

# Navigating the Changing Nature of Work





# Introduction

The COVID-19 pandemic has dealt a severe blow to Greater Houston's regional economy and workforce. This pandemic also has accelerated and accentuated a fundamental change that has been underway — a change in the education and skills needed to be successful in the workforce today and into the future. Automation technologies, higher levels of digital skills and globally integrated markets are transforming our economy and industries at a speed unparalleled in history. These forces are changing the nature of work and disrupting key career pathways low- and middle-skill workers use to increase their economic opportunity and prosperity. Today, it is essential for the Greater Houston region to identify and map viable and desirable job transition and upskilling opportunities that provide career and skills progressions for workers displaced by the pandemic and workers in occupations at risk of technological disruption.

In 2014, the Greater Houston Partnership created its UpSkill Houston initiative to address the growing gap between the education and skills employers require for an increasing number of regional occupations and the number of area individuals who possess such education and skills. Occupations requiring education and skills beyond a high school diploma but less than a four-year college degree — “middle-skill” occupations — are vital to Greater Houston and its residents, as evidenced by the region's utilization of the core middle-skill workforce.

UpSkill Houston documented that trend in its report “Middle Skills Matter to Greater Houston.”<sup>1</sup> This companion study, “Navigating the Changing Nature of Work,” provides additional data-driven insights and interventions that can accelerate efforts to attract, train, place and grow workers in the good middle-skill careers<sup>2</sup> in Greater Houston.

Key Findings in Brief:

- **The integration of automation technologies (i.e., artificial intelligence, Internet of Things, robotics and machine learning) into the workplace creates a significant risk of disrupting and shifting job tasks and skills requirements** among Greater Houston's low- and middle-skill workforce.
- **More than 50 percent of Greater Houston's existing middle-skill jobs face above average risks of automation.** Various middle-skill occupations face differing risks of automation. These factors will require many workers to develop enhanced skills and abilities as they work alongside new technologies.

- Middle-skill workers will need to learn new digital skills to use the automated technologies, and **strong digital skills are becoming increasingly necessary for all workers**, regardless of their industry, occupation or education level.
- **Greater Houston's workforce development stakeholders will need to develop a well-conceived, regional upskilling framework (encompassing all occupations) to guide workers** as they make decisions about investing limited time and resources to pursue career on-ramps that provide career and skill progressions with greater economic opportunity and prosperity.
- **Stakeholders in workforce development must identify and map viable and desirable upskilling career progressions** for middle-skill workers in Houston to support the continued growth of the Greater Houston economy and to increase economic opportunity and prosperity for the region's residents.

As a result of the COVID-19 pandemic and low oil prices, the Greater Houston economy has shed an unprecedented number of jobs and demonstrated more clearly the magnitude to which automation technologies and higher levels of digital skills are changing the nature of work going forward. UpSkill Houston's work will be essential to support the region's economic recovery. We will convene employers, education and community leaders, and other workforce stakeholders to drive and orchestrate the collective action necessary to support individuals who lost jobs and need re-skilling and upskilling to acquire the digital and essential skills employers

require to participate in this evolving digital economy. In addition, we will bring together these workforce partners to help job seekers navigate new career pathways across industries and occupations that can provide economic opportunity and mobility for all.

*UpSkill Houston engaged TEconomy Partners, LLC in the summer of 2019 (prior to the pandemic) to conduct the research highlighted in this report and in “Middle Skills Matter to Greater Houston.” The research*

*reflects an analysis of Houston’s labor market using historical trends and models to project long-term employment trends at a time when the Houston and national economies were growing and near or at full employment levels. TEconomy’s complete research, which includes more data than either UpSkill Houston report, is available in [“Assessing the Demand for Middle-Skill Jobs in Greater Houston.”](#)*

## Greater Houston’s Economic Strength Depends on a Spectrum of Skills

As Greater Houston takes steps to revive its economy after the upheaval brought on by closing down the economy in response to COVID-19 as well as the impact of low oil prices, looking back as well as forward will serve us well.

We entered this downturn after a sustained period of rapid growth and strong economic gains that placed strains on the regional labor market, among which was the challenge of filling many new jobs. Specifically, Greater Houston experienced a growing number of unfilled middle-skill jobs as a result of several factors: The strong push for students to pursue four-year college degrees; outdated perceptions about the work in certain sectors of the regional economy; little awareness of and counseling around middle-skill careers; barriers faced by unemployed or underemployed workers seeking to upskill or re-skill; and Houston’s changing demographics.

We know from UpSkill Houston’s “Middle Skills Matter” report that the strength of the region’s economy and its employers depends on a workforce with skills that span a broad spectrum. Those skills most often are

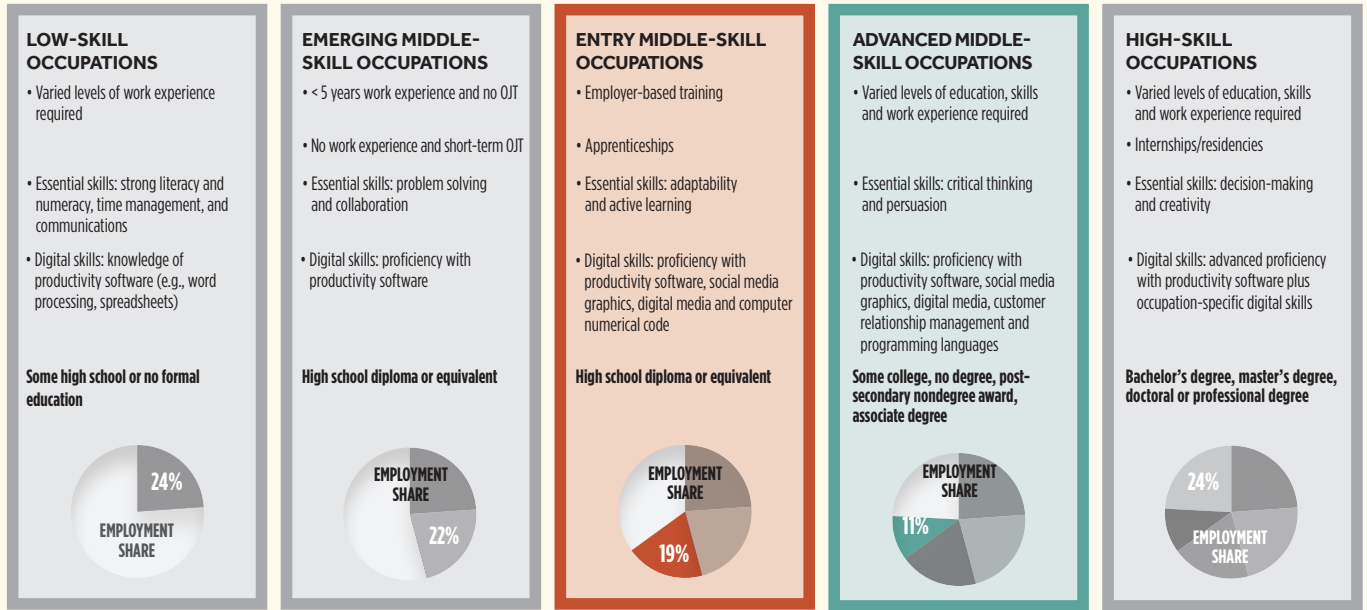
grouped according to the typical level of education, work experience and on-the-job training required to enter a specific occupation. The U.S. Bureau of Labor Statistics (BLS) provides an occupation-by-occupation assessment of skill groups, usually divided into low-, middle- and high-skill occupation categories.<sup>3</sup> (The low-, middle- and high-skill terminology is challenging because it does not capture the valuable mix of essential, cognitive, digital and technical skills that employers require for success in today’s economy. However, UpSkill Houston will continue to use this terminology as we explore better language options.)

While useful, the BLS skills framework does not convey the nuances necessary to understand and appreciate specific career progressions and opportunities available in middle-skill occupations. So, TEconomy developed a more detailed depiction of the middle-skill context in Greater Houston, defined in Figure 1. **TEconomy’s research focused on the two areas viewed as the core segments of the middle-skill workforce – the “entry” and “advanced” groups** depicted in Figure 1. UpSkill Houston continues to refine this spectrum to highlight the essential (i.e., “soft”) and digital skills that workers will need to be successful in this dynamic economy.

