Rise with the STARs

Building a Stronger Labor Market for STARs, Communities, and Employers

STARs
SKILLED THROUGH ALTERNATIVE ROUTES

Opportunity @Work

Foreword

In the past decades, rising career barriers for the 60% of American workers who do not have a bachelor's degree played a large role in downward mobility for half of the U.S. workforce.

Opportunity@Work's mission is to unlock economic opportunity for the 70+ million U.S. workers who are Skilled Through Alternative Routes (STARs), like community college, military service, training programs, skills bootcamps, and learning on the job—rather than a bachelor's degree.

Despite STARs demonstrating skills for higher-wage work, employers have carelessly screened out candidates who don't have bachelor's degrees in the pursuit of hiring efficiency. It is now clear that such self-harming, exclusionary hiring practices were built on two falsehoods: that low wage equals low skill, and that bachelor's degrees are the only gateway to job-relevant skills.

In *Reach for the STARs*, Opportunity@Work analyzed the skills proximities of every job role to every other, finding that millions of STARs have demonstrated skills for roles with at least 50% higher salaries than their current jobs. In *Navigating with the STARs*, we leveraged a dataset of 130 million job transitions over a decade to uncover the career pathways by which STARs increase their wages. The report highlighted 292 middle- and high-wage "Destination" jobs where STARs thrive, and a subset of 51 "Gateway" roles which have enabled millions of STARs to advance from low-wage "Origin" jobs to Destination jobs.

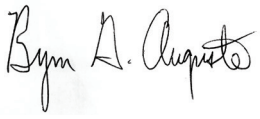
"Companies have overlooked so much skilled talent and built pointless barriers while opportunity gaps have widened to chasms."

This report, *Rise with the STARs*, shares new findings for managers, companies, industries, and regions to use as a foundation for action and a framework to unlock the skills of STARs within their hiring systems, talent pipelines, workforce strategies, and the workplace itself. This research reveals the impact of degree discrimination and STARs displacement in the last two decades. It also offers new tools to unblock clogged systems of opportunity and to unlock STARs talent—such as "30 Jobs to Turn the Tide" and the "STAR Mobility Index."

Facts inform, tools equip, stories inspire. *Rise with the STARs* includes profiles of STARs who leveraged their skills in the face of significant barriers to travel career pathways: from sales associate to merchandiser, construction worker to client services manager, office receptionist to billing coordinator, and child care provider to quality assurance engineer. Employers are missing out on millions more STARs with the skills, passion, and ingenuity of Robert, Courtney, Sharon, and Debrena.

Companies have overlooked so much skilled talent and built pointless barriers while opportunity gaps have widened to chasms. These trends are not forces of nature beyond our control. They are the sum of institutional and individual choices, choosing convenient shortcuts over consideration of skills. It's been a lose-lose bargain and today's labor shortage is the payback.

When smart managers, companies, and regions recognize and invest in STARs talent, they can outcompete those bogged down by bias. We can build a more resilient, adaptive, diverse, and skilled talent base: together, on purpose.



Byron Auguste

CEO and Co-Founder, Opportunity@Work

Executive Summary

Workers who are Skilled Through Alternative Routes (STARs) rather than a bachelor's degree face a stark opportunity gap in our labor market: it takes them more than 30 years of work experience to earn what a college graduate earns at the beginning of their career.

This study of STARs' experience in the labor market nationally, regionally, and in the workplace paints a picture of a labor market that excludes STARs from the jobs that offer them the most opportunity. This harms employers as well as workers. When STARs are denied these jobs, they lose the opportunity to build new skill sets and transition to the next higher-wage job. When employers overlook STARs, they miss a chance to expand and strengthen their talent pool. They also disproportionately exclude Black, Hispanic, veteran, and rural workers. Our findings underscore the critical role employers play in reestablishing opportunities for STARs and renewing talent pipelines.

National Perspective

STARs have lost access to jobs that provide upward mobility; 30 jobs can help reopen promising pathways.

Gateway and Destination jobs open pathways to upward mobility for STARs, but since 2000, STARs' share of employment in these vital jobs fell from 54% to 46%. As the labor market added 17.2 million new Gateway and Destination jobs, STARs claimed only 1.8 million of those positions, resulting in STARs' displacement from 7.4 million middle- and high-wage jobs.

Employers can broaden their talent pipelines and put more STARs on pathways to mobility, starting with 30 key occupations. 30 occupations account for nearly half of STARs' displacement. STARs currently fill over 20% of the jobs in these occupations, suggesting their exclusion is not due to a lack of skills. A change in hiring practices could reverse the downward trend.

Regional Perspective

There is important regional variation in STARs' mobility; Denver, Rochester, and Virginia Beach stand out.

Our regional analysis shows that opportunity for STARs is not a simple function of Gross Domestic Product (GDP) growth or demographics. The three regions that measure the highest by our STARs Mobility Index—Denver, CO; Rochester, NY; and Virginia Beach, VA—vary significantly in economic growth and demographics. Instead, we see patterns in workforce investment and collaboration that point to areas for further inquiry.

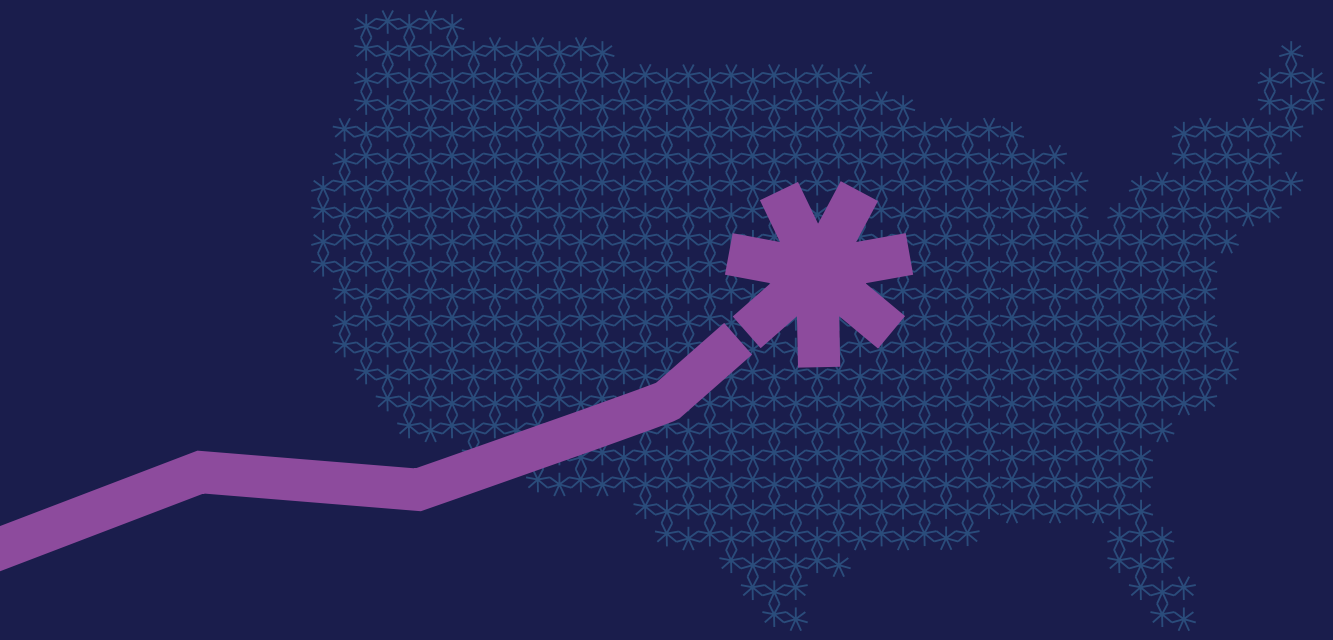
Employers can create reliable talent sources by collaborating with local partners. Intentional workforce planning across employers, educators, and nonprofits, supported by effective public policy, can strengthen the talent ecosystem.

Workplace Perspective

Workplace attitudes undermine STARs; effective diversity efforts include them.

An original survey shows managers with degrees overestimate the proportion of the workforce who hold degrees, and those misperceptions impact their hiring preferences. Given STAR demographics, such misperceptions negatively impact Black, Hispanic, and rural workers. Further, STARs describe different experiences from their degreed colleagues in pay equity, connection, and professional development.

Employers can improve their talent outcomes by establishing a workplace culture that values STARs. Given the demographic diversity of STARs, such efforts will strengthen company diversity, equity, inclusion, and belonging initiatives.



Introduction:
Employers hold the keys to reversing a 30-year opportunity gap

Workers Skilled Through Alternative Routes (STARs) rather than a bachelor's degree constitute more than half the active labor force and the overwhelming majority of the Black, Hispanic, rural, and veteran workforce.[1] STARs have skills for higher-wage work but, over the past 20 years, their access to middle- and high-wage jobs declined significantly. The exclusion of STARs from pathways to higher-wage work is detrimental to both workers and employers. STARs are denied the opportunity to develop their full potential and thrive in the labor market, while employers miss out on significant skilled talent.

Introduction

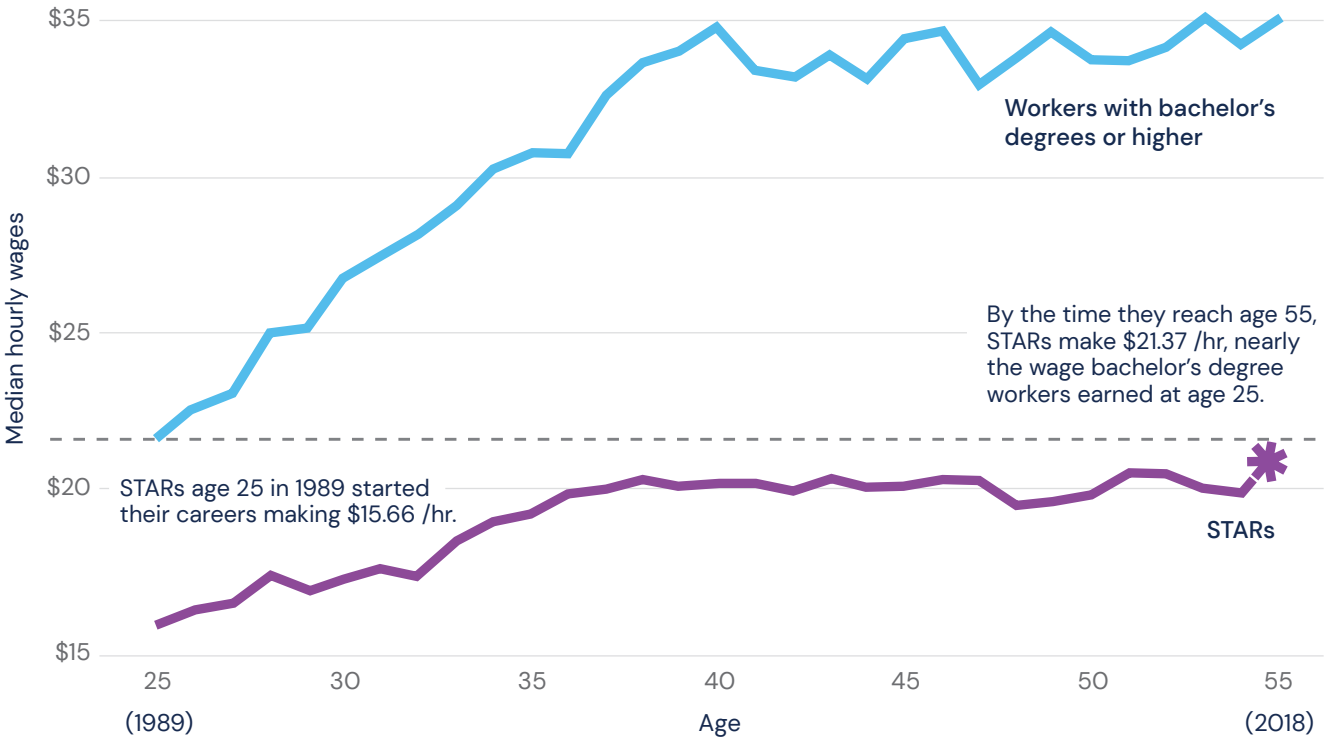
A generation of STARs has seen limited upward mobility

In this report, we illustrate the dire impact of this unnecessary contraction in the talent pool and outline actions employers can take nationally, regionally, and on their own teams to surface STAR talent for critical roles at their organizations, to make strategic investments in regional employment ecosystems that will promote stronger talent pipelines, and to begin shifting the mindsets of managers at their own firms. These actions are critical contributions for employers toward an outcome we all seek: a more robust and sustained pipeline of skilled talent in our workforce, as well as an equitable workforce ecosystem that supports American businesses while improving economic mobility opportunities for STARs.[2]

Our analysis of wages over time shows that **it takes a STAR 30 years to reach the starting wages of a recent college graduate**. In other words, our labor market equates four years of learning in college with three decades of work experience.[3] While a bachelor's degree has always been a critical pathway to higher wages in the U.S. labor market, this gap belies our common belief that learning can translate to earnings. The result is an entire generation of workers who have worked since 1989 with no appreciable upward mobility.

FIGURE 1: IT TAKES A STAR 30 YEARS TO REACH THE STARTING WAGE OF A COLLEGE GRADUATE

Progressive career wages from age 25 to 55



Note: Median hourly wages in 2019 dollars for workers aged 25 to 29 in 1989. Dotted line indicates median hourly wages for workers with a bachelor's degree at age 25 ($21.59).

Source: Adapted from Blair, Debroy, and Heck (2021). Data are from the 1989 to 2019 Current Population Survey, Annual Social and Economic Supplement, Integrated Public Use Microdata Series.

This stagnation for more than half the workforce is driving economic inequality and fueling worker frustration. It is also eroding the talent available to our growing economy — when STARs are denied access to jobs, they are denied the opportunity to develop new skills, squandering human capital in an economy that is desperate for skilled workers.

Employers are feeling the impact of these exclusionary trends. A *Fortune* magazine survey conducted in the fall of 2021 found that 73% of CEOs said a labor or skills shortage is the most likely external issue to disrupt their business in the next 12 months, while over 50% of CEOs named attracting, recruiting, and retaining talent among their organization's biggest challenges.[4] However, their own business talent practices are to a considerable extent responsible: between 2006 and 2017, 74% of all job postings were jobs where employers typically require a college degree, leaving just 26% of jobs open for the 60% of the workforce without a college degree.[5]

STAR Story: Courtney / Role: Client Services Manager

Constructing His Own Path

Courtney grew up in a family of hard workers who pushed him and his sister to seek out opportunities. He initially set out to pursue a career in mechanical engineering. While still in college, he interviewed for a job as a CAD designer at an architectural firm, and because he had a background in construction and experience managing people, the firm hired Courtney as a project manager instead. "My plan was to be a CAD designer because I had the skills and knew the craft, and then just finish up my degree part-time. Well, they ended up hiring me to be a project manager, because on the side, I was doing a lot of construction work and I had people working for me. I didn't know what a project manager was, but I was basically doing project management work." Courtney thought this job would launch his career but the 2008 housing crash hit the industry and he was laid off. He continued to work in construction through his own construction company and then moved to California, where he made a career shift into IT.

