
Oregon Talent Assessment 2020 Update

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Prepared for the Oregon Workforce and Talent Development Board

Final Report

ECONorthwest

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Table of Contents

1. INTRODUCTION AND SUMMARY	1
2. EMPLOYERS' PERSPECTIVES DURING AN UNPRECEDENTED ECONOMIC EXPANSION	3
PERSPECTIVES FROM THE <i>2018 ASSESSMENT</i>	3
PERSPECTIVES FROM THE <i>2019 OBC BUSINESS CLIMATE SURVEY</i>	3
3. WAGE GROWTH, SHORTAGES, AND LABOR PRODUCTIVITY	7
UPDATE ON WAGE GROWTH AND EVIDENCE OF SHORTAGES	7
RECENT FINDINGS ABOUT STATE-LEVEL LABOR PRODUCTIVITY	9
4. WORK OF THE FUTURE	10
TAKEAWAYS FROM THE <i>2018 ASSESSMENT</i>	10
RECENT FINDINGS ON WORK OF THE FUTURE	10
5. TRAINING FOR WORK OF THE FUTURE	16
6. POLICY IMPERATIVES	19

1. Introduction and Summary

Oregon's Workforce and Talent Development Board (WTDB) leads the state's thinking about the future of work and the skills required to complete it. In September 2018, the WTDB published the *Oregon Talent Assessment*, which offered business and industry's determination of in-demand occupations, in-demand skills, talent gaps, and trends. The report introduced a common taxonomy of skill problems (i.e., gaps, shortages, and mismatches) and diagnosed conditions through a combination of employer surveys and analyses of economic data. The *Assessment* determined that employers didn't perceive basic skills gaps but did see a shortage of skills required for specific occupations—with problem solving and critical thinking at the top of the list. Employers signaled a high demand for engineers, skilled tradespeople, and project managers. And the report concluded that key interpersonal skills (e.g., leadership, honesty, ability to work in teams) are lacking while also growing in importance. The *Assessment* served as a foundational document for the 2020-2021 WTDB strategic plan.

This report revisits the *Assessment's* findings to confirm, update, expand, or provide further support for them. Unprecedented economic times justify a new look. The U.S. is entering the 11th year of an economic expansion—the longest in history. The extended duration of the expansion has benefited workers with lower skills and/or higher barriers to employment. In this relatively tight labor market, employers who want to grow must consider candidates who require additional training and/or additional accommodations of workers' needs (e.g., transportation, childcare). Economists express no clear consensus about how many more candidates can be pulled off the sidelines without putting strong upward pressure on wages and triggering inflation. Oregon and the U.S. are in uncharted economic territory.

Eighteen months is quick turnaround for an update—especially in light of the stable economic conditions. Given the stability, this report has less to say about changing conditions on the ground and more to say about fresh perspectives on the pace of technological progress and the redesign of postsecondary education and training.

We summarize the key findings below:

- **Oregon business leaders have mixed views on the condition of the labor force.** A September 2019 survey of 469 executives—who lead small to large companies across the state—characterized Oregon's skilled labor as a competitive weakness. However, the same respondents were bullish on university-business relationships and on innovation infrastructure, including the availability of scientists and engineers. The responses suggest employers were more satisfied with the high-skill than the low-skill end of Oregon's labor market. Notably, the survey covered a much broader range of industries than the survey included in the *2018 Assessment*. The former extended into local sector businesses (e.g., retail trade); the latter was targeted to the traded sector. The timing of the survey, during the unprecedented 11th year of an economic expansion and a tight market for labor, undoubtedly influenced the perspective.

- **Strong wage gains in construction, transportation, and design suggests labor shortages.** Economists look to prices, in this case wages, for signals that talent is in short supply. Overall, median hourly wages just kept pace with inflation during 2016-2018, which does not suggest widespread shortages. Gains were stronger in the construction, transportation, and design sectors—unsurprising given building activity and the growth of Oregon’s sportswear and apparel sector. Hourly wages for sales, food preparation, personal care, and building/grounds maintenance workers also outpaced inflation. Increases in the minimum wage and a tight labor market drove the changes in these sectors.
- **The focus on technological disruption has drawn attention away from another important megatrend: slow growth of the so-called prime-age work force.** Demographers have anticipated the aging of the U.S. population for decades, but the labor force and economic effects are becoming more apparent as Baby-boomers fully transition out of their prime working years (i.e., 25-54). Nationally, the slow growth, or contraction, of the prime-age workforce is a rising concern. Almost one-half of the U.S. population lives in a county where the prime-age workforce shrank during 2007-2017. Based on these national trends, some top economists believe policymakers should shift their concerns from job *quantity* (they see plenty of work to go around) to job *quality*. Oregon, which will see stronger growth in the 25-54 cohort than the nation, should continue to worry about both.
- **New work—created in the last 50 years—has fallen into three categories and has exacerbated inequality.** Analyses of newly created occupational titles reveal three types of new work. Workers in *frontier jobs* design, build, and interact with newly created technologies (e.g., search engine optimization). *Last-mile* workers complete the final tasks in jobs that are otherwise highly automated (e.g., order fulfillment). And *wealth* workers provide services to affluent customers (e.g., yoga instructors). Big gains by the frontier workers, relative to the other two categories, have contributed to inequality during recent decades.
- **Cities are no longer the land of opportunity for non-college degree holders.** Circa 1970, cities employed sizable shares of non-college educated workers in “middle-skill” production, clerical, office administrative, and sales jobs. The middle-skill urban jobs served as economic ladders for non-college goers and delivered reliable urban wage premiums. Automation and globalization have sharply curbed the growth of urban, middle-skill work during the past five decades. What’s left are increasingly polarized urban job markets: higher skill work for the increasing shares of residents with college degrees and lower skill work, relative to the past, for anyone without a college degree. For now, it appears that large cities have lost their status as the land of opportunity for everyone.
- **Training for the work of the future will require an advanced ability to certify skills and redesign training.** Oregon appears to be ahead in the postsecondary redesign game, but it’s still early. Career pathway programs—education and training programs of various kinds that help students advance to better paying jobs over time¹—have taken

root across the state, and rates of apprenticeship participation are higher than most places outside of the Midwest. Methods of documenting and certifying skills, including competency-based education, are still in their infancy. Today's best practices could be outdated two years from now. Getting on, and staying on, the frontier of that work is an imperative.

2. Employers' Perspectives During an Unprecedented Economic Expansion

Perspectives from the 2018 Assessment

The 2018 *Talent Assessment* included findings from a survey of 363 employers from ten key industries identified by the WTDB. We supplemented the survey findings with 58 stakeholder interviews conducted one-on-one or small focus groups.

The 2018 report considered three types of skill problems: *gaps*, which involve a widespread shortfall of basic skills; *shortages*, which are shortfalls of skills required for specific occupations; and *mismatches*, which suggest an over- or undersupply of skills at a particular point in time.

Most employers did not report widespread gaps in basic skills and agreed that most applicants possessed the minimum skills required for their vacant positions. Employers identified shortages in problem solving and critical thinking skills and also signaled a high demand for engineers, skilled tradespeople, and project managers. Finally, our analysis suggested skill mismatches for some younger workers: only one-half of 23-29-year-old workers who held bachelor's degrees were employed in an occupation that required a bachelor's degree.