### Skills Matter in a Changing Economy

In “Navigating the Changing Nature of Work,” it becomes clear that skills matter in navigating career pathways that increase economic opportunity and mobility. Essential or soft skills such as clear communication, active listening, and social and emotional perceptiveness are not easily automated. Cognitive skills, including problem-solving and critical thinking, are at a premium. As this report demonstrates, mastery of digital skills will be essential for long-term success. Technical skills, including budgeting, coding and financial or data analysis, are important as well. Finally, the capability for continual learning and growth is now more important than ever. A mix of skills will be necessary to successfully navigate the changing nature of work.

**Figure 1: The Skills Spectrum Needed by Greater Houston’s Employers**



Source: TEconomy Partners, LLC.

## Automation Technologies are Disrupting Greater Houston’s Workforce

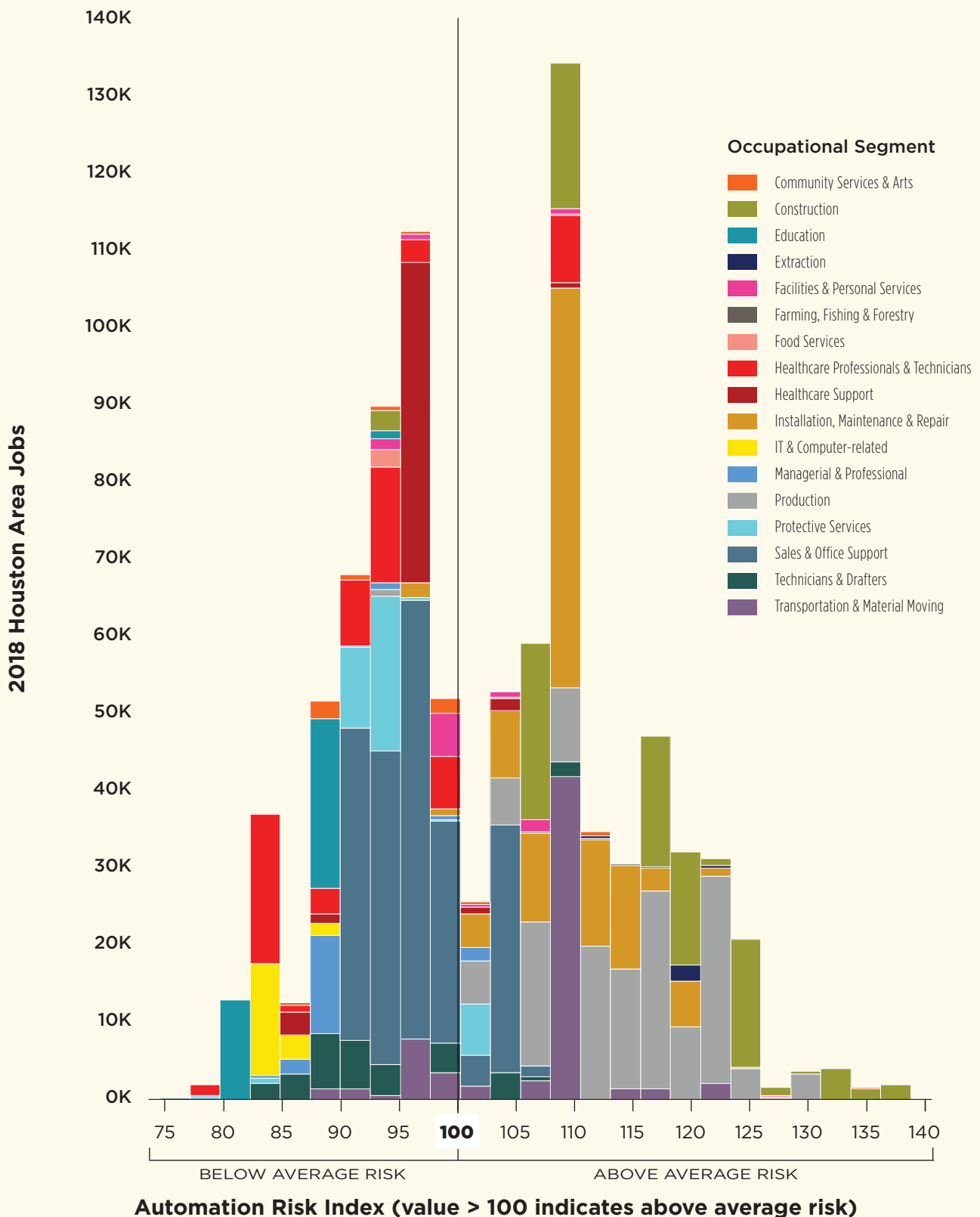
Automation technologies (i.e., artificial intelligence, Internet of Things, robotics and machine learning) are reshaping Greater Houston’s economy and its industries at an accelerating rate. These technologies, in turn, impact the talent and skill needs of employers and disrupt the career paths for low- and middle-skill workers. Global trends also are driving significant shifts in hiring and training decisions and are expected to disrupt the region’s middle-skill workforce into the future. These trends include:

- Globally integrated markets and supply chains
- Changing worker demographics and business operations models
- Integration of new automation technologies in work environments
- Rapidly changing skills requirements, including an increased need for higher digital skills


**As automation technologies are integrated into the workplace, there is a significant risk of disrupting and shifting job tasks and skills requirements for Greater Houston’s middle-skill workforce.** While shifts in skills will play out differently across industry sectors, they nonetheless will present an important near-term issue to which workforce development stakeholders must respond with enhanced and ongoing skills development programs.

A 2013 study by researchers Carl Benedikt Frey and Michael A. Osborne explored the future of employment and the risks from automation. The study estimated that 47 percent of all U.S. jobs are at a high risk of automation based on the fundamental routine and repeatable tasks they entail. This is particularly true for service, sales and administrative support roles.<sup>4</sup> More recent Brookings Institution research concluded that a quarter of the American workforce is facing high exposure to automation technologies and could suffer displacement as a result.<sup>5</sup>

**Figure 2: More than 50 Percent of Regional Middle-Skill Jobs (by Occupational Segment) Face Above Average Automation Risk**



Source: TEconomy's analysis of Emsi 2019.2 automation index.



To understand the automation risk profile for Greater Houston's middle-skill occupations, TEconomy used the methodology described in Frey and Osborne's research along with data from Emsi to calculate a regional automation risk index. Figure 2 plots the number of Greater Houston middle-skill jobs for each occupational segment on the vertical axis against the automation risk index on the horizontal axis.

An automation risk value greater than 100 indicates an above average risk, which could result in the restructuring of job tasks to accommodate new technology or in job displacement. Occupations with risk values that are closer to 100 are more likely to include some tasks that are easily automated and some that are not. Occupations with higher risk values are more likely to have tasks at risk of being automated than occupations with lower risk values. Workforce development stakeholders will need to understand the nature of the risks to develop effective approaches that can mitigate their impact on workers.

TEconomy's analysis suggests that **more than 50 percent of Greater Houston's existing middle-skill jobs face an above average automation risk.** Regional middle-skill occupations in health care and services have a more secure outlook and are expected to face less risk for automation because they include tasks that are not easily automated, such as assisting and caring for others, and that require social and emotional perceptiveness. On the other hand, occupations such as production, construction, repair and transportation — with large employment footprints in the region — face risk of disruption as companies adopt technologies that automate tasks. For example, prefabrication will allow a growing share of construction work to be performed under controlled conditions in a factory-like setting.

As reported in UpSkill Houston's "Middle Skills Matter," TEconomy found that 369,000 middle-skill jobs in Greater Houston are projected to be in high demand into 2024.<sup>6</sup> To refine its analysis of automation risk, TEconomy segmented Greater Houston's occupations by projected levels of demand, as shown in Figures 3a and 3b. This provides a more nuanced picture of the automation risk for middle-skill jobs in the region.

