Source: U.S. Bureau of Labor Statistics (Metro Area), April 2022.

Top 5 Industries Employing Tech Talent (2020)

32%	23%	13%	7%	5%
Core High-Tech*	Government	Prof'l Services***	Education	FIRE**

*Includes computer software and services and computer product manufacturing; **Finance, Insurance, Real Estate; ***Excl high-tech. Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Top 5 Most Concentrated U.S. Markets for Software Engineers Employed in the Tech Industry (2020)*

10 Seattle

74.6% SF Bay Area

68.0% Raleigh-Durham Portland

59.2%

Austin

Baltimore: 43.8%

*% of total software engineers across all industries; Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Workforce Diversity



Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022

Talent Pipeline & Diversity

Degree Completions (2020)	Total	Growth 2016-20	Male	Female
Computer Engineering	2,692	31%	73%	27%
Math/Statistics	577	34%	66%	34%
Other Tech Engineering	902	-12%	79%	21%
Totals	4,171	19%	73%	27%

Degree Completions (2020)	Total	White	Asian	Hispanic	Black	Othe
Computer Engineering	2,692	47%	21%	7%	21%	4%
Math/Statistics	577	61%	17%	8%	6%	7%
Other Tech Engineering	902	66%	10%	9%	10%	6%
Totals	4,171	53%	18%	8%	16%	5%

Office Rent & Vacancy Trends



#10	\$4
ank	

\$1.553

Per unit/month

*Ratio of annualized apartment rent (2021) to average annual wage for tech talent occupations (2021) Source: Bureau of Labor Statistics April 2022, CBRE Research (Metro) and Axiometrics (Metro) Q4 2021.

Population Trends



Source: The National Center for Education Statistics (Region), 2021.

Source: U.S. Census Bureau (Metro), 2022.

Score: 55.19

20.4%



5-year growth



#15 Montreal

Employment Breakdown

	Employed*	5-Yr Growth**	Avg Wage*	5-Yr Growth**
Total Tech Occupations	148,900	26.5%	\$84,906	13.8%
Software Developers & Programmers	46,500	32.5%	\$78,562	9.3%
Computer Support, Database & Systems	69,800	33.0%	\$85,030	16.7%
Computer & Information Systems Managers	9,200	-4.2%	\$113,277	4.9%
Technology Engineering-Related	23,400	14.1%	\$86,112	26.5%
Total Non-Tech Occupations	316,700	11.6%	\$59,488	20.2%
Sales	46,300	-15.0%	\$51,709	10.6%
Administrative & Office Support	136,800	10.8%	\$49,795	18.6%
Business Operations & Finance	89,000	22.1%	\$74,194	20.5%
Marketing	44,600	36.0%	\$67,974	22.3%

Workforce Diversity (by Sex), 2021



Total Workforce (All Industries and Occupations)



*2021, **2016-2021, 1In C\$; Source: Statistics Canada (Metro Area), April 2022.

Top 5 Industries Employing Tech Talent (2021)

41%	22%	8%	8%	5%
Core High-Tech*	FIRE**	Manufacturing***	Prof'l Services***	Government

*Includes computer software and services and computer product manufacturing; **Finance, Insurance, Real Estate; ***Excl high-tech. Source: Statistics Canada (Metro), and CBRE Research, April 2022.

Talent Pipeline & Diversity

Degree Completions (2020)	Total	Growth 2016-20	Male	Female
Computer Engineering	2,170	93%	75%	25%
Math/Statistics	356	5%	57%	43%
Other Tech Engineering	2,937	16%	79%	21%
Totals	5,463	37%	76%	24%

Source: Various Canadian Ministries of Education (Region), 2021.

Total Workforce by Race/Ethnicity





	\$	3	1	
			Та	al

Average Apartment Rent (2021)



20.1%

Per unit/month*

*In US\$ (\$913 in C\$); **Ratio of annualized apartment rent (2021) to average annual wage for tech talent occupations (2021) Source: Statistics Canada, April 2022, CMHC (Metro), Q4 2021

Population Trends

Twenty-somethings grew by 30,717 (5.5%) and thirty-somethings grew by 21,682 (3.6%) since 2015.





Score: 54.78





5-year growth

Rent-to-Tech Wage Ratio**

% of Pop. 13.6% 14.2% 13.8% 13.5% 11.4% 11.9% (thous.) 630 270 360 450 540 No distinction Ages ending 0-4 Aaes endina 5-9

#16 Phoenix

Employment Breakdown

	Employed*	5-Yr Growth**	Avg Wage*	5-Yr Growth*
Total Tech Occupations	99,600	18.3%	\$96,289	12.1%
Software Developers & Programmers	36,980	31.3%	\$104,744	15.9%
Computer Support, Database & Systems	43,940	-1.7%	\$103,243	34.7%
Computer & Information Systems Managers	9,270	66.4%	\$157,960	11.3%
Technology Engineering-Related	9,410	34.8%	\$86,149	3.5%
Total Non-Tech Occupations	296,150	14.5%	\$52,185	21.8%
Sales	25,530	1.5%	\$84,995	36.9%
Administrative & Office Support	207,370	11.2%	\$42,523	21.5%
Business Operations & Finance	44,880	35.5%	\$72,657	12.7%
Marketing	18,370	33.2%	\$65,647	5.6%

Tech Talent Workforce (All Industries)

Workforce Diversity



Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022

Talent Pipeline & Diversity

Degree Completions (2020)	Total	Growth 2016-20	Male	Female
Computer Engineering	4,223	14%	75%	25%
Math/Statistics	338	83%	65%	35%
Other Tech Engineering	1,205	22%	86%	14%
Totals	5,766	18%	77%	23%

Degree Completions (2020)	Total	White	Asian	Hispanic	Black	Other
Computer Engineering	4,223	51%	14%	16%	13%	5%
Math/Statistics	338	65%	12%	16%	2%	5%
Other Tech Engineering	1,205	65%	8%	18%	3%	6%
Totals	5,766	55%	13%	16%	10%	6%

Office Rent & Vacancy Trends



22	\$43
k	

\$1.605

Per unit/month

5-year growth

*Ratio of annualized apartment rent (2021) to average annual wage for tech talent occupations (2021) Source: Bureau of Labor Statistics April 2022, CBRE Research (Metro) and Axiometrics (Metro) Q4 2021.

Population Trends

Age Group



*2021; ** 2016-2021; Source: U.S. Bureau of Labor Statistics (Metro Area), April 2022.

Top 5 Industries Employing Tech Talent (2020)

34%	17%	6%	6%	6%
Core High-Tech*	FIRE**	Manufacturing ***	Prof'l Services***	Health

*Includes computer software and services and computer product manufacturing; **Finance, Insurance, Real Estate; ***Excl high-tech. Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Top 5 Most Concentrated U.S. Markets for Software Engineers Employed in the Tech Industry (2020)*

70 Seattle

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74.6%
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68 Raleigh-Durham Portland

.0%

59.2%

Austin

Phoenix: 50.1%

SF Bay Area

*% of total software engineers across all industries; Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Score: 54.00







#17 San Diego

Employment Breakdown

	Employed*	5-Yr Growth**	Avg Wage*	5-Yr Growth*
Total Tech Occupations	77,780	15.5%	\$106,617	6.8%
Software Developers & Programmers	28,870	10.4%	\$121,162	18.4%
Computer Support, Database & Systems	27,590	16.8%	\$103,029	22.4%
Computer & Information Systems Managers	7,220	73.6%	\$173,700	6.8%
Technology Engineering-Related	14,100	-6.9%	\$93,154	-9.6%
Total Non-Tech Occupations	137,010	-14.2%	\$60,308	22.0%
Sales	14,020	-18.4%	\$90,665	35.4%
Administrative & Office Support	84,750	-20.4%	\$46,061	20.6%
Business Operations & Finance	25,940	8.4%	\$85,128	8.8%
Marketing	12,300	2.1%	\$71,527	7.0%

*2021; ** 2016-2021; Source: U.S. Bureau of Labor Statistics (Metro Area), April 2022.

Top 5 Industries Employing Tech Talent (2020)

38%	15%	14%	6%	5%
Core High-Tech*	Manufacturing ***	Prof'l Services***	Government	FIRE**

*Includes computer software and services and computer product manufacturing; **Finance, Insurance, Real Estate; ***Excl high-tech. Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Top 5 Most Concentrated U.S. Markets for Software Engineers Employed in the Tech Industry (2020)*

70 Seattle

74.6% SF Bay Area Raleigh-Durham

68 Portland

.0%

59.2%

Austin

San Diego: 49.0%

*% of total software engineers across all industries; Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Workforce Diversity



Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022

Talent Pipeline & Diversity

Degree Completions (2020)	Total	Growth 2016-20	Male	Female
Computer Engineering	2,567	33%	81%	19%
Math/Statistics	1,240	159%	59%	41%
Other Tech Engineering	1,138	50%	80%	20%
Totals	4,945	56%	75%	25%

Degree Completions (2020)	Total	White	Asian	Hispanic	Black	Other
Computer Engineering	2,567	34%	35%	19%	5%	6%
Math/Statistics	1,240	30%	43%	20%	1%	6%
Other Tech Engineering	1,138	43%	25%	22%	2%	8%
Totals	4,945	35%	34%	20%	3%	7%

Source: The National Center for Education Statistics (Region), 2021.

Office Rent & Vacancy Trends



#6	
nk	

Average Apartment Rent (2021)

\$2.406

Per unit/month

5-year growth

*Ratio of annualized apartment rent (2021) to average annual wage for tech talent occupations (2021) Source: Bureau of Labor Statistics April 2022, CBRE Research (Metro) and Axiometrics (Metro) Q4 2021.

Population Trends



71 CBRE RESEARCH

Score: 53.49







[#]18 Salt Lake City

Employment Breakdown

	Employed*	5-Yr Growth**	Avg Wage*	5-Yr Growth*
Total Tech Occupations	55,930	29.0%	\$90,105	10.4%
Software Developers & Programmers	25,000	50.8%	\$98,493	7.7%
Computer Support, Database & Systems	23,420	24.6%	\$92,465	38.5%
Computer & Information Systems Managers	4,250	17.1%	\$141,410	25.1%
Technology Engineering-Related	3,260	-23.1%	\$74,049	-9.0%
Total Non-Tech Occupations	146,080	4.4%	\$49,796	18.7%
Sales	14,900	-7.5%	\$77,538	22.9%
Administrative & Office Support	97,930	0.3%	\$40,234	23.1%
Business Operations & Finance	22,380	26.0%	\$68,087	2.3%
Marketing	10,870	29.4%	\$60,252	5.4%

*2021; ** 2016-2021; Source: U.S. Bureau of Labor Statistics (Metro Area), April 2022.

Top 5 Industries Employing Tech Talent (2020)

45%	12%	7%	5%	4%
Core High-Tech*	FIRE**	Education	Manufacturing***	Health

*Includes computer software and services and computer product manufacturing; **Finance, Insurance, Real Estate; ***Excl high-tech. Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Top 5 Most Concentrated U.S. Markets for Software Engineers Employed in the Tech Industry (2020)*

14.6% 10 Seattle SF Bay Area

Raleigh-Durham

68 Portland

.0%

59.2%

Austin

Salt Lake City: 54.7%

*% of total software engineers across all industries; Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Workforce Diversity



Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022

Talent Pipeline & Diversity

Degree Completions (2020)	Total	Growth 2016-20	Male	Female
Computer Engineering	6,266	109%	87%	13%
Math/Statistics	431	38%	67%	33%
Other Tech Engineering	523	33%	91%	9%
Totals	7,220	95%	86%	14%

Degree Completions (2020)	Total	White	Asian	Hispanic	Black	Other
Computer Engineering	6,266	73%	7%	9%	7%	5%
Math/Statistics	431	81%	5%	9%	0%	5%
Other Tech Engineering	523	87%	3%	7%	0%	3%
Totals	7,220	74%	6%	9%	6%	5%

Source: The National Center for Education Statistics (Region), 2021

Office Rent & Vacancy Trends



#36	
Rank	

Average Apartment Rent (2021)

\$1.477

Per unit/month

5-year growth

Population Trends



Score: 52.47





Rent-to-Tech Wage Ratio*

*Ratio of annualized apartment rent (2021) to average annual wage for tech talent occupations (2021) Source: Bureau of Labor Statistics April 2022, CBRE Research (Metro) and Axiometrics (Metro) Q4 2021.

Twenty-somethings grew by 20,996 (19.0%) and thirty-somethings grew by 2,077 (2.6%) since 2015.
[#]19 Raleigh-Durham

Employment Breakdown

	Employed*	5-Yr Growth**	Avg Wage*	5-Yr Growth*
Total Tech Occupations	69,050	10.8%	\$100,683	8.6%
Software Developers & Programmers	30,740	39.7%	\$114,513	17.7%
Computer Support, Database & Systems	26,610	-10.2%	\$101,012	21.8%
Computer & Information Systems Managers	6,250	32.1%	\$153,565	10.5%
Technology Engineering-Related	5,450	-21.2%	\$83,031	-6.9%
Total Non-Tech Occupations	121,660	2.0%	\$59,203	21.2%
Sales	14,830	-2.6%	\$100,069	24.3%
Administrative & Office Support	71,410	-6.0%	\$42,041	20.4%
Business Operations & Finance	24,260	26.2%	\$79,571	12.6%
Marketing	11,160	26.0%	\$70,437	5.7%

*2021; ** 2016-2021; Source: U.S. Bureau of Labor Statistics (Metro Area), April 2022.

Top 5 Industries Employing Tech Talent (2020)

56%	11%	8%	5%	4%
Core High-Tech*	FIRE**	Manufacturing ***	Government	Prof'l Services**

*Includes computer software and services and computer product manufacturing; **Finance, Insurance, Real Estate; ***Excl high-tech. Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Top 5 Most Concentrated U.S. Markets for Software Engineers Employed in the Tech Industry (2020)*



74.6%

68.0% Raleigh-Durham Portland

59.2%

Austin

Raleigh-Durham: 72.0%

SF Bay Area

*% of total software engineers across all industries; Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Workforce Diversity



Talent Pipeline & Diversity

Degree Completions (2020)	Total	Growth 2016-20	Male	Female
Computer Engineering	2,676	33%	71%	29%
Math/Statistics	784	22%	59%	41%
Other Tech Engineering	959	20%	81%	19%
Totals	4,419	28%	71%	29%

Degree Completions (2020)	Total	White	Asian	Hispanic	Black	Other
Computer Engineering	2,676	58%	24%	5%	8%	5%
Math/Statistics	784	64%	24%	4%	4%	4%
Other Tech Engineering	959	80%	8%	6%	3%	2%
Totals	4,419	64%	20%	5%	6%	4%

Source: The National Center for Education Statistics (Region), 2021

Office Rent & Vacancy Trends



±13	\$4
nk	

\$1.429

Per unit/month

5-year growth

*Ratio of annualized apartment rent (2021) to average annual wage for tech talent occupations (2021) Source: Bureau of Labor Statistics April 2022, CBRE Research (Metro) and Axiometrics (Metro) Q4 2021.

Population Trends





Source: U.S. Census Bureau (Metro), 2022.

Score: 50.76

33.5%



Rent-to-Tech Wage Ratio*

Twenty-somethings grew by 11,446 (13.4%) and thirty-somethings grew by 14,064 (19.2%) since 2015.

#20 Chicago

Employment Breakdown

	Employed*	5-Yr Growth**	Avg Wage*	5-Yr Growth*
Total Tech Occupations	167,560	6.2%	\$99,763	10.2%
Software Developers & Programmers	64,510	20.8%	\$103,734	9.6%
Computer Support, Database & Systems	75,990	-1.6%	\$98,702	23.1%
Computer & Information Systems Managers	15,130	8.1%	\$157,220	13.6%
Technology Engineering-Related	11,930	-8.9%	\$87,614	3.7%
Total Non-Tech Occupations	508,820	-6.8%	\$57,185	17.5%
Sales	46,630	-14.5%	\$92,820	31.6%
Administrative & Office Support	336,080	-9.3%	\$44,346	18.1%
Business Operations & Finance	85,370	-3.9%	\$83,110	7.7%
Marketing	40,740	26.8%	\$67,983	11.3%

*2021; ** 2016-2021; Source: U.S. Bureau of Labor Statistics (Metro Area), April 2022.

Top 5 Industries Employing Tech Talent (2020)

33%	16%	10%	9%
Core High-Tech*	FIRE**	Prof'l Services***	Manufacturing ***

*Includes computer software and services and computer product manufacturing; **Finance, Insurance, Real Estate; ***Excl high-tech. Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Top 5 Most Concentrated U.S. Markets for Software Engineers Employed in the Tech Industry (2020)*

70 Seattle

74.6% SF Bay Area

68 Raleigh-Durham Portland

.0%

Chicago: 43.8%

*% of total software engineers across all industries; Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Workforce Diversity



Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022

Talent Pipeline & Diversity / /o

Health

59.2%

Austin

Degree Completions (2020)	Total	Growth 2016-20	Male	Female
Computer Engineering	5,109	-1%	76%	24%
Math/Statistics	1,522	23%	65%	35%
Other Tech Engineering	1,487	23%	75%	25%
Totals	8,118	7%	74%	26%
	Tetal			Diasta Oth

Degree Completions (2020)	Total	White	Asian	Hispanic	Black	Other
Computer Engineering	5,109	50%	23%	16%	7%	3%
Math/Statistics	1,522	55%	22%	14%	5%	4%
Other Tech Engineering	1,487	59%	16%	16%	5%	4%
Totals	8,118	53%	22%	16%	6%	4%

Source: The National Center for Education Statistics (Region), 2021.

Office Rent & Vacancy Trends



‡12	\$
ink	

\$1.660

Per unit/month

*Ratio of annualized apartment rent (2021) to average annual wage for tech talent occupations (2021) Source: Bureau of Labor Statistics April 2022, CBRE Research (Metro) and Axiometrics (Metro) Q4 2021.

Population Trends





8.0%



5-year growth



[#]21 Minneapolis/St. Paul

Employment Breakdown

	Employed*	5-Yr Growth**	Avg Wage*	5-Yr Growth*
Total Tech Occupations	100,990	4.8%	\$98,247	7.6%
Software Developers & Programmers	43,910	53.4%	\$103,904	10.2%
Computer Support, Database & Systems	42,590	-15.4%	\$100,558	22.5%
Computer & Information Systems Managers	8,030	-5.9%	\$159,070	12.0%
Technology Engineering-Related	6,460	-24.1%	\$83,909	-1.2%
Total Non-Tech Occupations	223,270	-7.8%	\$60,559	16.2%
Sales	21,510	-14.8%	\$89,463	9.1%
Administrative & Office Support	132,330	-11.6%	\$45,288	16.5%
Business Operations & Finance	45,490	-4.5%	\$84,018	16.5%
Marketing	23,940	22.0%	\$74,420	12.5%

*2021; ** 2016-2021; Source: U.S. Bureau of Labor Statistics (Metro Area), April 2022.

Top 5 Industries Employing Tech Talent (2020)

31%	19%	12%	5%	5%
Core High-Tech*	FIRE**	Manufacturing ***	Prof'l Services***	Governmen

*Includes computer software and services and computer product manufacturing; **Finance, Insurance, Real Estate; ***Excl high-tech. Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Top 5 Most Concentrated U.S. Markets for Software Engineers Employed in the Tech Industry (2020)*

14.6% 70 Seattle SF Bay Area Raleigh-Durham Portland

.0%

59.2%

Austin

Minneapolis/St. Paul: 43.7%

*% of total software engineers across all industries; Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Workforce Diversity



Talent Pipeline & Diversity

Degree Completions (2020)	Total	Growth 2016-20	Male	Female
Computer Engineering	2,374	8%	76%	24%
Math/Statistics	591	2%	59%	41%
Other Tech Engineering	770	22%	75%	25%
Totals	3,735	10%	73%	27%

Degree Completions (2020)	Total	White	Asian	Hispanic	Black	Other
Computer Engineering	2,374	61%	15%	5%	15%	4%
Math/Statistics	591	79%	12%	4%	2%	2%
Other Tech Engineering	770	84%	7%	3%	2%	4%
Totals	3,735	69%	13%	4%	10%	4%

Source: The National Center for Education Statistics (Region), 2021



‡15	\$4
ank	

Average Apartment Rent (2021)

\$1.399

Per unit/month

5-year growth

*Ratio of annualized apartment rent (2021) to average annual wage for tech talent occupations (2021) Source: Bureau of Labor Statistics April 2022, CBRE Research (Metro) and Axiometrics (Metro) Q4 2021.

