



# 2016 NYC TECH ECOSYSTEM

HR&A STUDY UPDATE

OCTOBER 2017

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# GUIDING STATEMENTS

## DIVERSE ECONOMY

Tech is core to NYC's major industries

## ACCESS TO TALENT

As tech needs diversify, NYC has the breadth and depth of talent to meet that need

## GROWING LABOR POOL

NYC produces, attracts, and retains high-quality tech talent

## TECH IS DISRUPTING ALL SYSTEMS OF URBAN LIFE

NYC is prepared to embrace its role as a “living laboratory”

## ACCESS TO CAPITAL AND ENTREPRENEURIAL RESOURCES

NYC enables tech entrepreneurship, with capital resources and access to key market segments to test concepts

## CULTURE OF PUBLIC SUPPORT

NYC provides strong public support to strengthen the ecosystem

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# NEW YORK CITY TECH ECOSYSTEM DEFINITION

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## TECH INDUSTRIES

- Is this industry enabled by tech?
- Does this industry primarily produce tech?



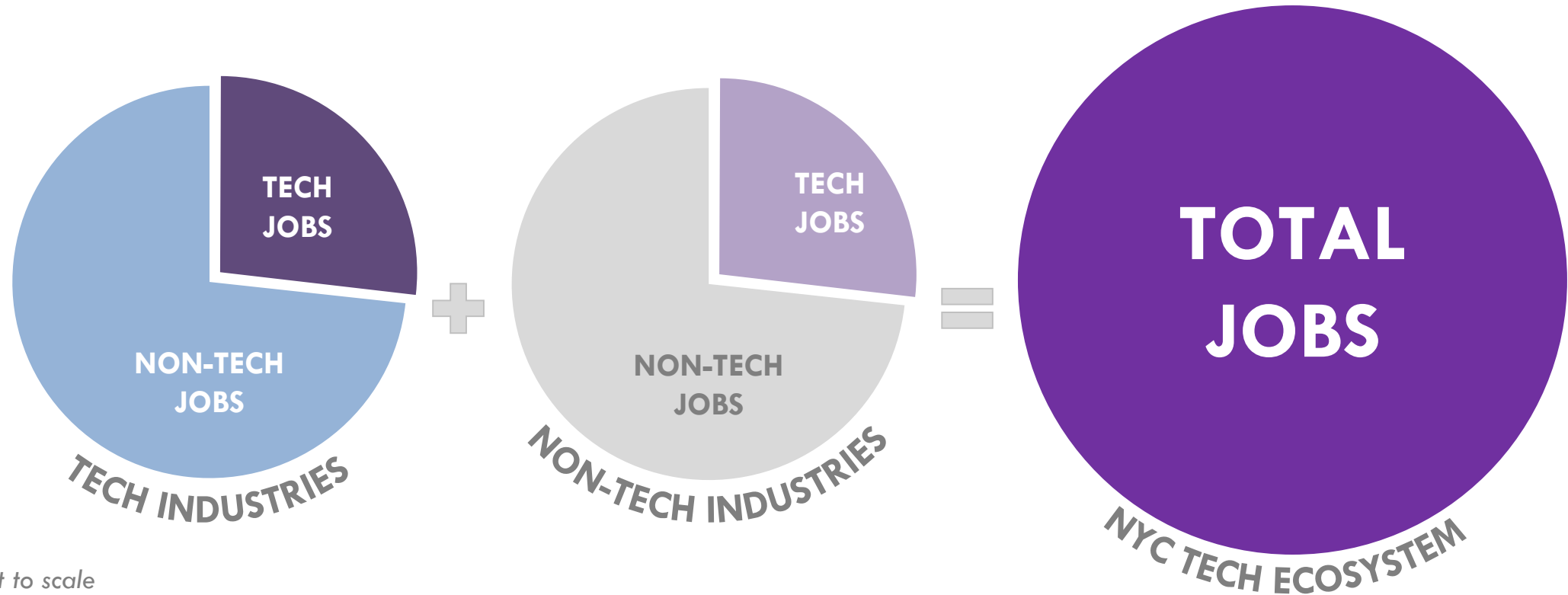
## TECH OCCUPATIONS

- Does this occupation directly produce tech?
- Does this occupation facilitate the use of tech by others?
- Would this occupation exist without the presence of tech?

While State and Federal labor data sources do not provide a formal definition for “tech jobs,” in an attempt to fully account for the wide range of occupations and industries that rely on tech in today’s economy, the definition used in this report uses the same methodology in the 2014 report *The New York City Tech Ecosystem* and includes industries and occupations that meet the above statements.

# NEW YORK CITY TECH ECOSYSTEM DEFINITION

NYC TECH ECOSYSTEM JOBS ARE DISTRIBUTED THROUGHOUT TECH AND NON-TECH INDUSTRIES AND OCCUPATIONS



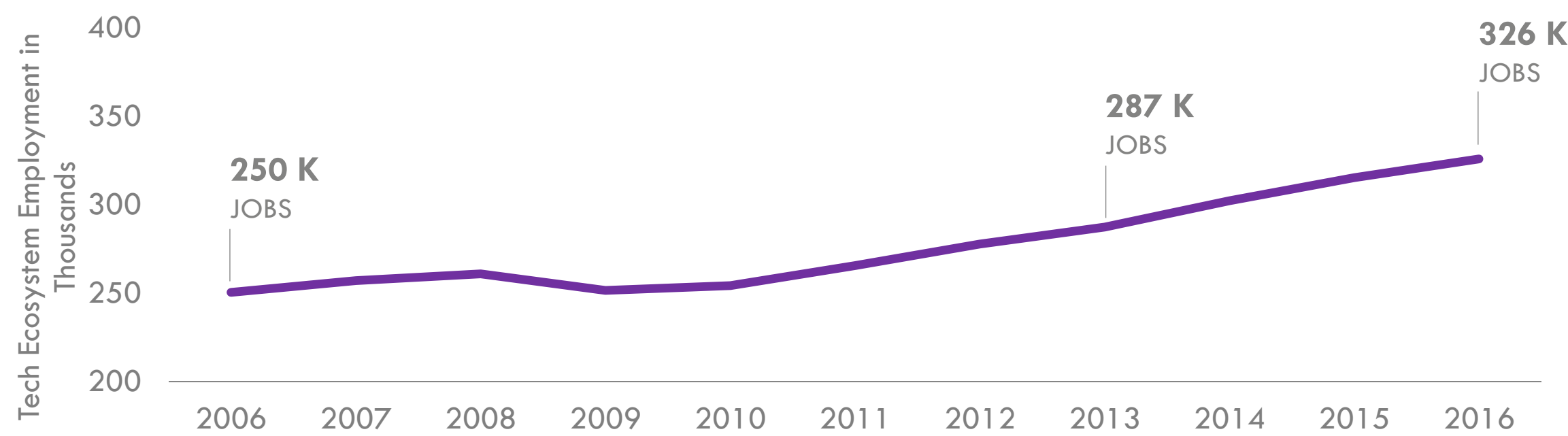
*Image not to scale*

Tech jobs fall into three buckets: 1) Tech Occupations in Tech Industries, 2) Tech Occupations in Non-Tech Industries, and 3) Non-Tech Occupations in Tech Industries.

# TECH ECOSYSTEM GROWTH

NYC’S TECH ECOSYSTEM HAS GAINED 76,000 JOBS IN THE PAST TEN YEARS & 39,000 JOBS IN THE PAST THREE YEARS

## TECH ECOSYSTEM JOB GROWTH (2006-2016)



Note: The 2014 report *The New York City Tech Ecosystem* quantified a 2013 Tech Ecosystem size of 291,000 jobs. Fluctuations in this figure are due to periodic updates in the underlying State and Federal labor data sources that comprise the EMSI data resource. This include updates to the BLS Quarterly Census of Employment and Wages, US Census American Community Survey, US Census County and Zip Code Business Patterns, and US Census Non-Employer Statistics.

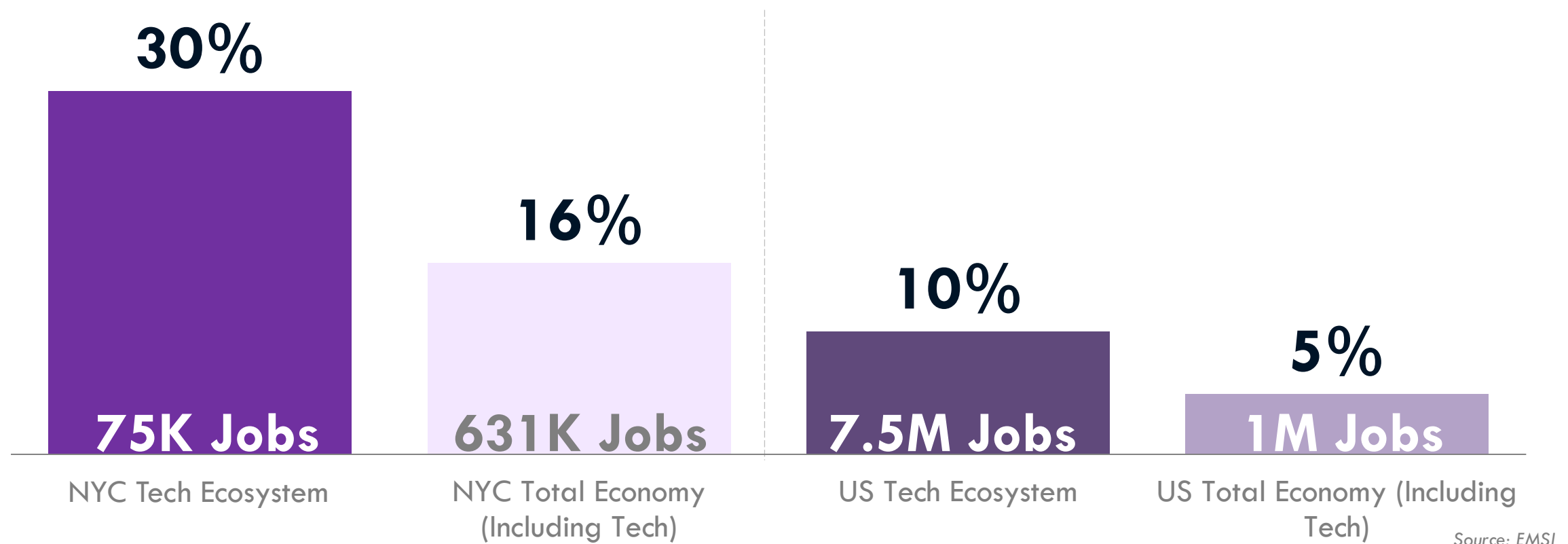
Source: EMSI



# TECH ECOSYSTEM GROWTH

NYC’S TECH ECOSYSTEM HAS GROWN NEARLY TWICE AS FAST AS NYC’S OVERALL ECONOMY, 3X FASTER THAN THE U.S. TECH ECOSYSTEM, AND 6X FASTER THAN THE OVERALL U.S. ECONOMY.

