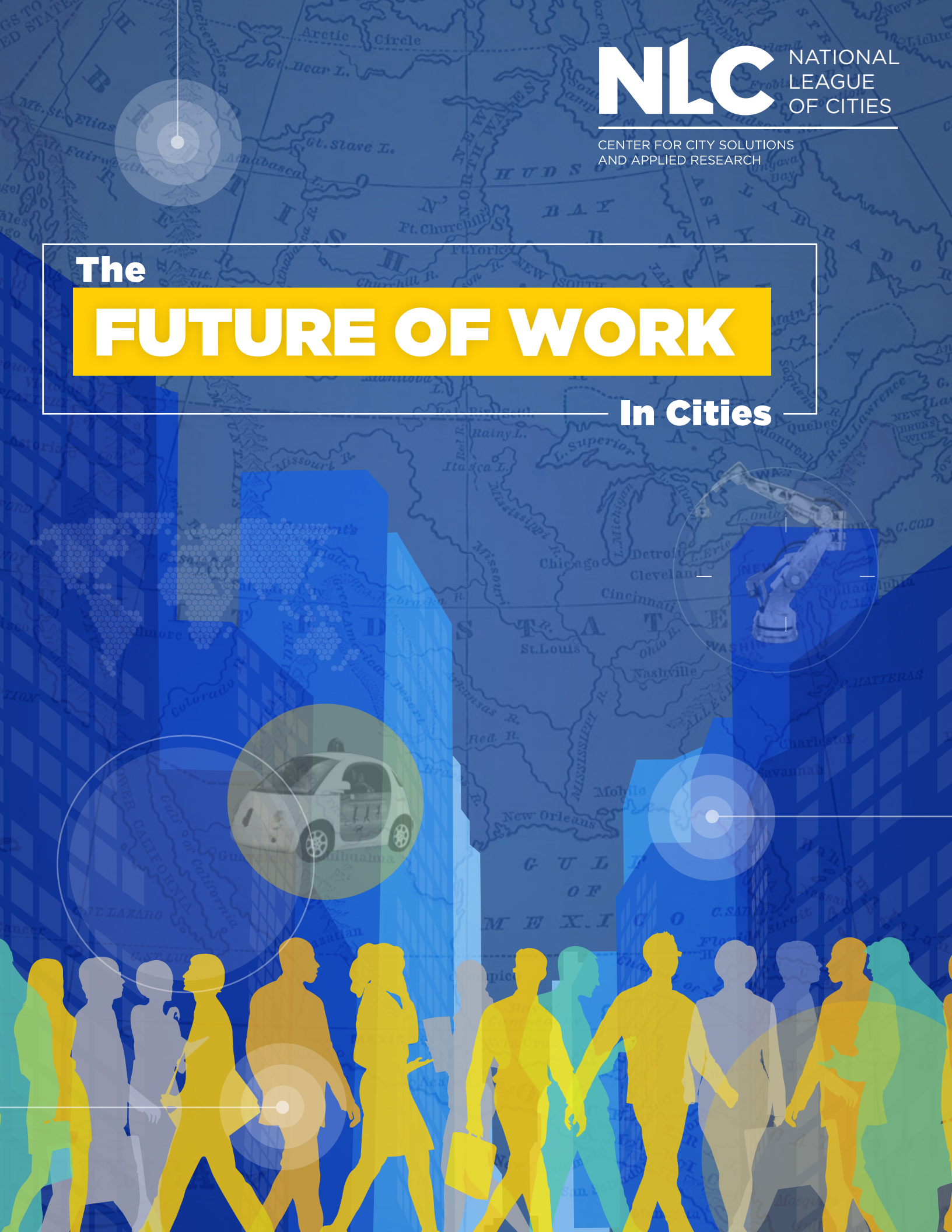


The

FUTURE OF WORK

In Cities



About the National League of Cities

The National League of Cities (NLC) is the nation's leading advocacy organization devoted to strengthening and promoting cities as centers of opportunity, leadership, and governance. Through its membership and partnerships with state municipal leagues, NLC serves as a resource and advocate for more than 19,000 cities and towns and more than 218 million Americans. NLC's Center for City Solutions and Applied Research provides research and analysis on key topics and trends important to cities, creative solutions to improve the quality of life in communities, inspiration and ideas for local officials to use in tackling tough issues, and opportunities for city leaders to connect with peers, share experiences, and learn about innovative approaches in cities. *The Future of Work in Cities* is the second report in NLC's *City of the Future* series.

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The

FUTURE OF WORK

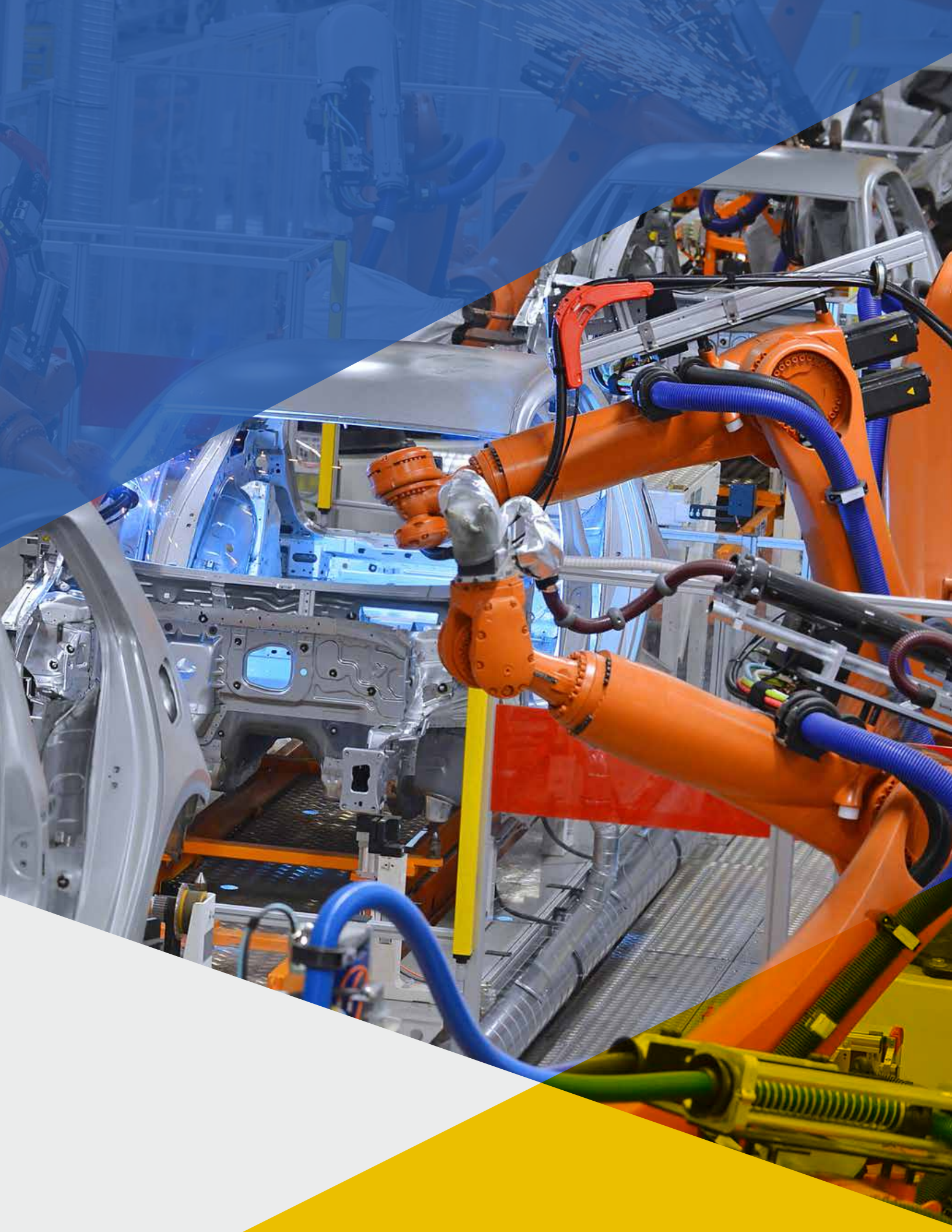
In Cities

NLC NATIONAL
LEAGUE
OF CITIES

CENTER FOR CITY SOLUTIONS
AND APPLIED RESEARCH

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NEW ENGLAND
NEW HAMPSHIRE
VERMONT
MAINE
NEW JERSEY
PENNSYLVANIA
DELAWARE
MARYLAND
VIRGINIA
NORTH CAROLINA
SOUTH CAROLINA
FLORIDA
ALABAMA
MISSISSIPPI
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ARKANSAS
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PROVINCES
NEW BRUNSWICK
QUEBEC
NOVA SCOTIA
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CITIES
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CLEVELAND
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NASHVILLE
MOBILE
NEW ORLEANS
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SAVANNAH
HAVANA
NASSAU

BODIES OF WATER
GULF OF MEXICO
GULF OF ST. LAWRENCE
L. SUPERIOR
L. MICHIGAN
L. HURON
L. ERIE
L. ONTARIO
R. ST. LAWRENCE
R. MISSISSIPPI
R. OHIO
R. TENNESSEE
R. MISSOURI
R. ARKANSAS
R. RED
R. DRAVES
R. ATLANTIC OCEAN

ISLANDS
BERMUDA
BAHAMAS ISLANDS
CUBA
HAWAII

OTHER
OTTAWA
MONTREAL
QUEBEC
ALBANY
WINDSOR
DETROIT
CINCINNATI
NASHVILLE
MOBILE
NEW ORLEANS
CHARLESTON
SAVANNAH
HAVANA
NASSAU

Historically, our culture of work has fueled the economic growth that is the cornerstone of American prosperity.