The survey and interview responses suggested Oregon's talent was generally meeting employers' needs but could improve with targeted technical training and project-based learning experiences.

Perspectives from the 2019 OBC Business Climate Survey

The Oregon Business Council (OBC) conducted a business climate survey during August-September 2019.² The survey, administered by DHM Research, asked executive-level respondents to assess a range of local conditions that affect business operations, including tax and regulatory policies, the availability and quality of skilled labor, the performance of education systems, and access to capital.

The *OBC Business Climate Survey* differed from the *Assessment* survey in a number of important ways. First, the OBC survey was much broader in its substantive scope and addressed talent-related issues together with a number of other business climate issues. Second, OBC reached out to a broader range of industries, including a number in the local sector (e.g., food service,

retail, real estate) that were not the focus of the *Assessment* survey. Third, OBC issued its survey later in the economic cycle, when employers were struggling with a tighter labor market. And, notably, the survey followed the enactment of the Corporate Activity Tax—a tax on adjusted business gross receipts—which generally earned neutral to negative reviews from the larger business community.

DHM targeted the online survey to senior executives (e.g., CEOs, presidents, CFOs, COOs, vice presidents) identified through common networks, including chambers of commerce and regional business associations. DHM and OBC made efforts to include a representative group of businesses based on location, total revenue, number of employees, and industrial sector. Four hundred and sixty-nine (469) respondents took an average 11 minutes to answer 43 questions. About one-quarter of the firms were located in Greater Portland, 40 percent were from the Willamette Valley, and the balance were from the rest of state, with good representation across subregions. Two-thirds of responding firms had total revenues below \$10 million annually, and 14 percent had yearly revenue in excess of \$100 million.

Respondents expressed strong concerns about the business climate generally. Most leaders—across industries, firm size, and regions—said the state’s business environment compared unfavorably with Oregon’s western neighbors³ (with the exception of California). Taxes and regulatory policies topped the list of concerns. As for strengths, respondents considered the quality of life a competitive strength.

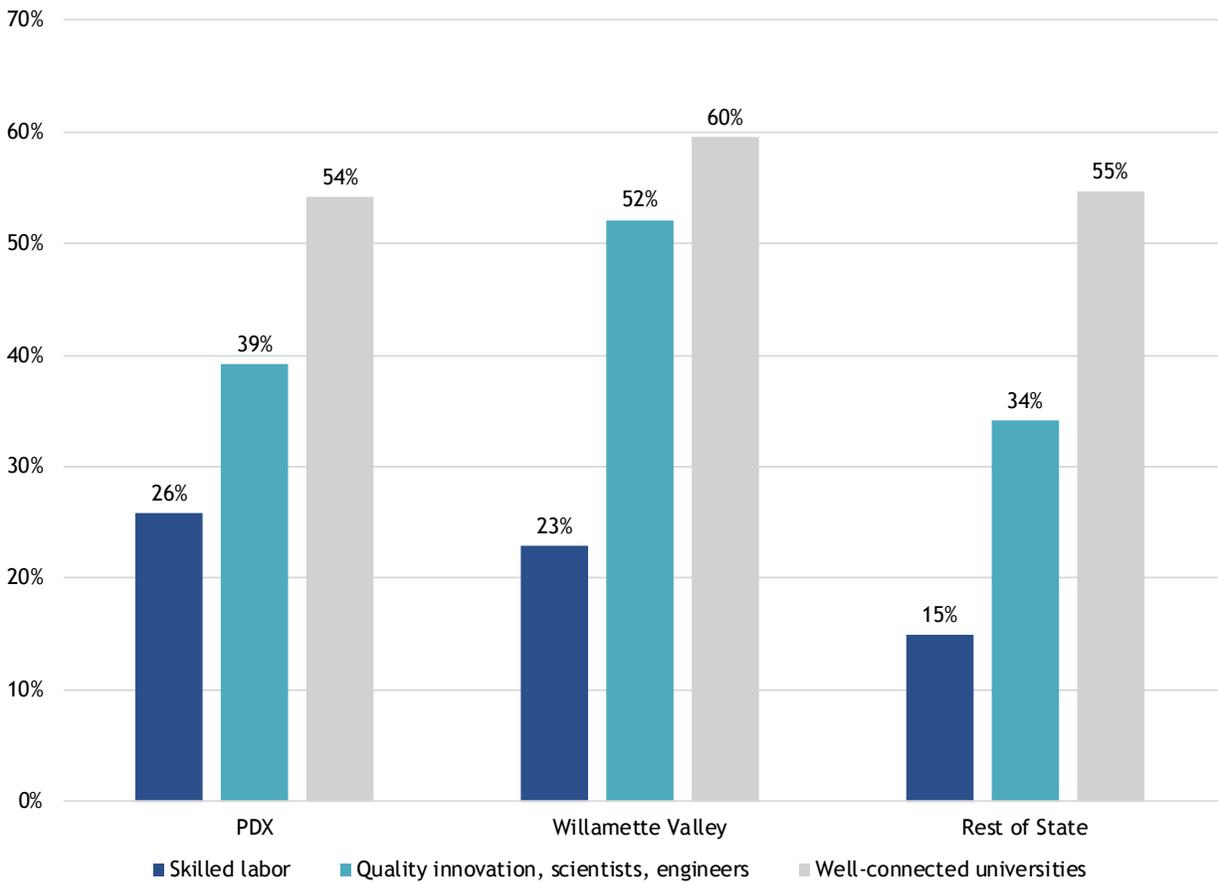
The survey inquired about three elements directly related to the postsecondary and workforce development systems:

- Availability of skilled labor and talent
- Innovation infrastructure (high-quality scientific research institutions, availability of scientists and engineers)
- High-quality universities with strong linkages to the private sector

Employers characterized skilled labor and talent as a competitive weakness and innovation infrastructure and high-quality universities as competitive strengths. Notably, the innovation infrastructure includes high-end workers: scientists and engineers.

Responses varied across the state (see Figure 1). Only about a quarter of Portland leaders considered skilled labor a competitive strength and that compared favorably with perspectives in the Willamette Valley and the rest of the state (23 and 15 percent, respectively). In open-ended responses, employers described tight labor markets, which have put upward pressure on wages. And several employers made reference to subpar work ethics. Respondents had more positive things to say about universities, research institutions, scientists, and engineers. Perhaps unsurprisingly, Willamette Valley employers, who operate in close proximity to the state’s flagship universities, were the most upbeat, with more than half deeming innovation infrastructure and universities competitive strengths.

