



MARCH
2024

INTERSTATE BRIDGE REPLACEMENT PROGRAM (IBR)

REGIONAL INFRASTRUCTURE WORKFORCE MARKET STUDY

THE COLUMBIA-WILLAMETTE WORKFORCE COLLABORATIVE
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Cover Photo: Worksystems 2019

EXECUTIVE SUMMARY

This in-depth regional infrastructure workforce market study was commissioned to help the Interstate Bridge Replacement program (IBR) team more effectively consider strategies that enhance career opportunities for women and people of color in the construction and professional, technical and engineering (PTE) trades to support equitable growth in the region's economy.

This report is the result of an extensive research study, which included collecting and analyzing existing available construction and PTE workforce supply data, forecasting the local five-year workforce demand, conducting extensive interviews with public agencies, contractors, apprenticeship programs, unions, contractors and pre-apprenticeship workers and foremen in the region. The research sought to uncover the major barriers to achieving equity and increasing diversity in the construction and PTE workforce for the Portland–Vancouver–Hillsboro Metropolitan Statistical Area (Portland MSA). A set of recommendations for success are outlined and described in the report.

The Bipartisan Infrastructure Law (BIL) / Infrastructure Investment and Jobs Act (IIJA) authorizes \$1.2 trillion in transportation infrastructure funding to states. This act focuses on grants as a primary funding mechanism for critical infrastructure projects. While the legislation incorporates labor and workforce standards, the realization of quality jobs and equitable access depends on policy decisions on specific projects. Federal agencies are providing greater guidance and oversight, emphasizing factors such as fair wages, union representation, employment access, workplace safety, training opportunities, and discrimination-free environments. The federal government, through the U.S. Department of Labor (DOL), also plays a vital role in supporting agencies to achieve equity and job quality goals by evaluating applicants' plans and enforcing standards and data collection. The public projects in our region have an incredible opportunity to align with these federal directives locally by expanding innovative and effective workforce equity strategies.

As our region rapidly diversifies, public project owners will dramatically benefit from a concerted effort to effectively respond to the growing industry opportunities and federal and local policy directives. Success for the IBR program can be achieved through recommendations as outlined in this report.

Diversifying the construction and PTE workforce will not only help create a stronger supply of needed workers for the industry; it will also directly address issues of poverty and economic mobility within communities of color and working families in the region.

Box 1. Construction-related occupations in Portland Metro Region in next ten years (2020–2030)

134,000 total jobs
13,000 new jobs, +10%
Over **40%** of the workforce is over 45 years old
\$33.00 is the median wage per hour

Box 2. Creating jobs for people of color and women in the Portland Metro Area

If all public projects over \$15M planned for the next five years implemented and met workforce goals of employing 21% people of color and 11% women, there would be:

- **4,700** FTE jobs for workers of color = **\$322.6 million** in earned wages
- **2,500** FTE jobs for women workers = **\$171.6 million** in earned wages

Findings Overview: Existing Workforce Supply

- Approximately 43,000 people work in nonresidential construction occupations in the greater Portland Metro area (2022).
- Five percent are women.
- Twenty-six percent are workers of color.
- Employment for workers of color is largely driven by workers who identify as Hispanic/Latino. Black and Asian workers are underrepresented in the trades.
- Women and people of color are more likely to work in lower paying trades.

Findings Overview: Projected Demand (5+ Years, public projects over \$15 million)

- From 2023 through at least 2028, the 107 known large public capital projects identified by this study will require over 22,000 construction workers.
- Some of these projects have stated apprentice and workforce diversity utilization goals, with average goals of 17 percent apprentices, 21 percent people of color, and 11 percent women.
- These average goals, if applied across all 107 projects, puts the 5-year demand at 3,800 apprentices, 4,700 people of color, and 2,500 female construction workers.
- The current 2022 workforce of 43,000 nonresidential construction workers appears to meet the future 5-year demand of 22,000 workers for large capital projects, even when incorporating the goals for apprentice and people of color utilization. However, the region will need an additional 370 female construction workers to meet diversification goals.
- While the workforce as a whole appears largely ready to meet the demand at a sum total level, this conclusion breaks down when looking through an occupational lens at diversification for each major trade.
- When diversification and workforce deficits are added together by trade, this analysis shows that the current supply would fall short by about 270 people of color, 1,050 females, and 1,290 apprentices to fill the needs for all trades in the region over the next 5 years. These deficits more accurately show the deep need for additional outreach to, training and retention of underrepresented groups for skilled trade career opportunities.
- An estimated 5,900 PTE workers will be needed. As with the trades, these positions may be filled by a combination of the existing workforce and new entrants.
- Three PTE occupations account for over half of total PTE demand: office clerks, project management specialists, and civil engineers.

Box 3. Supply of workers in the nonresidential construction trades in the Portland Metro area: 2022

Total number of Construction workers: **43,000**

- Total people of color: **11,200**
- Total women: **2,100**

Total number of PTE workers: **12,800**

- Total people of color: **2,900**
- Total women: **7,100**

Completion rate for all registered apprentices: **55%**

- People of color completion rate: **46%**
- Women completion rate: **46%**

Box 4. Demand for workers in the construction trades and PTE on public projects over \$15M in the Portland Metro area over the next 5+ years

Total number of projects: **107**

Total dollar amount of projects: **\$13.1–\$15.3 billion**

Total number of Construction workers needed: **22,000**

Total number of PTE workers needed: **5,900**

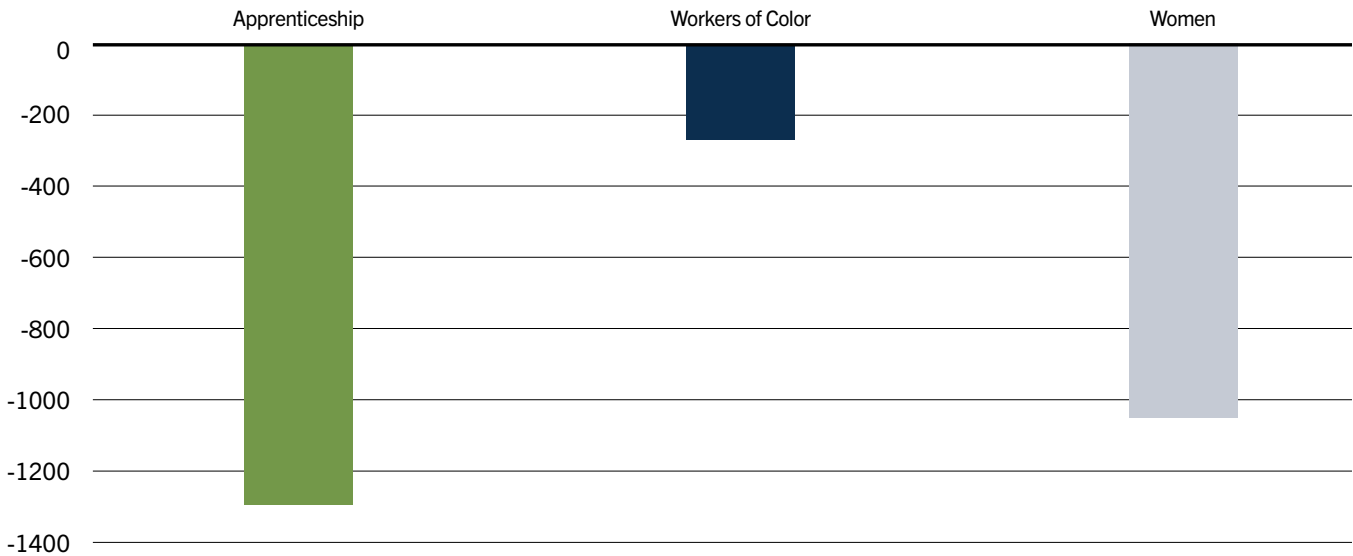
Demand for diverse workers and apprentices for current known workforce goals:

- Apprentices: **1,000**
- People of Color: **900**
- Women: **600**

Demand for diverse workers and apprentices, assuming all public projects have goals of 17% apprentice, 21% people of color, 11% women:

- Apprentices: **3,800**
- People of Color: **4,700**
- Women: **2,500**

SUPPLY AND DEMAND GAP ANALYSIS: Deficits by Trade Assuming Goals on All Projects



Findings Overview: Barriers to Diversifying

- Retention of diverse workers is adversely affected by the lower-quality training these workers often receive on the jobsite from supervising journeypersons, which means that these apprentices are less included in the trades and struggle to excel and advance.
- Harassment remains a significant issue on jobsites. This includes harassment based on gender, race, and other identities; harassment of apprentices; and disrespect often experienced by all workers. Workers also experience isolation and exclusion. This impacts the industry's ability to retain current workers and recruit future workers. The industry has not yet widely adopted policies and practices that effectively address jobsite harassment and discrimination incidents.
- Women and people of color are less likely to have opportunities for advancement within the industry such as becoming forepersons, superintendents, or company owners. Additional support is needed related to the transition from apprentice to journey-level.
- Real-life financial hardships or unexpected life situations often arise (i.e. family care needs, transportation issues, etc.), especially for early term apprentices who may have limited or no savings, which can be enough to prevent them from continuing with their careers. Additionally, the lack of steady work in the construction industry particularly impacts female workers and workers of color. Studies have shown that these workers work far fewer hours annually than their white male counterparts.
- Both the cost of childcare and access to childcare (especially for non-standard shifts) are a barrier to success for parents in the industry.
- Requirements for long shifts, changing schedules, and non-standard work hours without options for flexibility in work hours pose challenges for workers, especially those with caregiving needs.
- Most connections into apprenticeship still occur through personal referrals, which women and people of color are less likely to experience, and outreach that is done by word of mouth is rarely targeted specifically toward marginalized communities. Outreach and marketing efforts are not well coordinated across the region, frequently do not reach a diverse audience, and the impact of this outreach is unknown.
- State-certified pre-apprenticeship programs expose historically underrepresented populations to the trades, screen them for job readiness, and help to cultivate a pipeline of diverse jobseekers. However, these programs have limited capacity due to funding sustainability concerns and reporting fatigue for their numerous existing funders. Not having a more sustained and/or streamlined funding model for pre-apprenticeship programs is a barrier for better and increased recruitment of women and people of color into construction.
- Lastly, the majority of public projects in the Portland Metro area do not have workforce participation goals. Those that do have goals struggle with monitoring and enforcing them. Agencies reported that staff, time, and cost could be barriers to implementing and upholding goals.

Recommended Regional Actions for Diversifying the Construction and PTE Workforce

Meeting the increasing demand for a skilled workforce necessitates coordinated efforts on a regional scale, addressing retention barriers and entry faced by workers often marginalized in the sector. Successful strategies involve participating in regional collaborations to establish diverse worker and apprentice goals, collectively investing in recruitment and retention initiatives, identifying, and implementing culturally specific strategies tailored to the unique needs of workers, especially women and people of color, and addressing the challenge of affordable childcare. With leadership from the federal government and locally, the region has an historic opportunity to incorporate these promising practices into workforce equity strategy and community benefit outcomes.

The following recommendations are discussed at length in the full report:

1. Grow a diverse regional construction workforce through multi-jurisdictional collaboration, coordination, and targeted investments. Make the intentional choice to build up the regional workforce by joining forces with existing successful regional efforts to eliminate barriers for women, people of color and justice-involved¹ individuals accessing and staying in quality construction careers.

- Adopt the Construction Career Pathways Framework (CCPF).
- Join multi-jurisdictional coordination tables and Funder Collaborative to scale up regional workforce planning and investments. CCPF's Regional Collaborative Committee and the CCPF Funder Collaborative.
- Embed equity goals into all workforce agreements. The Regional Workforce Equity Agreement (RWEA) can be a model.

2. Improve retention through addressing jobsite culture and other challenges.

- Mandate contractors commit to actively improve jobsite culture by establishment of zero-tolerance policies, robust reporting mechanisms, and consistent implementation of proven positive work environment training.
- Invest in project-level retention support to keep skilled workers.
- Provide flexibility in work hours to address workers' caregiving and health needs.

3. Knock down the barriers that women and workers of color face to grow a skilled workforce.

- Fund and grow comprehensive support services programs that can help a new generation of workers advance in their careers.
- Make affordable, accessible, reliable, and high-quality childcare a signature workforce and community benefit.
- Allocate resources to fund and grow programs that remove barriers to entry for diverse workers.

4. Implement Effective Project Administration and Procurement Strategies.

- Effectively plan for and resource successful implementation of workforce equity policies within a public jurisdiction.
- Establish oversight committees and sustained labor management community committees to address challenges and share best practices.
- Use procurement processes to ensure contractor compliance on respectful workplaces, inclusion, and anti-harassment initiatives.

5. Increase Communication and Education for Project Managers and Contractors.

- Enhance Project Communication and Expectations between public administrators and contractors.
- Allocate resources for training opportunities and internal support tailored to project managers, focusing on advancing equity in construction projects.

6. Continue to explore and address Professional, Technical and Engineering (PTE) equity opportunities.

- Work with local and state educational institutions, students, and employers to identify the key barriers and solutions to more diversity in PTE jobs.
- Fund and grow comprehensive support services programs that can help a new generation of diverse workers grow in the PTE sectors. ■

¹ Justice-involved: refers to anyone who has had interaction with the criminal justice system as a defendant.

INTRODUCTION

The inaugural regional Portland Metro Construction Workforce Market Study², initiated in 2018 and commissioned by Metro and the City of Portland, sought to identify strategies supporting the growth of the construction workforce through diversifying the sector, especially through the recruitment and retention of women and people of color. **This update to the 2018 study underscores persistent challenges faced by workers of color and women in accessing and sustaining careers in construction.** The challenges have been further exacerbated by the pandemic and a severe shortage of childcare in the region.

Despite these hurdles, the introduction of the regional Construction Career Pathways Program, and multi-jurisdictional efforts such as the Regional Workforce Equity Agreement, coupled with the widespread implementation of respectful workplace training at job sites, instills a renewed sense of optimism. These initiatives not only offer promising new practices to address deeply pervasive problems in construction but have also resulted in tangible workforce outcomes and job stability for the region's large-scale construction projects.

The Portland–Vancouver–Hillsboro Metropolitan Statistical Area (Portland MSA) region foresees a need for thousands of construction workers over the next five years. A significant challenge to meeting this demand is that more than forty percent of the current construction labor pool in the region is aged 45 years or older. Demographics are also swiftly changing, where communities of color have grown by 45% in the last decade. As the local labor pool becomes more diverse and the demand for workers remains high, a new era is emerging in the construction and PTE sector. This shift brings the opportunity for women and workers of color to play a prominent role in the workforce.

It is crucial for businesses, governments, and unions to fully integrate these communities as vital contributors to the expanding workforce. A strategic effort that actively connects underrepresented communities, especially women and people of color, with the growing industry holds numerous advantages for the region's infrastructure developments and economic prosperity. Recognizing the need for a more diverse talent pool, contractors and industry stakeholders are aligning efforts to cultivate a workforce that reflects the community's growing

diversity, striving for success through an expanded pool of skilled workers, equitable job access on publicly funded projects, and an infrastructure workforce that mirrors our regional demographics. This diversification not only addresses the industry's need for a robust workforce but also directly confronts issues of poverty and elevates economic mobility within communities of color and working families in the region.

The infrastructure sector has not kept up with the rapidly diversifying workforce, especially in the numbers of women and workers of color working in the broader workforce. Ninety-five percent of construction workers are male, with sixty-six percent being white. And women constitute just 5% of the construction workforce, despite making up 47% of the total workers in the metro area. Additionally, workers of color hold 26% of construction sector jobs while representing 36% of the overall workforce in the region. While women and workers of color are crucial for meeting the construction demand in the next decade, the industry needs to invest more in recruiting and retaining them. For instance, only 31% of Black apprentices complete their training compared to 59% of white males. Although the construction sector can attract a more diverse workforce, addressing deeply embedded barriers for women and people of color to be successful in the trades is essential. A recent study found a hopeful trend, showing that between 2016 and 2019, the number of Hispanic/Latino apprentices in the trades almost doubled, and the number of Black women apprentices grew by almost 50 percent³. However, the same study revealed that many women, especially women of color, face discrimination and harassment on the job, making them less likely to complete their apprenticeships and more likely to leave the industry.