Courtney went through a formal training program with the San Diego Workforce Partnership to build his IT skills and leveraged his strong project management skills to transition to a new field. As a client services manager, he is responsible for project planning, troubleshooting, writing API scripts, and producing highly technical project implementation guides. This is work that requires both technical and soft skills, like organization, communication, relationship building, and conscientiousness. "I was fortunate because I had that strong project management background. And I was able to demonstrate, through my work, a lot of soft skills that were highly desirable, especially dealing with customers, being able to translate technical information into layman's terminology, a natural curiosity — things of that nature that are desirable, regardless of industry." In the future, Courtney plans to get a project management certificate and continue to grow his technical skill set.

National Perspective: Employers can strengthen talent pipelines with a focus on 30 occupations

Many factors contribute to our changing labor market. Globalization, automation, and outsourcing, among other practices, transformed the way we organize work and deploy talent.[6] Combined, these trends impacted our workforce in a number of ways. Most critically for STARs, this confluence of shifts led to one important fact: STARs were displaced from almost 7.5 million middle- and high-wage jobs that traditionally provided a path to a middle-class life. This is a bad development for STARs who seek mobility, but it is also bad news for employers as they seek to build a sustainable workforce to meet the rapidly changing business landscape. When STARs are excluded from these jobs, they are denied the opportunity to build the skills necessary for the next higher-paying job. That unrealized potential is also a loss to employers who, to continue to meet their business objectives, need a skilled workforce capable of performing well in middle- and high-wage jobs.

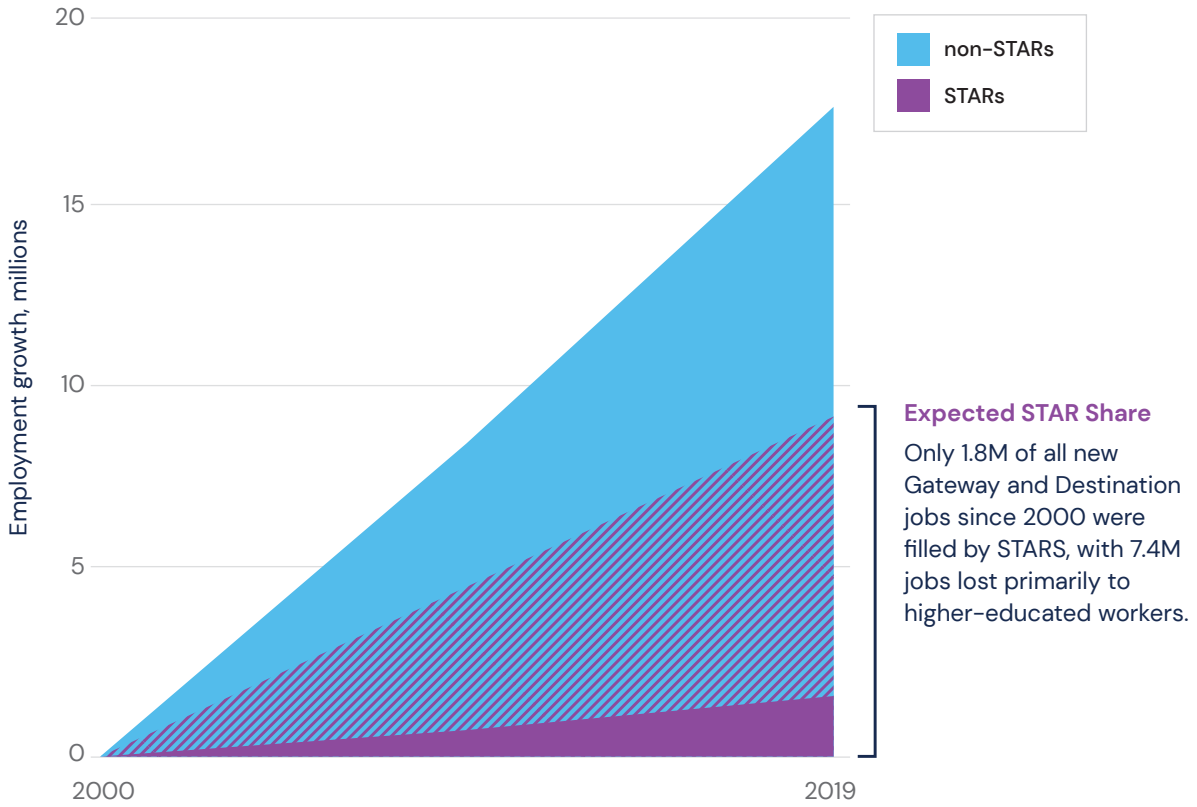
STARs lost access to almost 7.5 million jobs that open pathways to mobility

Our analysis of 130 million job transitions in the labor market between 2010 and 2019 identified 292 Destination jobs where STARs have translated skills they learned from a lower-wage job to achieve higher wages. Among those jobs, 51 Gateway jobs are especially powerful engines of mobility as they are accessible from commonly held lower-wage jobs, pay above median wage, and provide a stepping stone to even higher-paying jobs. Together, these Gateway and Destination jobs create promising pathways that serve as a blueprint for STAR mobility and employer talent pipelines.[7]

Unfortunately, STARs are not traversing these promising pathways in numbers that sustain their mobility or meet employers' increasing hiring needs. In fact, STAR representation in Gateway and Destination jobs declined precipitously over the past two decades. While STARs held 54% of Gateway and Destination jobs in 2000, they held only 46% of these occupations in 2020.

These shifts represent a steep drop in opportunity for STARs: since 2000, the U.S. labor market added 17.2 million Gateway and Destination jobs, but only 1.8 million (or 10%) of the workers who filled these 17.2 million additional jobs are STARs. Had employers filled these jobs with STARs in the same proportions as STARs' employment in 2019, there would be 7.4 million more STARs in Gateway and Destination jobs today.[8]

FIGURE 2: STARS WERE DISPLACED FROM 7.4 MILLION DESTINATION JOBS SINCE 2000



Note: Expected STAR employment change assumes that change in employment from 2000 to 2019 would have been equally distributed across STAR and non-STAR workers based on the proportion of workers within each job in 2019, respectively. See Data and Methods section for detailed methodology on displaced STARs.

Source: Opportunity@Work analysis of the 2019 1-year American Community Survey and 2000 Decennial Census, Integrated Public Use Microdata Series.

30 occupations account for close to half the displacement

Of the 292 Gateway and Destination occupations, a distinct subset accounts for a sizable portion of the displacements; specifically, 30 occupations are responsible for 3.1 million (or 41%) of the 7.4 million jobs lost. Each of these occupations employs more than 200,000 workers nationally, with the median occupation employing almost 1 million workers. The displacement of STARs from these large occupations represents a significant cumulative loss of opportunity. We focus our analysis on these occupations because they also offer the greatest opportunity for restoring jobs to STARs in companies of all sizes.[9]

Among these 30 occupations, some are growing at a faster pace than the labor market, some others are keeping pace with the growth of the labor market, and still others are declining in number. **Figure 3** shows these 30 occupations and their observed employment growth over the period from 2000 to 2019.

For growing occupations, employers hired STARs in declining numbers, leading STARs to make up a smaller proportion of workers in these growing jobs. For example, among registered nurses, growth in STAR employment in 2019 was 89% lower than expected, with the proportion of nursing jobs filled by STARs declining from 48% in 2000 to 32% in 2019, a loss of 509,000 well-paying jobs for STARs as hospitals struggle to fill positions.[10] STARs working as first-line supervisors of sales workers came closest to maintaining their share of new Gateway jobs, but still ceded 27,000 new jobs to primarily higher-educated workers.

For declining occupations, STAR losses exceeded expected employment declines, showing that not only is the "pie" getting smaller, but so is STARs' share, further eroding previously established pathways to mobility through common Gateway jobs such as secretaries, office supervisors, and accounting clerks.

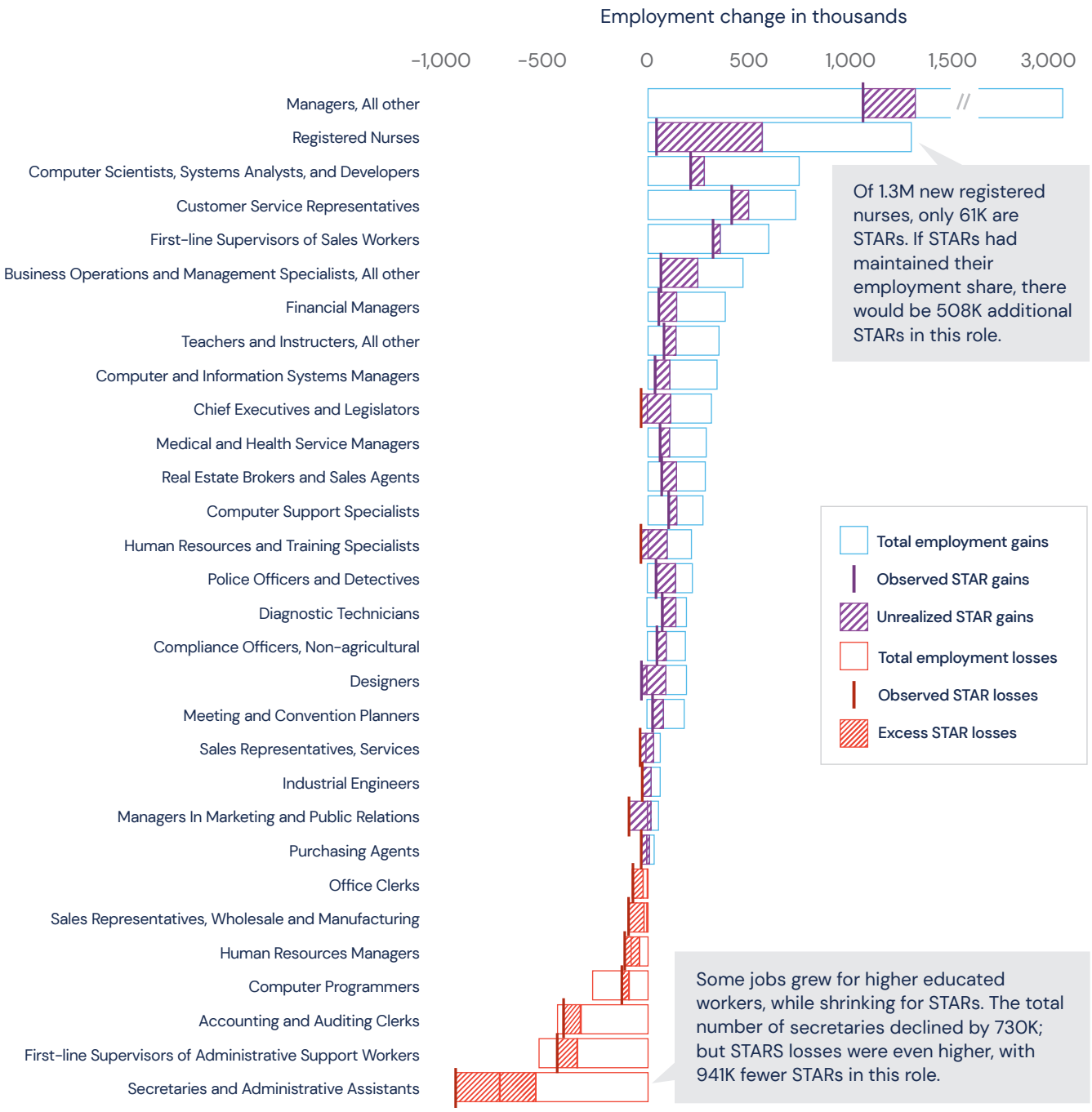
Who are STARs?

STARs are workers who are Skilled Through Alternative Routes. STARs are aged 25 or older, active in the labor force, have a high school diploma or equivalent, and have developed their skills through alternative routes such as community college, apprenticeships, bootcamps, and most commonly, on-the-job.

Learn more in our two other reports: *Reach for the STARs* and *Navigating with the STARs*.

FIGURE 3: STARS MISS OUT ON JOB GAINS AND BEAR WEIGHT OF JOB LOSSES

Expected and observed STAR employment change since 2000 in 30 key mobility jobs



Note: Expected STAR employment assumes that change in employment since 2000 would have been equally distributed across STAR and non-STAR workers based on the proportion of STARs in the occupation in 2000. Our estimates account for the decline in the proportion of STARs in the overall workforce over this period. See Data and Methods section for detailed methodology on displaced STARs.

Source: Opportunity@Work analysis of 2019 1-year American Community Survey and 2000 Decennial Census, Integrated Public Use Microdata Series.

Employers can reopen promising pathways for millions of STARs by hiring and promoting into these key jobs

The displacement of STARs from these jobs over the past 20 years does not mean STARs cannot do these jobs. In fact, STARs currently make up at least 20% of the workers in each of the 30 occupations, proving they can gain the appropriate skill sets through alternative routes. Further, STARs are well represented in the low-wage Origin jobs where employers traditionally source for these roles, creating a rich pipeline of talent.

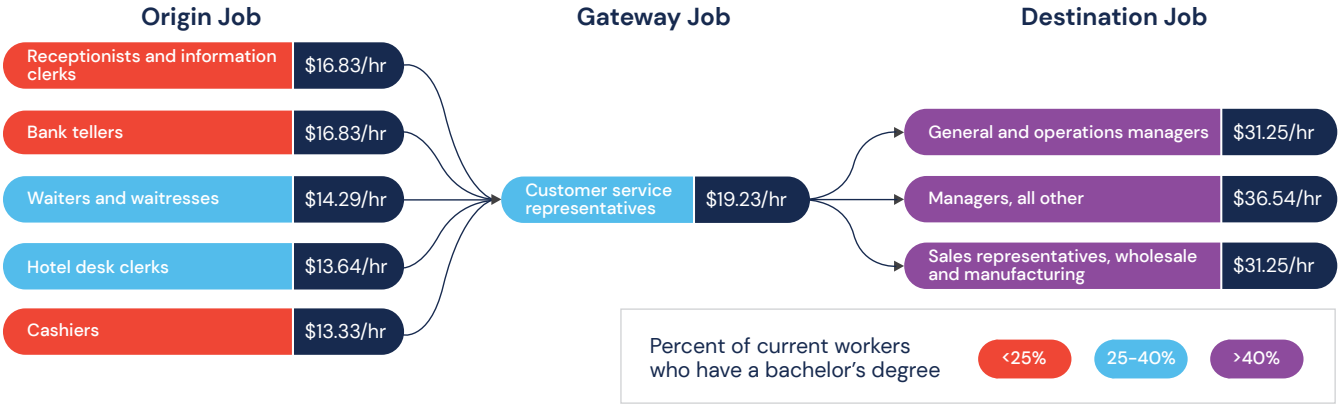
Table 1: 30 Jobs to Turn the Tide provides the full list of the jobs, their current STAR representation, and the percent of job postings requiring a degree. For example, consider compliance officers. Currently 26% of compliance officers are STARs. Common Origin jobs for this role include claims adjusters and office support workers, which employ an even greater number and proportion of STARs. And yet, in 2021, 87% of job postings for compliance officers required a degree, screening out STARs. This is just one example that represents an opportunity to reverse STAR displacement. For additional data on these jobs, their skills, and their common Origin jobs, see the Appendix.