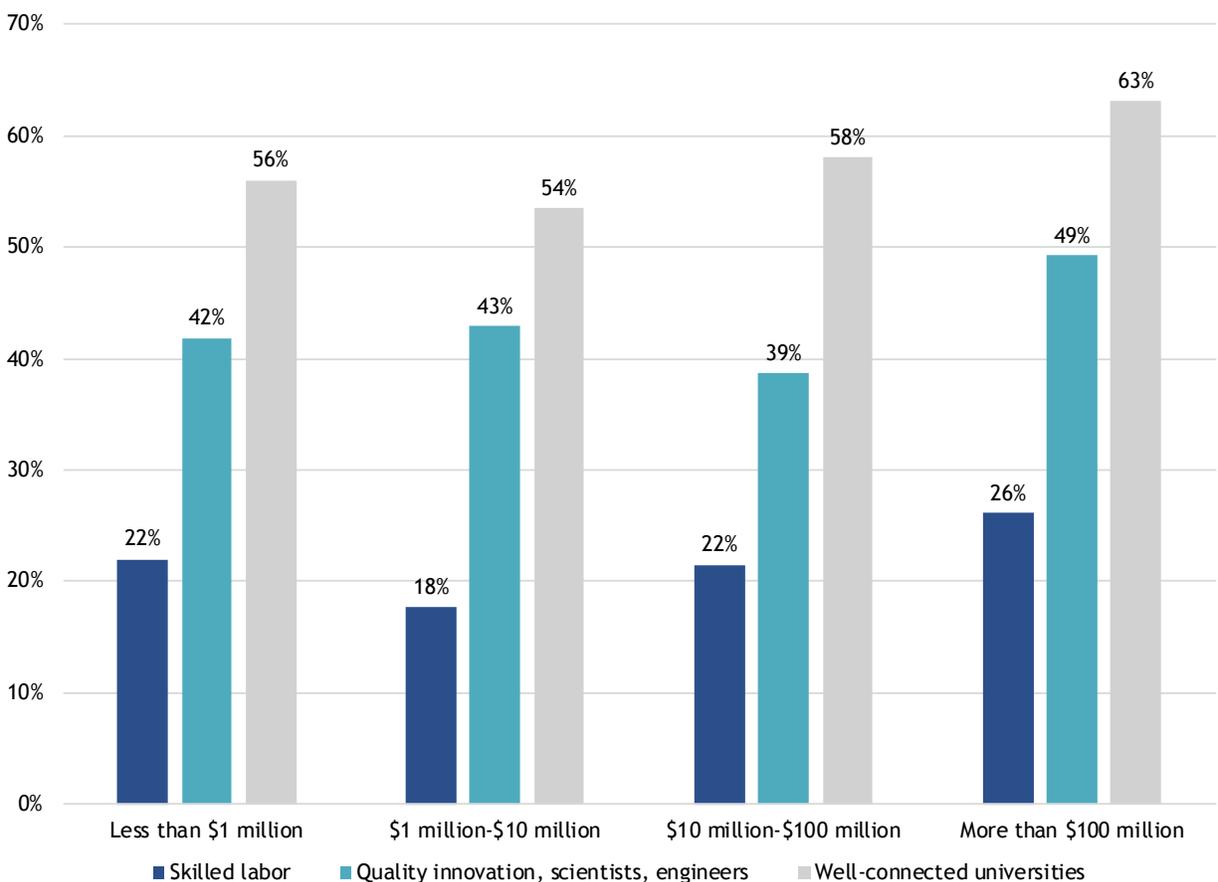
Figure 1. Share of survey respondents indicating that each element is a competitive strength for Oregon, by region, 2019



Data source: Oregon Business Council Business Climate Survey, 2019

The state’s largest employers—those with more than \$100 million in annual revenue—view better labor, innovation, and university conditions than their smaller counterparts (see Figure 2). Almost two-thirds of the larger employers see universities as a competitive strength.

Figure 2. Share of survey respondents indicating that each element is a competitive strength for Oregon, by employers' annual revenue category, 2019



Data source: Oregon Business Council Business Climate Survey, 2019

Asked about the three biggest impediments to Oregon’s growth going forward, the availability of skilled labor and talent topped the list (41%) followed by taxes and regulations. More than half of business leaders see skilled labor conditions deteriorating in coming years. They anticipate conditions at universities and research institutions will stay the same.

Stepping back from the detailed findings, a story begins to emerge. The responses suggest that Oregon’s market for labor is functioning better at the high end, where larger employers may have well-established and coordinated relationships with universities. The state has made intentional investments, especially in engineering, and they appear to be paying off. Moreover, when large employers run out of options in the local labor pool, they are more likely than their smaller counterparts to pull in talent from other places.

Outside of this university and innovation space, employers describe conditions that are much more dire than those offered by the *Assessment’s* respondents. Again, the *Assessment* was focused (mostly) on traded sector industries. By contrast, the *OBC Business Climate Survey* is picking up challenges experienced in the food service, accommodations, retail trade, and

wholesale trade sectors. Most of these employers are adjusting to the implementation of higher minimum wages along with competition for skilled labor in an unprecedented 11th year of a U.S. economic expansion. Operating one of these local-sector businesses in a small town likely adds to the challenge.

3. Wage Growth, Shortages, and Labor Productivity

Update on Wage Growth and Evidence of Shortages

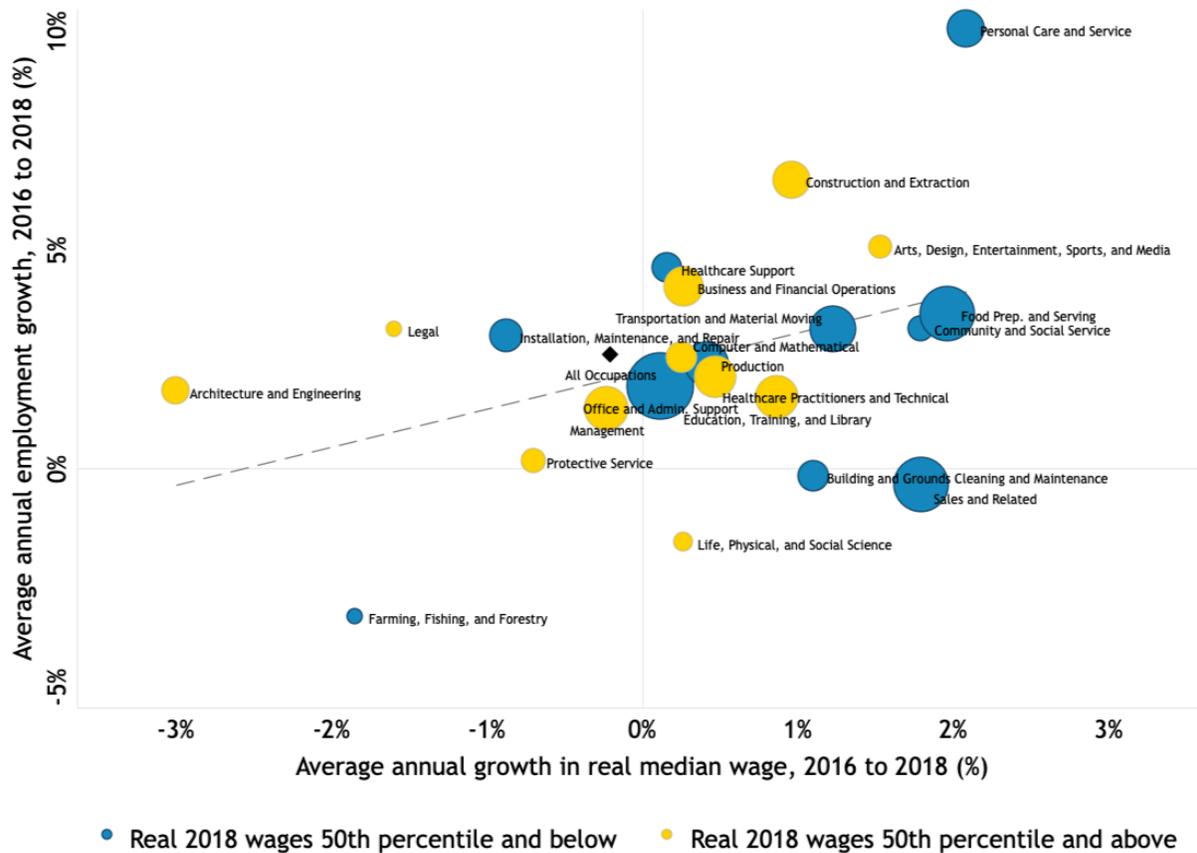
Reports of skill shortages were common early in this economic expansion, when unemployment rates were high, and have increased as the labor market has tightened. When economists hear reports of skill shortages, a first instinct is to investigate wages. Basic economic theory concludes that if a shortfall of a good or service exists, its price should rise. If the price isn't rising (in this case, employers aren't offering higher wages), then it suggests that the advertised positions may not be critical to the employers' business strategies.

