



# WELCOME

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FROM **JAMIE DIMON**, CHAIRMAN AND CHIEF EXECUTIVE OFFICER, JPMORGAN CHASE & CO. AND **MELODY BARNES**, FORMER ASSISTANT TO THE PRESIDENT AND DIRECTOR OF THE WHITE HOUSE DOMESTIC POLICY COUNCIL AND CO-CHAIR OF THE *NEW SKILLS AT WORK* ADVISORY COUNCIL

As co-chairs of the JPMorgan Chase Global Workforce Advisory Council, we are pleased to share this skills gap report for New York City. This is the first in a series that will examine labor market conditions in metropolitan regions across the United States and in France, Germany, Spain and the UK and provide data-driven solutions to address the mismatch between employer needs and the skills of current job seekers. This report, and those to follow, are a key component of *New Skills at Work*, JPMorgan Chase's five-year \$250 million global workforce readiness and demand-driven training initiative. Communities across the United States are working to rebuild their economies and the good news is that indicators, such as the unemployment rate, tell us we are moving in the right direction. At the same time, we face persistent challenges ensuring that everyone has access to opportunity as economies continue to strengthen and grow.

For JPMorgan Chase, we see an opportunity to impact the gap between the skilled workforce employers need to be competitive and the training opportunities available to job seekers. This is especially critical for middle-skill jobs – those that require a high school diploma and some postsecondary education and training, but not necessarily a four-year college degree. Aligning workforce training with the skills employers seek will benefit job seekers and employers, and contribute to more broadly shared economic prosperity.

One obstacle policymakers, civic leaders and employers face in solving this problem is the lack of actionable data. Everyone involved – from mayors to educators to employers – needs to understand what skills and competencies jobs require so that community colleges, training providers and high school career and technical education programs can align curriculum and credentials to actual industry needs. Good data can help everyone better target their efforts on key sectors and occupations where jobs – that pay good wages and offer opportunities for advancement – are going unfilled.

By focusing on the jobs that have opportunities for advancement along a clear career pathway, we can ensure workers have opportunities for advancement and businesses have the steady pipeline of skilled talent that they need. We also need to learn from best practice models of career pathway development that are already demonstrating success across communities and industries in the U.S. and overseas.

This report has been designed with these requirements in mind, and we hope the data presented here will support the work underway in New York City's Computer and Information Services (technology) and Healthcare industries and encourage additional efforts to build a pipeline of skilled workers for career-building jobs.



JAMIE DIMON



MELODY BARNES

# ACKNOWLEDGEMENTS

JPMorgan Chase & Co. is investing \$250 million over five years in a global initiative to help markets build a demand-driven workforce development system, and to prepare youth and adults for careers in high-demand, middle-skill occupations. To advance this work, we are supporting data analysis in domestic and international markets: Chicago, Columbus, Dallas, Detroit, Houston, Los Angeles, Miami, New York City, San Francisco, France, Germany, Spain and the UK.



## JOBS FOR THE FUTURE

JPMorgan Chase deeply appreciates the work of partners in producing this report. **Jobs for the Future** ([www.jff.org](http://www.jff.org)), which is a national partner in the *New Skills at Work* initiative, is serving as the lead intermediary for the US reports. Founded in 1983, Jobs for the Future works to ensure that all under prepared young people and workers have the skills and credentials needed to succeed in our economy, by creating solutions that catalyze change in our education and workforce delivery systems. We are especially thankful for the work of the writers of this report: Lucretia Murphy, Myriam Sullivan, and Lili Allen. The report has been strengthened by insightful feedback from Maria Flynn, Steven Baker, Mary V.L. Wright, Krista Ford, and John Dorrer.

Two national organizations, Economic Modeling Specialists Intl. and Burning Glass Technologies, provided the data and analysis for this report. **Economic Modeling Specialists Intl.**, a CareerBuilder company, turns labor market data into useful information that helps organizations understand the connection between economies, people, and work ([www.economicmodeling.com](http://www.economicmodeling.com)). **Burning Glass Technologies** develops leading technologies for matching people with jobs through pioneering solutions, and leverages a deep understanding of people and their careers in order to deliver superior workforce and marketplace insight ([www.burning-glass.com](http://www.burning-glass.com)).

Each report relies on the insights and feedback of local stakeholders. We would like to express our appreciation to the researchers, industry partnerships, employers, and practitioners in New York City who provided feedback on earlier drafts: Lesley Hirsch, Director, The New York City Labor Market Information Service; Michael Dardia, Co-Research Director at the Citizens Budget Commission; Kristen Titus, Founding Director of Tech Talent Pipeline, New York City Department of Small Business Services; Jacqueline Mallon, Deputy Commissioner for Workforce Development, Small Business Services; Shawna Traeger, Executive Director of the New York Alliance for Careers in Healthcare; and Hannah Weinstock, Director of External Relations and Communications at New York Alliance for Careers in Healthcare.

We would also like to thank Melody Barnes, former Assistant to the President and Director of the White House Domestic Policy Council and Co-chair of the *New Skills at Work* Advisory Council, and Katy Gaul-Stigge, Executive Director of the Mayor's Office of Workforce Development, for their insights, time and unwavering support throughout this process.

JPMorgan Chase acknowledges extensive contributions of particular stakeholders:

**New York City Labor Market Information Service** brings a deep knowledge of the city's labor market to its work through regular interactions with employers and industry experts as well as through its original multi-method research on industries, populations, and emerging workforce issues. It maintains strong ties to workforce, educational policy, and provider communities to ensure that its work is as relevant and actionable as possible, and has become known locally and nationally as an innovator in the use of real-time labor market information as well as in developing useful career-mapping tools for students and other jobseekers.

**New York Alliance for Careers in Healthcare (NYACH)** is an industry partnership formed in 2011 with funding from the National Fund for Workforce Solutions, including JPMorgan Chase investments, to create employer-led partnerships to address these workforce challenges. Through partnerships with key employers, associations, and labor management organizations, NYACH is developing partnerships to address staffing challenges faced by the city's acute, long-term and primary healthcare facilities.

**Tech Talent Pipeline (TTP)** was announced by Mayor Bill de Blasio in May 2014. The TTP is a \$10 million, three-year initiative established to provide leadership, funding, and support to public and private partners working to deliver technology education, training, and job opportunities to underserved New Yorkers. The TTP is supported by several philanthropic partners, including the inaugural funder JPMorgan Chase, the NY Community Trust and the NYC Workforce Funders. TTP is a collaboration between businesses, community groups, training providers, government, and academic institutions designed to support the growth of New York's tech ecosystem and prepare New Yorkers for 21st century jobs.

# EXECUTIVE SUMMARY

## MIDDLE-SKILL JOBS PROVIDE OPPORTUNITIES FOR NEW YORK CITY (NYC) FAMILIES

**4,000,000**  
workers in the labor force



**1,000,000**  
of these workers are in middle-skill jobs. The NYC median **hourly wage** for these workers is **\$31.88** versus the NYC median hourly **living wage** of **\$20.93**

Historically, the United States and much of the developed world benefited from an industrial economy that offered employment opportunities for workers of all skill levels.

In today's global economy, however, industries in the United States, Europe and elsewhere are experiencing rapid growth in middle-skill occupations, which require a high school degree and technical training but not a four-year college degree. It's these jobs that many employers around the world are struggling to fill.

In New York City (NYC), the skills gap is threatening the city's sustained economic growth and limiting opportunities for struggling New Yorkers. This is not the only challenge we face. Inadequate aggregate demand is the primary driver of unemployment and trends such as declining wages for entry-level jobs contribute to income inequality. We need solutions that address all these issues.

This report highlights the challenges contributing to New York's skills gap, as well as the many opportunities to move more New Yorkers into well-paying jobs.

The report findings show that there are over 1,000,000 middle-skill jobs in New York and 44,000 current openings. These are well-paying jobs with the potential for career growth, and they offer struggling families the real prospect of economic security. The report offers a framework for a systemic approach to scaling the education and training necessary to move more New Yorkers into these jobs and meet the demand for workers in these high-growth, middle-skill occupations. Detailed recommendations are also provided for building pathways systems for two of the highest-growth sectors: **healthcare and technology**.



# EXECUTIVE SUMMARY

## WHAT DOES THE NYC SKILLS GAP LOOK LIKE?

# 6%

growth in NYC labor market since 2010.



### HEALTHCARE



+

=

# 45%

### TECHNOLOGY



of the total middle-skill job postings in 2013-2014, and are each projected to grow by some 15% over the next five years.

An estimated **46%** of New Yorkers aged 25 and older lack the postsecondary credentials to fill these job openings.



Fortunately, NYC has a workforce development ecosystem with highly engaged stakeholders committed to meeting these challenges. The public education system – through high school career and technical education, as well as the City University of New York’s (CUNY) extensive degree and non-degree programs across 24 campuses – is also a critical workforce engine.

The City’s Office of Workforce Development has engaged stakeholders as part of the Mayor’s Jobs for New Yorkers Task Force. They are working together to redesign the city’s workforce development system using a sector-based approach to effectively train more New Yorkers for well-paying jobs with career mobility in the city’s high-demand sectors. The **research 1** and the recommendations provided in this report are intended to advance these efforts.

JPMorgan Chase recognizes the challenge that NYC and other metropolitan communities face when both demand for workers can’t be met and unemployment persists because individuals don’t have the skills employers need. Through **New Skills at Work 2** – our \$250 million, five-year global workforce readiness initiative to help build growing economies – JPMorgan Chase is making a commitment to help NYC and other metropolitan communities close this gap. Using our resources, expertise and global reach, we intend to help inform and accelerate efforts to support demand-driven skills training. Research is key to this initiative, and this is the first in a series of reports providing research on targeted industries in markets throughout the world.

## 1 Approach

A detailed description of this report’s methodology, including data limitations, is provided in Appendix A. To summarize, this report relies on data analysis from Economic Modeling Specialists Intl. (EMSI) and Burning Glass Technologies to provide a mixed-methodology approach of traditional and real-time data sources and analysis. This study expands the common definition of middle-skill occupations by adding three additional criteria (wage, growth rate and number of annual openings). Jobs for the Future (JFF) integrated this data and also vetted it with local stakeholders, researchers and industry partnerships, in order to contextualize the findings to reflect local market conditions and reconcile findings from EMSI and Burning Glass with other New York City research where possible.

## 2 New Skills at Work

### JPMorgan Chase & Co.’s Response to the Skills Gap

Around the world, employers, educators, policymakers, training organizations, and others have recognized the critical importance of tackling the skills gap. *Helping people develop the skills they need to compete for today’s jobs can transform lives and strengthen economies.*

Through *New Skills at Work*, JPMorgan Chase will use its resources, expertise, and global reach to help inform and accelerate efforts to build demand-driven systems, invest in the best training, and rely on data. JPMorgan Chase is investing in a series of reports in markets throughout the world, including New York City, to contribute data to ongoing efforts to eliminate the skills mismatch. The goal of our \$250 million, five-year initiative is to help build economies that grow by investing in people so that workers and industries have the skills to compete and prosper in the global economy.