Population Trends



Score: 48.68





Rent-to-Tech Wage Ratio*

Twenty-somethings grew by 7,115 (1.5%) and thirty-somethings grew by 45,918 (9.6%) since 2015.

[#]22 Philadelphia

Employment Breakdown

	Employed*	5-Yr Growth**	Avg Wage*	5-Yr Growth*
Total Tech Occupations	115,450	7.4%	\$97,822	4.3%
Software Developers & Programmers	48,530	28.9%	\$101,464	4.8%
Computer Support, Database & Systems	49,160	-7.4%	\$99,683	20.3%
Computer & Information Systems Managers	9,740	28.5%	\$162,050	1.3%
Technology Engineering-Related	8,020	-10.5%	\$84,308	-5.8%
Total Non-Tech Occupations	325,700	-12.5%	\$57,102	13.3%
Sales	27,010	-20.9%	\$89,885	11.7%
Administrative & Office Support	213,960	-14.6%	\$44,395	19.0%
Business Operations & Finance	63,120	-0.9%	\$81,597	3.5%
Marketing	21,610	-9.8%	\$70,397	2.5%

*2021; ** 2016-2021; Source: U.S. Bureau of Labor Statistics (Metro Area), April 2022.

Top 5 Industries Employing Tech Talent (2020)

33%	16%	9%	9%	6%
Core High-Tech*	FIRE**	Prof'l Services***	Manufacturing ***	Education

*Includes computer software and services and computer product manufacturing; **Finance, Insurance, Real Estate; ***Excl high-tech. Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Top 5 Most Concentrated U.S. Markets for Software Engineers Employed in the Tech Industry (2020)*



68 Raleigh-Durham Portland

.0%

59.2%

Austin

Philadelphia: 40.0%

*% of total software engineers across all industries; Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Workforce Diversity



Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022

Talent Pipeline & Diversity

Degree Completions (2020)	Total	Growth 2016-20) Male	Female
Computer Engineering	3,919	38%	74%	26%
Math/Statistics	901	14%	57%	43%
Other Tech Engineering	1,230	2%	78%	22%
Totals	6,050	25%	72%	28%
	T			

Degree Completions (2020)	Total	White	Asian	Hispanic	Black	Othe
Computer Engineering	3,919	59%	21%	7%	9%	4%
Math/Statistics	901	70%	15%	5%	6%	4%
Other Tech Engineering	1,230	74%	14%	6%	3%	3%
Totals	6,050	64%	19%	7%	7%	4%

Source: The National Center for Education Statistics (Region), 2021.

Office Rent & Vacancy Trends



19	\$4
nk	Tal

Average Apartment Rent (2021)

\$1.584

Per unit/month

*Ratio of annualized apartment rent (2021) to average annual wage for tech talent occupations (2021) Source: Bureau of Labor Statistics April 2022, CBRE Research (Metro) and Axiometrics (Metro) Q4 2021.

Population Trends



Source: U.S. Census Bureau (Metro), 2022.







5-year growth

Rent-to-Tech Wage Ratio*



#23 Portland

Employment Breakdown

	Employed*	5-Yr Growth**	Avg Wage*	5-Yr Growth*
Total Tech Occupations	67,410	28.0%	\$100,463	12.6%
Software Developers & Programmers	24,310	2.3%	\$108,614	15.5%
Computer Support, Database & Systems	22,810	7.0%	\$104,796	35.1%
Computer & Information Systems Managers	6,390	53.6%	\$146,450	10.6%
Technology Engineering-Related	13,900	139.7%	\$83,990	0.4%
Total Non-Tech Occupations	127,420	-2.5%	\$58,351	22.9%
Sales	10,310	-11.7%	\$94,840	37.5%
Administrative & Office Support	83,240	-6.0%	\$45,491	20.6%
Business Operations & Finance	22,010	6.2%	\$83,747	20.8%
Marketing	11,860	23.0%	\$69,757	9.0%

*2021; ** 2016-2021; Source: U.S. Bureau of Labor Statistics (Metro Area), April 2022.

Top 5 Industries Employing Tech Talent (2020)

51%	7%	6%	6%	5%
Core High-Tech*	Prof'l Services***	FIRE**	Manufacturing ***	Government

*Includes computer software and services and computer product manufacturing; **Finance, Insurance, Real Estate; ***Excl high-tech. Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Top 5 Most Concentrated U.S. Markets for Software Engineers Employed in the Tech Industry (2020)*

70 Seattle

74.6% SF Bay Area

Raleigh-Durham Portland

68

.0%

59.2%

Austin

Portland: 68.0%

*% of total software engineers across all industries; Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Workforce Diversity



Talent Pipeline & Diversity

Degree Completions (2020)	Total	Growth 2016-20	Male	Female
Computer Engineering	616	35%	76%	24%
Math/Statistics	283	83%	61%	39%
Other Tech Engineering	259	38%	77%	23%
Totals	1,158	45%	73%	27%

Degree Completions (2020)	Total	White	Asian	Hispanic	Black	Other
Computer Engineering	616	65%	15%	10%	2%	8%
Math/Statistics	283	65%	10%	13%	2%	9%
Other Tech Engineering	259	65%	10%	12%	3%	10%
Totals	1,158	65%	13%	11%	2%	9%

Office Rent & Vacancy Trends



18	\$
k	

Average Apartment Rent (2021)

\$1.628

Per unit/month

*Ratio of annualized apartment rent (2021) to average annual wage for tech talent occupations (2021) Source: Bureau of Labor Statistics April 2022, CBRE Research (Metro) and Axiometrics (Metro) Q4 2021.

Population Trends



Source: The National Center for Education Statistics (Region), 2021.

Source: U.S. Census Bureau (Metro), 2022.

Score: 46.84





5-year growth

Rent-to-Tech Wage Ratio*

Twenty-somethings grew by 20,392 (6.5%) and thirty-somethings grew by 35,261 (10.1%) since 2015.

[#]24 Waterloo Region, Canada

Employment Breakdown

	Employed*	5-Yr Growth**	Avg Wage*	5-Yr Growth**
Total Tech Occupations	24,000	8.1%	\$100,630	24.9%
Software Developers & Programmers	10,700	27.4%	\$118,269	38.8%
Computer Support, Database & Systems	9,900	19.3%	\$83,949	11.4%
Computer & Information Systems Managers	1,300	0.0%		
Technology Engineering-Related	2,100	-50.0%	\$87,547	24.0%
Total Non-Tech Occupations	35,400	-7.3%	\$62,962	18.7%
Sales	8,900	34.8%	\$65,250	26.0%
Administrative & Office Support	13,600	-20.9%	\$49,400	14.0%
Business Operations & Finance	9,500	-7.8%	\$76,315	23.2%
Marketing	3,400	-17.1%	\$74,256	1.2%

Workforce Diversity (by Sex), 2021



Total Workforce (All Industries and Occupations)



*2021, **2016-2021, 1In C\$; Source: Statistics Canada (Metro Area), April 2022.

Top 5 Industries Employing Tech Talent (2021)



*Includes computer software and services and computer product manufacturing; **Finance, Insurance, Real Estate; ***Excl high-tech. Source: Statistics Canada (Metro), and CBRE Research, April 2022.

Talent Pipeline & Diversity

Degree Completions (2020)	Total	Growth 2016-20	Male	Female
Computer Engineering	1,597	88%	82%	18%
Math/Statistics	1,262	25%	80%	20%
Other Tech Engineering	814	28%	60%	40%
Totals	3,673	47%	76%	24%

Source: Various Canadian Ministries of Education (Region), 2021.

Total Workforce by Race/Ethnicity



Office Rent & Vacancy Trends



3	\$3	41
		Tal

Average Apartment Rent (2021)



Per unit/month*

*In US\$ (\$1,307 in C\$); **Ratio of annualized apartment rent (2021) to average annual wage for tech talent occupations (2021) Source: Statistics Canada, April 2022, CMHC (Metro), Q4 2021

Population Trends

Twenty-somethings grew by 20,700 (26.2%) and thirty-somethings grew by 12,351 (16.8%) since 2015.



Score: 45.24





5-year growth

[#]25 Detroit

Employment Breakdown

	Employed*	5-Yr Growth**	Avg Wage*	5-Yr Growth*
Total Tech Occupations	93,770	5.2%	\$88,592	5.3%
Software Developers & Programmers	36,870	10.5%	\$90,111	4.7%
Computer Support, Database & Systems	36,330	-13.3%	\$88,535	15.7%
Computer & Information Systems Managers	7,580	27.8%	\$141,445	4.9%
Technology Engineering-Related	12,990	-0.8%	\$84,745	4.3%
Total Non-Tech Occupations	220,210	-14.7%	\$54,503	16.6%
Sales	20,100	-16.8%	\$84,791	12.0%
Administrative & Office Support	142,600	-21.7%	\$42,550	19.6%
Business Operations & Finance	40,770	10.1%	\$76,202	1.9%
Marketing	16,740	10.9%	\$67,110	1.3%

*2021; ** 2016-2021; Source: U.S. Bureau of Labor Statistics (Metro Area), April 2022.

Top 5 Industries Employing Tech Talent (2020)

34%	18%	9%	8%	7%
Core High-Tech*	Manufacturing***	FIRE**	Prof'l Services***	Education

*Includes computer software and services and computer product manufacturing; **Finance, Insurance, Real Estate; ***Excl high-tech. Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Top 5 Most Concentrated U.S. Markets for Software Engineers Employed in the Tech Industry (2020)*



74.6%

68.0% Raleigh-Durham Portland

Detroit: 45.1%

SF Bay Area

*% of total software engineers across all industries; Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Workforce Diversity



Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022

Talent Pipeline & Diversity

59.2%

Austin

Degree Completions (2020)	Total	Growth 2016-20	Male	Female
Computer Engineering	3,726	46%	71%	29%
Math/Statistics	605	11%	64%	36%
Other Tech Engineering	2,491	17%	77%	23%
Totals	6,822	30%	73%	27%

Degree Completions (2020)	Total	White	Asian	Hispanic	Black	Other
Computer Engineering	3,726	64%	23%	5%	4%	4%
Math/Statistics	605	64%	21%	5%	4%	6%
Other Tech Engineering	2,491	73%	12%	7%	3%	4%
Totals	6,822	67%	19%	6%	4%	4%

Source: The National Center for Education Statistics (Region), 2021.

Office Rent & Vacancy Trends



32	\$4
	Tale

Average Apartment Rent (2021)

\$1.153

Per unit/month

*Ratio of annualized apartment rent (2021) to average annual wage for tech talent occupations (2021) Source: Bureau of Labor Statistics April 2022, CBRE Research (Metro) and Axiometrics (Metro) Q4 2021.

Population Trends









5-year growth



[#]26 Pittsburgh

Employment Breakdown

	Employed*	5-Yr Growth**	Avg Wage*	5-Yr Growth**
Total Tech Occupations	43,910	2.2%	\$88,779	11.0%
Software Developers & Programmers	15,890	24.5%	\$87,273	5.2%
Computer Support, Database & Systems	19,370	-9.0%	\$91,364	25.5%
Computer & Information Systems Managers	3,990	39.0%	\$145,770	11.0%
Technology Engineering-Related	4,660	-21.5%	\$79,131	6.8%
Total Non-Tech Occupations	124,190	-16.4%	\$51,535	17.2%
Sales	9,020	-18.4%	\$79,660	12.9%
Administrative & Office Support	83,070	-21.6%	\$41,124	20.5%
Business Operations & Finance	23,390	2.3%	\$73,248	3.3%
Marketing	8,710	0.5%	\$63,393	6.0%

*2021; ** 2016-2021; Source: U.S. Bureau of Labor Statistics (Metro Area), April 2022.

Top 5 Industries Employing Tech Talent (2020)

27% Core High-Tech*

11%

FIRE** Manufacturing*** Transport, Warehouse Health & Wholesale

59.2%

Austin

8%

*Includes computer software and services and computer product manufacturing; **Finance, Insurance, Real Estate; ***Excl high-tech. Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Top 5 Most Concentrated U.S. Markets for Software Engineers Employed in the Tech Industry (2020)*

Seattle

70

74.6% SF Bay Area Raleigh-Durham

Portland

68.0%

Pittsburgh: 37.0%

*% of total software engineers across all industries; Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Workforce Diversity



Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022

8% **Talent Pipeline & Diversity**

Degree Completions (2020)	Total	Growth 2016-20	Male	Female
Computer Engineering	3,636	26%	66%	34%
Math/Statistics	648	42%	56%	44%
Other Tech Engineering	1,171	21%	72%	28%
Totals	5,455	26%	66%	34%

Degree Completions (2020)	Total	White	Asian	Hispanic	Black	Other
Computer Engineering	3,636	61%	24%	5%	6%	4%
Math/Statistics	648	62%	27%	5%	4%	2%
Other Tech Engineering	1,171	70%	13%	8%	5%	5%
Totals	5,455	64%	21%	6%	5%	4%

Source: The National Center for Education Statistics (Region), 2021.

Office Rent & Vacancy Trends



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nk	

Average Apartment Rent (2021)

\$1.280

Per unit/month

*Ratio of annualized apartment rent (2021) to average annual wage for tech talent occupations (2021) Source: Bureau of Labor Statistics April 2022, CBRE Research (Metro) and Axiometrics (Metro) Q4 2021.

Population Trends

Twenty-somethings declined by -11,774 (-3.9%) and thirty-somethings grew by 17,322 (6.3%) since 2015.

200



Source: U.S. Census Bureau (Metro), 2022.

Score: 42.88





5-year growth

Rent-to-Tech Wage Ratio*



250

300

Aaes endina 5-9

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No distinction

350

14.1%

14.1%

13.5%

(thous.)

[#]27 Charlotte

Employment Breakdown

	Employed*	5-Yr Growth**	Avg Wage*	5-Yr Growth*
Total Tech Occupations	61,950	21.8%	\$98,875	7.2%
Software Developers & Programmers	25,240	55.1%	\$113,431	15.3%
Computer Support, Database & Systems	27,100	1.7%	\$98,164	21.4%
Computer & Information Systems Managers	5,620	17.1%	\$160,930	12.5%
Technology Engineering-Related	3,990	-1.2%	\$74,835	-9.9%
Total Non-Tech Occupations	148,950	7.5%	\$54,825	17.2%
Sales	13,380	-10.7%	\$86,570	22.5%
Administrative & Office Support	91,780	-5.5%	\$40,514	15.6%
Business Operations & Finance	32,430	39.6%	\$77,030	-2.7%
Marketing	11,360	250.6%	\$69,673	24.2%

*2021; ** 2016-2021; Source: U.S. Bureau of Labor Statistics (Metro Area), April 2022.

Top 5 Industries Employing Tech Talent (2020)

29%	25%	7%	6%
Core High-Tech*	FIRE**	Health	Information

*Includes computer software and services and computer product manufacturing; **Finance, Insurance, Real Estate; ***Excl high-tech. Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Top 5 Most Concentrated U.S. Markets for Software Engineers Employed in the Tech Industry (2020)*



74.6%

68.0% Raleigh-Durham Portland

5%

59.2%

Austin

Prof'l Services**

Charlotte: 51.7%

SF Bay Area

*% of total software engineers across all industries; Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Workforce Diversity



Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022

Talent Pipeline & Diversity

Degree Completions (2020)	Total	Growth 2016-20	Male	Female
Computer Engineering	1,323	41%	76%	24%
Math/Statistics	230	11%	65%	35%
Other Tech Engineering	313	19%	88%	12%
Totals	1,866	32%	77%	23%

Degree Completions (2020)	Total	White	Asian	Hispanic	Black	Other
Computer Engineering	1,323	56%	17%	9%	13%	4%
Math/Statistics	230	65%	6%	8%	15%	7%
Other Tech Engineering	313	78%	6%	6%	4%	6%
Totals	1,866	62%	13%	8%	12%	5%

Source: The National Center for Education Statistics (Region), 2021.

Office Rent & Vacancy Trends



#20	\$
Rank	

Average Apartment Rent (2021)

\$1.430

5-year growth

Per unit/month

*Ratio of annualized apartment rent (2021) to average annual wage for tech talent occupations (2021) Source: Bureau of Labor Statistics April 2022, CBRE Research (Metro) and Axiometrics (Metro) Q4 2021.

Population Trends



Source: U.S. Census Bureau (Metro), 2022.

Score: 41.58







[#]28 Calgary

Employment Breakdown

	Employed*	5-Yr Growth**	Avg Wage*	5-Yr Growth*
Total Tech Occupations	40,600	22.3%	\$90,584	1.1%
Software Developers & Programmers	8,700	-3.3%	\$93,912	10.5%
Computer Support, Database & Systems	21,000	52.2%	\$83,595	-5.7%
Computer & Information Systems Managers	4,000	48.1%	\$127,587	16.9%
Technology Engineering-Related	6,900	-10.4%	\$85,883	-4.2%
Total Non-Tech Occupations	114,700	11.6%	\$71,074	8.9%
Sales	16,800	4.3%	\$68,536	-7.1%
Administrative & Office Support	48,600	10.5%	\$55,578	7.0%
Business Operations & Finance	32,800	4.1%	\$90,459	17.8%
Marketing	16,500	47.3%	\$80,746	10.2%

Workforce Diversity (by Sex), 2021



Total Workforce (All Industries and Occupations)



*2021, **2016-2021, 1In C\$; Source: Statistics Canada (Metro Area), April 2022.

Top 5 Industries Employing Tech Talent (2021)

36%	16%	9%	8%	5%
Core High-Tech*	Prof'l Services***	Energy	Manufacturing***	Education

*Includes computer software and services and computer product manufacturing; **Finance, Insurance, Real Estate; ***Excl high-tech. Source: Statistics Canada (Metro), and CBRE Research, April 2022.

Talent Pipeline & Diversity

Degree Completions (2020)	Total	Growth 2016-20	Male	Female
Computer Engineering	305	53%	84%	16%
Math/Statistics	109	63%	57%	43%
Other Tech Engineering	434	19%	82%	18%
Totals	848	35%	80%	21%

Source: Various Canadian Ministries of Education (Region), 2021.

Total Workforce by Race/Ethnicity



Office Rent & Vacancy Trends



Vacancv 35% 30.4% 30% 25% \$29.14 20% 15% Q4 2018 Q4 2017 Q4 2019 Q4 2020 Q4 2021 Rent (FSG) Vacancy % S2M S35.8M ent Office Rent Total

*Data in C\$; Source: CBRE Research (Metro Area), Q4 2021 Annual Operating Costs (2021) #L Rank Note: Data in US\$; Source: Statistics Canada April 2022, CBRE Research (Metro) Q4 2021.

-5	\$34N
	Tal

Average Apartment Rent (2021)



6.9%

Per unit/month*

*In US\$ (\$1,222 in C\$); **Ratio of annualized apartment rent (2021) to average annual wage for tech talent occupations (2021)

Source: Statistics Canada, April 2022, CMHC (Metro), Q4 2021

Population Trends

Twenty-somethings declined by -7,628 (-3.6%) and thirty-somethings grew by 21,718 (8.9%) since 2015.



Score: 41.54



5-year growth

[#]29 Orlando

Employment Breakdown

	Employed*	5-Yr Growth**	Avg Wage*	5-Yr Growth*
Total Tech Occupations	42,860	16.8%	\$90,378	11.4%
Software Developers & Programmers	15,670	22.3%	\$97,114	7.9%
Computer Support, Database & Systems	19,430	6.0%	\$92,096	30.6%
Computer & Information Systems Managers	3,480	68.9%	\$149,880	6.2%
Technology Engineering-Related	4,280	-4.0%	\$74,945	2.0%
Total Non-Tech Occupations	146,650	1.5%	\$49,859	22.7%
Sales	15,220	1.9%	\$79,585	29.3%
Administrative & Office Support	97,550	-6.4%	\$38,867	21.2%
Business Operations & Finance	23,860	11.3%	\$71,183	8.4%
Marketing	10,020	155.0%	\$60,947	16.6%

*2021; ** 2016-2021; Source: U.S. Bureau of Labor Statistics (Metro Area), April 2022.