Because the erosion of STARs' market share in these jobs occurred as STARs transitioned out of jobs and were replaced by workers with a bachelor's degree, reversing this trend will require active efforts to fill new open roles through sourcing, hiring, and developing STARs. Focusing efforts on these 30 occupations — in which STARs constitute at least 20% of workers today, and for which millions of other STARs also have skills — could improve opportunities for millions and refresh talent pipelines for employers.

STARs Navigate Promising Pathways

Visualizing STAR Mobility Pathways Across Origin, Gateway, and Destination Jobs

This Gateway job, a customer service representative, is accessible from these five common entry-level Origin jobs — among many others. This Gateway job positions workers for higher-wage work in three common Destination jobs — among many others. These depicted Destination jobs are currently held by workers with a bachelor's degree over 40% of the time.



Note: Wages calculated for workers aged 25 and older. See Data and Methods section for detailed methodology on Destination and Gateway jobs.

Source: Opportunity@Work analysis of the 2021 Current Population Survey, Annual Social and Economic Supplement, Integrated Public Use Microdata Series.

TABLE 1: 30 JOBS TO TURN THE TIDES

Data and analysis from Burning Glass Technologies shows that employers have decreased the number of degree requirements over the past few years.[1] However, job posting data in the table below shows there remain many roles where employers can improve access for STARs.

Occupation[2]	Number of Workers (1,000s)	Pct. STARs	Pct. of Job Openings Requiring a Bachelor Degree[3]
Industrial Engineers	198	20%	100%
Computer & Information Systems Managers	698	19%	94%
Business Operation & Mngmt. Specialists, All Other	790	26%	88%
Financial Managers	1,321	31%	88%
Comp. Scientists, Network Analysts & Web Developers	1,713	29%	88%
Managers in Marketing & Public Relations	1,234	26%	87%
Compliance Officers, Non-agricultural	276	26%	87%
Medical & Health Services Managers	759	26%	84%
Human Resources Managers	370	23%	84%
Chief Executives & Legislators	1,622	22%	82%
Computer Programmers	481	21%	76%
Managers, All Other	5,808	38%	75%
Purchasing Agents	184	45%	71%
Human Resources & Training Specialists	1,010	29%	68%
Teachers & Instructors, All Other	658	32%	67%
Meeting & Convention Planners	210	17%	59%
Sales Representatives, Wholesale & Manufacturing	1,136	49%	55%
First-Line Supervisors of Admin. Support Workers	1,250	59%	54%
Computer Support Specialists	539	45%	45%
Police Officers & Detectives	866	52%	44%
Registered Nurses	3,327	26%	40%
Accounting & Auditing Clerks	1,037	74%	37%
Sales Representatives, Services	498	40%	34%
Designers	819	33%	30%
Real Estate Brokers & Sales Agents	1,131	41%	29%
First-Line Supervisors of Sales Workers	4,138	60%	21%
Diagnostic Technicians	440	50%	20%
Secretaries & Administrative Assistants	2,206	62%	16%
Customer Service Representatives	1,961	62%	11%
Office Clerks	1,059	69%	10%

[1] Levanon, G., et al (2021).
[2] Occupational categories are based on the 2010 Integrated Public Use Microdata Series harmonized occupation coding scheme.
[3] Calculated as the proportion of national job postings from January 1, 2021 to November 31, 2021 with listed educational requirements where a bachelor's degree was the minimum requirement. Data from Burning Glass Technologies: Labor Insight. 2021.

"I want employers to know that I always get the job done. I strive for perfection and want people to be happy with my overall work."

STAR Story: Sharon

Administrative Skills Unlocked Higher Wages

Role: Billing Coordinator

Sharon grew up in what she defined as a "traditional" home. College was more encouraged for the men in her family, so Sharon did not get her bachelor's degree. Sharon went straight to work out of high school as a receptionist for a law firm. While her dream job was to be a court reporter, she worked a series of administrative jobs for law firms and accounting firms, picking up a few community college credits in business and a range of administrative and computer skills along the way. She eventually became a billing coordinator, a role that involves running, analyzing, and explaining financial reports for colleagues and clients.

Sharon has been a billing coordinator for 15 years. The organizational, analytical, and communication skills that she developed over her career serve her well. She has made multiple job transitions to higher-paying jobs and each of these jobs has given her more experience. Sharon believes this breadth of experience allowed her to get jobs that she might have been screened out of for lack of a degree. "Through the years, I've probably gotten some rejections where people said they wanted a bachelor's degree, but then I've also gone to places where they're perfectly fine with work experience."

Sharon has been strategic in her job choices. She observed differences in how workplaces treated their employees and navigated to jobs that met her preferences. She found that in small firms, she received more professional development support and a more welcoming workplace culture. Larger firms tended not to invest in her growth but offered higher pay and benefits. During the pandemic, when she realized she enjoyed the flexibility of a remote environment, she found a new job that allows her to work from home permanently. "I think my resume with the experience that I have helps me succeed."

Regional Perspective: Three metro areas demonstrate strategies to support STAR mobility

While STARs have seen their prospects narrowing nationally, a few metro areas show us that it is possible to swim against this tide. Opportunity@Work created the STAR Mobility Index to measure the economic opportunity available to STARs in a metro area.[11,12] There is significant regional variation in performance across the 50 largest metro regions in the country. The highest ranking communities — Denver, CO; Rochester, NY; and Virginia Beach, VA — demonstrate that there is no single factor or strategy to promote STAR mobility, but a qualitative study suggests that deliberate choices to invest collectively in a region can be beneficial to STARs.[13]

STARs experience different levels of mobility across regions

Opportunity@Work's **STAR Mobility Index** captures the variation in economic opportunity for STARs across the largest 50 metropolitan areas by comparing three key variables associated with their economic well-being.

Economic Mobility: This measure quantifies the extent that STARs have been able to transition into higher wage occupations over the past five years. An upwardly mobile job transition is identified when the wage in the worker's current job was at least 10% higher than the job held in the prior year. Nationally, 5% of STARs moved into higher wage occupations on average each year, ranging from a high of 10% in Rochester, NY, to a low of 2% in San Jose, CA.

Economic Equity: This measure captures the average wage penalty faced by STARs compared to workers with a bachelor's degree in the same occupations. Within each major metro area, we calculate the ratio of STAR median hourly wages to median wages for workers with at least a bachelor's degree in the same occupations. Occupation specific ratios are then weighted by the number of STARs working in each occupation. This ratio ranged from a high of 93% in Buffalo, NY, to a low of 84% in Austin, TX. In all metros, STARs earned less than their coworkers in the same occupations with a bachelor's degree.

Economic Security: As a measure of how accessible high-wage occupations are to STARs, we calculate the percentage of employed STARs within a metro area who work in occupations that pay above the median wage. The median hourly wage at the national level in 2019 was $21.63, corresponding to an annual salary for a full-time, year-round worker of $44,990. Nationally, 32% of STARs were in occupations that paid above the median wage in 2019, with this proportion ranging from 39% in Denver, CO, to 27% in Las Vegas, NV.

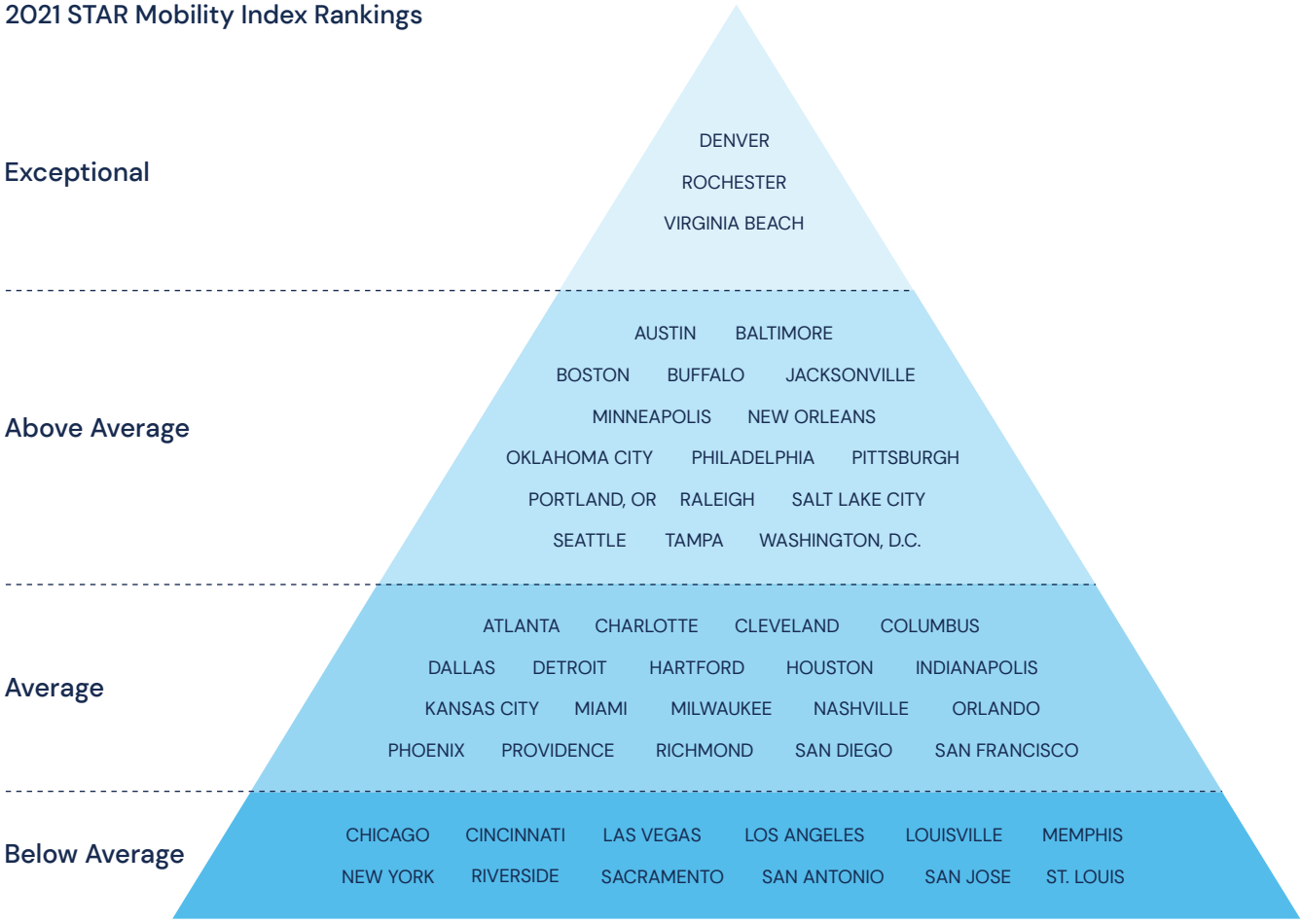
These three measures are equally weighted to create a relative composite measure we call the **STAR Mobility Index**. **Figure 4** illustrates the performance of the largest 50 metro areas across this measure and assigns cities to four groups based on their performance, with Denver, CO; Rochester, NY; and Virginia Beach, VA,[14] appearing at the top.

The top three metro areas have different strengths. Rochester, NY, is first among the 50 metro areas in *economic mobility* with 10% of all STARs making upwardly mobile transitions in an average year. For example, cashiers in Rochester, NY, are quite upwardly mobile with 55% transitioning annually into such higher paying roles as secretaries and personal care workers. Overall, a STAR in Rochester, NY, is 4.4 times more likely to experience upward mobility in a given year than a STAR in San Jose, CA. Denver, CO, measures highest in *economic security*, with 39% of STARs in high-paying occupations. Denver has a high concentration of high-wage occupations and STARs are 5% more likely than STARs in other cities to be in those high-wage occupations. Virginia Beach, VA, also scores relatively high across all three metrics for a strong composite score, but does particularly well in terms of *economic equity*. On average, STARs in Virginia Beach, VA, earn 90¢ on the dollar compared to their coworkers with a bachelor's degree, while the rate is 86¢ nationally. Additional detail on each metro area's measures is in the Appendix.

While the **STAR Mobility Index** does not capture the experience of all STARs in the U.S., the majority of STARs (53%) live in one of the 50 metro areas included in the measure. Even as STARs find exceptional mobility in these three metro areas, it is important to remember that they still lag their counterparts with a bachelor's degree. For example, in Denver, CO, STARs earn 12% less than their colleagues with a bachelor's degree and the majority of STARs work in lower-wage occupations.

FIGURE 4: DENVER, ROCHESTER, AND VIRGINIA BEACH OFFER EXCEPTIONAL MOBILITY FOR STARS

2021 STAR Mobility Index Rankings



Note: Sorted alphabetically within major category. City names refer to broader Metropolitan Statistical Areas. For example, Denver is referring to the entire Denver-Aurora-Lakewood, CO MSA. Some regions of focus may be colloquially referenced differently than labeled by their MSA (e.g. Virginia Beach MSA is frequently referred to as "Hampton Roads"). See Data and Methods section for detailed methodology of STAR Mobility Index.

Source: Opportunity@Work analysis of the 2019 1-year American Community Survey and 2017 to 2021 Current Population Survey, Annual Social and Economic Supplement, Integrated Public Use Microdata Series.

Regional economic growth does not explain STAR mobility

One might hypothesize that economic growth would fuel mobility for STARs as a rising tide should lift all boats. However, **Figure 5** shows that economic growth is not the driving factor for STAR mobility. All of the largest 50 metro areas saw increases in their inflation adjusted GDP over the period from 2015 to 2019, with some cities growing only slightly (Hartford, CT, at 2.5%) while others (San Jose, CA, at 28.4%) saw explosive growth. However, the highest ranking cities on the STAR Mobility Index (Denver, CO; Rochester, NY; Virginia Beach, VA) are not among the fastest growing economies and one of the fastest growing cities (San Jose, CA) is among the lowest performing for STARs.

