2016 NYC TECH ECOSYSTEM
HR&A STUDY UPDATE
OCTOBER 2017
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
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.
NYC TECH ECOSYSTEM JOBS ARE DISTRIBUTED THROUGHOUT TECH AND NON-TECH INDUSTRIES AND OCCUPATIONS

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
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

<table>
<thead>
<tr>
<th>NYC Tech Ecosystem</th>
<th>NYC Total Economy (Including Tech)</th>
<th>US Tech Ecosystem</th>
<th>US Total Economy (Including Tech)</th>
</tr>
</thead>
<tbody>
<tr>
<td>75K Jobs</td>
<td>631K Jobs</td>
<td>7.5M Jobs</td>
<td>1M Jobs</td>
</tr>
<tr>
<td>30%</td>
<td>16%</td>
<td>10%</td>
<td>5%</td>
</tr>
</tbody>
</table>

Source: EMSI
NYC’S TECH ECONOMY IS 3X THE NEAREST PEER CITY AND HAS GAINED TWICE THE NUMBER OF TECH JOBS

TECH ECOSYSTEM COMPARED TO EAST COAST PEER CITIES

<table>
<thead>
<tr>
<th>City</th>
<th>Total Jobs</th>
<th>Jobs Added (2006-2016)</th>
<th>Jobs Prior to 2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>New York City</td>
<td>326 K</td>
<td>+76K Jobs, +30%</td>
<td></td>
</tr>
<tr>
<td>Washington, D.C.</td>
<td>82 K</td>
<td>+5K Jobs, +7%</td>
<td></td>
</tr>
<tr>
<td>Boston-Cambridge</td>
<td>105 K</td>
<td>+36K Jobs, +52%</td>
<td></td>
</tr>
<tr>
<td>Atlanta</td>
<td>91 K</td>
<td>+11K Jobs, +14%</td>
<td></td>
</tr>
<tr>
<td>Philadelphia</td>
<td>41 K</td>
<td>+6K Jobs, +16%</td>
<td></td>
</tr>
</tbody>
</table>

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.

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

Source: EMSI

102,000 NON-TECH JOBS

73,000 TECH JOBS

151,000 TECH JOBS

326,000 TOTAL JOBS
### KEY GROWTH AREAS OF THE TECH ECOSYSTEM

NYC's tech industries contain a number of sectors relevant to core business within tech.

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

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

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

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

Total Jobs
- Midtown South: 77 K
- Lower Manhattan: 41 K
- Western Queens: 8 K
- Brooklyn Tech Triangle: 7 K

Jobs Added (2006-2016)
- Midtown South: +30,800 (+40%)
- Lower Manhattan: +15,200 (+37%)
- Western Queens: +800 (+10%)
- Brooklyn Tech Triangle: +4,900 (+54%)

Jobs Prior to 2006

Source: EMSI

2016 NYC Tech Ecosystem
TECH ECOSYSTEM MAJOR OFFICE EXPANSIONS SINCE 2010

Google
- 2010
- 2012
- 2013
- 2014
- 2016
- 2017
- 1.72M SF

Bloomberg
- 2011
- 2013
- 2013
- 950,000 SF

Facebook
- 2012
- 2013
- 2014
- 2015
- 2016
- 655,000 SF

Spotify
- 2013
- 2017
- 578,000 SF

Amazon
- 2017
- 360,000 SF

Salesforce
- 2015
- 300,000 SF

BuzzFeed
- 2014
- 200,000 SF

Etsy
- 2014
- 200,000 SF

Yelp
- 2014
- 2017
- 190,000 SF

Twitter
- 2014
- 140,000 SF

Snap Inc.
- 2014
- 2016
- 2017
- 120,000 SF

Source: Real Deal

Note: Figures do not contain spaces leased by tech companies prior to 2010.
NYC UNIVERSITY GRADUATE TALENT

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.

HR&A Advisors, Inc.
# NEW YORK METRO AREA LABOR POOL ACCESS

Millions of riders move throughout NYC every day via rail and bus.

