LinkedIn Workforce Report | United States | August 2018

With over 150 million LinkedIn members in the United States, we have unique insight into the real-time dynamics of Americans starting new jobs, learning new skills, and moving to new cities. This month's LinkedIn Workforce Report looks at our latest national data on hiring, skills, and migration trends through July 2018. For more insight into localized employment trends in 20 of the largest U.S. metro areas, check out this month's reports for: Atlanta, Austin, Boston, Chicago, Cleveland-Akron, Dallas-Ft. Worth, Denver, Detroit, Houston, Los Angeles, Miami-Ft. Lauderdale, Minneapolis-St. Paul, Nashville, New York City, Philadelphia, Phoenix, San Francisco Bay Area, Seattle, St. Louis, and Washington, D.C.

Our vision is to create economic opportunity for every member of the global workforce. Whether you're a worker, an employer, a new grad, or a policymaker, we hope you'll use these insights to better understand and navigate the dynamics of today's economy.

Key Insights

- **Hiring | Summer of strong hiring continues through July** – Nationally, across all industries, gross hiring in the U.S. was 4.6% higher than in July 2017. Seasonally-adjusted national hiring was up 0.5% in July from June 2018. The industries with the biggest year-over-year hiring increases in June were agriculture (26% higher); manufacturing (12.3% higher); and transportation & logistics (12% higher). Hiring in these sectors is running strong today, but they are also among the most vulnerable to a trade war escalation.

- **Skills Gaps | Demand for data scientists is off the charts** – In 2015, there was a national surplus of people with data science skills. An employer in Dallas or Atlanta who wanted to hire data scientists had plenty of options; aside from in a few tech or finance-heavy cities like San Francisco, New York City and Boston, there weren't many local shortages. But today, 3 years later, the picture has changed markedly: data science skills shortages are present in almost every large U.S. city. Nationally, we have a shortage of 151,717 people with data science skills, with particularly acute shortages in New York City (34,032 people), the San Francisco Bay Area (31,798 people), and Los Angeles (12,251 people). As more industries rely on big data to make decisions, data science has become increasingly important across all industries, not just tech and finance. In that sense, it's a good proxy for how today's cutting-edge skills like AI & machine learning may spread to other industries and geographies in the future.

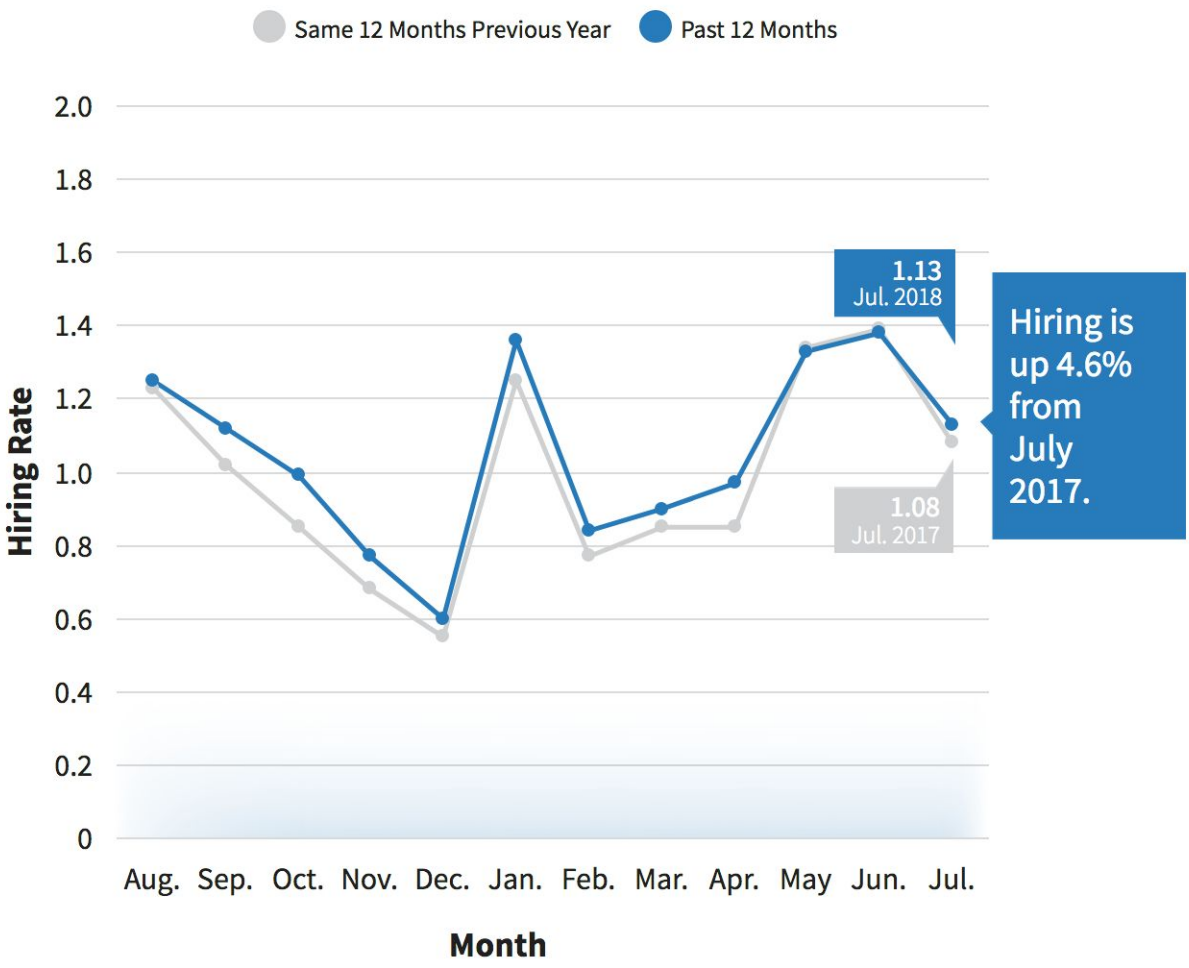
- **Migration | Austin's job market has never been hotter –** In July, hiring in Austin, TX, was up 14.3% from last year. The strong job market is drawing people from all over the country, bringing Austin to #1 on our ranking of U.S. cities attracting the most workers. For every 10,000 LinkedIn members in Austin today, 105 arrived in the past 12 months. Of those arrivals, 10.5% are from Houston, 7.6% are from San Francisco, and 4.8% are from New York. Austin's thriving tech scene is a big magnet, as indicated by large skills shortages in development tools and data storage technologies. But the city also has severe shortages in non-domain-specific skills like oral communication and digital literacy.