Denver, CO, has seen higher than average economic growth with a diverse economy uniquely focused on industries in aerospace, oil and gas extraction,

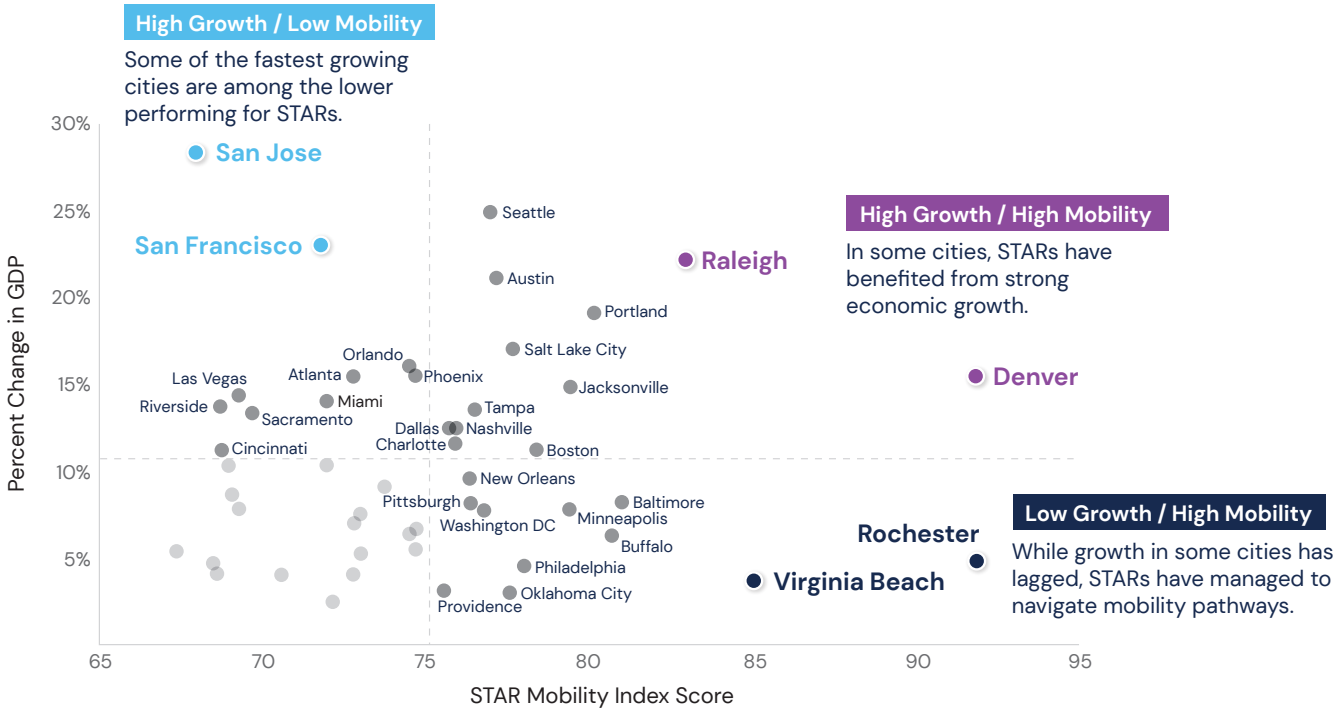
as well as data and telecommunications. Virginia Beach, VA, also provides exceptional STAR mobility while experiencing below average economic growth in a highly specialized economy built to support the military intelligence and manufacturing functions of the U.S. military.[15]

In terms of demographics, STARs make up 43% of workers in Denver, CO; 51% of workers in Rochester, NY; and 57% of all workers in Virginia Beach, VA, among the highest proportions among the top 50 major metro areas. Racially, the cities reflect different levels of diversity, 81% of workers in Rochester, NY, are non-Hispanic white, compared to only 56% of workers in Virginia Beach, VA. In Denver, CO, the largest minority group are Hispanics, who make up 20% of all workers, while in Virginia Beach, VA, Black workers make up 30% of the labor force, compared to 12% nationally.[16]

Further, STAR mobility varied significantly by population. When analyzing specific demographic groups — including women, Black, and Hispanic STARs, we found they had different experiences across metro areas that did not necessarily track with overall STAR mobility. For example, women STARs experience better mobility in Jacksonville, FL; Hispanic STARs find better opportunities in Baltimore, MD; and Black STARs fare better in Tampa, FL. We will expand on this preliminary analysis in future work.

FIGURE 5: ECONOMIC GROWTH IS NOT THE DRIVING FORCE BEHIND STAR MOBILITY

2021 STAR Mobility Index Score and 5-year GDP Growth by Metro



Note: City names refer to broader Metropolitan Statistical Areas. See Appendix for detailed methodology of STAR Mobility Index. Change in Gross Domestic Product (GDP) measured using constant dollars. Dotted lines indicate average change in GDP and Mobility Index Score for largest 50 metro areas. See Data and Methods section for detailed for detailed methodology of STAR Mobility Index.

Opportunity@Work analysis of the 2019 1-year American Community Survey; 2017 to 2021 Current Population Survey, Annual Social and Economic Supplement, Integrated Public Use Microdata Series; and Bureau of Economic Analysis 2015 to 2019 Regional Economic Accounts.

Local employers play a critical role in inclusive collective workforce efforts in Denver, CO

What drives the regional variability in STARs mobility? The answers are complex, but a look at the top performers provides some insight and areas for further inquiry and experimentation. Here, we share some observations about Denver, CO, gathered from a qualitative study and interviews with local workforce leaders in the fall of 2021. A story emerges that Denver, CO, developed robust, accessible talent pipelines through deliberate coordinated action across actors in the local workforce ecosystem, including employers (across multiple industries), policymakers (local and state government), educators (community colleges and talent developers), the social service network (nonprofit and public), and workers.

In Denver, CO, policymakers made sustained, significant, and deliberate investments in the workforce and in innovation. Through the Workforce Investment Act of 1998, the state of Colorado created the Colorado Workforce Development Council, an office responsible for the coordination of local actors and the deployment of strategies to create strong pipelines of talent and foster collaboration and innovation across the state. In Denver, CO, policymakers in the local ecosystem leveraged state resources to incentivize job creation and innovation amongst employers in the region. Additionally, Denver, CO, modeled the behavior they wanted to see from employers, deploying skills-based hiring practices across the city. That initial public investment and the influence of government action were a critical foundation from which other workforce efforts could succeed.

Employers were central to local efforts. Working together across industries and occupations, local employers collaborated to identify skills needed and define job pathways with a goal of strengthening their collective talent pipeline. Examples of this cooperation include The Core Alliance and Prosper Colorado. The Core Alliance is a regional employer-led effort to prepare a workforce for construction industry opportunities — including craft, office, professional service, and small business development. The Prosper Colorado movement, launched by the Denver Chamber of Commerce, focuses on pathways to better-quality jobs, in fields such as healthcare, by ensuring that employers with similar skills needs send clear demand signals to educators and workers in the region.

Denver, CO, demonstrates an effective ecosystem approach to building mobility opportunities and reliable talent pipelines. Employers, at the center of a workforce ecosystem, can partner with educators and talent developers to facilitate workers' access to skills-based transitions and training aligned to business needs. Further, when employers collaborate with nonprofit organizations, they can support workers through training and wraparound services to remove barriers to access. Workers in some of these industries bring a collective voice to ensure they make gains from the productivity they create and that their challenges are collectively addressed rather than individually. Local government plays a critical convening and coordinating role in this collective effort.

> **"Denver, CO, developed robust, accessible talent pipelines through deliberate, coordinated action across actors in the local workforce ecosystem"**

Workplace Perspective: Diversity, Equity, Inclusion, and Belonging Starts with STARs

Hiring more STARs is a critical step towards expanding the talent pool for employers, but it is only part of the solution. The workplace is where STARs have the chance to develop, expand, demonstrate, and leverage their skills for increased opportunity. To understand how employers support their STARs, we conducted a worker survey and a manager survey. These surveys, with 923 and 240 respondents respectively, included STARs and workers with bachelor's degrees (see the Data and Methods section for details). We find that managers with bachelor's degrees overestimate what portion of the workforce has a degree, and this perception is associated with hiring behaviors that harm STARs.

Managers overestimate the prevalence of college degrees

Managers who have bachelor's degrees tend to assume that others have them as well. When asked to estimate the percentage of the workforce that has a degree, over half of them overestimated. The more prevalent that managers believed degrees were in the American workforce, the more they wanted their next hire to have a college degree. Our survey results show that 47% of managers with bachelor's degrees rank a college degree as one of the top three priorities they would be looking for in a new hire, compared to 15% of managers who are STARs. Managers with bachelor's degrees are thus more likely to hire other workers with degrees.

Future research will assess whether these perceptions influence more than hiring. A manager who values a degree for hiring purposes may see the degree as a marker of the employee's potential and may be more likely to make decisions about investing their time and resources in professional development and mentoring accordingly. Additional research is needed to confirm such hypotheses and explore its effects on STARs' access to development and promotion.

STAR Story: Debrena / Role: QA Engineer

Technical Training Opened a Pathway

Debrena makes the most of every opportunity. From her very first job as a door-to-door saleswoman at 14, a job that only lasted a day, through jobs in childcare and sales, to her current job as a QA engineer, she has developed a deep and broad skill set. She never wanted to go to college, but through training programs, bootcamps, and self-guided learning, she learned technical skills like webpage programming in HTML, CSS, and JavaScript. On the job, in roles she sometimes characterized as "survival jobs," she learned to leverage those skills for professional success. Debrena recalls, "I learned really, really, really solid HTML and CSS. I just didn't know how to organize it very well and do it professionally. [Working] helped me understand the role of HTML, CSS, and JavaScript. You know, HTML is the framework and the framing of a house, the CSS is the paint and the décor, and JavaScript turns the lights on."

Debrena recognizes the importance of advocating for herself. For example, two weeks before her graduation from coding bootcamp, she overheard two other students in the program talking about an event hosted by a company she aspired to work for. She had written to the company about internship opportunities but she was discouraged due to her lack of a college degree. She did not know what the event was but she knew it was a way to get in the door so she got in the car and drove there. She recalls, "I was aggressively pitching myself and I made it... I made an impression, I filled out the application, and then I got the invitation to participate in a hackathon. I remember screaming in my car, like I can't believe this is happening. I participated in the hackathon and they selected me to be an apprentice there for three months." Debrena feels that all her skills have come together to get her where she is now. Looking forward, she hopes to use her experiences to do more educational and advocacy work.

Workplace attitudes undermine STARs' sense of belonging as they progress in the workplace

Our survey confirms that STARs feel the impacts of manager attitudes in their day-to-day experience on the job. We asked workers a number of questions to measure their sense of belonging and well-being on the job. We find that STARs experience the workplace differently from their counterparts with bachelor's degrees, and this in turn, is associated with a lower sense of belonging at work.

Our survey results shed some light to how STARs experience the workplace differently from their colleagues with degrees. STARs responses differed from workers with bachelor's degrees on measures related to pay equity, feedback and encouragement, connection, and professional development.

- **Pay disparities send a signal that STARs are not valued.** Our survey results show that 56% of STARs believe that in their workplaces "all employees receive equal pay for equal work" compared to 66% of workers with bachelor's degrees. STARs report lower incomes and less satisfaction with their pay compared to their colleagues with college degrees, even after accounting for differences in occupation and industries. When we asked in our survey why STARs did not feel they belonged, pay was among the top answers, specifically insufficient pay and low pay with high demands. As one STAR explained: "pay — plain and simple — they don't pay me my worth."

- **STARs report less encouragement on the job.** Only 68% of STARs in our survey believe that the way employees get feedback on their work is fair compared to 77% of workers with bachelor's degrees. STARs noted that they get less affirmation of their work. "I never get any 'good job,' only negative feedback is given and my pay is not so good," one STAR wrote. Further, STARs described environments where their ideas and opinions were not respected by their colleagues and bosses. One STAR wrote, "My opinions and thoughts are more often than not disregarded. I am treated as though because I have no college degree, my ideas have little to no weight."

- **STARs feel less connected to their colleagues.** While 55% of STARs agree with the statement that "some people I work with are close friends of mine," 65% of workers with bachelor's degrees agree with the statement. While having a friend at work may seem unimportant, it is actually one of the top indicators of employee engagement and team performance.[17] As one STAR described, "I am not a part of the 'in crowd.' I generally eat lunch by myself, and stay to myself during the day. I am not included in non-office conversations."

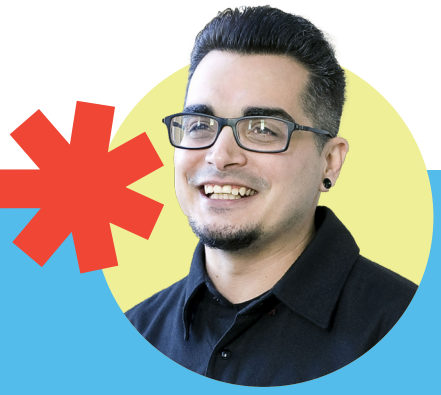
- **STARs see less investment in their professional development.** STARs report getting fewer opportunities for advancement. As one STAR described, "I have seniority and have been promised for years to be put on track for a management position but keep getting others picked over me. . . even [by] someone who only had 13 weeks experience to my seven years." In our survey, 55% of STARs agreed with the statement "my workplace invests in my professional development," compared to 69% of workers with bachelor's degrees.

STARs' experience of belonging is consistently lower than workers with bachelor's degrees. This brief analysis only touches the surface of the workplace experience of STARs, yet it points to important differences in the experiences of this group. Ultimately, belonging is an important factor in employee satisfaction, productivity, growth, and retention.[18] More analysis — of this survey and of others — is needed to inform better organizational practices for an inclusive workplace.

Effective diversity efforts begin with STARs

Diversity, equity, inclusion, and belonging (DEIB) is one of the major business challenges of our times. What the results of this survey lay bare is that no DEIB effort will be successful without attention to STARs. The inherent biases against workers who have learned their skills through routes other than college are detrimental to the hiring, development, and retention of STARs. And given that the majority of Black and Hispanic workers are STARs, any efforts at racial equity must account for STARs. This is also true for veterans, rural workers, and other historically excluded populations.

Changing workplace culture is hard. It requires getting to the root causes of implicit and explicit biases in human behavior as well as the unintentional ones embedded in algorithms and standard procedures. Simple practices like the scanning of resumes for bachelors' degrees can inadvertently screen out large numbers of talented workers. Casual attitudes about the value of a degree or even a specific school can affect the investment a manager makes in an employee. For employers to begin to reverse the trends that have excluded STARs from their talent pools over the past three decades, they must fix both systems and culture.