Top 5 Industries Employing Tech Talent (2020)

44%	9%	8%	6%	4%
Core High-Tech*	Education	Prof'l Services***	FIRE**	Transport, Warehouse

*Includes computer software and services and computer product manufacturing; **Finance, Insurance, Real Estate; ***Excl high-tech. Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Top 5 Most Concentrated U.S. Markets for Software Engineers Employed in the Tech Industry (2020)*



74.6%

68.0% Raleigh-Durham Portland

& Wholesale

59.2%

Austin

Orlando: 55.7%

SF Bay Area

*% of total software engineers across all industries; Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Workforce Diversity



Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022

Talent Pipeline & Diversity

Degree Completions (2020)	Total	Growth 2016-20	Male	Female
Computer Engineering	1,415	-9%	83%	17%
Math/Statistics	129	33%	62%	38%
Other Tech Engineering	1,441	110%	85%	15%
Totals	2,985	28%	83%	17%

Degree Completions (2020)	Total	White	Asian	Hispanic	Black	Other
Computer Engineering	1,415	50%	13%	24%	10%	3%
Math/Statistics	129	61%	11%	17%	4%	8%
Other Tech Engineering	1,441	55%	8%	25%	7%	5%
Totals	2,985	53%	10%	24%	8%	4%

Office Rent & Vacancy Trends



27	\$4
ik	

Average Apartment Rent (2021)

\$1.574

Per unit/month

*Ratio of annualized apartment rent (2021) to average annual wage for tech talent occupations (2021)

Population Trends



Source: The National Center for Education Statistics (Region), 2021.

83 CBRE RESEARCH

Score: 41.32





5-year growth

Rent-to-Tech Wage Ratio*

Source: Bureau of Labor Statistics April 2022, CBRE Research (Metro) and Axiometrics (Metro) Q4 2021.



#30 Madison

Employment Breakdown

	Employed*	5-Yr Growth**	Avg Wage*	5-Yr Growth*
Total Tech Occupations	24,060	2.0%	\$87,775	13.2%
Software Developers & Programmers	10,340	9.0%	\$84,036	6.2%
Computer Support, Database & Systems	10,910	0.5%	\$89,872	27.7%
Computer & Information Systems Managers	1,270	-20.6%	\$141,500	20.6%
Technology Engineering-Related	1,540	-0.6%	\$77,983	1.3%
Total Non-Tech Occupations	51,820	6.5%	\$54,089	17.7%
Sales	5,360	54.5%	\$76,415	5.1%
Administrative & Office Support	32,190	1.1%	\$42,001	16.6%
Business Operations & Finance	9,480	7.6%	\$77,778	20.7%
Marketing	4,790	5.5%	\$63,460	6.9%

*2021; ** 2016-2021; Source: U.S. Bureau of Labor Statistics (Metro Area), April 2022.

Top 5 Industries Employing Tech Talent (2020)

49%	7%	7%	5%	2%
Core High-Tech*	Prof'l Services***	Health	Education	Information***

*Includes computer software and services and computer product manufacturing; **Finance, Insurance, Real Estate; ***Excl high-tech. Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Top 5 Most Concentrated U.S. Markets for Software Engineers Employed in the Tech Industry (2020)*

70 Seattle

74.6%

Raleigh-Durham Portland

68.0%

59.2%

Austin

Madison: 54.6%

SF Bay Area

*% of total software engineers across all industries; Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Workforce Diversity



Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022

Talent Pipeline & Diversity

Degree Completions (2020)	Total	Growth 2016-20	Male	Female
Computer Engineering	1,190	72%	83%	17%
Math/Statistics	613	74%	64%	36%
Other Tech Engineering	634	7%	74%	26%
Totals	2,437	49%	76%	24%

Degree Completions (2020)	Total	White	Asian	Hispanic	Black	Other
Computer Engineering	1,190	76%	14%	4%	1%	5%
Math/Statistics	613	72%	13%	5%	0%	9%
Other Tech Engineering	634	84%	6%	6%	2%	3%
Totals	2,437	78%	11%	5%	1%	5%

Office Rent & Vacancy Trends



Vacancv 10% 8.4% 9% 8% \$20.38 7% 6% 5% Q4 2017 Q4 2018 Q4 2019 042020 Q4 2021 Source: CBRE Research (Metro Area), Q4 2021 Rent (FSG) Vacancy % Annual Operating Costs (2021) #3 41M S2M S42.3M Rank Talent Office Rent Total Source: U.S. Bureau of Labor Statistics April 2022, CBRE Research (Metro) Q4 2021.

87	\$4

Average Apartment Rent (2021)

\$1.236

9.6%

Per unit/month

*Ratio of annualized apartment rent (2021) to average annual wage for tech talent occupations (2021) Source: Bureau of Labor Statistics April 2022, CBRE Research (Metro) and Axiometrics (Metro) Q4 2021.

Population Trends



Source: The National Center for Education Statistics (Region), 2021.

CBRE RESEARCH

Score: 40.52





5-year growth



#31 Columbus

Employment Breakdown

	Employed*	5-Yr Growth**	Avg Wage*	5-Yr Growth*
Total Tech Occupations	50,390	3.6%	\$92,727	0.6%
Software Developers & Programmers	19,670	22.3%	\$97,251	-2.9%
Computer Support, Database & Systems	24,370	-6.6%	\$94,703	16.4%
Computer & Information Systems Managers	3,130	-15.9%	\$146,450	-1.1%
Technology Engineering-Related	3,220	17.9%	\$74,453	2.9%
Total Non-Tech Occupations	129,070	-0.1%	\$52,569	13.3%
Sales	8,850	-24.6%	\$84,735	12.3%
Administrative & Office Support	85,300	-1.2%	\$41,248	17.7%
Business Operations & Finance	25,030	8.4%	\$73,012	7.1%
Marketing	9,890	21.8%	\$69,690	10.2%

*2021; ** 2016-2021; Source: U.S. Bureau of Labor Statistics (Metro Area), April 2022.

Top 5 Industries Employing Tech Talent (2020)

26%	24%	9%	7%	5%
Core High-Tech*	FIRE**	Prof'l Services***	Education	Health

*Includes computer software and services and computer product manufacturing; **Finance, Insurance, Real Estate; ***Excl high-tech. Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Top 5 Most Concentrated U.S. Markets for Software Engineers Employed in the Tech Industry (2020)*

10 Seattle

74.6% SF Bay Area

68.0% Raleigh-Durham Portland

59.2%

Austin

Columbus: 31.4%

*% of total software engineers across all industries; Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Workforce Diversity



Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022

Talent Pipeline & Diversity

Degree Completions (2020)	Total	Growth 2016-20	Male	Female
Computer Engineering	1,190	11%	82%	18%
Math/Statistics	507	76%	64%	36%
Other Tech Engineering	864	7%	79%	21%
Totals	2,561	18%	77%	23%

Degree Completions (2020)	Total	White	Asian	Hispanic	Black	Other
Computer Engineering	1,190	75%	15%	4%	4%	3%
Math/Statistics	507	74%	12%	6%	3%	5%
Other Tech Engineering	864	84%	7%	5%	0%	4%
Totals	2,561	78%	11%	4%	3%	4%

Source: The National Center for Education Statistics (Region), 2021.

Office Rent & Vacancy Trends



Vacancv 21% 19.5% 19% 17% 15% 20.67 13% 11% Q4 2017 Q4 2018 Q4 2019 042020 Q4 2021 Source: CBRE Research (Metro Area), Q4 2021 Rent (FSG) Vacancy % Annual Operating Costs (2021) \$2M = S42.8M 1M R Talent Office Rent Tota Source: U.S. Bureau of Labor Statistics April 2022, CBRE Research (Metro) Q4 2021.

‡29	\$4
ank	

Average Apartment Rent (2021)

\$1.134

22.3%

Per unit/month

*Ratio of annualized apartment rent (2021) to average annual wage for tech talent occupations (2021) Source: Bureau of Labor Statistics April 2022, CBRE Research (Metro) and Axiometrics (Metro) Q4 2021.

Population Trends



Score: 40.34





5-year growth

Rent-to-Tech Wage Ratio*

Twenty-somethings grew by 13,092 (4.5%) and thirty-somethings grew by 33,826 (12.2%) since 2015.

#32 Kansas City

Employment Breakdown

	Employed*	5-Yr Growth**	Avg Wage*	5-Yr Growth*
Total Tech Occupations	52,500	0.2%	\$86,144	4.2%
Software Developers & Programmers	21,030	31.1%	\$96,168	9.6%
Computer Support, Database & Systems	23,490	-14.2%	\$90,462	23.0%
Computer & Information Systems Managers	3,310	-11.3%	\$139,740	8.9%
Technology Engineering-Related	4,670	-18.2%	\$76,706	-7.0%
Total Non-Tech Occupations	124,670	-10.7%	\$53,415	18.8%
Sales	13,410	13.5%	\$84,568	20.7%
Administrative & Office Support	77,850	-19.2%	\$41,150	17.0%
Business Operations & Finance	22,980	4.0%	\$73,167	9.2%
Marketing	10,430	12.2%	\$61,390	-1.0%

*2021; ** 2016-2021; Source: U.S. Bureau of Labor Statistics (Metro Area), April 2022.

Top 5 Industries Employing Tech Talent (2020)

40%

13% 10% 7%

68

Core High-Tech*

Prof'l Services*** Transport, Warehouse & Wholesale

.0%

5%

59.2%

Austin

*Includes computer software and services and computer product manufacturing; **Finance, Insurance, Real Estate; ***Excl high-tech. Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Top 5 Most Concentrated U.S. Markets for Software Engineers Employed in the Tech Industry (2020)*

Manufacturing***

74.6% 70 Seattle SF Bay Area

FIRE**

Raleigh-Durham Portland

Kansas City: 48.8%

*% of total software engineers across all industries; Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Workforce Diversity



Talent Pipeline & Diversity

Degree Completions (2020)	Total	Growth 2016-20	Male	Female
Computer Engineering	757	-19%	80%	20%
Math/Statistics	39	-26%	59%	41%
Other Tech Engineering	71	27%	89%	11%
Totals	867	-17%	80%	20%

Degree Completions (2020)	Total	White	Asian	Hispanic	Black	Other
Computer Engineering	757	53%	14%	9%	16%	8%
Math/Statistics	39	71%	6%	6%	11%	6%
Other Tech Engineering	71	70%	13%	7%	7%	4%
Totals	867	56%	13%	9%	15%	7%

Source: The National Center for Education Statistics (Region), 2021.

Office Rent & Vacancy Trends



#39	Ś
ank	

\$1.100

Per unit/month

*Ratio of annualized apartment rent (2021) to average annual wage for tech talent occupations (2021) Source: Bureau of Labor Statistics April 2022, CBRE Research (Metro) and Axiometrics (Metro) Q4 2021.

Population Trends





Score: 40.07





5-year growth



#33 South Florida

Employment Breakdown

	Employed*	5-Yr Growth**	Avg Wage*	5-Yr Growth*
Total Tech Occupations	66,660	7.6%	\$89,956	15.9%
Software Developers & Programmers	23,360	17.4%	\$94,726	15.3%
Computer Support, Database & Systems	31,930	-7.0%	\$93,996	35.0%
Computer & Information Systems Managers	6,190	75.4%	\$151,730	8.7%
Technology Engineering-Related	5,180	23.6%	\$74,968	8.5%
Total Non-Tech Occupations	341,480	-5.9%	\$51,208	20.1%
Sales	37,100	-2.2%	\$79,578	19.4%
Administrative & Office Support	231,160	-11.0%	\$39,995	20.4%
Business Operations & Finance	51,120	8.7%	\$75,337	9.9%
Marketing	22,100	22.5%	\$65,060	8.7%

*2021; ** 2016-2021; Source: U.S. Bureau of Labor Statistics (Metro Area), April 2022.

Top 5 Industries Employing Tech Talent (2020)

35%	11%	8%	7%	6%
Core High-Tech*	Education	Government	Transport, Warehouse & Wholesale	Health

*Includes computer software and services and computer product manufacturing; **Finance, Insurance, Real Estate; ***Excl high-tech. Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Top 5 Most Concentrated U.S. Markets for Software Engineers Employed in the Tech Industry (2020)*

10 Seattle

74.6% SF Bay Area

.0% Raleigh-Durham Portland

68

59.2%

Austin

South Florida: 57.0%

*% of total software engineers across all industries; Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Workforce Diversity



Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022

Talent Pipeline & Diversity

Degree Completions (2020)	Total	Growth 2016-20	Male	Female
Computer Engineering	2,204	18%	79%	21%
Math/Statistics	360	132%	56%	44%
Other Tech Engineering	510	11%	77%	23%
Totals	3,074	24%	76%	24%

Degree Completions (2020)	Total	White	Asian	Hispanic	Black	Other
Computer Engineering	2,204	21%	7%	53%	17%	3%
Math/Statistics	360	36%	6%	44%	8%	5%
Other Tech Engineering	510	26%	5%	60%	6%	3%
Totals	3,074	22%	7%	53%	14%	3%

Source: The National Center for Education Statistics (Region), 2021

Office Rent & Vacancy Trends



#25	\$4
ank	

Average Apartment Rent (2021)

\$2.115

Per unit/month

*Ratio of annualized apartment rent (2021) to average annual wage for tech talent occupations (2021) Source: Bureau of Labor Statistics April 2022, CBRE Research (Metro) and Axiometrics (Metro) Q4 2021.

Population Trends



Score: 40.05





5-year growth



#34 Tampa

Employment Breakdown

	Employed*	5-Yr Growth**	Avg Wage*	5-Yr Growth*
Total Tech Occupations	52,240	12.7%	\$89,198	14.6%
Software Developers & Programmers	17,400	14.2%	\$94,669	11.1%
Computer Support, Database & Systems	25,730	1.5%	\$92,347	33.8%
Computer & Information Systems Managers	4,270	93.2%	\$147,860	1.7%
Technology Engineering-Related	4,840	12.6%	\$74,278	6.0%
Total Non-Tech Occupations	181,730	-5.7%	\$49,858	21.7%
Sales	18,640	-4.6%	\$75,745	18.6%
Administrative & Office Support	123,500	-12.2%	\$39,369	23.2%
Business Operations & Finance	28,290	17.0%	\$74,208	9.4%
Marketing	11,300	35.2%	\$60,830	-0.5%

Workforce Diversity



Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022

5% **Talent Pipeline & Diversity**

Health

59.2%

Austin

Degree Completions (2020)	Total	Growth 2016-20	Male	Female
Computer Engineering	1,319	26%	75%	25%
Math/Statistics	164	74%	59%	41%
Other Tech Engineering	397	49%	82%	18%
Totals	1,880	34%	75%	25%

Degree Completions (2020)	Total	White	Asian	Hispanic	Black	Other
Computer Engineering	1,319	53%	11%	19%	13%	5%
Math/Statistics	164	64%	8%	15%	7%	6%
Other Tech Engineering	397	54%	8%	27%	8%	2%
Totals	1,880	54%	10%	20%	12%	4%

Office Rent & Vacancy Trends



Vacancv 20% \$30.89 18% 16% 14% 12% 10% 8% Q4 2017 Q4 2018 Q4 2019 Q4 2020 Q4 2021 Source: CBRE Research (Metro Area), Q4 2021 Rent (FSG) Vacancy % Annual Operating Costs (2021) # \$2M = 41M Rar Talent Office Rent Tota Source: U.S. Bureau of Labor Statistics April 2022, CBRE Research (Metro) Q4 2021.

28	\$
nk	

Average Apartment Rent (2021)

\$1.635

Per unit/month

*Ratio of annualized apartment rent (2021) to average annual wage for tech talent occupations (2021) Source: Bureau of Labor Statistics April 2022, CBRE Research (Metro) and Axiometrics (Metro) Q4 2021.

Population Trends



*2021; ** 2016-2021; Source: U.S. Bureau of Labor Statistics (Metro Area), April 2022.

Top 5 Industries Employing Tech Talent (2020)

37%	14%	13%	7%
Core High-Tech*	FIRE**	Prof'l Services***	Manufacturing***

*Includes computer software and services and computer product manufacturing; **Finance, Insurance, Real Estate; ***Excl high-tech. Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Top 5 Most Concentrated U.S. Markets for Software Engineers Employed in the Tech Industry (2020)*

70 Seattle

74.6% Raleigh-Durham

68 Portland

.0%

Tampa: 51.2%

SF Bay Area

*% of total software engineers across all industries; Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Source: The National Center for Education Statistics (Region), 2021.

Score: 39.48





5-year growth

Rent-to-Tech Wage Ratio*

Twenty-somethings grew by 29,389 (8.1%) and thirty-somethings grew by 58,246 (16.5%) since 2015.

#35 Edmonton

Employment Breakdown

	Employed*	5-Yr Growth**	Avg Wage*	5-Yr Growth**
Total Tech Occupations	32,400	39.7%	\$90,293	4.8%
Software Developers & Programmers	8,400	95.3%	\$86,902	-1.0%
Computer Support, Database & Systems	16,700	38.0%	\$86,362	6.9%
Computer & Information Systems Managers	2,800	64.7%	\$134,222	14.1%
Technology Engineering-Related	4,500	-11.8%	\$83,616	-3.5%
Total Non-Tech Occupations	94,000	13.4%	\$65,686	6.3%
Sales	15,600	-4.3%	\$68,474	2.9%
Administrative & Office Support	47,600	29.7%	\$54,829	10.5%
Business Operations & Finance	22,900	-5.4%	\$83,013	10.2%
Marketing	7,900	38.6%	\$75,566	8.4%

Workforce Diversity (by Sex), 2021



Total Workforce (All Industries and Occupations)



*2021, **2016-2021, 1In C\$; Source: Statistics Canada (Metro Area), April 2022.

Top 5 Industries Employing Tech Talent (2021)



*Includes computer software and services and computer product manufacturing; **Finance, Insurance, Real Estate; ***Excl high-tech. Source: Statistics Canada (Metro), and CBRE Research, April 2022.

Talent Pipeline & Diversity

Degree Completions (2020)	Total	Growth 2016-20	Male	Female
Computer Engineering	410	73%	80%	20%
Math/Statistics	175	23%	55%	45%
Other Tech Engineering	770	23%	78%	22%
Totals	1,355	35%	76%	24%

Source: Various Canadian Ministries of Education (Region), 2021.

Total Workforce by Race/Ethnicity



Office Rent & Vacancy Trends



-7	\$34
	Т

Average Apartment Rent (2021)



4.0%

Per unit/month*

*In US\$ (\$1,158 in C\$); **Ratio of annualized apartment rent (2021) to average annual wage for tech talent occupations (2021) Source: Statistics Canada, April 2022, CMHC (Metro), Q4 2021

Population Trends

Twenty-somethings declined by -4,399 (-2.0%) and thirty-somethings grew by 28,662 (13.0%) since 2015.





Score: 38.72





5-year growth

[#]36 Houston

Employment Breakdown

	Employed*	5-Yr Growth**	Avg Wage*	5-Yr Growth*
Total Tech Occupations	98,930	-2.2%	\$97,715	3.9%
Software Developers & Programmers	30,440	-0.5%	\$97,010	-3.4%
Computer Support, Database & Systems	48,070	-4.9%	\$100,815	17.6%
Computer & Information Systems Managers	7,630	31.8%	\$158,760	0.9%
Technology Engineering-Related	12,790	-27.2%	\$85,570	-1.8%
Total Non-Tech Occupations	331,080	-12.0%	\$53,539	5.1%
Sales	32,620	-13.4%	\$85,138	14.6%
Administrative & Office Support	224,110	-10.8%	\$40,907	10.6%
Business Operations & Finance	58,100	-18.1%	\$82,150	-3.2%
Marketing	16,250	0.1%	\$62,023	-3.9%

*2021; ** 2016-2021; Source: U.S. Bureau of Labor Statistics (Metro Area), April 2022.

Top 5 Industries Employing Tech Talent (2020)

37%	14%	8%	6%	5%
Core High-Tech*	Prof'l Services***	FIRE**	Manufacturing***	Education

*Includes computer software and services and computer product manufacturing; **Finance, Insurance, Real Estate; ***Excl high-tech. Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Top 5 Most Concentrated U.S. Markets for Software Engineers Employed in the Tech Industry (2020)*



74.6%

68.0% Raleigh-Durham Portland

59.2%

Austin

Houston: 50.2%

SF Bay Area

*% of total software engineers across all industries; Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Workforce Diversity



Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022

Talent Pipeline & Diversity

Degree Completions (2020)	Total	Growth 2016-20	Male	Female
Computer Engineering	1,770	15%	75%	25%
Math/Statistics	501	27%	59%	41%
Other Tech Engineering	616	9%	78%	22%
Totals	2,887	15%	73%	27%

Degree Completions (2020)	Total	White	Asian	Hispanic	Black	Othe
Computer Engineering	1,770	27%	29%	26%	15%	3%
Math/Statistics	501	37%	23%	27%	10%	3%
Other Tech Engineering	616	29%	20%	30%	17%	3%
Totals	2,887	29%	26%	27%	14%	3%

Office Rent & Vacancy Trends



‡21	\$4
ank	

\$1.231

Per unit/month

*Ratio of annualized apartment rent (2021) to average annual wage for tech talent occupations (2021) Source: Bureau of Labor Statistics April 2022, CBRE Research (Metro) and Axiometrics (Metro) Q4 2021.