Overall wage trends reported in the *2018 Assessment* report did not point to widespread shortages: Oregon's growth in real median hourly wage from 2016 to 2017 was just 0.1 percent. However, some occupations—mostly related to construction and transportation—did suggest shortages.

We return to the Oregon wage data with findings for an additional year (into 2018). Figure 3 reports annualized wage and job growth during 2016-2018 for key occupational sectors. As with our last report, growth in median hourly wages—measured across all occupations and adjusted for inflation—is close to zero.

Median hourly wages for the typical worker kept pace with inflation but didn't beat it. But there were winners and losers. Unsurprisingly given building activity, median wages for construction- and transportation-related occupations continue to show strong growth. Additionally, personal care and service, food preparation, social services, building and ground maintenance, and sales occupations had wage gains well above inflation. Not all of these occupations were growing in numbers—sales and building and grounds maintenance contracted slightly. Two factors may explain rising hourly wages in these slow- or no-growing occupations. First, Oregon's minimum wage, which increased during the period, almost certainly played a role. Second, late in this expansion, employers may have offered higher wages to compete with better paying alternatives.

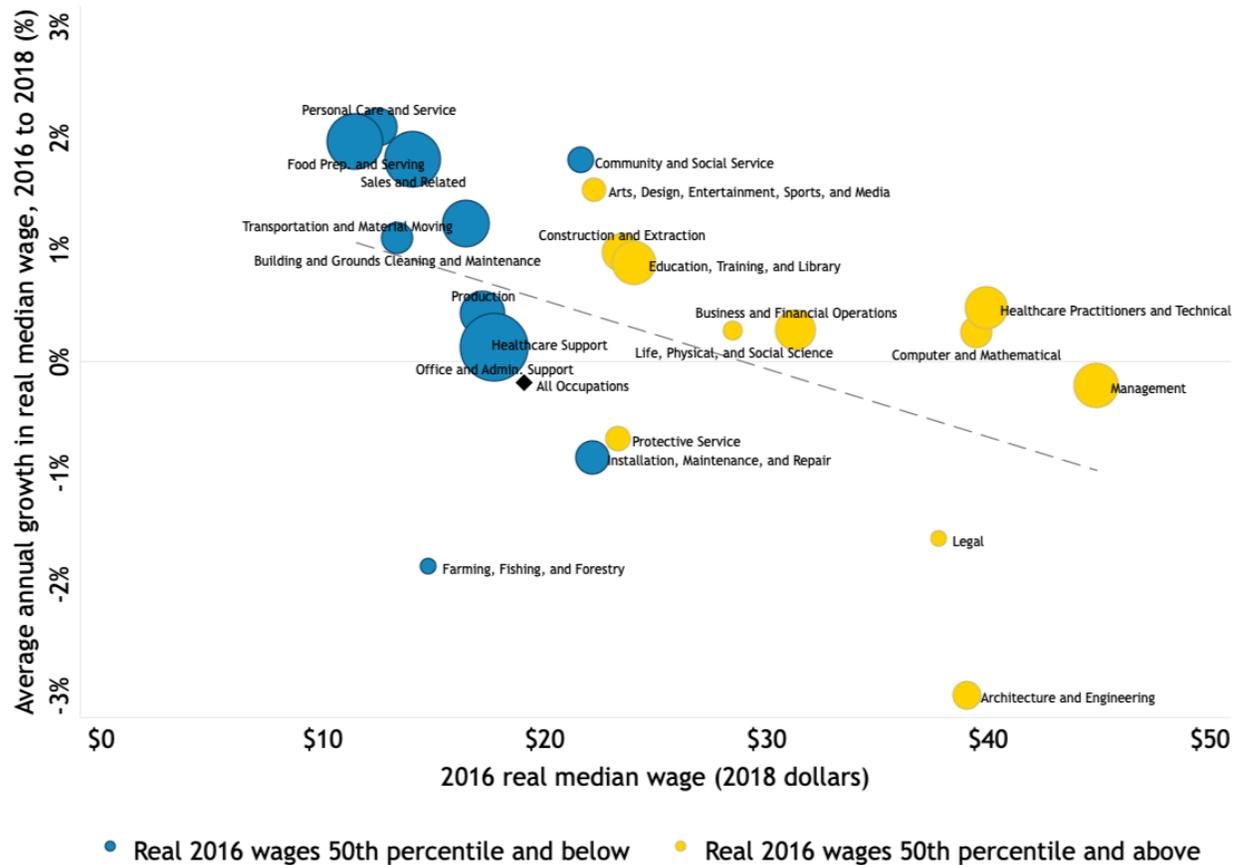
Figure 3. Average annual wage and employment growth by occupational sector, Oregon, 2016-2018



Data source: United States Bureau of Labor Statistics, Occupational Employment Statistics, Oregon, 2015-2018

Figure 4 compares wage growth to the occupational sector’s median wage and shows the biggest gains were for occupations at the lower end of the scale. Again, an increasing minimum wage and more competition for talent have both likely played roles.

Figure 4. Real median wage (2016) and average annual wage growth (2016-2018) by occupational sector, Oregon



Data source: United States Bureau of Labor Statistics, Occupational Employment Statistics, Oregon, 2015-2018

Recent Findings About State-level Labor Productivity

The U.S. Bureau of Labor Statistics (BLS) recently developed experimental measures of state-level labor productivity for the private nonfarm sector that highlight the extent to which states drive productivity growth at the national level.⁴ The numbers go back to 2007, when BLS began tracking state-level average weekly hours for all employees. From 2007 to 2017, average annual state-level labor productivity growth ranged from -0.7 percent for Louisiana to 3.1 percent for North Dakota (contributable to the state’s shale oil boom). After North Dakota comes California, Oregon, and Washington, all at 1.7 percent. BLS reports that most productivity gains over the time period were the result of hours worked falling faster than output. In Oregon and other states, productivity gains are correlated with the size of the information and communications technology sectors. Overall, Oregon’s talent is making a strong contribution to national productivity growth.