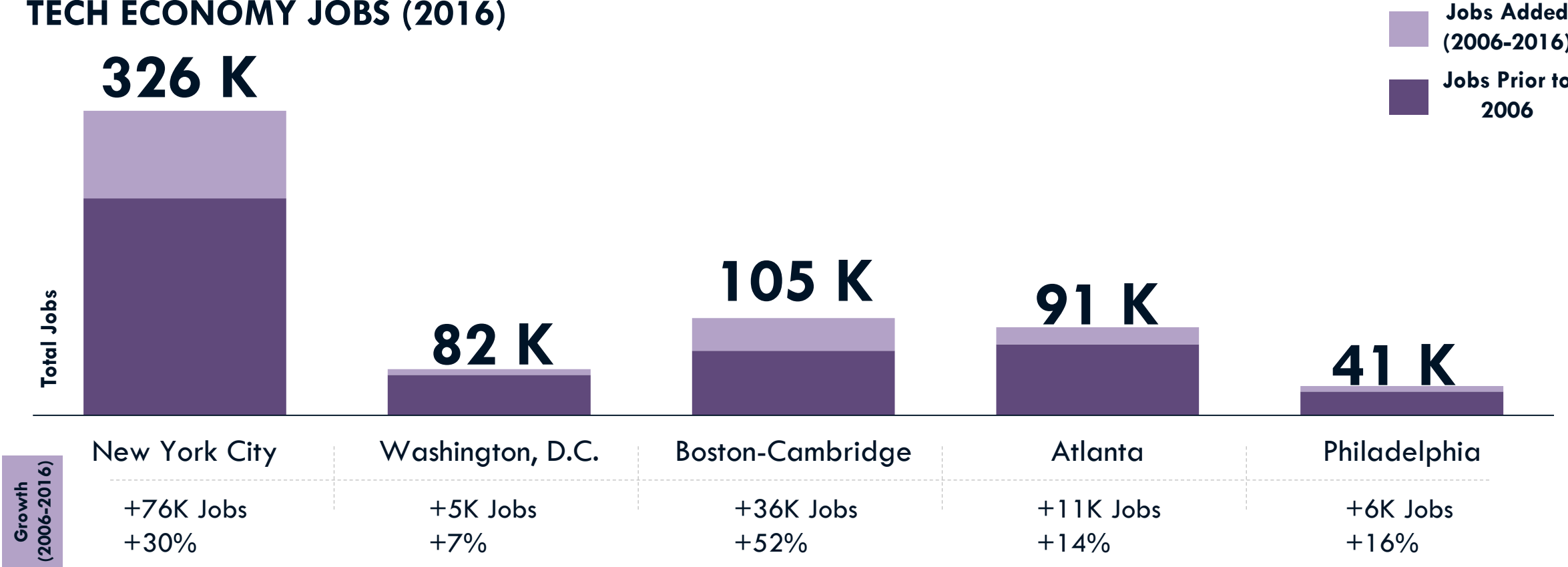
## TECH ECOSYSTEM JOB GROWTH 2006-2016



# TECH ECOSYSTEM COMPARED TO EAST COAST PEER CITIES

NYC'S TECH ECONOMY IS 3X THE NEAREST PEER CITY AND HAS GAINED TWICE THE NUMBER OF TECH JOBS

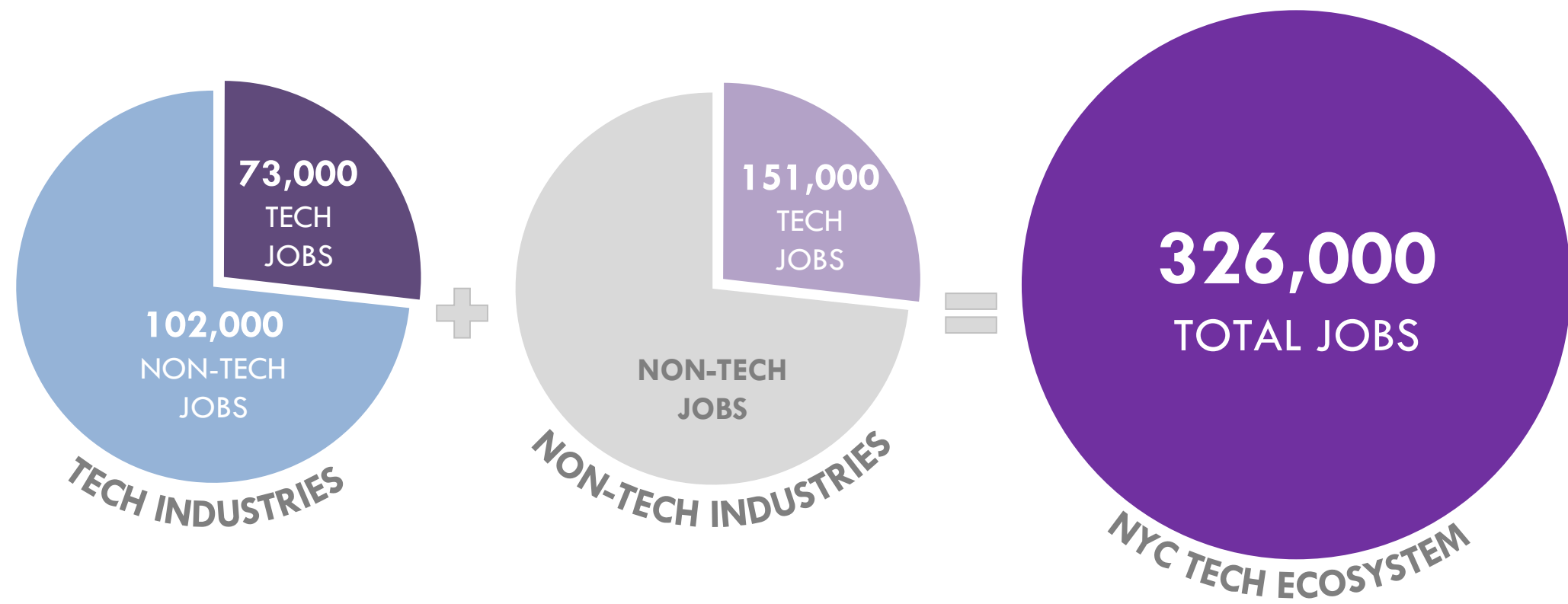
## TECH ECONOMY JOBS (2016)



Note: Geographical comparison by aggregated zip codes within city boundaries. The City of Boston in 2016 had 66K tech economy jobs, and saw 22K (51% growth) since 2006.

# NEW YORK CITY TECH ECOSYSTEM IN 2016

THE NYC TECH ECOSYSTEM HAS GROWN BY 39,000 JOBS SINCE 2013 (13% GROWTH)



Source: EMSI



# KEY GROWTH AREAS OF THE TECH ECOSYSTEM

NYC'S TECH INDUSTRIES CONTAIN A NUMBER OF SECTORS RELEVANT TO CORE BUSINESS WITHIN TECH

Size Rank	Tech Industries	2016 Jobs	2006-2016 % Growth
1	Computer Systems Design and Related Services	66,300	60%
2	Other Information Services	39,200	170%
3	Scientific Research and Development Services	17,850	15%
4	Wired Telecommunications Carriers	15,200	-26%
5	Electronic Shopping and Mail-Order Houses	13,000	104%
6	Data Processing, Hosting, and Related Services	8,450	72%
7	Software Publishers	5,450	331%
8	Other Telecommunications	2,650	-27%
9	Computer and Peripheral Equipment Manufacturing	1,700	1142%
10	Satellite Telecommunications	1,500	147%
11	Navigational, Measuring, Electromedical, and Control Instruments Manufacturing	850	-27%
12	Wireless Telecommunications Carriers (except Satellite)	800	-19%
13	Communications Equipment Manufacturing	700	43%
14	Semiconductor and Other Electronic Component Manufacturing	550	-41%
15	Aerospace Product and Parts Manufacturing	550	-30%

Source: EMSI

# KEY GROWTH OF TECH JOBS IN TECH INDUSTRIES

NYC TECH INDUSTRIES HAVE ADDED 14,350 SOFTWARE ENGINEERING JOBS IN THE PAST TEN YEARS

Growth Rank	SOC	Occupation	2016	2006-2016 Growth	2006-2016 % Growth
1	15-1132	Software Developers, Applications	18,350	9,300	102%
2	15-1121	Computer Systems Analysts	8,650	3,700	75%
3	15-1151	Computer User Support Specialists	7,150	3,050	74%
4	11-3021	Computer and Information Systems Managers	5,800	2,800	93%
5	15-1133	Software Developers, Systems Software	5,500	2,150	65%
6	15-1134	Web Developers	3,550	1,850	110%
7	15-1142	Network and Computer Systems Administrators	3,750	1,100	42%
8	15-1131	Computer Programmers	4,550	1,050	29%
9	41-3011	Advertising Sales Agents	1,300	800	158%
10	15-1152	Computer Network Support Specialists	1,950	350	24%
11	15-1122	Information Security Analysts	950	350	58%
12	15-1141	Database Administrators	1,000	300	48%
13	15-2031	Operations Research Analysts	1,950	250	17%
14	15-1143	Computer Network Architects	350	150	84%
15	27-1014	Multimedia Artists and Animators	300	50	13%
16	27-4032	Film and Video Editors	600	250	90%
17	17-2071	Electrical Engineers	100	50	182%
18	27-4011	Audio and Video Equipment Technicians	450	50	18%
19	49-2011	Computer, Automated Teller, and Office Machine Repairers	100	50	101%
20	27-4012	Broadcast Technicians	400	50	12%