Population Trends



Source: The National Center for Education Statistics (Region), 2021.

90 CBRE RESEARCH

Score: 37.54

13.8%



5-year growth

Rent-to-Tech Wage Ratio*

Twenty-somethings grew by 62,810 (6.9%) and thirty-somethings grew by 99,416 (10.6%) since 2015.

#37 Indianapolis

Employment Breakdown

	Employed*	5-Yr Growth**	Avg Wage*	5-Yr Growth*
Total Tech Occupations	40,120	13.2%	\$83,826	8.3%
Software Developers & Programmers	15,500	42.5%	\$91,119	17.0%
Computer Support, Database & Systems	19,800	4.3%	\$85,296	16.4%
Computer & Information Systems Managers	2,690	6.3%	\$132,100	15.1%
Technology Engineering-Related	2,130	-28.5%	\$79,480	13.9%
Total Non-Tech Occupations	118,010	-0.8%	\$52,752	14.4%
Sales	12,150	-5.8%	\$83,265	14.4%
Administrative & Office Support	75,730	-2.9%	\$40,281	12.7%
Business Operations & Finance	21,860	6.3%	\$76,128	16.8%
Marketing	8,270	9.8%	\$60,337	8.9%

*2021; ** 2016-2021; Source: U.S. Bureau of Labor Statistics (Metro Area), April 2022.

Top 5 Industries Employing Tech Talent (2020)

29%	11%	11%	11%	11%
Core High-Tech*	Manufacturing***	Education	FIRE**	Prof'l Services**

*Includes computer software and services and computer product manufacturing; **Finance, Insurance, Real Estate; ***Excl high-tech. Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Top 5 Most Concentrated U.S. Markets for Software Engineers Employed in the Tech Industry (2020)*

14.6% 10 Seattle SF Bay Area

68 Raleigh-Durham Portland

.0%

59.2%

Austin

Indianapolis: 38.2%

*% of total software engineers across all industries; Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Workforce Diversity



Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022

Talent Pipeline & Diversity

Degree Completions (2020)	Total	Growth 2016-20	Male	Female
Computer Engineering	883	112%	76%	24%
Math/Statistics	111	23%	68%	32%
Other Tech Engineering	354	70%	83%	17%
Totals	1,348	89%	77%	23%

Degree Completions (2020)	Total	White	Asian	Hispanic	Black	Othe
Computer Engineering	883	64%	9%	8%	15%	5%
Math/Statistics	111	85%	3%	2%	5%	4%
Other Tech Engineering	354	80%	4%	7%	6%	3%
Totals	1,348	69%	7%	7%	12%	5%

Source: The National Center for Education Statistics (Region), 2021.

Office Rent & Vacancy Trends



42	\$39
nk	

Average Apartment Rent (2021)

\$1.071

Per unit/month

*Ratio of annualized apartment rent (2021) to average annual wage for tech talent occupations (2021) Source: Bureau of Labor Statistics April 2022, CBRE Research (Metro) and Axiometrics (Metro) Q4 2021.

Population Trends



CBRE RESEARCH







5-year growth



#38 St. Louis

Employment Breakdown

	Employed*	5-Yr Growth**	Avg Wage*	5-Yr Growth*
Total Tech Occupations	53,910	2.1%	\$88,945	2.4%
Software Developers & Programmers	19,270	16.1%	\$87,896	-6.4%
Computer Support, Database & Systems	26,730	1.5%	\$93,211	19.9%
Computer & Information Systems Managers	3,440	6.2%	\$142,900	3.0%
Technology Engineering-Related	4,470	-28.5%	\$81,377	-8.7%
Total Non-Tech Occupations	151,060	-12.6%	\$52,231	18.0%
Sales	11,340	-30.7%	\$78,840	30.1%
Administrative & Office Support	100,320	-18.3%	\$41,277	18.1%
Business Operations & Finance	28,780	21.8%	\$75,772	3.7%
Marketing	10,620	4.8%	\$63,493	0.3%

*2021; ** 2016-2021; Source: U.S. Bureau of Labor Statistics (Metro Area), April 2022.

Top 5 Industries Employing Tech Talent (2020)

30%

19% 11%

FIRE**

7%

Core High-Tech*

Manufacturing*** Transport, Warehouse Prof'l Services*** & Wholesale

6%

59.2%

Austin

*Includes computer software and services and computer product manufacturing; **Finance, Insurance, Real Estate; ***Excl high-tech. Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Top 5 Most Concentrated U.S. Markets for Software Engineers Employed in the Tech Industry (2020)*

70 Seattle

74.6% 68.0%

Raleigh-Durham Portland

St. Louis: 35.9%

SF Bay Area

*% of total software engineers across all industries; Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Workforce Diversity



Talent Pipeline & Diversity

	inano
Computer Engineering 1,367 34% 75% 25	.5%
Math/Statistics 350 30% 59% 4	¥1%
Other Tech Engineering 606 14% 80% 20	0%
Totals 2,323 27% 74% 26	6%

Degree Completions (2020)	Total	White	Asian	Hispanic	Black	Other
Computer Engineering	1,367	70%	11%	5%	10%	4%
Math/Statistics	350	72%	13%	8%	4%	3%
Other Tech Engineering	606	78%	7%	7%	3%	4%
Totals	2,323	73%	10%	6%	7%	4%

Office Rent & Vacancy Trends



35	\$41
۱k	Т

\$1.109

Per unit/month

*Ratio of annualized apartment rent (2021) to average annual wage for tech talent occupations (2021) Source: Bureau of Labor Statistics April 2022, CBRE Research (Metro) and Axiometrics (Metro) Q4 2021.

Population Trends



Source: The National Center for Education Statistics (Region), 2021.

92 CBRE RESEARCH

Score: 36.66





5-year growth

Rent-to-Tech Wage Ratio*

Twenty-somethings declined by -11,251 (-3.0%) and thirty-somethings grew by 14,337 (4.0%) since 2015.

#39 Quebec City

Employment Breakdown

	Employed*	5-Yr Growth**	Avg Wage*	5-Yr Growth**
Total Tech Occupations	35,700	42.8%	\$81,765	15.3%
Software Developers & Programmers	8,700	47.5%	\$74,568	33.8%
Computer Support, Database & Systems	21,400	54.0%	\$82,680	10.1%
Computer & Information Systems Managers	1,500	87.5%	\$118,622	
Technology Engineering-Related	4,100	-6.8%	\$78,749	13.1%
Total Non-Tech Occupations	66,100	13.4%	\$61,859	19.6%
Sales	8,400	-4.5%	\$58,198	21.3%
Administrative & Office Support	24,200	1.3%	\$50,939	22.3%
Business Operations & Finance	23,400	22.5%	\$72,842	15.3%
Marketing	10,100	55.4%	\$65,603	9.0%

Workforce Diversity (by Sex), 2021



Total Workforce (All Industries and Occupations)



*2021, **2016-2021, 1In C\$; Source: Statistics Canada (Metro Area), April 2022.

Top 5 Industries Employing Tech Talent (2021)

33%	27%	14%	4%	4%
Core High-Tech*	Government	Education	Manufacturing***	Prof'l Services***

*Includes computer software and services and computer product manufacturing; **Finance, Insurance, Real Estate; ***Excl high-tech. Source: Statistics Canada (Metro), and CBRE Research, April 2022.

Talent Pipeline & Diversity

Degree Completions (2020)	Total	Growth 2016-20	Male	Female
Computer Engineering	243	62%	89%	11%
Math/Statistics	45	2%	67%	33%
Other Tech Engineering	261	51%	81%	19%
Totals	549	50%	83%	17%

Source: Various Canadian Ministries of Education (Region), 2021.

Total Workforce by Race/Ethnicity





Average Apartment Rent (2021)



Per unit/month*

*In US\$ (\$915 in C\$); **Ratio of annualized apartment rent (2021) to average annual wage for tech talent occupations (2021) Source: Statistics Canada, April 2022, CMHC (Metro), Q4 2021

Population Trends

Twenty-somethings declined by -2,337 (-2.2%) and thirty-somethings declined by -747 (-0.7%) since 2015.



Score: 36.48





5-year growth

[#]40 Sacramento

Employment Breakdown

	Employed*	5-Yr Growth**	Avg Wage*	5-Yr Growth*
Total Tech Occupations	43,530	8.9%	\$106,812	16.6%
Software Developers & Programmers	12,240	-20.8%	\$113,113	19.1%
Computer Support, Database & Systems	23,000	34.1%	\$109,453	36.2%
Computer & Information Systems Managers	3,800	65.9%	\$163,400	22.2%
Technology Engineering-Related	4,490	-22.2%	\$92,655	-6.9%
Total Non-Tech Occupations	103,900	-7.6%	\$59,082	24.8%
Sales	6,690	-8.7%	\$90,455	35.5%
Administrative & Office Support	68,230	-14.0%	\$46,835	24.1%
Business Operations & Finance	21,660	7.4%	\$82,715	13.4%
Marketing	7,320	30.7%	\$74,630	13.3%

*2021; ** 2016-2021; Source: U.S. Bureau of Labor Statistics (Metro Area), April 2022.

Top 5 Industries Employing Tech Talent (2020)

32%	29%	8%	7%	6%
Core High-Tech*	Government	Prof'l Services***	Health	FIRE**

*Includes computer software and services and computer product manufacturing; **Finance, Insurance, Real Estate; ***Excl high-tech. Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Top 5 Most Concentrated U.S. Markets for Software Engineers Employed in the Tech Industry (2020)*

74.6% 70 Seattle SF Bay Area

68 .0%

Raleigh-Durham Portland 59.2%

Austin

Sacramento: 51.1%

*% of total software engineers across all industries; Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Workforce Diversity



Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022

Talent Pipeline & Diversity

Degree Completions (2020)	Total	Growth 2016-20	Male	Female
Computer Engineering	1,036	51%	78%	22%
Math/Statistics	492	37%	57%	43%
Other Tech Engineering	695	17%	83%	17%
Totals	2,223	36%	75%	25%

Degree Completions (2020)	Total	White	Asian	Hispanic	Black	Other
Computer Engineering	1,036	31%	44%	15%	3%	6%
Math/Statistics	492	36%	37%	17%	2%	8%
Other Tech Engineering	695	40%	27%	22%	2%	8%
Totals	2,223	35%	37%	18%	3%	7%

Source: The National Center for Education Statistics (Region), 2021.

Office Rent & Vacancy Trends



±9	\$4
nk	

\$1.860

Per unit/month

5-year growth

*Ratio of annualized apartment rent (2021) to average annual wage for tech talent occupations (2021) Source: Bureau of Labor Statistics April 2022, CBRE Research (Metro) and Axiometrics (Metro) Q4 2021.

Population Trends



CBRE RESEARCH

Score: 33.44







[#]41 Nashville

Employment Breakdown

	Employed*	5-Yr Growth**	Avg Wage*	5-Yr Growth*
Total Tech Occupations	36,110	29.4%	\$86,217	9.5%
Software Developers & Programmers	10,890	35.4%	\$93,659	13.1%
Computer Support, Database & Systems	19,020	30.5%	\$83,762	16.8%
Computer & Information Systems Managers	4,020	24.4%	\$136,440	26.5%
Technology Engineering-Related	2,180	-3.7%	\$74,584	3.1%
Total Non-Tech Occupations	116,850	1.2%	\$47,880	9.4%
Sales	12,130	2.7%	\$65,615	1.1%
Administrative & Office Support	79,660	-2.4%	\$38,961	10.9%
Business Operations & Finance	19,760	19.3%	\$69,452	4.8%
Marketing	5,300	-3.1%	\$60,920	3.7%

*2021; ** 2016-2021; Source: U.S. Bureau of Labor Statistics (Metro Area), April 2022.

Top 5 Industries Employing Tech Talent (2020)

33%	16%	14%	8%	
Core High-Tech*	Health	FIRE**	Transport, Warehouse ६ Wholesale	

*Includes computer software and services and computer product manufacturing; **Finance, Insurance, Real Estate; ***Excl high-tech. Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Top 5 Most Concentrated U.S. Markets for Software Engineers Employed in the Tech Industry (2020)*

70 Seattle

74.6% SF Bay Area

68 Raleigh-Durham Portland

.0%

Nashville: 47.2%

*% of total software engineers across all industries; Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Workforce Diversity



Talent Pipeline & Diversity

6

59.2%

Austin

10

Government

Degree Completions (2020)	Total	Growth 2016-20	Male	Female
Computer Engineering	592	57%	75%	25%
Math/Statistics	323	87%	70%	30%
Other Tech Engineering	243	29%	77%	23%
Totals	1,158	57%	74%	26%

Degree Completions (2020)	Total	White	Asian	Hispanic	Black	Other
Computer Engineering	592	56%	20%	8%	12%	4%
Math/Statistics	323	68%	16%	7%	4%	5%
Other Tech Engineering	243	69%	7%	11%	8%	5%
Totals	1,158	62%	16%	8%	9%	5%

Source: The National Center for Education Statistics (Region), 2021.

Office Rent & Vacancy Trends



[£] 41	\$3
nk	

Average Apartment Rent (2021)

\$1.479

Per unit/month

5-year growth

Population Trends

Twenty-somethings grew by 23,236 (9.1%) and thirty-somethings grew by 28,347 (11.3%) since 2015.



Score: 32.98





Rent-to-Tech Wage Ratio*

*Ratio of annualized apartment rent (2021) to average annual wage for tech talent occupations (2021) Source: Bureau of Labor Statistics April 2022, CBRE Research (Metro) and Axiometrics (Metro) Q4 2021.

[#]42 Cleveland

Employment Breakdown

	Employed*	5-Yr Growth**	Avg Wage*	5-Yr Growth*
Total Tech Occupations	40,540	25.4%	\$89,424	14.4%
Software Developers & Programmers	15,520	47.1%	\$95,903	18.4%
Computer Support, Database & Systems	19,600	18.9%	\$90,983	32.2%
Computer & Information Systems Managers	2,780	5.3%	\$146,130	12.8%
Technology Engineering-Related	2,640	-5.0%	\$75,363	1.4%
Total Non-Tech Occupations	115,930	-1.6%	\$52,091	10.4%
Sales	8,550	-34.1%	\$84,925	13.8%
Administrative & Office Support	76,860	-1.1%	\$40,671	15.5%
Business Operations & Finance	21,870	14.0%	\$74,387	6.5%
Marketing	8,650	8.7%	\$64,733	0.8%

*2021; ** 2016-2021; Source: U.S. Bureau of Labor Statistics (Metro Area), April 2022.

Top 5 Industries Employing Tech Talent (2020)

33%	12%	12%	7%	6%
Core High-Tech*	FIRE**	Manufacturing***	Health	Prof'l Services**

*Includes computer software and services and computer product manufacturing; **Finance, Insurance, Real Estate; ***Excl high-tech. Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Top 5 Most Concentrated U.S. Markets for Software Engineers Employed in the Tech Industry (2020)*

70 Seattle

74.6% SF Bay Area

68 .0% Raleigh-Durham Portland

59.2%

Austin

Cleveland: 47.7%

*% of total software engineers across all industries; Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Workforce Diversity



Talent Pipeline & Diversity

Degree Completions (2020)	Total	Growth 2016-20	Male	Female
Computer Engineering	647	36%	77%	23%
Math/Statistics	161	6%	56%	44%
Other Tech Engineering	371	16%	79%	21%
Totals	1,179	25%	75%	25%

Degree Completions (2020)	Total	White	Asian	Hispanic	Black	Other
Computer Engineering	647	67%	15%	6%	5%	6%
Math/Statistics	161	74%	13%	4%	4%	5%
Other Tech Engineering	371	75%	9%	7%	4%	5%
Totals	1,179	71%	13%	6%	5%	6%

Source: The National Center for Education Statistics (Region), 2021.

Office Rent & Vacancy Trends



‡33	\$4
ank	

Average Apartment Rent (2021)

\$1.064

5-year growth

Per unit/month

*Ratio of annualized apartment rent (2021) to average annual wage for tech talent occupations (2021) Source: Bureau of Labor Statistics April 2022, CBRE Research (Metro) and Axiometrics (Metro) Q4 2021.

Population Trends



Score: 31.76







[#]43 Cincinnati

Employment Breakdown

	Employed*	5-Yr Growth**	Avg Wage*	5-Yr Growth*
Total Tech Occupations	38,650	4.9%	\$88,088	6.2%
Software Developers & Programmers	15,010	41.9%	\$88,239	4.1%
Computer Support, Database & Systems	18,120	-12.3%	\$93,123	22.0%
Computer & Information Systems Managers	2,780	-12.9%	\$148,220	15.8%
Technology Engineering-Related	2,740	1.1%	\$70,901	-3.8%
Total Non-Tech Occupations	120,300	-0.5%	\$52,539	12.2%
Sales	9,720	-29.0%	\$87,055	17.8%
Administrative & Office Support	77,750	-0.1%	\$41,065	18.7%
Business Operations & Finance	22,800	7.9%	\$70,757	2.9%
Marketing	10,030	21.1%	\$66,620	9.7%

*2021; ** 2016-2021; Source: U.S. Bureau of Labor Statistics (Metro Area), April 2022.

Top 5 Industries Employing Tech Talent (2020)

41% 12% 9% 9% Core High-Tech* FIRE** Manufacturing***

Prof'l Services*** Transport, Warehouse & Wholesale

5%

59.2%

Austin

*Includes computer software and services and computer product manufacturing; **Finance, Insurance, Real Estate; ***Excl high-tech. Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Top 5 Most Concentrated U.S. Markets for Software Engineers Employed in the Tech Industry (2020)*

70 Seattle

74.6% SF Bay Area

68.0% Raleigh-Durham Portland

Cincinnati: 52.1%

*% of total software engineers across all industries; Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Workforce Diversity



Talent Pipeline & Diversity

Degree Completions (2020)	Total	Growth 2016-20	Male	Female
Computer Engineering	1,382	76%	78%	22%
Math/Statistics	307	31%	58%	42%
Other Tech Engineering	582	7%	84%	16%
Totals	2,271	45%	77%	23%

Degree Completions (2020)	Total	White	Asian	Hispanic	Black	Other
Computer Engineering	1,382	81%	5%	3%	7%	3%
Math/Statistics	307	88%	4%	2%	2%	4%
Other Tech Engineering	582	86%	4%	3%	4%	3%
Totals	2,271	83%	5%	3%	5%	3%

Office Rent & Vacancy Trends



34	\$4
nk	

Average Apartment Rent (2021)

\$1.116

Per unit/month

*Ratio of annualized apartment rent (2021) to average annual wage for tech talent occupations (2021) Source: Bureau of Labor Statistics April 2022, CBRE Research (Metro) and Axiometrics (Metro) Q4 2021.

Population Trends



Source: The National Center for Education Statistics (Region), 2021.

97 CBRE RESEARCH

Score: 30.73

18.9%



5-year growth

Rent-to-Tech Wage Ratio*

Twenty-somethings grew by 12,155 (4.3%) and thirty-somethings grew by 19,522 (7.3%) since 2015.

[#]44 Hartford

Employment Breakdown

	Employed*	5-Yr Growth**	Avg Wage*	5-Yr Growth*
Total Tech Occupations	26,190	4.8%	\$100,846	6.1%
Software Developers & Programmers	10,330	22.1%	\$96,560	4.9%
Computer Support, Database & Systems	10,350	-11.2%	\$101,271	17.8%
Computer & Information Systems Managers	4,100	37.1%	\$152,470	4.9%
Technology Engineering-Related	1,410	-30.2%	\$86,485	0.9%
Total Non-Tech Occupations	61,360	-17.7%	\$57,679	11.4%
Sales	4,250	-26.2%	\$78,235	2.5%
Administrative & Office Support	40,460	-22.8%	\$46,219	11.9%
Business Operations & Finance	13,030	1.6%	\$82,402	4.9%
Marketing	3,620	1.4%	\$72,650	4.2%

*2021; ** 2016-2021; Source: U.S. Bureau of Labor Statistics (Metro Area), April 2022.