Middle-skill occupations that, according to TEconomy's analysis, are not in high demand

(Figure 3a) constitute the larger number of jobs that are at risk of being disrupted by automation, whether through task restructuring or worker displacement. Such occupations include production and installation, maintenance and repair. **As technology is increasingly integrated into the workplace, many workers will need to develop enhanced skills and abilities to work alongside the new technologies.**

While fewer in number, the occupations that are projected to be in high demand (Figure 3b) have a more secure outlook and are likely to face less risk for automation. Many, such as technicians and drafters, require cognitive tasks, such as problem-solving and critical thinking, which are not easily automated.

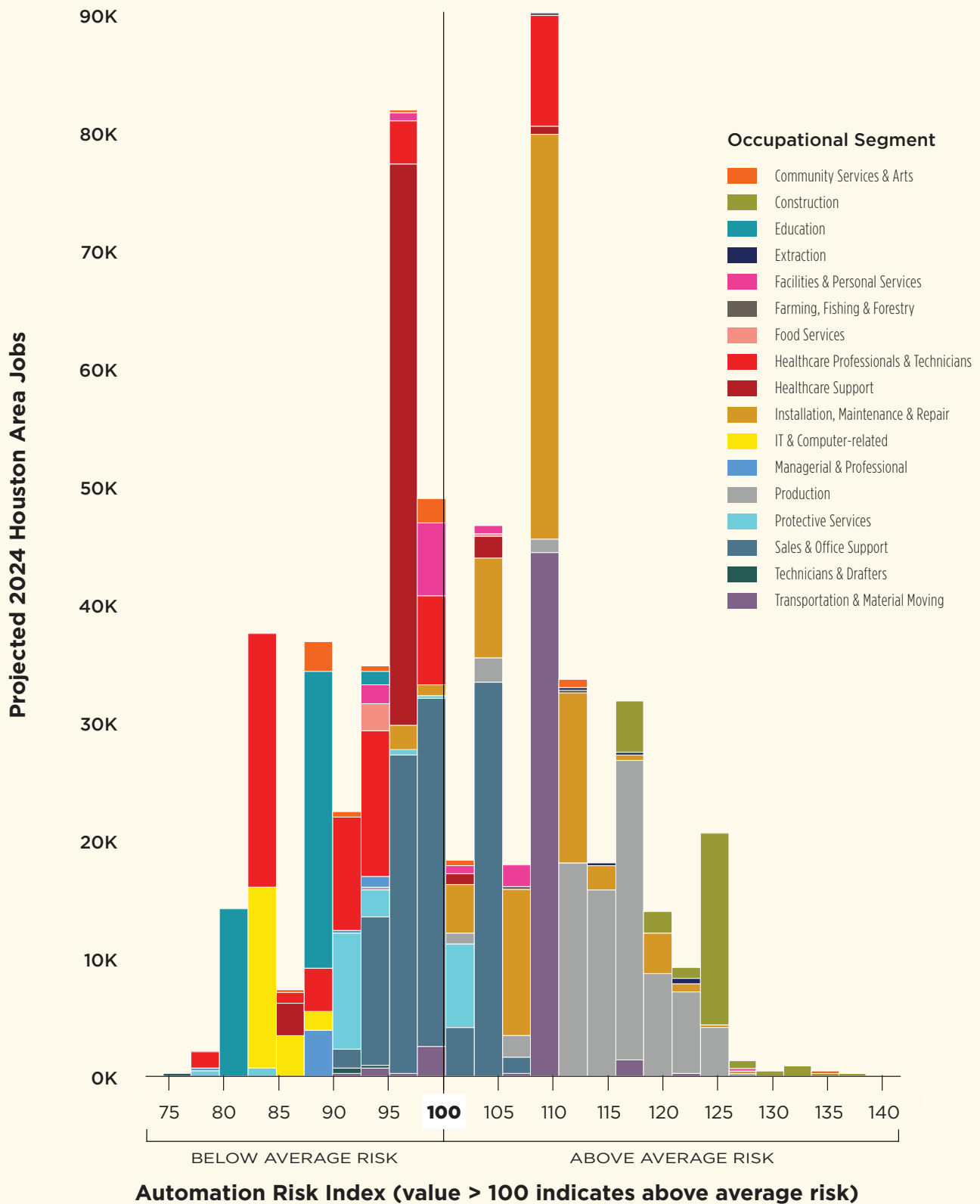
TEconomy's analysis highlights that regional middle-skill occupations face differing risks of automation. This will require that stakeholders develop a range of upskilling strategies to support workers facing these differing risks as new technologies come online. **Fundamentally, these strategies will require workers to develop the capability for continual learning and growth.**

For occupations at a higher automation risk, workers likely will need to switch industries or move to occupational categories adjacent to their experience, education and skills. This will require upskilling strategies that include both enhancing communication, creative and social skills, which are not as susceptible to automation as some other skills as well as adding new technical and digital skills such as coding or customer relationship management.

For occupations at a more moderate automation risk and facing a restructuring of tasks from the integration of technology, workers will increasingly need additional skills as they work alongside these technologies. Such skills include the ability to troubleshoot and repair the technology as well as to input and retrieve data. In addition, workers likely will need enhanced digital skills as well as strengthened communication, analytical, creative and social skills.

Workers in occupations with lower risks of automation should participate in similar skills development opportunities to mitigate the *future* effects of new technology in their workplaces.

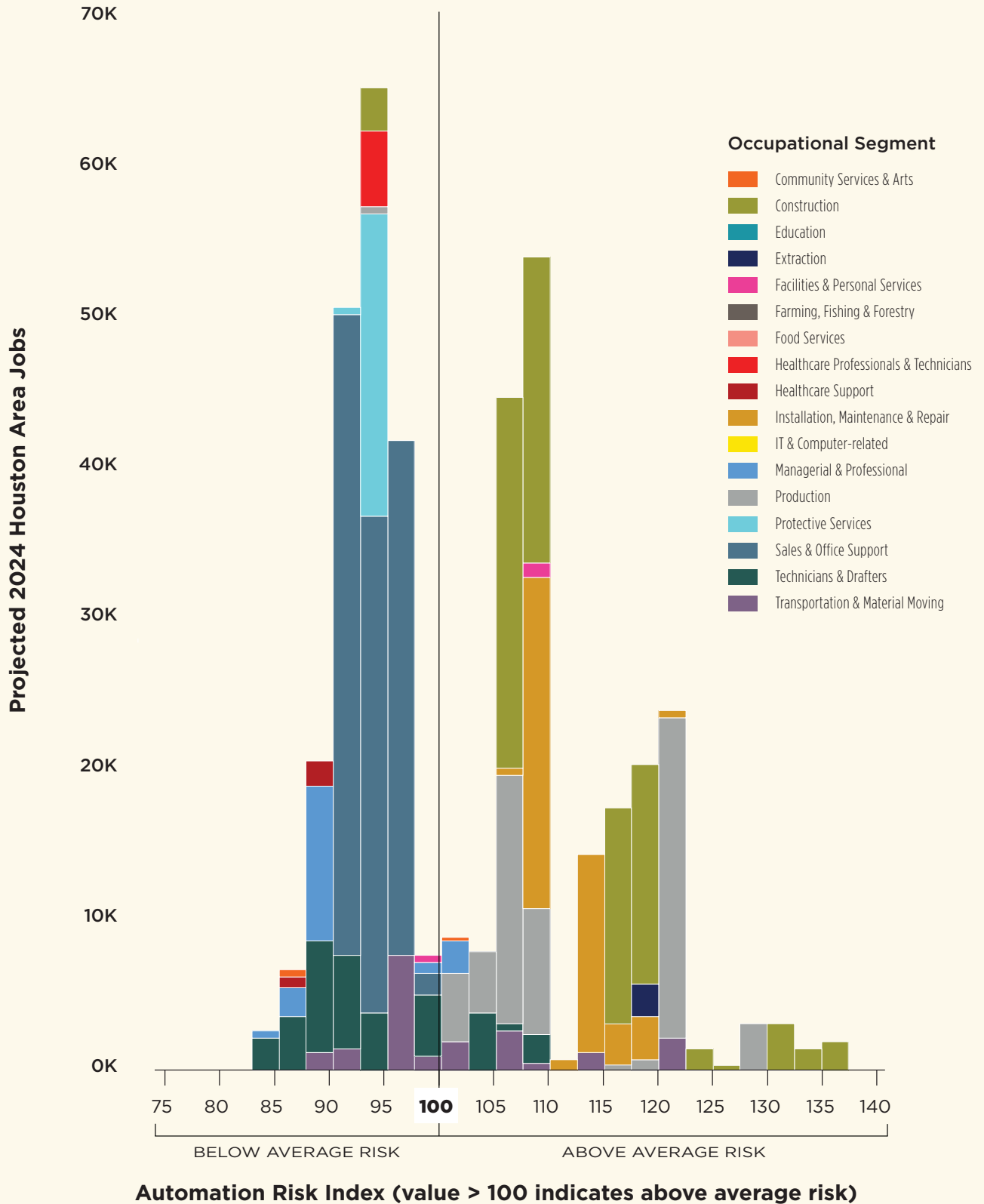
**Figure 3a: Automation Risk for Regional Middle-Skill Jobs Varies by Demand Type and Occupational Segment (Non-High Demand)**



Source: TEconomy's analysis of Emsi 2019.2 automation index.