# KEY GROWTH OF TECH JOBS IN NON-TECH INDUSTRIES

NYC NON-TECH INDUSTRIES HAVE ADDED 2,400 SOFTWARE ENGINEERING JOBS IN THE PAST TEN YEARS

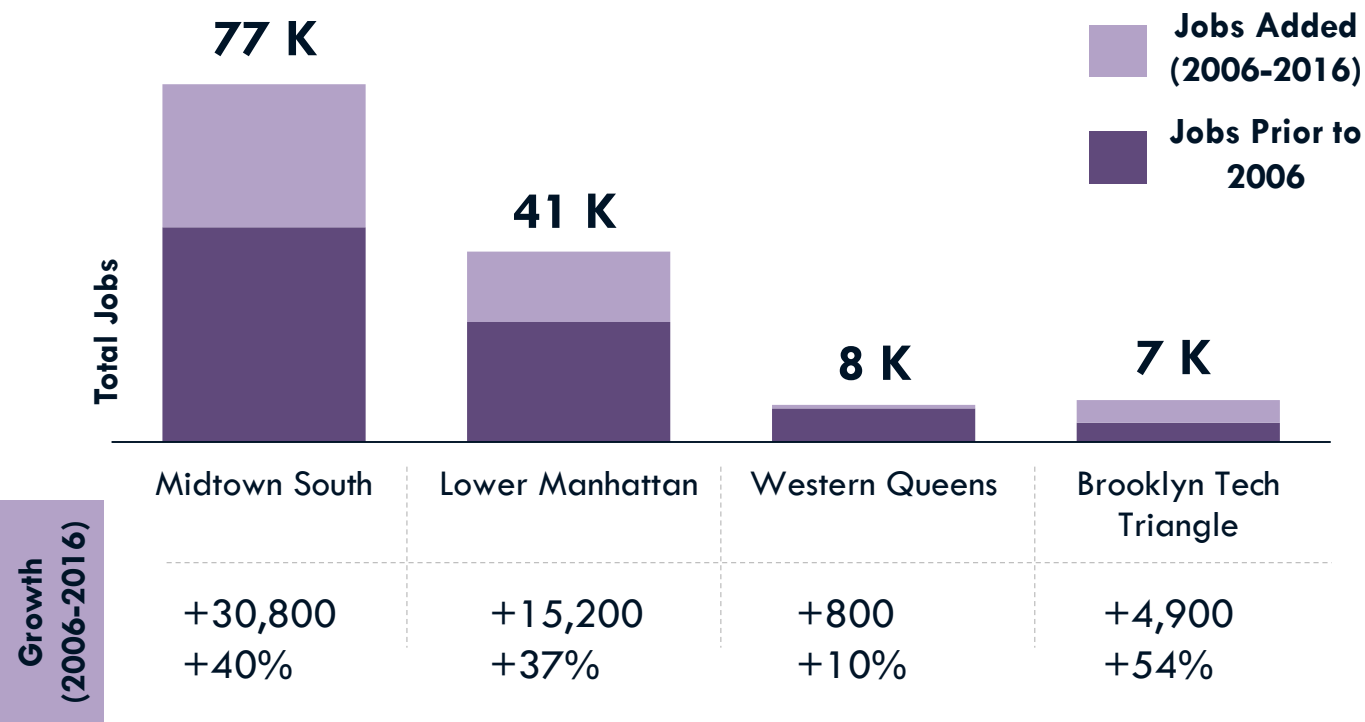
Growth Rank	SOC	Occupation	2016	2006-2016 Growth	2006-2016 % Growth
1	15-1121	Computer Systems Analysts	12,650	1,800	17%
2	27-4032	Film and Video Editors	4,550	1,500	49%
3	41-3011	Advertising Sales Agents	16,500	1,400	9%
4	15-1151	Computer User Support Specialists	14,050	1,350	11%
5	11-3021	Computer and Information Systems Managers	10,050	1,200	14%
6	15-1134	Web Developers	5,050	1,050	26%
7	15-1132	Software Developers, Applications	12,850	1,000	8%
8	27-4011	Audio and Video Equipment Technicians	4,700	900	24%
9	15-2031	Operations Research Analysts	3,200	600	23%
10	15-1142	Network and Computer Systems Administrators	9,100	600	7%
11	17-2071	Electrical Engineers	2,550	500	24%
12	29-2011	Medical and Clinical Laboratory Technologists	4,450	400	10%
13	49-2011	Computer, Automated Teller, and Office Machine Repairers	2,850	300	12%
14	15-1133	Software Developers, Systems Software	4,250	250	6%
15	15-1141	Database Administrators	2,600	200	8%
16	15-1152	Computer Network Support Specialists	3,450	200	6%
17	15-1122	Information Security Analysts	2,000	200	11%
18	29-2055	Surgical Technologists	2,650	100	4%
19	27-1014	Multimedia Artists and Animators	2,350	100	4%
20	15-1131	Computer Programmers	3,850	100	3%

# EXISTING CLUSTERS OF THE TECH ECOSYSTEM

WHILE CONCENTRATED IN MIDTOWN SOUTH, THERE ARE MULTIPLE TECH NODES THROUGHOUT NEW YORK CITY

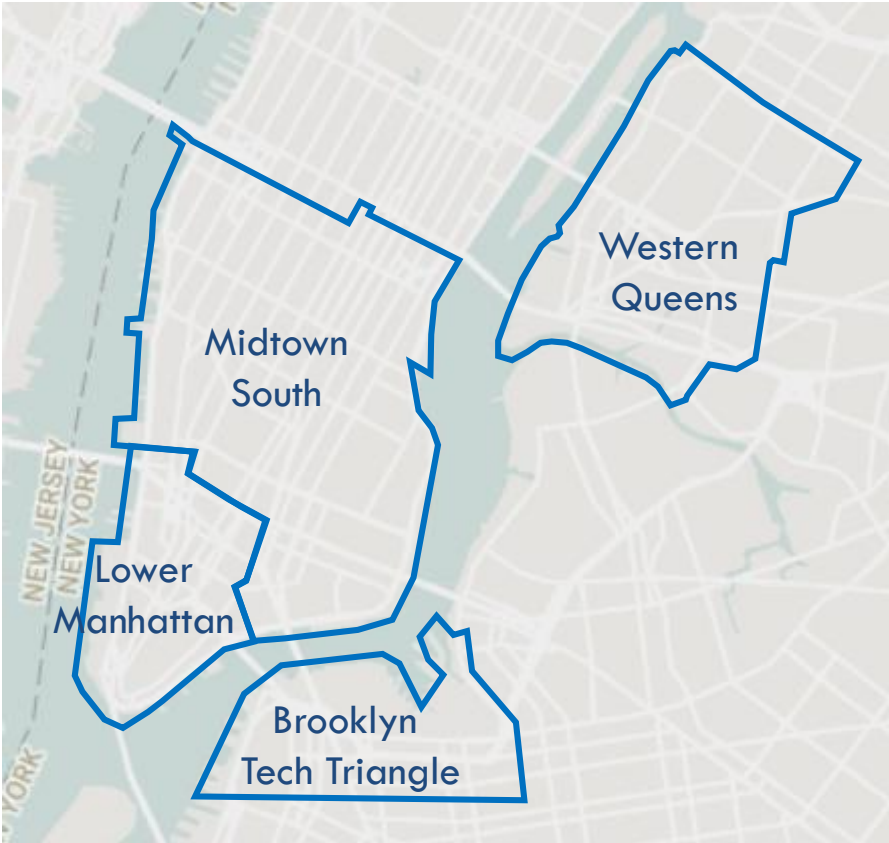
## EXISTING CLUSTERS

Tech Ecosystem Cluster Jobs (2006-2016)