Top 5 Industries Employing Tech Talent (2020)

29%	28%	7%	7%	6%
Core High-Tech*	FIRE**	Education	Manufacturing***	Health

*Includes computer software and services and computer product manufacturing; **Finance, Insurance, Real Estate; ***Excl high-tech. Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Top 5 Most Concentrated U.S. Markets for Software Engineers Employed in the Tech Industry (2020)*

70 Seattle

74.6% SF Bay Area

Raleigh-Durham Portland

68

.0%

59.2%

Austin

Hartford: 42.8%

*% of total software engineers across all industries; Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Workforce Diversity



Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022

Talent Pipeline & Diversity

Degree Completions (2020)	Total	Growth 2016-20	Male	Female
Computer Engineering	590	9%	80%	20%
Math/Statistics	571	22%	55%	45%
Other Tech Engineering	501	-5%	80%	20%
Totals	1,662	8%	72%	28%

Degree Completions (2020)	Total	White	Asian	Hispanic	Black	Other
Computer Engineering	590	63%	18%	8%	8%	3%
Math/Statistics	571	69%	14%	9%	3%	4%
Other Tech Engineering	501	73%	9%	11%	5%	2%
Totals	1,662	68%	14%	9%	6%	3%

Source: The National Center for Education Statistics (Region), 2021.

Office Rent & Vacancy Trends



<i>‡</i> 14	\$4
ink	

Average Apartment Rent (2021)

\$1.539

Per unit/month

*Ratio of annualized apartment rent (2021) to average annual wage for tech talent occupations (2021) Source: Bureau of Labor Statistics April 2022, CBRE Research (Metro) and Axiometrics (Metro) Q4 2021.

Population Trends



CBRE RESEARCH

Score: 29.92





5-year growth



#45 Milwaukee

Employment Breakdown

	Employed*	5-Yr Growth**	Avg Wage*	5-Yr Growth*
Total Tech Occupations	35,150	13.1%	\$85,989	8.6%
Software Developers & Programmers	15,970	78.8%	\$81,143	-1.1%
Computer Support, Database & Systems	13,900	-15.5%	\$88,527	24.3%
Computer & Information Systems Managers	1,850	-28.6%	\$150,280	20.9%
Technology Engineering-Related	3,430	3.6%	\$74,264	-2.6%
Total Non-Tech Occupations	94,940	-8.8%	\$53,169	15.3%
Sales	8,310	-6.2%	\$79,535	15.7%
Administrative & Office Support	62,860	-12.1%	\$41,562	12.7%
Business Operations & Finance	17,590	4.3%	\$78,375	15.1%
Marketing	6,180	-9.6%	\$64,037	7.7%

*2021; ** 2016-2021; Source: U.S. Bureau of Labor Statistics (Metro Area), April 2022.

Top 5 Industries Employing Tech Talent (2020)

38%	16%	10%	9%	6%
Core High-Tech*	FIRE**	Manufacturing***	Health	Education

*Includes computer software and services and computer product manufacturing; **Finance, Insurance, Real Estate; ***Excl high-tech. Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Top 5 Most Concentrated U.S. Markets for Software Engineers Employed in the Tech Industry (2020)*

74.6% 70 Seattle SF Bay Area

68 .0%

Raleigh-Durham Portland 59.2%

Austin

Milwaukee: 42.9%

*% of total software engineers across all industries; Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Workforce Diversity



Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022

Talent Pipeline & Diversity

Degree Completions (2020)	Total	Growth 2016-20	Male	Female
Computer Engineering	804	10%	78%	22%
Math/Statistics	102	-15%	59%	41%
Other Tech Engineering	518	-4%	84%	16%
Totals	1,424	3%	79%	21%

Degree Completions (2020)	Total	White	Asian	Hispanic	Black	Other
Computer Engineering	804	67%	12%	12%	5%	4%
Math/Statistics	102	74%	11%	8%	1%	6%
Other Tech Engineering	518	85%	5%	7%	1%	3%
Totals	1,424	74%	9%	10%	3%	4%

Office Rent & Vacancy Trends



38	\$4
nk	

Average Apartment Rent (2021)

\$1.301

Per unit/month

*Ratio of annualized apartment rent (2021) to average annual wage for tech talent occupations (2021) Source: Bureau of Labor Statistics April 2022, CBRE Research (Metro) and Axiometrics (Metro) Q4 2021.

Population Trends



Source: The National Center for Education Statistics (Region), 2021.

Score: 29.35





5-year growth



#46 Jacksonville

Employment Breakdown

	Employed*	5-Yr Growth**	Avg Wage*	5-Yr Growth**
Total Tech Occupations	22,110	16.2%	\$87,851	9.0%
Software Developers & Programmers	7,320	18.6%	\$97,130	8.5%
Computer Support, Database & Systems	11,010	5.4%	\$89,603	25.8%
Computer & Information Systems Managers	1,780	72.8%	\$139,350	12.7%
Technology Engineering-Related	2,000	16.3%	\$71,954	-0.2%
Total Non-Tech Occupations	88,760	0.1%	\$48,777	21.1%
Sales	7,520	-1.4%	\$81,428	35.0%
Administrative & Office Support	62,150	-4.2%	\$39,091	21.3%
Business Operations & Finance	14,010	11.0%	\$69,720	7.6%
Marketing	5,080	45.6%	\$61,187	5.8%

*2021; ** 2016-2021; Source: U.S. Bureau of Labor Statistics (Metro Area), April 2022.

Top 5 Industries Employing Tech Talent (2020)

35%	23%
Core High-Tech*	FIRF**

70

5% 5%

Prof'l Services*** Transport, Warehouse & Wholesale

Health

59.2%

Austin

*Includes computer software and services and computer product manufacturing; **Finance, Insurance, Real Estate; ***Excl high-tech. Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Top 5 Most Concentrated U.S. Markets for Software Engineers Employed in the Tech Industry (2020)*

Seattle

74.6% SF Bay Area

Raleigh-Durham Portland

68.0%

Jacksonville: 47.0%

*% of total software engineers across all industries; Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Workforce Diversity



Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022

10% **Talent Pipeline & Diversity**

Degree Completions (2020)	Total	Growth 2016-20	Male	Female
Computer Engineering	288	2%	80%	20%
Math/Statistics	58	14%	53%	47%
Other Tech Engineering	85	29%	79%	21%
Totals	431	28%	76%	24%

Degree Completions (2020)	Total	White	Asian	Hispanic	Black	Other
Computer Engineering	288	58%	14%	9%	12%	8%
Math/Statistics	58	64%	5%	16%	7%	7%
Other Tech Engineering	85	78%	3%	11%	4%	4%
Totals	431	63%	10%	10%	9%	7%

Source: The National Center for Education Statistics (Region), 2021

Office Rent & Vacancy Trends



40	\$40
k	

Average Apartment Rent (2021)

\$1.422

Per unit/month

*Ratio of annualized apartment rent (2021) to average annual wage for tech talent occupations (2021) Source: Bureau of Labor Statistics April 2022, CBRE Research (Metro) and Axiometrics (Metro) Q4 2021.

Population Trends



Score: 28.32





5-year growth



#47 San Antonio

Employment Breakdown

	Employed*	5-Yr Growth**	Avg Wage*	5-Yr Growth*
Total Tech Occupations	32,760	4.8%	\$93,458	7.1%
Software Developers & Programmers	8,560	1.4%	\$96,065	-6.9%
Computer Support, Database & Systems	19,050	4.7%	\$96,406	25.5%
Computer & Information Systems Managers	2,170	88.7%	\$146,000	-6.5%
Technology Engineering-Related	2,980	-4.5%	\$78,344	1.0%
Total Non-Tech Occupations	121,240	-8.1%	\$49,167	14.1%
Sales	9,420	-7.3%	\$80,733	31.2%
Administrative & Office Support	86,680	-10.4%	\$39,756	16.2%
Business Operations & Finance	18,930	-4.2%	\$73,732	4.1%
Marketing	6,210	15.4%	\$57,757	-12.3%

*2021; ** 2016-2021; Source: U.S. Bureau of Labor Statistics (Metro Area), April 2022.

Top 5 Industries Employing Tech Talent (2020)

38%	17%	9%	7%	4%
Core High-Tech*	FIRE**	Prof'l Services***	Education	Government

*Includes computer software and services and computer product manufacturing; **Finance, Insurance, Real Estate; ***Excl high-tech. Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Top 5 Most Concentrated U.S. Markets for Software Engineers Employed in the Tech Industry (2020)*

10 Seattle SF Bay Area

14.6% Raleigh-Durham

68 Portland

.0%

59.2%

Austin

San Antonio: 46.5%

*% of total software engineers across all industries; Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Workforce Diversity



Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022

Talent Pipeline & Diversity

Degree Completions (2020)	Total	Growth 2016-20	Male	Female
Computer Engineering	984	50%	84%	16%
Math/Statistics	142	8%	54%	46%
Other Tech Engineering	310	27%	84%	16%
Totals	1,436	39%	81%	19%

Degree Completions (2020)	Total	White	Asian	Hispanic	Black	Other
Computer Engineering	984	33%	8%	46%	7%	5%
Math/Statistics	142	37%	8%	49%	6%	1%
Other Tech Engineering	310	34%	8%	50%	5%	3%
Totals	1,436	34%	8%	47%	7%	4%

Source: The National Center for Education Statistics (Region), 2021

Office Rent & Vacancy Trends



#26	\$4
Rank	

Source: U.S. Bureau of Labor Statistics April 2022, CBRE Research (Metro) Q4 2021.

Average Apartment Rent (2021)

S1.161

Per unit/month

*Ratio of annualized apartment rent (2021) to average annual wage for tech talent occupations (2021) Source: Bureau of Labor Statistics April 2022, CBRE Research (Metro) and Axiometrics (Metro) Q4 2021.

Population Trends



Source: U.S. Census Bureau (Metro), 2022.



Talent

Office Rent

Total





5-year growth



#48 Virginia Beach

Employment Breakdown

	Employed*	5-Yr Growth**	Avg Wage*	5-Yr Growth**
Total Tech Occupations	29,040	3.4%	\$90,285	7.4%
Software Developers & Programmers	8,460	17.8%	\$101,752	5.5%
Computer Support, Database & Systems	14,740	3.4%	\$94,039	24.4%
Computer & Information Systems Managers	1,330	3.9%	\$147,160	4.7%
Technology Engineering-Related	4,510	-21.4%	\$77,805	0.1%
Total Non-Tech Occupations	72,860	-9.4%	\$50,626	18.7%
Sales	5,720	0.7%	\$87,618	40.6%
Administrative & Office Support	49,230	-15.0%	\$39,192	18.4%
Business Operations & Finance	13,730	2.4%	\$72,328	0.7%
Marketing	4,180	24.0%	\$63,383	9.2%

*2021; ** 2016-2021; Source: U.S. Bureau of Labor Statistics (Metro Area), April 2022.

Top 5 Industries Employing Tech Talent (2020)

30%	18%	13%	10%	7%
Core High-Tech*	Government	Prof'l Services***	FIRE**	Manufacturing***

*Includes computer software and services and computer product manufacturing; **Finance, Insurance, Real Estate; ***Excl high-tech. Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Top 5 Most Concentrated U.S. Markets for Software Engineers Employed in the Tech Industry (2020)*

74.6% 10 Seattle SF Bay Area

68 Raleigh-Durham

Portland

.0%

59.2%

Austin

Virginia Beach: 31.8%

*% of total software engineers across all industries; Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Workforce Diversity



Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022

Talent Pipeline & Diversity

Degree Completions (2020)	Total	Growth 2016-20	Male	Female
Computer Engineering	1,091	10%	80%	20%
Math/Statistics	156	-4%	49%	51%
Other Tech Engineering	430	9%	81%	19%
Totals	1,677	8%	78%	22%

Degree Completions (2020)	Total	White	Asian	Hispanic	Black	Other
Computer Engineering	1,091	54%	9%	8%	25%	4%
Math/Statistics	156	67%	6%	5%	12%	10%
Other Tech Engineering	430	69%	5%	10%	12%	5%
Totals	1,677	59%	8%	8%	21%	4%

Source: The National Center for Education Statistics (Region), 2021.

Office Rent & Vacancy Trends



±30	\$
nk	

Average Apartment Rent (2021)

\$1.329

5-year growth

Per unit/month

*Ratio of annualized apartment rent (2021) to average annual wage for tech talent occupations (2021) Source: Bureau of Labor Statistics April 2022, CBRE Research (Metro) and Axiometrics (Metro) Q4 2021.

Population Trends



Source: U.S. Census Bureau (Metro), 2022.

Score: 24.19







#49 Richmond

Employment Breakdown

	Employed*	5-Yr Growth**	Avg Wage*	5-Yr Growth*
Total Tech Occupations	26,870	5.4%	\$94,484	5.2%
Software Developers & Programmers	9,660	16.5%	\$107,278	12.6%
Computer Support, Database & Systems	13,640	3.3%	\$93,282	16.0%
Computer & Information Systems Managers	1,630	-5.2%	\$161,650	11.3%
Technology Engineering-Related	1,940	-10.6%	\$80,287	-1.7%
Total Non-Tech Occupations	76,760	-8.4%	\$54,211	16.5%
Sales	5,630	-3.6%	\$86,905	24.0%
Administrative & Office Support	48,310	-14.9%	\$40,031	14.9%
Business Operations & Finance	17,110	5.7%	\$78,438	7.3%
Marketing	5,710	13.1%	\$69,353	5.4%

*2021; ** 2016-2021; Source: U.S. Bureau of Labor Statistics (Metro Area), April 2022.

Top 5 Industries Employing Tech Talent (2020)

30%	14%	12%	10%	8%
Core High-Tech*	FIRE**	Government	Prof'l Services***	Education

*Includes computer software and services and computer product manufacturing; **Finance, Insurance, Real Estate; ***Excl high-tech. Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Top 5 Most Concentrated U.S. Markets for Software Engineers Employed in the Tech Industry (2020)*

10 Seattle

74.6% SF Bay Area

68 .0% Raleigh-Durham Portland

59.2%

Austin

Richmond: 41.6%

*% of total software engineers across all industries; Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Workforce Diversity



Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022

Talent Pipeline & Diversity

Degree Completions (2020)	Total	Growth 2016-20	Male	Female
Computer Engineering	484	21%	74%	26%
Math/Statistics	123	-5%	46%	54%
Other Tech Engineering	185	28%	86%	14%
Totals	792	18%	73%	27%

Degree Completions (2020)	Total	White	Asian	Hispanic	Black	Other
Computer Engineering	484	40%	21%	6%	27%	6%
Math/Statistics	123	46%	17%	5%	28%	4%
Other Tech Engineering	185	70%	9%	9%	8%	4%
Totals	792	48%	18%	6%	23%	5%

Source: The National Center for Education Statistics (Region), 2021.



#23	\$4
ank	

Average Apartment Rent (2021)

\$1.333

Per unit/month

5-year growth

*Ratio of annualized apartment rent (2021) to average annual wage for tech talent occupations (2021) Source: Bureau of Labor Statistics April 2022, CBRE Research (Metro) and Axiometrics (Metro) Q4 2021.

Population Trends



Score: 24.08

30.7%



Rent-to-Tech Wage Ratio*

Twenty-somethings grew by 643 (0.4%) and thirty-somethings grew by 13,395 (8.3%) since 2015.

#50 Inland Empire

Employment Breakdown

	Employed*	5-Yr Growth**	Avg Wage*	5-Yr Growth**
Total Tech Occupations	25,000	38.8%	\$94,908	23.1%
Software Developers & Programmers	7,280	17.3%	\$90,205	0.3%
Computer Support, Database & Systems	12,150	24.5%	\$95,322	38.1%
Computer & Information Systems Managers	2,030	81.3%	\$152,260	12.7%
Technology Engineering-Related	3,540	5.7%	\$88,119	7.8%
Total Non-Tech Occupations	122,620	-89.4%	\$52,354	12.9%
Sales	9,700	-6.4%	\$79,870	35.9%
Administrative & Office Support	89,260	-9.6%	\$43,859	19.9%
Business Operations & Finance	16,900	17.9%	\$76,510	14.6%
Marketing	6,760	10.8%	\$64,657	12.4%

*2021; ** 2016-2021; Source: U.S. Bureau of Labor Statistics (Metro Area), April 2022.

Top 5 Industries Employing Tech Talent (2020)

33%	10%	7%	7%	7%
Core High-Tech*	Government	Health	FIRE**	Prof'l Services***

*Includes computer software and services and computer product manufacturing; **Finance, Insurance, Real Estate; ***Excl high-tech. Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Top 5 Most Concentrated U.S. Markets for Software Engineers Employed in the Tech Industry (2020)*

14 70 Seattle SF Bay Area

Raleigh-Durham

68 Portland

.0%

59.2%

Austin

Inland Empire: 54.8%

*% of total software engineers across all industries; Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022.

Workforce Diversity



Source: U.S. Census (Metro), IPUMS and CBRE Research, May 2022

Talent Pipeline & Diversity

Degree Completions (2020)	Total	Growth 2016-20	Male	Female
Computer Engineering	1,034	8%	85%	15%
Math/Statistics	366	30%	57%	43%
Other Tech Engineering	274	56%	83%	17%
Totals	1,674	19%	78%	22%

Degree Completions (2020)	Total	White	Asian	Hispanic	Black	Other
Computer Engineering	1,034	23%	29%	38%	4%	6%
Math/Statistics	366	20%	23%	49%	3%	4%
Other Tech Engineering	274	30%	27%	37%	3%	4%
Totals	1,674	24%	27%	40%	4%	5%

Source: The National Center for Education Statistics (Region), 2021

Office Rent & Vacancy Trends



[±] 24	\$4
nk	

\$2.016

5-year growth

Per unit/month

*Ratio of annualized apartment rent (2021) to average annual wage for tech talent occupations (2021) Source: Bureau of Labor Statistics April 2022, CBRE Research (Metro) and Axiometrics (Metro) Q4 2021.

Population Trends



104 CBRE RESEARCH

Score: 18.72

42.6%





10 Appendix II: Full Report Data Summary

Local Market Profiles

Full Report Data Summary

TABLE 1: Tech Talent Workforce by Industry (2021)

Tech Talent Occupations in Each Industry as a % of U.S. Tech Talent

Industry	% of Total Tech Talent Labor
Core High-Tech*	41.1%
Professional, Scientific & Technical Services (Excluding High-Tech)	11.4%
FIRE	8.9%
Other	8.4%
Management of Companies & Enterprises	6.5%
Government	5.9%
Education	4.4%
Transportation, Warehousing & Wholesale	4.0%
Manufacturing (Excluding High-Tech)	3.5%
Information (Excluding High-Tech)	3.4%
Health Care	2.5%

TABLE 2: Which are the Top-Ranked Tech Talent Markets?

Rank (2022)	Market	Score	Rank (2022)	Market	Score
1	SF Bay Area	85.52	26	Pittsburgh	42.88
2	Seattle	79.39	27	Charlotte	41.58
3	Toronto	68.93	28	Calgary	41.54
4	Washington, D.C.	67.88	29	Orlando	41.32
5	New York Metro	67.08	30	Madison	40.52
6	Austin	65.19	31	Columbus	40.34
7	Boston	62.38	32	Kansas City	40.07
8	Vancouver	62.19	33	South Florida	40.05
9	Dallas/Ft. Worth	58.57	34	Tampa	39.48
10	Denver	57.53	35	Edmonton	38.72
11	Atlanta	57.16	36	Houston	37.54
12	Los Angeles/Orange Co.	57.12	37	Indianapolis	36.69
13	Ottawa	55.51	38	St. Louis	36.66
14	Baltimore	55.19	39	Quebec City	36.48
15	Montreal	54.78	40	Sacramento	33.44
16	Phoenix	54.00	41	Nashville	32.98
17	San Diego	53.49	42	Cleveland	31.76
18	Salt Lake City	52.47	43	Cincinnati	30.73
19	Raleigh-Durham	50.76	44	Hartford	29.92
20	Chicago	49.57	45	Milwaukee	29.35
21	Minneapolis/St. Paul	48.68	46	Jacksonville	28.32
22	Philadelphia	47.34	47	San Antonio	27.84
23	Portland	46.84	48	Virginia Beach	24.19
24	Waterloo Region, Canada	45.24	49	Richmond	24.08
25	Detroit	43.74	50	Inland Empire	18.72

*Includes computer software and services and computer product manufacturing Source: U.S. Bureau of Labor Statistics, April 2022. Source: CBRE Research, CBRE Econometric Advisors, U.S. Bureau of Labor Statistics, Statistics Canada, Oxford Economics, The National Center of Education Statistics, National Science Foundation, Axiometrics, 2022.