**NEW SKILLS <sup>AT</sup> WORK**

JPMORGAN CHASE & CO.

# EXECUTIVE SUMMARY

## OUR KEY FINDINGS

Middle-skill jobs are at the intersection of economic growth for employers and economic opportunity for individuals who continue to struggle with unemployment and limited job prospects. Based on the findings in this report, there is a significant concentration of middle-skill work in the healthcare and technology industries that would provide good jobs and economic mobility for New Yorkers. Closing the skills gap for employers in these sectors will continue the momentum of growth for NYC's economy.



Together the healthcare and technology sectors employ approximately **490,000** employees.

Openings in these sectors alone make up approximately 45% of the total postings for all middle-skill jobs in NYC between July 2013 and June 2014.

More than **190,000** of these workers are in middle-skill jobs.



There is also demand for new workers, with over **44,000** new job openings for middle-skill workers per year.

Over **2.6 million** New Yorkers aged 25 and older do not have the credentials required for these jobs, which means positions go unfilled and future growth is in jeopardy.

Employers are having trouble finding workers with the right skills - middle-skill postings in healthcare go unfilled for over **1 month** on average.

The healthcare and technology sectors are two of the cities high-demand industries; they are projected to grow significantly over the next five years.

**14%** projected growth rate for healthcare over the next five years.

**15%** projected growth rate for technology over the next five years.

### HEALTHCARE



### TECHNOLOGY



Middle-skill occupations in healthcare and technology are excellent opportunities for job seekers because they provide good jobs with career advancement and family-supporting wages.

In healthcare, for example, nursing (\$40.34), clinical practitioners (\$24.35), and health informatics and coding positions (\$21.32) pay a median hourly wage that far exceeds the living wage of \$20.93.

The median hourly wages for several high-demand technology occupations, including computer user support specialists (\$26.31) and web developers (\$34.93), all exceed the living wage.

### EXAMPLES OF MIDDLE-SKILL JOBS

- Registered Nurses
- Physical Therapy Assistants
- Computer Programmers
- Help Desk Staff
- Paralegals
- Graphic Designers

# OUR RECOMMENDATIONS

Finding enough qualified New Yorkers to fill the middle-skill openings in healthcare and technology – let alone other high-growth, high-demand sectors – will be impossible without redesigning the city’s workforce development system. In order to meet this demand, NYC will need to build an employer-led, sector-based workforce development system supported by robust career pathways.

## Recommendation

### **Expand a sector-focused workforce development system.**

A sector-focused workforce development system is responsive to the needs of the city’s high-demand sectors. The system must rely on multiple sources of labor market information and continuous engagement with employers in order to be responsive to sectors’ evolving expectations and priorities.

## Recommendation

### **Implement policies that incentivize a systemic approach to sector-focused career pathway development.**

Leverage local, state, and federal policies that support sector-based career pathways and allocate resources to programs that best prepare workers for high-demand, middle-skill jobs with career mobility.

## Recommendation

### **Create additional career pathways aligned with labor demand in healthcare and technology.**

In order to be effective, the education and training provided in a career pathways system must be aligned with local labor market demand and provide job seekers with the employment skills and middle-skill credentials these sectors require.

## Recommendation

### **Develop funding strategies that can sustain and scale a system of career pathways and expand the sector-focused approach to workforce development.**

Public investment and private philanthropy should align with the career pathways approach to education and training to ensure that the ecosystem of training and education providers can equip job seekers with the skills and credentials that employers require for the high-demand, middle-skill jobs.

## Recommendation

### **Ensure New Yorkers are aware of the middle-skill job opportunities in healthcare and technology.**

Middle-skill positions in these industries pay a living wage and offer career mobility. The city should market these opportunities as a pathway to economic prosperity for New Yorkers and help job seekers navigate the options to prepare for these jobs.

Given the size of the system and the scale of the need, this is a complex undertaking. But NYC is well positioned for success, given the sophistication and expertise of current sector-based work, the leadership of the Office of Workforce Development, and strong examples of career pathway programs. Through the *New Skills at Work* initiative, JPMorgan Chase & Co. will contribute resources and expertise to accelerate this work to transform lives and strengthen economies.

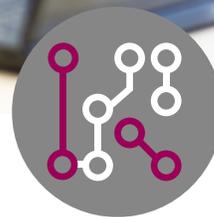
# INTRODUCTION

In New York City (NYC), despite the promise of sustained economic growth and a large workforce, many businesses in high-demand industries are struggling to fill open middle-skill positions. Developing strategies that train New Yorkers for these jobs will help families earn a living wage and will support the City's future economic growth.

This report will highlight challenges and opportunities for addressing this skills gap in NYC, particularly in the healthcare and technology sectors.



**HEALTHCARE**



**TECHNOLOGY**

# THE CHALLENGES

## WHILE MILLIONS OF PEOPLE ARE LOOKING FOR JOBS, EMPLOYERS REPORT THAT THEY ARE STRUGGLING TO FIND SKILLED WORKERS.<sup>1</sup>

Since the official end of the recession in 2009, the NYC labor market has grown by 6%, exceeding state and national growth.<sup>2</sup> Over the next decade (2013-2023), NYC's economy is expected to continue to grow by 1.1% annually, slightly slower than the projected national rate of 1.2% per year. (See Cumulative Employment Growth Rate Chart, 2001-2023 in Appendix B.)

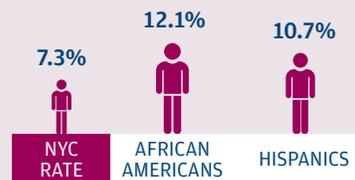
### Overall economic growth has not improved persistent disparities in unemployment rates among segments of the NYC population.

For example, African Americans (12.1%) and Hispanics (10.7%) have higher unemployment rates than the NYC unemployment rate of 7.3%. There is also a disparity in unemployment rates between neighborhoods. In 2014, unemployment in Manhattan (5.6%), Queens (6.1%) and Staten Island (6.7%) was close to the overall NYC unemployment rate of 6.9%, but the Bronx (9.8%) and Brooklyn (7.5%) were higher.<sup>3</sup>

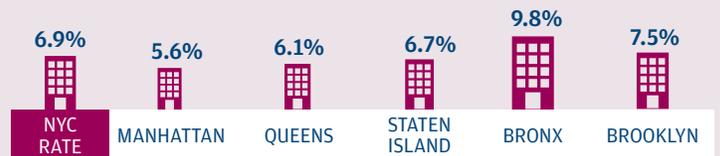
Similar to other large urban areas, NYC has a high youth unemployment rate, particularly for the "opportunity youth" population, 16-24 year olds who are out of school and out of work. Based on a recent report from **JobsFirstNYC** **3** approximately 172,000 young adults (ages 18-24) are out of school and unemployed, and 133,000 are employed in low-wage, low-skill jobs.



### Unemployment rates among minority populations



### Unemployment rates between neighborhoods (2014)



### 3 Jobs for NYC's Opportunity Youth

JobsFirst's Young Adult Sectoral Employment Project is developing sector-focused workforce partnerships to improve employment outcomes for opportunity youth. Partnerships require the participation of at least one organization with capacity and experience delivering skills for a specific sector and one organization with capacity and experience serving young adults, and one organization with employer ties or the ability to develop those ties quickly. Five partnerships across NYC are developing employer-driven pathways that provide the first on-ramp to higher paying occupations for opportunity youth in healthcare, information technology, transportation and warehouse logistics, and the food sector.

1 Based on multiple sources: The 2013 Nursing and Allied Healthcare Professionals Workforce Survey Report mentions positions for nurse managers, experienced registered nurses, clinical laboratory technologists, medical coders, and physical therapists continue to be the most difficult occupations to recruit to. To support this, the Burning Glass data show long average duration for job postings for these occupations. A recent Brookings study of the Burning Glass data found that nationally, the median duration of advertising for a STEM vacancy is more than twice as long as for a non-STEM vacancy. Also, computer skills are associated with the highest salaries and longest advertisement duration times among all major occupational groups. Also, a recent article found here – [www.inc.com/will-yakowicz/tech-hiring-gets-tougher-in-midwest.html](http://www.inc.com/will-yakowicz/tech-hiring-gets-tougher-in-midwest.html) – mentions difficulty finding computer science workers in NYC.

2 EMSI QCEW, Non-QCEW & Self Employed, 2014.2

3 Bureau of Labor Statistics, Local Area Unemployment Statistics Program, [labor.ny.gov/stats/laus.asp](http://labor.ny.gov/stats/laus.asp)

4 Unleashing the Economic Power of the 35 Percent: A Policy Paper Prepared by JobsFirstNYC (July 2014).

Finally, there is the particular challenge of the **long-term unemployed** **4**, i.e., individuals unemployed for more than 27 weeks.

In 2014, President Obama issued a call to action to the nation's employers to remedy this "stubborn legacy of the recession." Through the *New Skills at Work* (NSAW) initiative, JPMorgan Chase is putting its commitment into action, supporting local research to better understand the needs of the long-term unemployed in nine American communities and helping communities implement best practices that give these job seekers the education and training they need to get back to work. The work of NYC Labor Market Information Services will be critical to this research effort.

#### **4 (Re)employment for the Long-term Unemployed**

As of August 2013, three million unemployed Americans, or one-third, have been unemployed for more than six months and more than two million have been out of work for more than a year. Research suggests that the length of unemployment makes it more challenging to return to the workforce: skills deteriorate and there is no opportunity to build new skills. But the more virulent challenge is the impact on perception: employers come to see the long-term unemployed as risky hires; and the impact of weeks and months of failed job seeking causes the self-perception of the long-term unemployed to plummet.

The Work Place, a workforce development program in Connecticut, has developed a five-week program tailored to the needs of the older, long-term unemployed – "Platform to Employment" (P2E). The program is designed to address structural and personal challenges that these job seekers face, and to do that P2E includes job readiness, emotional readiness, and an eight-week work experience. This work experience element of the program gives a risk-free opportunity to evaluate and consider hiring participants while building the participants' skills and confidence.

### NUMBER OF UNEMPLOYED BY DURATION

	Number Unemployed in thousands	27 Weeks and Over	52 Weeks	Median Duration
NYC	339.0	161.4	109.1	25.6
Age 16-19	19.5	5.0	2.5	23.3
Age 20+	319.7	196.4	106.6	26.8
Male	190.2	91.7	62.4	27.8
Female	148.9	69.6	46.7	25.2
White	151.4	72.9	53.8	25.4
Black	134.0	64.2	38.8	25.2
Hispanic	115.3	55.3	38.2	26.0

Source: NYC Labor Market Information Service, August 2013 – July 2014



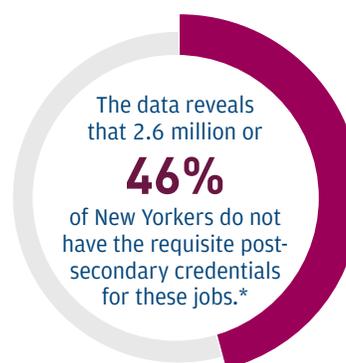
A breakdown by the NYC Labor Market Information Service shows almost half (48%) of New York's unemployed populations have been unemployed for more than 27 weeks and 32% have been unemployed for 52 weeks.