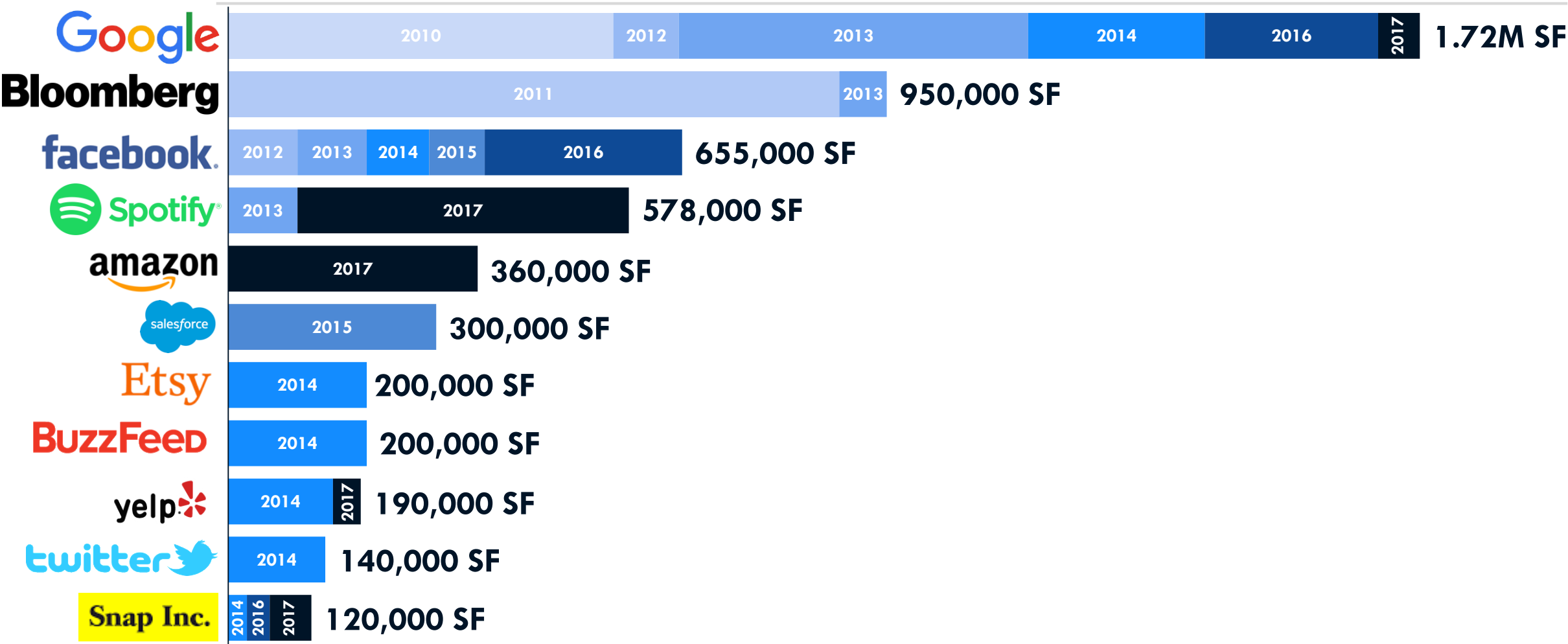
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EXISTING TECH CLUSTERS



Source: EMSI

# TECH ECOSYSTEM MAJOR OFFICE EXPANSIONS SINCE 2010



Source: Real Deal  
HR&A Advisors, Inc.

Note: Figures do not contain spaces leased by tech companies prior to 2010.

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# NYC UNIVERSITY GRADUATE TALENT

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NYC ATTRACTS TENS OF THOUSANDS OF HIGHLY EDUCATED PROFESSIONALS EVERY YEAR

**Workers with Bachelor's or Above**  
**2.25 Million**

*Source: 2016 ACS 1-Year Estimates By Place of Work*

**NYC Universities**  
**124**

*Source: EMSI (2016)*

**Annual New International, Out of State NYC**  
**Residents with Bachelor's or Above**  
**82,500**

*Source: 2016 ACS 1-Year Estimates*

**Annual New International, Out of State NYC**  
**Residents with Graduate or Professional Degree**  
**39,600**

*Source: 2016 ACS 1-Year Estimates*

# NEW YORK METRO AREA LABOR POOL ACCESS

NEW YORK'S EXTENSIVE REGIONAL TRANSIT SYSTEM ALLOWS ACCESS TO MILLIONS MORE WORKERS

**TOTAL RESIDENTS 25 AND OLDER**  
**20.15 Million**

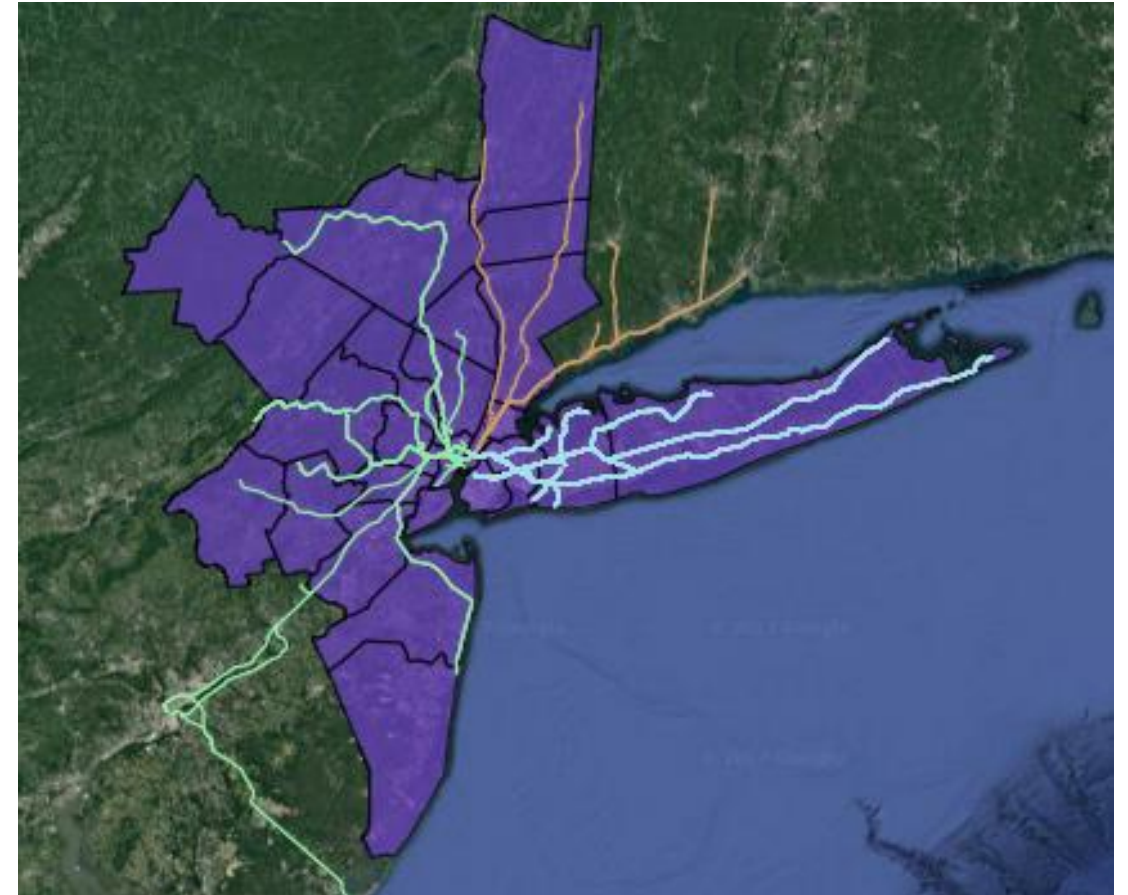
*Source: 2016 ACS 1-Year Estimates*

**RESIDENTS 25 AND OLDER WITH  
BACHELORS OR ABOVE**  
**5.44 Million**

*Source: 2016 ACS 1-Year Estimates*

**RESIDENTS 25 AND OLDER WITH  
GRADUATE OR PROFESSIONAL DEGREES**  
**2.28 Million**

*Source: 2016 ACS 1-Year Estimates*



Note: Statistics represent the educational attainment of residents within the New York-Newark-Jersey City NY-NJ-PA Metropolitan Statistical Area.