TABLE 3: Tech Talent Workforce Concentration

TABLE 4: Tech Talent in Tech Industry Concentration

Market	Tech Talent Jobs as a % of Total Jobs	Market	Tech Talent Jobs as a % of Total Jobs	Market	Tech Talent in Tech Industry as a % of Total Tech Talent Jobs	Market	Tech Talent in Tech Industry as a % of Total Tech Talent Jobs
Ottawa	11.6%	Hartford	4.8%	SF Bay Area	66.7%	South Florida	35.0%
SF Bay Area	11.4%	Phoenix	4.7%	Seattle	62.7%	Jacksonville	34.6%
Toronto	10.3%	Detroit	4.7%	Raleigh-Durham	55.7%	Detroit	34.3%
Seattle	9.9%	Milwaukee	4.5%	Portland	50.6%	Phoenix	33.7%
Waterloo Region, Canada	9.6%	Columbus	4.4%	Austin	49.9%	Nashville	33.3%
Vancouver	9.1%	Sacramento	4.4%	Madison	49.4%	Philadelphia	33.2%
Washington, D.C.	8.8%	Richmond	4.4%	Salt Lake City	45.5%	Chicago	33.1%
Montreal	8.6%	Philadelphia	4.3%	Orlando	44.0%	Cleveland	32.6%
Austin	7.9%	St. Louis	4.2%	Atlanta	41.8%	Inland Empire	32.5%
Quebec City	7.8%	Pittsburgh	4.2%	Cincinnati	41.4%	New York Metro	32.5%
Raleigh-Durham	7.3%	Cleveland	4.2%	Washington, D.C.	41.1%	Baltimore	31.6%
Denver	6.7%	Virginia Beach	4.1%	Boston	40.5%	Sacramento	31.6%
Boston	6.4%	Tampa	4.0%	Kansas City	40.2%	Minneapolis/St. Paul	30.8%
Madison	6.4%	Indianapolis	4.0%	San Antonio	38.2%	Virginia Beach	30.3%
Baltimore	6.3%	New York Metro	4.0%	Denver	38.1%	St. Louis	30.2%
Portland	6.0%	Chicago	4.0%	Milwaukee	38.1%	Richmond	30.2%
Calgary	5.9%	Los Angeles/Orange Co.	3.9%	San Diego	37.9%	Indianapolis	29.5%
Edmonton	5.7%	Cincinnati	3.8%	Los Angeles/Orange Co.	37.9%	Hartford	29.1%
Atlanta	5.6%	Nashville	3.7%	Tampa	36.9%	Charlotte	28.9%
San Diego	5.6%	Orlando	3.7%	Houston	36.9%	Pittsburgh	27.0%
Minneapolis/St. Paul	5.5%	Houston	3.4%	Dallas/Ft. Worth	36.6%	Columbus	26.3%
Salt Lake City	5.5%	San Antonio	3.3%				
Dallas/Ft. Worth	5.2%	Jacksonville	3.2%				
Kansas City	5.2%	South Florida	2.6%				
Charlotte	5.1%	Inland Empire	1.6%				

Note: Canadian markets have been recalculated based on revisions to Statistics Canada definitions. Source: U.S. Bureau of Labor Statistics (Metro) April 2022, Statistics Canada (Metro), 2021.

Note: Canadian markets have been recalculated based on revisions to Statistics Canada definitions. Source: U.S. Bureau of Labor Statistics (Metro), Statistics Canada (Metro), CBRE Research and IPUMS, May 2022.

TABLE 5: Top 10 Markets for Software Engineers Employed in the Tech Industry (2020)

Market	Software Engineers in Tech Industry
Seattle	77.1%
SF Bay Area	74.6%
Raleigh-Durham	72.0%
Portland	68.0%
Austin	59.2%
South Florida	57.0%
Orlando	55.7%
Inland Empire	54.8%
Salt Lake City	54.7%
Madison	54.6%
U.S.	53.8%

TABLE 6: Tech Talent Workforce by Market (2021)

Workforce Size	Market	Tech Talent Total	Workforce Size	Market
Large Tech Talent Markets	SF Bay Area	378,870	Large Tech	Charlotte
	New York Metro	344,520	Talent Markets Cont.	Salt Lake City
(> 50,000 Workforce)	Toronto	289,700	(> 50,000 Workforce)	St. Louis
	Washington, D.C.	259,310		Kansas City
	Los Angeles/Orange Co.	235,800		Tampa
	Seattle	189,570		Columbus
	Dallas/Ft. Worth	187,950	Small Tech	Pittsburgh
	Chicago	167,560	Talent Markets	Sacramento
	Boston	166,450	(< 50,000 Worktorce)	Orlando
	Montreal	148,900		Calgary
	Atlanta	145,080		Cleveland
	Denver	117,620		Indianapolis
	Philadelphia	115,450		Cincinnati
	Vancouver	115,400		Nashville
	Minneapolis/St. Paul	100,990		Quebec City
	Phoenix	99,600		Milwaukee
	Houston	98,930		San Antonio
	Detroit	93,770		Edmonton
	Austin	84,680		Virginia Beach
	Ottawa	81,200		Richmond
	Baltimore	79,000		Hartford
	San Diego	77,780		Inland Empire
	Raleigh-Durham	69,050		Madison
	Portland	67,410		Waterloo Regi
	South Florida	66,660		Jacksonville

Note: Canadian markets have been recalculated based on revisions to Statistics Canada definitions. Source: U.S. Bureau of Labor Statistics (Metro) April 2022, Statistics Canada (Metro), 2021.

Source: U.S. Census, IPUMS and CBRE Research, May 2022.

	Tech Talent Total
	61,950
City	55,930
	53,910
ty	52,500
	52,240
;	50,390
۱	43,910
to	43,530
	42,860
	40,600
	40,540
lis	40,120
	38,650
	36,110
ity	35,700
e	35,150
nio	32,760
١	32,400
each	29,040
	26,870
	26,190
pire	25,000
	24,060
Region, Canada	24,000
lle	22,110
TABLE 7: Tech Talent Workforce Growth Rates (2016-2021)

Workforce Size	Market	% Change	By Volume	Workforce Size	Market	% Change	By Volume
Large Tech	Vancouver	62.7%	44,460	Large Tech Talent Markets Cont.	Quebec City	42.8%	10,700
Falent Markets	Toronto	44.3%	88,900		Edmonton	39.7%	9,200
> 50,000 worktorce)	Montreal	26.5%	31,200	 (> 50,000 workforce) 	Inland Empire	38.8%	6,990
	Seattle	31.6%	45,560		Nashville	29.4%	8,200
	Salt Lake City	29.0%	12,570		Calgary	22.3%	7,400
	Ottawa	22.3%	14,800	Small Tech	Cleveland	25.4%	8,200
	Portland	28.0%	14,760	Talent Markets	Orlando	16.8%	6,180
	Denver	22.8%	21,810	 (< 50,000 WORKIDICE) 	Jacksonville	16.2%	3,090
	Charlotte	21.8%	11,100		Indianapolis	13.2%	4,690
	Austin	20.6%	14,450		Milwaukee	13.1%	4,070
	Phoenix	18.3%	15,410		Sacramento	8.9%	3,550
	San Diego	15.5%	10,440		Waterloo Region	8.1%	1,800
	Dallas/Ft. Worth	14.9%	24,360		Richmond	5.4%	1,370
	Tampa	12.7%	5,880		Cincinnati	4.9%	1,790
	SF Bay Area	12.6%	42,460		Hartford	4.8%	1,200
	Raleigh-Durham	10.8%	6,750		San Antonio	4.8%	1,500
	Los Angeles/Orange Co.	9.8%	20,960		Virginia Beach	3.4%	950
	South Florida	7.6%	4,690		Pittsburgh	2.2%	960
	Baltimore	7.6%	5,550		Madison	2.0%	480
	Philadelphia	7.4%	7,970		Hartford	4.6%	1,200
	Atlanta	6.5%	8,900		San Antonio	4.6%	1,500
	Chicago	6.2%	9,800		Virginia Beach	3.3%	950
	Washington, D.C.	5.7%	13,920		Pittsburgh	2.2%	960
	Detroit	5.2%	4,600		Madison	2.0%	480
	Minneapolis/St. Paul	4.8%	4,630				
	Columbus	3.6%	1,770				

Note: Canadian markets have been recalculated based on revisions to Statistics Canada definitions. Source: U.S. Bureau of Labor Statistics (Metro) April 2022, Statistics Canada (Metro), 2021.

TABLE 8: Top 10 Markets for Educational Attainment

25+ Years Old, Bachelor's Degree or Higher (2020)

Market	Educational Attainment Rate
Washington, D.C.	51.7%
SF Bay Area	51.2%
Boston	48.9%
Raleigh-Durham	47.4%
Madison	47.1%
Denver	46.5%
Austin	46.0%
Toronto	43.9%
Seattle	43.6%
Ottawa	43.0%
U.S.	32.9%
Canada	31.5%

Source: U.S. Census Bureau (Metro) and Environs Analytics, May 2022.

TABLE 9: Top 10 Markets for Tech Degree Completions

Market	Tech Degree Completions (2020)	Growth (2015-2020)
New York Metro	21,354	53.2%
Los Angeles/Orange Co.	14,504	46.0%
Boston	13,324	78.8%
Washington, D.C.	13,142	38.5%
SF Bay Area	9,920	33.4%
Atlanta	8,689	61.2%
Chicago	8,118	29.7%
Salt Lake City	7,220	93.3%
Dallas/Ft. Worth	7,009	50.6%
Toronto	6,931	54.1%

Note: Bachelor's Degree or Higher. Source: The National Center for Education Statistics (Region), Canadian Universities, May 2022.

TABLE 10: Where Are Tech Talent Workers Coming From and Where Are They Headed?

Toronto Vancouver Seattle Quebec City Montreal	29,312 14,041 20,973	88,900 44.460	59,588	SF Bay Area	40551	10.100	
Vancouver Seattle Quebec City Montreal	14,041 20,973	44.460			49,551	42,460	-7,091
Seattle Quebec City Montreal	20,973	,	30,419	Virginia Beach	8,185	950	-7,235
Quebec City Montreal		45,560	24,587	Dallas/Ft. Worth	33,056	24,360	-8,696
Montreal	2,318	10,700	8,382	South Florida	13,500	4,690	-8,810
	23,919	31,200	7,281	St. Louis	10,345	1,100	-9,245
Ottawa	9,365	14,800	5,435	Madison	9,987	480	-9,507
Portland	11,146	14,760	3,614	Columbus	11,690	1,770	-9,920
Calgary	3,852	7,400	3,548	San Diego	21,286	10,440	-10,846
Nashville	4,819	8,200	3,381	Phoenix	26,380	15,410	-10,970
Edmonton	5,871	9,200	3,329	Kansas City	11,208	90	-11,118
Charlotte	8,048	11,100	3,052	Raleigh-Durham	19,468	6,750	-12,718
Jacksonville	2,120	3,090	970	Salt Lake City	26,036	12,570	-13,466
Austin	13,771	14,450	679	Baltimore	19,062	5,550	-13,512
Inland Empire	7,414	6,990	-424	Waterloo Region, Canada	15,522	1,800	-13,722
Denver	22,581	21,810	-771	Minneapolis/St. Paul	18,433	4,630	-13,803
Indianapolis	5,965	4,690	-1,275	Houston	14,240	-2,190	-16,430
Richmond	3,669	1,370	-2,299	Philadelphia	30,106	7,970	-22,136
Tampa	8,597	5,880	-2,717	Pittsburgh	25,300	960	-24,340
Cleveland	10,977	8,200	-2,777	Detroit	32,729	4,600	-28,129
Milwaukee	7,618	4,070	-3,548	Atlanta	37,922	8,900	-29,022
San Antonio	6,117	1,500	-4,617	Chicago	41,595	9,800	-31,795
Sacramento	9,957	3,550	-6,407	Los Angeles/Orange Co.	65,834	20,960	-44,874
Hartford	8,445	1,200	-7,245	Washington, D.C.	59,581	13,920	-45,661
Orlando	13,449	6,180	-7,269	Boston	54,609	3,420	-51,189
Cincinnati	10,016	1,790	-8,226	New York Metro	94,823	8,880	-85,943

*Tech degrees cover the most recent five-year period available (2016-2020) and tech jobs added cover the time period reflecting when most graduates would be counted in employment figures (2017-2021). Source: CBRE Research, U.S. Bureau of Labor Statistics, National Center for Education Statistics (Metro), Canadian Universities, May 2022.

TABLE 11: 20-24 Year Old Population Change by Market (2015-2020)

Workforce Size Market % Change Workforce Size Market % Change Workforce Size Market % Change Workforce Size St. Louis Large Tech 17.8% Large Tech Large Tech 9.5% Large Tech -7.0% Ottawa Austin Talent Markets Talent Markets Cont. Talent Markets Talent Market 8.5% Philadelphia -8.4% Seattle 17.3% Toronto (> 50,000 Workforce) (> 50,000 Workforce) (> 50,000 Workforce) (> 50,000 Wo 7.9% San Diego -8.5% Toronto 16.3% Vancouver Salt Lake City 7.4% Baltimore -8.7% Tampa 16.3% 15.3% Raleigh-Durham 7.1% Los Angeles/Orange Co. -9.3% Ottawa Dallas/Ft. Worth 6.6% New York Metro -11.1% Vancouver 14.1% Small Tech Small Tech Montreal 6.3% Waterloo Region, Canada 12.1% Denver 14.1% Talent Markets Talent Market 4.5% 9.7% Charlotte 13.9% Phoenix Edmonton (< 50,000 Workforce) (< 50,000 Wo Charlotte 4.4% Calgary 9.3% Raleigh-Durham 13.3% 3.8% Madison 6.7% 12.5% Houston Phoenix Atlanta 3.8% Indianapolis 4.7% Columbus 11.3% 4.2% 10.5% Austin 2.9% Quebec City Portland Boston 2.3% San Antonio 4.0% Dallas/Ft. Worth 10.3% Hartford 1.9% 10.3% Kansas City 2.0% Houston 8.8% Denver 1.4% Nashville 1.8% Boston Washington, D.C. 0.8% SF Bay Area 8.7% Cincinnati 1.1% Portland 0.7% Orlando -0.5% San Diego 8.6% Cleveland -1.9% Salt Lake City 8.4% Tampa 0.2% Minneapolis/St. Paul 0.1% Inland Empire -3.5% Atlanta 8.1% Seattle -0.7% Jacksonville -4.0% 7.9% Detroit Columbus -1.3% Milwaukee -4.1% Kansas City 7.3% 7.2% Detroit -3.8% Sacramento -6.0% Minneapolis/St. Paul -7.1% 6.5% SF Bay Area -4.1% Richmond Montreal Chicago -4.7% Virginia Beach -7.2% Philadelphia 6.1% South Florida -5.1% -8.6% South Florida 5.8% Pittsburgh

Source: U.S. Census Bureau (County), Oxford Economics Canada (Metro), 2022.

Source: U.S. Census Bureau (County), Oxford Economics Canada (Metro), 2022.

TABLE 12: 25-39 Year Old Population Change by Market (2015-2020)

ize	Market	% Change				
	Baltimore	5.5%				
ts Cont. orkforce)	Washington, D.C.	4.3%				
	Los Angeles/Orange Co.	4.2%				
	St. Louis	2.9%				
	Chicago	0.2%				
	New York Metro	-1.8%				
	Waterloo Region, Canada	20.0%				
ts	Orlando	18.4%				
rkiorce)	San Antonio	16.5%				
	Jacksonville	14.1%				
	Nashville	13.0%				
	Sacramento	10.5%				
	Inland Empire	8.8%				
	Richmond	8.1%				
	Indianapolis	8.0%				
	Virginia Beach	7.8%				
	Edmonton	7.8%				
	Madison	7.4%				
	Cincinnati	7.4%				
	Cleveland	4.7%				
	Pittsburgh	4.2%				
	Hartford	3.9%				
	Calgary	3.6%				
	Milwaukee	3.5%				
	Quebec City	2.3%				

TABLE 13: Top 10 Most Concentrated 20-24 Year Old Markets (2020)

TABLE 14: Top 10 Most Concentrated 25-39 Year Old Markets (2020)

Market	Population Concentration
Madison	9.4%
Salt Lake City	8.9%
Virginia Beach	7.8%
San Diego	7.5%
Inland Empire	7.2%
Hartford	7.2%
Boston	7.1%
San Antonio	7.0%
Austin	6.9%
Los Angeles/Orange Co.	6.8%

Market	Population Concentration
Austin	25.6%
Seattle	24.7%
Denver	24.1%
SF Bay Area	23.8%
San Diego	23.6%
Salt Lake City	23.2%
Portland	23.1%
Columbus	22.8%
Nashville	22.6%
Los Angeles/Orange Co.	22.6%

Source: U.S. Census Bureau (Metro) and Oxford Economics (Metro), 2022.

Source: U.S. Census Bureau (Metro) and Oxford Economics (Metro), 2022.

TABLE 15: U.S. Workforce by Age for Selected Industries (2020)

Tech Talent All Industries	20-24 yr.	25-29 yrs.	30-34 yrs.	35-39 yrs.	40-44 yrs.	45-49 yrs.	50-54 yrs.	55-59 yrs.	60-64 yrs.	65+ yrs
Female	7.6%	12.8%	13.1%	12.6%	10.5%	10.8%	9.2%	9.9%	7.3%	6.2%
Male	7.3%	13.3%	14.8%	14.0%	12.1%	10.5%	8.9%	7.6%	6.2%	5.3%
Total	7.4%	13.2%	14.4%	13.6%	11.7%	10.6%	9.0%	8.2%	6.5%	5.5%

Tech Talent

(Tech Industry)	20-24 yr.	25-29 yrs.	30-34 yrs.	35-39 yrs.	40-44 yrs.	45-49 yrs.	50-54 yrs.	55-59 yrs.	60-64 yrs.	65+ yrs
Female	8.4%	17.2%	17.5%	14.7%	9.9%	9.4%	7.7%	6.4%	5.0%	3.8%
Male	7.0%	15.4%	16.4%	15.4%	11.3%	10.6%	8.2%	6.3%	5.0%	4.5%
Total	7.3%	15.8%	16.6%	15.3%	11.0%	10.3%	8.1%	6.3%	5.0%	4.4%

Office-Using

Ind	ustries	(Non-	Tech
	astrics	(11011	10011

Occupations)	20-24 yr.	25-29 yrs.	30-34 yrs.	35-39 yrs.	40-44 yrs.	45-49 yrs.	50-54 yrs.	55-59 yrs.	60-64 yrs.	65+ y
Female	7.1%	10.7%	11.0%	10.7%	10.1%	9.8%	10.2%	10.4%	9.5%	10.6
Male	6.6%	10.5%	11.7%	11.3%	10.7%	10.1%	9.7%	9.8%	8.7%	10.9
Total	6.8%	10.6%	11.3%	11.0%	10.4%	9.9%	10.0%	10.1%	9.1%	10.7

Source: U.S. Census, IPUMS and CBRE Research, May 2022.

5+ yrs.

6.2% 5.3%

yrs.

3.8%

4.4%

yrs.

5%

9%

.7%

TABLE 16: U.S. Tech Talent Workforce Concentration by Industry (2021)

Tech Talent Occupations as a % of All Occupations in Each Industry

Industry	Tech Talent as % of Total Industry Occupations
Core High-Tech*	47.0%
Information (Excluding High-Tech)	12.6%
Professional, Scientific & Technical Services (Excluding High-Tech)	8.6%
Management of Companies & Enterprises	7.9%
FIRE	6.0%
Total U.S. Employment	3.9%
Government	3.4%
Education	1.9%
Transportation, Warehousing & Wholesale	1.8%
Manufacturing (Excluding High-Tech)	1.5%
Other	1.0%
Health Care	0.7%

TABLE 17: U.S. Workforce by Race/Ethnicity for Selected Industries, 2020

	White	Asian	Hispanic	Black	Other	Female
Total Workforce (All Industries and Occupations)	59.2%	7.3%	19.4%	11.5%	2.6%	47.4%
Office-Using Industry Workforce (Non-Tech Occupations)	65.5%	7.8%	13.1%	9.4%	4.3%	52.2%
Tech Industry Workforce (All Occupations, Tech & Non-Tech)	57.5%	19.6%	11.6%	7.0%	4.2%	32.5%
Tech Talent Workforce (Tech Industry)	56.6%	25.3%	8.4%	5.5%	4.2%	21.3%
Tech Talent Workforce (All Industries)	58.2%	19.7%	10.0%	7.7%	4.3%	24.4%

Source: U.S. Census, IPUMS and CBRE Research, May 2022.