4. Work of the Future

Takeaways from the *2018 Assessment*

The *2018 Assessment* drew on the Oregon Employment Department's (OED) 2020-2027 job projections, which boil down to several broad themes: an aging population will demand more healthcare and caregiving; automation will continue to erode employment in all sectors related to paper, from papermaking to publishing; Oregon's low residential and commercial vacancy rates (and high prices) suggested strong growth in the construction sector; and the government—at all levels—was positioned for slow growth. Five of the top ten fastest growing occupations were health-related: physician assistants, home health aides, nurse practitioners, health specialties teachers, and health diagnosing practitioners. With the leading edge of the Baby-boom generation entering their mid-70s, the projections seemed reasonable at the time—and they still do.

The scope and pace of technological progress was the big question mark. Most observers anticipated continued destruction of routine work tasks, with disproportionate impacts in food service, office and administrative, sales, and production occupations. Economists argued affected occupations wouldn't disappear entirely, but the tasks within occupations would change, and workers would have to adapt accordingly. Artificial intelligence experts anticipated even more disruption and see technology outperforming human labor at higher points on the skill ladder (e.g., disease diagnosis, creative writing, clothing design).

Recent Findings on Work of the Future

Only 18 months old, the conclusions of the *Assessment* still ring true. That said, the interplay between labor and technology is an active area of research, and a number of relevant, new analyses have emerged since the *Assessment's* release. Below, we highlight findings from the Massachusetts Institute of Technology (MIT) Task Force on the Work of the Future,⁵ the Brookings Institution, and others.

- **Technology will progress but probably not at the rate projected by alarmists.** Economists have always been skeptical that technological advances would abruptly reduce the need for human labor. An unprecedented series of monthly job gains in this economic expansion, together with historically low unemployment rates, have reinforced their case.

The pace of technological gains has been moderated for a variety of reasons. Industrial robots, while ever more capable, are still expensive and best deployed in highly controlled, segregated settings. Workplace safety concerns, for the humans who complement and maintain the robots, slow the pace of implementation. Automation outside of controlled factory settings, including the deployment of autonomous vehicles, is facing increased scrutiny after high-profile accidents. Here too, safety concerns will

slow the adoption of autonomous vehicles, especially in complex urban environments. And the field of machine learning must address concerns about potential biases in underlying data and be better positioned to provide explanations on how machine learning makes decisions, even as it successfully complements some occupations.

Bottom line: what technologists are able to conceive and what communities and markets are willing to accept are different. Robotics, artificial intelligence, and machine learning—like technologies of the past—will advance, substitute for labor in some settings, complement it in others, and, hopefully, boost productivity and standards of living. Technical feasibility and trust will govern the pace of change.

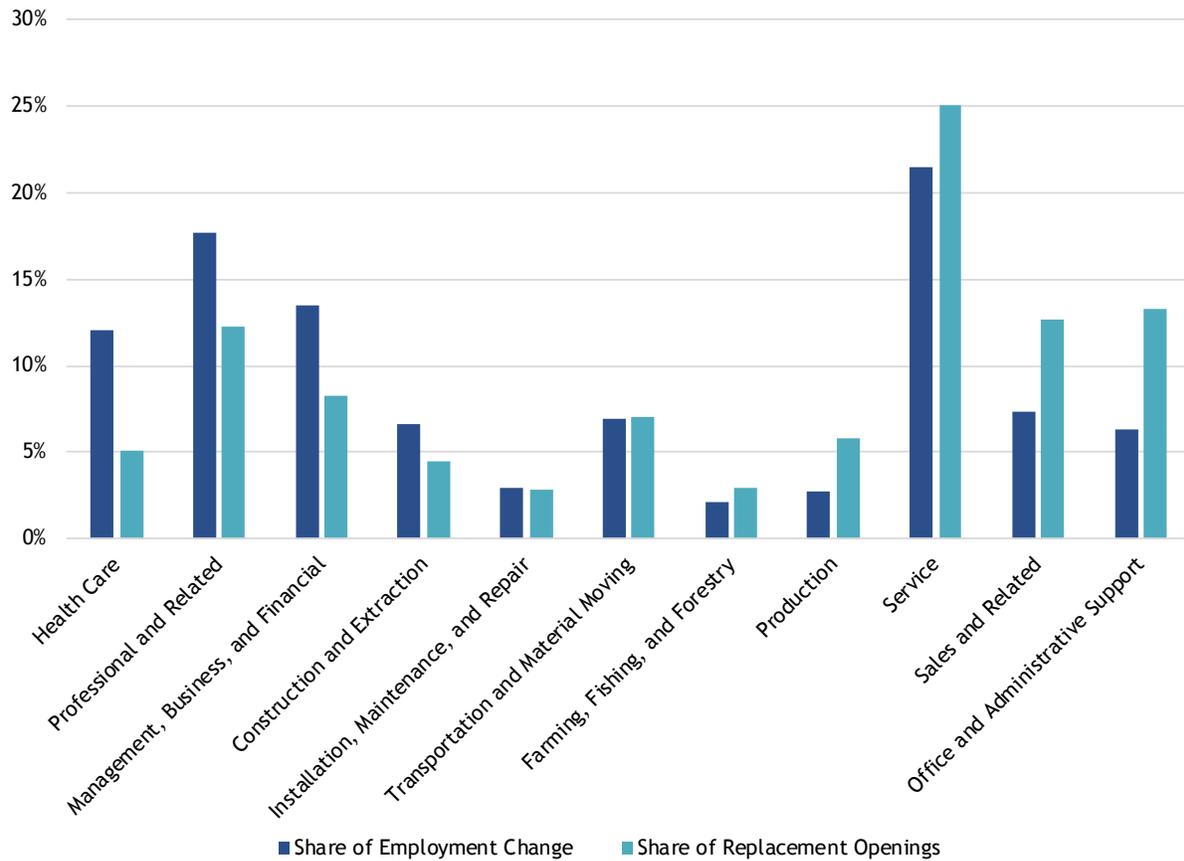
- **Nationally, labor scarcity may be a bigger concern than technological disruption. Oregon’s labor force outlook is better than the nation’s.** A recent focus on technological changes has overshadowed another trend that will shape the future of work: slow growth of the prime-age workforce (i.e., workers aged 25-54). Demographers have anticipated the aging of the U.S. population for decades, but the labor force and economic effects are becoming more apparent as Baby-boomers fully transition out of their prime working years.

One consequence is that even slow-growing occupations will have sizable numbers of job openings, in part, because of exiting retirees. In Oregon, for example, economists predict automation will slow the growth of total jobs in production, office administration, and sales occupations, but hiring will continue: the three occupation groups compose only 17 percent of projected employment change during 2017-2027 but 32 percent of replacement job openings (see Figure 5).

Nationally, the slow growth, or contraction, of the prime-age workforce in the face of projected employer demand for workers is a rising concern. Almost one-half of the U.S. population lives in a county where the prime-age workforce shrank during 2007-2017. Thanks in part to in-migration, the comparable number for Oregon is only 18 percent. And going forward, Oregon appears to be better positioned: demographers project Oregon’s 25-54-year-old population will increase 21 percent during 2020-2040 compared to only 14 percent for the nation. Nine states anticipate no growth or declines.⁶

Based on these national trends, the MIT Task Force believes policymakers should shift focus from job *quantity* (they see plenty of work to go around) to job *quality*. Oregon, with its growing prime-age population and projected job growth, should continue to address both.