Listed above is a table showing the number of unemployed by duration.

In the previous workforce development paradigm, the goal would have been to connect these job seekers to any job as quickly as possible. It is a more difficult task, but even more urgent, that those with limited prospects and/or the long-term unemployed are connected to the career pathways that can provide the education and training they need to build the skills required in high-demand middle-skill occupations.

## NYC talent supply pipeline is not sufficient to meet current demand for middle-skill workers in healthcare and technology.

Middle-skill occupations do not require a Bachelor's degree, but they are skilled positions that require some education and training beyond high school. Based on data from the Quarterly Census of Employment and Wages (QCEW), 2.6 million or 46% of New Yorkers aged 25 and older do not have the requisite postsecondary credentials for these jobs. In fact, the percentage of New Yorkers with a high school diploma, or some college or an Associate's degree is below the state and national percentages.



### LEVELS OF EDUCATION ATTAINMENT\*

Education Level	2013 Population	2018 Population	% of Population		
			2013	2013 State	2013 National
Less Than 9th Grade	504,910	486,402	9%	6%	5%
9th Grade to 12th Grade	747,065	842,280	13%	11%	11%
High School Diploma	1,400,115	1,434,795	24%	27%	28%
Some college	840,817	885,510	15%	16%	21%
Associate's Degree	343,698	354,224	6%	8%	7%
Bachelor's Degree	1,133,116	1,165,984	20%	18%	18%
Graduate Degree and Higher	757,584	767,750	13%	14%	10%
<b>Total</b>	<b>5,727,305</b>	<b>5,936,945</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

Source: QCEW Employees, Non-QCEW Employees & Self-Employed – EMSI 2014.2 Class of Worker

\*These figures refer to New Yorkers aged 25 and older

Retention is a common challenge in the nation's education system, and NYC also has this problem. For example, even recognizing City University of New York's (CUNY's) ability to train a growing workforce in today's changing economy, this substantial pipeline faces the very common challenge of **student retention** <sup>6</sup>: nearly 40% of CUNY's enrolled students are no longer registered a year after beginning classes and, two years later, half are no longer enrolled.<sup>5</sup> It is clear that the supply of middle-skill workers in NYC will not meet the demand when millions lack the necessary credentials and training programs struggle to retain students.

It is important for stakeholders to recognize that it will take longer and require a more concentrated investment of time and resources by the job seekers and the workforce development ecosystem of providers and partners to move toward career pathways as a systemic approach to skill building, but this evolution will accelerate ongoing efforts to address the skills mismatch.

#### 6 CUNY: Success Through Acceleration

As an example of efforts to improve retention, CUNY has developed programs like Accelerated Study in Associates Programs (ASAP) with evidence of success. These programs feature academic preparation with comprehensive support services and financial resources – targeted efforts to identify issues that contribute to students leaving their program and provide supports to eliminate those as barriers. This program is part of CUNY's commitment to graduating at least 50% of students within three years.

#### The Need for Better Workforce Data

Limited supply data underscores the need for workforce development and education system leaders to address the problems of the uncredentialed and effectively match the newly credentialed to the employers that need them. Employment in the right middle-skill job will pay off for individuals and create a more diverse talent pool for employers in high-demand industries. In order to achieve this, the city needs a comprehensive data system that connects education data with workforce information.

5 [www.cuny.edu/irdatabook/rpts2\\_AY\\_current/RTGS\\_0001\\_FT\\_FTFR\\_ASSOC\\_TOT\\_UNIV.rpt.pdf](http://www.cuny.edu/irdatabook/rpts2_AY_current/RTGS_0001_FT_FTFR_ASSOC_TOT_UNIV.rpt.pdf)

# THE OPPORTUNITIES

According to analysis by Economic Modeling Specialists Intl. (EMSI), NYC's top six industry categories based on the total number of employees in the sector are Healthcare, Financial and Insurance Services (Finance), Education, *Multimedia Entertainment* <sup>8</sup>, Computer and Information Services (Technology), and Corporate Headquarters.<sup>6</sup> Preparing job seekers for employment in these industries will ensure continued economic growth for the city and economic opportunities for more New Yorkers.

Of the identified industries, healthcare and technology represent the largest sectors in terms of current jobs (healthcare) and projected growth (technology) and they have a strong concentration of high-demand and high-growth, middle-skill occupations.

JPMorgan Chase & Co. also recognizes that *industry partnerships* <sup>9</sup> will need to play a significant role in developing strategies and mobilizing resources. Another reason technology and healthcare are prioritized in this report is that both industries have industry partnerships positioned to lead this work: the nationally recognized *New York Alliance for Careers in Healthcare (NYACH)* <sup>10</sup> has been working deeply in the healthcare sector, and the Tech Talent Pipeline (TTP) has recently been established to advance work in that sector.

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## <sup>8</sup> *Multimedia Entertainment Industry*

There has been a growing interest in nurturing NYC's Multimedia Entertainment sector. This sector is not a focus of this report, but there are middle-skill occupations identified in the technology sector that can also be considered part of the Multimedia Entertainment sector, such as web developers, graphic designers, film and video editors, and camera operators, television, video, and motion picture. (See Technology Sector Occupations that Overlap with Multimedia Entertainment in Appendix B)

## <sup>9</sup> *Industry partnerships*

Industry partnerships are employer-led but include a wide range of partners, including education and training providers, industry associations, and community-based organizations. These partnerships are critical to the work because they often focus as the locus of strategy, resources, and expertise for meeting the needs of employers/industry and job seekers.

## <sup>10</sup> *New York Alliance for Careers in Healthcare*

New York Alliance for Careers in Healthcare is a nationally recognized healthcare industry partnership that has been working with healthcare employers and education and training providers to develop pilot programs and strategies to address staffing challenges faced by the city's employers.

<sup>6</sup> **Multimedia entertainment** includes the motion picture, video and related sectors, sound recording/production, radio, television and cable, live entertainment/performing arts and agents, managers and independent artists. **Healthcare** includes ambulatory healthcare services, hospitals, and nursing and residential care facilities. The **Financial and Insurance Services** sector includes business primarily engaged in financial and/or facilitating financial transactions. **Corporate headquarters** includes offices of bank holding companies, offices of other holding companies, and corporate, subsidiary and regional managing offices.



# OPPORTUNITIES IN HEALTHCARE

THE HEALTHCARE INDUSTRY HAS A HIGH CONCENTRATION OF MIDDLE-SKILL OCCUPATIONS THAT PAY A FAMILY-SUSTAINING WAGE.

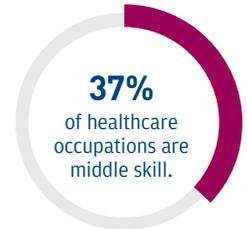
## Healthcare has a wide range of middle-skill occupations and many occupations pay a living wage.

Currently, there are approximately 423,000 healthcare workers in NYC, and the sector is projected to grow by 14% over the next five years. The chart below identifies the occupation groupings that will continue to see high growth and be in high demand over the next decade. Some of this demand is driven by incentives created by the Affordable Care Act (ACA), which will increase the numbers of insured and, thereby, increase the numbers of residents seeking healthcare services.<sup>7</sup>

Some 37% of healthcare occupations are middle skill and, based on job postings, healthcare accounts for 31% of all middle-skill employment demand in NYC. There are over

**25,000**

postings across positions in five occupation groupings that require a sub-baccalaureate credential. (See the chart below.)



## TOTAL JOB POSTINGS FOR HEALTHCARE OCCUPATION GROUPINGS\*

Occupation	Total Postings (July 2013–June 2014)	Projected 10-year growth	Mean Hourly Wage	% of Postings in Hospitals	Average Posting Duration
Nursing	11,053	13%	\$39.00	59%	37 days
Administrative	5,352	13%	\$32.41	69%	35 days
Sub-BA Practitioner	4,182	19%	\$24.45	60%	35 days
Healthcare Support	3,129	35%	\$12.59	38%	35 days
Technical, Non-Patient Care	1,295	17%	\$20.79	62%	60 days
Health Information Management	744	11%	\$21.32	78%	62 days

Source: Burning Glass Technologies

\*All of the position groupings in this chart are middle-skill positions for individuals with less than a four-year degree.

As the data illustrates, many of the positions in these groupings are in high demand, projected to grow, and pay comparatively well. There are 35 middle-skill healthcare occupations with average earnings of \$25 per hour in the region. (See The Opportunities in Healthcare Chart in Appendix B.) Training in these fields would be a promising investment for the workforce system because each step progression will result in a significant increase in the employee’s salary. It’s a good investment for the system and individual. It is also a promising pipeline for a work-based learning program for employers seeking to “grow their own” talent from incumbent **entry-level workers** **11**.

### **11 Home Health Aides: Work Without a Living Wage**

A sector-based workforce development system directs individuals to high-demand, high-growth occupations. If the system is trying to promote “good jobs”, then working conditions and wages should also be considered. Therefore, without additional strategies to make “bad jobs better”, this should rule out investments in training for positions, like home health aides, that promise a high-demand but too often offer poor job quality. By current state law, most all NYC entry-level home care aides earn \$14.09/hour (\$10 in wages/\$4.09 in benefits), compensation that has increased by 50% over the past three years, but that is still far below a living wage in the city. Organizations like Paraprofessional Health Care Institute (PHI) organize and campaign tirelessly on behalf of better wages and benefits for home care workers. In NYC, Cooperative Home Care Associates, a PHI affiliate, has achieved this goal by organizing workers into an employee-owned company. Similarly, training for this type of position as a terminal job is only a good investment if it is also accompanied by a comprehensive strategy of entry-level job redesign.

<sup>7</sup> For a more comprehensive overview of the Affordable Care Act and its implications for workforce development, see (Wilson, R., 2014). *Implementing the Patient Protection and Affordable Care Act: Impacts on the Frontlines of Caregiving*. Boston, MA. Jobs for the Future.

For example, within **Nursing** occupations, registered nurses, a high-growth occupation, earn a median hourly salary of \$40.34 per hour. Over 11,000 jobs were posted between July 2013 and June 2014, and this occupation is projected to grow by 13% over the next decade. (See The Opportunities in Healthcare Chart in Appendix B.) Nursing programs will need to build their capacity to meet the scale of the demand in the industry. However, training programs report challenges with expansion due to faculty shortages and limited space to provide the requisite clinical training. This is a pain point for the industry and providers, presenting an opportunity for partnerships between the **education providers** **12**, employers and funders, to develop strategies to address efforts to scale up programming.