Barriers to building a diverse and inclusive construction workforce are multifaceted and include issues related to a culture of exclusion on job sites, insufficient financial and programmatic support for apprentices (especially access to childcare), and lack of pathways highlighting the quality and desirability of jobs in the skilled trades. As noted from focus groups with current construction workers and apprentices, many workers face numerous barriers based on their gender and racial and ethnic backgrounds. Some barriers for women include inadequate restroom and lactation facilities, limited access to mentorship and training opportunities, and

² <https://www.oregonmetro.gov/sites/default/files/2018/07/02/C2P2-regional-construction-workforce-market-study-07022018.pdf>

³ https://iwpr.org/wp-content/uploads/2021/03/Here-to-Stay_revision2.pdf

difficulties in achieving work-life balance. The lack of support for parents, especially mothers, is evident in the absence of childcare accommodations and resources and the stress associated with managing work that conflicts with parenting responsibilities. Financial hardships further exacerbate the challenges, with some workers facing struggles such as the inability to take medical leave and precarious financial situations impacting their overall well-being.

Many workers, both in our focus groups and across national studies, describe construction sites with pervasive jobsite harassment. There, they face discriminatory comments, gender-based challenges, and experience unequal treatment overall, collectively contributing to a hostile work environment. Experiences of more subtle exclusion and discrimination can also include being the sole representative of a particular demographic on a jobsite to encountering obstacles in accessing mentorship, training, and job opportunities. Addressing these problems with management can prove challenging, as individuals may fear negative repercussions or reprisal for reporting incidents, which fosters a culture of silence around jobsite harassment and discrimination. The cumulative effect of these barriers underscores the urgent need for comprehensive initiatives to promote diversity, equity, and inclusion within the industry.

This report is the result of an extensive research study, which included collecting and analyzing existing available construction and PTE workforce supply data, forecasting the local five-year workforce demand, conducting extensive interviews with public agencies, contractors, apprenticeship programs, unions, contractors and pre-apprenticeship programs, and holding focus groups with diverse construction workers and foremen in the region. The research sought to uncover the major barriers to achieving equity and increasing diversity in the construction and PTE workforce for the Portland MSA. A set of recommendations for success are outlined and described in the report. ■



Photo: Oregon Tradeswomen, Inc. / Dawn Jones Redstone

LABOR MARKET SUPPLY & DEMAND

Construction Workforce

Data show that there are an estimated 43,000 nonresidential construction workers in the Portland MSA. **Women and people of color are underrepresented in construction.** Five percent of construction workers are women, compared to 49 percent of the working age population. Twenty-six percent of workers in construction identify as people of color, compared to 32 percent of the total working age population. People of color in the construction workforce is primarily made up of people who identify as Hispanic/Latino and make up 19 percent of all construction workers.

Ninety-six percent of workers employed in construction in the Portland MSA are male. In the five largest occupations, between 95 percent and 98 percent of workers are male. The three occupations with the largest percentage of female workers are floor, ceiling and wall insulation workers (9%), construction maintenance and painters (12%), and construction and building inspectors (13%).

More than 40 percent of the current construction labor pool is 45 years or older. In the five largest occupations, the percentage of workers 45 years or older ranges from 37 percent (construction laborers) to 54 percent (first-line supervisors). New workers will be needed as older workers retire or leave the labor force.

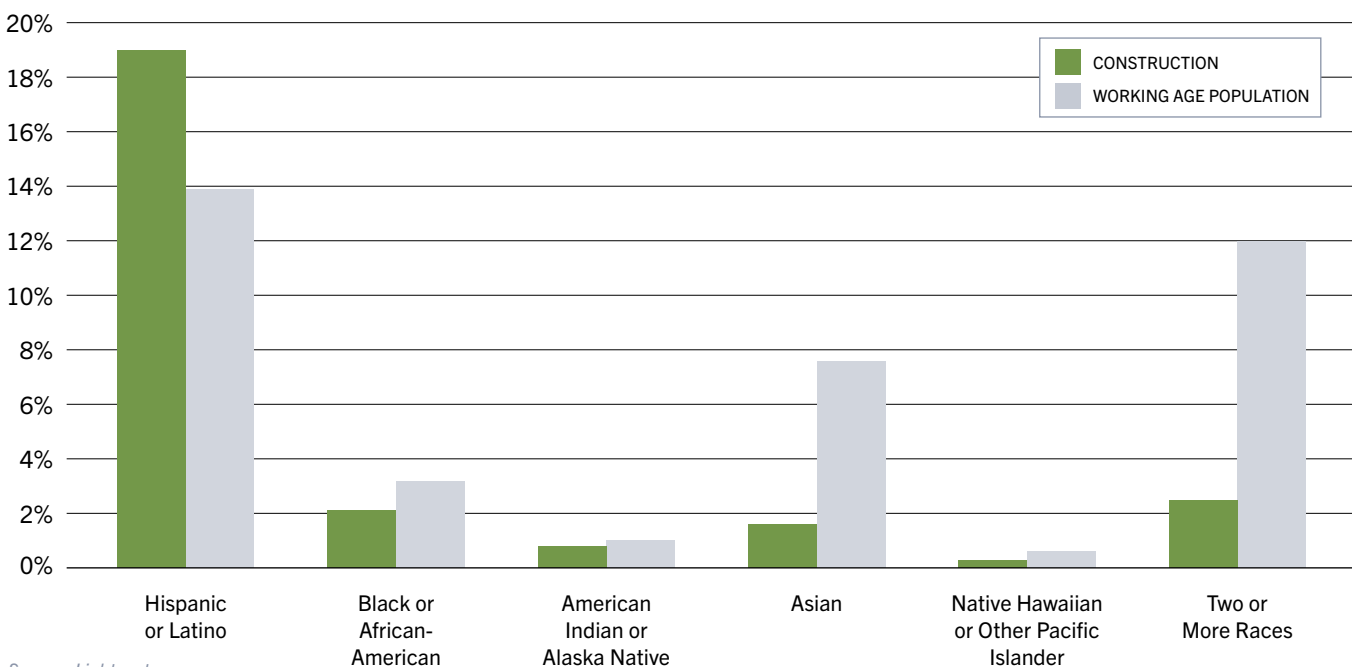
WAGES

Median wages for construction occupations range from \$21.53/hr. to \$59.73/hr. Wages vary widely by subindustry. Residential construction tends to pay lower wages. This impacts the median wages for occupations such as carpenters where a third of workers are employed in residential construction.

Compared to their white counterparts, women and workers of color are more likely to work in lower paying trades. Women are both a small fraction of the construction workforce and are especially underrepresented among the highest paid occupations.

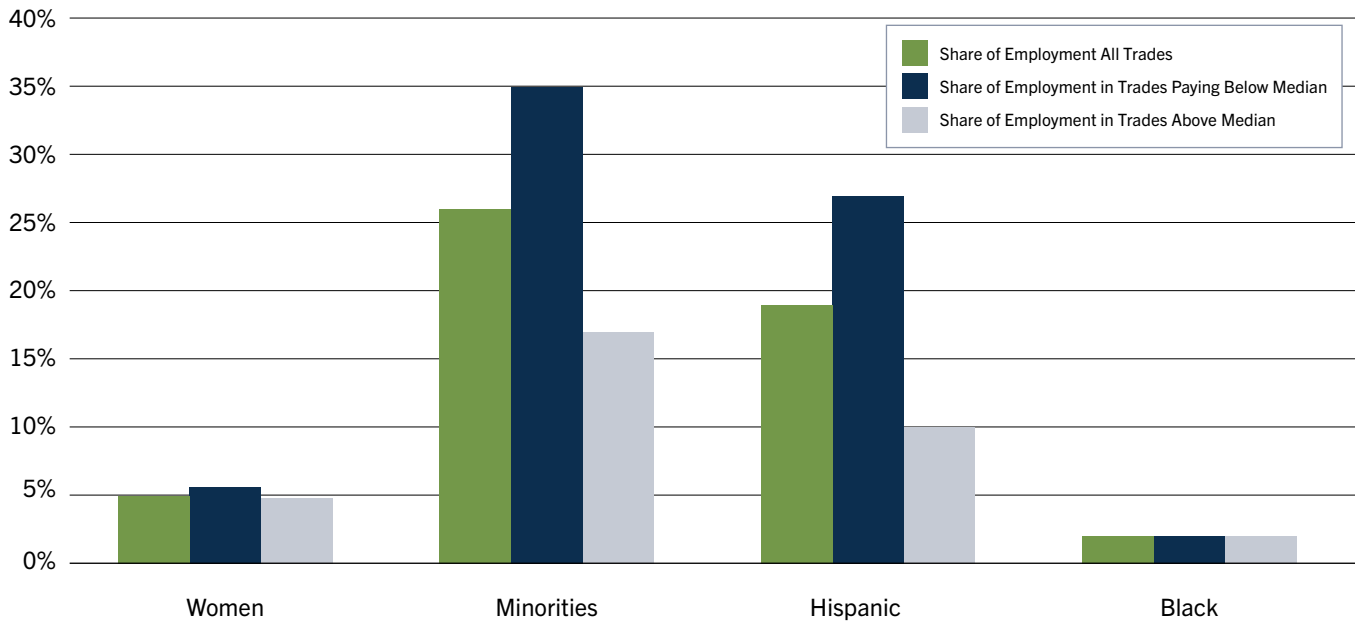
Across occupations, there is also a strong negative correlation between median wage and racial and ethnic diversity. The percentage of workers of color is noticeably lower in higher paid occupations. At the lower end of the wage spectrum, the percentage of workers of color increases.

FIGURE 1: Construction Workforce by Race and Ethnicity, Portland MSA, 2022



Source: Lightcast

FIGURE 2: Share of Employment by Wage for Select Demographics, Portland MSA, 2022



Source: Lightcast

2023 Active Registered Apprentices⁴

As of December 2023, there are currently 4,759 active registered apprentices with the Bureau of Labor and Industries (BOLI) in Portland MSA⁵. This includes more than 1,000 active apprentices who live in Washington State and are registered with BOLI apprenticeship programs⁶.

Seventy-five percent of apprentices work in the industry’s largest occupations: carpenters, construction laborers, electricians, and plumbers, pipefitters, and steamfitters.

Sixty-three percent of active apprentices are in union-affiliated programs.

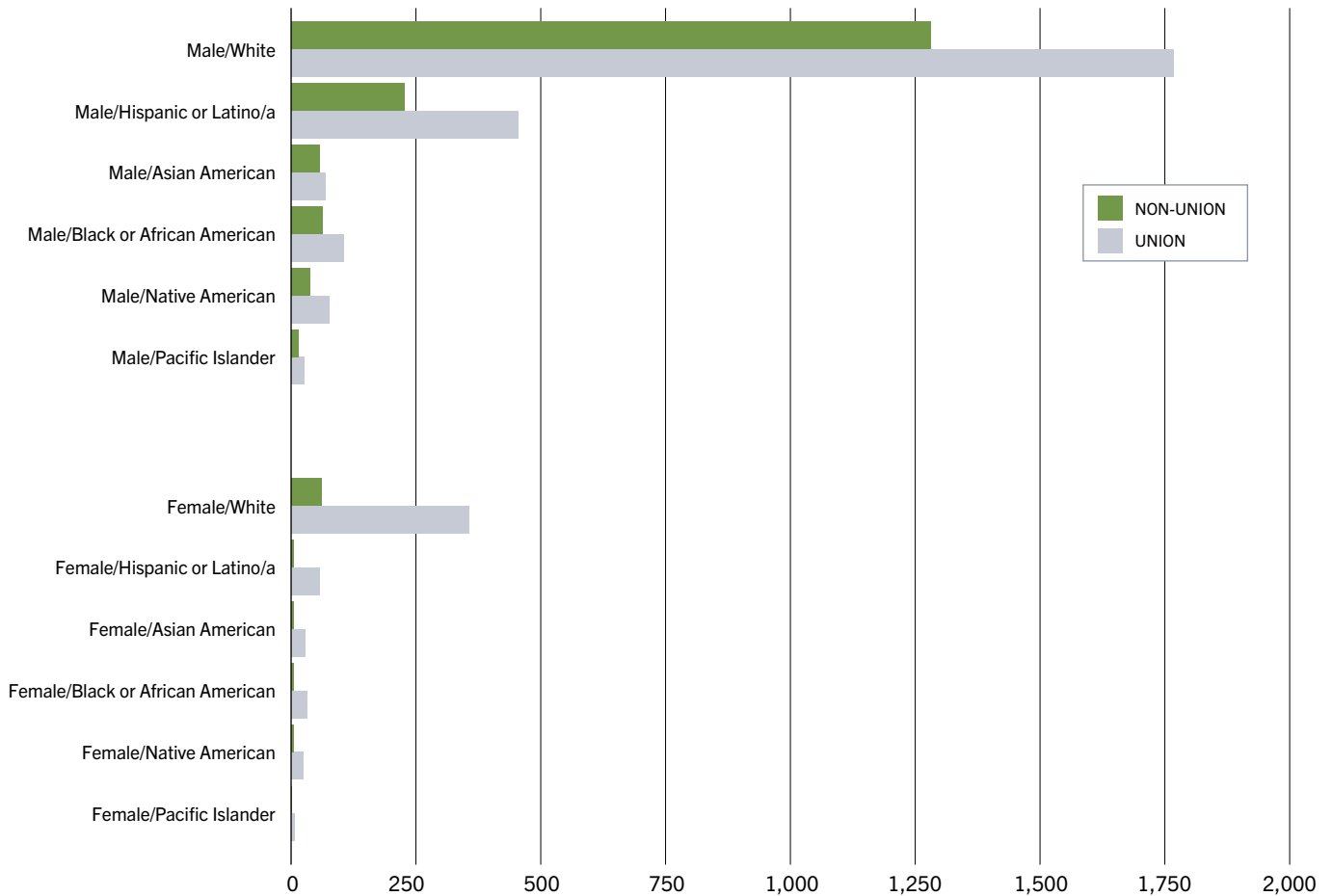
Eighty-eight percent of active apprentices are male, and 12 percent are female or non-binary. Seventy-three percent of active apprentices are white. Apprentices who identify as Hispanic or Latino comprise the second largest racial or ethnic group (16%). Sixty-four percent of active apprentices are white men.

⁴ The following data were collected from the Oregon Bureau of Labor and Industries (BOLI). They are the state agency that regulates and oversees the State Registered Apprenticeship programs. They collect data from all State Registered Apprenticeship programs and update that data regularly. These data include the demographic information of all registered apprentices, the enrollment rates, exit rates, completion rates, as well as oversight on the performance of all programs.

⁵ The geography for this dataset is determined by the home address of the apprentice. Apprentices who listed their home address in Clackamas, Columbia, Multnomah, Washington, or Yamhill counties in Oregon or an address in SW Washington are included. The data is not an exact match for the Portland MSA. Participants who live in a county in SW Washington that is not Clark or Skamania but are registered with an apprenticeship program in the area are included. The county of residence for Washington state apprentices is not available.

⁶ There are also active apprentices registered with programs regulated by the Washington State Department of Labor & Industries (L&I). Despite our best efforts, we were unable to obtain comparable data for the apprentices registered with L&I.