**Figure 3b: Automation Risk for Regional Middle-Skill Jobs Varies by Demand Type and Occupational Segment (High Demand)**



Source: TEconomy's analysis of Emsi 2019.2 automation index.



# Strong Digital Skills are Increasingly Necessary for Greater Houston's Workforce

As companies increasingly integrate automation technologies into the workplace, middle-skill workers will be required to learn new digital skills to use these technologies effectively and efficiently. **Strong digital skills are becoming increasingly necessary for workers, regardless of their industry, occupation or education level.** Assessing gaps in digital skills preparedness can reveal places for intervention to help new and incumbent workers compete in a rapidly changing landscape.

TEconomy applied a Brookings Institution methodology for analyzing the level of knowledge and work activity associated with proficiency in digital technologies within specific occupations (see sidebar below) to Greater Houston's middle-skill occupations. TEconomy calculated the digital skills scores for all middle-skill occupations within each occupational segment to arrive at a Greater Houston overall average digital skills score for

each occupational segment (Figure 4). Based on TEconomy's analysis, most middle-skill occupational segments in the region currently require at least a *medium* level of proficiency in digital skills, as represented by an average digital skills score between 33 and 60 in Figure 4.

The level of digital skills necessary for success in *middle-skill* occupations in Greater Houston increased significantly between 2002 and 2016, mirroring national trends for that time noted in the Brookings study (average digitalization scores rose by 57 percent across *all* occupations). This trend likely will continue rising in Greater Houston as industries further integrate digital technologies into their business operations. Accordingly, workers will need continual education and upskilling to achieve the significant levels of digital skills critical to success across occupational segments today and into the future.

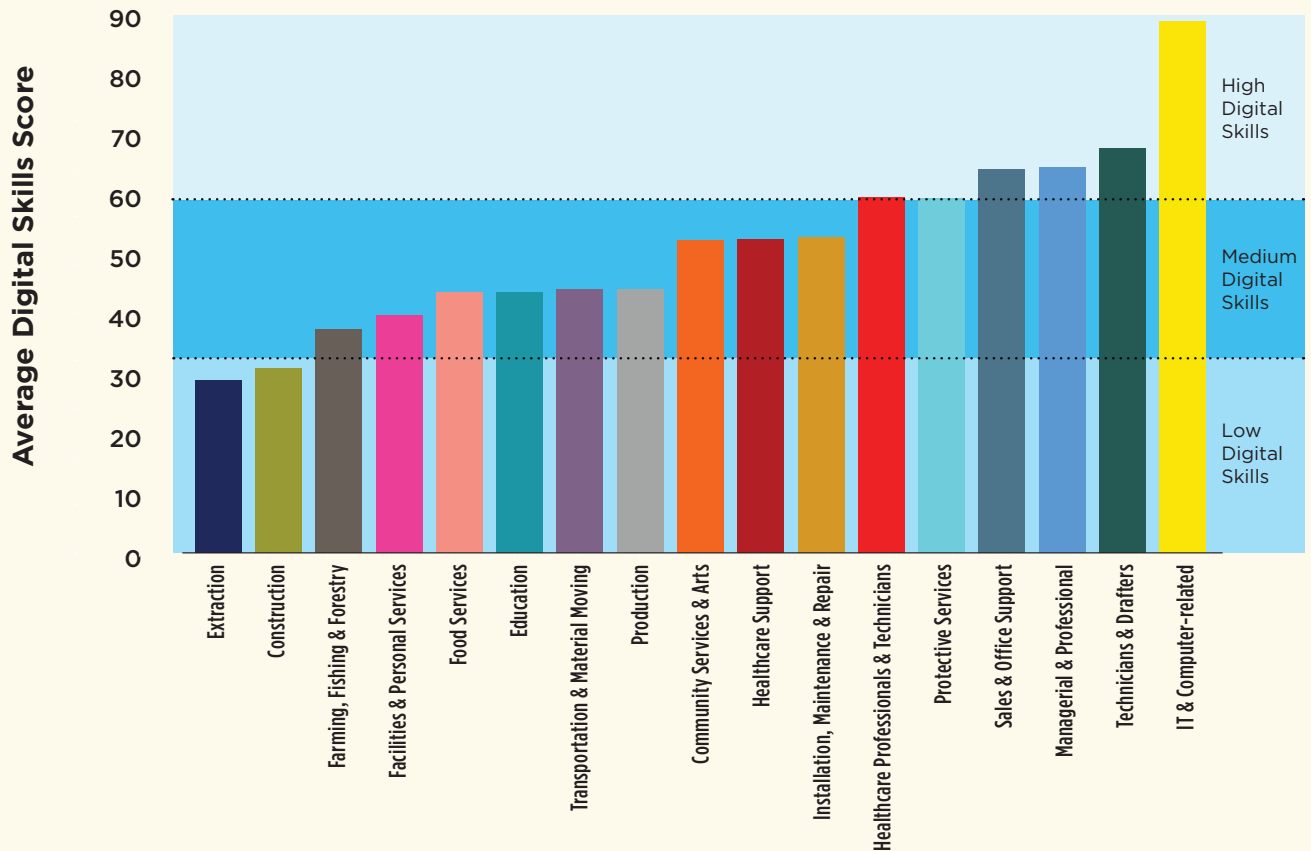
## The Increasing Digital Content of Jobs

The Brookings Institution conducted a study in 2017 to analyze the changes in the digital content of occupations in all industries in the U.S. between 2002 and 2016.<sup>7</sup> The study found that the share of employment that required substantial digital knowledge and skills rose from 44.3 percent in 2002 to 70.7 percent in 2016. Across occupations in the Houston MSA, specifically, the mean digital score rose from 26 in 2002 to 41 in 2016.<sup>8</sup>

The Brookings analysis used O\*Net, a database of occupational information maintained by the U.S. Department of Labor's Employment and Training Administration, which provides information on the *required computer knowledge* and *interactivity with computers* for various occupations. Based on the data, Brookings assigned a numerical digital score to each occupation, with 100 being the maximum and most digitally intense score. The analysis created score cutoffs to classify occupations as low (0 to 32), medium (33 to 60) or high (61 to 100) digital jobs.

In addition to the individual occupational analysis, Brookings developed scores for industries and states and metropolitan areas. The analysis concluded that "digitalization is proceeding rapidly and widely but not evenly across occupations and industries."