## **12** Employers Engaged in Curriculum Design

NYACH is working with the City University of New York (CUNY) to enhance its employer certificate program in medical billing. Employers had indicated that Associates degrees are not required for that position, and that they are seeking specific skills along with certification by way of examination. Now, NYACH is working with the 1199SEIU Healthcare Workers Union and the Greater New York Hospital Association to help CUNY redesign its curriculum to meet employer requirements.

### **i** Job Seekers

Administrative positions are a great middle-skill opportunity for job seekers in healthcare and across industries. Twelve percent of all **administrative** job ads in NYC were in healthcare, but that ranks third – behind the finance sector and professional services sector – in terms of total demand. The growth is also projected to be 13% over the next decade. Job seekers should also note that this occupation grouping provides opportunities across multiple high-demand industries in the region. (See The Opportunities in Healthcare Chart in Appendix B.)

### **Just as demand is increasing, the skill requirements, and in some cases credentials required, for middle-skill positions are changing.**

It is important for job seekers and training providers to recognize significant changes in the skills required for middle-skill occupations, especially in patient care and technology categories.

#### **Patient Care Occupations**

Credential requirements for the nursing profession are changing. Increasingly, hospitals, which employ the bulk of nurses, are requiring a Bachelor of Science in Nursing (BSN) for the most lucrative jobs. The 2013 Nursing and Allied Healthcare Professionals Workforce Survey confirms this shift. In NYC, 50% of nurses had a BSN in 2012, compared to 39% in 2011. The Registered Nurse (RN) position is still projected to grow, but upskilling or “degree creep” might mean that there are fewer RNs in hospitals. However, this is offset by more RNs in non-hospital settings. The position will continue to serve as an important entry point into nursing and the community of workforce providers will need to continue to invest in RN education and training.

At the same time, some patient care positions, such as Licensed Practical Nurses (LPNs), are decreasing significantly. In 2007 in NYC, there was one LPN job posting for every seven RN postings. In the last 12 months, demand has dropped to one LPN posting for eight RN postings. The loss of this position has implications for the overall nursing career ladder. First, the RN is now essentially the entry-level nursing position in most hospitals and there will be pressures on this position to have the experience to operate at the top of the skill level.<sup>8</sup> Second, a once critical rung in the career ladder from front-line patient care to RN is missing.

Job seekers wanting to advance on this nursing career ladder would be advised to focus on earning an RN, rather than an LPN, to see a faster labor market payoff.

#### **Technology-Focused Occupations**

Technology is changing healthcare occupations and creating higher skill demands in many jobs. Health information and coding is an example of this evolution. The greatest demand within this occupation grouping is for the two Associate’s degree level positions: Medical Coder and Medical Records/Coding Supervisor. (See The Opportunities in Healthcare Chart in Appendix B.) Higher skills do result in a greater payoff, but this also means the rigor of the training program increases. This may call for bridge programs to ensure the career pathway programs reach the lower-skilled applicants and intensified student supports to promote their success in pathway programs.

<sup>8</sup> Wilson, R. 2014. *Implementing the Patient Protection and Affordable Care Act: Impacts on the Frontlines of Caregiving*. Boston, MA. Jobs for the Future.



## OPPORTUNITIES IN THE TECHNOLOGY SECTOR

WHILE THE BREADTH OF THE SECTOR HAS NOT YET BEEN *DEFINED*<sup>13</sup>, IT OFFERS A RANGE OF MIDDLE-SKILL OCCUPATIONS THAT CAN PROVIDE A LIVING WAGE FOR NEW YORKERS.

Real-time labor market data from Burning Glass revealed that the technology sector has grown by 12% in the last decade and is projected to grow by 15% over the next five years – the highest growth rate among high-demand industries. Middle-skill jobs within the sector account for 16% of all of the middle-skill job postings in NYC, or a little more than 8,100 jobs.

There are 10 selected technology occupations with **median hourly salaries**<sup>14</sup> that range from \$26.00 to \$56.00. All of these positions are in high demand: ranging from 2,500 postings for Information Security Analysts to more than 5,100 postings for Computer User Support Specialists. The help desk occupation category is an example. (See Middle-Skill Occupations with Median Hourly Earnings in Appendix B.)

Even at the entry level, PC Technician workers earned an annual salary of **\$45,473** in 2014.<sup>9</sup>

### <sup>13</sup> Defined

NYC has a growing technology ecosystem. For the purposes of this report, the technology sector will include the following: software publishing and reproducing, data processing hosting, and related services, internet publishing and broadcasting and web search portals, computer programming services, systems design services, computer facilities management services and satellite communications. EMSI based its analysis of the industry on select industry codes from the North American Industrial Classification System (NAICS).

### <sup>14</sup> Median Hourly Salaries

Job seekers can confirm salaries for this industry sector through the Robert Half Salary Guide for Technology Professionals. The table below provides a salary guide for the Help Desk tier.

Job Title	2013		2014	
	Min	Max	Min	Max
Help Desk Tier 3	\$70,853	\$91,298	\$74,730	\$96,585
Help Desk Tier 2	\$56,400	\$73,320	\$59,220	\$76,845
Help Desk Tier 1	\$44,768	\$59,925	\$46,530	\$62,393
PC Technician	\$44,063	\$64,860	\$45,473	\$66,975

### **i** Job Seekers

**Middle-skill technology occupations cross multiple industry sectors.**

Data show that technology occupations cross industry boundaries. The chart on page 16 shows the distribution of technology occupations across industry sectors, particularly the Financial and Insurance Services sectors. These industries have a higher percentage of technology workers than the technology industry in four occupations: Computer Systems Analysts, Information Security Analysts, Database Administrators, and Network and Computer Systems Administrators. And the percentage of NYC technology occupations in these sectors is more than double the percentage in the financial and insurance services nationally.

The prevalence of technology workers in non-technology industries is a unique characteristic of the NYC labor market. With the exception of Educational Services and Retail Trade, non-technology industries in NYC have a higher percentage of technology postings than their peer industries nationally. (See Distribution of Technology Job Postings by Industry Sector in Appendix B.)

### Bringing Technology Jobs Home – to the Bronx

StartUp Box, a Bronx-based social enterprise organization founded by the Majora Carter Group, draws young adults into the technology pipeline by training them to conduct quality assurance (QA), a function most often off-shored, for games software developers. StartUp Box responds to software developers' established outsourcing practices as a subcontractor, not a "job placement" service – with rapid-response customer service and with trained game testers who know the American market. Testers generate income, are exposed to a wide range of product failures/success, and build a professional network they can access for further training in the industry.

<sup>9</sup> The data from multiple sources demonstrate technology occupations pay family-sustaining wages; however, this is an area where "one-size-fits-all" analysis becomes problematic as small firms with lower salaries may be complaining of shortage and skills gaps while larger firms are doing fine competing for workers.

## DISTRIBUTION OF TECHNOLOGY EMPLOYMENT IN SIX KEY NYC INDUSTRIES, 2013

SOC	Title	Healthcare	Financial and Insurance Services	Education	Multimedia Entertainment	Computer and Information Services	Corporate Headquarters
15-1121	Computer Systems Analysts	2%	35%	2%	1%	27%	10%
15-1122	Information Security Analysts	2%	55%	1%	1%	17%	7%
15-1131	Computer Programmers	1%	19%	2%	3%	42%	5%
15-1133	Software Developers, Systems Software	0%	28%	1%	1%	38%	7%
15-1134	Web Developers	1%	13%	2%	7%	30%	4%
15-1141	Database Administrators	2%	34%	3%	2%	17%	9%
15-1142	Network and Computer Systems Administrators	3%	24%	4%	4%	18%	8%
15-1143	Computer Network Architects	2%	25%	2%	2%	29%	8%
15-1151	Computer User Support Specialists	3%	20%	8%	2%	24%	7%
15-1152	Computer Network Support Specialists	3%	20%	5%	3%	24%	8%

Source: Burning Glass Technologies

### The technology sector has a concentration of middle-skill jobs, but findings from various research reports suggest a discrepancy between posted requirements about the credentials actually required for the occupations.

Based on data and analysis from EMSI, this report has identified the technology sector as an industry with a high concentration of middle-skill occupations for job seekers, with 52% of job postings not requiring a Bachelor's degree (BA). Other reports have found similar findings: HR&A's 2014 Technology Ecosystem Report found up to 44% of "technology ecosystem" job postings do not require a BA. However, research on current technology employees shows that the majority of technology workers do have a BA degree. The NYC Labor Market Information Service (LMIS) found that only 24% of the people currently employed in the technology sector have less than a four-year degree. The majority of current technology workers are BA graduates. (See Technology Employment by Education Attainment 2008–2013 in Appendix B.) Based on these findings, the postings do not reflect the current picture of the credentials that are actually held by current job holders.

**Recent feedback from local employers suggests that the technical and cognitive skills that job seekers need for positions in the technology sector can be acquired with education and training less than a Bachelor's degree; and that some skills may be more important than a four-year degree. So given this, there may be a change in future hiring practices.**

These findings provide a starting point for discussion among stakeholders in the sector to clarify the credential expectations for occupations moving forward. Do these middle-skill positions actually require a BA, and therefore should they no longer be posted as middle-skill jobs? Are these, in fact, middle-skill jobs but the BA is being used as a proxy for skills and competencies to facilitate screening and hiring processes? Are there customized trainings that employers and partners can provide on the job to advance workers' skills if experience beyond middle-skill credentials is required but not necessarily a BA?

**Tech Talent Pipeline 15** will play a crucial role in facilitating these conversations for industry partners and customized research from partners like the LMIS can inform the process.

*"Available tech jobs aren't just for people with Bachelor's degrees. The JPMorgan Chase report reaffirms that New York City's technology sector also desperately needs people that have specialized skills training and the motivation and passion for learning new things."*

**Hagos Mehreteab**, Head of Talent Acquisition of AppNexus

#### **15 Tech Talent Pipeline (TTP)**

Announced by Mayor de Blasio in May 2014, the TTP is a \$10 million, three-year initiative established to provide leadership, funding, and support to public and private partners working to deliver technology education, training, and job opportunities to underserved New Yorkers. The TTP is supported by several philanthropic partners, including the inaugural funder JPMorgan Chase, the NY Community Trust and the NYC Workforce Funders. The TTP is a collaboration between businesses, community groups, training providers, government, and academic institutions designed to support the growth of New York's tech ecosystem and prepare New Yorkers for 21st century jobs.