# NEW YORK METRO AREA LABOR POOL ACCESS

MILLIONS OF RIDERS MOVE THROUGHOUT NYC EVERY DAY VIA RAIL AND BUS

## AVERAGE WEEKDAY PASSENGER TRIPS:

**NYCT Subway**  
8,612,000

**NYCT Bus**  
2,348,000

**LIRR**  
350,000

**Metro-North**  
286,000

**NJ Transit Rail**  
288,000\*

**NJ Transit Bus**  
475,000\*

**PATH Train**  
267,000

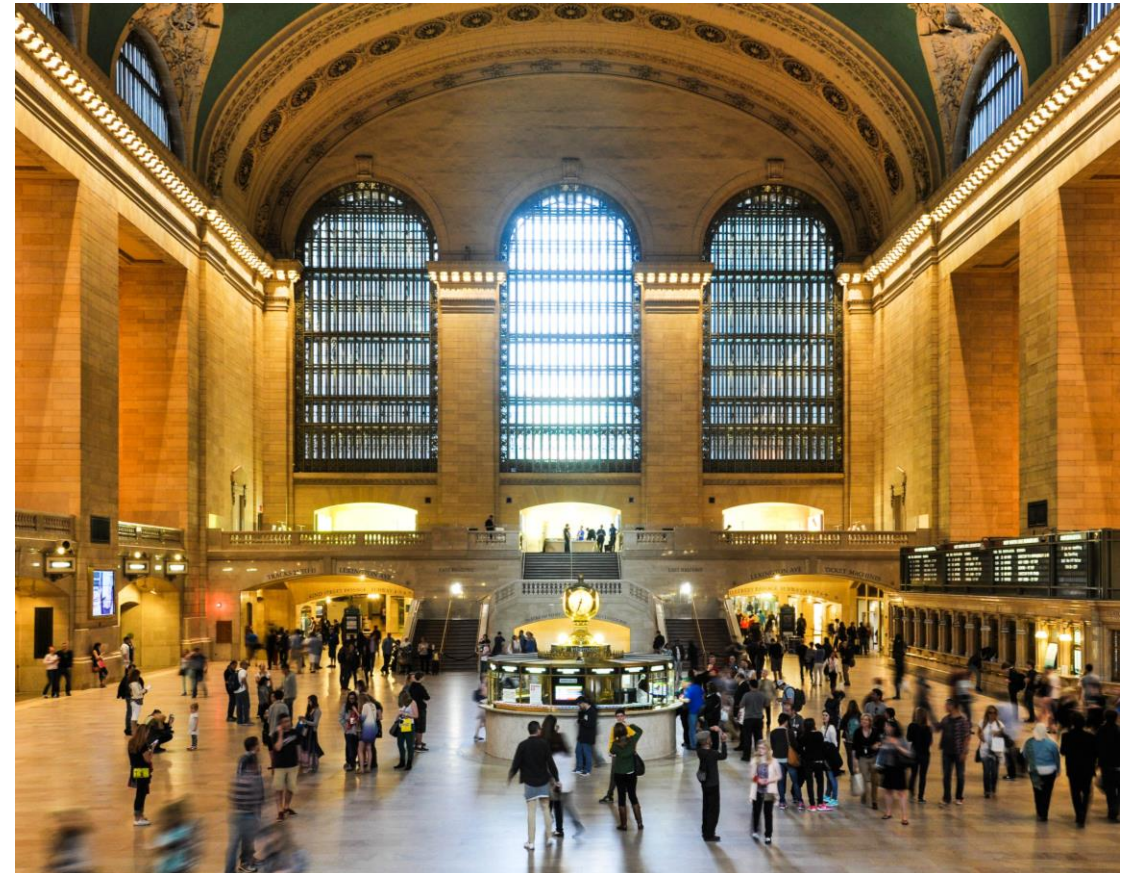


Image Source: Flickr user - sopasnor

Source: APTA Transit Ridership Report 2017-Q1

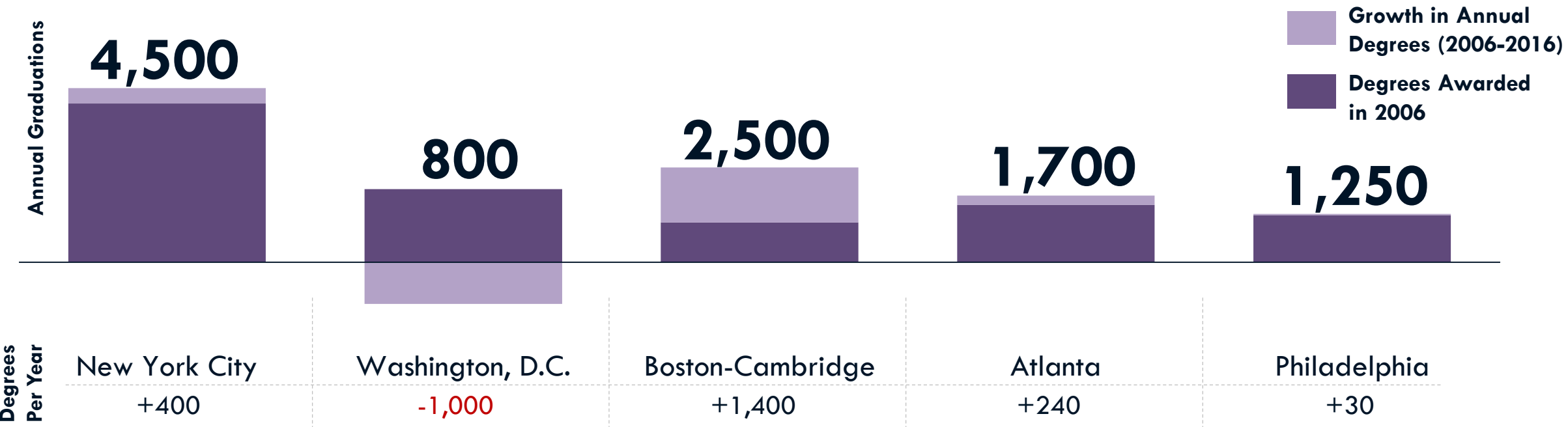
Note: Average weekday unlinked transit passenger trips, inclusive of transfers. \*NJ Transit figures are estimates based on January 2017 monthly counts.

HR&A Advisors, Inc.

# DEVELOPER DEGREES COMPARED TO EAST COAST PEER CITIES

EVERY YEAR, NYC GRADUATES NEARLY TWICE AS MANY COMPUTER SCIENCE MAJORS THAN PEER CITIES

TOTAL ANNUAL GRADUATIONS IN COMPUTER SCIENCE DEGREES (2016)



Degree programs included: Computer and Information Sciences, General; Computer Programming; Data Processing; Information Science/Studies; Computer Systems Analysis; Data Entry/Microcomputer Applications; Computer Science; Computer Software and Media Applications; Computer Systems Networking and Telecommunications; Computer/Information Technology Administration and Management; Computer and Information Sciences and Support Services, Other

Note: Geographical comparison by aggregated zip codes within city boundaries. The city of Boston in 2016 had 1,700 graduations in computer science, and saw growth of 1,000 graduates since 2006.

# NYC UNIVERSITY GRADUATE TALENT

Cornell Tech | Manhattan, NY



# CORNELL TECH



**Mission:** Brings together faculty, business leaders, tech entrepreneurs and students in a catalytic environment to produce visionary results grounded in significant needs that will reinvent the way we live in the digital age.

- **Jacobs Technion-Cornell Institute:** Translational research in a set of industry-focused “hubs” that address social and economic need.
- **Master of Laws in Law, Technology and Entrepreneurship:** Legal principles and practical business applications relating to entrepreneurship, early-stage enterprise and established tech business.
- **WiTNY:** In partnership with CUNY, WiTNY prepares high school girls getting ready for college, undergraduate, and graduate women to secure positions in tech industries.

## Footprint:

- 710K SF of development across 5 facilities.
- 2M SF of development by 2043.



# NYC UNIVERSITY GRADUATE TALENT

CUNY | New York City (All Boroughs), NY



**Mission:** Third-largest university system in the country that aims to provide a **quality, accessible education**, regardless of background or means for approximately 500,000 students in New York City's five boroughs.

- **IN2NYC:** First municipal program in the country designed to help international entrepreneurs access visas so they can create jobs in the U.S. by basing their business in a CUNY incubator.
- **CUNY Tech Prep:** Provides CUNY's top computer science students with industry exposure and a connection to tech jobs post-graduation.
- **Tech Jobs Academy:** Collaboration between CUNY, Microsoft, and the Tech Talent Pipeline to expand industry-driven technical training to un/underemployed New Yorkers.
- **Hub for Innovation & Entrepreneurship:** Supports faculty entrepreneurship, creates educational and career opportunities for students, and fosters collaborations with business and industry.



## Footprint:

- **11 Senior Colleges** with baccalaureate degree programs
- **7 Community Colleges** that provide students with associate degree programs to prepare students for senior colleges or careers.
- **6 Graduate, Honors, and Professional Schools** that offer more the 30 doctoral programs.

# NYC UNIVERSITY GRADUATE TALENT

NYU Center for Urban Science & Progress | Brooklyn, NY



NYU

Center for Urban  
Science + Progress



**Mission:** Research and education center in natural, data, and social sciences to **understand and improve cities throughout the world**, with a focus on applied data science & urban informatics.

**Footprint:**

- 65,000 SF CUSP space
- 33,500 SF incubator for businesses spun off by NYU students and affiliates

**Number of Students:** 71 M.S. students and 19 PhD students enrolled in the 2017-18 academic year. 215 graduated with MS degrees 2014-2017.

# NYC UNIVERSITY GRADUATE TALENT

Other Programs | New York City, NY



New York City has a long history of supporting tech education and businesses at all levels.

- **CS4All:** Through an unprecedented \$81 million public-private partnership, CS4All will ensure all NYC public school students learn computer science, with an emphasis on female, black, and Latino students.
- **Metrotech Center:** The nation's largest urban academic-industrial research park is home to businesses at all stages, and facilitates cross-industry connections.
- **NYU Tandon School of Engineering** (*including space at Metrotech*): A 2014 engineering and applied sciences university merger which created a comprehensive school of education and research, rooted in a tradition of invention and entrepreneurship, and dedicated to furthering technology in service to society.

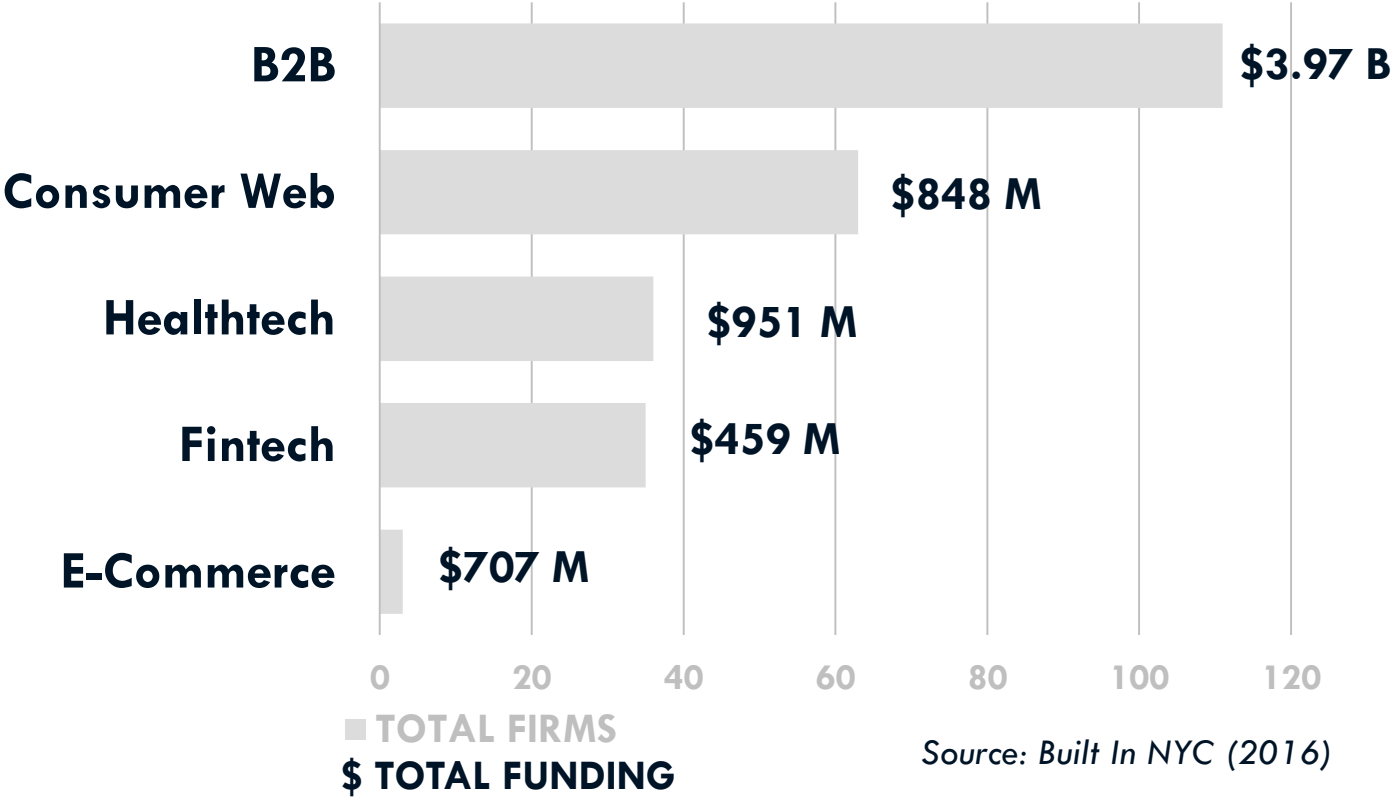
# ENTREPRENEURS & STARTUP FUNDING

NYC'S STARTUPS CONCENTRATE IN A VARIETY OF FIELDS



Source: Digital.NYC (2017)