FIGURE 3: Active Apprentices in Portland MSA, 2023



Source: BOLI

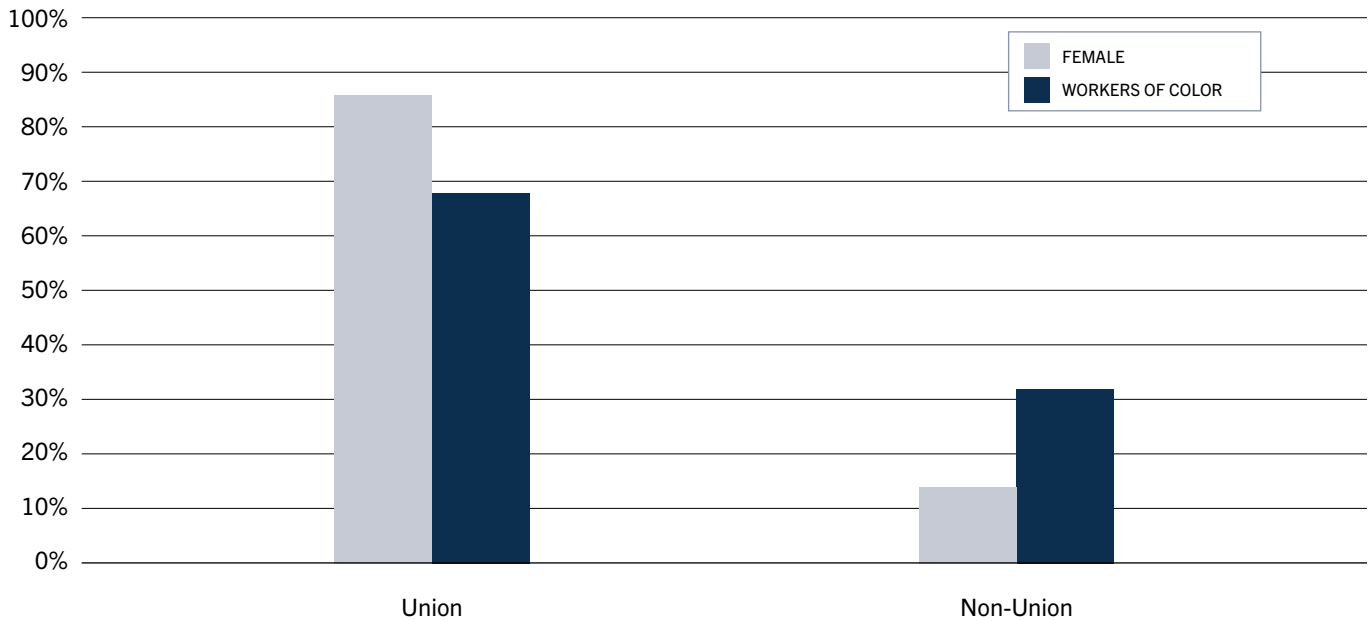
Union and Non-union Affiliated Apprenticeship

A higher share of apprentices who identify as female or non-binary are enrolled in union-affiliated programs (17% v. 5%). There is also a higher total number of women and non-binary apprentices enrolled in union-affiliated programs: 506 women and non-binary apprentices in union-affiliated programs and 79 in non-union-affiliated programs.

Union-affiliated apprenticeship programs also have higher numbers and concentration of people of color. Twenty-nine percent of active apprentices in union-affiliated programs identify as people of color, compared to 24 percent in non-union programs. There are more than twice as many people of color in union-affiliated programs (881) as non-union-affiliated programs (415).

Apprentices who identify as female, non-binary and/or people of color are more likely to participate in union-affiliated programs. **Eighty-six percent of all female or non-binary active apprentices and 68 percent of all people of color active apprentices in 2023 are in union-affiliated programs.**

FIGURE 4: Active Apprentices by Union Affiliation, Portland MSA: 2023



Source: BOLI

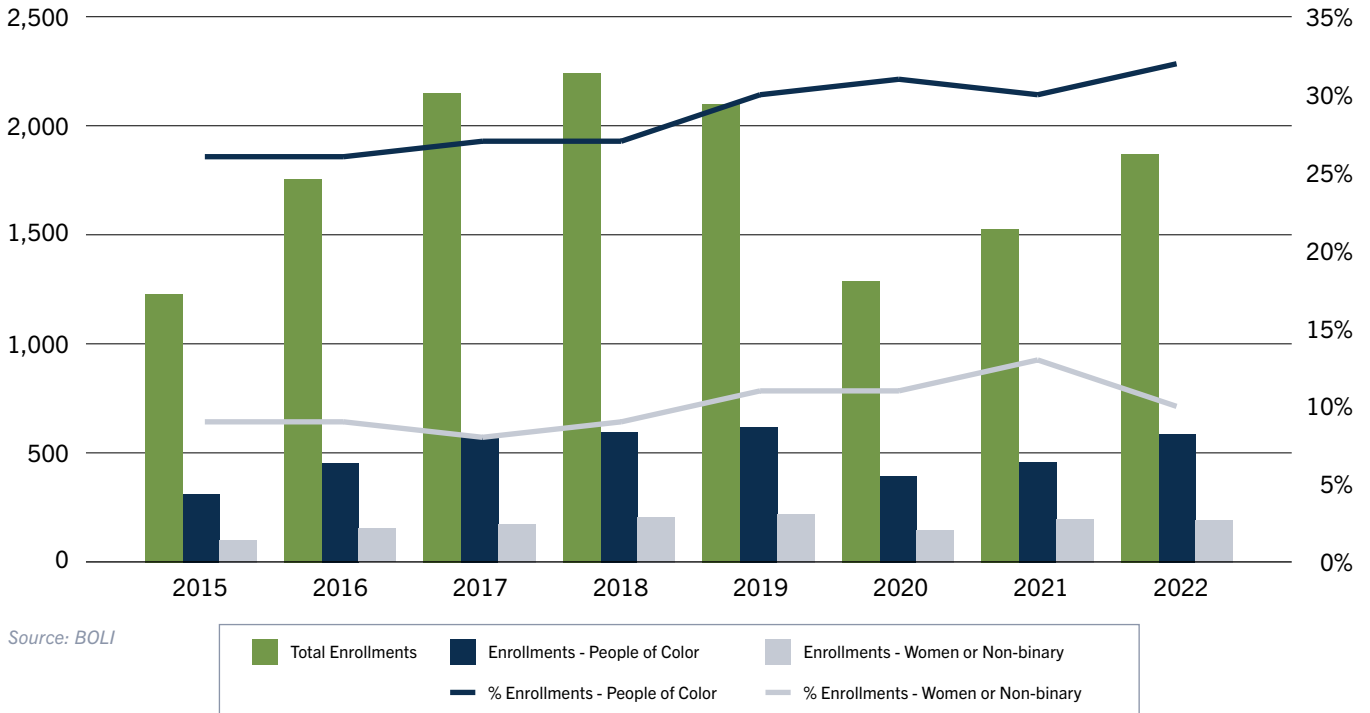
2022 New Apprenticeship Enrollments

In 2022, 1,873 new people enrolled in construction apprenticeships in the Portland MSA. New enrollment dropped dramatically in 2020. Despite a steady increase over the past two years, enrollments have not returned to pre-pandemic levels.

Nearly three quarters of new enrollments (71%) were in apprenticeship programs for the industry’s largest occupations: carpenters, construction laborers, electricians, and plumbers, pipefitters, and steamfitters.

Nearly 90 percent of all new enrollments in 2022 identified as male. Eleven percent identified as female or non-binary. Sixty-eight percent of participants identified as white. The second largest group by race and ethnicity was Hispanic/Latino who accounted for 19 percent.

FIGURE 5: BOLI Registered Apprenticeship New Enrollments, Portland MSA, 2015–2022



Source: BOLI

Registered Apprenticeship Completions

A total of 2,653 apprentices graduated to journey level from 2020–2022 in the Portland MSA in Construction related registered apprenticeship programs. Of those, 196 (7%) were female and 596 (22%) were apprentices of color. Nearly ten percent of all union apprenticeship completers were female while non-union female completers made up about three percent of all non-union completers. Union apprentices of color made up about 25 percent of all union completers and non-union apprentices of color made up about 19 percent of all non-union completers.

Additionally, over 80 percent of all female apprentice completers from 2020–2022 graduated from union apprenticeship programs and over 67 percent of all apprentices of color completers graduated from a union apprenticeship program.

TABLE 1: Demographic Makeup of All Union Apprenticeship Completers, 2020–2022

	2020	2021	2022	TOTAL	%
Union female	41	41	77	159	9.86%
Union people of color	114	113	175	402	24.92%
All Union completers	406	486	720	1,612	

Source: BOLI

TABLE 2: Demographic Makeup of All Non-union Apprenticeship Completers, 2020–2022

	2020	2021	2022	TOTAL	%
Non-union female	5	14	18	37	3.55%
Non-union people of color	31	83	80	194	18.64%
All Non-union completers	282	354	405	1,041	

Source: BOLI

TABLE 3: Female Apprenticeship Completers, by Program Type, 2020–2022

Female Completers	UNION	NON-UNION	TOTAL
2020	41	5	46
2021	354	282	1,041
2022	77	18	95
Total	159	37	196
%	81.12%	18.88%	

Source: BOLI

TABLE 4: Apprentice of Color Completers, by Program Type, 2020–2022

People of Color Completers	UNION	NON-UNION	TOTAL
2020	114	31	145
2021	113	83	196
2022	175	80	255
Total	402	194	596
%	67.45%	32.55%	

Source: BOLI



Photo: Worksystems 2019

Projected Demand (5+ Years, Public Projects over \$15 Million): Construction Occupations

The 107 known large public capital projects identified in this study will cost between \$13.1 and \$15.3 billion and require nearly 22,000 construction workers from 2023 through at least 2028 (some projects extend beyond the five-year study period).

Note that these 22,000 jobs are a total count spread throughout the study period. They are not net new jobs as they may be filled by the existing workforce as well as new entrants. For this study, the terms FTE (full time equivalent) and worker are interchangeable.

Carpenters, construction laborers, operating engineers, and electricians are projected to have the largest demand, accounting for half of total construction labor needs.

Ironworkers, cement masons, plumbers and pipefitters will also be in high demand, with between 1,300 and 1,700 workers needed over the study period.

Nearly half of the identified projects have stated apprentice and/or workforce diversity goals, averaging 17 percent apprentices, 21 percent workers of color, and 11 percent women. The remaining projects did not state goals or were unable to provide specifics (e.g. “TBD”). Applying the average stated goals to these projects, combined with the projects with stated goals, results in the **demand for approximately 3,800 apprentices, 4,700 workers of color, and 2,500 female workers in the trades.**

Box 5. Demand for workers in construction in the region by trade on public projects over \$15M in the Portland Metro area over the next 5+ years

Total projects: 107

Total cost of projects: **\$13.1–\$15.3 billion**

Total construction workers: **22,000**

Demand for diverse workers and apprentices for known workforce goals:

- Apprentices: **1,000**
- Workers of Color: **900**
- Women: **600**

Demand for diverse workers and apprentices, assuming all projects have goals of 17% apprentice, 21% workers of color, 11% women (the average of projects with known goals):

- Apprentices: **3,800**
- Workers of Color: **4,700**
- Women: **2,500**

TABLE 6: Construction Workforce Demand by Occupation

	DEMAND	SHARE
Carpenters	3,880	18%
Construction Laborers	3,100	14%
Operating Engineers (Excavators, Heavy Equipment Operators)	2,250	10%
Electricians and Telecommunications	1,960	9%
Ironworkers	1,670	8%
Cement Masons	1,430	6%
Plumbers and Pipefitters	1,300	6%
Other Construction Trades (Please specify)	1,000	5%
Truck Drivers	790	4%
Drywall Installers	710	3%
Painters and Tapers	700	3%
Construction Managers (incl. Project Engineers, etc.)	590	3%
Sheet Metal Workers	500	2%
Equipment Operators	380	2%
Glaziers	350	2%
HVAC	310	1%
Brick Layers	290	1%
Roofers	260	1%
Construction Supervisors	180	1%
Floor Coverers	130	1%
Pile Drivers	120	1%
Elevator Installers	80	0%
Insulators	40	0%
Tile Setters	10	0%

Methodology⁷

The construction workforce demand for the identified public capital projects is a model-based estimate derived via interviews with the public agencies responsible for these and similar projects, and with local contractors. Some agencies provided detailed information such as diversity goals and anticipated hourly demand by individual trade. However, most agencies were unable to provide anything more than the project type and cost. The mix of occupational needs may change as more information becomes available. At the time of this study, the design and construction materials for the Interstate Bridge replacement had not been finalized.

To address the gaps in the data, the team worked with local contractors to develop staffing patterns and demand based on project type and costs. The team used this, along with the known data, to estimate the future labor demand.

KEY MODELING ASSUMPTIONS

- A worker is defined as working 2,080 hours a year (full-time, year-round employment).
- For those projects with only costs provided, the team used a ratio of 2,800 to 5,000 trades hours per \$1 million in hard costs, depending on project type. This ratio was informed by data from past projects and contractor interviews and feedback.
- To estimate occupational employment for those projects without detailed workforce needs, the team used staffing patterns for 16 different project types based on known data from past projects, contractor interviews, and contractor-reviewed national industry-based staffing patterns.
- Staffing patterns derived from a sample of projects are representative of all projects.
- Diversity and/or apprenticeship goals provided by 44 projects apply to those projects with no stated goals.
- Diversity and apprenticeship goals apply to each occupation.

Comparing Supply and Demand

Comparing the projected project demand analyzed based on public agency data and interviews to the current 2022 supply of employed construction and PTE workers and 2023 active registered apprentices can provide insight into areas where additional workers may be needed to meet industry goals. It does, however, need to be placed into the broader overall regional context.

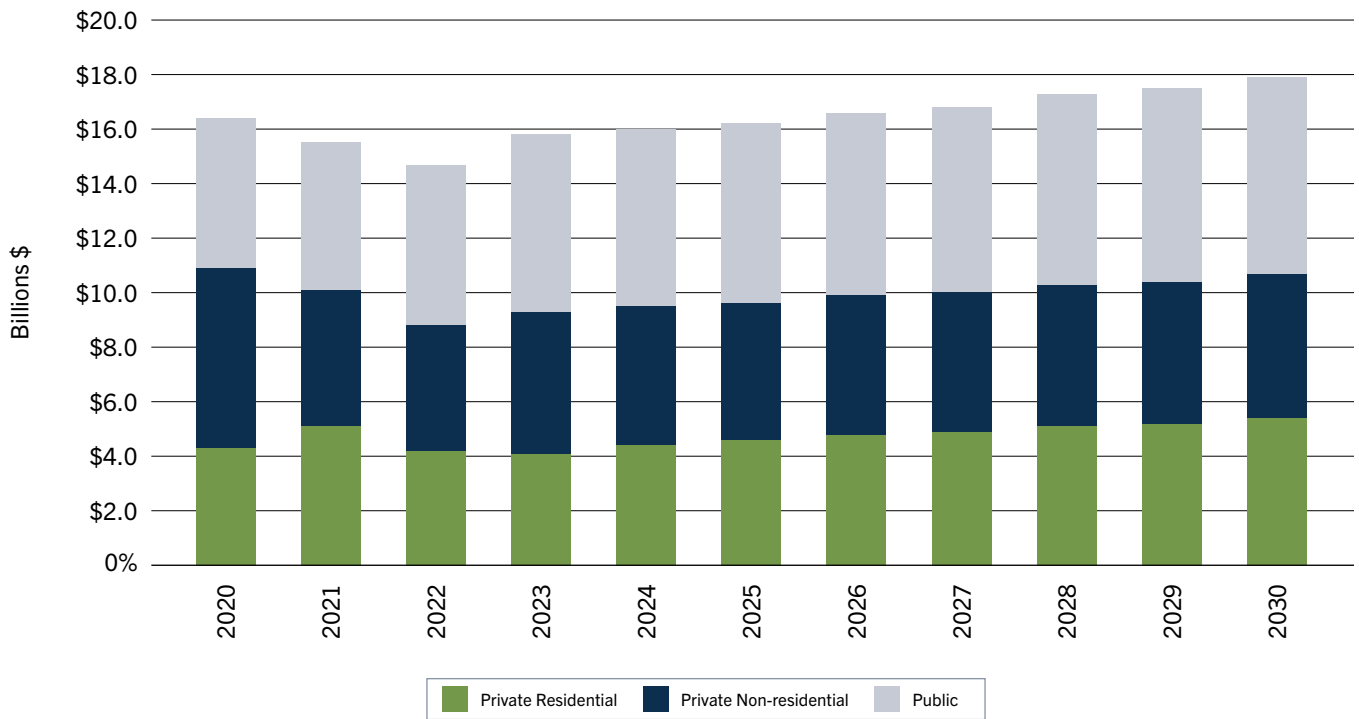
The regional labor force is not static. Workers change jobs, enter and leave the labor force, or find work inside or outside the region. It is critical to keep in mind this analysis utilizes the current 2022 workforce supply, which doesn't account for any new workers that will be trained or move to the area and enter the workforce in the next five years. It also does not account for workers leaving the labor force. **Construction occupations tend to have higher annual replacement rates than other industries. Over 40% of the 2022 Construction workforce is over the age of 45.** Between 2022 and 2032, there will be an estimated 6,700 new jobs for the five largest construction occupations (carpenters, construction laborers, electricians, plumbers, pipefitters, and steamfitters, and first line supervisors of construction workers). During the same period, there will be an **estimated 38,475 replacement jobs** for the same occupations.

The overall construction labor demand is also much larger than what is included in this scope. While this analysis was detailed and systematic, **the projected demand included in this analysis only includes green-lighted public capital projects over \$15 million** that were captured through our surveys and interviews. This analysis does not include a) Private projects b) Public projects under \$15 million and c) Any data that may not have been disclosed during the public agency interviews. Below is a chart that illustrates the broader Construction spending that is forecasted across the region in the next 5 years that includes both private and other public spending not included in this study.