Hiring | Summer of strong hiring continues through July

The LinkedIn hiring rate is a measure of gross hires divided by LinkedIn membership. Nationally, across all industries, gross hiring in the U.S. was 4.6% higher than in July 2017.

August 2018

Hiring on LinkedIn in the United States



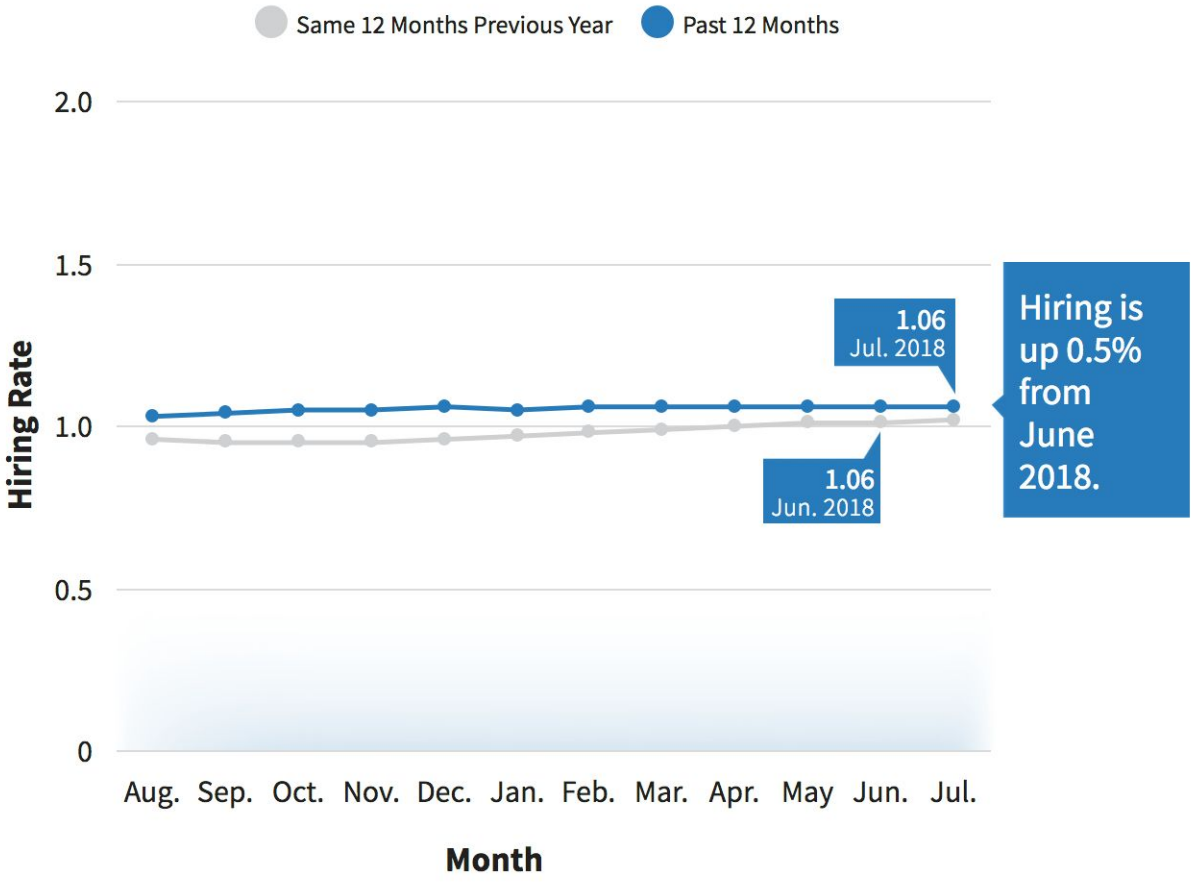
"Hiring Rate" is the percentage of LinkedIn members who added a new employer to their profile in the same month the new job began, divided by the total number of LinkedIn members in the U.S. By only analyzing the timeliest data, we can make month-to-month comparisons and account for any potential lags in members updating their profiles. This number is indexed to the average month in 2015-2016; for example, an index of 1.05 indicates a hiring rate that is 5% higher than the average month in 2015-2016.