## BIGGEST GROWTH INDUSTRIES FOR NYC STARTUPS (2016)



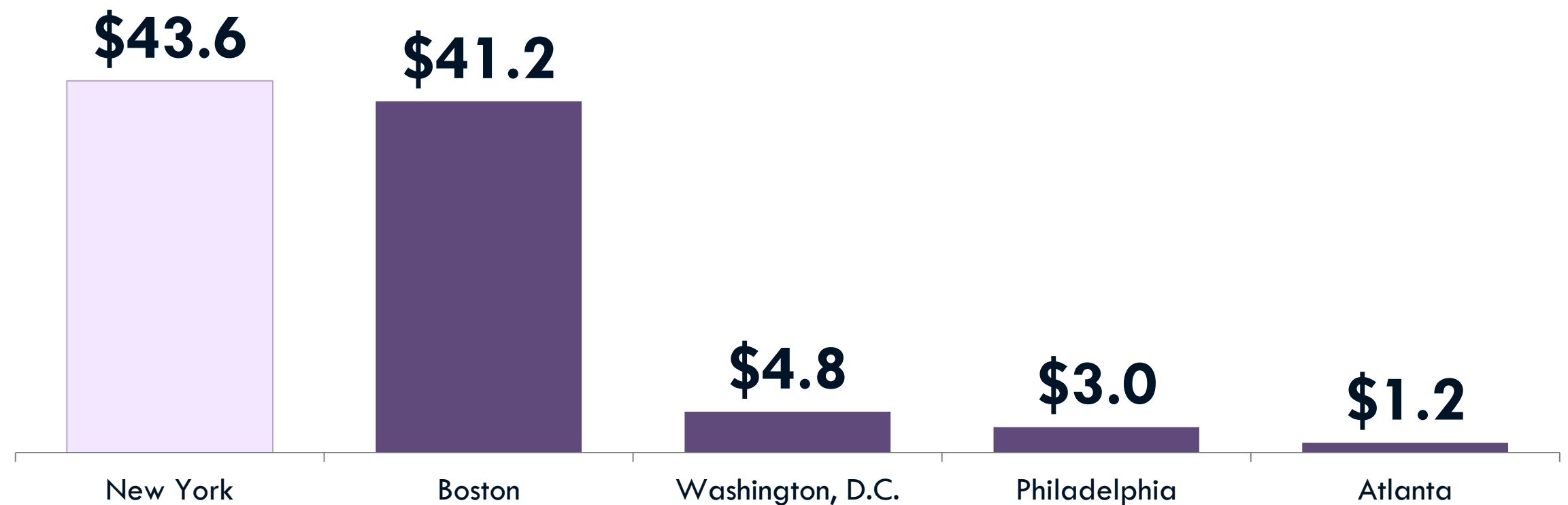
Source: Built In NYC (2016)



# ENTREPRENEURS & STARTUP FUNDING

SINCE 2006, NYC HAS RAISED THE MOST VENTURE CAPITAL FUNDS IN THE COUNTRY AMONGST EAST COAST REGIONS

## TOTAL VC FUNDS RAISED SINCE 2006



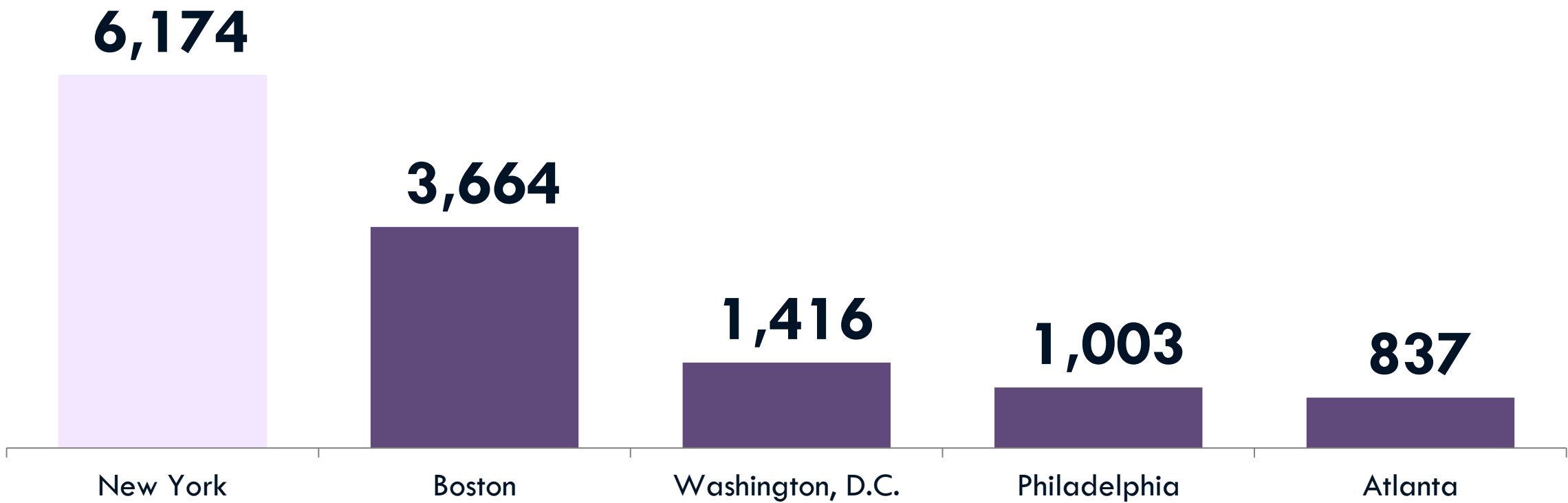
Note: Geographical comparison by Metropolitan Statistical Area

Source: PitchBook Venture Ecosystem FactBook (2017)

# ENTREPRENEURS & STARTUP FUNDING

ALMOST 70% MORE VC ROUNDS HAVE OCCURRED IN NEW YORK, COMPARED TO EAST COAST PEER REGIONS

## TOTAL NUMBER OF VC ROUNDS SINCE 2010



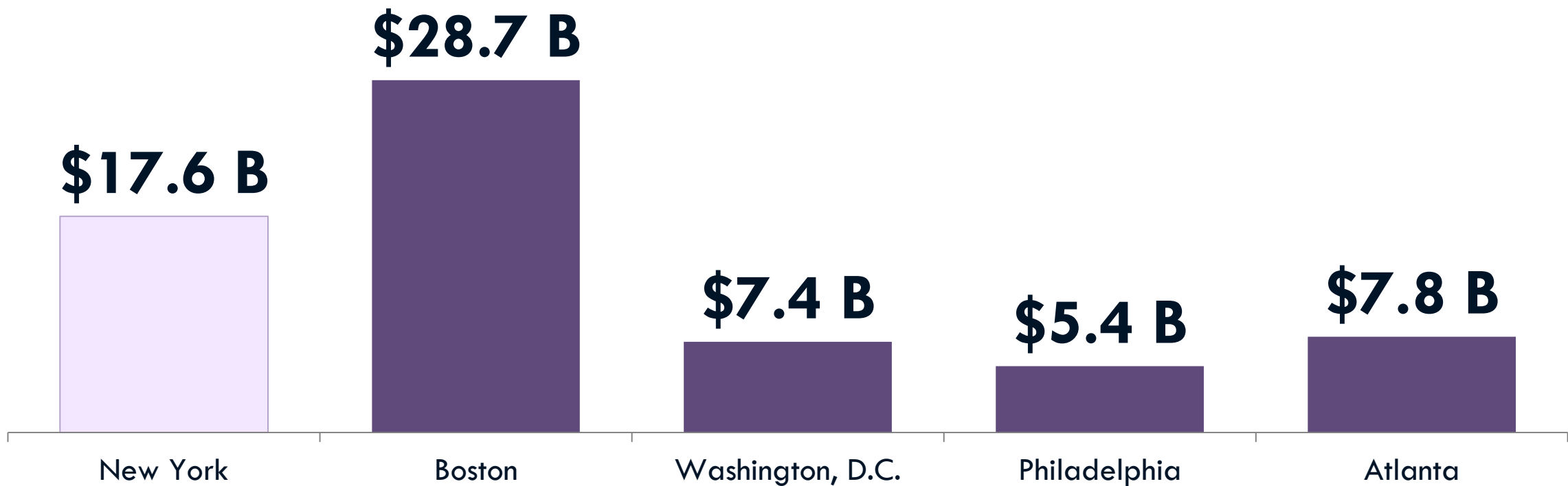
Note: Geographical comparison by Metropolitan Statistical Area

Source: PitchBook Venture Ecosystem FactBook (2017)

# ENTREPRENEURS & STARTUP FUNDING

NYC RANKS SECOND IN EAST COAST PEER REGIONS, WITH MORE THAN \$17B IN EXIT VALUE

## TOTAL EXIT VALUE SINCE 2010



Note: Geographical comparison by Metropolitan Statistical Area

Source: PitchBook Venture Ecosystem FactBook (2017)

# EXAMPLES OF ENTREPRENEURIAL SUCCESS

## ACQUISITION



*Acquired by Atlassian for  
\$425 M in 2017*



*Acquired by Yahoo for  
\$1.1 B in 2013*

## FUNDING



*Raised \$68 M and was  
acquired by Oracle for \$850 M  
at \$434 M valuation in 2017*



*Raised \$8.9 B in  
financing since 2011*

## IPO



*Raised \$300 M in  
financing since 2008, has  
since filed for IPO*



*Raised \$116 M at \$940 M  
valuation in 2017 IPO*

# NYC IS A LIVING LABORATORY FOR NEW CONCEPTS

**LinkNYC** is transforming outdated payphones across New York City into 7,500 communication hubs, re-envisioning the City's existing telecommunications network and public-private franchise structure to provide for free services including:

- **Public Wi-Fi and phone calls**
- **Digital access to city services and maps**
- **911 emergency button**
- **USB charging port**
- **HD digital displays for public service announcements, community messaging and advertising**

This new communication network provides critical digital amenities across the City, is funded through advertising, and is managed by the private consortium CityBridge through a 12-year franchise agreement with the City of New York.