STAR Story: Robert / Role: Merchandiser

Workplace Culture Supports Strong Performance

In his first job, at a skate shop, Robert learned to manage people and inventory. He helped his boss open and operate three new stores. With that background in sales and management, Robert transitioned to a larger company where he started as a sales associate and over 10 years, moved through several management roles to become a merchandiser in the corporate office.

Robert loves his job. He pays close attention to the inventory numbers to identify trends so that he can get the correct inventory to all the stores. When he was offered the opportunity to become a buyer, another attractive role, he realized how much he enjoyed the problem solving and analytical aspects of merchandising. Instead of pursuing the buyer role, he joined the company's training team to teach others the ins and outs of that process.

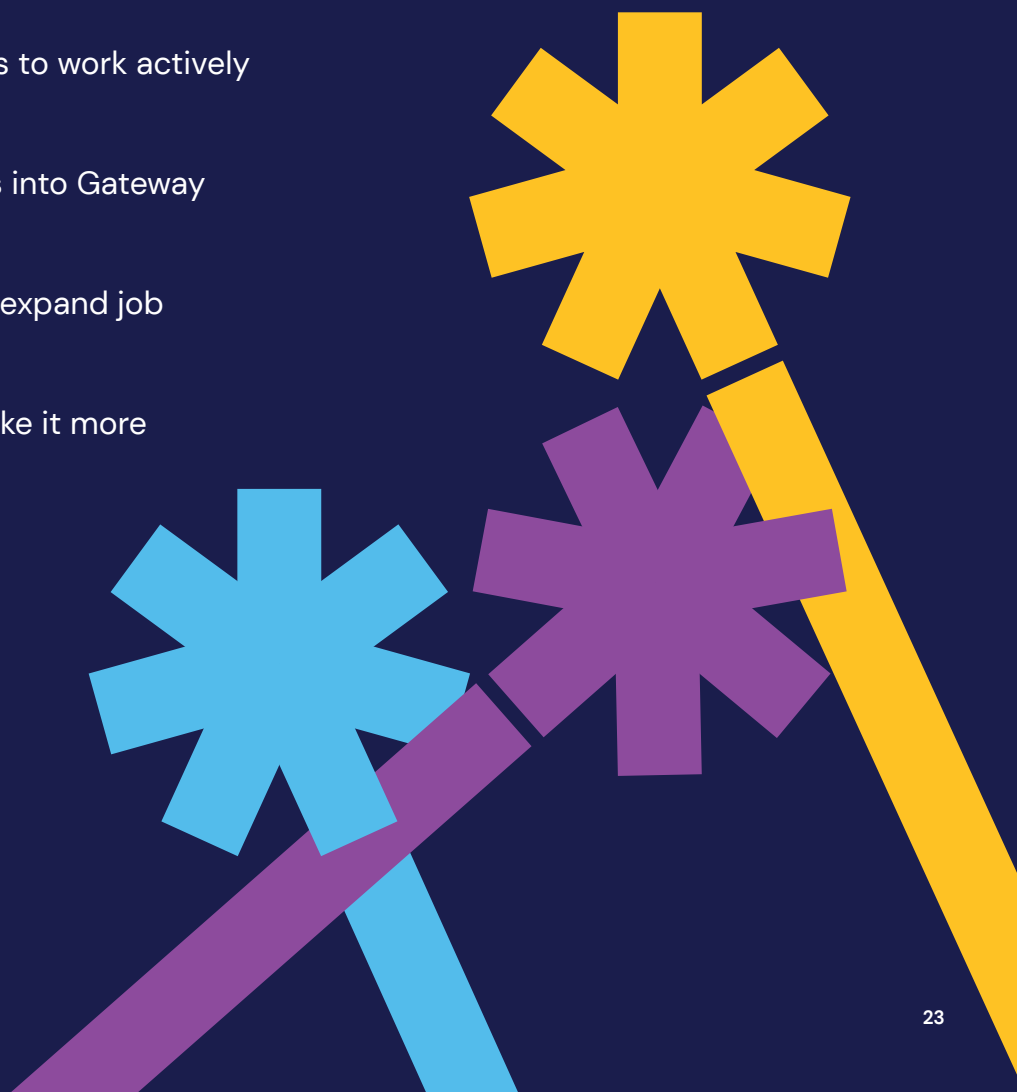
Robert attributes his motivation and longevity to a company culture that invests in its employees. He has been offered extensive on-the-job training and likes that "one of the core values of the company is that we hire from within and promote from within."

Call to Action:
Work together to expand access to jobs

Employment trends over the past 20 years have been catastrophic to STARs' economic well-being and have set employers up for an unnecessary zero-sum war for talent. The loss of STARs in Gateway and Destination jobs eroded the quality of the collective talent pipeline because skilled workers have been systematically locked out of opportunities to leverage their skills for higher-value work. We need to focus our collective efforts on expanding STARs access to jobs so that we can revitalize the labor market.

We call on all workforce partners to work actively towards efforts to:

1. Hire higher volumes of STARs into Gateway and Destination jobs,
2. Build local partnerships that expand job pathways for STARs, and
3. Change the workplace to make it more supportive of STARs.



Hire STARs into 30 key occupations

This report identifies 30 occupations that make up almost half the jobs STARs were displaced from in the past 20 years. These 30 jobs offer a strong starting point for collective efforts. Each of these jobs employs over 200,000 people nationally. They include roles such as HR managers and office clerks who are found across businesses and industries, as well as roles like registered nurses and computer programmers, where we experience chronic shortages. For more detail on these 30 occupations, see the Appendix.

EMPLOYERS

Pursue an explicit talent strategy to hire STARs into the 30 key occupations.

- Identify jobs for STARs in your organization. Based on growth and turnover, establish a goal for the number of STARs to hire in the next five years.
- Remove degree requirements from your job descriptions. Recent data from Burning Glass shows many firms are already doing so but there is progress to be made.
- Refresh your sourcing. Find talent developers who work with STARs.
- Look for internal candidates. Identify STARs in your organization who show potential for these roles.
- Incentivize managers to hire and promote STARs. Recognize that managers perceive risks in hiring STARs and counter their concerns.
- Track your efforts. Success of this effort requires accountability. Set goals, collect data, and assess progress over time.

WORKFORCE AND EDUCATION ORGANIZATIONS

Facilitate employers' STAR-focused talent strategy.

- Help employers source STARs. Use data about STARs to show employers where STARs are working and the skills they have.
- Support services that address common barriers to STAR mobility.
- Bring your voice to the STARs narrative. Use skills-first language in your initiatives to highlight STARs' skills.

RESEARCHER COMMUNITY

Collaborate across disciplines to provide the data and insights to improve hiring practices.

- Strengthen the data and analysis of workers' skills to improve our collective understanding of skills in the labor market.
- Investigate employment practices and their disparate impacts on STARs.
- Explore STARs barriers to mobility across geography, race, gender, industry, and other demographic characteristics.

POLICYMAKERS AND CIVIC LEADERS

Facilitate employers' STAR-focused talent strategy.

- Use federal and local funding to expand STARs' access to the 30 key jobs in your region.
- Identify policy barriers to the 30 key jobs, such as licensing requirements, and consider alternatives.
- Consider where your own hiring could advance STAR mobility.

Invest in regional partnerships to strengthen job pathways for STARs

Our regional analysis only scratches the surface of the actions taken in Denver, Co; Rochester, NY; and Virginia Beach, VA to create conditions for STAR economic mobility — and other communities are having success as well in creating mobility for subpopulations of STARs. There is no shortage of good ideas but there is significant work to do to implement these ideas, bring them to scale, and make them the norm. This effort will require steady, sustained cooperation across all actors in the workforce ecosystem.

EMPLOYERS

Work with regional partners to strengthen job pathways across industries and businesses.

- Recognize that workers in your organization are developing skills that are valuable to other employers and vice versa. Expect workers to move across organizations and broaden pathways to optimize that movement.
- Collaborate with regional businesses to identify common skills needs and the jobs or programs to teach those skills. Build and expand job pathways for STARs within and across industries.
- Provide information about the skills you seek and the availability of jobs to local talent developers that support STARs.
- Understand how STARs are faring in your region and participate in collective work to set goals for STAR regional mobility.

WORKFORCE AND EDUCATION ORGANIZATIONS

Advocate for and facilitate STARs access to job pathways in your region.

- Collaborate with employers to build specific job pathways that help STARs move from low-wage Origin jobs to higher-wage jobs.
- Align training and education programs with these defined job pathways.
- Help employers understand the potential of the STARs talent pool.

RESEARCHER COMMUNITY

Equip the field with an understanding of STARs' pathways to mobility.

- Serve as data partners for regional efforts and build the analytic case for good practices.
- Open universities and research centers to STARs by removing degree requirements and inviting STARs to participate in extension programs.

POLICYMAKERS AND CIVIC LEADERS

Convene the stakeholders to develop strategies for expanding pathways for STARs.

- Set objectives for a regional workforce strategy that engages and elevates both college educated workers and STARs.
- Use STARs data to inform your strategy. Build cross-sector partnerships around the 30 key roles.
- Bring your resources to bear. Combine funding streams (federal and local) to remove barriers to and create incentives for STARs' hiring and advancement.

Create a workplace culture that values and supports STARs

Our work shows that STARs experience the workplace in ways that are likely to hinder their professional development. However, these conditions can be addressed through intentional efforts in diversity, inclusion, equity, and belonging. Given the diversity that STARs bring to the workforce, no DIEB effort will be successful without them. Employers who create equitable work environments for STARs should see a competitive advantage in attracting, retaining, and developing STAR talent.

EMPLOYERS

Build a workplace culture that recognizes STARs' contributions and potential.

- Find the managers in your organization who support STARs. Support them and equip them to influence other managers.
- Begin the hard work of addressing underlying mindsets to create a more STARs-inclusive environment. Explicitly link this work to a DEIB agenda.
- Work closely with STARs at your organization to understand their needs.

WORKFORCE AND EDUCATION ORGANIZATIONS

Bring voice to the STAR experience in the workplace.

- Showcase STARs in your community. Highlight their skills, accomplishments, and potential.
- Build out tools and approaches to support the employer behavior and culture change required to deliberately pursue a STARs talent strategy.

RESEARCHER COMMUNITY

Improve our collective understanding of how workplace culture impacts STARs.

- Survey employers to better understand executive and manager mindsets. Establish a baseline so we can track attitudes and behaviors at organizations toward STARs.
- Run experiments on workplace practices. Translate findings for a business audience to support shifts in beliefs and behavior.

POLICYMAKERS AND CIVIC LEADERS

Lead the conversation.

- Demonstrate through action. Be a leading employer of STARs.
- Share local workforce data with employers, helping them understand the skills workers have regardless of degree and the discriminatory impact of degree requirements.

Appendix

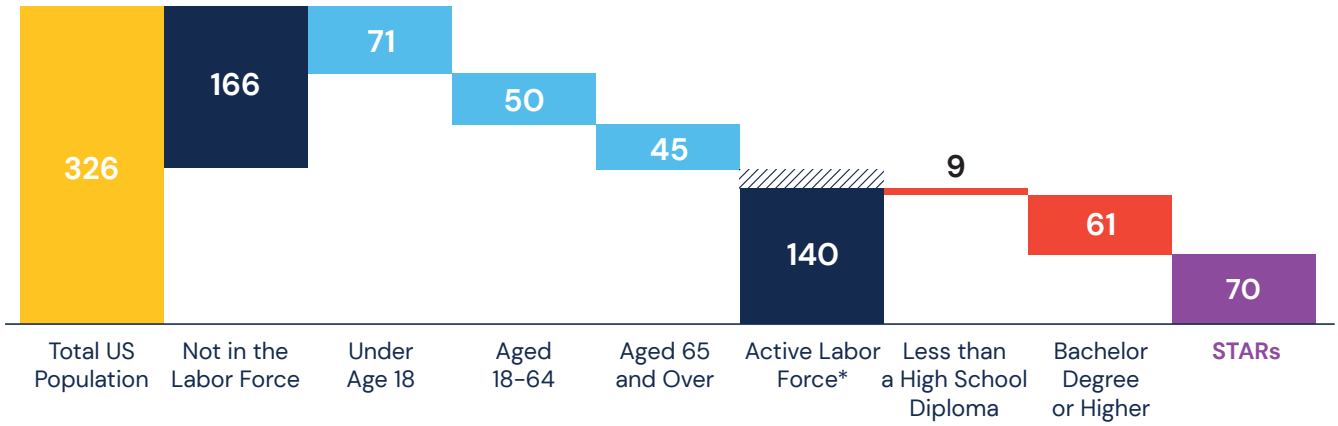
Who are STARs?

STARs are workers who are Skilled Through Alternative Routes. STARs are aged 25 or older, active in the labor force, have a high school diploma or equivalent, and have developed their skills through alternative routes such as community college, apprenticeships, bootcamps, and most commonly, and through on-the-job experience.

In 2021, there were over 70 million STARs in the U.S., with 7 out of 10 working full-time, year-round. Over half of all STARs have an associate's degree or some college credit.

70 MILLION STARS MAKE UP THE MAJORITY OF THE U.S. WORKFORCE

2021 Distribution of the U.S. Population, in Millions.



* We exclude 20 million workers under the age of 25 from our analysis of the labor force to ensure that the majority of the population studied has completed their education.

Source: Opportunity@Work analysis of the 2021 Current Population Survey, Annual Social and Economic Supplement, Integrated Public Use Microdata Series.

At half the workforce, STARs represent the full diversity of the U.S. labor market, but several demographic groups are overrepresented among STARs.

Source: Opportunity@Work analysis of the 2021 Current Population Survey, Annual Social and Economic Supplement, Integrated Public Use Microdata Series.

STARs have skills for higher-wage work

In our prior work, we analyzed the largest public datasets on U.S. occupational roles, skills, wages, and workers to identify the more than 70 million workers who are STARs and characterize their experience in the labor market. We compared the skills required for the STARs' occupations to all other occupations in the labor market and found that the majority of STARs have skills, based on their current job, to transition to a higher-paying job.

"Low wage" does not equal "low skill." In our foundational report, *Reach for the STARs*, we used data from the O*NET to compare the skills needed across all jobs. We calculated a "skills distance" to measure the similarity of the skill sets and found that many low- and middle-wage jobs had similar skill sets to jobs that paid significantly more. See the figure below for an example.

MANY STARS HAVE THE SKILLS TODAY TO DO HIGHER WAGE WORK

This figure shows the high skills overlap between two sales roles. The first is accessible to STARs, while the second is less so. About 96,000 STARs have made this transition in the five-year period from 2017 to 2021.

Note: Wages calculated for workers aged 25 and older.

Source: Opportunity@Work analysis of the O*NET 25.3 Database and 2017 to 2021 Current Population Survey, Annual Social and Economic Supplement, Integrated Public Use Microdata Series.