# CAREER LADDERS IN NEW YORK CITY'S HIGH-DEMAND INDUSTRIES

Clear ladders of progression from entry level to middle-skill jobs (and more advanced positions) exist in both healthcare and technology. In this section, we offer a career ladder for a select occupation in both areas. Industry partnerships (e.g., New York Alliance for Careers in Healthcare, and Tech Talent Pipeline) can adapt the model for developing these career maps to other priority occupations by identifying the priority position, mapping the progressive vertical steps of responsibility and salary, and aligning each step with any required certifications or credentials. With these career ladder maps, employers can articulate the trajectory for career advancement, translate the career progression to the education and training providers, and communicate these opportunities to job seekers so they can understand how they can enter the industry and advance to middle-skill opportunities that are available in healthcare and technology.



## CAREER LADDER IN THE HEALTHCARE SECTOR

Emerging technology-heavy occupations are also high growth and offer promising employment opportunities. Based on research from the NYC LMIS, jobs in health administration and electronic health records provide employment with clear paths for career advancement. The chart on page 18 draws from that research and identifies positions in this occupation grouping by education level and shows the pay range for each position. NYACH is using this information to shape their programming to prepare job seekers for careers in this area.

## EDUCATION, PAY RANGE, AND PLACE OF WORK BY JOB TYPE

Occupation	Job Type	Pay Range in NYC*	Typical Place of Work
<b>HS Diploma and Training</b>			
Medical Receptionist		\$22,480 – \$35,180	Healthcare providers – hospitals, outpatient care, long-term care
Patient Registrar		<b>\$22,000 – \$30,000</b>	
Patient Services Representative		<b>\$27,000 – \$37,000</b>	
Medical Secretary		\$33,600 – \$47,100	
Medical Billing Clerk		\$25,000 – \$48,000	Healthcare providers, insurance carriers
Accounts Receivable Representative		\$30,350 – \$54,040	Offices of physicians, hospitals
<b>Post-HS Certificate or Associate Degree</b>			
Certified Medical Coder (CCA or CPC)		<b>\$27,000 – \$39,000</b>	Outpatient care providers and Emergency Departments
Certified Medical Coder (CCS)		<b>\$31,000 – \$44,000</b>	Hospitals
Health Record Analyst		<b>\$31,000 – \$44,000</b>	Hospitals, government-funded e-health collaborative, staffing firms
Medical Records Technician		\$32,990 – \$50,100	Healthcare providers, health consulting firms
Help Desk/Desktop Support		\$35,990 – \$60,860	Healthcare providers, health insurance companies, consulting firms
<b>Associate Degree with Experience</b>			
Health Information Manager		<b>\$42,000 – \$59,000</b>	Skilled nursing/residential care facilities
Coding Manager		<b>\$50,000 – \$67,000</b>	Hospitals

 HIM-Related     HIM     Health IT

\*Because many health information occupations are new, some wages are not yet available from traditional sources like the New York State Department of Labor. Pay ranges that appear in blue are from Payscale, Inc., a web-based repository of online work histories.

Source: August 2014 Careers in Health Information, page 6. [www.gc.cuny.edu/CUNY\\_GC/media/365-Images/Uploads%20for%20LMIS/Reports%20and%20Briefs/August-2014-LMIS-CCP-Careers-in-Health-Information.pdf](http://www.gc.cuny.edu/CUNY_GC/media/365-Images/Uploads%20for%20LMIS/Reports%20and%20Briefs/August-2014-LMIS-CCP-Careers-in-Health-Information.pdf)

The healthcare sector also provides an example of a lattice approach to career advancement. The chart below shows common healthcare-specific administrative roles as well as Extended Occupations, which are general roles that offer additional demand opportunities across a range of employment sectors.

## JOB POSTINGS FOR ADMINISTRATIVE OCCUPATIONS IN HEALTHCARE AND OUTSIDE OF HEALTHCARE

Occupation	Number of Postings (July 2013–June 2014)	➔	Extended Occupations (Related Jobs Outside of Healthcare)	Number of Postings (July 2013–June 2014)
Medical Office/Practice Manager	219 		Office Manager	1,630 
Medical Secretaries	747 		Administrative and Executive Assistants	15,881 
Medical Biller	176 		Bookkeeping/Accounting Clerks	4,204 
			Billing and Posting Clerks	614 
Patient Representative	93 		Customer Service Representatives	6,508 

Source: Burning Glass Technologies

### Job Seekers

This is important for job seekers to note: the required skills for many administrative healthcare roles are transferable to other sectors. The “Extended Occupations” column identifies some of those opportunities.



# CAREER LADDER IN THE TECHNOLOGY SECTOR

Middle-skill technology jobs cover a broad range of roles and skill levels, from computer sales through sophisticated networking and database roles. Based on the Burning Glass analysis, the largest and most important category is **Help Desk 16**, within the Computer User Support Specialist occupation; this is an important entry point into the technology sector that can serve as a stepping stone to more advanced technical roles.

Below is a sample career pathway for Help Desk/Computer User Support Occupations:

## 16 Help Desk

The most requested requirements, technical, and baseline skill requirements for the help desk/computer support occupations in the industry sectors.

### Certifications

- A+ Technician
- Network
- Microsoft-Certified Systems Engineer
- Cisco-Certified Network Associate
- Security

### Technical Skills

- Help Desk
- Computer Repair
- Hardware and Software Installation
- System and Network Configuration
- Basic Troubleshooting
- Microsoft Office Applications
- VPN

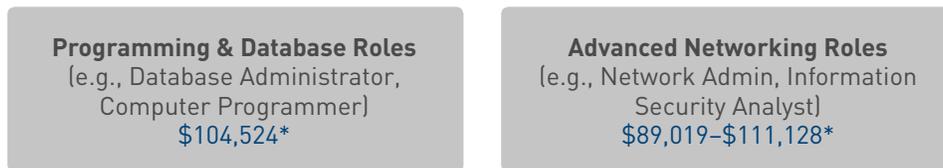
### Baseline Skills

- Communication
- Customer Service
- Writing
- Problem Solving
- Organization
- Leadership
- Multi-Tasking
- Project Management
- Planning
- Detail-Oriented

## PROGRESSION WITH MIDDLE-SKILL SECTOR THROUGH TO ADVANCED ROLES

### Advanced Roles:

Typically require a BA and substantial experience.



### Upward Roles:

Require more technical IT skills or experience and offering a viable transition upward from Help Desk roles.



### Help Desk:

Important entry point into IT workforce. Account for over half (57%) of middle-skill IT jobs in NYC.



**Lateral Off-Ramp Roles:** Roles leveraging similar knowledge and skills outside of the IT field.

■ Middle-Skill Roles   ■ Advanced Roles   \*Average Advertised Salary in NYC

Even taking into account the preference for BA holders, this is an occupation for technology-inclined job seekers to explore. Providers should work closely with the Tech Talent Pipeline and employer partners to ensure job seekers are clear on credential requirements for the occupations they choose; as described below, there is also a clear need for bridge programming for the lowest-skilled New Yorkers to access the lowest rung of the ladder.

# RECOMMENDATIONS

As identified in the report, there is work to be done in each sector to clarify expectations around these opportunities, but it is clear that there is a range of middle-skill occupations in healthcare and technology that offer good paying jobs with the opportunity for career mobility. Based on the findings in this report, we offer some recommendations for stakeholders trying to build the talent pipeline for middle-skill jobs, clarify opportunities and expectations for middle-skill occupations in the healthcare and technology sector, ensure pathways align with these expectations, and integrate these strategies into the larger policy and systemic efforts in the city.

## Recommendation

### **Expand a sector-focused workforce development system.**

A sector-focused workforce development system is responsive to the needs of the city's high-demand sectors. The system must rely on multiple sources of labor market information and continuous engagement with employers in order to be responsive to sectors' evolving expectations and priorities.

- Use traditional and real-time labor market information to understand which healthcare and technology occupations have the greatest demand and what the skill and credential requirements are for the in-demand jobs.
- Industry partnerships should vet existing labor market information to clarify skills and credential requirements for middle-skill occupations, and prioritize the gaps to address them.

## Recommendation

### **Develop funding strategies that can sustain and scale a system of career pathways and expand the sector-focused approach to workforce development.**

Public investment and private philanthropy should align with the career pathways approach to ensure that the ecosystem of training and education providers can equip job seekers with the skills and credentials that employers require for high-demand, middle-skill jobs.

- Direct investments toward industry partnership efforts to pilot industry-vetted curriculum and training initiatives, including employer-designed, work-based learning programs for training toward middle-skill jobs.
- Invest in career pathway development, including the on-ramps necessary to provide a strong first rung of skill building for very low-skilled job seekers.

## Recommendation

**Create additional career pathways that are aligned with labor demand in healthcare and technology.** In order to be effective, the education and training provided in a career pathways system must be aligned with local labor market demand and provide job seekers with the employment skills and middle-skill credentials these sectors require.

- Industry partnerships should work with providers to translate labor market information and disseminate employer expectations and requirements to education and training providers to ensure the pathway programs are aligned with employer demands.
- Education and training providers should develop customized career pathways that target particular challenges faced by the long-term unemployed, young adults who are not in school or working, and minority populations to improve retention and credential attainment. For example, training programs that target the first rungs of the career ladder should include basic skill-building and comprehensive supports to help these populations get a strong start on the pathway.

## Recommendation

**Implement policies that incentivize a systemic approach to sector-focused career pathway development.** Leverage local, state, and federal policies that support sector-based career pathways and allocate resources to programs that best prepare workers for high-demand, middle-skill jobs with career mobility.

- Providers should leverage policies and resources, like the recently reauthorized Workforce Innovation and Opportunity Act, that support the development of sector-based pathways, collaboratives, and industry partnerships.
- The workforce system should develop criteria for program investments, including factors like living wage salary and opportunity for career mobility. This will ensure that both the system's and job seekers' investments will have a payoff in the labor market.
- The city should make investments and enact policies that extend and intensify support needed for career pathway programs that prepare disadvantaged populations for high-demand, middle-skill occupations.

## Recommendation

**Ensure New Yorkers are aware of the middle-skill job opportunities in healthcare and technology.** Middle-skill positions in these industries pay a living wage and offer career mobility. The city should market these opportunities as a pathway to economic prosperity for New Yorkers and help job seekers navigate the options to prepare for these jobs.

- Stakeholders should develop an awareness campaign that educates New Yorkers about quality middle-skill jobs and the available middle-skill occupations in healthcare and technology.
- Program providers and partners should develop strategic counseling and tools that job seekers can use to evaluate the best opportunities for their needs and navigate the career pathway system to select the right career pathway program.
- Industry partnerships should develop aggressive outreach strategies to increase the representation of marginalized groups. For example, outreach to increase women and minorities in the technology talent pipeline.

# CONCLUSION

There are significant skills gaps facing New York City's fastest-growing industries, in particular the healthcare and technology sectors, and they will only continue to grow without comprehensive interventions. They threaten to not only constrain the city's future economic growth, but to limit opportunities for the millions of NYC job seekers striving to improve their lives. The good news is that significant efforts are already underway to address these challenges.