# NYC IS A LIVING LABORATORY FOR NEW CONCEPTS

The **Mayor's Office of Tech + Innovation** has undertaken several initiatives, and among others has:

- Launched a **\$10 million initiative to bring free broadband** for 3 years to 5 public housing sites, beginning with the nearly 7,000 residents at the Queensbridge Houses, the largest public housing development in North America.
- Through NYCEDC's annual **BigApps competition**, supported winning startup Vizalytics to create a mobile platform called "Mind My Business" to provide shopkeepers with targeted, hyperlocal information that could impact their business, such as changes in City code and upcoming roadwork.
- In partnership with the Department of Sanitation, rolled out **Big Belly solar compacting trash receptacles** in Brownsville. Using real-time data generated by the trash receptacles, the Pitkin Avenue BID empties the compactors as needed, and DSNY collects the bags on the regular collection cycles.
- The Mayor's Office of Tech + Innovation is working with +Pool to help understand the potential regulatory challenges to the proposed water-filtering floating pool and navigate government bureaucracy. In addition, the office is partnering to **create a digital dashboard that makes City water quality data accessible** through visualizations, educating residents on the City's natural environment and addressing public health concerns for the pool.





# NYC IS A LIVING LABORATORY FOR NEW CONCEPTS

Among other initiatives, the **Applied Sciences RFP was released** with the goal of expanding New York City's capacity in the applied sciences to maintain New York City's global competitiveness and create jobs. Teams were made up of institutions of higher education, research institutions, and private partners. Commitments from the city included:

- Availability of **City-owned land** at a set of designated sites.
- Up to **\$100M seed investment** of City capital.
- **Expedited City approvals** process.

**Among others, awardees included:**

- **Cornell Tech** – The City supported a proposal to build a \$2 B, two-million SF applied science and engineering campus on Roosevelt Island in New York City.
- **Columbia University** – The City supported the creation of a new Institute for Data Sciences and Engineering, and the hiring of dozens of new faculty
- **NYU CUSP** – The City supported a consortium of world-class academic institutions and private technology companies in the creation of the NYU Center For Urban Science and Progress in Downtown Brooklyn.







# 2016 NYC TECH ECOSYSTEM

HR&A STUDY UPDATE APPENDIX

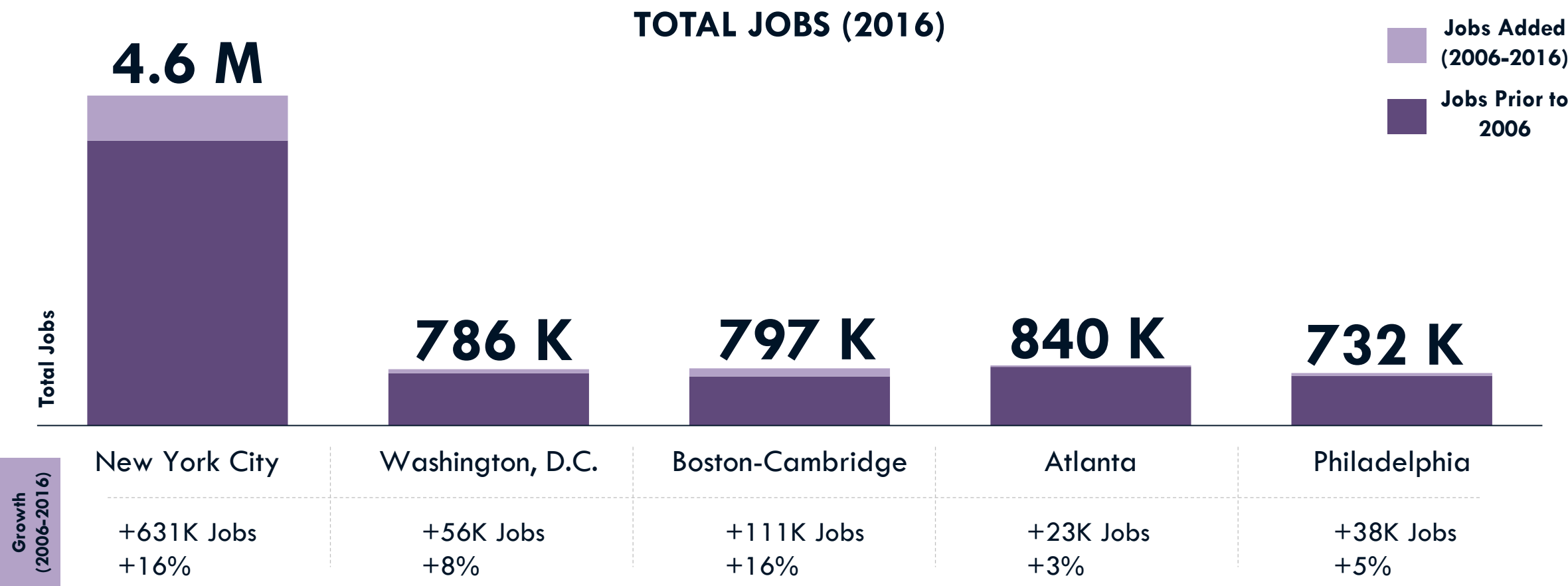
OCTOBER 2017

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Analyze. Advise. Act.

**abny** **tech:**  **PARTNERSHIP**  
**nyc** for New York City

# TOTAL EMPLOYMENT COMPARED TO EAST COAST PEER CITIES

NYC'S ECONOMY HAS EXCEEDED PEER CITIES BY BOTH THE NUMBER OF NEW JOBS AND THE RATE OF GROWTH



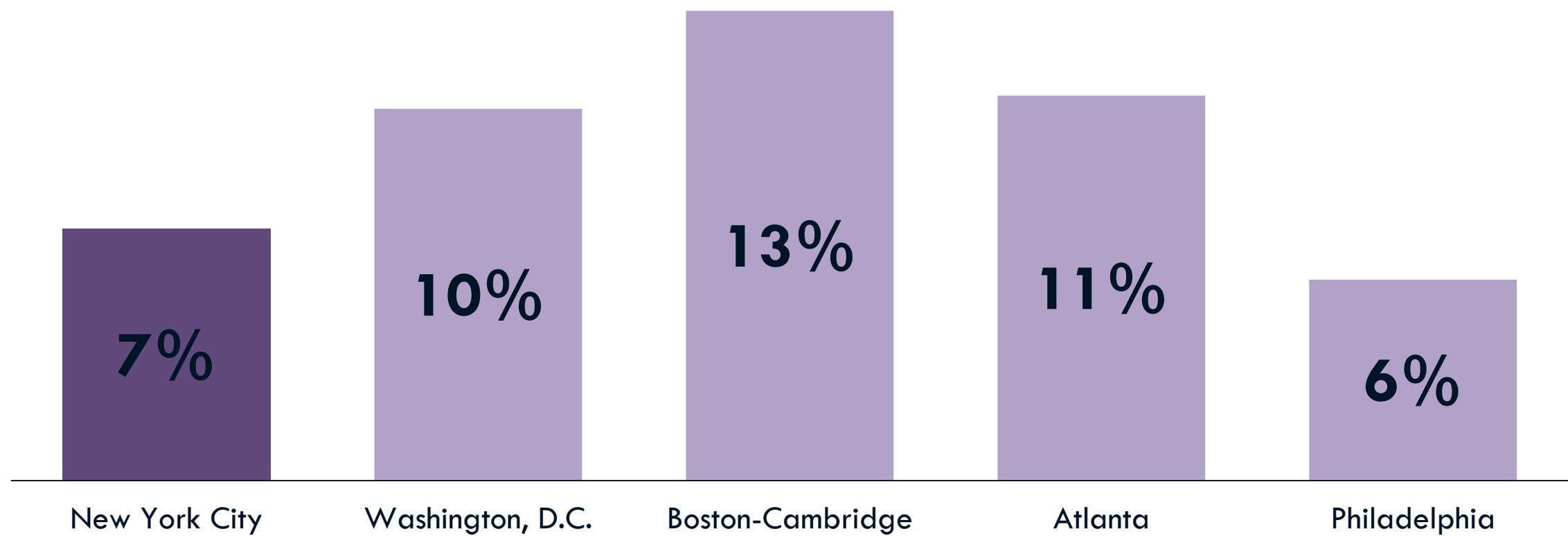
Note: Geographical comparison by aggregated zip codes within city boundaries. The City of Boston in 2016 had 661K total jobs, and saw 74K (13% growth) since 2006.