Now that culture is changing rapidly. Globalization and the emergence of new technologies are revolutionizing the way we structure our businesses, hire our employees, and produce our goods. This change is manifesting itself first and foremost in cities, which serve as the economic drivers of society and focal points for innovation.

This historic change brings both anxiety and opportunity. As federal and state governments remain sclerotic and mired in partisanship, local governments have taken up the mantle of leadership in adapting themselves to this new and changing economy.

THIS REPORT:

- 1 Presents the history of work,** demonstrating that though broad-scale changes to work happen rather infrequently, they can prove monumental. The report seeks to contextualizes this moment—a period of slower growth and wage stagnation, but also immense productivity and profitability—and forecast the changes yet to come.
- 2 Examines the technologies fueling a drive towards automation,** and how automation will vastly improve productivity and raise wages in some jobs while erasing or transforming others entirely. Current estimates suggest 15-25% of tasks in manufacturing, packing, construction, maintenance, and agriculture could be cost-effectively automated by 2025.¹
- 3 Explores changing relationships between capital and labor,** firm and employee, and traditional workforces and the growing “1099” or “gig” economy that has today grown to include 53 million people—34% of the workforce.²
- 4 Includes economic forecasting** in which the NLC examines two distinct employment sectors in which rising productivity is having diverse effects on wage and employment growth.
- 5 Provides recommendations to city leaders** so they can prepare for and harness potential shifts in the future of work while ensuring the values of equity and inclusion are front and center. Through an examination of workforce and business development; infrastructure and built environment; and the central idea of building a new safety net, we explore predicted impacts and potential strategies for city leaders to consider.

All of these forces of change will converge in cities, which will serve as the laboratories for bold and constant experimentation, and forums for the tensions and divisions that these changes will likely bring. As labor is commoditized and platformized, workers increasingly rely less on an employer's capital (like an office or a factory) and more on their own homes, laptops, cars, and smartphones. Cities are central to all of this, and will shape—and be shaped by—these shifts and interactions.

The Future of Work in Cities contrasts the realities cities face today with the ways they are planning for tomorrow, exploring the means by which cities can exploit innovative opportunities while realigning local governance priorities.

This research initiative aims to empower local leaders in cities across America to be proactive rather than reactive toward the changing economy, helping them position cities for growth as these trends accelerate.

While this report specifically focuses on the history and future of work in cities, it also seeks to define cities in the broader context of the macro-level economy. Through examination of the past and projection of the future, the report will identify ways in which city governments can work with partners at the state and federal levels to prepare cities for the inevitable economic changes to come.

THERE IS NO DOUBT THAT ACTION WILL BE NEEDED BY LEADERS AT ALL LEVELS OF GOVERNMENT TO ENSURE THAT WORKERS ACROSS SOCIETY CAN HAVE AN OPPORTUNITY TO BENEFIT FROM THESE CHANGES.

THE HISTORY OF WORK AND TECHNOLOGICAL ADVANCEMENT



The Industrial Revolution transformed an agrarian society into one driven by large-scale factory operations.

1870



1900



1930



1960



1990



2020



Prior to the Industrial Revolution, the majority of people worked in agriculture or small businesses.



In the first half of the 20th Century, the labor movement gained significant strength, but union membership has declined significantly since 1954.

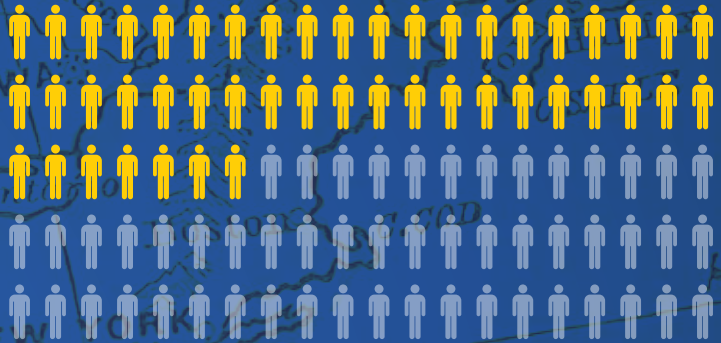


Advances in information technology, advanced robotics and artificial intelligence have increased productivity and disrupted the relationship between capital and labor.



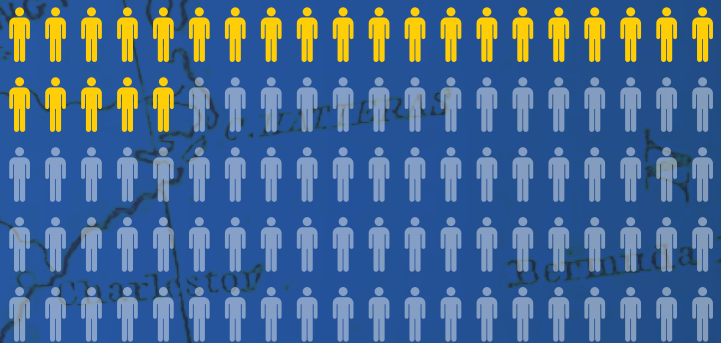
As new technologies revolutionize the workforce, jobs in 2025 and beyond will look very different from those of today.

47%



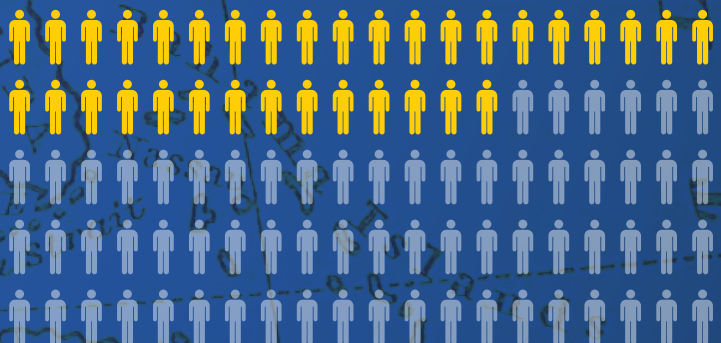
Within two decades, 47% of U.S. jobs might be at risk due to advances in computers, automation, and AI.

25%



15 – 25% of tasks in manufacturing, packing, construction, maintenance, and agriculture could be automated by 2025.

34%



Already we're seeing the number of freelance workers grow. Today, America has roughly 53 million freelance workers. That's 34% of the workforce.



**HISTORICAL
PERSPECTIVES ON
WORK AND CURRENT
CHALLENGES**



Prior to the Industrial Revolution, a majority of people in the United States worked in what could be classified as small business or an agricultural operation.

The Industrial Revolution, which exploded across Europe and the United States during the 19th century, transformed an agrarian society into one comprised mostly of large-scale factory operations for the textiles, iron, and transportation sectors, among others.³ The revolution certainly changed the economy in terms of its scale and production capabilities, but it also drastically changed the relationship between people and work, leading to the rise of corporations and eventually to the organized labor movement.

In the first half of the 20th century, the labor movement gained significant strength in the United States. Just after World War II, approximately one out of every three workers (excluding agricultural workers) belonged to an organized labor union. In 1954, the number peaked with approximately 35% of American workers belonging to unions.⁴

Since that peak, overall union membership in this country has declined significantly. In 2013, 11.3% of U.S. workers were members of unions.⁵ The steep decline in union membership and prominence has left many workers without the employment protections and mechanisms that once promoted equality and democracy in the workplace, set uniform

wage scales and standards for workplace conditions, and prevented undue layoffs and terminations. The shift away from unions in the second half of the 20th century is often cited as a driving force behind the increasing wage gap between blue collar and white-collar workers.

This shift has significantly altered the way people work. Fifty years ago, it was common for individuals to remain in the same job for the entire duration of a career. Today, that career trajectory is quite rare. Robin Chase, co-founder of Zipcar and noted sharing economy expert, recently asserted that “my father had one job in his lifetime, I will have six jobs in my lifetime, and my children will have six jobs at the same time.”⁶ The sharing economy has supercharged an already pronounced uptick in contract work. While there have always been certain employment sectors that made up the 1099 workforce (real estate agents, non-unionized construction workers, and professional home cleaning workers, for instance) the emergence of the sharing economy has presented several new platform-based businesses like Uber, Lyft, Task Rabbit, and DogVacay, that employ the majority of their workforce on a contractual basis.



**“FROM BOWLING ALONE
TO DE TOCQUEVILLE WE’VE
LEARNED THAT PEOPLE DO
BETTER IN GROUPS THAT ARE
VOLUNTARY AND OF THEIR
OWN CHOOSING.”**

//SARA HOROWITZ, EXECUTIVE DIRECTOR
FREELANCER’S UNION

VIEWPOINTS ON THE FUTURE

Arun Sundararajan

Arun Sundararajan is a Professor at NYU's Stern School of Business, and author of *The Sharing Economy*. His research focuses on how digital technologies transform business, government and civil society. He argues that many new work opportunities in cities over the coming decades will not come through the creation of more full-time jobs, but through work opportunities and small business formation that is facilitated by peer-to-peer platforms. Thus, policy that encourages activity through these peer-to-peer platforms is akin to policy that creates jobs.

Sundararajan points out that our existing infrastructure for regulating commercial activity in many industries is not well suited for regulating peer-to-peer commercial activity. "Part of the reason for this" he argues, "is because regulation is often created with the expectation that there will be a large

organization that comprises professional providers on the receiving end."