Through the *New Skills at Work* initiative, JPMorgan Chase & Co. proposes to help advance these efforts by offering guidance on how to develop a demand-driven workforce system aligned with industry-supported education and training models that prepare individuals for careers in high-demand sectors. This means identifying the high-growth industries and occupations in the market; working with employers to determine the skills they need to fill available jobs; and developing education and training pathways that prepare job seekers for careers in high-demand occupations. Mayor de Blasio's Jobs for New Yorkers Task Force is charged with redesigning the workforce development system to focus on preparing workers for quality jobs that pay a family-sustaining wage. Targeting the middle-skill segment of the healthcare and technology industries provides a critical opportunity to implement this strategy in NYC and realize the vision of ensuring that all New Yorkers are prepared for good jobs in high-demand industries.

# APPENDIX A – Methodology

To provide a picture of the economy (e.g., description of employment, unemployment, productivity, workforce and education) this report utilizes Economic Modeling Specialists Intl.'s (EMSI) data aggregated from over 90 federal, state and private sources. EMSI aggregates data such as the Quarterly Census of Employment and Wages (QCEW) from the Bureau of Labor Statistics, Local Area Personal Income (LAPI) from the Bureau of Economic Analysis, County Business Patterns (CBP) from the Census Bureau, and Education Completers data from the Department of Education. EMSI applies proprietary methods to remove suppressions and includes data for proprietors to yield a comprehensive representation of the regional workforce.

The report includes analytical information from Burning Glass Technologies, which provides real-time labor market demand information from online job postings. Burning Glass aggregates and codes data from online job postings based on the North American Industry Classification System (NAICS), Standard Occupational Classification (SOC), and the Occupational Information Network (O\*NET). Burning Glass's patented parsing and data extraction capabilities can extract, derive and infer more than 70 data elements from any online job posting, providing in-depth insights into employers' demand for skills and credentials.

Jobs for the Future augmented the analysis by incorporating additional data sources from the Census Bureau's Longitudinal Employer-Household Dynamics, Quarterly Workforce Indicators. The Quarterly Workforce Indicators (QWI) identify worker flows – hires, separations, turnover and net employment growth.

## Methodology to Identify “Middle-Skill” Occupations

Four criteria were used to identify middle-skill occupations as follows:

1. Selected occupations must pass a minimum requirement for the percentage of their workforce that possesses a high-school diploma and less than a four-year degree.
2. 25% or more of the workforce for each target occupation must surpass the living wage for families with two adults and one child.<sup>10</sup>
3. Each occupation must surpass a minimum growth rate over the past three years.
4. Occupations with limited annual openings are filtered out.

The term “middle-skill” typically refers to the level of education required by a job. This study expands the common definition by adding three additional criteria (wage, growth rate and number of annual openings). This expanded approach will make sure selected occupations are not only middle skilled but also provide a living wage and are growing.

## Report Limitations

When assessing a phenomenon as complex as a local economy, gaps in our analysis and understanding remain. While traditional labor market information (LMI) offers the best data available to capture historic industry and occupational trends, it is infrequently updated. In addition, occupational projections assume that what has happened in the past will happen in the future – they do not account for future macro or micro economic shifts in supply or demand, and they remain only a best guess. Supply also remains very hard to pin down with traditional LMI data. EMSI draws from Integrated Postsecondary Education Data System data on the number of graduates by postsecondary programs to assess labor market supply. Particularly for middle-skill occupations where on-the-job training may be significant, the supply numbers may be undercounted. There is also no way to capture how many incumbent, unemployed, or out-of-the-labor-force workers may have requisite skills to fill in-demand jobs.

Real-time labor market information complements the traditional LMI with more recent information on employer skills, education and credential demand. By scouring recent online postings, Burning Glass can offer insight into newly emerging skills in unique combinations. However, it should be kept in mind that a limitation of the BG data is that it scours only those ads that are indeed posted. Jobs that go unposted (which may include a large share of the middle-skill occupations) remain invisible.

Some of the limitations from both traditional and real-time LMI will be ameliorated through qualitative interviews with employers, educators, policymakers and workforce intermediaries whose on-the-ground experience can fill in gaps about both future employer skill demand and participant supply.

<sup>10</sup> Living wages are determined using the Living Wage Calculator from the Massachusetts Institute of Technology ([livingwage.mit.edu/](http://livingwage.mit.edu/)).

### Job Postings Data

All job postings data reflect job postings in NYC from July 2013–June 2014.

### Employment Data

All industry and occupation employment data presented in this report are over a five-year period between 2013 and 2018.

### Geography

The NYC region consists of the five boroughs, or the following five counties: Bronx, Kings, New York, Queens, Richmond.

### Technology Industry

Employment (jobs) numbers presented in this report for the technology sector utilize the NAICS. The NAICS is a hierarchical system, with six-digit numbers assigned to the most specific industries. Listed opposite are the industry codes used to determine how many workers are employed by the technology industry.

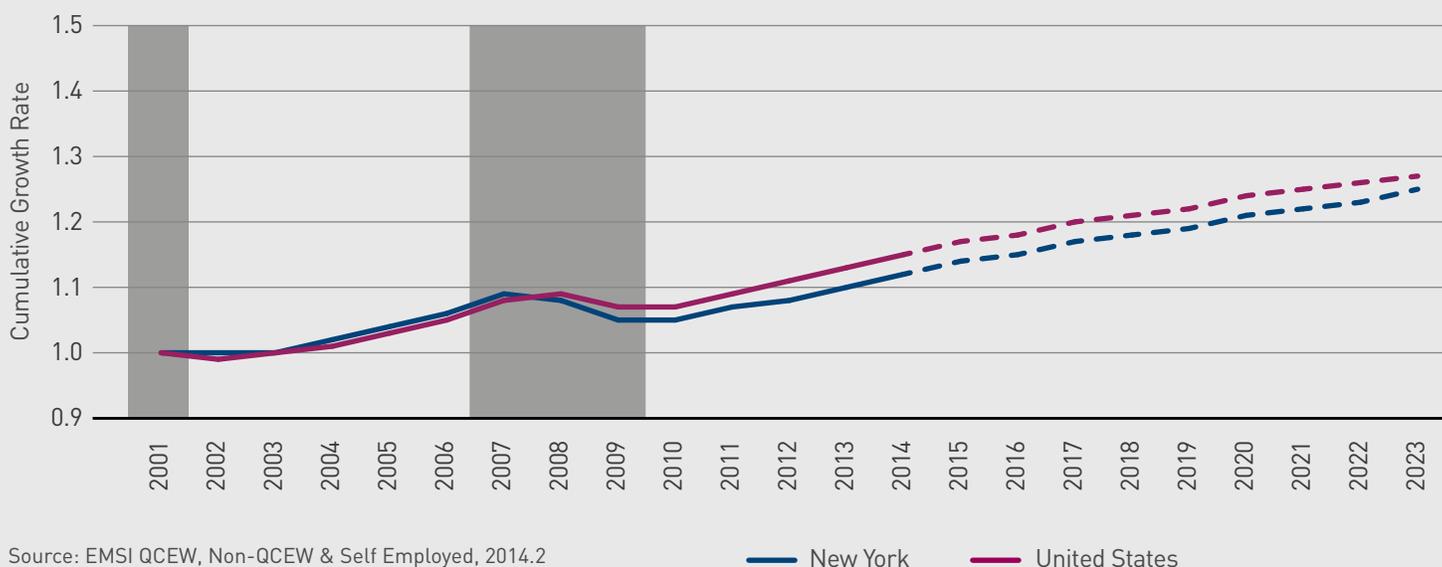
NAICS Code	Title
334611	Software Reproducing
511210	Software Publishers
517410	Satellite Telecommunications
518210	Data Processing, Hosting, and Related Services
519130	Internet Publishing and Broadcasting and Web Search Portals
541511	Custom Computer Programming Services
541512	Computer Systems Design Services
541513	Computer Facilities Management Services
541519	Other Computer-Related Services

# APPENDIX B – Charts Referred To in the Text

You can find more detailed information about the high-demand industries and middle-skill occupations discussed in this report, including data on wages, required credentials, and the total number of middle-skill job postings, at : [www.jpmorganchase.com/corporate/Corporate-Responsibility/new-skills-at-work.htm](http://www.jpmorganchase.com/corporate/Corporate-Responsibility/new-skills-at-work.htm)

## THE CHALLENGE

### CUMULATIVE EMPLOYMENT GROWTH RATE, 2001–2023



## OPPORTUNITIES

### TECHNOLOGY SECTOR OCCUPATIONS THAT OVERLAP WITH MULTIMEDIA ENTERTAINMENT

SOC	Description	2013 Jobs	Median Hourly Earnings	2013–18 Average Annual Openings
15-1121	Computer Systems Analysts	17,681	\$44.58	650
15-1122	Information Security Analysts	2,936	\$54.66	121
15-1131	Computer Programmers	12,078	\$41.61	502
15-1133	Software Developers, Systems Software	8,173	\$52.88	310
15-1134	Web Developers	6,151	\$37.81	246
15-1141	Database Administrators	3,892	\$46.35	135
15-1142	Network and Computer Systems Administrators	11,359	\$44.22	335
15-1143	Computer Network Architects	3,467	\$56.59	117
15-1151	Computer User Support Specialists	18,294	\$28.17	649
15-1152	Computer Network Support Specialists	4,460	\$37.50	128
27-1024	Graphic Designers	16,310	\$27.36	702
27-3011	Radio and Television Announcers	1,490	\$18.29	64
27-3012	Public Address System and Other Announcers	1,254	\$17.61	64
27-4011	Audio and Video Equipment Technicians	5,639	\$26.91	223
27-4014	Sound Engineering Technicians	2,815	\$28.58	81
27-4031	Camera Operators, Television, Video, and Motion Picture	2,074	\$22.76	52
27-4032	Film and Video Editors	4,031	\$33.93	124
27-4099	Media and Communication Equipment Workers, All Other	1,022	\$41.48	35