**Figure 4: Strong Digital Skills are Increasingly Necessary for Middle-Skill Occupations in Greater Houston**

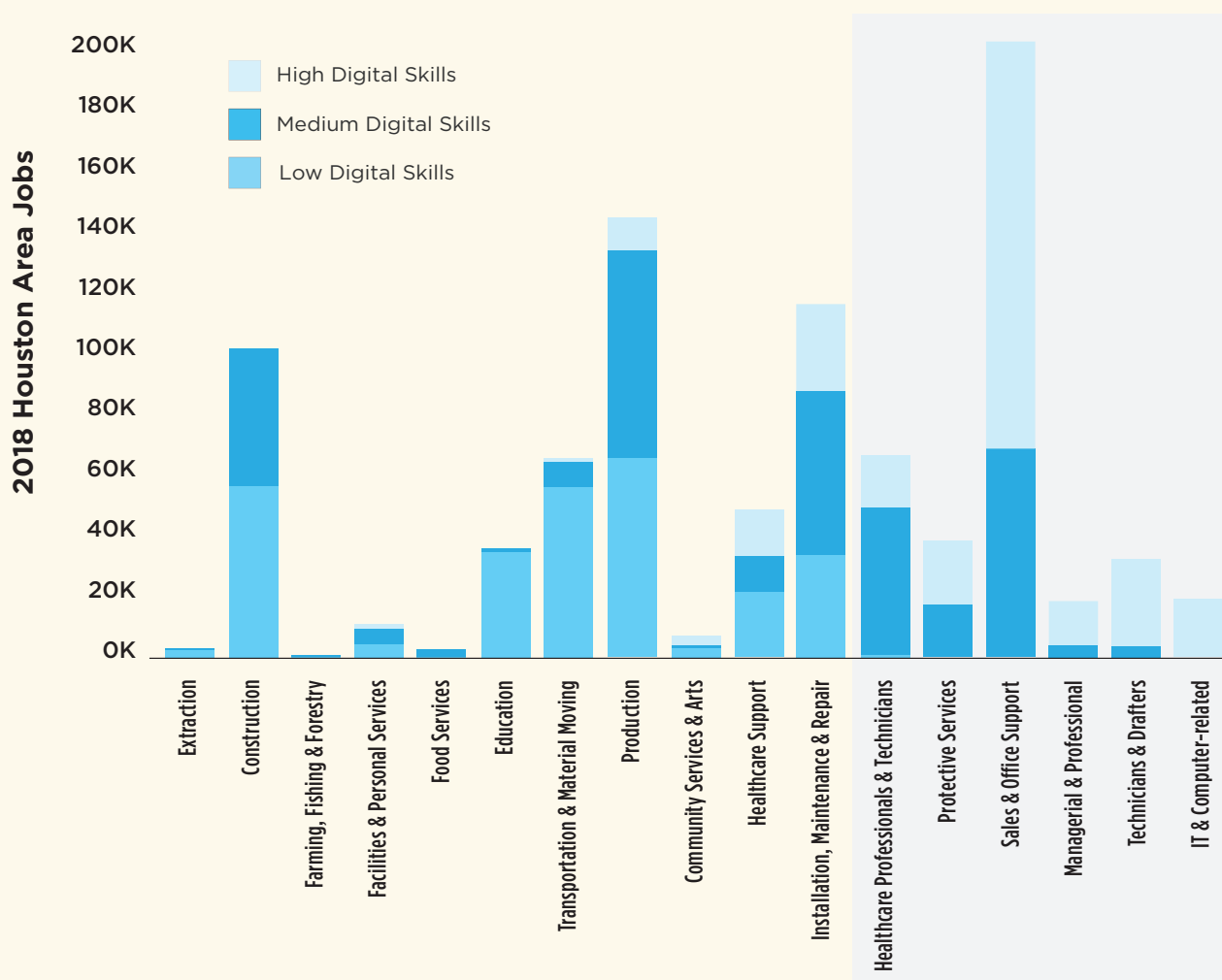


Source: TEconomy's analysis of O\*Net and Brookings Institution methodology

As shown in Figure 5, TEconomy also divided occupational segments in Greater Houston by digital skill tier — low, medium or high. There are **six regional middle-skill occupational segments with requirements for higher levels of digital skills** (i.e., medium and high digital skills). These segments include occupations in health care; IT and computer-related; technicians and drafters; managerial and professional; and protective services. Sales and office

support is the middle-skill occupational segment with the largest number of jobs requiring higher levels of digital skills — likely including proficiency in word-processing, spreadsheet manipulation, virtual/web conferencing and customer relationship management. Conversely, construction, production, and transportation and material moving occupations, with high levels of employment in Greater Houston, currently require lower levels of digital skills.

**Figure 5: Six Middle-Skill Occupational Segments in Greater Houston Require Higher Levels of Digital Skills**



Source: TEconomy's analysis of O\*Net and Brookings Institution methodology

Greater Houston's occupational segments with high levels of employment and lower requirements for digital skills represent opportunities to help workers increase their digital skills. Digital skills provide additional practical skills, which can help workers be agile as the economy continues its digital transition. Likewise, digital skills can build workers' resiliency before new dynamics and new occupations take hold in both long-established and emerging industry sectors.

The Brookings study suggests that digital skills can have a significant impact on prosperity and opportunity. Brookings points to "what Burning Glass calls the 'humbler world of everyday software: spreadsheets and word processing, programs for medical billing and running computerized drill presses.'"<sup>9</sup> Brookings then concludes that "basic digital skills, specifically spreadsheet and word-processing proficiencies, have now become a baseline prerequisite for the vast majority of middle-skill decent jobs."<sup>10</sup>

# Upskilling Pathways Create Opportunity and Prosperity for Greater Houston's Middle-Skill Workers

Automation technologies, higher digital skills requirements and globally integrated markets are disrupting the career pathways low- and middle-skill workers use to increase their economic opportunity and prosperity. These dynamic forces are changing and increasing the education and skills that workers must possess to be successful in the regional economy, today and into the future. **To support the continued growth of the Greater Houston economy and to increase economic opportunity and prosperity for the region's residents, stakeholders in workforce development must:**

- 1. Develop a well-conceived, regional upskilling framework to guide workers in various industries and occupations as they make decisions about investing limited time and resources to upskill themselves.**
- 2. Identify and map viable and desirable upskilling progressions and career on-ramps to specific occupations with career and skills transitions that create mobility for workers and their families.**

With those goals in mind, TEconomy analyzed and identified pathways for helping workers transition up the skills continuum and into more viable and desirable careers. TEconomy applied a methodology developed by the World Economic Forum (WEF) and Boston Consulting Group (BCG)<sup>11</sup> to identify viable and desirable upskilling transitions from the perspective of workers. A key application of the WEF-BCG methodology is to map job transition opportunities for workers holding jobs at risk of technological disruption and to identify upskilling options. This methodology leverages an analysis of online job postings in conjunction with assumptions about how individuals make career decisions to transition to new jobs with better prospects for future growth and increased income.