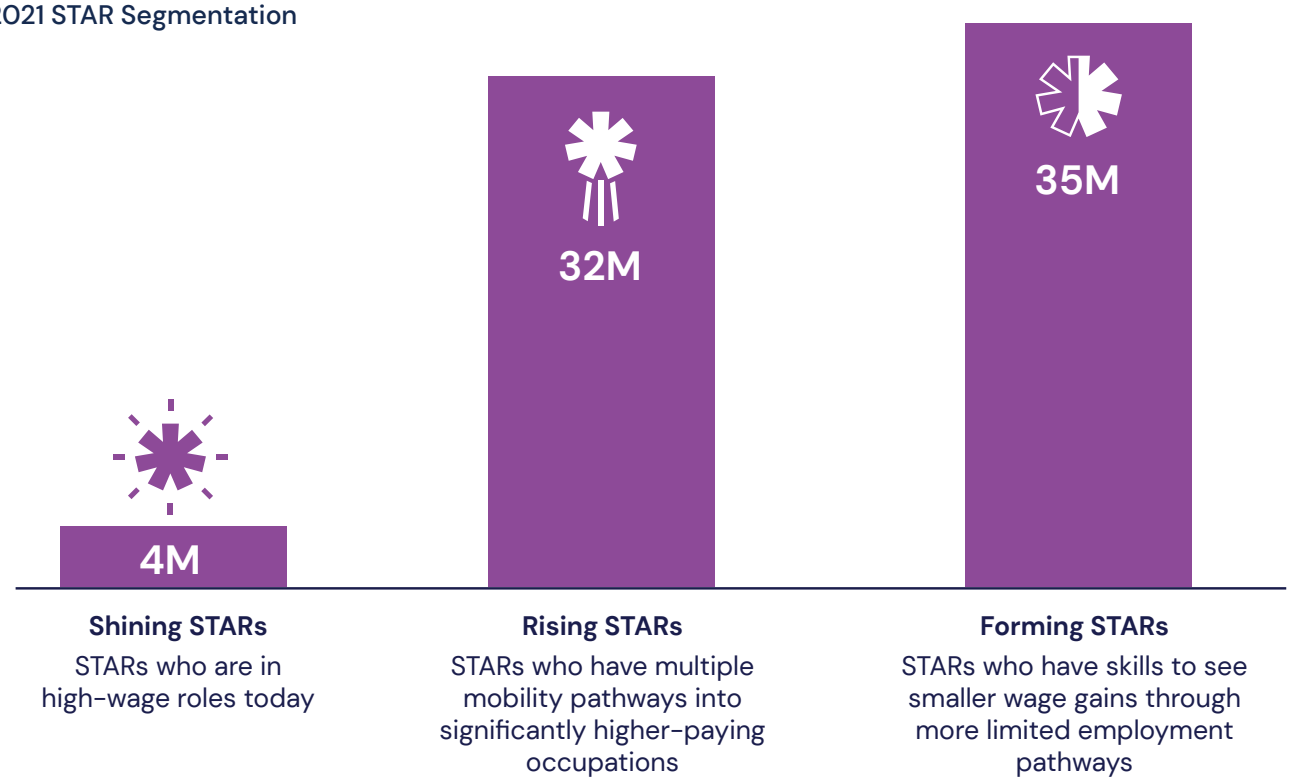
STARs have different trajectories to higher wages

Skills are the currency of the labor market. In our second report, *Navigating with the STARs*, we analyzed the actual job transitions that workers made in the labor market and found the skills distance to be an excellent predictor of job transitions. Specifically, the more similar the skills, the more likely the worker will transition from one job to another. And yet, we see that STARs make transitions to higher paying jobs at lower rates than their degreed counterparts.

STARs' skills position them for different trajectories to higher wages. Based on our skills analysis, we segmented STARs into three groups to reflect their readiness for higher-wage work. We see that half of STARs are in high wage work (Shining) or have the skills for higher wage work (Rising) today.

OVER HALF OF ALL STARS ARE IN OR READY FOR HIGH WAGE WORK

2021 STAR Segmentation



Note: See Data and Methods section for detailed methodology of STAR segmentation.

Source: Opportunity@Work analysis of the O*NET 25.3 Database; 2012 to 2021 Current Population Survey, Annual Social and Economic Supplement; 2019 1- and 5-year American Community Survey, Integrated Public Use Microdata Series.

Appendix Table 1: 30 Jobs of Focus

Occupation[1]	Number of Workers (1,000s)	Pct. STARs	Pct. of Job Openings Requiring a Bachelor Degree[2]	Skills Needed[3]	Best Sourcing Jobs[4]
UPPER & HIGH WAGE					
Chief Executives & Legislators					
Executive Director Chief Operating Office Chief Executive Officer	1,622	22%	82%	Budgeting Project Management Staff Management	General & Operations Managers Management Analysts Personal Financial Advisors
Computer & Information Systems Managers					
IT Director Productivity Solutions Manager Director of Software Engineering	698	19%	94%	Communication Collaboration Planning	Administrative Services Managers Network & Computer Systems Administrators Software Developers
Computer Programmers					
Computer Programmer Mobile Expert Programmer/Analyst	481	21%	76%	SQL Java Software Development	Applications & Systems Software Developers Database Administrators Network & Computer Systems Administrators
Computer Scientists, Network Analysts & Web Developers					
Data Analyst Systems Engineer Scrum Master	1,713	29%	88%	Project Management SQL Python	Applications & Systems Software Developers Network & Computer Systems Administrators Database Administrators
Financial Managers					
Controller Branch Manager Accounting Manager	1,321	31%	88%	Accounting Budgeting Financial Reporting	Administrative Services Managers Accountants & Auditors General & Operations Managers
Human Resources Managers					
Human Resource Manager Human Resources Director Talent Acquisition Manager	370	23%	84%	Employee Relations Onboarding Human Resource Management	Constructions Managers Purchasing Managers Farmers, Ranchers & Other Agricultural Managers
Industrial Engineers					
Industrial Engineer Quality Engineer Environmental, Health & Safety Engineer	198	20%	100%	Industrial Engineering Occupational Health & Safety Project Management	Engineers, Other Civil Engineers Electrical & Electronics Engineers

(continued)

Occupation[1]	Number of Workers (1,000s)	Pct. STARs	Pct. of Job Openings Requiring a Bachelor Degree[2]	Skills Needed[3]	Best Sourcing Jobs[4]
Medical & Health Services Managers					
Director of Nursing Clinical Supervisor Medical Director	759	26%	84%	Budgeting Patient Care Scheduling	Food Service & Lodging Managers Education Administrators Property, Real Estate & Community Managers
Managers in Marketing & Public Relations					
Sales Manager Product Manager Business Development Manager	1,234	26%	87%	Sales Budgeting Product Management	Administrative Services Managers Retail Salespersons General & Operations Managers
Managers, All Other					
Project Managers Program Manager Project Coordinator	5,808	38%	75%	Project Management Budgeting Scheduling	Food Service & Lodging Managers Property, Real Estate & Association Managers Education Administrators
Registered Nurses					
Registered Nurse Nurse Practitioner Case Manager	3,327	26%	40%	Patient Care Advanced Cardiac Life Support Treatment Planning	Physical Therapists Occupational Therapists Therapists, Other
Sales Representatives, Services					
Route Sales Representative Member Services Representative Automotive Sales Consultant	498	40%	34%	Sales Customer Service Customer Contact	Retail Salespersons Cashiers Advertising Sales Agents
MIDDLE WAGE					
Accounting & Auditing Clerks					
Bookkeeper Accounting Clerk Accounts Payable Clerk	1,037	74%	37%	Accounting Accounts Payable/Receivable Data Entry	Receptionists & Information Clerks Bank Tellers Billing & Posting Clerks
Business Operations & Management Specialists, All Other					
Marketing Coordinator Marketing Specialist Social Media Manager	790	26%	88%	Marketing Social Media Project Management	Management Analysts Claims Adjusters, Appraisers & Investigators Retail Salespersons
Compliance Officers, Non-agricultural					
Compliance Specialist Regulatory Affairs Specialist Compliance Officer	276	26%	87%	Legal Compliance Project Management Regulatory Affairs	Management Analysts Claims Adjusters, Appraisers & Investigators Misc. Office & Administrative Support Workers

(continued)

Occupation[1]	Number of Workers (1,000s)	Pct. STARs	Pct. of Job Openings Requiring a Bachelor Degree[2]	Skills Needed[3]	Best Sourcing Jobs[4]
Computer Support Specialists					
It Support Specialist Desktop Support Technician Help Desk Technician	539	45%	45%	Technical Support Customer Service Help Desk Support	Applications & Systems Software Developers Network & Computer Systems Administrators Database Administrators
Customer Service Representatives					
Customer Service Representative Customer Service Associate Call Center Representative	1,961	62%	11%	Customer Service Customer Contact Scheduling	Receptionists & Information Clerks Couriers & Messengers Billing & Posting Clerks
Designers					
Retail Merchandiser Graphic Designer Merchandise Associate	819	33%	30%	Merchandising Retail Industry Knowledge Customer Service	Artists & Related Workers Athletes, Coaches & Related Workers Musicians, Singers & Related Workers
Diagnostic Technicians					
Radiologic Technologist MRI Technologist CT Technologist	440	50%	20%	Radiology Patient Care Ultrasound	Health Diagnosing & Treating Support Technicians Clinical Laboratory Technologists & Technicians Licensed Practical & Vocational Nurses
First-Line Supervisors of Administrative Support Workers					
Office Manager Customer Service Manager Front Office Manager	1,250	59%	54%	Customer Service Scheduling Office Management	Cashiers Sales & Related Workers, All Other Janitors & Building Cleaners
First-Line Supervisors of Sales Workers					
Assistant Store Manager Store Manager Shift Lead	4,138	60%	21%	Retail Industry Knowledge Store Management Customer Service	Retail Salespersons Cashiers Stock Clerks & Order Fillers
Human Resources & Training Specialists					
Recruiter Human Resource Coordinator	1,010	29%	68%	Recruiting Onboarding Talent Acquisition	Management Analysts Claims Adjusters, Appraisers & Investigators Cost Estimators
Meeting & Convention Planners					
Event Coordinator Event Manager Planner	210	17%	59%	Event Planning Budgeting Scheduling	Management Analysts Claims Adjusters, Appraisers & Investigators Logisticians

(continued)

Occupation[1]	Number of Workers (1,000s)	Pct. STARs	Pct. of Job Openings Requiring a Bachelor Degree[2]	Skills Needed[3]	Best Sourcing Jobs[4]
Office Clerks					
Office Assistant Office Administrator Office Clerk	1,059	69%	10%	Sales Customer Service Sales Goals	Stock Clerks & Order Fillers Office & Administrative Support Workers, Other Shipping, Receiving & Traffic Clerks
Police Officers & Detectives					
Police Officer Boarder Patrol Agent Public Safety Officer	866	52%	44%	Public Health & Safety Law Enforcement Surveillance	Sheriffs, Bailiffs & Correctional Officers Security Guards & Gaming Surveillance Officers Misc. Production Workers
Purchasing Agents					
Buyer Purchasing Agent Procurement Specialist	184	45%	71%	Purchasing Procurement Contract Management	Management Analysts Claims Adjusters, Appraisers & Investigators Wholesale & Retail Buyers, Except Farm
Real Estate Brokers & Sales Agents					
Listing Consultant Real Estate Agent Leasing Agent	1,131	41%	29%	Sales Leasing Customer Service	Retail Salespersons Cashiers Insurance Sales Agents
Sales Representatives, Wholesale & Manufacturing					
Sales Representative Outside Sales Representative Account Manager	1,136	49%	55%	Sales Sales Goals Customer Service	Retail Salespersons Cashiers Insurance Sales Agents
Secretaries & Administrative Assistants					
Administrative Assistant Executive Assistant Medical Receptionist	2,206	62%	16%	Administrative Support Scheduling Customer Service	Stock Clerks & Order Fillers Office & Administrative Support Workers, Other Data Entry Keyers
Teachers & Instructors, All Other					
Substitute Teacher Tutor Music Teacher	658	32%	67%	Teaching Tutoring Lesson Planning	Elementary & Middle School Teachers Secondary School Teachers Preschool & Kindergarten Teachers

[1] Occupational categories are based on the 2010 Integrated Public Use Microdata series harmonized occupation coding scheme.

[2] Calculated as the proportion of national job postings from January 1, 2010 to December 31, 2010 and January 1, 2021 to November 1, 2021 where listed minimum educational requirements did not include a bachelor's degree or higher. Data from Burning Glass Technologies: Labor Insight. 2021.

[3] Skills needed are based on the most specified skills listed in national job postings from January 1, 2021 to November 1, 2021. Data from Burning Glass Technologies: Labor Insight. 2021.

[4] Best sourcing jobs are identified as the most commonly observed origin jobs for workers who have transitioned into this occupation over the 10-year period from 2012 to 2021. We exclude the 30 targeted destination occupations from being included as origin jobs.

Source: 2021 Burning Glass Technologies: Labor Insights and Opportunity@Work analysis of the 2021 Current Population Survey, Annual Social and Economic Supplement, Integrated Public Use Microdata Series.