Seasonally-adjusted national hiring was up 0.5% in July from June 2018.

August 2018

Seasonally Adjusted Hiring on LinkedIn in the United States

Using the U.S. Census Bureau's method to calculate seasonal adjustment, we remove predictable seasonal hiring variations to allow for easier comparison between months and analysis of emerging hiring trends.



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The industries with the biggest year-over-year hiring increases in July were agriculture (26% higher); manufacturing (12.3% higher); and transportation & logistics (12% higher). These sectors are running strong today, but they are also among the most vulnerable to a trade war escalation.

(Note: This month we updated our industry taxonomy from 13 industry groupings to 24 industry groupings, in order to provide more granular insights. Let us know if you have any feedback on the new format!)

Table 1: Hiring on LinkedIn by Industry, through July 2018

Industry	LinkedIn Hiring Rate	July 2017	...	April 2018	May 2018	June 2018	July 2018	% Change
Agriculture	Non-seasonally Adjusted	0.97	...	1.29	1.95	1.44	1.22	**+26% YoY**
	Seasonally Adjusted	1.08	...	1.20	1.22	1.21	1.23	**+1.2% MoM**
Arts	Non-seasonally Adjusted	0.91	...	0.76	1.18	1.20	0.88	**-4% YoY**
	Seasonally Adjusted	0.92	...	0.92	0.92	0.92	0.91	**-1.2% MoM**
Construction	Non-seasonally Adjusted	1.10	...	1.21	1.67	1.43	1.15	**+4.4% YoY**
	Seasonally Adjusted	1.12	...	1.17	1.18	1.19	1.20	**+0.9% MoM**
Consumer Goods	Non-seasonally Adjusted	1.04	...	1.02	1.34	1.32	1.05	**+1% YoY**
	Seasonally Adjusted	1.02	...	1.04	1.05	1.01	1.02	**0.7% MoM**
Corporate Services	Non-seasonally Adjusted	1.03	...	0.95	1.18	1.48	1.13	**+9.7% YoY**
	Seasonally Adjusted	0.99	...	1.08	1.09	1.04	1.08	**+3.9% MoM**
Design	Non-seasonally Adjusted	0.94	...	0.90	1.36	1.32	1.00	**+6.3% YoY**
	Seasonally Adjusted	0.93	...	0.98	0.98	0.96	0.98	**1.4% MoM**
Education	Non-seasonally Adjusted	1.37	...	0.62	1.00	1.25	1.38	**+0.6% YoY**
	Seasonally Adjusted	1.03	...	1.06	1.06	1.05	1.05	**-0.1% MoM**
Energy &	Non-seasonally Adjusted	1.15	...	1.20	1.70	1.46	1.25	**+8.5% YoY**

Mining	Seasonally Adjusted	1.13	...	1.19	1.21	1.21	1.23	**1.6% MoM**
Entertainment	Non-seasonally Adjusted	0.87	...	0.83	1.19	1.25	0.85	**-2.5% YoY**
	Seasonally Adjusted	0.92	...	0.95	0.93	0.90	0.89	**-1.7% MoM**
Finance	Non-seasonally Adjusted	1.10	...	1.04	1.41	1.65	1.18	**+7.3% YoY**
	Seasonally Adjusted	1.02	...	1.08	1.09	1.07	1.09	**1.7% MoM**
Hardware & Networking	Non-seasonally Adjusted	1.03	...	0.90	1.25	1.24	1.00	**-3.2% YoY**
	Seasonally Adjusted	0.97	...	0.92	0.95	0.92	0.93	**+0.3% MoM**
Health Care	Non-seasonally Adjusted	1.16	...	0.96	1.20	1.28	1.20	**+2.6% YoY**
	Seasonally Adjusted	0.99	...	1.02	1.02	1.02	1.02	**+0.2% MoM**
Legal	Non-seasonally Adjusted	0.86	...	0.86	1.74	1.17	0.88	**+3.3% YoY**
	Seasonally Adjusted	0.97	...	1.00	0.99	0.99	0.99	**+0.2% MoM**
Manufacturing	Non-seasonally Adjusted	1.06	...	1.11	1.63	1.48	1.19	**+12.3% YoY**
	Seasonally Adjusted	1.06	...	1.14	1.14	1.15	1.16	**+1.1% MoM**
Media & Communications	Non-seasonally Adjusted	0.89	...	0.89	1.24	1.33	0.91	**+2.2% YoY**
	Seasonally Adjusted	0.94	...	0.97	0.97	0.93	0.94	**+0.8% MoM**
Nonprofit	Non-seasonally Adjusted	1.02	...	0.84	1.26	1.34	1.01	**-1% YoY**
	Seasonally Adjusted	1.01	...	1.02	1.01	1.01	1.00	**-0.4% MoM**
Public Administration	Non-seasonally Adjusted	0.92	...	0.82	1.40	1.40	0.98	**+6.5% YoY**
	Seasonally Adjusted	0.94	...	1.03	1.04	1.00	0.98	**-2.1% MoM**