Figure 5. Employment change and replacement openings as a share of total employment, Oregon, 2017-2027



Data source: Oregon Employment Department, Workforce and Economic Research, Oregon Employment Projections, 2017-2027

- New work over the last 50 years has fallen into three categories.** Economists follow the evolution of Census occupational titles to track changes in the nature of work. Previously unnamed, unclassified jobs eventually grow large enough in number that the Census Bureau issues a title.⁷ A recent analysis found the new jobs—those created since 1970—have landed in one of the three clusters (see Table 1).

Table 1. Examples of new job titles by new work category and decade, 2019

	Frontier Work	Last Mile Work	Wealth Work
1980	Supervisor, Word Processing Controller, Remotely-Piloted Vehicle	Check Writer Tamale-Machine Feeder	Hypnotherapist Gift Wrapper
1990	Circuit Layout Designer Robotic Machine Operator	Vending-Machine Attendant Film Touch-Up Inspector	Dance Therapist Singing Messenger
2000	Artificial Intelligence Specialist Echocardiographer	Chat Room Host / Monitor Bicycle Messenger	Counselor, Marriage-Family Employee Wellness Coordinator
2010	Technician, Wind Turbine Intelligence Analyst	Underground Utility Cable Locator Technician, Prepress	Exercise Physiologist Sommelier

Source: Autor, David and Salomons, Anna. “New Frontiers: The Evolving Content and Geography of New Work in the 20th Century [Extended Abstract].” May 2019.

Workers in *frontier jobs* design, build, and interact with newly created technologies (e.g., robot integration, search engine optimization). They earn 30 percent more than the average worker and are more likely to hold college degrees. *Last-mile* workers complete the final tasks in jobs that are otherwise highly automated (e.g., order fulfillment, call-center operators). They earn 20 percent less than average worker and are less likely to hold college degrees. Finally, *wealth* workers provide services to affluent customers (e.g., yoga instruction, personal training, counseling). They earn average wages, are more likely to be female, and their educational attainment levels fall between those of the two other categories.

This “new” work—created since 1970—composed 13.1 percent of all jobs in 2015. How these three categories of work grow will influence levels of inequality.

- **Cities are no longer the land of opportunity for non-college degree holders.**

Historically, when job opportunities weakened for workers without college degrees in rural areas, workforce developers could direct job seekers to cities. Circa 1970, cities employed sizable shares of non-college educated workers in “middle-skill” production, clerical, office administrative, and sales jobs. The middle skill, urban jobs served as economic ladders for non-college goers and delivered reliable urban wage premiums.

Automation and globalization have sharply curbed the growth of urban, middle-skill work during the past five decades.⁸ What’s left are increasingly polarized urban job markets: higher skill work for the increasing shares of residents with college degrees and lower skill work, relative to the past, for anyone without a college degree. For now, it appears that large cities have lost their status as the land of opportunity for people of all education levels.

- **Characteristics of low-wage workers will vary across geography, and so will their needs.** Low-wage workers are a heterogeneous group. Many are living in or near

poverty. Some are sole earners and others are secondary earners. Some are just getting a start in their careers while others may be at a plateau.

Recent work took a deep look at low-wage workers across the U.S. and within 373 metropolitan areas.⁹ The analysis found 53 million low-wage workers aged 18-64. They represented 44 percent of all workers and earned about \$16 per hour during 2012-2016. Researchers sorted the workers into nine clusters that varied by age and level of educational attainment:

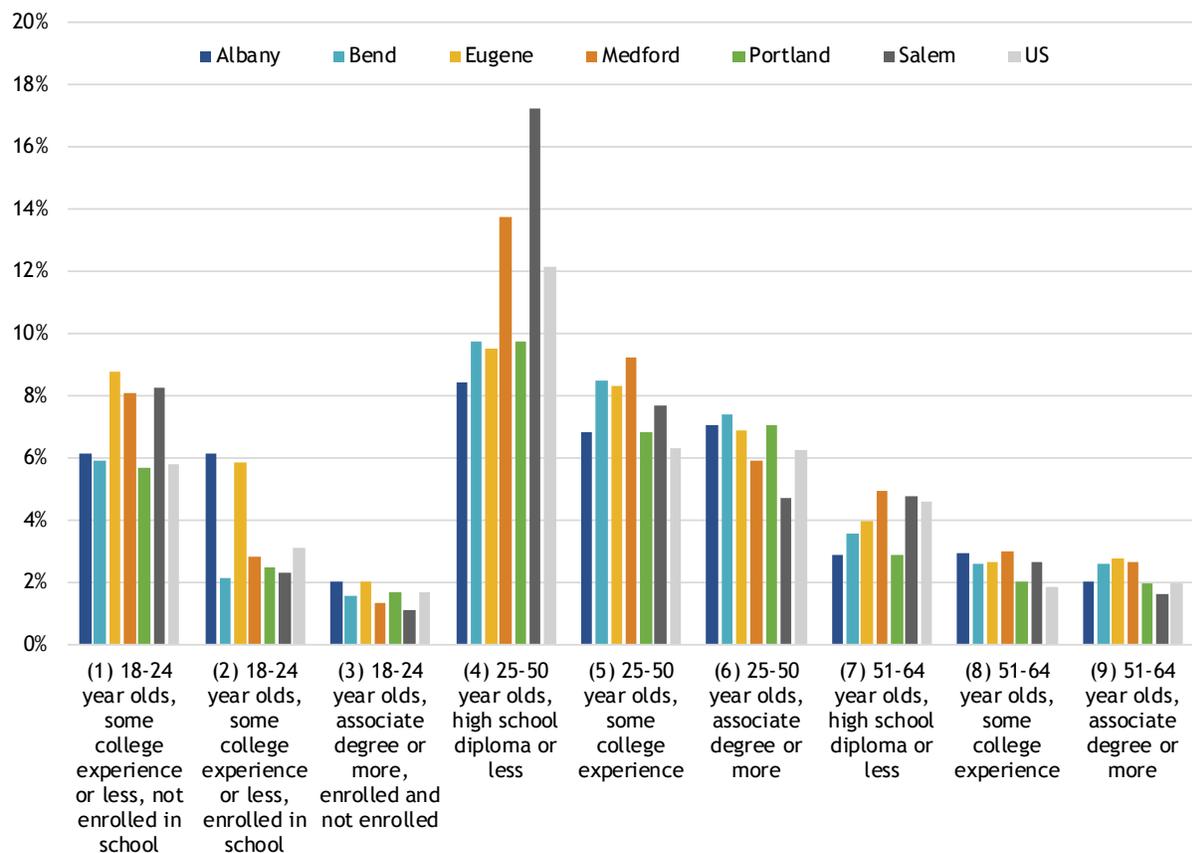
- 1) Ages 18-24 not in school, no college degree
- 2) Ages 18-24 in school, no college degree
- 3) Ages 18-24, with an associate degree or more
- 4) Ages 25-50, with a high school diploma or less
- 5) Ages 25-50, with some college but no degree
- 6) Ages 25-50, with an associate degree or more
- 7) Ages 51-64, with a high school diploma or less
- 8) Ages 51-64, with some college but no degree
- 9) Ages 51-64, with an associate degree or more

Clusters 1, 4, and 5 showed higher levels of financial vulnerability: higher poverty rates and workers who were more likely to be sole earners in their households.