Source: EMSI QCEW, Non-QCEW & Self Employed, 2014.2

## OPPORTUNITIES IN HEALTHCARE

Occupation	Healthcare Grouping	Typical Training Required	Median Hourly Wage (BLS)
Nursing Manager/Supervisor	Administrative	RN/BSN	\$54.90
Registrar/Patient Service Representative	Administrative	High School with Training	\$14.77
Medical Secretary	Administrative	High School with Training	\$20.49
Interpreter/Translator	Administrative	Postsecondary Certificate or an AA	\$30.40
Housekeeping/Environmental Services Supervisor	Administrative	High School with Training	\$24.59
Residential Assistant/Advisor	Administrative	High School with Training and On-the-Job or Technical Training	\$13.61
Medical Office/Practice Manager	Administrative	High School with Training	\$30.05
Medical Biller	Administrative	High School with Training	\$21.32
Patient Advocate/Liaison	Administrative	High School with Training	\$17.96
Medical Transcriptionist	Administrative	Postsecondary Certificate or an AA	\$20.35
Home Health Aide	Healthcare Support	High School with Training	\$9.47
Nursing Assistant	Healthcare Support	High School with Training	\$16.45
Caregiver/Personal Care Aide	Healthcare Support	High School with Training	\$10.67
Transporter/Orderly	Healthcare Support	High School with Training	\$15.92
Occupational Therapy Aide	Healthcare Support	High School with Training	\$16.42
Mental Health/Psychiatric Technician	Healthcare Support	High School with Training	\$20.46
Physical Therapy Aide	Healthcare Support	High School with Training	\$12.10
Medical Coder	Health Information Management	Associate's Degree	\$21.32
Medical Records/Coding Supervisor	Health Information Management	Associate's Degree	\$21.32
Health Information Technician	Health Information Management	Postsecondary Certificate or an AA	\$21.32
Medical Records Clerk/Technician	Health Information Management	High School with Training	\$21.32
Registered Nurse	Nursing	RN/BSN	\$40.34
Nurse Case Manager	Nursing	RN/BSN	\$40.34
Licensed Practical/Vocational Nurse	Nursing	Postsecondary Certificate or an AA	\$25.05
Medical Assistant	Sub-BA Practitioner	Postsecondary Certificate	\$15.87
Health Technician/Technologist (Other)	Sub-BA Practitioner	Postsecondary Certificate or an AA	\$22.24
Occupational Therapy Assistant	Sub-BA Practitioner	Associate's Degree	\$28.34
Surgical Technician/Technologist	Sub-BA Practitioner	Postsecondary Certificate or an AA	\$23.27
Cardiovascular Technician/Technologist	Sub-BA Practitioner	Associate's Degree	\$27.17
Physical Therapy Assistant	Sub-BA Practitioner	Associate's Degree	\$28.12
Dental Assistant	Sub-BA Practitioner	Postsecondary Certificate	\$16.79
Phlebotomist	Sub-BA Practitioner	High School with Training	\$18.14
Ultrasound Technologist/Sonographer	Sub-BA Practitioner	Associate's Degree	\$32.04
Radiology Technician	Sub-BA Practitioner	Associate's Degree	\$33.81
MRI/CT Technician/Technologist	Sub-BA Practitioner	Associate's Degree	\$39.01
EMT/Paramedic	Sub-BA Practitioner	Postsecondary Certificate	\$19.40
Massage Therapist	Sub-BA Practitioner	Postsecondary Certificate	\$22.85
Dialysis Technician	Sub-BA Practitioner	High School with Training	\$22.24
Respiratory Therapist	Sub-BA Practitioner	Associate's Degree	\$34.17
Ophthalmic Technician	Sub-BA Practitioner	Postsecondary Certificate or an AA	\$21.62
Dental Hygienist	Sub-BA Practitioner	Associate's Degree	\$37.28

Continued on page 26

Occupation	Healthcare Grouping	Typical Training Required	Median Hourly Wage (BLS)
Neurodiagnostic Technician/Technologist	Sub-BA Practitioner	Postsecondary Certificate or an AA	\$22.24
Anesthesia Technician	Sub-BA Practitioner	Postsecondary Certificate	\$23.27
Radiation Therapist	Sub-BA Practitioner	Associate's Degree	\$48.48
Nutrition/Dietetic Assistant	Sub-BA Practitioner	High School with Training	\$18.04
Nuclear Medicine Technologist	Sub-BA Practitioner	Associate's Degree	\$39.42
Telemetry Technician	Sub-BA Practitioner	Associate's Degree	\$22.24
Endoscopy Technician	Sub-BA Practitioner	High School with Training	\$17.46
Emergency Room/Department Technician	Sub-BA Practitioner	High School with Training	\$22.24
Hearing Screener/Technician	Sub-BA Practitioner	Postsecondary Certificate or an AA	\$29.03
Speech Language Pathology Assistant	Sub-BA Practitioner	High School with Training	\$17.46
Medical Laboratory Technician	Technical, non-patient care	Associate's Degree	\$23.22
Pharmacy Technician	Technical, non-patient care	High School with Training	\$16.63
Sterile Processing Technician	Technical, non-patient care	High School with Training	\$18.14
Histotechnologist/Histotechnician	Technical, non-patient care	Postsecondary Certificate or an AA	\$31.97
Biomedical Equipment Technician	Technical, non-patient care	Associate's Degree	\$27.15
Pharmacy Aide	Technical, non-patient care	High School with Training	\$10.95
Dental Laboratory Technician	Technical, non-patient care	Certificate or an AA	\$19.68
Medical Device Assembler	Technical, non-patient care	High School with Training	\$15.91

## OPPORTUNITIES IN THE TECHNOLOGY SECTOR

### MIDDLE-SKILL OCCUPATIONS WITH MEDIAN HOURLY EARNINGS, 2013

Description	2013 Jobs	Median Hourly Earnings
Computer Systems Analysts	35,708	\$43.45
Information Security Analysts	5,294	\$56.84
Computer Programmers	25,400	\$40.43
Software Developers, Systems Software	19,964	\$50.55
Web Developers	10,378	\$34.93
Database Administrators	8,465	\$43.54
Network and Computer Systems Administrators	23,630	\$41.84
Computer Network Architects	8,689	\$53.17
Computer User Support Specialists	38,502	\$26.31
Computer Network Support Specialists	10,357	\$34.37

Source: EMSI QCEW, Non-QCEW & Self Employed, 2014.2

## DISTRIBUTION OF TECHNOLOGY JOB POSTINGS BY INDUSTRY SECTOR, JULY 2013–JUNE 2014

Industry Sector	Postings (New York City, July 2013–June 2014)	% in Industry Sector (NYC)	% in Industry Sector (National)
Professional, Scientific, and Technical Services	3,533	33%	31%
Finance and Insurance	2,546	24%	10%
Information (Includes Technology)	959	9%	7%
Healthcare and Social Assistance	660	9%	8%
Educational Services	636	6%	6%
Retail Trade	543	6%	11%
All Other	1,835	5%	27%

Source: Burning Glass Technologies

## DETAILED MIDDLE-SKILL TECHNOLOGY JOB POSTINGS

### MIDDLE-SKILL TECHNOLOGY POSTINGS

Occupation	Postings		NYC Location Quotient	% of Postings Requesting a BA		Average Advertised Salary		% Entry-Level (<2 yrs of Experience)	
	NYC	National		NYC	National	NYC	National	NYC	National
Help Desk	5,194	173,743	2.0	68%	42%	\$66,314	\$42,928	43%	52%
Advanced Help Desk	2,828	60,184	3.1	92%	79%	\$80,099	\$66,238	24%	30%
Help Desk Manager	455	8,199	3.6	92%	85%	\$92,059	\$76,283	14%	14%
Network Support	382	12,122	2.1	79%	64%	\$95,214	\$83,622	22%	31%
<b>All Middle Skills</b>	<b>9,082</b>	<b>254,248</b>	<b>2.2</b>	<b>76%</b>	<b>53%</b>	<b>\$72,315</b>	<b>\$48,564</b>	<b>36%</b>	<b>47%</b>

Source: Burning Glass Technologies

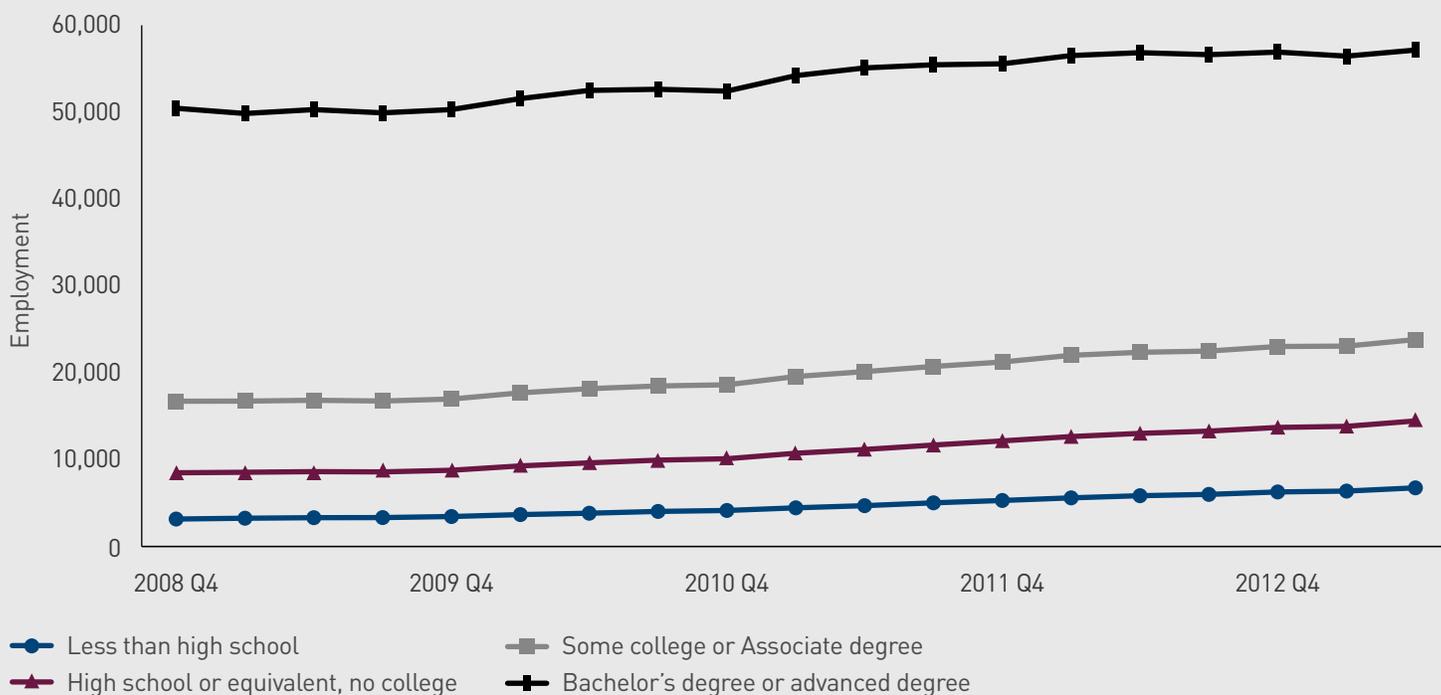
## ADVANCED IT ROLES

Occupation	Postings		NYC Location Quotient	% of Postings Requesting a BA		Average Advertised Salary		% Entry-Level	
	NYC	National		NYC	National	NYC	National	NYC	National
Network Administrators	3,907	141,631	1.7	88%	74%	\$89,019	\$78,059	22%	24%
Database Administrators	4,929	121,806	2.4	88%	80%	\$104,524	\$82,935	16%	20%
Information Security Analysts	2,581	74,472	2.6	91%	84%	\$111,128	\$96,212	10%	15%