Public Safety	Non-seasonally Adjusted	1.20	...	0.95	1.34	1.34	1.28	**+6.6% YoY**
	Seasonally Adjusted	1.00	...	1.06	1.04	1.05	1.06	**+1.2% MoM**
Real Estate	Non-seasonally Adjusted	1.12	...	1.26	1.43	1.37	1.18	**+5.2%YoY**
	Seasonally Adjusted	1.16	...	1.23	1.21	1.19	1.20	**+1.3% MoM**
Recreation & Travel	Non-seasonally Adjusted	1.01	...	1.13	1.59	1.37	1.06	**+5% YoY**
	Seasonally Adjusted	1.07	...	1.11	1.11	1.09	1.10	**+0.5% MoM**
Retail	Non-seasonally Adjusted	1.01	...	0.98	1.30	1.30	1.03	**+2% YoY**
	Seasonally Adjusted	1.00	...	1.03	1.04	1.02	1.03	**+0.7% MoM**
Software & IT Services	Non-seasonally Adjusted	1.09	...	1.07	1.30	1.41	1.18	**+7.5% YoY**
	Seasonally Adjusted	1.02	...	1.07	1.08	1.06	1.08	**+2.4% MoM**
Transportation & Logistics	Non-seasonally Adjusted	1.13	...	1.20	1.54	1.48	1.26	**+12% YoY**
	Seasonally Adjusted	1.11	...	1.20	1.21	1.19	1.22	**+2% MoM**
Wellness & Fitness	Non-seasonally Adjusted	1.08	...	1.01	1.28	1.27	1.11	**+2.8% YoY**
	Seasonally Adjusted	1.05	...	1.08	1.07	1.06	1.07	**+0.8% MoM**

Methodology: "Hiring Rate" is the count of hires (LinkedIn members in each industry who added a new employer to their profile in the same month the new job began), divided by the total number of LinkedIn members in the U.S. By only analyzing the timeliest data, we can make accurate month-to-month comparisons and account for any potential lags in members updating their profiles. This number is indexed to the average month in 2015-2016 for each industry; for example, an index of 1.05 indicates a hiring rate that is 5% higher than the average month in 2015-2016.

Skills Gaps | Demand for data scientists is off the charts

In 2015, there was a national surplus of people with data science skills. An employer in Dallas or Atlanta who wanted to hire data scientists had plenty of options; aside from in a few tech or finance-heavy cities like San Francisco, New York City and Boston, there weren't many local shortages.

But today, 3 years later, the picture has changed markedly: data science skills shortages are present in almost every large U.S. city. Nationally, we have a shortage of 151,717 people with data science skills, with particularly acute shortages in New York City (34,032 people), the San Francisco Bay Area (31,798 people), and Los Angeles (12,251 people). As more industries rely on big data to make decisions, data science has become increasingly important across all industries, not just tech and finance. In that sense, it's a good proxy for how today's cutting-edge skills like AI & machine learning may spread to other industries and geographies in the future.

Table 2: The intensification of local shortages for data science skills, July 2015 to July 2018

	Metro Area	July 2015	July 2018	3Y Delta
1	New York City, NY	+4,132	+34,032	+29,900
2	San Francisco Bay Area, CA	+10,995	+31,798	+20,803
3	Los Angeles, CA	+425	+12,251	+11,826
4	Boston, MA	+1,667	+11,276	+9,609
5	Seattle, WA	+1,182	+9,688	+8,506
6	Chicago, IL	-1,826	+5,925	+7,751
7	Washington, D.C.	+735	+7,686	+6,951
8	Dallas-Ft. Worth, TX	-2,496	+3,641	+6,137
9	Atlanta, GA	-2,301	+3,350	+5,651
10	Austin, TX	+26	+4,949	+4,923

Methodology: This table ranks U.S. metro areas by the intensification of their skills gap for data science skills between July 2015 and July 2018, and shares the shortage (+) or surplus (-) of people with data science skills in each metro area, and the associated delta over three years. A skills gap is a mismatch between the skills employers need (demand) and the skills workers have (supply). Skill supply is calculated as the number of members in a city who have listed a certain skill on their profiles. Our skill demand measure comes from a weighted combination of the skills that appear in job postings on LinkedIn and the frequency that members in a city with a certain skill are hired relative to members without that skill.