Appendix Table 2: 2021 STAR Mobility Index, Most Populous Metropolitan Areas

Metropolitan Statistical Area	STAR Earnings Ratio[1]	STARs Above Median Wage[2]	Upwardly Mobile STARs[3]	STAR Mobility Ranking[4]
Atlanta-Sandy Springs-Roswell, GA	84.5%	33.7%	4.4%	Average
Austin-Round Rock, TX	83.7%	38.0%	4.8%	Above Average
Baltimore-Columbia-Towson, MD	88.1%	36.6%	5.9%	Above Average
Boston-Cambridge-Newton, MA-NH	88.6%	33.0%	6.0%	Above Average
Buffalo-Cheektowaga-Niagara Falls, NY	92.7%	32.7%	6.3%	Above Average
Charlotte-Concord-Gastonia, NC-SC	83.9%	32.9%	5.7%	Average
Chicago-Naperville-Elgin, IL-IN-WI	88.4%	29.4%	4.5%	Below Average
Cincinnati, OH-KY-IN	87.9%	32.6%	3.1%	Below Average
Cleveland-Elyria, OH	89.0%	29.9%	5.6%	Average
Columbus, OH	88.3%	32.4%	4.4%	Average
Dallas-Fort Worth-Arlington, TX	86.9%	34.2%	5.0%	Average
Denver-Aurora-Lakewood, CO	87.9%	39.0%	8.7%	Exceptional
Detroit-Warren-Dearborn, MI	88.3%	30.2%	5.5%	Average
Hartford-West Hartford-East Hartford, CT	92.4%	32.7%	3.7%	Average
Houston-The Woodlands-Sugar Land, TX	84.5%	34.0%	4.4%	Average
Indianapolis-Carmel-Anderson, IN	87.1%	30.5%	5.4%	Average
Jacksonville, FL	89.0%	34.9%	5.7%	Above Average
Kansas City, MO-KS	87.5%	32.3%	5.1%	Average
Las Vegas-Henderson-Paradise, NV	91.0%	26.6%	4.5%	Below Average
Los Angeles-Long Beach-Anaheim, CA	84.6%	31.7%	3.8%	Below Average
Louisville/Jefferson County, KY-IN	88.4%	31.5%	2.9%	Below Average
Memphis, TN-MS-AR	86.3%	29.7%	4.0%	Below Average
Miami-Fort Lauderdale-West Palm Beach, FL	89.0%	30.9%	4.4%	Average
Milwaukee-Waukesha-West Allis, WI	91.0%	30.9%	4.5%	Average
Minneapolis-St. Paul-Bloomington, MN-WI	91.6%	34.5%	5.5%	Above Average
Nashville-Davidson-Murfreesboro-Franklin, TN	88.6%	33.3%	5.1%	Average

Metropolitan Statistical Area	STAR Earnings Ratio[1]	STARs Above Median Wage[2]	Upwardly Mobile STARs[3]	STAR Mobility Ranking[4]
New Orleans-Metairie, LA	89.1%	30.2%	6.0%	Above Average
New York-Newark-Jersey City, NY-NJ-PA	87.4%	30.4%	3.9%	Below Average
Oklahoma City, OK	90.3%	34.8%	5.0%	Above Average
Orlando-Kissimmee-Sanford, FL	88.3%	31.6%	5.1%	Average
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	87.9%	33.4%	5.8%	Above Average
Phoenix-Mesa-Scottsdale, AZ	86.1%	35.4%	4.4%	Average
Pittsburgh, PA	92.4%	33.0%	4.9%	Above Average
Portland-Vancouver-Hillsboro, OR-WA	91.5%	33.4%	6.1%	Above Average
Providence-Warwick, RI-MA	91.7%	32.3%	4.9%	Average
Raleigh, NC	85.9%	36.3%	6.8%	Above Average
Richmond, VA	86.8%	31.9%	4.8%	Average
Riverside-San Bernardino-Ontario, CA	90.0%	31.4%	3.2%	Below Average
Rochester, NY	89.0%	32.1%	10.4%	Exceptional
Sacramento-Roseville-Arden-Arcade, CA	87.0%	34.2%	3.1%	Below Average
Salt Lake City, UT	90.3%	37.6%	4.3%	Above Average
San Antonio-New Braunfels, TX	85.8%	32.1%	3.6%	Below Average
San Diego-Carlsbad, CA	86.7%	34.6%	3.7%	Average
San Francisco-Oakland-Hayward, CA	85.5%	33.3%	4.2%	Average
San Jose-Sunnyvale-Santa Clara, CA	86.7%	35.0%	2.4%	Below Average
Seattle-Tacoma-Bellevue, WA	89.3%	35.0%	4.9%	Above Average
St. Louis, MO-IL	88.4%	31.2%	3.4%	Below Average
Tampa-St. Petersburg-Clearwater, FL	89.0%	34.9%	4.8%	Above Average
Virginia Beach-Norfolk-Newport News, VA-NC	90.2%	36.2%	7.0%	Exceptional
Washington-Arlington-Alexandria, DC-VA-MD-WV	87.2%	35.9%	4.8%	Above Average

[1] Ratio of STAR median hourly wages to wages for workers with at least a bachelor's degree in the same occupation.

[2] % of STARs working in occupations where hourly wages are above the national median.

[3] Annual % of STARs who experience an upwardly mobile job transition, average over the past 5 years. An upwardly mobile transition is defined as a change in occupation where the median national wage in the destination job was at least 10% higher than the job held in the prior year. This measure does not include workers who moved into a job from a period of unemployment.

[4] Components are weighted equally to assign a composite score based on the relative scores across each of the largest 50 MSAs. Statistical clustering techniques are used to classify metro areas into four groups.

Note: See Data and Methods section for detailed methodology of the STAR Mobility Index.

Source: Opportunity@Work analysis of the 2019 1-year American Community Survey and 2017 to 2021 Current Population Survey, Annual Social and Economic Supplement, Integrated Public Use Microdata Series.

Data and Methods

We utilize a number of different public data sources to understand the characteristics and mobility opportunities available to STARs. Here we describe our methods in four parts:

Part A: STARs and STAR Segmentation

Part B: Displaced STARs

Part C: The STARs Mobility Index

Part D: Destination and Gateway Jobs

Part E: STARs Belonging Survey and Manager Survey

Part A: STARs and STAR Segmentation

1. Estimating STARs: Defining the Population Universe

We use the U.S. Census Bureau 2021 Current Population Survey, Annual Social and Economic Supplement (CPS ASEC) available through the University of Minnesota Integrated Public Use Microdata Series (IPUMS) to understand the educational attainment of the U.S. population.

Our study population is limited to adults aged 25 and older[1] in the civilian, non-institutionalized labor force. This excludes active-duty military, residents of nursing homes or correctional facilities, and individuals who are not currently working or looking for work. This population includes 140 million individuals, of which 70 million, or 50%, are STARs.

STARs have graduated high school or earned a GED equivalency and may have attended college, technical schools, or earned associate degrees or technical certifications, however, they have not completed a bachelor's degree. Individuals with a bachelor's degree or higher are similarly diverse. These workers may have attained a bachelor's degree (BA, BS, BFA), master's degree (MBA, MS), professional degree (MD, JD), or PhD. Among workers with at least a bachelor's degree, 37% have a master's degree or higher.

2. Producing STAR Segmentation on Trajectories to Higher Wages

In addition to the CPS ASEC, we use a number of additional datasets to better understand how STARs can best leverage their on-the-job skills to move into higher-paying occupations.

This methodology includes 3 main steps:

a. Classify STARs by current wage group

b. Identify feasible, similarly skilled, and higher paying occupations

c. Assign STARs to new mobility segments based on their possible pathways

2a. Classify STARs by current wage group

Because we are focused on identifying upwardly mobile job transitions, we must first understand the wages STARs are earning in their current jobs. Earnings for workers vary by occupation, experience, and geography, and we try to capture this detail when assigning wage classes. Because we want to be able to account for these nuances, we use a much larger survey that provides better precision at this level of detail, the U.S. Census Bureau 2019 5-year American Community Survey (ACS) available through the University of Minnesota Integrated Public Use Microdata Series (IPUMS).

Using the ACS 5-year Survey, we calculate the median hourly wage associated with workers across 71,296 unique combinations of occupation, age group (25-34, 35-44, 45-54, 55-64, 65+), and state.[2] We compare median hourly wages for these workers to state level median wages, and assign subpopulations as low, middle, upper, or high wage depending on wage associated with their occupation, age, and state. As a reference, the national median hourly wage over the 5-year period from 2015 to 2019 was

approximately $18.75 ($39,000 annually for a full-time, year-round worker) with a substantial degree of state-level variation (e.g., Mississippi $15.37 and the District of Columbia $28.17).[3]

Low-wage: workers with a median hourly wage (for that occupation, age, and state subpopulation) below 66% of the state median wage. On average, low-wage STAR workers are earning below $11.21 an hour.

Middle-wage: workers in a subpopulation with median hourly wage between 66% and 133% of the state level median. On average, this includes workers earning $17.67 an hour.

Upper-wage: subpopulations with median hourly wages between 133% and 200% of the state median. On average, these workers earn $30.25 an hour.

High-wage: subpopulations with median hourly wages at least two times (200%) of the state median. On average, this includes workers in occupations that earn at least $43.96 an hour.

Wages and wage classifications calculated from the ACS are then assigned to workers in the CPS based on their occupation, age, and state of residence. These subpopulation wage estimates are similarly used to measure the wage gain associated with skills-based job changes.

2b. Identify feasible, similarly skilled, and higher paying occupations

We use a number of data sources to identify Destination jobs that are similarly skilled and offer established mobility pathways for STARs.

To determine the skill similarity across occupations, we use the Occupational Information Network (O*NET) 25.3 Database which provides data on job-related skills and their importance across the 923 occupations defined in their O*NET-SOC 2019 taxonomy which is based on the 2018 Standard Occupational Classification (SOC) system, a federally defined standard for classifying workers into occupational categories.

We use O*NET occupational skill requirements as a proxy for the skills possessed by each worker sampled in the CPS ASEC. These requirements reflect analyst ratings across a set of 35 skills within seven broad categories: basic, complex problem solving, resource management, social, systems, and technical. Each skill is rated on a scale from 1 to 5 based on how important that skill is in order to perform tasks associated with a given occupation. The O*NET provides ratings of these 35 skills for 873 occupations, using the O*NET-SOC 2019 occupation codes. In order, To use these skill ratings with the CPS ASEC, we use three crosswalks to move from (1) the O*NET-SOC 2019 classification system (873 occupations) to the SOC 2018 system (759 occupations), (2) from the SOC 2018 system to the 2018 Census system (565 occupations), and (3) from the 2018 Census system to the 2010 IPUMS harmonized occupation coding scheme (422 occupations). This final step allows us to look at cross-occupational transitions across ten years of the CPS ASEC using common occupations.

To move from the O*NET-SOC 2019 classification system to the SOC 2018 system, we rely on a crosswalk provided by the O*NET. Whenever multiple occupations match to the same occupation, we take the average of the occupations' skill ratings.

To move from the SOC 2018 system to the 2018 Census system, we use a crosswalk provided by the U.S. Census Bureau. Whenever multiple occupations match to the same occupation, we take the weighted average of the occupations' skill ratings, using the total number of workers in each SOC 2018 occupation in 2019 as weights.

To move from the 2018 Census system to the 2010 IPUMS harmonized occupation coding scheme, we create a crosswalk from the 2019 5-year ACS as downloaded from IPUMS which includes a variable for both coding systems. Whenever multiple occupations match to the same occupation, we take the weighted average of the occupations' skill ratings, using the total number of workers in each occupation in the 2019 5-year ACS as weights.

As a result, we are able to obtain a 35-dimension skill vector for each occupation in the CPS-ASEC. In order, To understand the similarity of the skills required for any pair of occupations, we calculate the "skill distance" between a pair of occupations using

the Euclidean distance between their skill vectors. Occupations that are "closer" to one another in terms of skill distance share a more similar set of skill requirements; occupations that are "farther apart" in terms of skill distance have less overlap in the skills required to perform the jobs.

There is no single skill distance threshold for determining whether jobs are "similarly skilled." Instead we combine the O*NET skill distance measure with historic data over the past 10 years from the 2012 to 2021 CPS ASEC to evaluate the strength of specific skills based pathways. Because the CPS ASEC provides data on respondents' current occupation, and occupation in the previous year, we can better understand how skill distance as measured in the O*NET aligns with observed job transitions over the past 10 years. Based on this evaluation, we determine jobs as similarly skilled if:

- They have a skill distance less than 2.25 and we have observed at least 2,000 workers making this transition over the past 10 years;
- They have a skill distance between 2.25 and 3.0 and we have observed at least 15,000 workers making this transition over the past 10 years; or
- They have a skill distance of 3.0 or higher and we have observed at least 100,000 workers making this transition over the past 10 years.

To further ensure the feasibility of what we're calling "skills-based transitions," we exclude potential destination jobs where 90% or more of workers held a bachelor's degree in 2019, as measured by the U.S. Census Bureau 2019 1-year ACS. We also require the Destination job to pay at least 10% higher wages, but provide no more than a 300% increase. Wages for Destination jobs are similarly based on subpopulation estimates from the 2019 5-year ACS.

In some cases, a worker's current job may offer multiple similarly-skilled, higher paying destination jobs. In these cases, we prioritize selecting a single best destination job based on the following criteria:

- The job that provide at least a 50% wage increase;
- The job that moves workers into the highest wage class;
- The job with the minimum Euclidean skill-distance measure; and
- The destination job with the most observed transitions over the past 10 years.

2c. Assign STARs to new mobility segments based on their possible pathways

Once we have identified the single best Destination job for every origin job, and the associated wage gains based on a worker's age and state of residence, we return to the 2021 CPS ASEC to assign STARs into groups based on their mobility potential.

STARs who are already working in high-wage occupations — those that pay at least two times more than state median wage — are classified as Shining STARs. STARs with at least two job pathways, both offering a higher wage class, are classified as Rising STARs. These workers have the skills to move into significantly higher-paying jobs through multiple avenues. Forming STARs are workers who may have the skills to move into higher-wage jobs, but where wage gains are not as significant and occupation pathways are more limited. The Forming STAR group also includes workers for whom a higher-paying, similarly-skilled Destination job can not be assigned or who were unemployed or had limited attachment to the labor force last year.[4]

Part B. Calculating Displaced STARs Longitudinally

We know that STARs are concentrated in lower-wage occupations, and that in many cities they have missed out on the mobility gains that should accompany economic growth. While we know intuitively that these are concerning trends, we attempt to gauge the magnitude of this problem by developing a counterfactual measure of the mobility STARs could, or should, have seen had there been more equitable growth in the labor market.

Using the U.S. Census Bureau 2000 Decennial Census and the 2019 1-year ACS, both accessed through IPUMS, we can observe how the labor force has changed over the past 19 years across a number of dimensions that are crucial for STARs. Using these sources, we are able to measure the change in total employment by education and race within harmonized occupations over time. We create two separate estimates of counterfactual employment scenarios: aggregate employment across all Destination and Gateway jobs, and job level estimates for individual Destination and Gateway occupations.

When looking at overall change in the labor force from 2000 to 2019, we calculate the aggregate growth in the number of workers across all Gateway and Destination jobs from 2000 to 2019 (a gain of 17.2 million workers). We calculate the expected share of STAR employment in these new jobs based on the proportion of STARs in the overall labor force in 2019 (53.1%). Comparing the expected increase in STARs employed in Gateway or Destination jobs (9.1 million) to the observed change in the number of STARs in these occupations (1.8 million) provides us with an overall measure of the 7.4 million STARs who were displaced from, or failed to realize, these employment gains.

Within individual occupations, we make slight modifications to these calculations. We estimate expected job level STAR employment in 2019 by assuming that overall employment gains or losses observed from 2000 to 2019 should be distributed to STAR and non-STAR workers equally based on their educational distribution within that occupation in 2000. Because the overall distribution of STARs in the labor force declined from 58% in 2000 to 53% in 2019, we attempt to account for that by adjusting the expected portion of job gains or losses accruing to STARs to reflect a 8.1% decline from their occupation share in 2000.[5] We compare this expected estimate of job gains or losses accruing to STARs to the observed change in STAR employment over this time period, which allows up to identify the primarily high-wage, upwardly-mobile jobs where STARs have ceded job-gains to higher educated workers, and the predominantly low-wage jobs where STARs have been displaced to.