For those reasons, there is significant demand in the region for construction workers outside of the scope of this study. **However, this analysis likely includes most of the projected demand for apprentices, workers of color and female workers in the region.** This is because utilization goals for these types of workers primarily exist for public capital projects and are rarely present in the private market. This doesn't mean, however, that apprentices, women, and people of color aren't employed elsewhere. Public sector projects will still need to compete with other markets for this workforce.

⁷ For more details, please refer to [APPENDIX D: Data Notes and Methodology](#)

FIGURE 6: Oregon Total Forecasted Construction Spending



Source: U.S. Census, IHS Markit, Oregon Office of Economic Analysis



Photo: Worksystems 2019

Potential Surplus/Deficit

Overall, the workforce as of 2022 of 43,000 nonresidential construction workers appears to meet the future demand of 22,000 workers for this study’s reported large capital projects, even when assuming all projects have goals. Broken out by stated apprentice and diversity goals, this is also true for workers of color and apprentices (4,700 and 3,800 respectively). There will, however, be a shortfall of nearly 400 female construction workers to fulfill the projected demand included in this study.

Although most goals appear to be met at the sum total level, there is a lack of diversity at the individual occupational level. If diversity goals were applied to each individual trade, many occupations fall short. **This can be better summarized if we add up all the deficits by trade, which better illustrates the needs of specific trade occupations for the region.** A licensed plumber, for example, is not synonymous with a skilled carpenter in their abilities and skillset. **The current supply would fall short by approximately 270 workers of color, approximately 1,050 female workers, and approximately 1,290 apprentices** to fill the needs for all trades in the region over the next 5 years.

FIGURE 8: Total Need by Worker Category

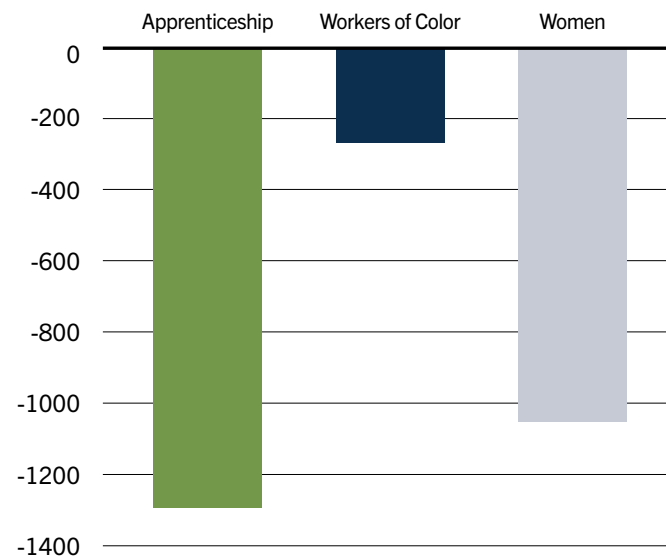
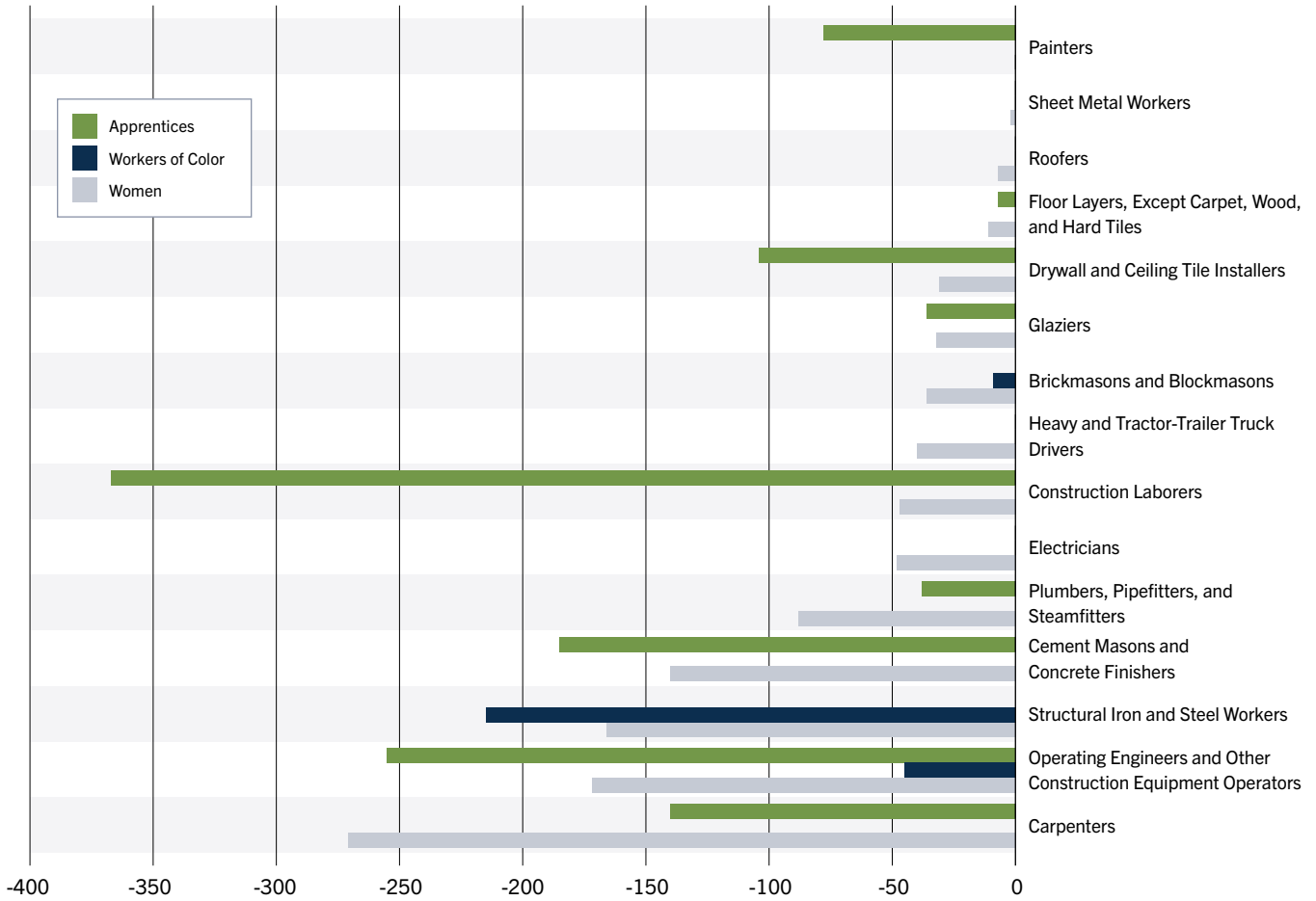


Photo: Oregon Tradeswomen, Inc. / Dawn Jones Redstone

FIGURE 9: Deficit by Occupation



Source: Lightcast; BOLI

There is a likely shortage of registered apprentices for ten occupations. The occupations with the largest discrepancy between the current active apprentices and projected demand include construction laborers, operating engineers, cement masons, carpenters, and structural iron and steel workers.

There is a likely shortage of female workers for fourteen occupations. The occupations with the largest discrepancy between the current workforce and projected demand include carpenters, operating engineers, structural iron and steel workers, and cement masons and concrete finishers.

There is a likely shortage of workers of color for three occupations: structural iron and steel workers, operating engineers, and brickmasons and blockmasons.

Structural iron and steel workers indicated likely shortages across all categories of workers.

Professional, Technical, Engineering Workforce

In addition to construction occupations, this study looks at professional, technical, and engineering (PTE) occupations. PTE occupations include engineers and technicians, office and business staff, and project managers.

Approximately 12,800 people work commercial construction and construction-related engineering in PTE occupations in the Portland MSA (2022). Demographic and wage data are available for each occupation as a whole but the data are not granular enough to look at the demographic information for an occupation within a sub industry. For example, data exists on the racial and ethnic breakdown of accountants but does not exist for accountants who work in construction specifically. Similarly, data about wage differentials between sub industries is not available.

Women are slightly overrepresented in PTE occupations. Fifty-six percent of current PTE workers are women, compared to 49 percent of the working age population.

Workers of color are underrepresented in PTE occupations. Twenty-three percent of workers in PTE occupations are people of color, compared to 32 percent of the working age population. The greatest disparity is seen in people who identify as Hispanic or Latino and people who identify as two or more races. People who identify as Hispanic or Latino are 14 percent of the working age population but hold just eight percent of PTE jobs. For workers who identify as two or more races, the gap is even wider. They comprise 12 percent of the working age population and hold just three percent of PTE jobs.

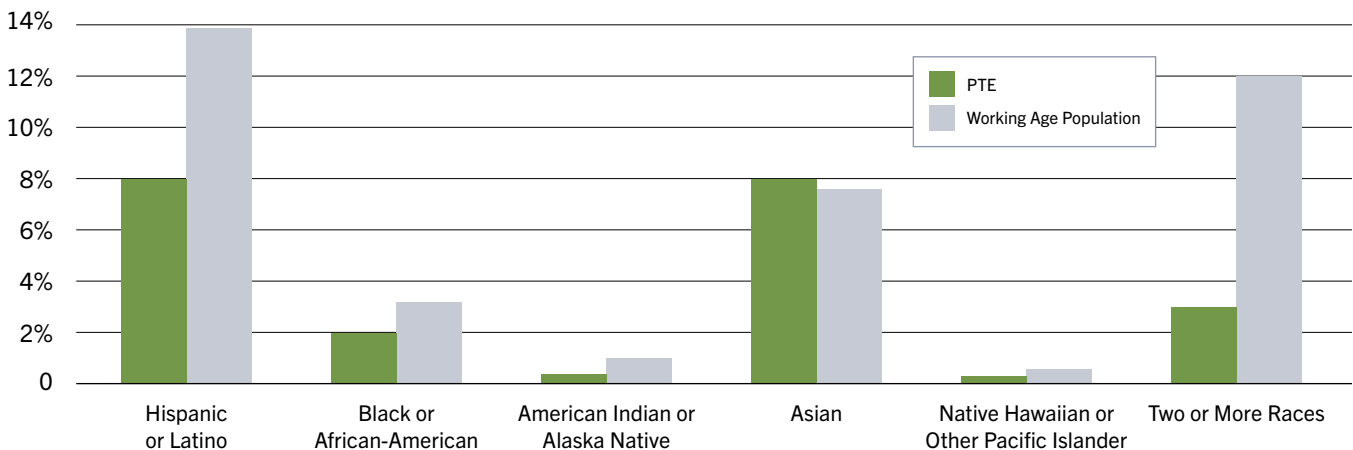
Demographics vary widely by occupation. The percentage of workers who identify as non-white ranges from ten percent of surveyors to 32 percent of electrical engineers. In the seven occupations with the largest presence in construction, workers of color represent between 11 and 27 percent of employed workers.

TABLE 7: PTE Occupations, Portland MSA, 2022

SOC	DESCRIPTION	2022 JOBS	2022 JOBS IN CONSTRUCTION	% OF OCCUPATION EMPLOYED IN CONSTRUCTION
13-1082	Project Management Specialists	12,648	2,991	24%
43-9061	Office Clerks, General	21,498	2,147	10%
43-3031	Bookkeeping, Accounting, and Auditing Clerks	16,712	1,359	8%
13-1051	Cost Estimators	2,613	1,299	50%
17-2051	Civil Engineers	2,060	565	27%