This shortage of people with data science skills is smaller, but growing faster, than the national shortage of software development skills (which includes programming languages, like C++ and Java). Today there's a shortage of 212,838 people with software development skills. But 3 years ago, software development skills were *already* in shortage nationally—so the "intensification" of the shortage for data science is actually larger than that for software development.

There are still cities in the U.S. today with surpluses of data science skills, where an employer could potentially find and recruit from untapped talent pools, but they are few and far between. The ten biggest cities with data science skills surpluses are Cleveland-Akron (1,206 people), Minneapolis (832 people), Cincinnati (770 people), Greensboro-Winston Salem (601 people), Kansas City (521 people), Milwaukee (430 people), Memphis (331

people), Dayton (323 people), Birmingham (308 people), and Louisville (247 people). But these surpluses are all relatively small and narrowing rapidly. There is a big opportunity for people who are interested in data science to learn new skills and successfully find a job in this in-demand field.

(Note: This month we updated the skills gap methodology in the LinkedIn Workforce Report to include absolute headcounts to precisely measure skills gaps. To learn more about this updated methodology, see here.)

A skills gap is the gap between supply and demand for a specific skill, in a specific local labor market, at a specific point in time. That means that skills gaps are fundamentally local, and specific to the supply and demand of individual skills within a labor market. The U.S. cities with the largest skills gaps overall are New York City, San Francisco Bay Area, and Los Angeles.

August 2018

Cities with the Largest Skills Gaps

1 New York City, NY
1,285,175 people

2 San Francisco Bay Area, CA
1,088,634 people

3 Los Angeles, CA
576,587 people

4 Boston, MA
431,827 people

5 Chicago, IL
387,299 people

6 Washington, D.C.
381,255 people

7 Seattle, WA
357,995 people

8 Philadelphia, PA
246,807 people

9 Dallas-Ft. Worth, TX
242,741 people

10 Atlanta, GA
237,068 people

A skills gap is a mismatch between the skills employers need (demand) and the skills workers have (supply). Our skill demand measure comes from a weighted combination of the skills that appear in job postings on LinkedIn and the frequency that members in a city with a certain skill are hired relative to members without that skill. Skill supply is calculated as the number of members in a city who have listed a certain skill on their profiles. To develop the list of cities with the largest skills gaps, we aggregated and ranked the gross headcount of all skills in shortage and in surplus, by city.

LinkedIn

New York City, the San Francisco Bay Area, and Los Angeles also see the greatest *shortages* across all skills. To see which skills are driving these massive shortages, check out our localized reports.