Part C. Methodology to Create the STARs Mobility Index

The STARs Mobility Index compares occupational mobility for STARs in the 50 largest U.S. Metropolitan Statistical Areas (MSAs). This multidimensional measure accounts for wage penalties associated with not having a bachelor's degree, the distribution of STAR workers in high-wage occupations, and the amount of upward mobility observed among STAR workers over the prior five years. The Mobility Index is a relative scale from 0 to 100, with 100 indicating a metro area ranks first in all three measures. In 2019, Denver, CO — with a score of 92 — was among the highest ranked metro areas, while Louisville, KY — with a score of 67 — was among the lowest ranked metro areas for STAR mobility among major U.S. cities. We use statistical clustering techniques to classify metro areas into four groups, designed to minimize within group variance and maximize across group variance based on Mobility Scores indicating metro areas that are providing below average, average, above average, and exceptional mobility opportunities for STARs.

The Mobility Index is a composite of three separate and equally weighted measures of the civilian, non-institutionalized labor force aged 25 and older within a given metro area. The three measures are calculated as follows:

1. Measure to understand Economic Mobility

This measure quantifies the extent that STAR workers have been able to transition into higher wage occupations over the prior five years. The measure is calculated as a percentage of all STARs in a given metro area who worked in back-to-back years spanning from 2017 to 2021. An upwardly mobile job transition is defined as a change in occupation where the median national wage in the worker's current job was at least 10% higher than the job held in the prior year. This measure does not include workers who moved into a job from a period of unemployment. Nationally, 5% of STAR workers moved into higher wage occupations

across years over the period from 2017 to 2021, ranging from a high of 10% in Rochester, NY to a low of 2% in San Jose, CA. Estimates are derived from the 2017 to 2021 Current Population Survey, Annual Social and Economic Supplement, Integrated Public Use Microdata Sample.

2. Measure to understand Economic Equity

This measure captures the wage penalty faced by STAR workers compared to workers with a bachelor's degree in the same occupation. Within each major metro area, we calculate the ratio of STAR median hourly wages to median wages for workers with at least a bachelor's degree within 422 occupational groups.[6] These occupation specific ratios are then weighted by the number of STARs working in each occupation, providing the average wage penalty faced by STAR workers in a given metro. This ratio ranged from a high of 93% in Buffalo, NY, to a low of 84% in Austin, TX. Estimates are derived from the 2019 5-year American Community Survey Integrated Public Use Microdata Sample.

3. Measure to understand Economic Security

As a measure of how accessible high-wage occupations are to STAR workers, we calculate the percentage of employed STARs within a metro area who work in occupations where national wages within that occupation are above the overall national median wage. The median hourly wage at the national level for workers aged 25 and older in 2019 was $21.63, corresponding to an annual salary for a full-time, year-round worker of $44,990. Nationally, 32% of STAR workers were in occupations that paid above the median wage in 2019, however, this proportion ranged from 39% in Denver, CO, to 27% in Las Vegas, NV. Estimates are derived from the 2019 1-year American Community Survey, Integrated Public Use Microdata Sample.

These three measures are weighted equally to assign a composite Mobility Index Score based on relative scores across each of the top 50 MSAs. As shown in Appendix Table 2, the STAR earnings ratio in Denver, CO, is 87.9%, compared to the best performing metro (Buffalo, NY) Denver, CO, has a relative value of 94.8% for this measure. Alternatively, Denver ranks first in the proportion of STARs working in high-wage jobs (39%), so a relative value of 100% for this measure. The overall Mobility Index score for each metro is the sum of these relative values across all three measures, equally weighted by one-third. We use statistical clustering techniques to classify metro areas into four groups, designed to minimize within group variance and maximize across group variance based on their Mobility Scores, indicating metro areas that are providing below average, average, above average, and exceptional mobility opportunities for STARs.

Part D. Destination and Gateway Jobs

In our previous report, *Navigating with the STARs*, we pooled the 2010 - 2019 CPS ASEC and studied the year-to-year cross-occupational transitions to higher wage jobs made by STARs. We identified 292 Destination occupations which led STARs to earn at least 9.5% higher wages than their previous occupation and which moved STARs from a low-wage occupation into a middle-wage occupation or from a mid-wage occupation into a high-wage occupation. Occupations were classified as low-wage if the median hourly wage was less than the national median, middle-wage occupations if the median hourly wage was greater than the national median but less than twice the national median, and high-wage if the median hourly wage was greater than twice the national median.

Among these 292 Destination jobs, we identified 51 jobs that we termed "Gateway" jobs because they open a pathway to upward mobility to STARs. Gateway jobs offer a significant wage increase from the prior origin job and, in turn, can also lead to higher wage destination jobs. A Gateway job (for example, customer service representative) is accessible from many entry level jobs (such as tellers, cashiers, and couriers) and helps the worker build a skill set to achieve a higher wage job (such as a manager or sales representative).

Gateway jobs have to meet specific criteria: (1) Wages: Gateway jobs pay above the national median wage ($37,500/yr or $18.0/hr). (2) Trajectory: Each Gateway job is a destination occupation for at least five lower-wage occupations and is an origin job for at least five higher-wage occupations. In other words, STARs move into it from a lower-paid occupation and move from it to a higher-paid occupation. (3) Reality check: We observed actual transitions by STARs from Origin job to Gateway job, and then from Gateway job to Destination job at least 2,000 times in the 2010-2019 CPS ASEC.

Part E. STARs Belonging Survey and Manager Survey

Opportunity@Work partnered with Professor Peter Belmi and Catherine Owsik of the University of Virginia Darden School, to field two online surveys by a third party firm in August and September of 2021. The first survey was targeted towards STARs and college degree workers and the second was targeted towards only managers. The worker survey was completed by 923 individuals about their sense of belonging in the workplace. The managers survey was completed by 240 individuals about their perceptions of the American workforce, as well as STARs. In both surveys, individuals were asked about their educational backgrounds, work histories, experience in the workforce and perceptions of those with and without bachelor's degree. This included a combination of validated existing scales and newly developed questions.[8] Frequent attention checks were placed throughout the surveys to ensure respondents were reporting accurately.

The first survey aimed to understand how STARs (individuals skilled through alternative routes to a bachelor's degree) differed from those individuals with a bachelor's degree. This included investigating their beliefs about how their educational background affects their economic opportunity, job mobility, belonging in the workplace, and perception by others. The second survey focused on managers and how they viewed job success for STARs in comparison to individuals with a bachelor's degree. Here we also examined their beliefs of how their employees' educational backgrounds affected their opportunities for economic growth, job mobility, acceptance in the workplace, and overall perception.

Both surveys used a number of filtering questions to narrow our sample to those who were full-time employed and between the ages of 25-65. The questions excluded those who were enrolled in school or currently serving in the military. The result was 923 completed responses in the first survey, and 240 in the latter.

In the STAR survey, of the 923 qualified participants, over half were STARs. The average age was 45 years old, with STARs averaging slightly older than non-STARs. Half the overall participants were male, and this 50/50 percentage was consistent for both only-STARs and only-non-STARs. 641 participants (70%) were white, and this percentage was consistent for both only-STARs and only-non-STARs. There was a great deal of variation in the socioeconomic status (SES) backgrounds of respondents (see Table 3).

TABLE 3. COMPARISON OF DEMOGRAPHIC AVERAGES OF STARS AND NON-STARS.

	Non-STARs	STARs	Overall
Age	43	47	45
Annual Income	$83,000	$42,000	$62,000
Subjective SES	6 / 10	5 / 10	5.5 / 10

TABLE 4. NUMBER OF PARTICIPANTS SPLIT BY EDUCATIONAL ATTAINMENT, RACE/ ETHNICITY, AND GENDER.

	non-STARs		STARs	
	Female (or other)	Male	Female (or other)	Male
Non-White[9]	74	71	58	79
White	119	187	151	184

Methodology Endnotes

1. We exclude 20 million members of the labor force under the age of 25 from our analysis to ensure that the majority of the population studied has completed their education, this threshold is the norm in literature focused on educational attainment.
2. We are unable to assign wages to workers in subpopulations with fewer than five workers sharing the same occupation, age group, and state. These workers are subsequently classified as Forming STARs and account for 1.6% of all STARs.
3. Estimates of five-year national and state median wages include workers under age 25.
4. STARs who were unemployed last year or who worked for less than 14 weeks or for less than 10 hours a week are assigned as Forming STARs as they are unlikely to demonstrate full competence in the skills associated with their occupation.
5. Note that because some occupations employ more or less workers than others, applying a 8.1% rate of decline in STAR share consistently across all occupations may under or overestimate aggregate STAR employment, making this method most appropriate for studying changes at the job level, rather than across the entire labor market.
6. Occupations that do not have reliable estimates of median wages for both educational attainment groups within a given metro are excluded from analysis. On average, we compare 211 detailed occupations across the 50 largest MSAs.
7. Calculated as 87.9% (Denver, CO) divided by the maximum value of 92.7% (Buffalo, NY).
8. The following validated scales were used in the study: Identity threat (adapted from Cohen & Garcia, 2005); Perceived expectations of Disrespect (Belmi et al., 2014); Sense of Belonging (Good et al., 2012); Inclusive climate measure (adapted from Nishii, 2013); Need satisfaction at work (adapted from Van den Broeck, 2010); Family achievement guilt (adapted from Covarrubias et al., 2020);Depression (Lowe at al., 2005); Creative Self (adapted from Karwowski, 2012).
9. For ease of reportability in this preliminary analysis, we use non-white as a category for participants that are Black, Asian, Hispanic, multiracial, etc. We also combined "female" gender with the four participants that reported they were non-binary, other, or preferred not to answer.

Endnotes

1. A worker who is a STAR is Skilled Through Alternative Routes instead of a bachelor's degree. There are more than 70 million workers who have a high school diploma but who do not have a bachelor's degree who we classify as STARs. Unless otherwise noted, all estimates in this report are based on Opportunity@Work analysis of the 2021 Current Population Survey (CPS) Annual Social and Economic Supplement (ASEC) Integrated Public Use Microdata Series (IPUMS).
2. Economic mobility can be measured in a number of ways, but at its core, it refers to how individuals or communities move up or down the economic ladder over time. In this report, we are referring to individuals' ability to move into higher paying occupations over the course of their working lives. This measure of absolute financial intragenerational mobility is narrowly defined; we are not accounting for mobility through social or human capital gains, or the longer-term impact of intergenerational gains in economic standing.
3. Adapted from Blair, Debroy, and Heck (2021, 2-3). Using data from the 1989 to 2019 Annual Social and Economic Supplement (ASEC) of the Current Population Survey (CPS) microdata accessed via IPUMS, the authors calculated median wages in 2019 dollars for STARs and workers with a bachelor's degree or higher who were 25 to 29 years old in 1989 and followed that age cohort over the course of their careers (i.e., 26 to 30 years old in 1990, 27 to 31 years old in 1991, etc.).
4. Lambert, Lance. (2021). "How do CEOs view the labor shortage?" *Fortune Magazine*, October 21. https://fortune.com/2021/10/21/the-great-resignation-is-no-joke/.
5. Blair et al., (2020).
6. Autor. (2010).
7. Gateway jobs are defined in *Navigating with the STARs* as occupations which meet the following criteria: (1) Wages: Gateway jobs pay above the national median wage. (2) Trajectory: Each Gateway job is a destination occupation for at least five lower-wage occupations and is an Origin job for at least five higher-wage occupations. In other words, STARs move into it from a lower-paid occupation and move from it to a higher-paid occupation. (3) Reality check: We observed actual transitions by STARs from the Origin to Gateway job, and then from Gateway job to Destination job at least 2,000 times in the last ten years. See the Appendix Section D for additional details on the methodology used to identify Gateway and Destination jobs.
8. We calculate this figure by considering how many more STARs would be in Gateway and Destination occupations had new jobs (or jobs lost) been filled by the proportion of STARs in the overall labor market in 2019 (53.1%). Using this measure, we find that 7.4 million STARs have been displaced from Gateway and Destination occupations. See Appendix Section E for additional details on the methodology used to identify displaced STARs.
9. This work aligns with other similar efforts to identify occupations that offer outsize opportunity to workers without a bachelor's degree, most notably, work done by researchers at the Federal Reserve Banks of Cleveland and Philadelphia to identify what they refer to as "opportunity occupations." Of the 30 occupations we identify as occupations of focus for STARs, 18 are also identified as among the 100 largest opportunity occupations.
10. American Association of Colleges of Nursing. (2020).
11. A number of other researchers and organizations have made significant contributions to quantify how economic mobility varies geographically, most notably through the Harvard University Opportunity Insights Program and by researchers at the Federal Reserve Banks of Cleveland, Philadelphia, and Atlanta. The STAR Mobility Index differs from these measures in a number of ways, namely we are studying mobility within a workers' lifetime rather than intergenerational mobility. Further, in addition to incorporating the prevalence of high-paying jobs within a metro area, we also incorporate measures of observed jobs transitions and pay equity across educational attainment groups.
12. For a comparison of regional exposure to automation and trade, see Autor and Dorn (2013) or Autor et al. (2013)
13. In this report, we refer to metropolitan statistical areas (MSAs) based on their principal city, for example, Denver, CO, is referring to the entire Denver-Aurora-Lakewood, CO, MSA. Some regions of focus may be colloquially referenced differently than labeled by their MSA (ex: "Hampton Roads" is frequently how the Virginia Beach, VA, MSA is referred), here, we label the metro region by their MSA principal city.
14. The Virginia Beach, VA, MSA also spans portions of North Carolina.
15. Opportunity@Work analysis of the 2019 1-year American Community Survey, Integrated Public Use Microdata Series.
16. Opportunity@Work analysis of the 2019 1-year American Community Survey, Integrated Public Use Microdata Series.
17. Gallup Poll Item 10: I Have a Best Friend at Work
18. Walton & Cohen, 2011; Belmi & Schroeder, 2021; Good et al., 2012; Phillips et al., 2020.

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About Opportunity@Work

Opportunity@Work is a nonprofit social enterprise with a mission to increase career opportunities for the more than 70 million adults in the U.S. who do not have a bachelor's degree but are Skilled Through Alternative Routes (STARs). For STARs, the American Dream has been fading due in part to an "opportunity gap," in which access to the good jobs required for upward mobility often depends less on people's skills and more on whether and where they went to college, who they know professionally and socially, or even how they look. We envision a future in which employers hire people based on skills rather than their pedigree. We are uniting companies, workforce development organizations, and philanthropists in a movement to restore the American Dream so that every STAR can work, learn, and earn to their full potential.

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