Focusing on Oregon's metropolitan areas, low-wage earners represent about 44 percent of all workers in Bend and Corvallis-Albany (similar to the U.S. average), 40 percent in Portland, and more than 50 percent in Eugene, Medford, and Salem. Medford and Salem have above-average shares of workers in all three financially vulnerable clusters (i.e., 1, 4, 5), Eugene stands out in Clusters 1 and 5, and Bend in Cluster 5 (see Figure 6).

The work illustrates variations across geography and underscores that policy responses should be tailored to local conditions. The high shares of low-wage workers in Medford and Salem, for example, are driven both by the low educational attainment of their workforces and the nature of the jobs available to them. In the past, economists may have encouraged some of these workers to move to Portland (or another large city), but that advice is not as helpful as it was in the past (per the discussion above). Colleges and workforce developers need to support skill development for workers who lack postsecondary credentials. But, if the situation is going to improve, economic developers will also have to grow, or attract, better paying jobs.

Figure 6. Percent of metro area’s workers who have low wages, by cluster, 2016



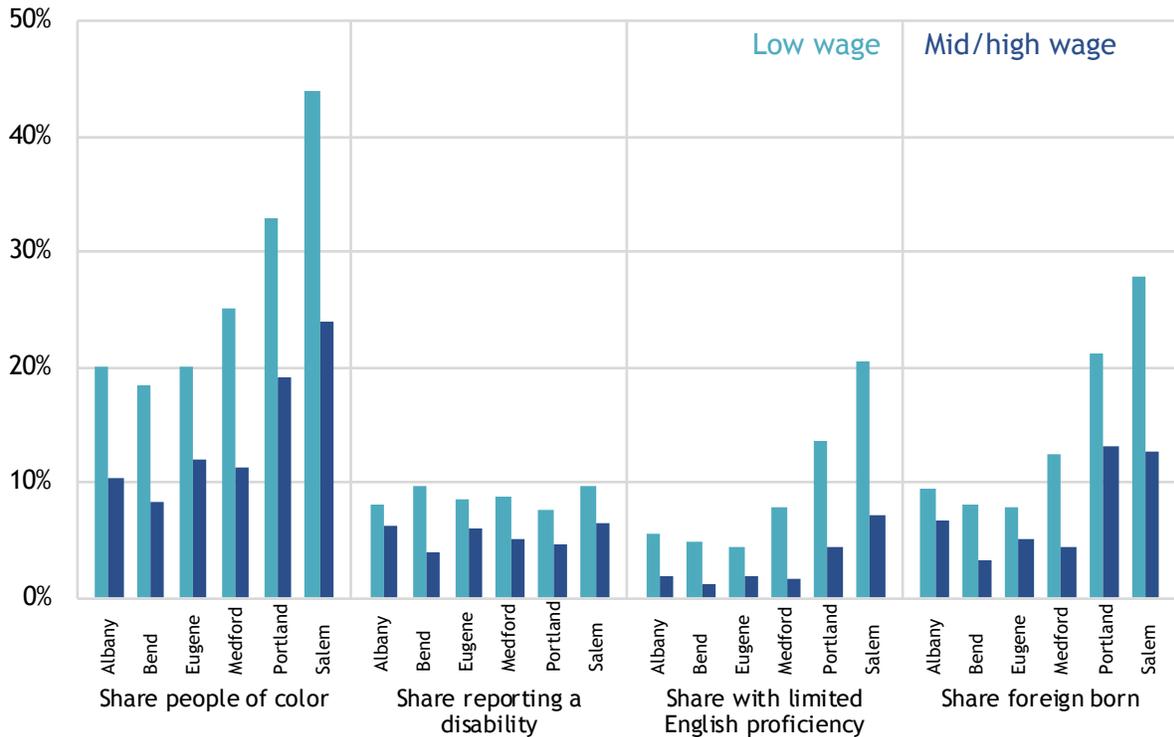
Data source: Ross, Martha and Bateman, Nicole. “Meet the Low-wage Workforce.” *Brookings Metropolitan Policy Program*. November 2019.

- People from underserved populations continue to make up a disproportionate share of low-wage workers.** In every metro area across the state, when compared with mid- to high-wage workers, higher shares of low-wage workers are people of color, people with a disability, people with limited English proficiency, and people who are foreign born (see Figure 7). These workers face relatively more exposure than do higher wage workers to challenging conditions associated with the “fissured workplace,” in which large employers hire out work functions that were once performed by internal employees.¹⁰ The resultant more-fragmented workplace and growth in alternative work arrangements is beneficial to businesses and some workers but might also apply downward pressure on wages and benefits at the low end and contributes to increased risks of inadequate or unsafe working conditions and labor violations.

People of color and other underserved populations also face the highest relative costs of going or returning to work. Affordable housing and childcare are not readily available in many job-rich areas, and the farther one lives from work the higher the cost of transportation. And as discussed above, urban areas do not hold the promise of middle-income jobs they once did. The expected high growth in low-wage jobs (for example,

child and elder care jobs) should keep these challenges front-of-mind for policymakers and economic developers interested in tapping into the talent of all workers and potential workers.¹¹

Figure 7. Characteristics of low-wage workers versus mid- to high-wage workers in Oregon metro areas, 2016



Data source: Ross, Martha and Bateman, Nicole. “Meet the Low-wage Workforce.” Brookings Metropolitan Policy Program. November 2019.

5. Training for Work of the Future

Postsecondary educators and workforce developers are operating in challenging times. The precise pace of technology’s progress may be unclear, but most observers agree that advances in robotics and artificial intelligence will disrupt occupations and demand that workers continuously upgrade their skills throughout their careers. But this need for reskilling is happening during a time when the overall college-wage premium appears to be flattening—the consequence of declines in middle-skill and some very-high-skill jobs.¹² And the flattened college-wage premium is colliding with the rising cost of providing education—a labor-intensive service that has yet to benefit from major technology-induced cost reductions.

The bottom line: a sizable majority of workers will need training beyond high school but, due to the high costs of traditional delivery models, it will have to be accessed and acquired differently

than in the past. Labor market experts at the Urban Institute recently called for progress on three fronts¹³:

- **Improving access to relevant training through better information and technology.**

Until the past 5-10 years, prospective students and trainees had only vague information on how educational investments translated into employment and earnings. Data on return on investment (ROI) was crude at best. Now states can link college coursework and degree data to labor market outcomes at the individual student level. The data matching and analyses have supported a wide array of reports that document ROI for postsecondary institutions of all sizes and can highlight differential outcomes across income groups, races, and ethnicities. Making the information accessible to prospective students is a work in progress. Additionally, online tools, like the U.S. Department of Labor's mySkills myFuture,¹⁴ help job seekers identify openings that draw on skills used in a current or past job.