TABLE 18: U.S. Female Workforce for Selected Industries, 2020

% Female of Total Workforce (Male and Female)

	All Races	Other	Black	Hispanic	Asian	White	Unrepresented
Total Workforce (All Industries and Occupations)	47%	49%	53%	45%	48%	47%	48%
Office-Using Industry Workforce (Non-Tech Occupations)	52%	54%	62%	55%	46%	51%	57%
Tech Industry Workforce (All Occupations, Tech & Non-Tech)	33%	32%	43%	36%	31%	31%	37%
Tech Talent Workforce (Tech Industry)	21%	19%	27%	19%	26%	19%	22%
Tech Talent Workforce (All Industries)	24%	23%	35%	24%	27%	22%	28%

*Hispanic, Black, Other Non-White/Non-Asian

Note: Office-using industries includes information, financial activities and professional and business services (excluding tech industry within these categories) Source: U.S. Census, IPUMS and CBRE Research, May 2022.

*Includes computer software and services and computer product manufacturing. Source: U.S. Bureau of Labor Statistics, April 2022.

TABLE 19: U.S. Tech Talent Occupation Category by Race/Ethnicity & Sex, 2020

		Race/Ethnicity Share of Occupation				ations		
Tech Talent Occupation Category	Share of Occupations	White	Asian	Hispanic	Black	0		
Software Developers, Programmers & Engineers (42% of Jobs)								
Female	18.8%	47.1%	37.2%	6.4%	5.7%	3		
Male	81.2%	57.9%	26.3%	7.9%	3.6%	L		
Total (Female and Male)	100.0%	55.9%	28.3%	7.6%	4.0%	4		
Computer Support, Database & Systems (58% of Jobs)								
Female	28.5%	55.9%	14.6%	11.7%	13.6%	Ĺ		
Male	71.5%	61.6%	13.0%	11.9%	9.0%	Ĺ		
Total (Female and Male)	100.0%	60.0%	13.5%	11.8%	10.3%	4		
Total Tech Talent (100% of Jobs)								
Female	24.4%	53.0%	21.9%	10.0%	11.0%	2		
Male	75.6%	59.9%	19.0%	10.1%	6.6%	L		
Total (Female and Male)	100.0%	58.2%	19.7%	10.0%	7.7%	4		

Source: U.S. Census, IPUMS and CBRE Research, May 2022.

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3.6%

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4.2%

4.3%

4.5%

4.4%

4.1%

4.4%

4.3%

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TABLE 20: U.S. Tech Talent Workforce by Race/Ethnicity and Income Range (2020)

Total Tech Talent, All Industries	All Races	White	Black	Asian	Hispanic	Other
Less than \$50K	29.7%	30.5%	39.2%	19.0%	37.5%	31.8%
\$50-\$100K	36.5%	37.0%	39.8%	30.5%	40.2%	40.3%
\$100-\$150K	21.9%	21.2%	15.5%	31.0%	15.3%	18.0%
\$150-\$200K	7.0%	6.7%	4.1%	11.0%	4.4%	5.4%
\$200K+	4.9%	4.6%	1.4%	8.5%	2.7%	4.5%

Female Tech Talent, All Industries	All Races	White	Black	Asian	Hispanic	Other
Less than \$50K	37.3%	38.9%	40.5%	26.0%	48.2%	41.7%
\$50-\$100K	38.5%	40.1%	40.7%	33.8%	37.2%	39.2%
\$100-\$150K	17.9%	16.2%	15.6%	27.5%	10.4%	13.3%
\$150-\$200K	4.1%	3.2%	3.2%	7.5%	3.2%	3.2%
\$200K+	2.2%	1.6%	0.1%	5.1%	0.9%	2.6%

Male Tech Talent, All Industries	All Races	White	Black	Asian	Hispanic	Other
Less than \$50K	27.1%	28.0%	38.5%	16.1%	33.9%	28.5%
\$50-\$100K	35.8%	36.1%	39.4%	29.2%	41.2%	40.7%
\$100-\$150K	23.3%	22.7%	15.4%	32.3%	16.9%	19.6%
\$150-\$200K	8.0%	7.7%	4.6%	12.4%	4.8%	6.1%
\$200K+	5.8%	5.5%	2.1%	9.9%	3.2%	5.2%

TABLE 21: U.S. Software Engineers by Race/Ethnicity and Income Range (2020)

Total Software Engineers, All Industries	All Races	White	Black	Asian	Hispanic	Other
Less than \$50K	20.6%	22.5%	23.5%	14.6%	26.5%	22.2%
\$50-\$100K	31.9%	33.0%	38.6%	26.2%	37.1%	38.1%
\$100-\$150K	28.5%	26.9%	26.0%	34.1%	23.1%	24.2%
\$150-\$200K	10.7%	10.0%	7.2%	13.8%	7.6%	8.1%
\$200K+	8.4%	7.6%	4.6%	11.3%	5.7%	7.5%

Female Software Engineers, All Industries	All Races	White	Black	Asian	Hispanic	Other
Less than \$50K	26.9%	29.7%	26.4%	21.6%	35.1%	30.8%
\$50-\$100K	35.7%	40.4%	43.3%	29.1%	34.4%	32.6%
\$100-\$150K	25.9%	21.9%	25.4%	31.6%	22.3%	26.8%
\$150-\$200K	6.6%	4.7%	4.9%	9.4%	7.2%	3.4%
\$200K+	4.9%	3.2%	0.0%	8.3%	0.9%	6.3%

Male Software Engineers, All Industries	All Races	White	Black	Asian	Hispanic	Other
Less than \$50K	19.1%	21.1%	22.3%	12.1%	24.8%	20.3%
\$50-\$100K	30.9%	31.6%	36.8%	25.2%	37.6%	39.2%
\$100-\$150K	29.1%	27.9%	26.3%	34.9%	23.2%	23.7%
\$150-\$200K	11.7%	11.0%	8.1%	15.3%	7.7%	9.0%
\$200K+	9.2%	8.4%	6.4%	12.4%	6.7%	7.7%

Source: U.S. Census, IPUMS and CBRE Research, May 2022.

Source: U.S. Census, IPUMS and CBRE Research, May 2022.

TABLE 22: Underrepresented Race/Ethnic Groups in U.S. Tech Talent Workforce by Market (2020)

Workforce Size	Market	Difference*	Tech Talent Share of Underrepresented Groups**	Office-Using Share of Underrepresented Groups**
Most Diverse				
Large Tech	Tampa	2.4%	33.5%	31.1%
Talent Markets	Boston	1.4%	16.1%	14.7%
(> 50,000 WORKIOFCE)	Salt Lake City	-3.4%	13.8%	17.1%
	South Florida	-3.7%	60.1%	63.8%
	Seattle	-4.1%	12.9%	17.0%
Small Tech	Pittsburgh	1.4%	12.8%	11.3%
Talent Markets	Jacksonville	0.7%	33.2%	32.5%
(< 50,000 WORKIOICE)	Virginia Beach	0.4%	36.8%	36.4%
	Richmond	0.0%	28.3%	28.3%
	Sacramento	-2.5%	26.6%	29.1%
Least Diverse				
Large Tech	Los Angeles/Orange Co.	-14.3%	27.9%	42.2%
Talent Markets	Houston	-13.9%	30.8%	44.7%
(> 50,000 WORKIOFCE)	Austin	-10.7%	21.1%	31.8%
	San Diego	-10.6%	20.6%	31.2%
	Dallas/Ft. Worth	-10.3%	26.3%	36.6%
Small Tech	San Antonio	-16.4%	45.5%	61.9%
Talent Markets	Inland Empire	-13.7%	40.4%	54.1%
(SO,000 WORKIOFCE)	Madison	-7.4%	6.6%	14.1%
	Indianapolis	-6.0%	12.0%	18.0%
	Orlando	-5.3%	36.5%	41.9%

*Difference calculation: tech talent Share minus Office-Using Share Benchmark **Hispanic, Black, Other Non-White/Non-Asian Source: U.S. Census, IPUMS and CBRE Research, May 2022.

TABLE 23: Females in U.S. Tech Talent Workforce by Market (2020)

Workforce Size	Market	Difference*	Tech Talent Share of Underrepresented Groups	Office-Using Share of Underrepresented Groups
Most Diverse				
Large Tech	Washington, D.C.	-17.9%	31.4%	49.3%
Talent Markets	SF Bay Area	-18.6%	25.1%	43.7%
(> 50,000 WORKINCE)	Portland	-19.3%	28.0%	47.4%
	Detroit	-21.6%	27.7%	49.3%
	Dallas/Ft. Worth	-21.8%	26.8%	48.6%
Small Tech	Madison	-14.1%	33.2%	47.3%
Talent Markets	Sacramento	-18.5%	32.6%	51.1%
(< 50,000 WORKIDICE)	Jacksonville	-21.6%	34.4%	56.0%
	Virginia Beach	-21.7%	31.7%	53.4%
	Orlando	-24.2%	25.9%	50.1%
Least Diverse				
Large Tech	Kansas City	-28.4%	23.4%	51.8%
Talent Markets	Los Angeles/Orange Co.	-27.3%	22.8%	50.1%
(> 50,000 WORKINCE)	Salt Lake City	-26.9%	18.1%	45.0%
	South Florida	-26.7%	24.3%	51.0%
	Baltimore	-26.3%	23.5%	49.8%
Small Tech	Cleveland	-32.4%	18.5%	50.9%
Talent Markets	Milwaukee	-31.8%	20.8%	52.6%
(~ JO,OOO WOLKIOICE)	Hartford	-31.7%	19.9%	51.6%
	Indianapolis	-29.3%	23.0%	52.3%
	San Antonio	-28.8%	22.6%	51.4%

*Difference calculation: tech talent Share minus Office-Using Share Benchmark Source: U.S. Census, IPUMS and CBRE Research, May 2022.

TABLE 24: U.S. Tech Degree Graduate's Race/Ethnicity & Sex (2020)

Bachelor's Degree or Higher

		S	ex		Race/Ethnicity				
Year	Total Graduates	Male	Female	White	Asian	Hisp	Black	Other	
2010	156,333	78.2%	21.8%	73.4%	10.4%	7.8%	7.2%	1.2%	
2011	166,344	78.1%	21.9%	70.0%	13.2%	8.3%	7.1%	1.5%	
2012	178,283	77.9%	22.1%	69.3%	12.9%	8.9%	7.1%	1.8%	
2013	192,191	77.8%	22.2%	67.8%	13.0%	9.3%	7.8%	2.2%	
2014	211,353	77.4%	22.6%	66.9%	12.8%	10.1%	7.4%	2.8%	
2015	233,970	76.9%	23.1%	65.9%	13.1%	10.4%	7.4%	3.2%	
2016	263,364	76.4%	23.6%	64.2%	14.1%	10.9%	7.2%	3.6%	
2017	288,446	76.1%	23.9%	62.9%	14.9%	11.4%	7.1%	3.8%	
2018	304,692	75.5%	24.5%	61.7%	15.6%	11.6%	7.1%	4.0%	
2019	318,659	75.1%	24.9%	60.3%	16.2%	12.1%	7.3%	4.2%	
2020	338,883	74.3%	25.7%	59.0%	16.7%	12.5%	7.2%	4.5%	

TABLE 25: U.S. Tech Degree Graduate's Race/Ethnicity & Sex by Market (2020)Bachelor's Degree or Higher

				Race/Ethnic	ity							
Market	Total Graduates	White	Asian	Underrepresented*	Hisp	Black	Other					
Most Diverse (High	est % Underrepresente	d Groups*)										
South Florida	3,074	22.5%	6.6%	70.9%	53.2%	14.3%	3.4%					
San Antonio	1,436	33.7%	7.8%	58.5%	46.4%	7.3%	5.3%					
Inland Empire	1,674	23.7%	27.2%	49.1%	40.4%	3.6%	5.1%					
Houston	2,887	29.5%	25.9%	44.7%	27.0%	14.4%	3.2%					
Orlando	2,985	53.0%	10.5%	36.5%	24.2%	8.0%	4.4%					
Least Diverse (Low	est % Underrepresente	d Groups*)										
Madison	2,437	78.3%	11.3%	10.5%	4.7%	1.1%	4.6%					
Columbus	2,561	78.1%	11.4%	10.5%	4.3%	2.5%	3.7%					
Cincinnati	2,271	83.3%	4.9%	11.8%	3.2%	5.4%	3.2%					
Detroit	6,822	67.2%	19.2%	13.6%	5.6%	3.8%	4.2%					
Raleigh-Durham	4,419	64.2%	20.3%	15.5%	5.1%	6.4%	4.0%					

		S	ex			S	ex
Market	Total Graduates	Men	Women	Market	Total Graduates	Men	
Most Diverse (Highe	est % Female)			Least Diverse (Higl	hest % Male)		
South Florida	3,074	22.5%	6.6%	Salt Lake City	7,220	86.1%	
San Antonio	1,436	33.7%	7.8%	Orlando	2,985	83.1%	
Inland Empire	1,674	23.7%	27.2%	San Antonio	1,436	80.8%	
Houston	2,887	29.5%	25.9%	Kansas City	867	79.6%	
Orlando	2,985	53.0%	10.5%	Milwaukee	1,424	79.1%	

*Aggregate of Hispanic, Black, Other Non-White/Non-Asian

Note: Total tech degree graduates and male/female breakdown includes U.S. resident and foreigners. Race/ethnicity breakdown excludes unknown races and foreigners. Source: IPEDS and CBRE Research, April 2022.

Note: Total tech degree graduates and male/female breakdown includes U.S. resident and foreigners. Race/ethnicity breakdown excludes unknown races and foreigners. Source: IPEDS and CBRE Research, April 2022.

TABLE 26: Tech Talent by Type: Software Developers & Programmers

Ranked by % of Tech Talent

Market	Software Developers & Programmers	% of Tech Talent	Market	Software Developers & Programmers	% of Tech Talent
Seattle	113,550	59.9%	Phoenix	36,980	37.1%
SF Bay Area	182,300	48.1%	San Diego	28,870	37.1%
Vancouver	52,600	45.6%	Orlando	15,670	36.6%
Milwaukee	15,970	45.4%	Pittsburgh	15,890	36.2%
Salt Lake City	25,000	44.7%	Portland	24,310	36.1%
Boston	74,370	44.7%	Richmond	9,660	36.0%
Waterloo Region, Canada	10,700	44.6%	St. Louis	19,270	35.7%
Raleigh-Durham	30,740	44.5%	Dallas/Ft. Worth	66,740	35.5%
Minneapolis/St. Paul	43,910	43.5%	Washington, D.C.	90,980	35.1%
New York Metro	148,090	43.0%	South Florida	23,360	35.0%
Madison	10,340	43.0%	Atlanta	50,290	34.7%
Philadelphia	48,530	42.0%	Ottawa	27,800	34.2%
Charlotte	25,240	40.7%	Tampa	17,400	33.3%
Kansas City	21,030	40.1%	Jacksonville	7,320	33.1%
Hartford	10,330	39.4%	Montreal	46,500	31.2%
Detroit	36,870	39.3%	Houston	30,440	30.8%
Columbus	19,670	39.0%	Nashville	10,890	30.2%
Cincinnati	15,010	38.8%	Baltimore	23,800	30.1%
Indianapolis	15,500	38.6%	Virginia Beach	8,460	29.1%
Chicago	64,510	38.5%	Inland Empire	7,280	29.1%
Cleveland	15,520	38.3%	Sacramento	12,240	28.1%
Los Angeles/Orange Co.	90,130	38.2%	San Antonio	8,560	26.1%
Denver	44,890	38.2%	Edmonton	8,400	25.9%
Austin	31,940	37.7%	Quebec City	8,700	24.4%
Toronto	109,200	37.7%	Calgary	8,700	21.4%

Note: Software Developers & Programmers include: computer programmers; software application developers, software systems software developers and web developers. Source: U.S. Bureau of Labor Statistics, Statistics Canada, April 2022.

TABLE 27: Tech Talent by Type: Computer, Support Database & Systems

Ranked by % of Tech Talent

Market	Computer, Support Database & Systems	% of Tech Talent	Market	Computer, Support Database & Systems	% of Tech Talent
Quebec City	21,400	59.9%	Madison	10,910	45.3%
San Antonio	19,050	58.2%	Orlando	19,430	45.3%
Sacramento	23,000	52.8%	Kansas City	23,490	44.7%
Nashville	19,020	52.7%	Austin	37,400	44.2%
Baltimore	41,500	52.5%	Phoenix	43,940	44.1%
Calgary	21,000	51.7%	Pittsburgh	19,370	44.1%
Washington, D.C.	134,000	51.7%	Charlotte	27,100	43.7%
Edmonton	16,700	51.5%	Ottawa	35,300	43.5%
Richmond	13,640	50.8%	Philadelphia	49,160	42.6%
Virginia Beach	14,740	50.8%	Denver	49,890	42.4%
Jacksonville	11,010	49.8%	Minneapolis/St. Paul	42,590	42.2%
St. Louis	26,730	49.6%	Salt Lake City	23,420	41.9%
Atlanta	71,700	49.4%	Waterloo Region, Canada	9,900	41.3%
Indianapolis	19,800	49.4%	New York Metro	139,940	40.6%
Tampa	25,730	49.3%	Los Angeles/Orange Co.	93,340	39.6%
Columbus	24,730	49.1%	Milwaukee	13,900	39.5%
Inland Empire	12,150	48.6%	Hartford	10,350	39.5%
Houston	48,070	48.6%	Vancouver	42,600	36.9%
Cleveland	19,600	48.3%	Detroit	36,330	38.7%
South Florida	31,930	47.9%	Raleigh-Durham	26,610	38.5%
Cincinnati	18,120	46.9%	San Diego	27,590	35.5%
Montreal	69,800	46.9%	Boston	57,410	34.5%
Dallas/Ft. Worth	87,580	46.6%	Portland	22,810	33.8%
Toronto	133,600	46.1%	SF Bay Area	113,050	29.8%
Chicago	75,990	45.4%	Seattle	52,880	27.9%

Note: Computer Support, Database & Systems include: computer and information research scientists, computer systems analysts, information security analysts, database administrators, network and computer systems administrators, computer network architects, computer user support specialists, computer network support specialists and all other computer occupations.

TABLE 28: Tech Talent by Type: Computer & Information Systems Managers

Ranked by % of Tech Talent

Market	Computer & Information Systems Managers	% of Tech Talent	Market	Computer & Information Systems Managers	% of Tech Talent
Hartford	4,100	15.7%	Detroit	7,580	8.1%
SF Bay Area	45,620	12.0%	Jacksonville	1,780	8.1%
Boston	19,180	11.5%	Minneapolis/St. Paul	8,030	8.0%
Nashville	4,020	11.1%	Houston	7,630	7.7%
New York Metro	37,530	10.9%	Salt Lake City	4,250	7.6%
Ottawa	8,800	10.8%	Baltimore	5,780	7.3%
Los Angeles/Orange Co.	24,990	10.6%	Cincinnati	2,780	7.2%
Calgary	4,000	9.9%	Vancouver	7,800	6.8%
Portland	6,390	9.5%	Cleveland	2,780	6.9%
Phoenix	9,270	9.3%	Washington, D.C.	17,620	6.8%
South Florida	6,190	9.3%	Denver	7,920	6.7%
San Diego	7,220	9.3%	Indianapolis	2,690	6.7%
Pittsburgh	3,990	9.1%	San Antonio	2,170	6.6%
Charlotte	5,620	9.1%	Toronto	19,000	6.6%
Raleigh-Durham	6,250	9.1%	St. Louis	3,440	6.4%
Chicago	15,130	9.0%	Kansas City	3,310	6.3%
Sacramento	3,800	8.7%	Columbus	3,130	6.2%
Atlanta	12,560	8.7%	Montreal	9,200	6.2%
Edmonton	2,800	8.6%	Richmond	1,630	6.1%
Dallas/Ft. Worth	15,980	8.5%	Seattle	11,220	5.9%
Philadelphia	9,740	8.4%	Waterloo Region, Canada	1,300	5.4%
Austin	6,930	8.2%	Madison	1,270	5.3%
Tampa	4,270	8.2%	Milwaukee	1,850	5.3%
Inland Empire	2,030	8.1%	Virginia Beach	1,330	4.6%
Orlando	3,480	8.1%	Quebec City	1,500	4.2%

Source: U.S. Bureau of Labor Statistics, Statistics Canada, April 2022.