Peer-to-peer platforms instead create a distributed set of small-scale providers, many of whom blur the lines between personal and professional in the provision of commercial services. While advocating a new balance between government and self-regulation, he also highlights the important other roles that work plays in peoples' lives.

"Work is most people's primary social network and an important source of identity. As more and more people do not have this institutional affiliation, and are working more independently, cities will need to work to develop new community infrastructures, to be community creators for their freelance workforces."



**"CITIES NEED TO DEVELOP A
NEW SOCIAL CONTRACT."**

//ARUN SUNDARARAJAN
PROFESSOR, NEW YORK UNIVERSITY



The Sharing Economy

The sharing economy, also commonly referred to as collaborative consumption, the collaborative economy, or the peer-to-peer economy, refers to businesses that provide consumers the ability and platform to share resources and services from housing to vehicles and more, typically taking place via an online and/or application-based business model.

The 1099 Workforce

The term 1099 workforce refers to a subset of working individuals otherwise known as independent contractors, freelancers, or self-employed that report their income via IRS form 1099-MISC. This particular form is used to report income paid out to individuals who are not classified as employees. Individuals who are classified as employees, and who are typically paid salaries or regular hourly wages, would instead use the standard IRS W-2 form. The 1099 workforce is comprised of individuals who work through “sharing economy” platforms, consultants, independent contractors, some non-unionized workers, temporary employees (temps), and those who identify as freelancers.⁷

The image features a blue-tinted background of industrial machinery, including a robotic arm and various mechanical components. A prominent yellow rectangular box is centered horizontally, containing the word "AUTOMATION" in white, bold, uppercase letters.

AUTOMATION



Advances in information technology, advanced robotics, and artificial intelligence will likely lead to dramatic increases in productivity, in turn shaping and disrupting the classical relationship between capital and labor.

While technological unemployment is as old as technological innovation, we are entering a period where the maturation of certain technologies will serve as a force multiplier, affecting every sector of the economy, every worker, and every job.

Which technologies will change labor?

Over the past 20 years, advanced robotics have undergone rapid technological improvements, impacting both capability and availability. The cost of robotics has fallen 10% annually for the past decade.⁸ As costs have declined, sales have soared. Between 2009 and 2011, industrial robot sales grew 170%. The McKinsey Global Institute estimates that 15-25% of tasks in manufacturing, packing, construction, maintenance, and agriculture could be cost-effectively automated by 2025.⁹ Commercial-service robots could perform 7-12% of tasks in food preparation, health care, commercial cleaning, and elder care by 2025.¹⁰ This means high cost, urbanized areas—which already skew toward accommodating upwardly mobile and wealthy white collar workers—will see the working class segments of their workforces undercut significantly. Automation will serve to eliminate many of the aforementioned jobs, likely pushing many individuals out of the workforce and out of the city.

Automation of knowledge work

Advances in artificial intelligence and machine learning have only recently made the automation of knowledge work possible. If advances continue at their present pace, automation tools could perform the work of between 110 and 140 million people globally by 2025, impacting clerical, customer service, sales, education, health care, science and engineering, IT, finance, and legal sectors.¹¹ While automation of knowledge work will certainly free up the time and productivity of a large portion of the service sector, it will also supplant some jobs entirely.

Autonomous vehicles as a harbinger for change

Many cities and companies have begun to embrace and plan for the advent of autonomous or near-autonomous vehicles. In DARPA's 2004 Grand Challenge the best-performing driverless car drove seven miles. Google's autonomous fleet has now logged over 1.5 million miles. Besides the boon such technology would have for public safety, it would affect a mammoth industry in the United States. Transport is the largest occupation in the United States for adult men, employing 9.5 million people, over a third of whom drive trucks. Some studies predict that by 2025, between ten and twenty percent of

the 1.2 billion cars on the road globally will be self-driving, significantly impacting cities both economically and in terms of their design.¹² While cities are beginning to plan for these rapid shifts in vehicle automation, the vast impacts that this technology will have on workers that drive for a living or work in a host of complementary industries is only now beginning to be more fully explored.¹³

The outsized impact of technology on the workforce is ever growing

The increasing digitalization of the U.S. economy boosts the potential for exponential technological disruptions in the

workforce. While the benefits may be great, the challenges will be enormous. Urban environments often lead trend cycles for mass adoption of new technologies, making cities ground zero for these transformations.

Technology exacerbates growing inequality in the workforce, impacting most sectors of the economy in some way. Between 1997 and 2013 the leading sectors of the economy increased their levels of digitalization four-fold. As other sectors catch up—most are roughly 15% as digitized as these leading sectors—the broader economy is poised for widespread disruption.²² The magnitude

A Scenario for 2025

Taken separately these technologies are impressive, but together they will revolutionize our commercial interactions and expand possibilities like never before. While it is hard to predict where and when certain jobs will disappear, the jobs we will see in 2025 and beyond will look very different from those of today. Manufacturing jobs will likely focus on training, maintaining, and supervising assembly floors of advanced robots. Surgeries will be faster and safer due to robotic assistance. A restaurant's human staff might consist of a manager, a hostess, and a head chef, while robots perform line-cook duties, wash dishes, and take orders. An

office manager will spend the day managing robotic clerks, ensuring their interactions with customers are satisfactory and dealing with only the most difficult interactions themselves. A truck driver will spend time checking schedules and fuel levels at the head of an autonomous column of trucks, deciding when and where the fleet will refuel before reaching its delivery destination. All of these scenarios share two key aspects: they involve fewer humans, and those humans still involved enjoy a much higher utility. While those still employed may realize real wage gains due to this increased productivity, many workers may see their jobs taken by machines.

of this disruption, and future growth, will depend upon how quickly investment and firms themselves pursue and adopt these technologies.²³

Automation taking hold in the broader economy

The increasing ubiquity of automation and AI across economic sectors means we all live in a more robotic and automated world—a byproduct of the aforementioned rise in digitalization across the economy. An examination of investments major companies are making suggests we have only scratched the surface of what's possible.

A recent report exploring the subject of where machines could and could not replace humans found that 8% of all work tasks are predictable physical tasks, 16% are data processing, and 17% are data collection—all of which are highly susceptible to automation. On the other end of the spectrum, work that either involves managing others (7%) or applying expertise (14%) proves the least susceptible. In sectors such as accommodations and food service, 73% of the activities workers perform have a high potential for automation, making them the most readily automatable sectors in the US economy. Manufacturing, already wracked by upheaval due to automation and shifting workforce trends, is the second most automatable sector.²⁴

Historically an increase in automation has not necessarily meant a concomitant decrease in employment, but rather an increase in efficiency. Any examination of the future of work must explore whether this historical precedent holds in the 21st century.

Cities are the meeting ground for these forces

These potential tensions and upheavals associated with automation will converge in cities. Not contingent solely on technological feasibility, adoption of automation will also rely upon the costs of the technology, the type of labor replaced, and—critically—social acceptance.

As these technologies offer to replace tasks or entire jobs, reactions will range from optimistic acceptance to anger, frustration, and potentially even violent upheaval. Negative reactions may originate in a more localized manner among those losing wages and employment. Positive reactions on the other hand may be more broadly dispersed amongst consumers benefiting from lower prices and greater choice. Policy choices will be critical, as the gains to society could be more equally dispersed or—following recent historical trends—concentrated at the top of the income pyramid.

Winners and losers of new technology

City leaders should weigh the benefits of these innovations and new technologies with the broader reactions of their residents, promoting dialogue and transparency in order to avoid greater conflict.

While politically powerful constituencies can often extort concessions which might delay or ease their transition, ultimately change spawns winners and losers. Those who focus on how best to utilize technological change within their cities to benefit community members will be the big winners in this economy.

Examples of Workforce Automation



Many elements of the workforce have already been automated, and these early examples reveal that we might be losing more than just jobs to automation. In many cases businesses will benefit from efficiency while consumers may be frustrated by the loss of interaction and socialization. An automated customer service prompt may increase efficiency and lower wait times for callers, but fail to account for individual nuance and increase irritation. Other examples of automated functions and interfaces include:

Eatsa, a fast-food restaurant requiring zero human interaction. Customers place orders via tablet and receive their prepared food through one of several glass cubbies set into a wall. Line cooks and kitchen staff remain out of sight on the other side of this wall.¹⁴

Momentum Machines has developed a robotic system capable of making 400 hamburgers an hour, automating everything from the grinding of the meat to bagging the order. The company plans to open its first restaurant in San Francisco in the next few months.¹⁵

Amazon's fulfillment warehouses¹⁶ employ Robo-Stow, a six-ton robotic arm that moves large inventory, and crate-moving robots

made by **Kiva Systems**.¹⁷ Since introducing Kiva, the average time for finding something and boxing it for shipping has gone from an hour and a half to 15 minutes. After Amazon bought Kiva and stopped selling its robots to other retailers, major U.S. retailers are racing to develop more advanced automation technologies. Amazon has invested significantly in automated drones and artificial intelligence via its new Amazon Robotics division.

Robotic security guards developed by **Silicon Valley's Knightscope** are equipped with 360 degree cameras, intelligent threat and breach identification, and autonomous patrolling capabilities.¹⁸

Aido's personal home robot moves around the home on its own and has an HD projector in its body, along with sensors for air quality, temperature, humidity, noise, ambient light, pressure, and gravity. Aido can also talk to other home appliances using wifi, BLE, ZigBee, and Z-Wave.¹⁹

IBM Watson-powered Pepper is a continuously learning interactive robot that will be first tested in the hospitality and retail sectors.^{20 21}

The Death of Distance?