August 2018

Cities with the Largest Skills Shortages

1 New York City, NY
1,090,586 people

2 San Francisco Bay Area, CA
1,070,307 people

3 Los Angeles, CA
505,893 people

4 Boston, MA
368,744 people

5 Seattle, WA
336,185 people

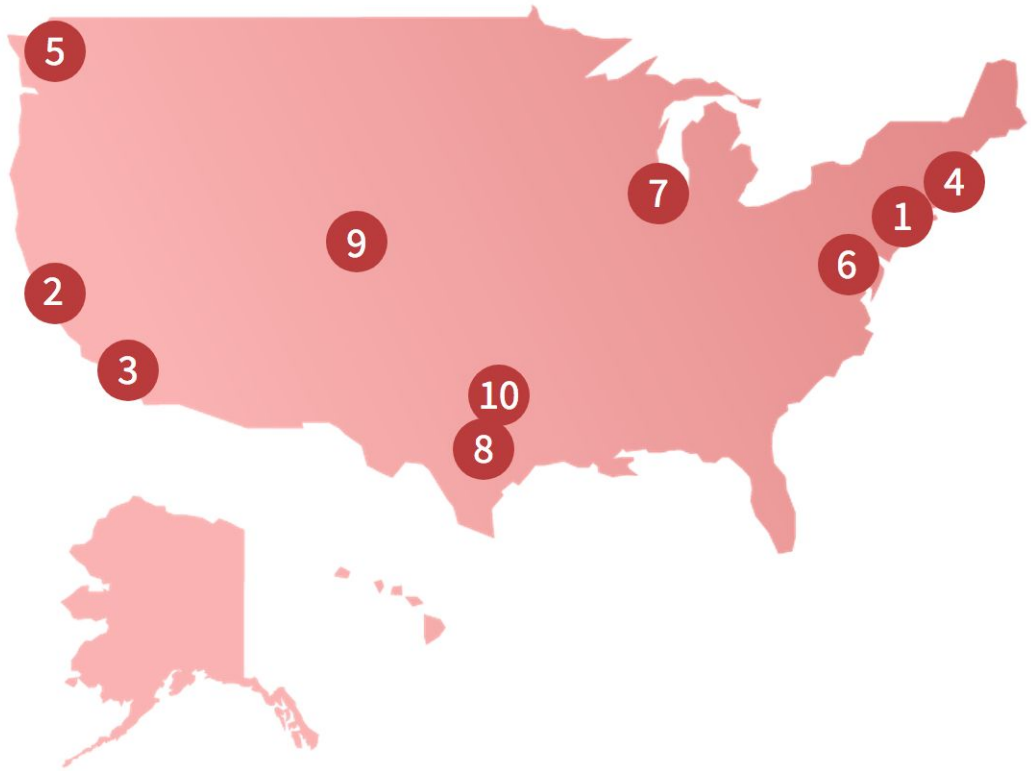
6 Washington, D.C.
275,602 people

7 Chicago, IL
220,955 people

8 Austin, TX
213,053 people

9 Denver, CO
191,837 people

10 Dallas-Ft. Worth, TX
158,403 people



A skills gap is a mismatch between the skills employers need (demand) and the skills workers have (supply). Within a city, a skill is in shortage when employer demand exceeds local worker supply of that particular skill. Our skill demand measure comes from a weighted combination of the skills that appear in job postings on LinkedIn and the frequency that members in a city with a certain skill are hired relative to members without that skill. Skill supply is calculated as the number of members in a city who have listed a certain skill on their profiles. To develop the list of cities with the largest skills shortages, we aggregated and ranked the gross headcounts of all skills in shortage, by city.

LinkedIn

The cities with the greatest surpluses across all skills are New York City, Chicago, and Philadelphia. You'll notice that New York City has the biggest shortages *and* surpluses; because it is the most populous city, its shortages and surpluses have greater magnitudes.

August 2018

Cities with the Largest Skills Surpluses

1 New York City, NY
194,588 people

2 Chicago, IL
166,344 people

3 Philadelphia, PA
165,582 people

4 Houston, TX
157,344 people

5 Minneapolis-St. Paul, MN
135,257 people

6 Detroit, MI
130,663 people

7 Cleveland-Akron, OH
115,236 people

8 Atlanta, GA
113,558 people

9 Washington, D.C.
105,654 people

10 St. Louis, MO
91,627 people