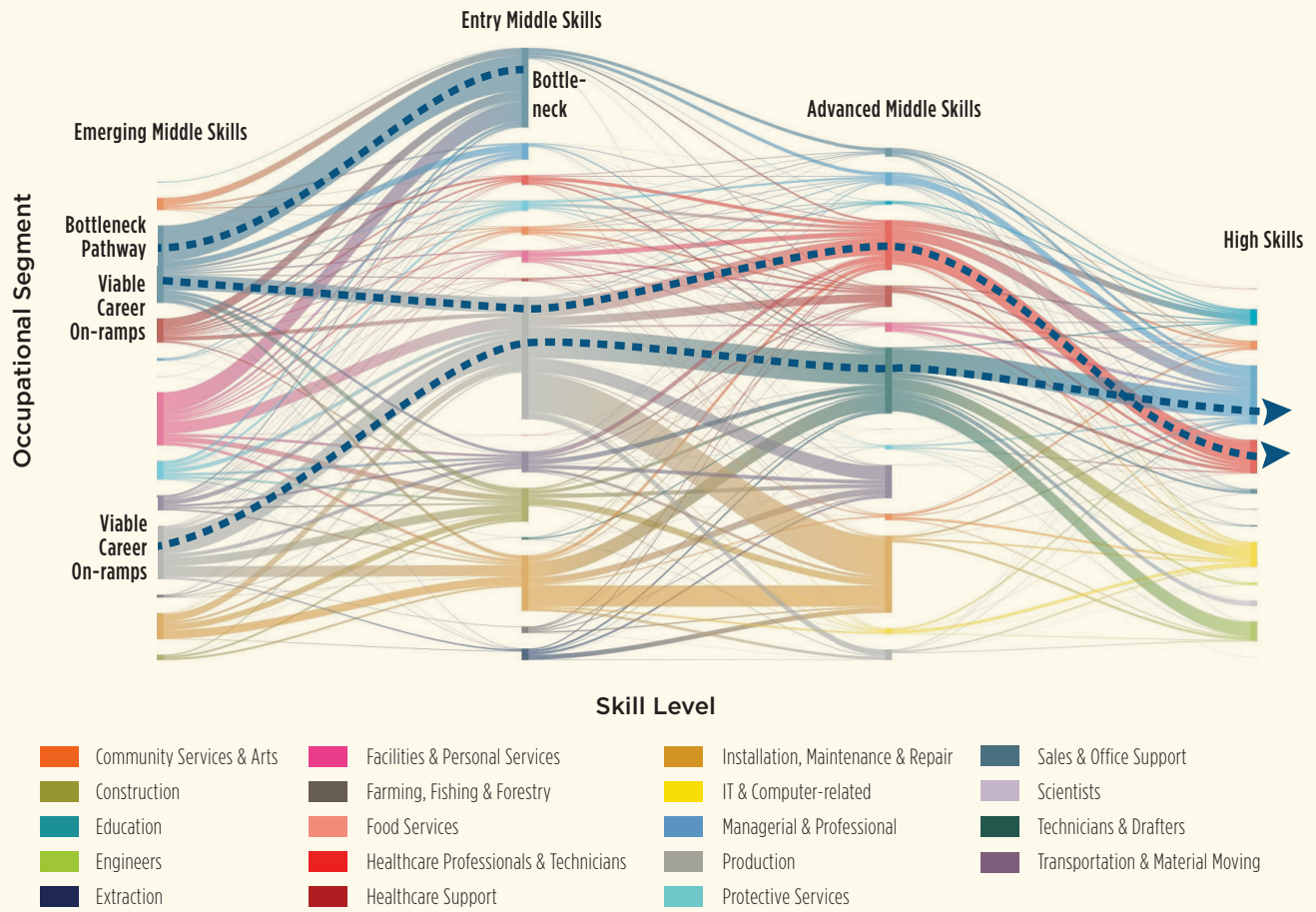
TEconomy found that a *viable* job transition for a worker in Greater Houston is one in which the new job is similar enough to the old job to be accessible

and involves a realistic increase in education, experience and skills. Likewise, a *desirable* job transition for a regional worker is one in which the new job has stable or growing long-term job prospects and the same or increased wages to maintain the worker's standard of living.

TEconomy used Greater Houston data from Emsi and occupational data from O\*Net to identify optimal pathways across all occupations, given their current and future projected trends. Figure 6 is one way to visualize a set of pathways across the skills continuum and occupational segments, as defined by the pathway's typical education, work experience and on-the-job-training requirements. Figure 6 also shows the flow of upskilling pathways by broad skill category and occupational segment, with the thickness of connecting segments indicating the volume of viable pathways. Finally, the figure highlights occupational segments that can provide career on-ramps with greater opportunity for career and skills transitions or that can encounter bottlenecks where there are no or very restricted pathways to a new, upskilled occupation.

**A well-conceived, regional upskilling framework (Figure 6) can help workers avoid pathways to bottlenecks or find career on-ramps with greater opportunities for career and skills transitions.** For example, the framework would show a worker in an emerging middle-skill role how to circumvent an entry middle-skill occupation that could be a bottleneck with limited opportunity for transitioning to an advanced middle-skill occupation. The framework would also highlight a viable and desirable pathway from a similar emerging middle-skill role to an entry-middle skill occupation with career on-ramps to advanced middle-skill occupations and possibly even to high-skilled occupations. In addition, the upskilling framework could help guide workers to the region's advanced middle-skill occupations, which may be a desirable endpoint because many of these occupations have some of the highest relative wages as well as some of the highest projected levels of openings over the next five years.

**Figure 6: An Upskilling Framework (by Skill Level and Occupational Segment) Can Guide Regional Workers to Pathways of Opportunity**



Source: TEconomy's analysis utilizing WEF and BCG approaches to identifying optimized viable and desirable job transitions developed and reported in "Towards a Reskilling Revolution: A Future of Jobs for All," January 2018.

# Upskilling Progressions Lead to Increased Opportunity in Greater Houston

In addition to creating a well-conceived, regional upskilling framework, workforce development stakeholders must identify and map viable upskilling progressions for specific occupations. These **upskilling progressions can inform workers about opportunities and requirements for advancement as well as provide insights into intervention options and considerations for different segments of the middle-skill workforce in Greater Houston.**

Figures 7 through 9 provide illustrative upskilling progressions for regional middle-skill occupations — starting with occupations that could serve as entry points into the workforce and following specific upskilling progressions that are viable and desirable for workers looking to advance across occupational skill segments.

- Figures 7 and 8 illustrate upskilling progressions available when an individual selects an occupational segment that provides growth opportunities within that segment.
- Figure 9 illustrates upskilling progressions available when an individual selects an occupational segment that provides growth opportunities into different occupational segments or industries.

As Figure 7 illustrates, a worker in an entry middle-skill IT occupation could transition into an advanced middle-skill role in network support or web development with additional post-secondary education or a two-year technical degree from a community college. Further opportunities for growth could be available with the equivalent of a bachelor's degree.

As Figure 8 illustrates, a helper who starts in an emerging middle-skill construction craft could become a craft professional, journeyman or first-line supervisor with long-term on-the-job training, apprenticeships or additional skills in areas such as management or computer-aided design (CAD). A two-year technical degree from a community college could provide access to additional career opportunities.

As Figure 9 highlights, certain entry middle-skill occupations provide growth opportunities into other industry segments. An entry middle-skill

assembler could transition to an adjacent advanced middle-skill occupation as an electronics or HVAC technician by leveraging existing skills and experience plus additional postsecondary education. These occupations also provide transitions to advanced middle-skill or high-skill roles with further education.

The above examples suggest a few broad conclusions for Greater Houston to support the continued growth of the Greater Houston economy and to increase economic opportunity and prosperity for the region's residents.

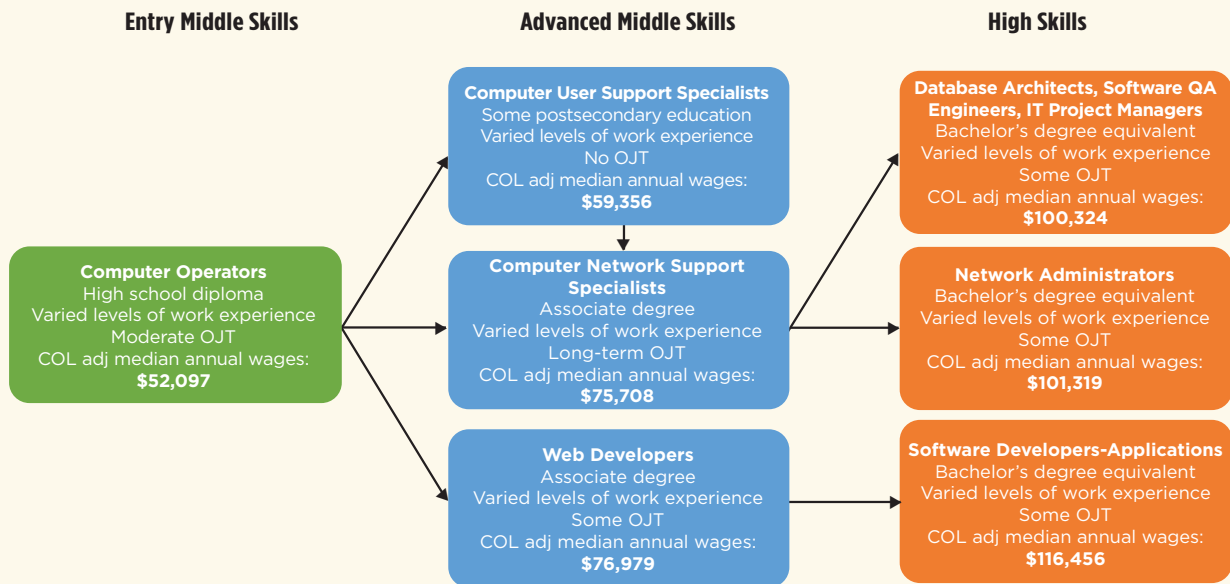
First, **the region's advanced middle-skill component could provide a viable endpoint for upskilling.** Many of the region's advanced middle-skill occupations have some of the highest relative wages as well as some of the highest projected levels of job openings over the next five years. These occupations include chemical equipment operators, medical technicians and specialized mechanics. This confirms the benefits and viability of middle-skill opportunities and means that workers seeking to optimize their career paths could need only upskill to occupations such as these to achieve both relatively high standards of living and job stability.