In Frances Cairncross' 1997 *The Death of Distance*, the author argues that communications and information technology will bring greater autonomy and leisure to our workforce.²⁵ Nearly twenty years later, many workers already enjoy more flexible hours as teleworking and telecommuting policies supplant the factory-modeled nine-to-five workday.

While increased leisure time does not show up in national accounts and GDP forecasts, these policies have real, positive effects on both workers and the cities in which they live. They reduce commute times, congestion, and carbon emissions while granting workers more time to raise their children, look after loved ones, and take better care of themselves. In turn, increased leisure time

for workers has helped revitalize urban cores previously hollowed out by office space and left empty outside of traditional work hours. New types of businesses have flourished in this setting, catering to more mobile and independent workers.

However, as the boundary between work and non-work hours blurs, these more flexible employees may feel increasingly tethered to their jobs as calls and emails creep into non-traditional work hours. As these nontraditional work arrangements become more and more ubiquitous, it is important that cities consider the policies that are best for their residents and their neighborhoods.

Cities can inform the culture and debate surrounding this changing economy and empower residents to embrace both innovation and disruption. A revival and reinforcement of the American culture of constant bold experimentation, as well as assurances that the most vulnerable will not be disadvantaged by it, will go a long way towards diminishing potential conflict.

Implications

Capital will increasingly take the place of labor in a more automated economy, improving productivity and efficiency but potentially threatening wages and employment rates. Likely there will be fewer jobs—and even fewer good paying jobs. Employers will need to reconsider the skills necessary to meet their workforce needs, and work with cities to ensure that workforce development efforts are meeting those needs.

Wages

Though automation promises an exponential increase in productivity, it involves fewer and fewer humans. As business becomes more capital intensive, the returns to capital owners have grown rapidly at the expense of labor income. Public investment in education and infrastructure is lagging behind the stream of private investment into capital, threatening an imbalance in the market that could lead to higher unemployment and lower wages. Capital is still seen as a business investment, whereas labor is a business cost. As capital begins performing many of the functions of labor, this line will become increasingly blurry. Larry Summers, the former Secretary of the Treasury, has proposed that capital should be viewed as at least a partial substitute for labor and has called for

vast public reinvestment in education and infrastructure.²⁹ This substitution phenomenon helps explain why recessions are increasingly being borne by reductions in employment and not in capital stock.

Workforce skills

While the promise of automation is already bearing fruit, its full potential will not be realized if workforce skills do not keep pace with employer needs. Of the 11.6 million jobs that have been created since the last recession, 95 percent required some postsecondary education.³⁰ In addition to education and training attainment, aka “hard skills,” employers report a need for and general lack of 21st century “soft skills,” including critical thinking, communication, collaboration, and creativity.³¹

Employment prospects

In an MGI survey of 2,000 business executives, 65% reported productivity improvements while reducing employment between 2008 and 2011.³² Between 2000 and 2007 the United States saw the weakest job growth since the Great Depression, at just 7%. From the 1970s onward, every recession has seen a greater share of the decline in GDP absorbed by employment. In 1973, employment absorbed 32% of every percentage point decline in GDP. In 2007, this figure stood at 98%.³³ As technological advances enable more and more labor to be automated, businesses are shedding employment in times of recession and instead investing more in labor-saving capital. Brent Neiman and Loukas Karabarounis, economists at the University of Chicago, estimate that nearly half of the decline in labor’s income is due to this increasing automation.³⁴



Pittsburgh - Always Fighting

Pittsburgh has a story to tell.

First settled in 1764 at the confluence of the Monongahela and Allegheny rivers, the city was an active supporter of the Whiskey Rebellion of 1794, the railroad strikes of 1877, and the steel strikes of 1892. As Pittsburgh quickly industrialized, it soon provided between a third and half of all U.S. steel output. All of those steel mills supplied good-paying blue collar jobs, as well as enough soot to brand the city with one of its many monikers, Soot City. As Andrew Carnegie began automating his factories, he increasingly replaced skilled unionized labor with unskilled labor, causing some of the greatest labor disputes in American history. The Homestead Steel strike, between Carnegie Steel Co. and the Amalgamated Association of Iron and Steel Workers, ended

in 1892 with martial law being declared and the state militia billeted in the steel mill. Industrial barons like Carnegie marked Pittsburgh with more than their factories, however, endowing universities like Carnegie Mellon as a means to provide skilled engineers for their companies. In 1900 Carnegie Mellon joined other city fixtures like the University of Pittsburgh, chartered in 1787, and later Chatham College, founded in 1869. By 1910, Pittsburgh was the nation's eighth-largest city, behind only New York and Chicago in corporate headquarters employment.

In 1950, Pittsburgh could boast a population of 680,000. In the 1970s, as deindustrialization of American steel began, the city shed workers. Between 1970 and 2000, Pittsburgh lost 40% of its population. The 1980s are still seen by many locals as the nadir for Pittsburgh. By 1983, unemployment hit 17.1% and the city was losing 4,000 residents a month. As the mills closed, opportunity seemed to close with them. But Pittsburgh chose to fight its decline, and not by holding onto its past but by embracing a realizable future. A report commissioned in the 1990s led to the creation of a roadmap consolidating economic development plans around five sectors: finance, energy, information



technology, manufacturing, and healthcare.²⁶ Officials from the ten counties in and around Pittsburgh joined together to form the Southwestern Pennsylvania Growth Alliance. Together, these counties cooperated and pooled resources as they lobbied for state and federal funding, united by a common vision of a revitalized region. Part of this shift toward high-tech was serendipitous. In 1979, Carnegie Mellon formed its Robotics Institute, which would earn acclaim by building a robot able to enter the radioactive core at Three Mile Island. This helped put robotics on the map nationally, stimulating a wave of interest and funding. Since 2000 the city has reversed its decline, growing by 40% and getting younger. It now boasts a population of just more than 300,000, and a 2014 National Bureau of Economic Research report found Pittsburgh to be the second-best U.S. city for intergenerational economic mobility.²⁷ It is safe, affordable, and livable. The smog has long since cleared, and while steel mills haven't returned, Google, Apple, Bosch, Uber, Facebook, Nokia, and IBM have moved in, generating together with other tech firms \$20.7 billion in annual payrolls.

Pittsburgh still has its challenges. Almost a quarter of the city lives in poverty, while more

than one in ten residents are left without health insurance. In 2013, 79% of those living in poverty are in the suburbs, compared with the national average of 55%.²⁸ The Allegheny Conference on Community Development, an affiliate of the Greater Pittsburgh Chamber of Commerce, the Pennsylvania Economy of Greater Pittsburgh, and the Pittsburgh Regional Alliance, has focused its strategy for future inclusive growth on infrastructure, workforce, and economic and community initiatives. Pittsburgh is a success story, largely thanks to the grit of its residents, the support of its educational institutions, and the cooperation of its public officials. But it's never done fighting.

Hollowing out of the middle class and job polarization

Job polarization is the term economists have given to a recent phenomenon in which mid-skill white and blue collar jobs have stagnated (and in some cases declined) as employment demand has grown for both high-skilled professionals and low-skilled caretakers. The St. Louis Federal Reserve found that both manual and cognitive jobs have suffered from stagnant growth since 1990, and that automation and offshoring are the two greatest forces driving this phenomenon.³⁵ These jobs—in sales and office occupations, construction, transportation, production, and repair—are easily automated or offshored to other countries with more competitive wages. Non-routine jobs such as management, professional occupations, and service occupations are much harder to automate or offshore. As a result, non-routine yet low-skill service occupations have seen steady growth, alongside non-routine, high-skill jobs. These jobs also display less volatility throughout the business cycle, as they are harder to economize.

Experiential work versus routine work

As computers increasingly perform low and mid-skilled tasks with greater precision and speed and at lower costs, those unable to retrain and refocus their skills toward high-skill tasks machines cannot perform will lose many employment prospects. As robots begin taking orders at restaurants and assisting individuals with their online shopping, humans who work in these sectors will be expected to provide something “extra,” something social,


that robots cannot. This shift toward selling more personalized or unique experiences—or the “commodification of experience”—is already emerging.

For example, with increasing regularity restaurants offer “chef’s menus” and “chef’s table” dining experiences in which patrons have an opportunity to eat meals exclusively designed and prepared by a restaurant’s chief executive, often with an opportunity to interact with the chef throughout the meal. High-end fashion stores offer personal assistants who are fun and persuasive (compared to a robotic assistant), and online retailers like StitchFix offer personal stylists that select pieces of clothing fitting a client’s individual needs or tastes. In these cases, businesses sell a human experience to the consumer as much as a product.

While high-skilled jobs will be more productive than ever under an increasingly automated workforce, previously low and mid-skilled jobs will either disappear or transform themselves, and there will be a greater premium on interpersonal and communication skills as a result.

The transformation of employment throughout the workforce

At every layer of the economy, jobs are undergoing transformation. New technology and peer-to-peer platforms as well as a greater emphasis on personal craftsmanship and human ability has fueled the growth of a creative class of individuals capable of marketing their work from home. The Maker Movement—a movement of craftspeople who market their products directly to consumers on sites like Etsy—demonstrates the greater premium placed on distinctly human creativity



and skill. This emphasis will likely continue to spread across the lower-skilled labor market, where individuality and a personal touch are valued and where services cannot be outsourced or easily automated.

While the mid-skilled technician or office administrator has seen employment opportunities decline, those that have been able to augment their work with technological advances have seen gains in productivity and salary. As some workers have learned to run with their machines, others have embraced more of what makes them distinctly human. Those that have failed to adjust at all are increasingly left behind.