## Average Weekday Passenger Trips:

<table>
<thead>
<tr>
<th>Service Type</th>
<th>Trips</th>
</tr>
</thead>
<tbody>
<tr>
<td>NYCT Subway</td>
<td>8,612,000</td>
</tr>
<tr>
<td>NYCT Bus</td>
<td>2,348,000</td>
</tr>
<tr>
<td>LIRR</td>
<td>350,000</td>
</tr>
<tr>
<td>Metro-North</td>
<td>286,000</td>
</tr>
<tr>
<td>NJ Transit Rail</td>
<td>288,000*</td>
</tr>
<tr>
<td>NJ Transit Bus</td>
<td>475,000*</td>
</tr>
<tr>
<td>PATH Train</td>
<td>267,000</td>
</tr>
</tbody>
</table>

Source: APTA Transit Ridership Report 2017-Q1

*NJ Transit figures are estimates based on January 2017 monthly counts.

Image Source: Flickr user - sopasnor

Note: Average weekday unlinked transit passenger trips, inclusive of transfers.
EVERY YEAR, NYC GRADUATES NEARLY TWICE AS MANY COMPUTER SCIENCE MAJORS THAN PEER CITIES

TOTAL ANNUAL GRADUATIONS IN COMPUTER SCIENCE DEGREES (2016)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>New York City</td>
<td>4,500</td>
<td>+400</td>
<td>3,100</td>
</tr>
<tr>
<td>Washington, D.C.</td>
<td>800</td>
<td>-1,000</td>
<td>1,800</td>
</tr>
<tr>
<td>Boston-Cambridge</td>
<td>2,500</td>
<td>+1,400</td>
<td>1,100</td>
</tr>
<tr>
<td>Atlanta</td>
<td>1,700</td>
<td>+240</td>
<td>1,460</td>
</tr>
<tr>
<td>Philadelphia</td>
<td>1,250</td>
<td>+30</td>
<td>1,220</td>
</tr>
</tbody>
</table>

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.

Source: EMSI
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.
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 than 30 doctoral programs.
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.
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.
NYC'S STARTUPS CONCENTRATE IN A VARIETY OF FIELDS

NYC startups
9,670

NYC incubators
120

Source: Digital.NYC (2017)

BIGGEST GROWTH INDUSTRIES FOR NYC STARTUPS (2016)

<table>
<thead>
<tr>
<th>Industry</th>
<th>Total Firms</th>
<th>Total Funding</th>
</tr>
</thead>
<tbody>
<tr>
<td>B2B</td>
<td></td>
<td>$3.97 B</td>
</tr>
<tr>
<td>Consumer Web</td>
<td></td>
<td>$848 M</td>
</tr>
<tr>
<td>Healthtech</td>
<td></td>
<td>$951 M</td>
</tr>
<tr>
<td>Fintech</td>
<td></td>
<td>$459 M</td>
</tr>
<tr>
<td>E-Commerce</td>
<td></td>
<td>$707 M</td>
</tr>
</tbody>
</table>

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

New York: $43.6
Boston: $41.2
Washington, D.C.: $4.8
Philadelphia: $3.0
Atlanta: $1.2

Note: Geographical comparison by Metropolitan Statistical Area

Source: PitchBook Venture Ecosystem FactBook (2017)
ALMOST 70% MORE VC ROUNDS HAVE OCCURRED IN NEW YORK, COMPARED TO EAST COAST PEER REGIONS

TOTAL NUMBER OF VC ROUNDS SINCE 2010

<table>
<thead>
<tr>
<th>Geographical Area</th>
<th>VC Rounds Since 2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>New York</td>
<td>6,174</td>
</tr>
<tr>
<td>Boston</td>
<td>3,664</td>
</tr>
<tr>
<td>Washington, D.C.</td>
<td>1,416</td>
</tr>
<tr>
<td>Philadelphia</td>
<td>1,003</td>
</tr>
<tr>
<td>Atlanta</td>
<td>837</td>
</tr>
</tbody>
</table>

Note: Geographical comparison by Metropolitan Statistical Area

NYC ranks second in East Coast peer regions, with more than $17B in exit value

TOTAL EXIT VALUE SINCE 2010

New York: $17.6 B
Boston: $28.7 B
Washington, D.C.: $7.4 B
Philadelphia: $5.4 B
Atlanta: $7.8 B

Note: Geographical comparison by Metropolitan Statistical Area

Source: PitchBook Venture Ecosystem FactBook (2017)
EXAMPLES OF ENTREPRENEURIAL SUCCESS