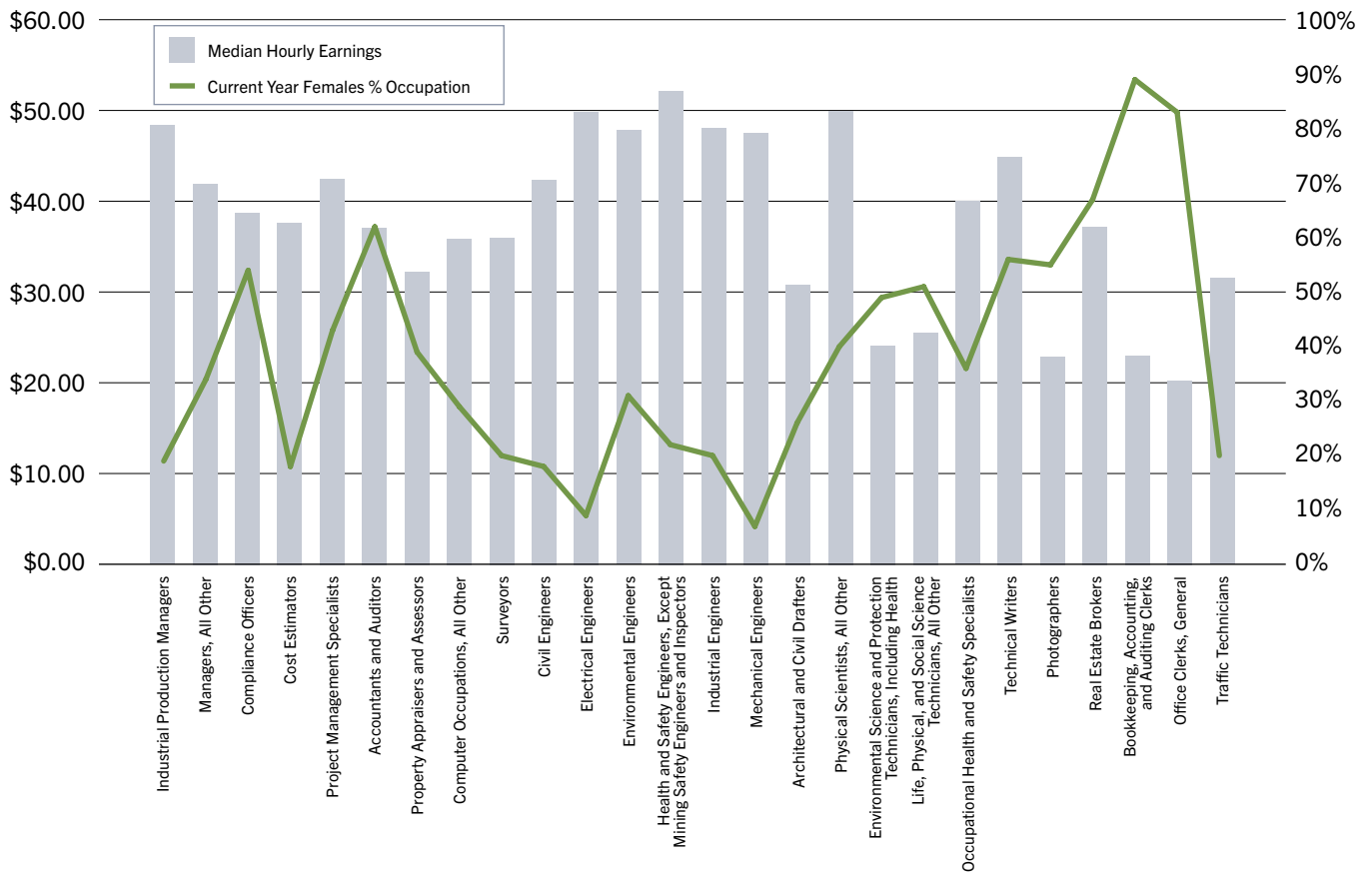
Source: Lightcast

FIGURE 10: PTE Workforce by Race and Ethnicity, Portland MSA, 2022



Source: Lightcast, US Census Bureau, American Community Survey

FIGURE 11: PTE Workforce, by Sex and Median Wage, Portland MSA, 2022



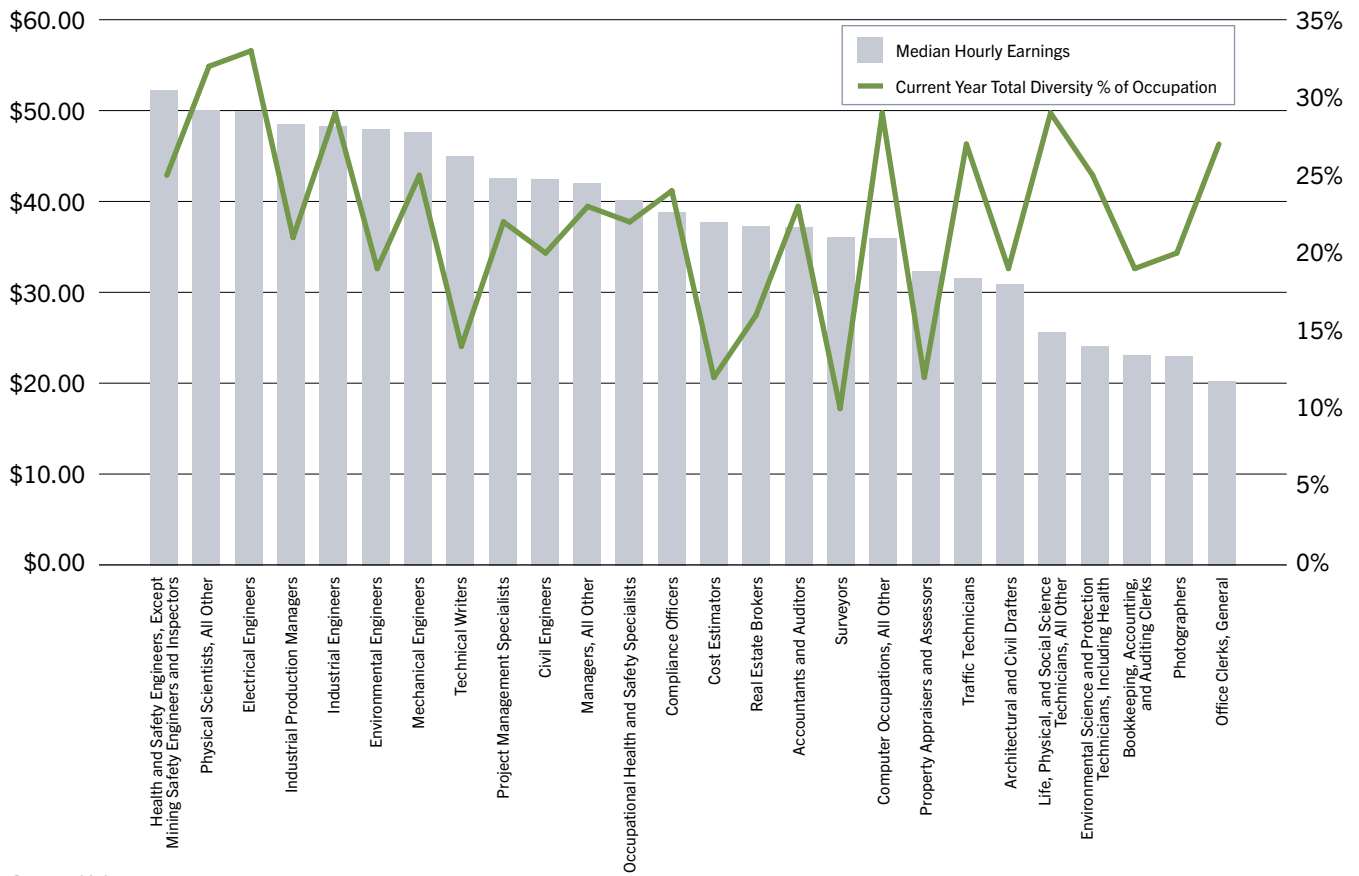
Source: Lightcast

WAGES

Median wages for PTE occupations range from \$21.53/hr. to \$59.73/hr. **While women are overrepresented in all PTE occupations, they are underrepresented in nearly all occupations at the top and middle of the wage scale.** Women are clustered in occupation near the bottom of the wage scale, most notably bookkeeping, accounting, and auditing clerks and office clerks.

While there isn't an exact correlation between median wage and workers of color, there is a noticeable increase in percentage of workers of color at the lower end on the wage spectrum.

FIGURE 12: PTE Workforce, by Race, Ethnicity, and Median Wage, Portland MSA, 2022



Source: Lightcast



Photo: Oregon Tradeswomen, Inc. / Dawn Jones Redstone

Educational Pipeline

In Oregon and SW Washington, 43 colleges and universities offer 37 programs for PTE occupations. They include Oregon’s 17 public community colleges, seven public universities, and a variety of for- and not-for-profit colleges. Between 2015 and 2021, more than 45,000 students earned a degree in one of these programs. Colleges and universities in other areas of Washington state offer bachelor’s degrees in PTE fields. While some students may work in this area from these schools, as well as other states, students from Oregon are more likely to seek employment in the Portland MSA. Demographic data on degree-earning students is not available.

Seventy-seven percent of graduates earned degrees in engineering, engineering technologies and engineering-related fields, or business management, marketing and related support services. **Two schools, Oregon State University and Portland State University, represent 75 percent of degrees in engineering, engineering technologies and engineering-related fields during this period.**

Seven schools granted more than 1,000 degrees in business, management, marketing, and related support services during this period: Clark College, George Fox, Oregon State University, Portland Community College, Portland State University, Southern Oregon University, and the University of Oregon. Together, they accounted for 65 percent of graduates in this field.

Projected Demand (5+ Years, Public Projects over \$15 Million): Professional, Technical, and Engineering Occupations

The upcoming public capital projects will create demand for workers in professional, technical, and engineering (PTE) occupations in addition to the trades. Unlike the trades, PTE staffing patterns are not available based on project type. However, data is available based on detailed industry. For the construction industries represented in the list of capital projects and for engineering firms that commonly support construction projects, national data show that for every 1,000 trades occupations there are roughly 300 workers in those PTE occupations identified in the study.

Assuming this relationship applies locally and extends to the estimated need for over 20,000 tradesworkers on the identified capital projects⁸, an estimated 5,900 PTE workers will be needed. As with the trades, these positions may be filled by a combination of the existing workforce and new entrants. In other words, the 5,900 figure does not represent net new jobs.

Three PTE occupations account for over half of total PTE demand: office clerks, project management specialists, and civil engineers.

TABLE 7: Top PTE Occupations in Demand for Regional Public Projects

SOC	DESCRIPTION	REGIONAL DEMAND	2022 SUPPLY	DIFFERENCE
43-9061	Office Clerks, General	1135	2,147	1,012
13-1082	Project Management Specialists	993	2,991	1,998
17-2051	Civil Engineers	966	2,060	1,094
43-3031	Bookkeeping, Accounting, and Auditing Clerks	592	1,359	767
13-1051	Cost Estimators	582	1,299	717
13-2011	Accountants and Auditors	286	484	198
17-2141	Mechanical Engineers	272	456	184
17-3011	Architectural and Civil Drafters	238	365	127
17-2071	Electrical Engineers	224	517	293
11-9199	Managers, All Others	113	245	132
17-1022	Surveyors	104	197	93
17-2112	Industrial Engineers	101	146	45
19-5011	Occupational Health and Safety Specialists	85	173	88
17-2081	Environmental Engineers	68	133	65
15-1299	Computer Occupations, All Others	50	86	36
13-1041	Compliance Officers	39	67	28

Source: Lightcast

⁸ Engineering Services (NAICS 54133). This industry is comprised of firms “engaged in applying physical laws and principles of engineering in the design, development, and utilization of machines, materials, instruments, structures, processes, and systems.” They perform a variety of activities including “feasibility studies, preparation of preliminary and final plans and designs, provision of technical services during the construction or installation phase, inspection and evaluation of engineering projects, and related services.”

Implications

At least 22,000 construction workers will be needed to complete the 107 large capital projects analyzed in this report. Data indicate the current available supply of workers will not meet the projected demand, specifically in key occupations and for diverse workers. The projected shortage will impact the industry's ability to meet project specific diversity and apprenticeship goals. An estimated 1,050 female workers and 270 workers of color are needed and the gap between the anticipated need for and current supply of apprentices is more than 1,200 workers.

The shortage of workers indicated in this analysis is also likely much larger when placed in a broader context that includes other regional demand such as private, residential and smaller public projects. Competition for workers from other sectors and changes in labor force availability will impact the availability of workers.

These data illustrate an opportunity for local public agencies to proactively address and plan for the future workforce need of registered apprentices, workers of color, and female workers. The next section provides detailed recommendations and descriptions of best practices that can support the region's ability to work toward collective strategies and solutions to advance workforce equity. ■



Photo: Worksystems 2019

KEY BARRIERS AND WHAT PUBLIC PROJECT OWNERS CAN DO

This study included extensive interviews, focus groups, and surveys with industry stakeholders, including diverse registered apprentices, journeyworkers, union leaders, apprenticeship staff, contractors, and public agencies. A full list of participants can be found in [Appendix B](#). The following section highlights the key barriers that emerged from this deep engagement, the major factors that prevent the successful maturation of a diverse construction workforce in our region, and what public project owners can do to help address these issues.

The Construction industry has a significant issue with retention, as demonstrated in low completion rates for apprentices, particularly for women and people of color. For example, **Portland State researchers found that 49% of apprentices who started a highway trades apprenticeship in Oregon in 2014–2015 had completed it by the end of 2022** (Kelly and Benitez 2022). Completion rates by race and gender are shown in the figure below. Note, however, that there were too few Black, Asian, and Native women as well as too few Hawaiian and Pacific Islander women and men in highway trades to calculate completion rates for these groups; completion rates are presented for Hispanic/Latino women but this represents only thirteen individuals.

Increasing Retention of a Diverse Workforce through Addressing Jobsite Issue

BARRIERS	SOLUTIONS	PUBLIC PROJECT OWNER ROLE
Challenges accessing quality training on the job	Increase monitoring of on-the-job training of apprentices by supervisors and well-trained experts	Provide more oversight to address quality of on-the-job training (e.g. third-party reporting, partnership with BOLI/ L and I, shop stewards)
Harassment on the job	Increase monitoring of job site culture by supervisors and well-trained experts; address construction job site culture through respectful workplaces trainings with proven results	Contractually require contractor to implement respectful workplace trainings with proven results
Lack of effective policies and practices to address jobsite harassment and discrimination incidents	Ensure policies and practices are effective best practices for reporting (e.g. shift from focusing only on formal reporting to include other options) and discipline (e.g. effective education, accountability, discipline for workers who harass and discriminate); continue collaborative work to address respectful job sites	Contractually require contractor to implement incident response policies and practices based on best practice models
Exclusion and isolation on the job	Creating cohorts or affinity groups of women and people of color workers; cultivate community through recognition; ensure all workers have the opportunity to engage in group discussions; providing big picture information about the project to all workers	Give contractors credit on bids who provide affinity groups and other supports to mitigate exclusion and isolation on their projects and within their company
Issues with lack of clean restrooms and spaces for lactation	Provide clean restrooms and spaces for lactation (and the ability to access these without censure)	Contractually require clean restrooms and spaces for lactation

Portland State researchers surveyed 231 registered apprentices who had either completed or terminated an apprenticeship in 2020–2021 about their experience with jobsite challenges. **The survey found that 42% of participants reported that being treated disrespectfully was a challenge during their apprenticeship.** These experiences varied by race and gender, with white men less likely to experience jobsite challenges. For example, while 4% of white men and 7% of men of color reported experiencing unwanted sexual attention or sexual comments (i.e. sexual harassment), 41% of white women and 50% of women of color reported this experience.

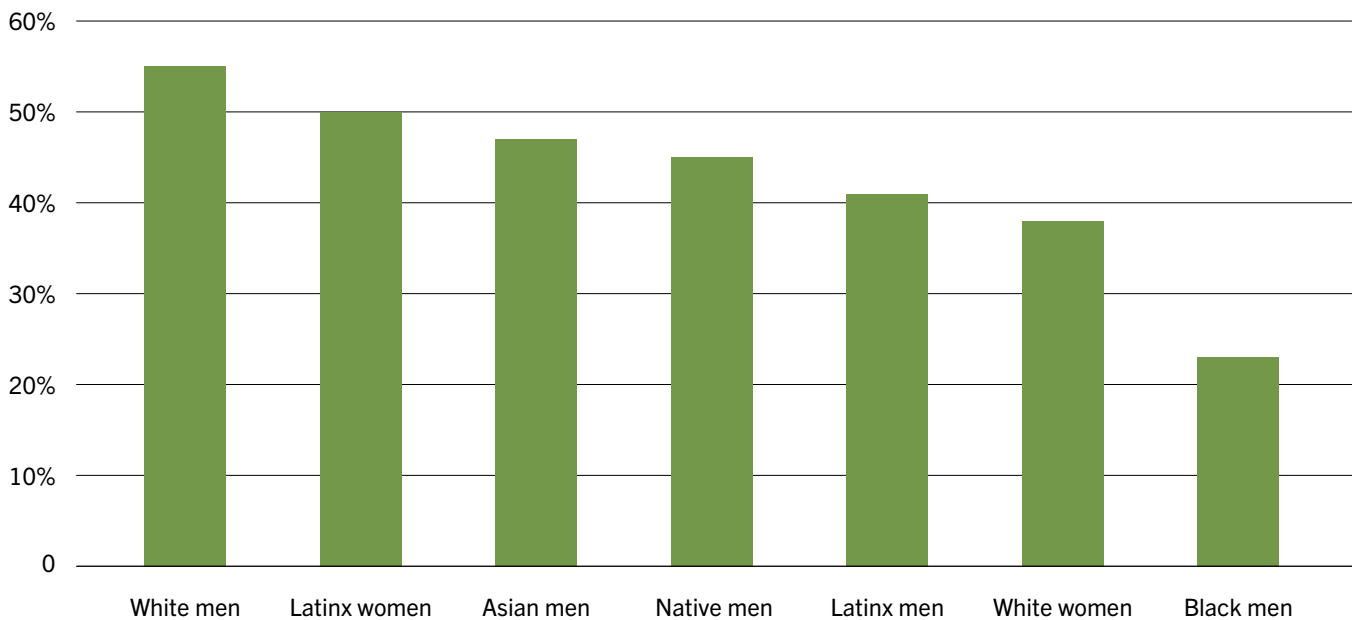
The Portland State survey also assessed apprentices’ reasons for leaving an apprenticeship. Of the 59 apprentices who chose to leave an apprenticeship in 2020–2021, the survey found that the most common reasons why apprentices did not complete were: (1) leaving for another opportunity; (2) financial challenges (especially being out of work too much); (3) problematic jobsite culture; (4) illness, injury, or concerns about safety (not explicitly related to Covid-19); and (5) poor-quality training. For several participants, having another opportunity outside the trades as well as disliking the jobsite culture, contributed to their leaving. For example, one participant reported *“I decided I didn’t want to do it for the rest of my life and I wasn’t a big fan of the atmosphere.”*

Box 6. Challenges accessing quality training on the job

“[A challenge for apprentices is] not getting appropriate training, not being given a variety of work, being sort of stuck in that apprentice role. There are still companies out there that see apprentices as being expendable, low wage workers.” (Journeyworker)

“[A foreman asked if I would like a male apprentice to unload a truck instead of me, a female.] So I looked at him, I said, ‘Do you know a journeyman that doesn’t know how to unload a truck?’ And he was just looking at me and walked away. And then he apologized later and he said, ‘I’m sorry, I just feel like I need to protect you and you’re still a baby.’ And I was like, ‘you can’t baby me.’ And ever since then, that was one moment where at that company, I was able to do so much more, but I had to be really vocal about it and get angry about it. Because yeah, if I hadn’t done that, there were probably so many other things I wouldn’t have had the confidence to be like, let me try it and prove it.” (Apprentice focus group)

FIGURE 13: Percent of Apprentices in Highway Trades Completing by Race and Gender, 2014-2015



Source: Kelly and Benitez 2022

In additional analyses, the jobsite challenges most highly correlated with terminating (rather than completing) an apprenticeship were: being unfairly laid off, not having anyone as a mentor or teacher of necessary skills on the jobsite and being unfairly assigned tasks unrelated to trade skills. While jobsite harassment (e.g. hearing offensive jokes or comments) is often correctly identified as a major issue impacting retention, **a lack of access to quality training on the job site is also a significant issue** less frequently included in discussions of retention.

To address the related issues of apprentices' access to on-the-job training and job site culture, workers and staff suggested **increasing monitoring of job sites by supervisors and well-trained experts**. Workers reported that they appreciated it when leaders on the jobsite performed this role; however, that was not common. Others noted that journeymen could be reviewed to ensure they were effectively training their apprentices.

"It was like [my foreman] could just walk around and just put fires out constantly, just see things, be really proactive about them." (Apprentice focus group)

"Having a third party come in and assess the actual job site and then actually report back to the owner." (Apprentice focus group)

One apprentice noted that having more diverse workers in leadership would help reduce jobsite issues:

*"I think there just needs to be more Black, more brown, more trans apprentices, and there needs to be more Black, more brown, more trans journeymen. There needs to be people in positions of power. And I say women too, but specifically race, and trans folks, need to be empowered to use the skills that we have. And it is impressive, **the cultural shift that automatically happens when we are someone's boss** and that trickles down hard."* (Apprentice focus group)

Workers and staff also reported the need to **address construction job site culture through respectful workplaces trainings with proven results**. Workers and staff noted that poor quality content or implementation of workplace trainings can have negative impact on jobsite culture.