Examples of Current Workforce Development Efforts

The recovery from the last economic recession has created 11.6 million jobs, 95% of them going to individuals with some postsecondary education.³⁶ As this trend continues, cities have begun partnering with business leaders, educational institutions, and community-based organizations to help prepare this new workforce.

Cities Unlocking Their Talent

In 2010, Louisville made a city-wide commitment to add 55,000 degrees (40,000 bachelor's and 15,000 associate degrees) to its workforce by 2020. The lowest-hanging fruit: More than 90,000 Louisville adults that already have some college coursework completed. Degrees At Work aims to help 15,000 working adults earn degrees by 2020, working with local companies that have stepped up to provide tuition reimbursement, college advising, and flexible schedules to their employees.

Cities Building Pathways

In Long Beach, CA, Mayor Robert Garcia has championed a partnership between the school district and the business community to connect students and school curricula to real-life workplace experiences in healthcare, IT, business, entertainment, and other industries.

Cities Connecting Education and Business

The City of Tucson and The University of Arizona have formed the Commercialized Advisory Network linking 750 industry professionals and providing guidance and opportunities to tech entrepreneurs in the city. The result: 200 new patents, 86 licenses, and 12 new startups in biotech, materials science, software, and publishing.

The emergence of innovation hubs—where maker spaces and technology start-ups have become a part of the city landscape—can also be access points where cities can connect education and business. In North Little Rock, the Arkansas Regional Innovation Hub has opened its door to young people, offering free after-school classes, clubs, workshops, and summer programming exposing young people to art, technology, and entrepreneurship.

Cities Preparing the Next Generation

Early childhood programs are the most cost-effective ways to ensure the healthy development of children, offering some of the greatest societal and economic returns to cities. Children who attend some form of a preschool program at age 4 are 9 percentage points more likely to be school-ready than other children,³⁷ and every dollar invested in high-quality early childhood programs yields an economic return on investment of as much as \$16.³⁸ To foster a strong workforce, it pays for cities to support children early.





**THE CHANGING
RELATIONSHIP
BETWEEN CAPITAL
AND LABOR**

Capital will become more productive, more profitable, and more ubiquitous. Capital services, or the flow of productive services from assets, has more than doubled over the past two decades due to technological advances that have made capital assets such as machines and computers much more productive.

Wages have stagnated since the mid-1980s, actually falling as a percent of GDP, while corporate profits have increased alongside the growth of capital productivity. Along with growing capital income, capital intensity—or the degree to which human labor is augmented with capital—has also seen a rapid increase. Between 1989 and 2009 capital stock nearly doubled in proportion to labor. Factories, hospitals, restaurants, offices, and stores became more crowded with labor- and time-saving machines.

Labor's share of income will decline even as productivity increases

Income in our economy accrues to either labor or capital. Both are needed for any output, and whereas labor is generally equally distributed across the economy, capital is less evenly held. Labor's share of income remained relatively constant around 62% for most of the post-war years into the mid-1980s, in large part due to rising labor income in services even as it shrank in manufacturing. From the 2000s on, labor's share of income began to fall precipitously. Labor's share dropped below 60% in 2004 for the first time, and fell to 56% in 2014. This decline in labor's share of income has long-term effects on inequality and wage and employment growth. Economists disagree over the causes of

labor's declining share of income. While there is consensus forming about the way labor productivity continues to increase, leaving behind anemic wage growth, economists disagree over the causes.³⁹

Some economists argue that the increase in income inequality caused by large wage increases at the top of the pay scale has distorted current measurements of labor's share of income. Those with superior skills are compensated at rates much higher than those left behind, artificially inflating labor's share of income. The result is that reality is probably even more shocking than the data tells us, and while labor is much more productive today than ever before, much of that productivity is coming from capital inputs and more of the resulting wealth is flowing back to capital.⁴⁰ As new technologies mature and adoption increases, this trend is likely to accelerate.

Why is this time different?

The steam engine and electrical dynamo were two technological force multipliers that launched the first and second industrial revolutions, reducing employment while increasing output. The computer is a third such technology, but it is having far-reaching and very different effects. Previous technological advances that spurred the first and second

VIEWPOINTS ON THE FUTURE

Erik Brynjolfsson



Erik Brynjolfsson is the Director of the MIT Initiative on the Digital Economy and Professor at MIT's Sloan School. Co-author of *The Second Machine Age: Work, Progress and Prosperity in a Time of Brilliant Technologies*, his research focuses on the ways that advancing technology is making the economic pie bigger, and the ways in which society can adjust to these new developments in a way that maximizes benefits for everyone. "Municipal leaders should think not about slowing down technology, but about how we can use technology to create shared prosperity. And the main barriers are not technological, they are in adapting and taking advantage of these technologies: the organizations, the institutions, the regulations." He argues that attempting to preserve the old way of doing things is always a losing strategy, and that a better approach is to think about ways that we can make our local economies more flexible "...because there are going to be new kinds of business models and organizations and institutions and goods and services that take advantage of new technologies and platforms." City leaders are in the position to think about how to best provide the complementary organizational and institutional innovations that might allow their communities to best benefit from technological advances. "The cities that embrace it in a forward-looking way I think are going to thrive and ultimately create not just prosperity but shared prosperity."

Brynjolfsson identifies steps cities can take today to position themselves for long-term growth in the new economy. Most critical, he suggests, is building an educated workforce and rethinking the educational and training programs that do so. This will require individuals to have not only coding skills, but more diverse math, reading, interpersonal and creative skill sets. He also argues that building up a connected ecosystem to support the new economy is vitally important. "A second big thing would be having an infrastructure, things like broadband internet and other basic services, that make it easy for people to get around and connect to each other and share ideas, either digitally or face to face."

His third suggestion for cities is "reducing barriers to entrepreneurship and innovation." This would involve limiting the number of occupational licenses necessary or, at the very least, the red tape that creates barriers for new business owners to get those licenses. More generally, cities can take a pro-innovation approach to new technologies. Ultimately, he argues that policy and decision makers have the opportunity to influence the ways in which this plays out. "I'm optimistic that we can do the right things, but I don't believe that the outcomes are automatic or inevitable, they really depend on our choices."

industrial revolutions replaced muscle-power with engine-power. This century's breakthroughs are replacing thought-power with computer-power, revolutionizing the way we structure businesses, hire employees, and produce goods.

While productivity growth, employment growth, and wage growth historically moved in lockstep, the introduction of the computer into the workplace uncoupled these factors. Since the early 1970s, productivity has continued to rise. In manufacturing, productivity rose an average of 2.9% since 1949. Business sector productivity grew an average of 2.2% since 1947. For both manufacturing and services, however, employment and wage growth have not kept pace. While labor's share of manufacturing output actually grew in the 1950s and 1960s, it declined from the early 1970s onward, and precipitously between 2003 and 2008.

From the 1970s onward—and particularly since 2000 and the explosion of networked computing—computers have increased productivity faster than at any other time in history, including during the industrial revolution. Unfortunately, however, computers have also decoupled this increase in output from increases in employment or real income. This has been referred to as the Great Decoupling, and although some are optimistic about what computing technology can provide in terms of productivity by freeing human labor from drudgery and repetitive skills, short-term dislocations are sure to follow. Much like earlier great shifts in the workforce, cities as the economic epicenters of America, are the first to feel the aftershocks of the disruptive shifts moving rapidly through society.

VIEWPOINTS ON THE FUTURE

Sarah Horowitz



The most significant macro-level shift happening in the workforce is the “change in the size and scope of work, [moving] away from the manufacturing and white collar 40-hour work week construct to this notion of gig or short term work,” says Sarah Horowitz, founder and executive director of the Freelancer’s Union, and a self-described innovator for tomorrow’s workforce. This shift from employee status to independent contractor status means that for many, work becomes more episodic, not only in lower-wage sectors but also in professional and middle class sectors. “The crux of the matter,” she argues, “is figuring out how to use policy levers to strengthen the social safety net and smooth out that episodic work.”

There are two critical issues, according to Horowitz:

Wage theft is a major risk for independent contractors, and proves a problem for cities as well. New York City recently passed a law that penalizes employers that fail to pay their contract employees by requiring them to pay double the original fee plus damages and attorney fees. The law also aims to facilitate the increase in groups representing the

interests of 1099 employees (without creating more government infrastructure). Policies like this have the potential to make cities very attractive to creative types and artists, adding value for everyone in a community.

Cities can also backstop their 1099 workers via unemployment insurance. “In a traditional manufacturing model there will be rare instances of unemployment but they will be long, and the actuarial tables are all based on that. A new model that is more appropriate for the new economy might account for several instances of unemployment during the course of the year, but those instances would be very short,” Horowitz says. “Again, this represents an opportunity to smooth out the impacts of episodic income.” Such measures are important because higher minimum wage rates and augmented benefits are less impactful when an increasing number of people are working in circumstances where they have no employment protections or benefits.



**AN ECONOMIC
FORECAST: RETAIL
AND OFFICE
ADMINISTRATION**



We chose to examine two of the largest sectors of employment in the U.S., office administration and retail.


We focused on a subset of the sector, business services, because no reliable sector-wide productivity data for office administration exists. Productivity growth is representative of technological growth here, and as the technologies discussed in this report impact our economy, the resulting increase in productivity growth will mean different things for employment and wages in different sectors of our economy.

In sectors like retail, as productivity grows, wages and employment also grow, though at a much slower rate. Although these sectors remain major employers and may see large gains in productivity growth and revenue in the future, these gains will not be shared evenly, and workers within these industries will not see commensurate wage or employment growth. As technology improves performance in these sectors, most of the gains will go to the shareholders and not the workers of these firms. While profits increase, wages and employment will remain stagnant.