A skills gap is a mismatch between the skills employers need (demand) and the skills workers have (supply). Within a city, a skill is in surplus when worker supply exceeds local employer demand for that particular skill. Our skill demand measure comes from a weighted combination of the skills that appear in job postings on LinkedIn and the frequency that members in a city with a certain skill are hired relative to members without that skill. Skill supply is calculated as the number of members in a city who have listed a certain skill on their profiles. To develop the list of cities with the largest skills shortages, we aggregated and ranked the gross headcounts of all skills in surplus, by city.

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Check out our localized reports for Atlanta, Austin, Boston, Chicago, Cleveland-Akron, Dallas-Ft. Worth, Denver, Detroit, Houston, Los Angeles, Miami-Ft. Lauderdale, Minneapolis-St. Paul, Nashville, New York City, Philadelphia, Phoenix, San Francisco Bay Area, Seattle, St. Louis, and Washington, D.C., to see top skills in demand locally and other insights.

Migration | Austin's job market has never been hotter

In July 2018, hiring in Austin was up 14.3% from a year prior. The strong job market is drawing people from all over the country, bringing Austin to #1 on our ranking of U.S. cities attracting the most workers.

For every 10,000 LinkedIn members in Austin, TX, 105 arrived in the past 12 months. Of those arrivals, 10.5% are from Houston, 7.6% are from San Francisco, and 4.8% are from New York. Austin's thriving tech scene is a big magnet, as indicated by large skills shortages in development tools and data storage technologies. But the city also has severe shortages in non-domain-specific skills like oral communication and digital literacy.

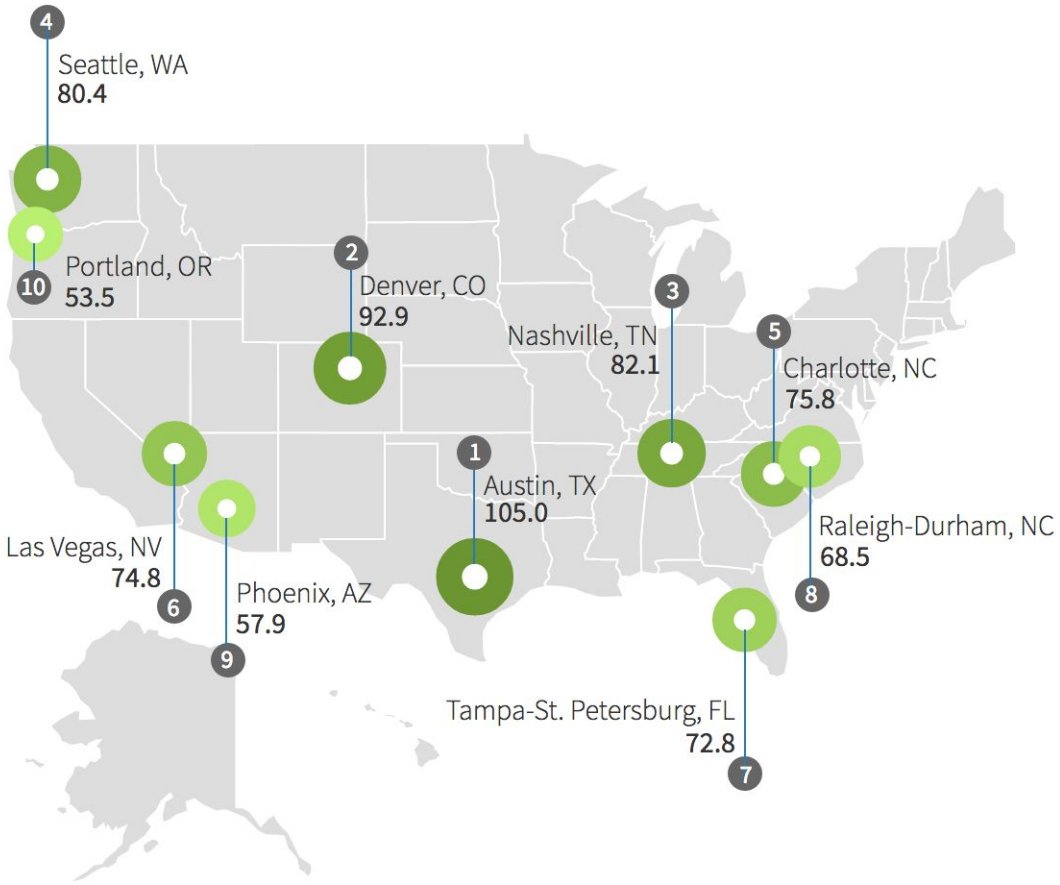
Overall, the U.S. cities gaining the most people are Austin, Denver, and Nashville. For every 10,000 LinkedIn members in Austin, 105 arrived in the last 12 months.