Second, **workers in many of Greater Houston's middle-skill jobs at risk of automation could experience qualification bottlenecks in trying to transition into advanced middle-skill and high-skill occupations.** For example, workers in entry middle-skill occupations in sales and office support could need retraining and increased digital and essential skills to transition to occupational segments that have greater technical skill requirements but more job openings and progressions to advanced middle-skill careers. Similar bottlenecks could exist for workers in advanced middle-skill occupations in technician and IT-related careers who often have the necessary experience and applied knowledge to advance to high-skill occupations in IT, engineering and other STEM occupations, but face the barrier of earning a bachelor's degree to be considered.

Third, a well-conceived, regional upskilling framework can serve as a decision-support tool, assisting regional workers in making informed decisions about

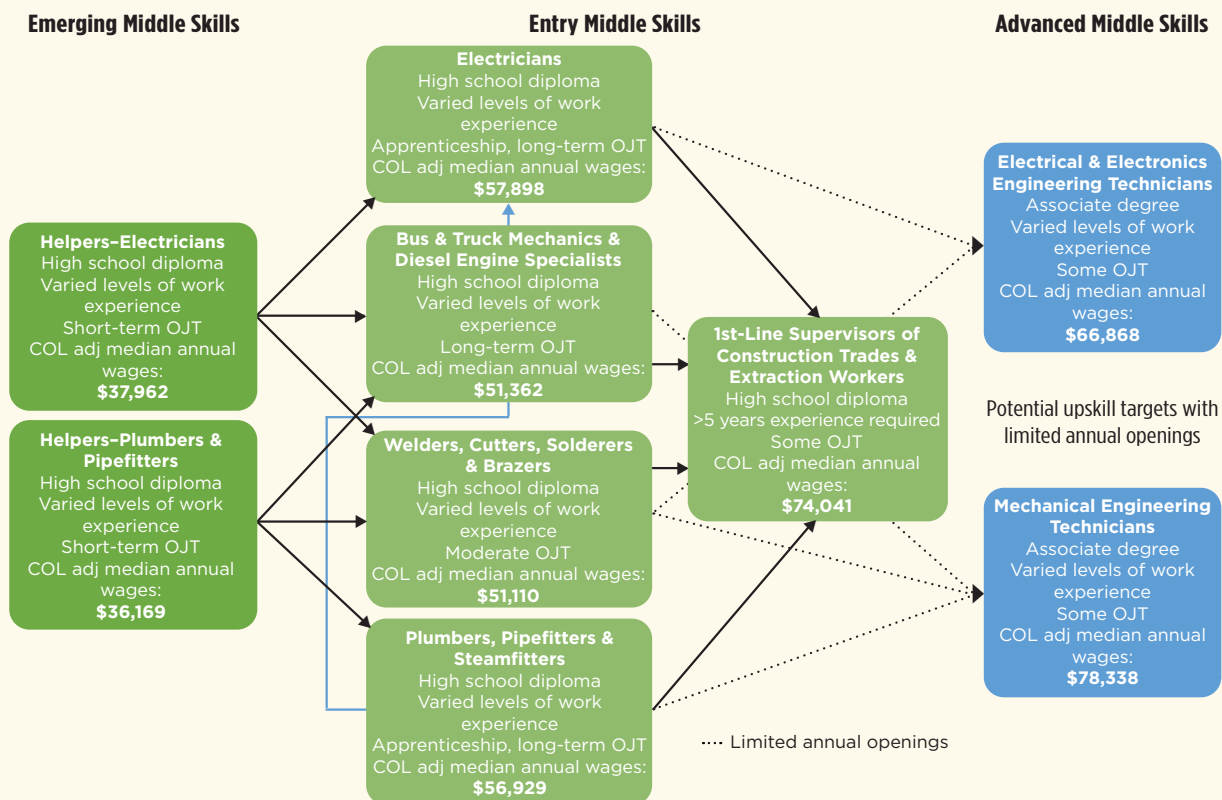


**Figure 7: Entry Middle-Skill IT Occupations Can Provide Viable and Desirable Upskilling Progressions Into Other IT-Related Occupations**



Source: TEconomy Partners, LLC.

**Figure 8: Emerging Middle-Skill Construction Crafts Can Provide Viable and Desirable Upskilling Progressions**

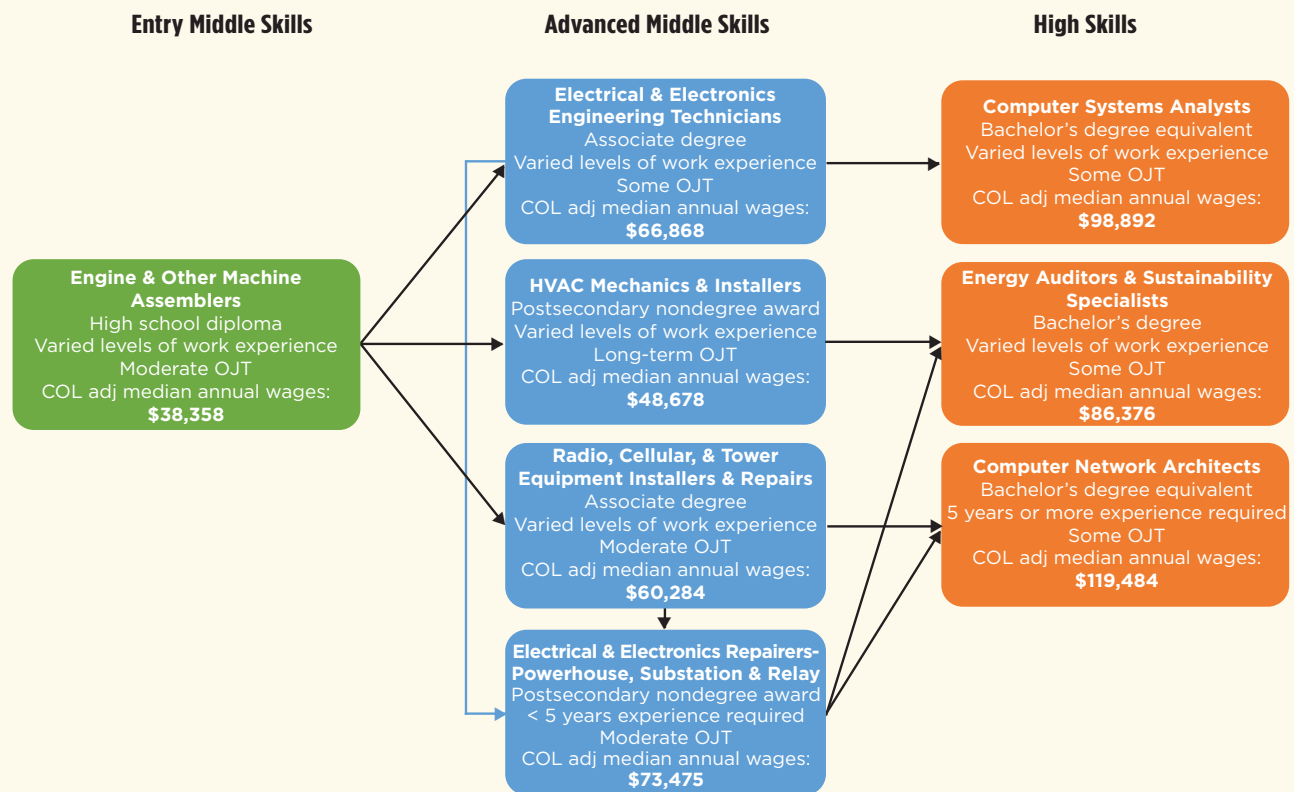


Note: Dotted lines indicate that these advanced middle-skill transitions do not satisfy the annual openings criteria described above due to limited levels of projected annual openings through 2024 for the Greater Houston area. They were included to show that viable transitions to advanced middle-skill occupations in these areas exist based on similarity and improved job prospects criteria; but may not be attainable when factoring in perceived desirability criteria or may represent bottlenecks in terms of the availability of sufficient volumes of open positions in target occupations for workers seeking to upskill.