ACQUISITION

Trello
Acquired by Atlassian for $425 M in 2017

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

FUNDING

Tumblr
Acquired by Yahoo for $1.1 B in 2013

Wework
Raised $8.9 B in financing since 2011

IPO

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

Yext
Raised $116 M at $940 M valuation in 2017 IPO
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.
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.
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.
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

TOTAL JOBS (2016)

New York City | Washington, D.C. | Boston-Cambridge | Atlanta | Philadelphia
--- | --- | --- | --- | ---
4.6 M | 786 K | 797 K | 840 K | 732 K

Growth (2006-2016)

- New York City: +631K Jobs (+16%)
- Washington, D.C.: +56K Jobs (+8%)
- Boston-Cambridge: +111K Jobs (+16%)
- Atlanta: +23K Jobs (+3%)
- Philadelphia: +38K Jobs (+5%)

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

HR&A Advisors, Inc.
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

NYC - 75K

ADDED TECH ECOSYSTEM JOBS BY TYPE (2006-16)

New York City: 26K
  - Tech in Non-Tech: 14K
  - Non-Tech in Tech: 35K
  - Tech in Tech: 36K

Washington, D.C.: 5K
  - Tech in Non-Tech: 3K
  - Non-Tech in Tech: 2K
  - Tech in Tech: 11K

Boston-Cambridge: 6K
  - Tech in Non-Tech: 4K
  - Non-Tech in Tech: 5K
  - Tech in Tech: 8K

Atlanta: 36K
  - Tech in Non-Tech: 8K
  - Non-Tech in Tech: 21K
  - Tech in Tech: 11K

Philadelphia: 6K
  - Tech in Non-Tech: 3K
  - Non-Tech in Tech: 2K
  - Tech in Tech: 11K


Source: EMSI

HR&A Advisors, Inc.
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)

<table>
<thead>
<tr>
<th>City</th>
<th>Jobs Added (2006-2016)</th>
<th>Jobs Prior to 2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>New York City</td>
<td>58K</td>
<td>9K</td>
</tr>
<tr>
<td>Washington, D.C.</td>
<td>9K</td>
<td>19K</td>
</tr>
<tr>
<td>Boston-Cambridge</td>
<td>17K</td>
<td>6K</td>
</tr>
<tr>
<td>Atlanta</td>
<td>17K</td>
<td>6K</td>
</tr>
<tr>
<td>Philadelphia</td>
<td>6K</td>
<td>1K</td>
</tr>
</tbody>
</table>

Total Jobs

New York City: 58K (58K - 9K = 49K growth)
Washington, D.C.: 9K (9K - 1K = 8K growth)
Boston-Cambridge: 19K (19K - 6K = 13K growth)
Atlanta: 17K (17K - 3K = 14K growth)
Philadelphia: 6K (6K - 1K = 5K growth)

Growth (2006-2016)
New York City: +17K Jobs (+40%)
Washington, D.C.: +1K Jobs (+14%)
Boston-Cambridge: +6K Jobs (+51%)
Atlanta: +3K Jobs (+24%)
Philadelphia: +1K Jobs (+23%)

Source: EMSI

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.

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.

HR&A Advisors, Inc.
NYC’S ECONOMY IS DIVERSE AND RESILIENT

**SHARE OF JOBS BY INDUSTRY (2016)**

<table>
<thead>
<tr>
<th>Industry</th>
<th>NYC</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professional, Scientific, and Technical</td>
<td>10%</td>
<td>17%</td>
</tr>
<tr>
<td>Services</td>
<td>8%</td>
<td></td>
</tr>
<tr>
<td>Information</td>
<td>4%</td>
<td></td>
</tr>
<tr>
<td>Financial &amp; Real Estate</td>
<td>16%</td>
<td></td>
</tr>
<tr>
<td>Healthcare</td>
<td>12%</td>
<td></td>
</tr>
<tr>
<td>Government</td>
<td>8%</td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>6%</td>
<td></td>
</tr>
<tr>
<td>Accommodation &amp; Food Services</td>
<td>8%</td>
<td></td>
</tr>
<tr>
<td>Admin. Support</td>
<td>5%</td>
<td></td>
</tr>
<tr>
<td>Other Services</td>
<td>5%</td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>5%</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>12%</td>
<td></td>
</tr>
</tbody>
</table>

Source: EMSI

HR&A Advisors, Inc.