*"I've been through all the trainings, I've been through bystander intervention, I've been through Green Dot, I've been through whatever [my union] is using right now. But I think we're reaching the wrong people. **We're putting the apprentices through all this training, but you really need to get it out to the field people [e.g. journeymen, foremen]. And I don't think it can be on a voluntary basis.** Because you're just going to capture people like me who are interested in the topic, but you're not going to catch the people who need, I guess, their consciousness raised. And I know that some job sites are doing this. Some of the general contractors are implementing that kind of training, but I don't think it's taken very seriously. And so a lot of times if you're sitting in a contractor's new hire orientation, they might put you through it, or they'll put you through some sort of harassment training, but **in a training that is supposed to take two hours, they might do it in 35 minutes.** So if you want to make a change, if you're talking about culture change, you can't just wait for the old farts to die. You have to start training them and giving them real examples of what's going on at the job site."* (Journeyworker)

Box 7. Harassment on the job

"I've been told I have a bitchy face and that I have a really bad attitude." (Apprentice focus group)

"But it is emotionally exhausting and I feel like it wears. It has put so much wear and tear on me depending on the job or the crew. And some have been absolutely amazing. For every one person that is a problem for me, there's 50 other ones that are having my back. Just in my experience. But it's emotionally exhausting to have to navigate that all the time. [Lots of nods]" (Apprentice focus group)

"[Women and minorities] being outnumbered the way they are on a job, they get harassed, and some of them get discouraged and leave. It's a hard fact, but it's true." (Apprenticeship staff)

Box 8. Lack of effective policies and practices to address jobsite harassment and discrimination incidents

"The one time I did speak up, I learned my lesson, **I'm not going to do that again because we both got laid off.** He got a thirty day call back and then I'm like, so he learned nothing, nothing came of it and now I'm off to a new job, which ended up being good anyways, but still it shouldn't be that way." (Apprentice focus group)

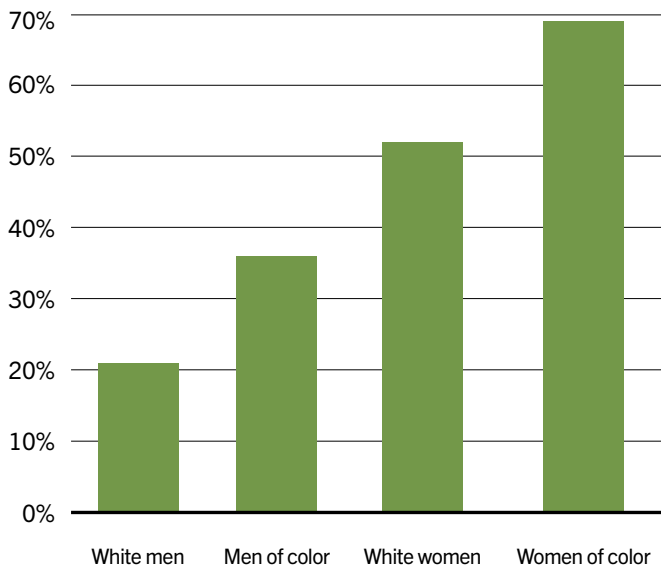
"It's obvious, where I'm at, who the people are that are just consistently every day just assholes. And it's obvious and nobody says anything... **The foreman knows. The superintendents know.** [Others verbally agree]" (Apprentice focus group)

"There's times [when an apprentice is being mistreated] where we have to step in and say [to the contractor], 'No, you guys, you need to do more.' We don't always get that cooperation." (Apprenticeship staff)

Workers and staff emphasized that a critical solution needed to address the issue of harassment on the job would be to **implement policies and practices related to reporting and discipline that reflect effective best practices.** Apprenticeship staff noted that this can be supported by continuing collaborative work to address respectful job sites (e.g. Culture of Care, Safe from Hate). Specific changes that were recommended were: shift from focusing only on formal reporting to more realistic options; end the practice of firing or moving the person being harassed rather than the harasser; end the practice of moving harassers from one job site to the next. Workers and staff also suggested that repeat offenders could be tracked over time by unions or contractors.

*“Somebody gets fired for sexual harassment, they just start looking for another job. It’s just expected that you lose your job, that that was the punishment. Maybe in some cases it is, but in a lot of cases, like right now with construction workers being in demand, it’s not much of a punishment. Usually people can get back out on a job site the next week, sometimes even the next day. So maybe that’s something we circle back to, the beginning of that question, is **maybe we need to find some way, some policy or practice that doesn’t allow that to happen without some sort of interference and education, something that keeps that from happening again.**” (Apprenticeship staff)*

FIGURE 14: Percent of Apprentices Reporting that Hearing Offensive Jokes or Comments Was a Problem, by Race and Gender



Source: Kelly and Benitez 2022

Another barrier to retention was experiences of exclusion and isolation on the job. While workers of all identities can experience this negative aspect of jobsite culture, it is heightened for marginalized workers, given low numbers of marginalized workers on most job sites as well as prejudice from other workers. Some recommended **creating cohorts or affinity groups for diverse workers** (e.g. cohorts of pre-apprenticeship students; affinity groups within unions; support networks on job sites).

*“If you’re looking at work for a development, particularly for the interstate [bridge] project, maybe part of that is that **some of those [support networks for women and/or workers of color] are built in,** that there’s opportunities for apprentices from all trades to come together to talk their experience. I think there’s not a lot of cross trade solidarity in that aspect.” (Journeyworker)*

Workers and staff also recommended efforts to **cultivate community on job sites.** Some strategies include building relationships as well as individual and team recognition. This could be accomplished through everyday actions such as ensuring workers are not excluded from group discussions about the work and providing big picture information about the project to all workers.

*“What I really think, down at a deep, deep, deep core, is **what would make it better is if you could really establish a sense of community.** We’re all working towards this tangible goal. We’re going to build this building, we’re going to be done, we’re going to be on the next job. But the most satisfying jobs that people go to are when they’re building relationships within their crews, within other trades. And so somehow fostering that, I think would really make a difference.” (Journeyworker)*

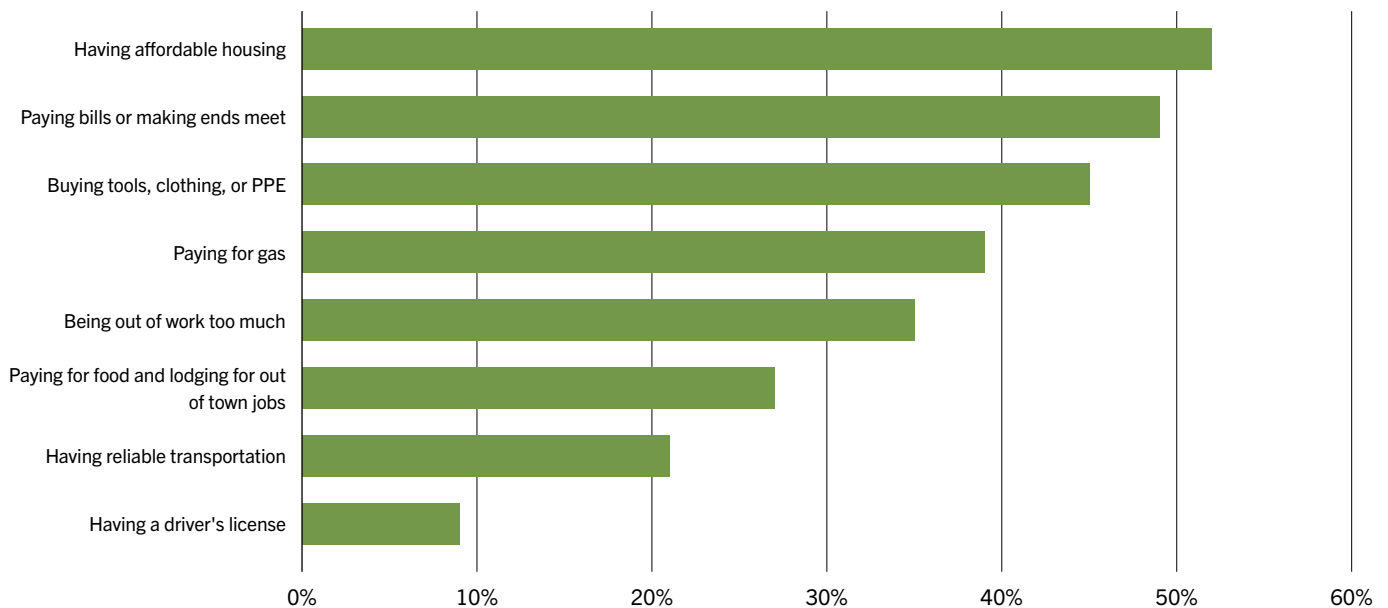
Box 9. Exclusion and isolation on the job

*“**[Women and minorities] are often shut out of job site discussions about what’s going on.** And I’ve experienced that myself, where in the morning, when jobs are being discussed, there’ll be a circle of men standing around, and **I’ll have to actually physically insert myself into that circle. The circle does not naturally open up,** and that’s the best way I can explain. And that’s fifteen years of experience in the trade.” (Journeyworker)*

Increasing Retention of a Diverse Workforce through Addressing Worker Needs

BARRIERS	SOLUTIONS	PUBLIC PROJECT OWNER ROLE
Being out of work	Improve forecasting data and communication across industry partners; require workforce agreements that have utilization goals	Require workforce agreements that have utilization goals by both apprentice and journey level by trade
Challenges accessing career mentorship and advancement opportunities	Ensure equitable access to mentorship and opportunities to advance; provide support for apprentice to journeyworker transition	Require that contractors provide all workers access to mentorship and advancement opportunities and protections from disparate treatment on the job
Financial challenges (e.g. transportation, housing, medical bills)	Provide financial supportive services and referrals to retain workers	Onsite Retention coordinators ; Provide dedicated hardship funds for jobsites
Non-financial challenges (e.g. alcohol and drug use, legal issues, mental and physical health)	Provide non-financial supportive services and referrals to retain workers	Onsite Retention coordinators
Cost of childcare and access to childcare	Increase access to childcare by creating new childcare options, especially for non-standard shifts; Increase affordability of childcare by offering subsidies	Provide dedicated childcare funds for workers; engage in collaborative efforts to fund childcare for the industry; Prioritize increasing the number of childcare spots available when implementing policies related to childcare
Lack of flexibility in work hours	Provide flexibility in work hours to address workers' caregiving and health needs	Require contractor bids to include a plan where contractors will implement innovative scheduling models
Inability to travel	Allow workers to pass on out-of-town jobs without being penalized; provide financial incentive for out-of-town work	Embed equity provisions in workforce agreements to create a system to address these needs in dispatch with apprenticeship programs

FIGURE 15: Percent of Apprentices Reporting Financial Challenges



Source: Kelly and Benitez 2022

Some reported the **need for clean restrooms and spaces for lactation (and the ability to access these without censure)**. The lack of facilities represents a practical issue for workers needing a clean environment to urinate while sitting or squatting and attend to menstruation as well as a separate space for breastfeeding; additionally, a lack of facilities signals that some types of workers are not welcome on job sites.

*"If there's one female on the job site, we're supposed to have a female bathroom. **We never got it. We never got it, until I went to the female electrician and then both of our unions went together.** And then we finally got bathrooms for women and then the men."* (Apprentice focus group)

In addition to issues experienced on the jobsite, there are other challenges that impact retention. Registered apprentices who had completed or terminated an apprenticeship in 2020–2021 were surveyed about financial challenges during their apprenticeship.

The financial challenges most highly correlated with terminating (rather than completing) an apprenticeship were **being out of work too much and being unfairly laid off**. Notably, over one third of apprentices reported that being out of work had been a challenge during their apprenticeship and women were more likely than men to report being out of work too much.

Box 10. Being out of work too much

*"When I had my surgery, I didn't [have enough financial resources]. You were saying how you have to have so many hours for your medical [benefits to take effect]. I couldn't get FMLA or anything. **So I'm over here struggling, just ran out of unemployment, and it's during that season when there's no work, so I'm over here struggling.** I had to move back with my mom. Me and my wife and daughter are literally sharing a room at the moment because of this and I couldn't get it figured out." (Apprentice focus group)*

*"There is some time in between jobs or projects sometimes, and **that can be hard for an apprentice that's maybe used to a more stable place to work.** You're going to work each day building a project, that project's going to end, and that can be difficult at times." (Union staff)*

One solution to this issue is to **require both apprenticeship and journey-level diversity utilization on Projects and to improve forecasting data and communication across industry partners related to demand for apprentices**. This way, contractors have a vested interest in apprentices being retained and successfully graduating to journey level to ensure a diverse pool of available journeyworkers.

"[To better forecast,] I would know all the man-hours on every contract signed. If I knew all those contracts that were signed and the man-hours, well, I would know exactly how much the work is happening in the next two, three years." (Apprenticeship staff)

One staff member that they tried to intervene when apprentices are not getting enough work hours:

*"We look at their hours every month when we're entering them into the BOLI system. **And if they're not getting hours [with their employer], then we reach out to them [the apprentice] and have a conversation like, "Why are you not working? What's the issue?" And then we try to shift them to a different shop, or even contact the contractor and say, "Hey, what's going on? Why are all these people working and this person isn't?"**" (Apprenticeship staff)*

Staff noted public project owners could **require workforce agreements that have utilization goals**:

"I feel like really policy needs to change around the opposition of workforce agreements. Regional workforce equity agreement, community benefits agreement, community workforce agreement, project labor agreements, that include the utilization of apprentices. And I think that's probably the biggest thing." (Apprenticeship staff)

Others noted the need to **provide support for apprentice to journeyworker transition**. Staff members noted that the inability to pay journeyworkers for additional training and the inability to require mentorship trainings were a barrier. This issue is particularly important as some of the trainings focus on how to be a mentor, which would support not only the journeyworker but also the future apprentices they train.

*"I think maybe [it would help the transition from apprentices to journeyworker] **if there was maybe some targeted training for BIPOC and women, new journeyworkers, on what it means to advance in your career, what kind of opportunities there are, what you can do to make yourself a good candidate for those advancements.** How to tactfully approach leadership to say that they're interested in those types of roles, I think that would be very helpful. Because a lot of times it's a mystery on how somebody becomes a foreman. It's like, 'Really? That person? Okay.'" (Apprenticeship staff)*

Workers and staff reported that, in addition to the challenges that arise from not having consistent work, there are financial issues that impact workers through all stages of the apprenticeship, although financial challenges are often most significant early in apprenticeship when wages are lower and there has been less time to save money or accumulate unemployment. A recommendation was to **provide financial supportive services and referrals to retain workers** (e.g. tools/clothing/PPE, gas, parking, lodging and per diem for out-of-town work).

Additionally, workers experience a variety of other non-financial issues; the most commonly mentioned was mental health issues, although others discuss addiction, legal issues, and concerns about treatment on the job. As one apprenticeship staff person mentioned: “I feel like we've lost members to mental health issues over the last five years or so. And so I feel like those things are coming more to the forefront and it's important to support everyone.” One recommendation was to **provide non-financial supportive services and referrals to retain workers** (e.g. support for harassment on the job, domestic violence, alcohol/drug issues, financial advice, legal advice, physical and mental health issues). A best practice is to provide wraparound services that provide workers with a single point of contact who can connect them to needed resources.