Sectors such as business services show a different relationship. While productivity may grow at a slower rate in these sectors, wage growth is more closely tied to productivity. Workers in these sectors will see larger wage growth alongside productivity, but also negative employment growth. As technology makes firms in these sectors more competitive, they will require fewer workers and pay those workers better wages.

These relationships between productivity, wage, and employment growth tell us something about what future wages and employment prospects will look like. Technology continues to unlock great productivity gains, but these gains have disparate effects on different industries. In sectors such as retail and hospitality, these productivity gains will translate into increased profits, while employment and wage growth slow. These sectors can no longer be looked to as the great job creators of the future. In sectors such as business services and manufacturing, higher productivity will translate into fewer workers with higher wages. These sectors will shrink even as they grow in value, putting pressure on local economies to embrace other fast-growth sectors, such as health care.

This is illustrated when we take a closer look at an average American city, representative of most cities in that together retail and office administration represent a quarter of the city's employment. Because we have data for business services, that subsector dominates office administration in our example city. Projecting fifteen years out, at the average urban population growth rate for the past decade, the population of this city will have grown faster than some of the city's dominant employers. Business services shrank in absolute terms, shedding jobs. Even though retail employment grew modestly, it still shrank in relative terms from employing 12.5% of the population to just 12%. Unless



this city can attract and retain other growing employment sectors during these fifteen years, structural unemployment will increase by 3% in a decade and a half. And this only considers two of the many sectors that will change drastically as new technologies are adopted. Most cities are already confronting these economic forces.⁴¹

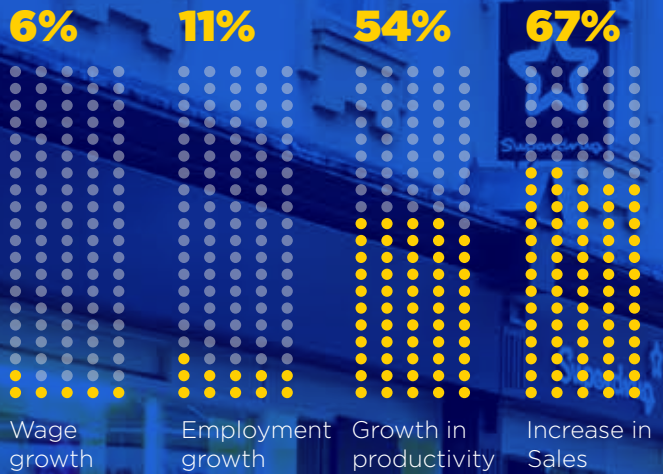


FORECAST OF RETAIL AND OFFICE ADMINISTRATION

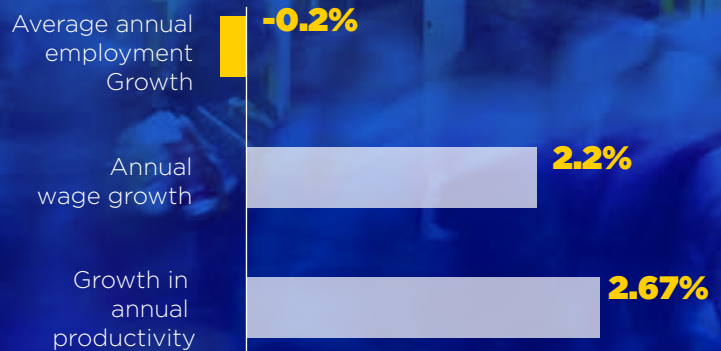


ONE in **FOUR** Americans are employed in retail or office administration

Retail: A Closer Look (2000-2015)



Business Services: A Closer Look (2000-2015)



PRODUCTION



Average City, USA

2015 Employment



Population

1 Million

Retail

125,000 Employed

Business Services

125,000 Employed

2030 Employment



Population

1.18 Million

Retail

143,750 Employed

3x Productivity

2x Sales

15% Wage growth

Business Services

121,390 Employed

54% Growth in productivity

38% Wage growth

3,610 People lost their jobs

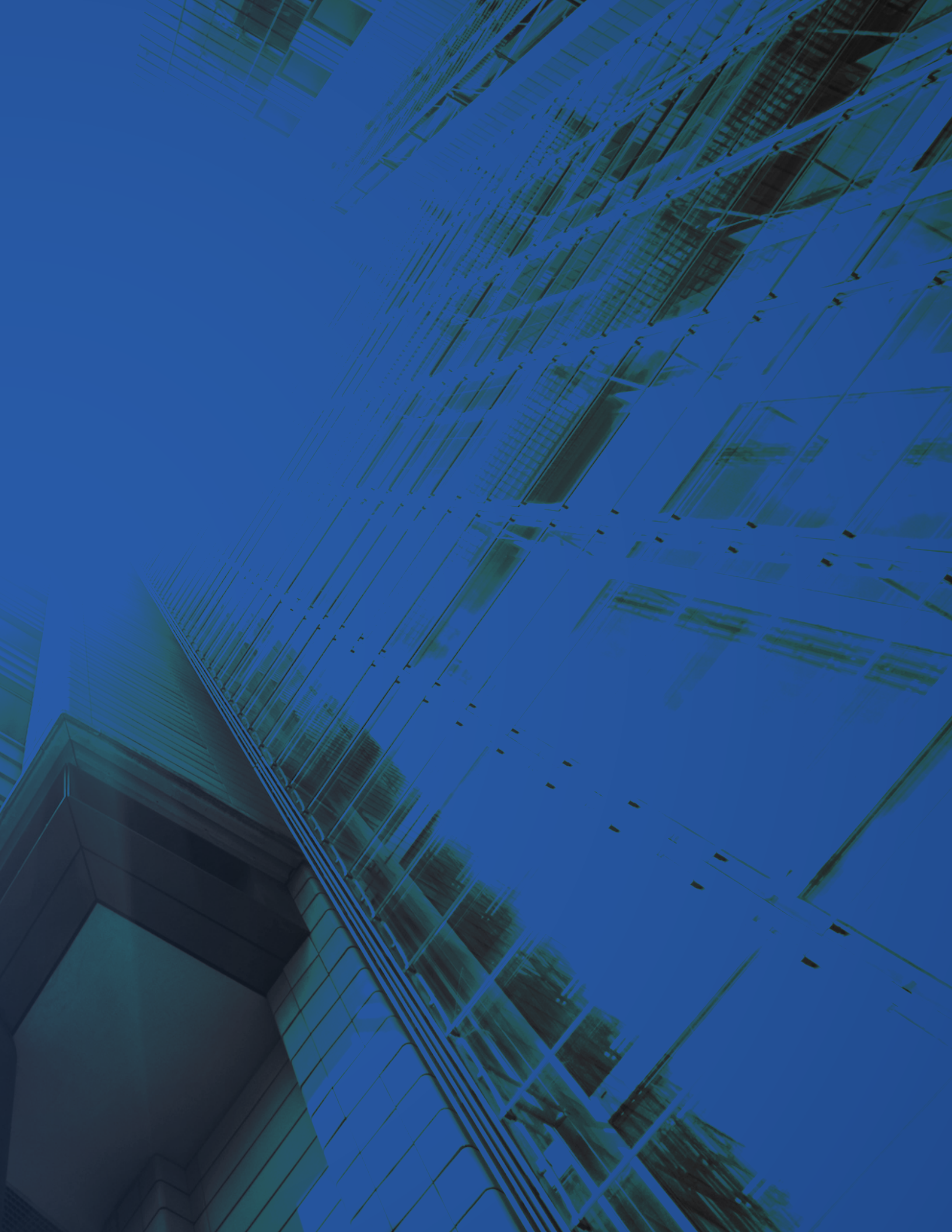
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The number of Business Services jobs **LOST** from 2000-2015



**FUTURE POLICY
CHOICES AND
STRATEGIES: WHAT
THIS MEANS FOR
CITIES AND WHAT
CITIES CAN DO**





Workforce and Business Development

Cities will need to rethink education and workforce training programs to meet constantly changing employer needs.

Municipal leaders recognize that the strength of their city is the people that live there. As cities prepare for the future of work, they must address talent development as a key to growing a robust economy. This means working with business leaders, educational institutions and community-based organizations to ensure that workforce needs are fulfilled by regional training and educational programs.

Cities should work to create policies that build pathways between post-secondary education institutions and their business communities. They can institute policies and programs that encourage employers to offer tuition reimbursements and flexible schedules that might enable employees to pursue continuing education or additional training. Investment in improving and increasing access to early childhood, K-12, and postsecondary educational opportunities will position cities to not only benefit from automation and other technology changes, but also ensure that the local workforce has the skills to contribute to and share in the gains.

Work-related policies will need to change with the changing composition of the workforce. Tomorrow's workforce will be significantly more diverse than the one of today. The workforce is also becoming older, as older workers delay retirement and younger workers delay their entry into the workforce.^{42 43} Data also shows that more women have entered the workforce over

the last 50 years, and will continue to in the coming years. In 2010, women accounted for 47% of the total U.S. labor force, and over half (51%) of those in professional and technical fields. Finally, the racial and ethnic makeup of the workforce will change, as the coming decades will see immigration drive net population growth.⁴⁴

The changing composition of the workforce will certainly impact the pipeline of available employees, but more significantly it will result in a shift in the needs of employees, and subsequently, the way employers respond to those needs.⁴⁵ In crafting their workplace policies and benefits, employers will be pressed to accommodate working individuals who need flexibility due to child and elder care responsibilities.⁴⁶ Cities can augment and encourage a more diverse workforce by passing family leave policies and ensuring that the members of their community have access to affordable childcare and pre-k options.