TABLE 29: Tech Talent by Type: Technology Engineering-Related

Ranked by % of Tech Talent

Market	Technology Engineering-Related	% of Tech Talent	Market	Technology Engineering-Related	% of Tech Talent	Occupation Pools
Portland	13,900	20.6%	Tampa	4,840	9.3%	Tech talent Employees*
San Diego	14,100	18.1%	San Antonio	2,980	9.1%	Support Non-Tech Employees
Calgary	6,900	17.0%	Jacksonville	2,000	9.0%	(excluding Management)
Montreal	23,400	15.7%	Kansas City	4,670	8.9%	Management
Virginia Beach	4,510	15.5%	Waterloo Region	2,100	8.8%	
Inland Empire	3,540	14.2%	St. Louis	4,470	8.3%	
Edmonton	4,500	13.9%	Raleigh-Durham	5,450	7.9%	
Detroit	12,990	13.9%	South Florida	5,180	7.8%	
Houston	12,790	12.9%	Atlanta	10,530	7.3%	
Denver	14,920	12.7%	Richmond	1,940	7.2%	
Los Angeles/Orange Co.	27,340	11.6%	Chicago	11,930	7.1%	
Quebec City	4,100	11.5%	Cincinnati	2,740	7.1%	
Ottawa	9,300	11.5%	Philadelphia	8,020	6.9%	
Vancouver	12,400	10.7%	Cleveland	2,640	6.5%	
Pittsburgh	4,660	10.6%	Washington, D.C.	16,710	6.4%	
Sacramento	4,490	10.3%	Charlotte	3,990	6.4%	
Baltimore	7,920	10.0%	Madison	1,540	6.4%	
SF Bay Area	37,900	10.0%	Minneapolis/St. Paul	6,460	6.4%	
Orlando	4,280	10.0%	Columbus	3,220	6.4%	
Austin	8,410	9.9%	Seattle	11,920	6.3%	
Milwaukee	3,430	9.8%	Nashville	2,180	6.0%	
Toronto	27,900	9.6%	Salt Lake City	3,260	5.8%	
Phoenix	9,410	9.4%	New York Metro	18,960	5.5%	
Dallas/Ft. Worth	17,650	9.4%	Hartford	1,410	5.4%	
Boston	15,490	9.3%	Indianapolis	2,130	5.3%	

TABLE 30: Average U.S. Tech Company Occupation Pools 500 Employees

Note: Technology Engineering-Related includes: computer programmers; computer hardware engineers, electrical engineers, electronics engineers except computer, electrical and electronics drafters, electrical and electronics engineering technicians and electro-mechanical technicians. Source: U.S. Bureau of Labor Statistics, Statistics Canada, April 2022. *Tech talent includes the following occupation categories: software developers and programmers; computer support, database and systems; technology and engineering related; and computer information system managers. Source: U.S. Bureau of Labor Statistics (National), April 2022.

Employees	% of Tech Talent Labor
235	47%
199	40%
66	13%

TABLE 31: Estimated One-Year Costs by Market: Wage and Rent Obligation for Typical Tech Firm

Tech Firm Estimates: 500 Employees, 75,000 Sq. Ft. of Office Space

Market	Rent Cost (Avg. Rent x 75,000 SF)	Tech Talent Wages (Avg. Wage x 235 People)	Support Non-Tech Wages (Avg. Wage x 199 People)	Management Wage (Avg. Wage x 66 People)	Total	Market	Rent Cost (Avg. Rent x 75,000 SF)	Tech Talent Wages (Avg. Wage x 235 People)	Support Non-Tech Wages (Avg. Wage x 199 People)	Management Wage (Avg. Wage x 66 People)	Total
SF Bay Area	\$5,206,149	\$32,878,133	\$16,399,910	\$14,734,830	\$69,219,022	San Antonio	\$1,797,750	\$21,962,524	\$9,784,155	\$9,636,000	\$43,180,429
New York Metro	\$5,808,443	\$27,644,699	\$13,714,003	\$13,384,800	\$60,551,944	Orlando	\$1,944,840	\$21,238,742	\$9,922,019	\$9,892,080	\$42,997,680
Seattle	\$3,194,250	\$28,750,167	\$13,851,523	\$12,223,860	\$58,019,799	Tampa	\$2,317,103	\$20,961,497	\$9,921,738	\$9,758,760	\$42,959,099
Washington, D.C.	\$3,124,500	\$26,753,706	\$14,542,903	\$11,712,360	\$56,133,469	Columbus	\$1,549,936	\$21,790,823	\$9,790,512	\$9,665,700	\$42,796,971
Boston	\$3,168,000	\$26,342,628	\$13,372,185	\$11,352,660	\$54,235,473	Virginia Beach	\$1,531,500	\$21,217,040	\$10,074,558	\$9,712,560	\$42,535,658
San Diego	\$2,833,769	\$25,055,016	\$12,001,293	\$11,464,200	\$51,354,278	Pittsburgh	\$1,725,000	\$20,863,061	\$10,255,476	\$9,620,820	\$42,464,357
Los Angeles/Orange Co.	\$3,220,428	\$24,616,355	\$11,841,354	\$11,557,590	\$51,235,727	Detroit	\$1,463,250	\$20,819,059	\$10,846,025	\$9,335,370	\$42,463,704
Denver	\$2,384,177	\$23,874,385	\$12,939,473	\$11,229,240	\$50,427,276	Cleveland	\$1,403,250	\$21,014,557	\$10,366,026	\$9,644,580	\$42,428,413
Sacramento	\$1,890,000	\$25,100,751	\$11,757,270	\$10,784,400	\$49,532,420	Cincinnati	\$1,439,250	\$20,700,571	\$10,455,240	\$9,782,520	\$42,377,581
Baltimore	\$1,776,000	\$25,537,112	\$11,734,582	\$10,198,980	\$49,246,674	St. Louis	\$1,644,750	\$20,902,163	\$10,393,899	\$9,431,400	\$42,372,213
Austin	\$3,383,285	\$23,031,470	\$11,090,937	\$10,522,380	\$48,028,072	Salt Lake City	\$1,893,767	\$21,174,728	\$9,909,341	\$9,333,060	\$42,310,896
Chicago	\$2,686,133	\$23,444,339	\$11,379,764	\$10,376,520	\$47,886,756	Madison	\$1,528,500	\$20,627,126	\$10,763,775	\$9,339,000	\$42,258,401
Raleigh-Durham	\$2,293,500	\$23,660,535	\$11,781,384	\$10,135,290	\$47,870,709	Milwaukee	\$1,514,168	\$20,207,461	\$10,580,675	\$9,918,480	\$42,220,784
Hartford	\$2,593,500	\$23,698,857	\$11,478,195	\$10,063,020	\$47,833,572	Kansas City	\$1,578,160	\$20,243,854	\$10,629,581	\$9,222,840	\$41,674,435
Minneapolis/St. Paul	\$2,092,554	\$23,088,124	\$12,051,152	\$10,498,620	\$47,730,450	Jacksonville	\$1,664,485	\$20,645,067	\$9,706,622	\$9,197,100	\$41,213,274
Atlanta	\$2,211,000	\$23,691,812	\$11,018,383	\$10,723,020	\$47,644,215	Nashville	\$2,150,250	\$20,260,907	\$9,528,130	\$9,005,040	\$40,944,327
Dallas/Ft. Worth	\$2,052,750	\$24,330,039	\$10,728,445	\$10,494,660	\$47,605,894	Indianapolis	\$1,590,000	\$19,699,181	\$10,497,709	\$8,718,600	\$40,505,489
Portland	\$2,397,000	\$23,608,846	\$11,611,794	\$9,665,700	\$47,283,340	Waterloo Region, Canada*	\$2,004,000	\$18,381,629	\$9,739,132	\$5,863,591	\$35,988,352
Philadelphia	\$2,161,170	\$22,988,150	\$11,363,347	\$10,695,300	\$47,207,967	Ottawa*	\$1,988,528	\$17,093,655	\$10,691,359	\$6,187,972	\$35,961,513
Charlotte	\$2,420,257	\$23,235,626	\$10,910,268	\$10,621,380	\$47,187,531	Calgary*	\$1,698,789	\$16,546,572	\$10,993,918	\$6,545,443	\$35,784,722
Houston	\$2,358,846	\$22,963,020	\$10,654,234	\$10,478,160	\$46,454,260	Vancouver*	\$3,078,691	\$16,747,869	\$9,436,573	\$6,242,403	\$35,505,536
Phoenix	\$2,150,250	\$22,627,881	\$10,384,875	\$10,425,360	\$45,588,366	Edmonton*	\$1,929,064	\$16,493,416	\$10,160,488	\$6,885,830	\$35,468,798
Richmond	\$1,515,750	\$22,203,780	\$10,788,051	\$10,668,900	\$45,176,481	Toronto*	\$2,682,268	\$16,120,961	\$9,710,052	\$6,219,984	\$34,733,265
Inland Empire	\$1,755,000	\$22,303,341	\$10,418,517	\$10,049,160	\$44,526,019	Montreal*	\$2,110,370	\$15,509,397	\$9,201,764	\$5,811,314	\$32,632,845
South Florida	\$3,063,593	\$21,139,651	\$9,807,135	\$9,286,860	\$43,297,240	Quebec City*	\$1,518,650	\$14,935,645	\$9,568,517	\$6,085,522	\$32,108,334

*in US\$

Source: U.S. Bureau of Labor Statistics, April 2022, Canada Statistics April 2022, CBRE Research (Metro), Q4 2021.

TABLE 32: Office Asking Rent by Market (Q4 2021)

Market	Annual Gross Direct Asking Rent (US\$)	Office Rent 5 Yr. Growth	Market	Annual Gross Direct Asking Rent (US\$)	Office Rent 5 Yr. Growth
New York Metro	\$77.45	14%	Dallas/Ft. Worth	\$27.37	25%
SF Bay Area	\$69.42	15%	Waterloo Region, Canada	\$26.72	14%
Austin	\$45.11	21%	Ottawa	\$26.51	9%
Los Angeles/Orange Co.	\$42.94	16%	Orlando	\$25.93	14%
Seattle	\$42.59	17%	Edmonton	\$25.72	22%
Boston	\$42.24	14%	Salt Lake City	\$25.25	16%
Washington, D.C.	\$41.66	19%	Sacramento	\$25.20	13%
Vancouver	\$41.05	7%	San Antonio	\$23.97	17%
South Florida	\$40.85	18%	Baltimore	\$23.68	17%
San Diego	\$37.78	13%	Inland Empire	\$23.40	10%
Chicago	\$35.82	22%	Pittsburgh	\$23.00	17%
Toronto	\$35.76	14%	Calgary	\$22.65	30%
Hartford	\$34.58	24%	Jacksonville	\$22.19	22%
Charlotte	\$32.27	16%	St. Louis	\$21.93	13%
Portland	\$31.96	19%	Indianapolis	\$21.20	19%
Denver	\$31.79	19%	Kansas City	\$21.04	14%
Houston	\$31.45	25%	Columbus	\$20.67	20%
Tampa	\$30.89	18%	Virginia Beach	\$20.42	11%
Raleigh-Durham	\$30.58	11%	Madison	\$20.38	8%
Atlanta	\$29.48	23%	Quebec City	\$20.25	10%
Philadelphia	\$28.82	19%	Richmond	\$20.21	10%
Nashville	\$28.67	18%	Milwaukee	\$20.19	14%
Phoenix	\$28.67	20%	Detroit	\$19.51	16%
Montreal	\$28.14	15%	Cincinnati	\$19.19	19%
Minneapolis/St. Paul	\$27.90	21%	Cleveland	\$18.71	15%

Note: New York represents Manhattan only, all others are metro area. Source: CBRE Research (Office Market), Q4 2021.

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TABLE 33: Office Vacancy Rate by Market (Q4 2021)

Market	Vacancy Rate	5 Yrs. Ago (Q4 2016)	Market	Vacancy Rate	5 Yrs. Ago (Q4 2016)
Vancouver	7.0%	10.7%	Seattle	16.5%	8.1%
Madison	8.4%	6.3%	San Antonio	16.7%	16.2%
Ottawa	8.6%	11.1%	Pittsburgh	16.8%	9.6%
Quebec City	9.5%	8.8%	Baltimore	16.8%	13.6%
Richmond	9.8%	11.0%	South Florida	17.9%	12.0%
Inland Empire	10.2%	12.7%	Tampa	18.2%	11.7%
Virginia Beach	10.6%	12.0%	Nashville	18.3%	5.5%
Raleigh-Durham	11.1%	7.2%	Denver	18.9%	12.9%
St. Louis	13.2%	9.9%	Cincinnati	18.9%	15.0%
San Diego	13.3%	12.1%	Indianapolis	19.0%	12.6%
Sacramento	13.4%	15.2%	Washington, D.C.	19.1%	15.4%
Orlando	13.7%	10.5%	Portland	19.4%	10.2%
Toronto	13.9%	9.2%	Philadelphia	19.4%	11.0%
Waterloo Region, Canada	14.0%	14.6%	Columbus	19.5%	12.1%
New York Metro	14.0%	8.0%	Phoenix	19.8%	16.4%
Kansas City	14.2%	12.4%	Austin	20.7%	7.7%
Milwaukee	14.4%	13.6%	Minneapolis/St. Paul	21.1%	15.9%
Boston	14.4%	9.5%	Edmonton	21.6%	17.8%
Cleveland	14.8%	10.9%	Jacksonville	21.7%	12.0%
Montreal	15.0%	13.8%	Chicago	22.5%	14.0%
SF Bay Area	15.5%	7.7%	Atlanta	22.6%	15.1%
Salt Lake City	15.7%	10.0%	Hartford	23.7%	17.5%
Los Angeles/Orange Co.	16.0%	12.7%	Houston	24.8%	19.9%
Detroit	16.2%	15.9%	Dallas/Ft. Worth	25.3%	17.5%
Charlotte	16.4%	10.4%	Calgary	30.4%	23.7%

Note: New York represents Manhattan only, all others are metro area. Source: CBRE Research (Office Market), Q4 2021.

TABLE 34: Tech Talent Wages by Market (2021)

U.S. Average = 100%

Market	Average Tech Talent Wage	Wage Relative to U.S. Average	Talent Wage 5 Yr. Growth	Market	Average Tech Talent Wage	Wage Relative to U.S. Average	Talent Wage 5 Yr. Growth
SF Bay Area	\$139,907	137%	16%	Columbus	\$92,727	91%	1%
Seattle	\$122,341	120%	9%	Orlando	\$90,378	88%	11%
New York Metro	\$117,637	115%	11%	Virginia Beach	\$90,285	88%	7%
Washington, D.C.	\$113,846	111%	5%	Salt Lake City	\$90,105	88%	10%
Boston	\$112,096	109%	8%	South Florida	\$89,956	88%	16%
Baltimore	\$108,669	106%	10%	Cleveland	\$89,424	87%	14%
Sacramento	\$106,812	104%	17%	Tampa	\$89,198	87%	15%
San Diego	\$106,617	104%	7%	St. Louis	\$88,945	87%	2%
Los Angeles/Orange Co.	\$104,750	102%	8%	Pittsburgh	\$88,779	87%	11%
Dallas/Ft. Worth	\$103,532	101%	13%	Detroit	\$88,592	87%	5%
Hartford	\$100,846	99%	6%	Cincinnati	\$88,088	86%	6%
Atlanta	\$100,816	98%	10%	Jacksonville	\$87,851	86%	9%
Raleigh-Durham	\$100,683	98%	9%	Madison	\$87,775	86%	13%
Denver	\$101,593	99%	3%	Nashville	\$86,217	84%	10%
Portland	\$100,463	98%	13%	Kansas City	\$86,144	84%	4%
Chicago	\$99,763	97%	10%	Milwaukee	\$85,989	84%	9%
Charlotte	\$98,875	97%	7%	Indianapolis	\$83,826	82%	8%
Minneapolis/St. Paul	\$98,247	96%	8%	Waterloo Region, Canada*	\$78,220	76%	25%
Austin	\$98,006	96%	8%	Ottawa*	\$72,739	71%	11%
Philadelphia	\$97,822	96%	4%	Vancouver*	\$71,268	70%	17%
Houston	\$97,715	95%	4%	Calgary*	\$70,411	69%	1%
Phoenix	\$96,289	94%	12%	Edmonton*	\$70,185	69%	5%
Inland Empire	\$94,908	93%	23%	Toronto*	\$68,600	67%	7%
Richmond	\$94,484	92%	5%	Montreal*	\$65,997	64%	14%
San Antonio	\$93,458	91%	7%	Quebec City*	\$63,556	62%	15%

*data in US\$ Source: U.S. Bureau of Labor Statistics (Metro), Statistics Canada (Metro), April 2022.

TABLE 35: Tech Wage to Apartment Rent Ratio (US\$)

Market	Annualized Apt. Rent (2021)	Average Annual Tech Wage (2021)	Rent-to-Tech Wage Ratio	Market	Annualized Apt. Rent (2021)	Average Annual Tech Wage (2021)	Rent-to-Tech Wage Ratio
New York Metro	\$37,686	\$117,637	32.0%	Hartford	\$18,468	\$100,846	18.3%
Los Angeles/Orange Co.	\$30,653	\$104,750	29.3%	Ottawa	\$13,077	\$72,739	18.0%
South Florida	\$25,374	\$89,956	28.2%	Virginia Beach	\$15,948	\$90,285	17.7%
San Diego	\$28,872	\$106,617	27.1%	Charlotte	\$17,160	\$98,875	17.4%
Boston	\$29,333	\$112,096	26.2%	Pittsburgh	\$15,360	\$88,779	17.3%
Inland Empire	\$24,192	\$94,908	25.5%	Baltimore	\$18,636	\$108,669	17.1%
SF Bay Area	\$33,316	\$139,907	23.8%	Minneapolis/St. Paul	\$16,788	\$98,247	17.1%
Tampa	\$19,620	\$89,198	22.0%	Raleigh-Durham	\$17,148	\$100,683	17.0%
Toronto	\$14,560	\$68,600	21.2%	Richmond	\$15,996	\$94,484	16.9%
Orlando	\$18,888	\$90,378	20.9%	Madison	\$14,832	\$87,775	16.9%
Sacramento	\$22,320	\$106,812	20.9%	Dallas/Ft. Worth	\$16,932	\$103,532	16.4%
Denver	\$21,229	\$101,593	20.9%	Calgary	\$11,398	\$70,411	16.2%
Nashville	\$17,748	\$86,217	20.6%	Detroit	\$13,836	\$88,592	15.6%
Vancouver	\$14,337	\$71,268	20.1%	Waterloo Region, Canada	\$12,191	\$78,220	15.6%
Chicago	\$19,920	\$99,763	20.0%	Edmonton	\$10,801	\$70,185	15.4%
Washington, D.C.	\$22,716	\$113,846	20.0%	Indianapolis	\$12,852	\$83,826	15.3%
Phoenix	\$19,260	\$96,289	20.0%	Kansas City	\$13,200	\$86,144	15.3%
Seattle	\$24,156	\$122,341	19.7%	Cincinnati	\$13,392	\$88,088	15.2%
Salt Lake City	\$17,720	\$90,105	19.7%	Houston	\$14,772	\$97,715	15.1%
Portland	\$19,536	\$100,463	19.4%	St. Louis	\$13,308	\$88,945	15.0%
Philadelphia	\$19,008	\$97,822	19.4%	San Antonio	\$13,932	\$93,458	14.9%
Jacksonville	\$17,064	\$87,851	19.4%	Columbus	\$13,608	\$92,727	14.7%
Austin	\$18,720	\$98,006	19.1%	Cleveland	\$12,768	\$89,424	14.3%
Atlanta	\$19,032	\$100,816	18.9%	Quebec City	\$8,535	\$63,556	13.4%
Milwaukee	\$15,612	\$85,989	18.2%	Montreal	\$8,516	\$65,997	12.9%

*in US\$

Note: New York represents Manhattan only, all others are metro area.

Source: U.S. Bureau of Labor Statistics April 2022, Statistics Canada April 2022, CBRE Econometric Advisors, Axiometrics, CMHC Q4 2021.

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Visit the Scoring Tech Talent website for an interactive report overview.

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