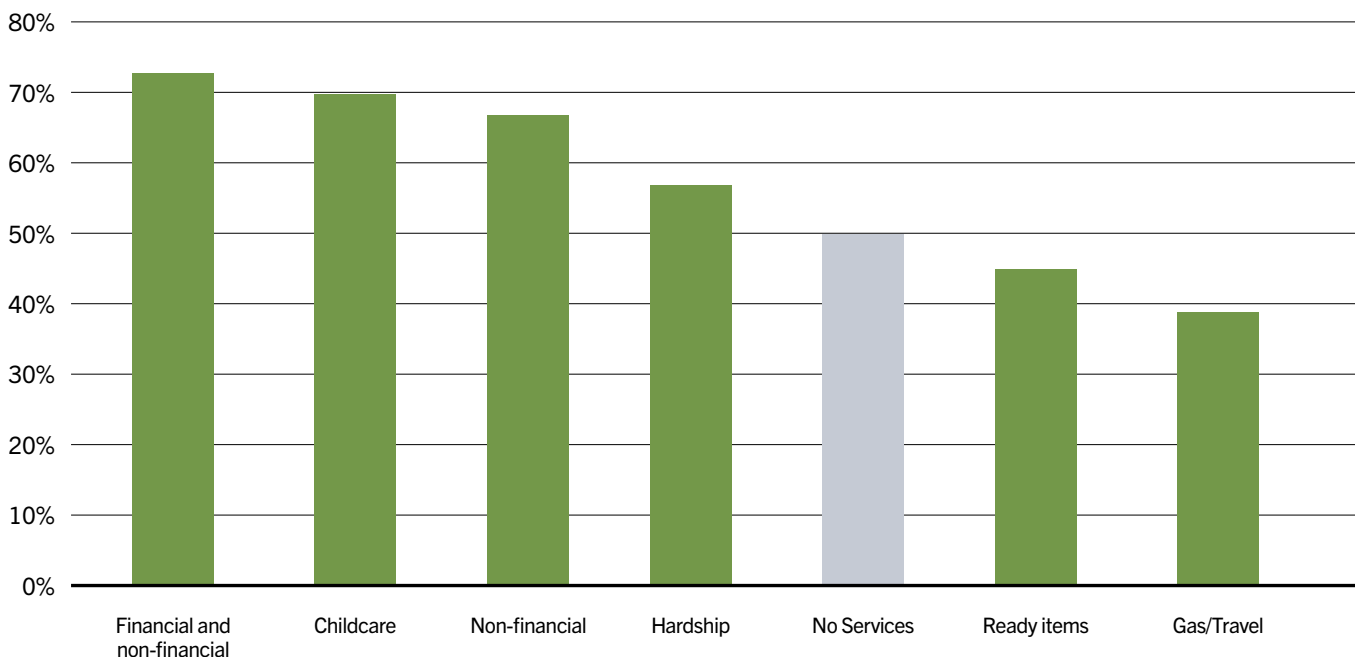
The ODOT/BOLI Highway Construction Workforce Development Program continues to improve completion rates for apprentices who receive services. Receiving both financial and non-financial services had the largest impact on completion, followed by childcare subsidies, non-financial services, and hardship funds. **Readiness items and gas/travel did not have a positive impact on completion.**

Box 11. Financial challenges

“You think of **housing**, most of the work happens in the bigger cities, and people can't afford to live even close to the bigger cities. So then there's the fuel cost. You got to have **transportation**. Public transportation just isn't quite enough for what is demanded out of a construction workday. You have to be there really early. A lot of trains or buses don't run that early.” (Apprenticeship staff)

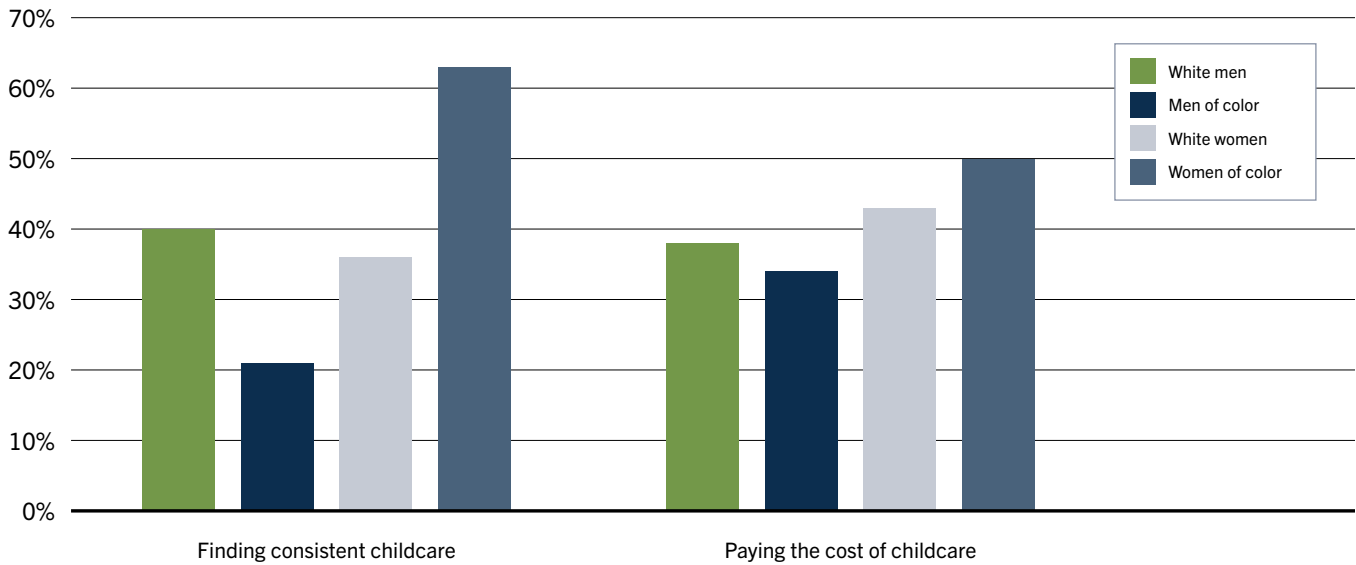
“I know one guy who actually had to drop out of the apprenticeship because his child was diabetic and he had to wait the 90 days to get insurance and all that kind of stuff. And so his kid was dependent on that insulin and could not live 90 days without it. Because he **could have potentially been an awesome worker, but we'll never know because he had to keep his kid alive.**” (Apprentice focus group)

FIGURE 16: Percent of Highway Trades Apprentices in the 2014–2015 Cohort Completing, by Service Type



Source: Kelly 2022

FIGURE 17: Percent of Apprentices with Children Who Reported Challenges Related to Childcare, by Race and Gender



Source: Kelly and Benitez 2022

Workers and staff emphasized the need to **increase affordability of childcare by offering subsidies** as well as **increase access to childcare by creating new childcare options, especially for non-standard shifts** (e.g. new childcare center; offer childcare subsidies allowing friends and family not previously employed as childcare providers to provide care). Workers and staff noted that addressing childcare in the construction industry will need to be a collaborative effort:

“[In relation to assisting with access to affordable childcare] the onus is for sure on all of the JATCs, all of the locals, all crafts union. But the onus is also on contractors and other folks that have a huge stake in these jobs and our training. I feel like that is a holistic picture with a lot more folks involved. Lot more that needs to happen.” (Apprentice focus group)

Box 12. Challenges with childcare

*“I’ve worked seven twelves [seven shifts, twelve hours a day] graveyard, that does not help being a parent. Starting at 4:00 AM, starting at 6:00 AM, and having to travel a distance. You’re at work before your kids are even up for school sometimes. And there’s no daycare that can accommodate that. **If I didn’t have family [to help with childcare], I would not be in this [apprenticeship].**” (Apprentice focus group)*

The construction industry offers low levels of flexibility in work hours to accommodate workers’ responsibilities to care for others (e.g. childcare responsibilities) as well as attend to their own health needs (e.g. sick days, doctor’s appointments). Solutions include **providing flexibility in work hours to address workers’ caregiving needs and health needs**. Apprentices focus group participants noted that these decisions were primarily made at the supervisor level and supervisors were more likely to accommodate white men’s requests for flexibility. Some examples:

*“If this industry could go to some semblance of job flexibility, that would go a huge, long way. **Why can’t someone who has to be at their school [to pick up their kids] at 3:00 PM, why can’t they work 6:00 to 2:30 and not be penalized because they can’t work the 10-hour days?** So having that kind of flexibility, I think, would be the key for women, people of color, I mean everybody. But if that burden falls on women, the women to be home, to take care of their sick kid, the women to be home to meet the other tradesperson at their house sort of thing. So I’d say that was my number one thing.” (Journeyworker)*

An issue related to work/life conflict is the expectation that all workers always be available to travel long distances and/or work out-of-town; this is particularly challenging for those with caretaking responsibilities. Apprentices' inability to travel can lead to longer stretches of unemployment, which often leads to termination. Possible solutions include changing policies to **allow workers to pass on out-of-town jobs without being penalized** as well as **providing a financial incentive for out-of-town work** to encourage those who can travel to do so.

Increasing Recruitment of a Diverse Workforce

BARRIERS	SOLUTIONS	PUBLIC PROJECT OWNER ROLE
Recruitment of all apprentices is primarily through referrals, which largely reproduces a white male workforce	Build on current levels of support for pre-apprenticeship programs and other organizational partnerships	Embed apprenticeship and diversity goals into all projects to create sustained demand for diverse apprentices on all jobsites
Pre-apprenticeship has not been fully funded or integrated into the workforce pipeline	Secure a multi-year funding stream to increase capacity and ensure programs are sufficiently and consistently funded; increase direct entry from pre-apprenticeship into apprenticeship programs	Contribute to regional efforts that support pre-apprenticeship training with multi-year funding for programs and include stipends to participants enrolled in pre-apprenticeship trainings
Outreach and marketing efforts are not well coordinated across the region, frequently do not reach a diverse audience, and the impact of this outreach is unknown	Build on current successful partnerships for recruitment; coordinate additional outreach efforts across the region	Participate in regional partnerships to increase marketing and outreach efforts in the region
Challenges navigating the apprenticeship program application process, particularly for marginalized workers	Evaluate application process and scoring; provide resources to help potential applicants navigate the application process	Implement Workforce Agreements that include apprenticeship diversity requirements in partnership with Joint Apprenticeship Training Committees (JATCs)

Box 13. Lack of flexibility in work hours

"As a single mom, it's a lot. So especially when you're working six tens [six ten hour days] and then you've got a child that may have some sort of special needs, or some behavioral issues, or whatever it is that depends on you and you're the phone call. *I've lost three jobs because of some incidents with my kid. I had to leave. There was nothing I could do.* So I've dealt with consequences and thankfully she's grown out of some of that. But at the same time, it doesn't help the day to day." (Apprentice focus group)

Box 14. Ability to travel

"Willingness to travel is important. We cover a large area and that tends to be something that is a hindrance to some. Oregon and Southwest Washington is fine, but *when you have a family and you need to be home at night, that makes it a little more challenging.*" (Apprenticeship staff)

The construction industry in Oregon and Washington has engaged in significant efforts to diversify the construction workforce. One commonly mentioned approach was to rely on pre-apprenticeship programs, which have demonstrated success in recruiting marginalized workers, particularly women (Kelly 2022). Specifically, the industry could **secure a multi-year funding stream to increase program capacity and ensure programs are sufficiently and consistently funded as well as increase direct entry from pre-apprenticeship into apprenticeship programs**. Pre-apprenticeships mentioned by apprenticeship staff included: trades-specific pre-apprenticeship, Oregon Tradeswomen, Constructing Hope, ANEW, Job Corps, Portland YouthBuilders, and POIC.

“If they’ve gone through a pre-apprenticeship program, that definitely helps because they’ve kind of already established that baseline. Most of them have drug screening. Most of them have pretty strict attendance requirements for them to get through the program and then they introduce them to those expectations early on. So if they make it through there [the pre-apprenticeship program], they’re going to be more competitive coming to [our program].” (Apprenticeship staff)

Other outreach and marketing efforts have not yet been studied and the impact is largely unknown. Interviews with apprenticeship staff found that **these efforts are not well coordinated across the region and frequently miss marginalized communities**. Apprenticeship staff suggested the industry **build on current successful partnerships for recruitment**. These efforts would benefit from improved **coordination and additional outreach across the region, including a shared tracking mechanism for impact such as attendance and placements**. Partnerships mentioned by interviewees included:

- Incarcerated or formerly incarcerated people (e.g. Coffee Creek; Oregon State Penitentiary; Northwest Regional Re-entry Center)
- Community organizations (e.g. Latino Build, APANO, VA, Central City Concern; Partners in Employment; Northwest Regional Re-entry Center; Urban League)
- Higher education institutions (e.g. Clackamas Community College, Clatsop Community College, Columbia Gorge Community College, Klamath Community College, Lane Community College, Linn-Benton, Mount Hood, Portland State)
- High schools (e.g. Hood River Valley High School, David Douglas High School, Benson Technical)

In addition to a lack of knowledge about trades careers in the community, apprenticeship coordinators noted a stigma about the construction industry that may deter potential applicants. Staff noted that this could be addressed through education and outreach. Additionally, changes to the industry described above to support retention will also positively impact recruitment. For example, **workers are more likely to enter an industry that has a reputation for positive jobsite culture and offers work/life balance**. Higher retention will result in more successful diverse tradesworkers out in the community serving as role models for others (as opposed to current patterns of completion that results in many diverse former tradesworkers who left the industry and are much less likely to endorse careers in the trades).

In addition to the suggestion to **increase direct entry from pre-apprenticeship into apprenticeship programs**, participants noted that apprenticeship program staff could **evaluate the application process and scoring** (e.g. required documentation) as well as **provide resources to help potential applicants navigate the application process** (e.g. support for interview skills).

“Part of my job, so if folks are applying to the program, is to try to figure out exactly why we’ve had somebody of whatever characteristic apply and not get into the program and see if we can remove that barrier. And I wish I had the answer for that, but I don’t have a good answer. Everybody individually, I’ll call them, our coordinators call them, we’ll try to work through whatever the issues are.” (Apprenticeship staff)

“I know a lot of the pre-apprenticeship programs, we’ll go over there and do mock interviews and I’ll tell the kids or the adults that when you go to these interviews, you look them in the eye, act like you’re supposed to be there, that you belong there, because I mean, that’s also part of it too.” (Apprenticeship staff)

Box 15. Challenges with the apprenticeship program applications

*“With tribal applicants, they’re not required to have a **state-issued driver’s license** [on the reservation]. So a lot of them don’t get a driver’s license where they could go to any job and drive a company truck or something like that. So they’re allowed to drive as long as the job is on a reservation, but they can’t drive anywhere outside of that. So that becomes a bit of a challenge too.” (Apprenticeship staff)*

*“I think that a lot of women and people of color probably just aren’t mentored or encouraged into the construction trades. I think that also tends to lead to **a little bit of a lack of confidence perhaps in the interview** when they get to that interview stage of the application process.” (Apprenticeship staff)*

*“Oregon and Washington, it’s legal. **So marijuana is legal, but they still test for it.**” (Apprenticeship staff)*

Professional, Technical and Engineering (PTE) Workforce

There has been decreasing enrollment in higher education institutions generally (due to demographic shifts) and construction-related programs specifically. Portland State University (PSU), University of Portland, and Oregon State University (OSU), but not Portland Community College (PCC), have been experiencing declines in construction-related programs. OSU has recently launched a four year fully online degree in Construction Engineering Management and has hired new instructors to support this program; an increase in enrollment is expected, consisting of students currently working in the industry as well as students outside of Corvallis. PCC faculty note that they have facilities to train Portland area workers and are willing to work with the industry to help produce more construction management graduates: “There are a lot of creative ways that we could solve the challenge of getting this thing [training enough workers for the IBR project] done. I'm confident that the workers that we have locally are up to the task.”

Faculty report that there continue to be challenges in recruiting diverse workers into PTE majors and careers. **Some of the challenges faced by workers in PTE occupations that impact retention are similar to construction apprentices: jobsite culture, lack of mentorship, work/life conflict, and financial challenges.** While efforts to diversify the construction workforce have been focused on the skilled trades, similar solutions are relevant to PTE to recruit and retain a diverse workforce.