Entrepreneur and startup support will be a vital workforce development strategy. Economists point to the past thirty-year decline in business dynamism and startup creation as another weight on future growth. The number of startups created annually has indeed decreased over the past thirty years. A recent report by MIT's Lab for Innovation Science and Policy created its own metrics for gauging this phenomenon, controlling for the quality of the startup as well as its growth potential.⁴⁷ While the vast majority of startups and businesses in the United States are small sole-proprietorship or limited liability companies, these businesses, which include businesses like food vendors, cleaning and gardening companies, landscapers, plumbers, and electricians, have a low potential for

the high growth that fuels economic gains. While the MIT study did find a numerical decline in the number of these limited growth startups, it also found a sustained increase in the creation of new high-growth potential startups from 2010 onwards. Despite this, the ability of these firms to scale up continues to fall, while regional variation reflects significant differences in both the quality and growth of these startups. MIT's report recommends a customized approach to creating the local and regional ecosystem to support high potential growth startups. To this end, MIT offers a Regional Entrepreneurial Acceleration Program, which works with local stakeholders to craft an analysis-informed regional entrepreneurship acceleration strategy.

Technological advances and peer-to-peer platforms are dramatically lowering the information asymmetries and capital requirements that are common obstacles to starting a business. When cities are clear in their commitment to lower barriers of entry, increase local access to capital markets, and support local startups not just under one administration but in the long-term as part of a coordinated and bipartisan consensus, startups will flourish. The Startup in a Day (SIAD) joint initiative of the White House, NLC, and the Small Business Administration aims to make it easier for entrepreneurs to start businesses by reducing the amount of time it takes to register and apply for permits and licenses. This allows business owners to apply online and in multiple languages, further lowering barriers to entry. As of September 2016, six cities had already launched their own innovative SIAD solutions.⁴⁸ Local leaders need to be cognizant that creating a startup culture is just the first step. Cities and regional partners should come together to create

an environment rich with an educated and flexible labor force, low tax and regulatory barriers, and the regional network and access to capital that will allow high-growth startups to quickly scale up.

Cities will need to ensure that their business development programs consider equity.

Equity is an important dimension to consider when building a strategy for economic growth. In an IMF report out of their Fiscal Affairs Department, researchers highlighted ways in which broad-based equity further fuels growth.⁴⁹ Besides the moral argument for broad and inclusive equity, policies that promote equity such as health and education often have positive effects on economic growth as well. In addition, policies that address marginalized groups reduce political conflict and strengthen public institutions and social organizations, feeding into a virtuous cycle of growth. Many mayors have announced programs to support minority- and women-owned businesses within their localities. Targeted investments in low-income neighborhoods often bring higher growth rates along with broader equity.

Infrastructure and Built Environment

Infrastructure investment will be critical to supporting the workforce of tomorrow.

Much of the infrastructure necessary to support work both now and moving forward is technology oriented. As businesses grow increasingly dependent on computers and automated systems, reliable, investment in high-speed broadband internet will prove critical to supporting a competitive 21st-century workforce. Currently, more than 62% of Americans depend on internet access

for their day-to-day jobs, and jobs that require broadband are projected to increase 25% by 2018.⁵⁰ In addition to being central to attracting and supporting new types of businesses and jobs, internet access is increasingly necessary for entrance into the workforce at all levels. Today, even companies such as Subway and Target require individuals to submit applications online for employment opportunities.⁵¹ In addition to supporting jobs, broadband investment creates new ones as well, as a \$5 billion investment in broadband has been shown to create 250,000 jobs.⁵² Reliable gigabit speed (or higher) fiber networks are critical to supporting traditional large- and small- businesses as well as micro-enterprises that conduct business from homes or other non-traditional locations. Given the significant reliance of our economic engine on broadband, more cities should invest in 5G networks and gigabit speed internet.

Roads, bridges, and transit systems will need to be retooled and expanded. Hard infrastructure such as roads, bridges and transit systems will also need retooling to accommodate 21st century work and the associated changes in commuting habits. With more people working remotely and growing preferences for the flexibility of contract work, there will be a decline in traditional 9-5 jobs in which workers commute to a central location, work for several hours, and commute home. Commuting patterns and preferences will also be altered significantly by younger generations' preference for urban living. Commuter preference for walking, biking, and using public transit might surpass single occupancy vehicle use. This means that cities will need to rethink their infrastructure investment priorities and consider new development uses for car-oriented infrastructure like parking garages.

There will be less need to invest in physical office space. White-collar workforce trends toward office-sharing and telecommuting suggest that by 2025, fewer companies will feel the need to invest as much in physical office spaces. The move toward “creative class work” and 1099 labor increases the need for shared and temporary space. With less need for or inclination toward permanent office buildings and heightened interest in living in downtown corridors this might encourage organizations to commit to establishing teleworking policies that enable employees to work from anywhere. Investment in physical office space will be geared more toward co-working spaces, allowing workers access to physical workspace if needed. As the relationship between work and home becomes more fluid, there will likely be some sectors of the workforce that embrace new models such as co-working and living spaces.

Building a New Safety Net

The need to reduce poverty, provide a strong social underpinning, and support education is critical. In any economic period, government supported poverty reduction and/or eradication is a broad scale societal challenge. State and federal institutions and governments typically provide and/or subsidize services such as welfare, unemployment benefits, state sponsored healthcare, homeless shelters, and soup kitchens that help individuals and unprotected classes from falling below the poverty line. However, these programs often sit at the center of political disputes focused on resource allocation, the appropriate role of government, or sustainable government spending. City officials are put in the complicated position of fighting for the well-

Seattle: A Frontier of Cooperation

Settled in 1852 as a logging town, Seattle quickly became the largest city in the Pacific Northwest and the gateway to Alaska and the Yukon Territory during the Klondike gold rush of the 1890s. The Great Seattle Fire of 1889 destroyed the central business district and led to the founding of Washington Mutual in its wake. In 1907, Seattle's James Casey founded the American Messenger Company (later UPS). Boeing incorporated in Seattle in 1916 due to the local supply of wood for its airplanes. In the Second World War Boeing built a large number of the B-17 and B-29 bombers, ranking twelfth in value of wartime production contracts and establishing Seattle as a center for aircraft manufacturing.

In 1979, Microsoft moved from Albuquerque to nearby Bellevue, while Amazon was founded in Seattle in 1994. Starbucks and Tully's both call the coastal city home, as does the third largest port in North America.⁵³ The city's vibrant economy has made it into one of the fastest growing cities in America, with 50,000 new residents added in the 1990s. Its population has increased by 12.5% cumulatively since 2010. This new population tends to be highly educated, attracted by high-skilled jobs offered by Boeing, Microsoft, Amazon, and others. Seattle is America's most educated city, with over 93% of its population having finished high school and nearly 58% of its residents having attained a bachelor's degree or higher.⁵⁴

The city's rapid growth has created challenges as well. In 2015, chief executives from over a dozen of the area's largest companies, including Microsoft, Amazon, and Boeing formed a coalition called Challenge Seattle, led by the former Washington

governor Chris Gregoire.⁵⁵ Challenge Seattle has set the goal of creating 80,000 jobs over the next five years by attracting international firms to the region while increasing the number of low-income high school students who attend college by 50%. Microsoft also provided \$40 million in funding towards a partnership between the University of Washington and Tsinghua University to create the Global Innovation Exchange, a degree-granting partnership with a global focus that brings together students, academics, and professionals over a project-based curriculum.⁵⁶ Challenge Seattle announced its first priority is improving the city's transportation infrastructure; the city is investing nearly \$1 billion over the next decade to improve its existing infrastructure and expanding its light rail system. Challenge Seattle announced its own initiative that would turn I-5 into a smart corridor, place residents at the center of transportation planning, create a sustainable funding model, and better coordinate operations and planning. The coalition also announced a new Mobility Innovation Center in partnership with the University of Washington aimed at developing innovative solutions for the region's transit infrastructure. The ultimate goal: having no more than 35% of the coalition's employees commuting via single-occupancy vehicles by 2035.⁵⁷ Recognizing that city challenges are shared challenges, Seattle's largest companies have demonstrated that creative partnerships—in this case between the private sector, civic leadership, and the University of Washington—can bring prosperity to an entire region.

being of all citizens, sometimes against the background of changing economic conditions and shifting politics.

Historically there has been a relationship between levels of education and participation in the workforce. Per 2015 data from the Bureau of Labor Statistics, the labor force participation rate for those with less than a high school diploma is 44.4% (unemployment rate of 8.5%); for those with just a high school diploma 57.3% (unemployment rate of 5.7%); for those with some college or associate degree 67.2% (unemployment rate of 4.4%); and for those with a bachelor's degree and higher is 75.1% (unemployment rate of 2.7%). However, there are many additional factors that influence who participates

in the labor force, how successful certain populations are, and how many people get left behind—especially in times of significant economic change. Cities must make several considerations as they evaluate and prepare a safety net to accommodate the workforce of the future.