(Note: This month you'll notice some smaller U.S. cities pop up in our migration rankings. That's because we have updated our migration methodology to include movements between all cities, rather than between the 50 largest U.S. cities as in previous reports.)

August 2018

Cities that Gained the Most Workers

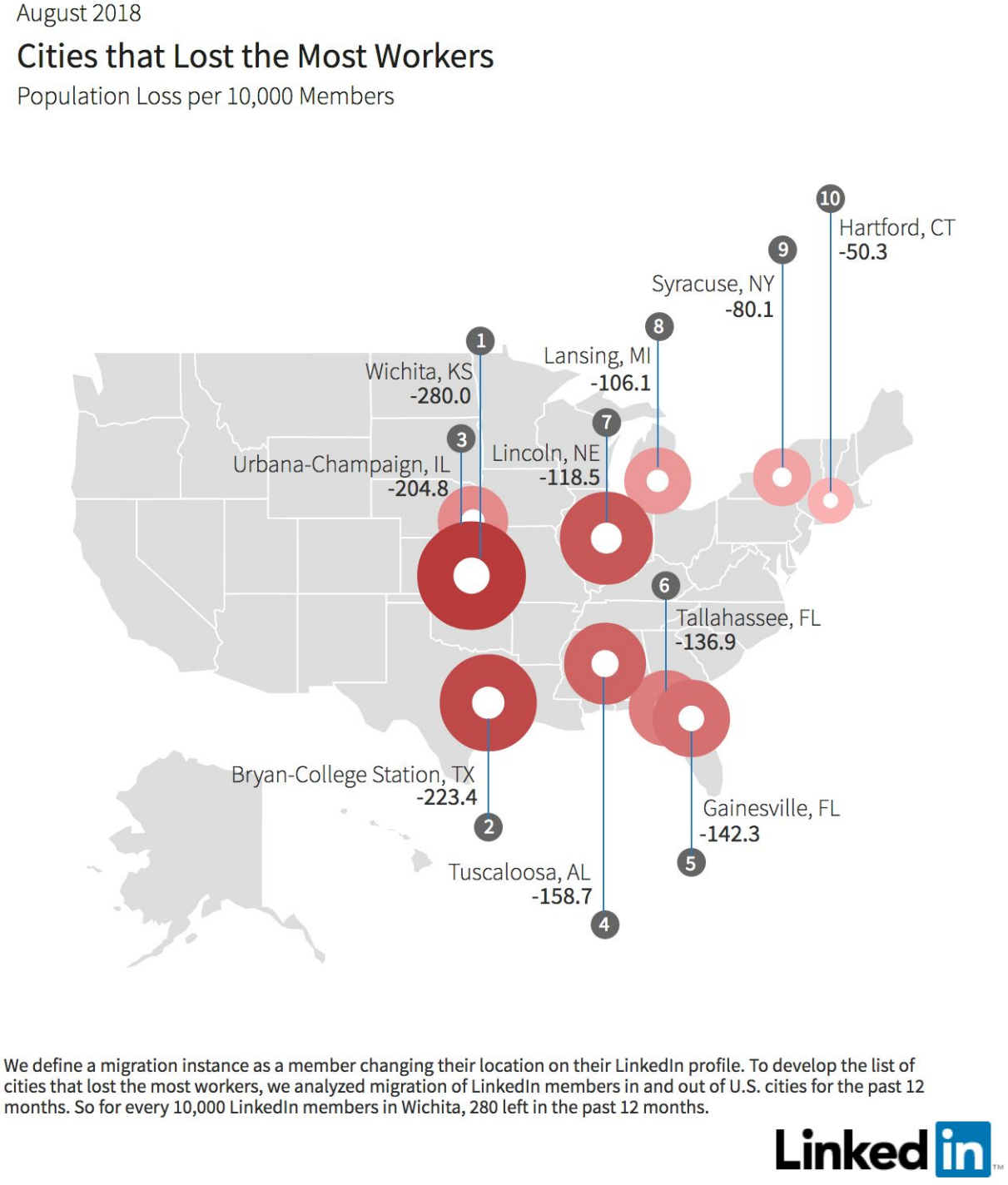
Population Gain per 10,000 Members



We define a migration instance as a member changing their location on their LinkedIn profile. To develop the list of cities that gained the most workers, we analyzed migration of LinkedIn members in and out of U.S. cities for the past 12 months. So for every 10,000 LinkedIn members in Austin, 105 arrived in the past 12 months.

LinkedIn

The cities losing the most people are Wichita, Bryan-College Station, and Urbana-Champaign. For every 10,000 LinkedIn members in Wichita, 280 left in the past 12 months.

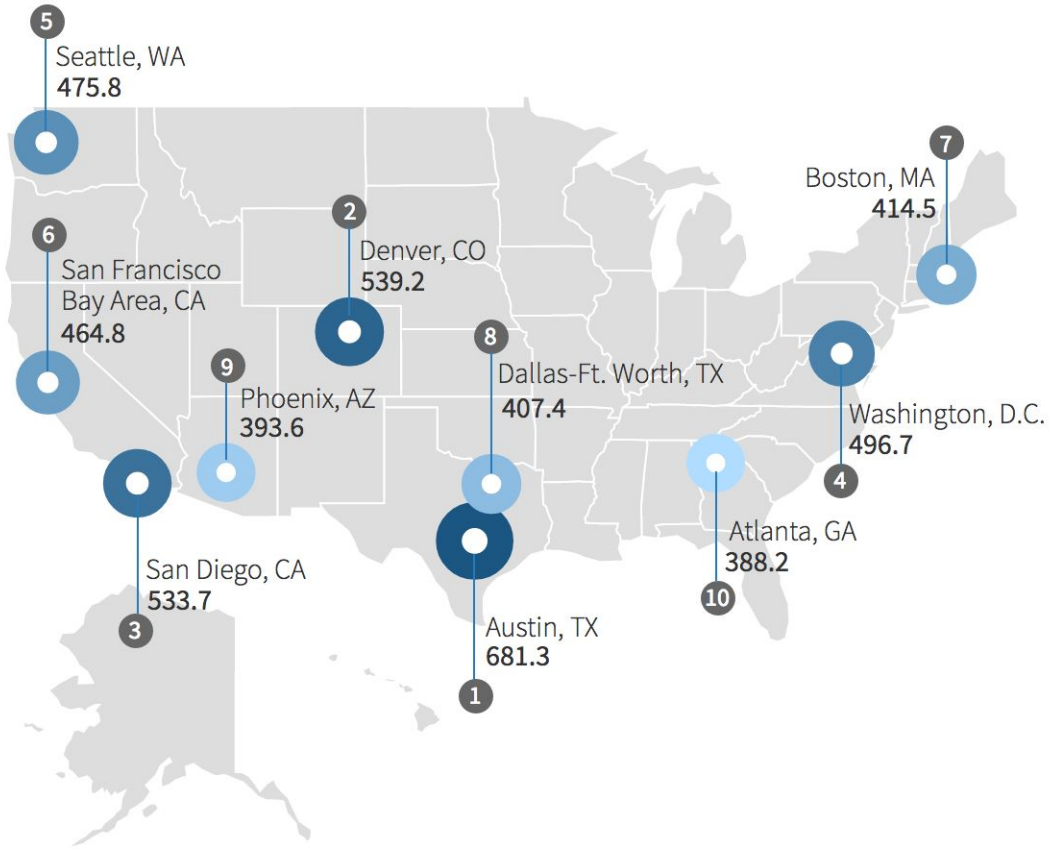


Austin, Denver, and San Diego are the U.S. cities experiencing the most total migration (workers moving into and out of a city). This list captures the most transient cities. For every 10,000 LinkedIn members in Austin, 681.3 arrived in or left the city in the last 12 months.

August 2018

Cities with the Most Migration

Migration per 10,000 Members



We define a migration instance as a member changing their location on their LinkedIn profile. To develop the list of cities with the most migration, we analyzed migration of LinkedIn members in and out of U.S. cities for the past 12 months. So for every 10,000 LinkedIn members in Austin, 681 arrived or departed in the past 12 months.

Check out our reports for Atlanta, Austin, Boston, Chicago, Cleveland-Akron, Dallas-Ft. Worth, Denver, Detroit, Houston, Los Angeles, Miami-Ft. Lauderdale, Minneapolis-St. Paul, Nashville, New York City, Philadelphia, Phoenix, San Francisco Bay Area, Seattle, St. Louis, and Washington, D.C., to see which skills are in shortage in those cities, and which jobs are open.