Source: TEconomy Partners, LLC.



**Figure 9: Entry Middle-Skill Assembler Occupations Can Provide Viable and Desirable Upskilling Progressions Into Other Occupational Segments**



Source: TEconomy Partners, LLC.

the most effective ways to invest limited time and resources to pursue career on-ramps with career and skills transitions that create opportunity and mobility for workers and their families. This tool can help job seekers, career coaches or counselors explore ways to transition through the range of middle-skill occupations, particularly at intersections where workers could face bottlenecks or viable career on-ramps to upskilling options.

Finally, stakeholders in workforce development must identify and map viable upskilling progressions and career on-ramps for occupations to create economic

opportunity and mobility for workers and their families. Stakeholders, including career coaches and counselors, should increase their focus on upskilling options for workers at risk of technological disruption and support for these individuals as they acquire the digital and essential skills necessary to participate in this evolving digital economy. In addition, **workforce stakeholders, especially career coaches and counselors, will need to assist and support individuals in navigating new career transitions across industries and occupations**, so they avoid potential bottlenecks and find career on-ramps to achieve greater economic mobility.

# Key Recommendations for Workforce Development Stakeholders

While this report offers many findings, it provides crucial implications for workforce development stakeholders in Greater Houston as they develop upskilling interventions to address barriers and accelerate efforts to attract, train, place and grow workers in good middle-skill careers. **Workforce development stakeholders must:**

- **Tackle Upskilling by Aggregating Demand and Identifying Skills.** For occupations that play key roles across many industry clusters in the region, UpSkill Houston should convene employers to aggregate demand and identify current and future skills needed for success. For example, industrial machinery mechanics and information technology are crucial to many industries and have a core set of common skills.
- **Highlight Opportunities in Advanced Middle-Skill Careers.** Working with partners, UpSkill Houston should raise awareness around a range of two-year technical degrees and high-demand career opportunities for advanced middle-skill occupations that are deployed across a number of regional industries. These advanced middle-skill occupations, which are specialized and almost always require an associate degree, could provide a viable and desirable endpoint for upskilling. Examples include technicians and drafters. In raising awareness of these positions, it will be important to illustrate the multi-industry, specialized opportunities.
- **Encourage Workers Across All Occupations to Develop Strong Digital Skills.** UpSkill Houston should champion and support efforts that enhance workers' technical, digital and essential skills, regardless of industry or education level. Core digital skills needed by all workers include proficiency in word-processing, spreadsheet manipulation, virtual and web conferencing, and customer relationship management. Further, digital marketing and mobile application development are becoming more relevant and increasing in demand as a result of the pandemic. As individuals work alongside new technologies, they will need additional skills to

add to their value in the digital world. Such skills include the abilities to troubleshoot and repair as well as to input and retrieve data.

- **Create an Upskilling Framework to Guide Individuals to Pathways of Opportunity.** UpSkill Houston should bring together workforce development stakeholders to develop a well-conceived regional upskilling framework that can help workers make informed decisions that avoid career transitions with bottlenecks and find career on-ramps with skill progressions that create economic opportunity and mobility for workers and their families. In addition, the framework can suggest capabilities workers should add to their toolbox to mitigate the risks associated with increased automation and requirements for greater digital skills.
- **Identify and Map Good Job Transitions.** UpSkill Houston should work with employers and stakeholders in workforce development to identify and map viable and desirable job transition and upskilling progressions for workers holding jobs at risk of technological disruption. Employers and industries will need to identify and explore common skill sets across industry clusters with aggregated regional demand for workers.
- **Support and Coach Workers in Upskilling Pathways.** UpSkill Houston should engage workforce development stakeholders, including career coaches and counselors, to enhance support and guidance for workers navigating career transitions in the same or different industries. These stakeholders must be able to support workers' continual growth and learning with a focus on enhancing essential skills — such as clear communication, creativity and social engagement — as well as increasing digital skills. In addition, employers should enable their workers to be more agile and adaptable to changes in the workplace by diversifying their skills, so they can play multiple roles rather than be limited to roles that historically have been specialized.



# Conclusion

TEconomy's demand-side analysis featured in UpSkill Houston's "Middle Skills Matter to Greater Houston" pointed to nearly 50 good middle-skill occupations on which to focus initiatives designed to maintain Greater Houston's economic competitiveness and create opportunity for its residents, now and into the near future. Research highlighted in "Navigating the Changing Nature of Work" calls attention to the disruption that increased automation and requirements for digital skills will create for the region's workforce and the importance of building those digital skills as early as in middle and high school.

As a result of the COVID-19 pandemic and low oil prices, Greater Houston has experienced unprecedented job loss on top of the automation technologies and increased requirements for digital skills that are changing the nature of work. Together these factors have accelerated the disruption of key career pathways low- and middle-skill workers use to increase their economic opportunity and prosperity.

As Greater Houston's economy recovers from the pandemic and low oil prices, UpSkill Houston will

continue to convene employers, education and community leaders, and other workforce stakeholders in innovative ways. Together with workforce development partners, UpSkill Houston will drive and orchestrate collective action to support individuals who lost jobs and need re-skilling and upskilling to acquire the digital and essential skills necessary to participate in this evolving digital economy. In addition, UpSkill Houston and its workforce partners will provide support to workers as they navigate new career and skills transitions across industries and occupations that can provide economic opportunity and mobility.

To support the continued growth of the Greater Houston economy and to increase economic opportunity and prosperity for the region's residents, **we will need targeted interventions. This report spotlights analytical approaches to identify viable and desirable upskilling progressions for good middle-skill occupations and to remove barriers creating bottlenecks along those pathways.**

# Notes

- 1 “Middle Skills Matter to Greater Houston,” Greater Houston Partnership, 2020.
- 2 “Middle Skills Matter to Greater Houston” defines “good middle-skill careers” or “good jobs” as those that are in high demand, projected to need a high volume of workers, and pay livable wages exceeding the overall regional median wage.
- 3 See Bureau of Labor Statistics, Office of Employment Projections: <https://www.bls.gov/emp/documentation/education/tech.htm>.
- 4 “The Future of Employment: How Susceptible Are Jobs to Computerisation?” Frey & Osborne, Oxford Martin School, 2013.
- 5 “Digitalization and the American Workforce,” Muro, Liu, Whiton, & Kulkarni. Brookings Institution, 2017.
- 6 “Middle Skills Matter to Greater Houston,” Greater Houston Partnership, 2020. (See page 8.)
- 7 “Digitalization and the American Workforce,” Muro, Liu, Whiton, & Kulkarni. Brookings Institution, 2017.
- 8 “Digitalization and the American Workforce,” Muro, Liu, Whiton, & Kulkarni. Brookings Institution, 2017.
- 9 Burning Glass, “Crunched by the Numbers.”
- 10 “Digitalization and the American Workforce,” Muro, Liu, Whiton, & Kulkarni. Brookings Institution, 2017.
- 11 World Economic Forum in collaboration with Boston Consulting Group, “Towards a Reskilling Revolution: A Future of Jobs for All,” January 2018.

## About UpSkill Houston

UpSkill Houston — an employer-led initiative of the Greater Houston Partnership — mobilizes the collective action of more than 200 critical stakeholders to strengthen the pipeline of skilled workers that employers need and to create better pathways to economic opportunity and prosperity for all Houstonians. Our focus is on the good careers in Houston that require skills beyond high school, but less than a four-year college degree.

[www.houston.org/upskillhouston](http://www.houston.org/upskillhouston)

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## About Greater Houston Partnership

The Greater Houston Partnership works to make Houston one of the best places to live, work and build a business. As the economic development organization for the Houston region, the Partnership champions growth across 11 counties by bringing together business and civic-minded leaders who are dedicated to the area’s long-term success. Representing 1,100 member organizations and approximately one-fifth of the region’s workforce, the Partnership is the place business leaders come together to make an impact.

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