There will be a need to accommodate past-prime and technologically displaced workers. As people live longer and are less-adequately prepared for retirement, many older individuals will experience technological displacement and struggle to become re-employed. This population will include those whose jobs are replaced by technological advancements (i.e. robots) and those who no longer have the technological skills and

New Workspace Models

Most people are probably familiar with co-working hubs, in which open concept office spaces accommodate location-independent individuals from different companies, ventures, and lines of work. Today, these types of communal office hubs exist in cities of all sizes across the country. In taking communal space a step further, a new company called Roam has established a new network of co-working and living spaces. These serve members of the workforce who are location-independent in terms of both their work and their domestic lives. The model aims to sustain a feeling of adventure and, more

importantly, community even as people come and go. Every room has a bed and a private bathroom. Communal spaces include work spaces, kitchens, and gathering spaces. Roam accommodates both short- and long-term leases (everything from a week to several months to a year) so that users can stay for a term that works best for them. And of course the facilities have reliable internet access so that adventure and work are not mutually exclusive. To date, Roam has locations in Miami, FL, Bali, and Madrid, and facilities planned for Tokyo, London, and San Francisco.

capacity to compete in the job market. Cities can counter the negative impacts of this in several ways. One way to ensure people have enough savings as they near retirement is to institute a framework for mandatory 401ks, which require individuals to withdraw some amount of money from each paycheck for retirement savings. Cities can also institute training programs for technologically displaced individuals and older workers that enable them to develop competitive new skills.

Cities can amend policies for individuals with criminal records to make it easier for them to participate in the workforce.

Reducing employment barriers for those with criminal records will allow greater opportunity for former prisoners to reintegrate into society, as well as more opportunities to engage new people in the labor force. Ban-the-box is a nationwide campaign encouraging employers to eliminate the requirement that those with criminal records disclose them when applying for jobs.⁵⁸ As corrections institutions shift their programs from punitive to rehabilitative, a reassessment of workplace policies that keep individuals with non-violent criminal records from actively participating in the workforce will be necessary. An estimated 1 in 3 American adults has some type of criminal record, and communities of color are disproportionately impacted by the country's racially-biased mass incarceration system. To date, more than 100 cities have taken measures to eliminate employment barriers for otherwise qualified individuals who have records.⁵⁹ City leaders are in a position to ensure that all of their constituents, regardless of their past indiscretions, have the opportunity to rehabilitate and contribute meaningfully to society through work.

Families need access to affordable childcare services and paid leave.

As more women join the American workforce, local governments should press themselves to reconsider policy related to childcare and paid parental leave. Currently, women make up around 47% of the U.S. workforce and the majority (51%) of workers in professional and technical occupations.⁶⁰ However, the United States is among the only developed countries in the world that fails to offer some type of guaranteed paid leave for new parents.⁶¹ Paid leave for new parents imparts myriad public health and societal benefits, and companies that offer it experience the business-side advantage of retaining more employees after they choose to start families. Since there is little substantive movement on this issue at the federal level, many of America's cities are moving to right this monumental wrong. The San Francisco Board of Supervisors recently moved to mandate six weeks of paid parental leave for workers.⁶² This long overdue policy benefits everyone—it gives parents the opportunity to maintain their careers while starting a family, it helps organizations retain employees who might otherwise opt out for financial reasons, and it brings stability to the city's workforce and economy.

Childcare, a sizable, expenditure for most 21st-century families with working parents, has come to represent a stressor for many participants in the workforce. In some cases, the significant cost of childcare drives parents out of the workforce, especially when the monthly cost is comparable to their take-home pay. Childcare subsidies can represent a critical component of the social safety net, in that they help those individuals who receive assistance transition from public assistance programs to full-time, stable employment

“PEOPLE ACTUALLY LIKE TO LIVE THEIR LIVES IN A WAY IN WHICH THEY CAN PLAN TO WORK IN DIFFERENT WAYS AND DIFFERENT AMOUNT OF TIMES DURING THEIR LIVES. WHEN PEOPLE HAVE KIDS THEY WANT TO WORK LESS, WHEN THEY HAVE OLDER PARENTS THEY WANT TO WORK LESS, AND WHEN THEY RETIRE THEY DON’T WANT TO STOP WORKING ENTIRELY. WE CAN PLAN FOR THIS IN A WAY THAT LETS US PUT TOGETHER OUR LIVES IN WAYS THAT WE WANT TO.”

**//SARA HOROWITZ, EXECUTIVE DIRECTOR,
FREELANCER’S UNION**

situations. To offset that challenge, cities can offer childcare subsidies and work with community, home, center and school-based pre-k providers to increase the number of affordable seats available for children.

Cities can re-evaluate minimum wage increases. There are several income-focused policies that cities can tackle to address inequities in the new economy. Some cities, such as Washington, DC, Seattle, WA, and Clarkston, GA, have already instituted minimum wage hikes that move to \$15 dollars per hour. The state of California recently passed a law requiring all businesses with 26 employees or more to increase their minimum wages to \$15 dollars per hour by 2022.⁶³ By leveling the playing field for workers, cities hope to ensure that all workers—regardless of livelihood—make a living wage. Large cities

also sometimes opt to increase the minimum wage in an acknowledgement of the high cost of living in major metropolitan areas, where there is also a significant dependence on service sector and low-wage workforces. The impacts of these sorts of policy moves are vast and uneven, but in many cases an increased minimum wage has the potential to hamper the 21st century economy’s ever-expanding wage disparity.

Cities can consider offering portable benefit systems. As workers change jobs more and more frequently, on-demand and contract work becomes more common. As the benefits that once accompanied most employment situations become more and more elusive, thought leaders and experts suggest portable benefits, where job benefits are tied to individuals rather than employers. These

typically include paid leave, health insurance, worker's compensation/unemployment, and some sort of retirement fund matching.⁶⁴ Proposals for this type of system vary. Some have suggested that it should be universal and administered by the government or a public/private institution created for such a purpose.⁶⁵ Others suggest that it should be administered by non-governmental community-based groups.⁶⁶ Either way portable benefits have the potential to support those who work outside the realm of the traditional 9-5 economy.

Cities can explore basic income and other more broad based social support systems.

Another policy proposal gaining support in policy conversations in the United States and globally is basic income. These policy prescriptions have been examined throughout time by both conservative and liberal thinkers. Proposed basic income programs are similar to U.S. social security and welfare systems, with the major exception that the benefit goes to everyone, regardless of age, ability, class status, or participation in the workforce. A basic income guarantees every citizen in a jurisdiction a regular, unconditional sum of money, and is meant to serve the same function as a living wage, by bringing all individuals up to an economic baseline. Proposals for basic income in capitalist economies often suggest taxation might be the medium by which this sort of system could be funded.⁶⁷

Advocates of basic income systems come from various ideological camps, but generally fall into one of several categories. Some individuals from the tech world tout basic income as a way to counteract the economic blow of automation replacing jobs currently occupied

by humans. Other supporters argue that basic income is more streamlined, efficient, and transparent than currently administered social welfare systems. Finally, there are some individuals who endorse the idea of less work overall, arguing that a basic income might free up the time individuals spend working and allow them pursue other, more creative, and enjoyable pursuits.⁶⁸ Many critiques of basic income systems center on how it will be sustainably funded or the cultural implications of instituting such a system.



CONCLUSION

We are clearly entering into a period of great challenges, but also great opportunities.

It is up to us collectively to define our future. Historically, America has risen to challenges and grown stronger as a result. Now is such a time.

There are fundamental shifts happening in society. The nature of work and the allocation of resources has changed—these changes are incredibly impactful for all of us. Fears around technological changes in the workforce wiping out jobs are not new: from the Luddites onward people have been talking about technology taking away jobs. Despite the evolving nature of the economy, we are still working, the economy is growing, and indicators show that life has gotten better for the majority of the world's workers.

While the benefits of the new economy may largely accrue in cities, they will also likely be the epicenters of potential tensions and upheavals associated with automation. Drastic and rapid change makes it easy to focus on what has and will be lost, but comparisons to the past do not have to dominate our narrative of tomorrow. We must move the policy discussion away from job retraining towards job rethinking.

Even though great swaths of the workforce could be automated, it does not follow that we, as a society, will always want to take that path. Ultimately the cultural shift—rather than the technological shift—will be the larger impactor. How we collectively handle these changes will make a big difference in whether we reach the future in a positive, rather than a potentially fractious way.

Forecasting based on current trends can show us a great deal, but unexpected and impactful exogenous shocks surprise us all the time. We all need to be more flexible to prepare for what may come—we can't predict the future, but surely we can prepare for the future of work and the outsized impact it will have on our cities. It is a safe assumption that what we imagine as the future today might not come to pass—there are a wide range of potential career paths that are not even on our radar screens yet.

There is no doubt, however, that action will be needed by leaders at all levels of government to ensure that all workers have an opportunity to benefit from impending changes. We need to rethink how we approach work across the economic spectrum—from service industry to professional jobs, white collar and blue collar—and also how to impart new skills and education to everyone.

These ideas should be higher on the agenda of policy makers as they think about the effects these future shifts will have on all of us. Automation and artificial intelligence will have great impact on the future of work, play, and life. However, we shouldn't jump to the assumption that this will be a net negative. We need to circle back and focus on what has always been unique about humans: creativity. It is high time to see ingenuity, craftsmanship, and connectivity as the critical differentiators, and move toward a place where we embrace and usher forward a positive future of work for all.

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A blue-toned historical map of North America, showing various geographical features, rivers, and cities. The map is overlaid with a large white logo for the National League of Cities. The logo consists of the letters 'NLC' in a large, bold, sans-serif font, followed by the text 'NATIONAL LEAGUE OF CITIES' in a smaller, all-caps, sans-serif font. The map background shows the continent of North America, including the United States, Canada, and parts of Mexico. Key geographical features like the Rocky Mountains, Appalachian Mountains, and the Gulf of Mexico are visible. Major cities such as New York, Washington, and Philadelphia are labeled. The map also shows the Arctic Circle and the Tropic of Capricorn.

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