Beyond providing a platform for better information, technology should be able to provide expanded access to training. But the jury is still out. Findings on the effectiveness of online training are mixed at best and suggest outcomes may be worse for less-prepared students. Major online training initiatives—anchored by College of America, the Lumina Foundation, and private sector partners—will add to the evidence base and should point to opportunities where technology can cost-effectively expand training capacity.

- **Scaling practices that document and certify skills.** As states develop strategies to meet their postsecondary completion goals, many distinguish between postsecondary degrees and postsecondary training. Degree attainment has long been the dominant indicator of potential worker productivity. But given the rapidly changing nature of work, policymakers recognize conventional 2- and 4-year degree programs are not well-suited, in cost or in time, for all the workers who need skill upgrades. They are exploring other ways to deliver and reliability document training and skill acquisition.

On the documentation side, a national nonprofit, the Credential Engine, is one example of the work going on to bring transparency and organization to the rapidly evolving credential marketplace. By Credential Engine's count, the marketplace now includes more than 730,000 unique credentials.¹⁵ These include degrees and certificates issued by postsecondary institutions but extend into an array of credentials offer by non-academic organizations: occupational licenses, industry certifications, military certifications, registered apprenticeships, digital badges, and more. With a better understanding of the landscape, future steps include documenting associated competencies and the credentials' relative values in the marketplace.

Better documentation is also required on the worker side. Employees build skills throughout their careers—some are signaled through a credential, but many others are not. Arnold Packer, formerly of Johns Hopkins University, has advanced the idea of a verified resume, which would attempt to bridge the gap between a LinkedIn skills profile and credential-based resume. Educators, non-profits, and employers could

document specific skills and behaviors with market value (e.g., the ability to work in teams, handle data, keep to a schedule). The Kellogg Foundation and Open Society Institute have funded demonstrations to test feasibility of the concept.

Educators have been deploying a variety of methods to improve the efficiency of skill certification and acquisition. Southern New Hampshire University (SNHU) and Western Governors University (WGU) are leaders in competency-based education (CBE), which severs the relationship between seat time and credit completion. Colleges are also offering targeted coursework tightly organized around specific career pathways, which students can often complete in a year or less.

- **Expanding apprenticeships.** The U.S. has looked to Europe's more advanced system of apprenticeships as a way to expand training, meet employers' needs, and keep costs down for trainees. Apprenticeships offer high-level training on a work site. Apprentices are paid and contribute to projects while learning. Switzerland is the pace setter: 70 percent of young Swiss go through an apprenticeship and 95 percent of 25-year-olds hold either a bachelor's degree or an apprenticeship qualification.

Outcomes have been strong for the U.S.'s less expansive system. A ten-state study found that apprentice participants earned \$5,839 more per year than similar non-participants, and that the benefits of the programs exceeded the costs by more than \$49,000.¹⁶

Oregon has made good progress on a number of these fronts in part because education stakeholders recognized the need to reinvent delivery when they advanced the nation's most ambitious postsecondary goal (40-40-20). Seventeen (17) community colleges offer career pathway opportunities from seamanship and historic restoration in Astoria to equine production and crop science in Ontario. Oregon has a relatively well-developed apprenticeship system with active apprenticeships per million workers ranking in the top 10 nationally.¹⁷ CBE has been a long-time interest of education stakeholders¹⁸ but it remains in its infancy at the postsecondary level, with only Southern Oregon University and Oregon Health Sciences University operating versions of the concept.¹⁹

The Higher Education Coordinating Commission's 2017-2021 strategic framework suggests more progress is on the way. It emphasizes better information about affordable postsecondary options, improved career planning tools, and streamlined pathways to allow learners to seamlessly track and transport credits and skills across institutions and to employers.

6. Policy Imperatives

This report updates a broad assessment of Oregon’s talent published just 18 months ago. Our high-level takeaways are unchanged. Oregon has outperformed the nation in this cycle, with above-average rates of job and income growth. The economic performance was built on a foundation of a solid labor pool that fueled one of the better economic recoveries in the country since the Great Recession. However, Oregon average incomes are still below U.S. levels. So, if broad economic performance were the measure of talent, one could conclude Oregon’s workforce is a competitive strength with additional room for improvement. New estimates of state-level labor productivity, which place Oregon in an upper tier, reinforce this good-but-could-be-better assessment.

When recently asked about talent, Oregon business leaders were not as cheery. Executives from a broad cross-section of Oregon industries characterized skilled labor as a competitive weakness but praised university-business connections and the state’s innovation infrastructure, including access to engineers and scientists. The dim view of skilled labor generally may be picking up employer frustration as labor market conditions tighten in this unprecedented 11th year of a U.S. expansion. It may lack a broader perspective about the severity of labor challenges elsewhere. The economies of many U.S. states, and counties, are anticipating labor shortages in coming years as their prime-age-working populations decline. That’s not the case in Oregon. In a relative sense, demography is working in Oregon’s favor.

Eighteen months is quick turnaround for an update—especially in light of the stable economic conditions. Given the stability, this report has less to say about changing conditions on the ground and more to say about fresh perspectives on the pace of technological progress and the redesign of postsecondary education and training. We conclude this report with several observations to inform education and workforce strategy going forward.

First, the state’s postsecondary completion goals—among the most aggressive in the country—are warranted. While they may seem overly ambitious to some, that is likely because they hold a narrow definition of postsecondary completion, rather than a definition that includes a wide range of credentials and skill certification. The sooner Oregon documents all the ways that workers can acquire focused, market-relevant training, including through competency-based education, the sooner policymakers will be able to steer investments in productive directions and prospective trainees will be able to steer themselves to opportunity.

Second, Oregon appears to be ahead in the postsecondary redesign game, but it’s still early. Career pathway programs have taken root across the state, and rates of apprenticeship participation are higher than in most places outside of the Midwest. But today’s best practices could be outdated two years from now. Getting on, and staying on, the frontier of postsecondary redesign work is an imperative.

Third, demography, technology, and globalization are changing labor markets and creating challenges that educators and workforce developers cannot fix on their own. Supporting skill development through cost-effective, evidence-based programming is necessary but insufficient.

The MIT Task Force sees job *quality* as a bigger concern than job *quantity* despite the warnings of technologists. Forecasts from Oregon's employment department point in the same direction: many openings for low-wage, low-skill work despite technology's progress. Policymakers and employers should focus on ways to improve the quality of the jobs and/or make low-wage, low-skill work the first step on a longer and more lucrative career trajectory.

Moreover, recent findings on the geography of work, shaped by technology and globalization, is unsettling. Five decades ago, big cities were the land of opportunity for non-college workers who found wage and career ladders in production and office administrative occupations. That work is in short supply. The paucity of middle-skill, middle-income opportunities, together with high housing costs, has essentially locked many non-college graduates out of major urban areas. That leaves Oregon's smaller cities and towns as their best alternatives, which in turn puts more pressure on economic developers, policymakers, and business leaders, especially in the service sector, to create good jobs across the state.

Finally, technologists and employers have important roles to play in focusing their efforts on designing and investing in technologies that complement labor, boost worker productivity, and improve service and products. Computer-aided design (CAD) software, medical imaging tools, and automated tellers have complemented workers and improved service. The jury's out on computerized telephone agents and self-service kiosks. The more businesses invest in labor-enhancing technology, the better will be the outlook for workers, customers, and business profitability.

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