## LATERAL OFF-RAMP ROLE

Occupation	Postings		NYC Location Quotient	% of Postings Requesting a BA		Average Advertised Salary		% Entry-Level	
	NYC	National		NYC	National	NYC	National	NYC	National
IT Recruiter	659	13,050	3.3	89%	82%	\$86,448	\$70,469	29%	36%

## TECHNOLOGY EMPLOYMENT BY EDUCATION ATTAINMENT, 2008–2013



Source: U.S. Census Bureau; Local Employment-Household Dynamics Program

# REFERENCES

- Burtless, G. (2014) Unemployment and the 'Skills Mismatch' Story: Overblown and Unpersuasive. *Brookings*. [www.brookings.edu/research/opinions/2014/07/29-skills-mismatch-overblown-burtless](http://www.brookings.edu/research/opinions/2014/07/29-skills-mismatch-overblown-burtless)
- Cappelli, P. 2014. "Skills Gaps, Skill Shortages and Skill Mismatches: Evidence for the U.S. National Bureau of Economic Research." [www.nber.org/papers/w20383.pdf](http://www.nber.org/papers/w20383.pdf)
- Casselman, B. (2012, March 26). Time Not on Side of the Jobless. *Wall Street Journal*.
- Closing the skills gap: Companies and colleges collaborating for change. 2014. The Economist Intelligence Unit. [www.economistinsights.com/leadership-talent-education/analysis/closing-skills-gap](http://www.economistinsights.com/leadership-talent-education/analysis/closing-skills-gap)
- Desjardins, R., & Rubenson, K. (2011) An Analysis of Skill Mismatch Using Direct Measures of Skills. *OECD Education Working Papers, No. 63, OECD Publishing*. [dx.doi.org/10.1787/5kg3nh9h52g5-en](https://doi.org/10.1787/5kg3nh9h52g5-en)
- Estevao, M., & Evridiki, T. 2011. Has the Great Recession Raised US Structural Unemployment? *IMF working paper WP/11/105*.
- Faberman, R. J., & Mazunder, B. (2012, July). Is There a Skills Mismatch in the Labor Market?
- Fischer, D. J., & Reiss, J. 2010. *Closing the Skills Gap: A Blueprint for Preparing New York City's Workforce to Meet the Evolving Needs of Employers*. Community Service Society. [nycfuture.org/pdf/Closing\\_the\\_Skills\\_Gap.pdf](http://nycfuture.org/pdf/Closing_the_Skills_Gap.pdf)
- Immigration and New York City: The Contributions of Foreign-Born Americans to New York's Renaissance, 1975-2013*. 2014. American Society & Council for the Americas. [www.as-coa.org/sites/default/files/NYImmigrationReport2014.pdf](http://www.as-coa.org/sites/default/files/NYImmigrationReport2014.pdf)
- Innovations and the City Going Beyond the Bottom Line*. 2013. New York University. [wagner.nyu.edu/files/labs/Innovation-and-the-City.pdf](http://wagner.nyu.edu/files/labs/Innovation-and-the-City.pdf)
- Inside the FOMC, Fed Reserve Bank of Minneapolis President, Narayana Kocerlakota, August 17, 2010.
- IT Grows in Brooklyn*. 2014. Brooklyn Chamber of Commerce. [www.ibrooklyn.com/CWT/EXTERNAL/WCPAGES/WCMEDIA/DOCUMENTS/SPRING%202014%20BLMR.PDF](http://www.ibrooklyn.com/CWT/EXTERNAL/WCPAGES/WCMEDIA/DOCUMENTS/SPRING%202014%20BLMR.PDF)
- Janoski, T., Luke, D., & Oliver, C. 2014. *The Causes of Structural Unemployment*. Polity Press, UK.
- Jobs for all New Yorkers, Growth for all Neighborhoods*. 2013. Office of Bill DiBlasio. [advocate.nyc.gov/files/DeBlasio-JobsForAllNYers.pdf](http://advocate.nyc.gov/files/DeBlasio-JobsForAllNYers.pdf)
- Jobs for NYC's Future*. 2012. Report of The City University of New York Jobs Task Force. [www.cuny.edu/employment/Jobs-Task-Force.pdf](http://www.cuny.edu/employment/Jobs-Task-Force.pdf)
- Krugman, P. (2010, Sept. 26). What Structural Unemployment Looks Like. *New York Times*.
- Lazear, E. P., & Spletzer, J. R. 2012. "The United States Labor Market: Status Quo or a New Normal?" *National Bureau of Economic Research Working Paper 18386*.
- McDaniel, P. 2014. *How Immigration is the Key to NYC's Renaissance*. American Immigration Council. [immigrationimpact.com/2014/04/16/how-immigration-is-key-to-new-york-citys-renaissance/](http://immigrationimpact.com/2014/04/16/how-immigration-is-key-to-new-york-citys-renaissance/)
- Modestino, A. S. 2010. *Mismatch in the Labor Market: Measuring the Supply of and Demand for Skilled Labor in New England*. New England Public Policy Center, Research Report 10-2. Federal Reserve Bank of Boston.
- Moving the Goalposts: How Demand for a Bachelor's Degree is Reshaping the Workforce*. 2014. Burning Glass Technologies. [www.burning-glass.com/media/4737/Moving\\_the\\_Goalposts.pdf](http://www.burning-glass.com/media/4737/Moving_the_Goalposts.pdf)
- New York City's Growing High-Tech Industry*. 2014. Office of the State Comptroller. [www.osc.state.ny.us/osdc/rpt2-2015.pdf](http://www.osc.state.ny.us/osdc/rpt2-2015.pdf)
- New York City Immigrants in the Great Recession: Divergent fates by Neighborhood, Race and Ethnicity*. 2010. The Fiscal Policy Institute. [www.fiscalpolicy.org/FPI\\_NeighborhoodUnemployment\\_NYC.pdf](http://www.fiscalpolicy.org/FPI_NeighborhoodUnemployment_NYC.pdf)
- New York City Jobs Blueprint*. 2013. Partnership for New York City. [www.nycjobsblueprint.org/wp-content/uploads/2013/04/nyc-blueprint-report.pdf](http://www.nycjobsblueprint.org/wp-content/uploads/2013/04/nyc-blueprint-report.pdf)
- The New York City Tech Ecosystem Generating Economic Opportunities for All New Yorkers*. 2014. HR&A Advisors. [www.hraadvisors.com/nyc-tech-study/](http://www.hraadvisors.com/nyc-tech-study/)
- New York's Health Care Sector: A Changing, Growing Workforce Demand Continues for Health Care Professionals*. 2013. Community Health Association of New York State. [www.hanys.org/workforce/survey/reports/2013\\_nursing\\_allied\\_workforce\\_survey\\_report.pdf](http://www.hanys.org/workforce/survey/reports/2013_nursing_allied_workforce_survey_report.pdf)
- New York's Forgotten Middle Skill Jobs*. 2011. National Skills Coalition. [www.fmsworkforcesolutions.org/Middle-Skills%20Jobs%20report%20\(r\).pdf](http://www.fmsworkforcesolutions.org/Middle-Skills%20Jobs%20report%20(r).pdf)
- Now Hiring*. 2012. Center for an Urban Future. [nycfuture.org/pdf/Now\\_Hiring.pdf](http://nycfuture.org/pdf/Now_Hiring.pdf)
- Osterman, P., & Weaver, A. 2014. "Skills and Skill Gaps in Manufacturing." In *Production in the Innovation Economy*, edited by Richard Locke and Rachel Wellhausen. Cambridge, MA. MIT Press.
- Parrot, J., & Treschan, L. 2013. *Barriers to Entry: The Increasing Challenges Faced by Young Adults in the New York City Labor Market*. The Fiscal Policy Institute and The Community Service Society of New York. [fiscalpolicy.org/wp-content/uploads/2013/04/JFNYC\\_Barriers\\_to\\_Entry\\_5-2-13.pdf](http://fiscalpolicy.org/wp-content/uploads/2013/04/JFNYC_Barriers_to_Entry_5-2-13.pdf)
- Re-envisioning the NYC Workforce System*. 2013. NYC Workforce Strategy Group. [media.wix.com/ugd/587030\\_2d70b9c787776f81a790fb9377430c7b.pdf](http://media.wix.com/ugd/587030_2d70b9c787776f81a790fb9377430c7b.pdf)
- Rothwell, J. 2014. *Still Searching: Job Vacancies and STEM Skills*. Metropolitan Policy Program at Brookings. [www.brookings.edu/~media/research/files/reports/2014/07/stem/job%20vacancies%20and%20stem%20skills.pdf](http://www.brookings.edu/~media/research/files/reports/2014/07/stem/job%20vacancies%20and%20stem%20skills.pdf)
- Sahin, A., Song, J., Violante, G. T. G. Oct. 2011. Measuring Mismatch in the US Labor Market. Working paper. Federal Reserve. New York.
- Samuelson, R. J. (2011, June 19). The Great Jobs Mismatch. *Washington Post*.
- Shierholz, H. (2014 Jan. 23). Is There Really a Shortage of Skilled Workers? *EPI Commentary*.
- Shimer, R. 2007. Mismatch. *American Economic Review*, vol 97, no. 4, Sept. 1074-1101
- The Slow Recovery of the Labor Market*. 2014. Congress of the United States Congressional Budget Office. [www.cbo.gov/sites/default/files/cbofiles/attachments/45011-LaborMarketReview.pdf](http://www.cbo.gov/sites/default/files/cbofiles/attachments/45011-LaborMarketReview.pdf)
- The State of Working New York 2013: Workers Are Paying a High Price for Persistent Unemployment*. 2013. Fiscal Policy Institute. [fiscalpolicy.org/wp-content/uploads/2013/08/SWNY-2013.pdf](http://fiscalpolicy.org/wp-content/uploads/2013/08/SWNY-2013.pdf)
- Treschan, L., Soriano-Vasquez, S., & Richie-Babbage, B. 2011. *Missed Opportunity: How New York City Can Do a Better Job of Reconnecting Youth on Public Assistance to Education and Jobs*. The Community Service Society.
- What Works – and What Doesn't – in Re-Structuring Workforce Development Systems in U.S. Cities and States*. 2013. New York City Workforce Strategy Group. [www.usmayors.org/workforce/documents/2014-2-21ResearchReportRe-EnvisioningReportFebruary2014\(2\).pdf](http://www.usmayors.org/workforce/documents/2014-2-21ResearchReportRe-EnvisioningReportFebruary2014(2).pdf)
- Wilson, R., & Holm, R. 2012. *CareerSTAT: A Guide to Making the Case for Investing in the Frontline Hospital Workforce*. Boston, MA. Jobs for the Future & National Fund for Workforce Solutions.

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