Source: EMSI

# TECH SHARE COMPARED TO EAST COAST PEER CITIES

NYC'S DIVERSE ECONOMY BENEFITS FROM STRENGTHS ACROSS SECTORS THAN MORE CONCENTRATED PEER CITIES

TOTAL TECH ECONOMY SHARE OF TOTAL ECONOMY (2016)

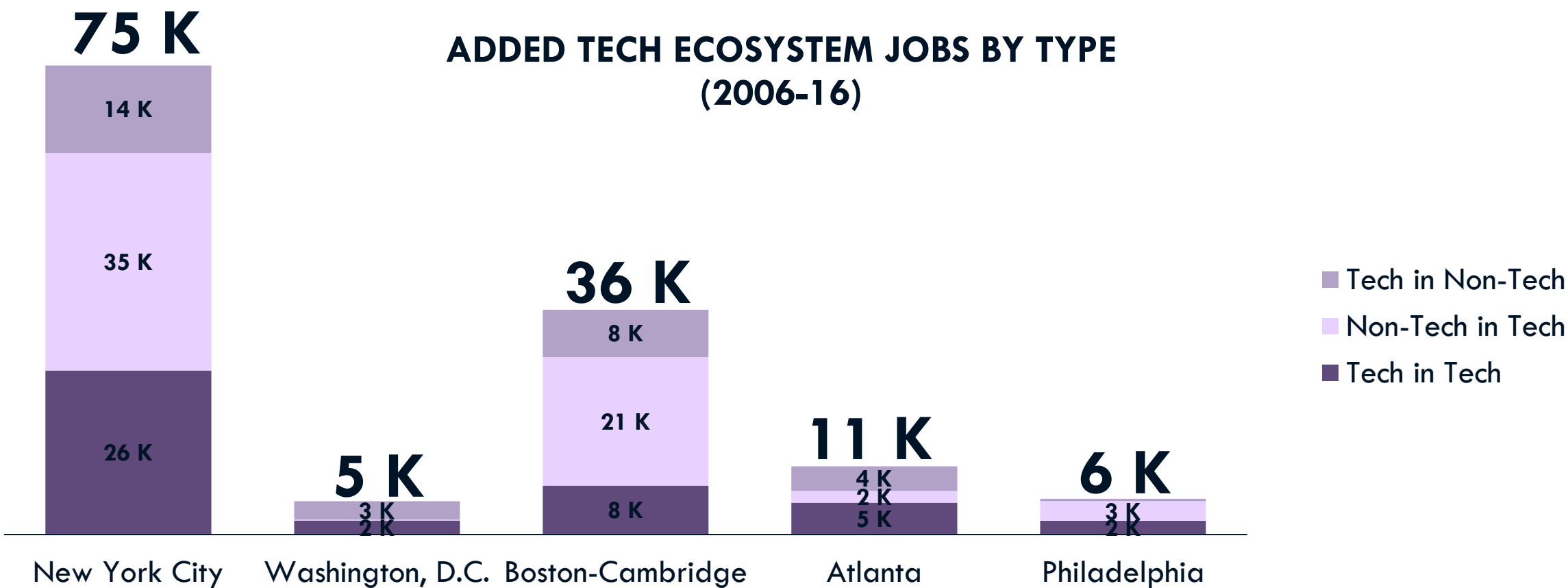


Note: Geographical comparison by aggregated zip codes within city boundaries. The City of Boston's tech economy represented 10% of the total economy in 2016.

Source: EMSI

# TECH ECOSYSTEM COMPONENT GROWTH COMPARED TO EAST COAST PEER CITIES

NYC'S TECH ECONOMY GROWTH IN ALL INDUSTRIES HAS EXCEEDED PEER CITIES

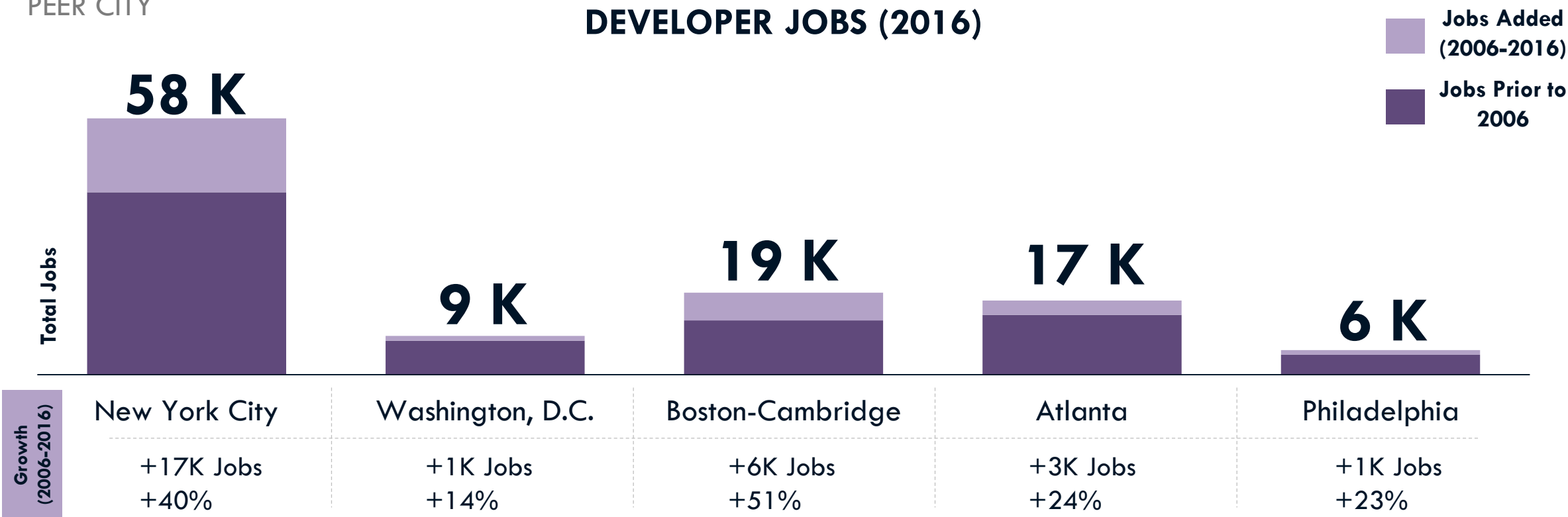


Note: Geographical comparison by aggregated zip codes within city boundaries. The City of Boston 2006-2016 added 22K tech ecosystem jobs: 4K Tech in Non-Tech jobs, 10K Non-Tech in Tech jobs, and 8K Tech in Tech jobs.

# SOFTWARE ENGINEERING JOBS COMPARED TO EAST COAST PEER CITIES

NYC'S TECH ECONOMY CONTAINS MORE THAN 3X THE NUMBER OF SOFTWARE ENGINEERS THAN THE NEAREST PEER CITY

## DEVELOPER JOBS (2016)



Software Engineers include SOC Codes: 15-1131 Computer Programmers; 15-1132 Software Developers, Applications; 15-1133 Software Developers, Systems Software; and 15-1134 Web Developers

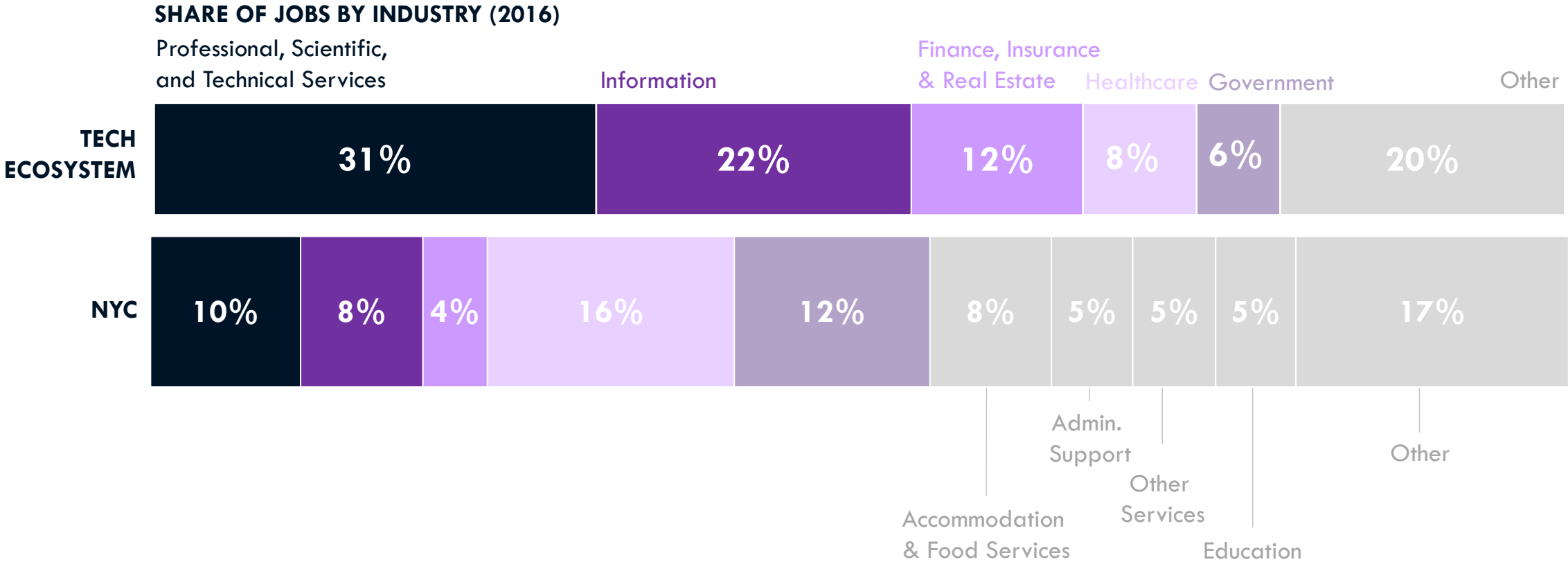
Note: Geographical comparison by aggregated zip codes within city boundaries. The City of Boston in 2016 had 13K developer jobs, and saw 5K (66%) growth since 2006.

Source: EMSI

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# DISTRIBUTION OF NYC ECONOMY

NYC'S ECONOMY IS DIVERSE AND RESILIENT



Source: EMSI