*“If we lose our best, thoughtful people because they just don't want to deal with the bullshit of harassment that takes place on the job, then they can never move into a decision-making role in the industry. That continues to be a challenge for women. It continues to be a challenge for people of color. It's a challenge for everybody because there are white males on the job who don't want to be listening to this bullshit, because there's one guy who's doing it old school. **Old school needs to go away in that context.**” (PCC)*

*“The fact that people were taking a lower paying job [a public agency] because they could more effectively manage their work-life balance says something about it. **If you want smart people and you want to keep them, you need to help them be able to manage the other things in their life.** And if the hours is the number one bugaboo, it's the most obvious one, then our consulting friends need to do something about that.” (PSU)*

*“When I think of my students, the challenge that they face the most, is getting through college [financially]. **If the industry and the state could have part of this program [IBR] be scholarships to help them actually get the training that they need, that would be huge.**” (PCC)*

Developing More Robust Equity Policies and Practices to Support the Recruitment and Retention of a Diverse Workforce

BARRIERS	SOLUTIONS	PUBLIC PROJECT OWNER ROLE
The majority of public projects have no workforce goals	Enforce contract goals, with consequences for non-compliance	Adopt policies to deliver workforce equity on projects such as the Construction Careers Pathways Framework (CCPF)
Where goals exist, lack of transparent and accessible data reports, investments in monitoring, and enforcement of goals	Improve oversight to achieve workforce goals on public projects	Invest in both workforce tracking software and compliance staff to monitor progress weekly. Utilize workforce agreements to establish labor and community committee to help contractors monitor progress and address gaps
Lack of regionally coordinated approach to implementing workforce goals and policies	Public agencies, labor, contractors, and community workforce advocates have a shared roadmap to achieve goals in the region	Coordinate demand-side strategies to advance workforce equity. Adopting shared frameworks like the Construction Career Pathways Framework (CCPF) and working together through a regional collaborative will ensure a cohesive approach to achieving goals
Lack of private market uptake of diversity/equity policies and practices	Provide a roadmap with clear goals and expectations across the region for contractors to align with and deliver. Build connections across construction stakeholders to build partnerships and strategies together	Work together to align workforce equity goals and expectations for contractors through procurement processes and ongoing education of contractors. Be equipped to assist contractors in understanding why workforce equity is important and what are the best practices to achieve goals
Challenges meeting goals perceived as due to a lack of supply of diverse workers	Sustain a regional investment in the construction workforce pipeline	Regionally invest the resources to help grow a diverse and skilled regional workforce, to ensure infrastructure projects can be delivered on time and within budget and to create access to family-sustaining careers for local communities

Interview themes related to improving contracting policies and processes designed to increase opportunities for women and people of color:

“What else would you like the interstate bridge replacement program [to know]? I think a workforce agreement. And I know there’s people pushing to not have a workforce agreement on it, which I think would be very bad.” (Apprenticeship staff)

“I just know that what I’m hearing is that not all agencies are holding contractors accountable. It seems like what tends to happen is that you have these government agencies that have hundreds of contracts out the door, and they only have one or two compliance officers. How do you manage so much workload and only have two compliance officers, or at times one? Do you think that any of this is going to be in compliance? Of course not.” (Contractor staff)

“There’s another pet peeve of mine that I ran into in the last years is that [a public agency] specifically has put in sort of requirements for people to secure these contracts and it has to do with having minorities and apprenticeship members on the job. A certain amount of hours need to be done by a registered apprenticeship. And what I ran into is [the public agency had] awarded the contract to a contractor that had no way of satisfying those requirements. And then calling me with the contractor sitting there, they’re helping the contractors and they’re saying, ‘We have a contractor that only has so many hours left on this project, they have to be done by an apprentice, preferably women or minorities. Can you help us? Can you send us one?’” (Apprenticeship staff) ■

RECOMMENDATIONS

In the dynamic landscape of the Portland Metro region's infrastructure industry, the impending demand for thousands of workers over the next five years presents a critical challenge. Over forty percent of the current labor pool is aged 45 or older, prompting a need for innovation and new practices. The region's demographics, characterized by a 45% growth in communities of color, create a pivotal moment for businesses, governments, and unions to actively integrate these communities into the workforce. Recognizing the advantages of a diverse talent pool, industry stakeholders are aligning efforts for equitable job access on publicly funded projects, fostering a workforce that mirrors regional demographics, and addressing issues of poverty and economic mobility within communities of color. This strategic diversification not only meets the industry's demand for a robust workforce but also directly confronts socioeconomic challenges, elevating the region's economic prosperity.

However, the current state of the construction sector does not align with the rapidly diversifying workforce. While women and workers of color constitute a smaller percentage of the construction workforce than their overall representation in the metro area, barriers to their recruitment and retention persist. Addressing multifaceted barriers is not only an ethical imperative but an economic necessity, highlighting the urgent need for comprehensive initiatives promoting diversity, equity, and inclusion within the industry. By embracing innovation and dismantling systemic barriers, the industry can engage with a wealth of untapped talent, fostering a vibrant, inclusive, and sustainable future.

Governments, particularly as public project owners, possess the resources and authority to promote workforce equity through their investments and policies. By implementing impactful procurement policies and making strategic regional investments, government agencies can collaborate with prime contractors and other industry leaders dedicated to advancing workforce equity while ensuring timely and budget-compliant project delivery.

As mentioned in this report, recent successes in Multnomah County and City of Portland have shown that public agencies can build a diverse workforce on their projects when they 1) set consistent workforce diversity goals, 2) invest in recruitment, training, and retention strategies, 3) change the culture on worksites, 4) utilize workforce agreements to establish job quality, job access and project delivery expectations with labor partners and 5) track and measure workforce diversity outcomes on projects and region-wide.

1. Grow a diverse regional construction workforce through multi-jurisdictional collaboration, coordination, and targeted investments.

Make the intentional choice to build up the regional workforce by joining forces with existing successful regional efforts to eliminate barriers for women, people of color, and justice-involved individuals accessing and staying in quality construction careers.

Recommendation 1: Construction Career Pathways Framework (CCPF) Adoption.

Local and regional jurisdictions should adopt and implement the Construction Career Pathways Framework (CCPF) to exponentially grow over the next five years the size and scale of the current construction workforce.

- ✓ The CCPF Framework comprises clear goals for the participation of women, workers of color, and apprentices on public projects; establishes clear project thresholds for workforce equity standards to be enacted; embeds equity goals in workforce agreements on large projects; allocates funding to support the needs of diverse workers, including mandatory respectful workplace training; and tracks progress on meeting goals by project and the region. Nine agencies in the Portland Metro region, including Metro, TriMet, City of Portland, and others, have successfully adopted and implemented the CCPF framework.

Recommendation 2: *Join multi-jurisdictional coordination tables and Funder Collaborative to scale up regional workforce planning and investments. CCPF's Regional Collaborative Committee and the CCPF Funder Collaborative align efforts of public agencies to proactively forecast and plan for regional workforce needs.*

- ✓ **The Regional Collaborative Committee (RCC)**, comprising around 30 organizations, including jurisdictions adopting the CCPF, labor representatives, contractor associations, and workforce stakeholders, is instrumental in tracking the progress of women and workers of color on projects and in the region. It involves establishing regional governance, ensuring accountability, and utilizing comprehensive tracking systems for workforce and contractor utilization data. There are also opportunities for cross-sector problem-solving to support the recruitment and retention of workers of color and women apprentices and journeyworkers.
- ✓ **The CCPF Funder Collaborative has invested over \$3 million, enabling regional investments in culturally relevant recruitment, training, and retention programs, fostering a diverse supply of skilled labor.** Public agencies benefit from pooled resources to scale up workforce efforts for large-scale construction projects over the next five years and growing the funding needed for worker supportive services including childcare. The collaborative also establishes a regional planning and assessment loop to ensure investments are timely and strategically targeted to address workforce gaps by trade, demographics, etc.

Recommendation 3: *Embed equity goals into all workforce agreements. The Regional Workforce Equity Agreement (RWEA) can be a model.*

- ✓ **The Regional Workforce Equity Agreement (RWEA) in the Portland Metro region** is a multi-jurisdictional Workforce Agreement, which provides mechanisms for setting goals, clear project thresholds for workforce equity, mandatory respectful workplace training, and monitoring on job sites. This agreement integrates equity goals into enforceable contracts governing employment terms on construction projects, covering an estimated \$728 million in projects. The RWEA ensures accountability for diversity goals and promotes equitable practices for both unionized and non-unionized/minority contractors. Multnomah County's Library Operations Center project, using the RWEA, surpassed diversity goals, with 43.3% of construction hours performed by people of color and 20.44% by women, and 36.7% (Certified and Qualified Business Enterprise Inclusion and Diversity—COBID) utilization, with over 19% earned specifically by minority-owned firms (MBEs.) The City of Seattle and partner public owners utilize a Community Workforce Agreement (CWA) and currently have it applied to 20 projects, with an additional 15 upcoming.⁹

TABLE 9: Local Public Project Equity Outcomes with a Workforce Agreement

	MULTNOMAH COUNTY LIBRARY	CITY OF PORTLAND KELLY BUTTE	CITY OF PORTLAND INTERSTATE	MULTNOMAH COUNTY COURTHOUSE	CITY OF PORTLAND COLUMBIA BLVD
WORKFORCE					
BIPOC Apprentices	51%	50%	28%	29%	53%
BIPOC Journey	40%	29%	21%	28%	36%
Women Apprentices	48%	28%	34%	20%	21%
Women Journey	10%	6%	3%	7%	12%
CONTRACTING					
Minority owned businesses (MBE)	19%	22%	33%	11%	27%
Women owned businesses (WBE)	18%			19%	0.5%

Source: Multnomah County and City of Portland

⁹ <https://www.seattle.gov/purchasing-and-contracting/priority-hire/cwa-projects#upcoming>

2. Improve retention through addressing jobsite culture and other challenges.

Recommendation 1: *Mandate contractors commit to actively improve jobsite culture by establishment of zero-tolerance policies, robust reporting mechanisms, and consistent implementation of proven positive work environment training.* Procurement processes can be designed to establish contractual obligations for jobsite training and monitoring.

- ✓ **Work with contractors to build an inclusive work environment for apprentices to learn and grow their skills and be mentored by skilled tradespeople.** Contractors must address harassment as well as disparate or unequal treatment of diverse workers on the job as soon as possible and work with mentors and supervisors to ensure quality training and support.
- ✓ **Increase monitoring of job sites to prevent harassment and ensure equitable access to on-the-job training of apprentices.** Workers in supervisory positions should be expected to address issues with harassment and access to training as they see it. Additional monitoring by well-trained experts (e.g. public agency staff, shop stewards) may also be needed.
- ✓ **Ensure policies and practices are effective best practices for reporting and discipline.** This includes shifting from focusing only on formal reporting to include other options (e.g. increased monitoring by those in supervisory positions, anonymous reporting) as well as providing effective education, accountability, and discipline for workers who harass and discriminate.
- ✓ **Require respectful workplaces trainings with proven results.** Addressing construction jobsite culture can be achieved through the implementation of respectful workplaces training with demonstrated positive results.

Recommendation 2: *Invest in project-level retention support to keep skilled workers.* Recognizing the diverse needs of apprentices and vulnerable workers in construction, the worksite serves as a crucial setting for delivering tailored resources. Acknowledging that there is no one-size-fits-all solution, helping in accessing support programs and addressing unforeseen financial or family challenges can significantly impact the success of diverse workers in navigating their new careers in construction.

- ✓ **Create agency staff "retention coordinators" on all jobsites.** Through spending time on the jobsite and interviewing workers, retention coordinators would play a vital role in identifying and helping to resolve issues with harassment and access to on-the-job training for apprentices as well as providing essential hardship and non-financial support and referrals. Their presence can significantly contribute to maintaining a supportive and inclusive work environment, enhancing retention among workers. Specific budget allocation can be provided to this effort and can help establish onsite support system that augments community and apprenticeship program efforts.
- ✓ **Establish flexible and responsive worker hardship funds on a project** to address unplanned needs, especially for apprentices. This fund can serve as a crucial resource in overcoming unforeseen challenges and barriers to retention on the project.

Recommendation 3: *Provide flexibility in work hours to address workers' caregiving and health needs.* In the context of a labor landscape that increasingly features remote work and flexible work times, the construction industry will need to shift expectations about worker availability in order to attract and retain workers.

- ✓ **Require contractor bids to include a plan where contractors will implement innovative scheduling models.** This might include allowing for workers to take certain amounts of planned and unplanned time off, offering workers the option to cap their weekly hours, as well as offering new scheduling approaches such as alternate start/end times and shortened workdays or workweeks.

3. Knock down the barriers that women and workers of color face to grow a skilled workforce.

Recommendation 1: *Fund and grow comprehensive support services programs that can help a new generation of workers advance in their careers. Allocate resources to fund comprehensive programs that remove barriers to retention for diverse workers by providing wrap-around supportive services and mentorship opportunities. These services help new workers gain a foothold in their career and navigate the challenges of their demanding but rewarding work in construction.*

✓ **Join and invest in the CCPF Funder Collaborative to deliver various financial and support services to new workers.**

- Fund training programs addressing the unique needs of justice-involved individuals, including mental health and well-being support.
- Provide holistic support, including financial literacy coaching, debt repayment assistance, childcare and transportation connections, reentry clinics, expungement clinics, and mental health support.
- Establish flexible and responsive worker "hardship funds" to address unplanned needs and barriers to retention on projects, particularly for apprentices.

Recommendation 2: *Make affordable, accessible, reliable, and high-quality childcare a signature workforce and community benefit. Invest resources to increase access to childcare by creating new childcare options, especially for non-standard shifts. Increase affordability of childcare by offering subsidies and helping grow the supply of childcare in the region. Quality and stable childcare support can serve as both a recruitment and retention strategy, impacting new entrants and journey level workers as well. This should be within reach for low- and medium-income households.*

- ✓ Ensure childcare solutions are inclusive by co-designing with workers and childcare advocates:
- Implement affordable and flexible childcare options tailored to the diverse needs of construction workers.
 - Employers can explore mixed delivery models, including on-site care, off-site care with cash assistance, and direct sponsorships, providing varied options for workers.

- ✓ Partner with state and local governments and childcare experts to increase childcare supply. Establish strong collaborations between government, community, and workforce partners to secure funding for comprehensive childcare systems.

- Oregon's Employee Related Day Care Fund (ERDC) is a subsidy program that can be utilized to administer direct childcare subsidies to specific workers who are eligible for this support. Apprentices currently on ODOT highway-related projects and in targeted trades are offered childcare subsidies through ERDC program using project funds.

- ✓ Provide flexibility in work hours to address workers' caregiving and health needs.

Recommendation 3: *Allocate resources to fund and grow programs that remove barriers to entry for diverse workers. Scale up current successful partnerships for recruitment and coordinate additional outreach efforts across the region.*

- ✓ **Join and invest in the CCPF Funder Collaborative to expand multi-year funding streams to community-based and pre-apprenticeship programs to increase capacity.** Include stable and multi-year funding to increase the number of classes provided each year, increase number of available instructors who reflect the demographics of participants, and provide one-on-one coaching to pre-apprentices seeking entry into apprenticeship programs.

- ✓ **Provide stipends to individuals participating in pre-apprenticeship programs.** While these programs currently utilize state and federal funding to assist with needs such as childcare and housing, a notable obstacle is the requirement of committing to 280 hours of training without any stipends or pay. Introducing stipends can enhance participants' sense of commitment to their training program, enabling them to better navigate the challenges of an intensive program, especially for working parents and those with little to no financial stability. Additionally, consider providing graduation bonuses for pre-apprentices to support their transition into formal apprenticeship programs.

- ✓ **In partnership with Apprenticeship programs, increase direct entry from pre-apprenticeship into apprenticeship programs.** There is still a big gap between pre-apprenticeship graduates and those who enter Registered Apprenticeship. Partner with local Joint Apprenticeship Training Committees (JATCs) to ensure explicit partnership with pre-apprenticeship programs to increase entry into Apprenticeship. Additionally, work with the JATCs to review and update their ranking and scoring methods.

- ✓ **Assess partnerships with Middle and High schools in the region to understand the opportunity to expand construction-related curricula or vocational training programs.** This can expose students to the industry early on and help them see pathways into skilled trades. Ensure any expansions support the engagement of diverse students.
 - Beaverton School District built a Construction Magnet program¹⁰ in partnership with Apprenticeship programs and industry leaders to create a viable pipeline of young people into the industry.
 - Promote apprenticeship programs that allow students to gain practical experience while still in high school. This hands-on approach can make the construction industry more appealing to students.
 - Provide comprehensive career counseling services that include information about construction careers. This ensures that students are aware of the various opportunities and the skills required for success in the field.

¹⁰ <https://www.beaverton.k12.or.us/departments/teaching-learning/student-programs/career-technical-education-cte/merlo-programs>

4. Implement effective project administration and procurement strategies.

Recommendation 1: *Effectively plan for and resource successful implementation of workforce equity policies within a public jurisdiction.* Public agencies have the resources and authority to promote workforce equity through their procurement strategies and compliance efforts.

- ✓ **Allocate resources to increase the number of compliance staff responsible for monitoring workforce goals at a granular level.** Employ compliance staff dedicated to ensuring the effective implementation of equity policies, conducting regular assessments, and providing timely feedback to project managers and contractors. Ensure staff have necessary software and tracking systems to be effective.
- ✓ **Establish "retention coordinators" focused primarily on troubleshooting recruitment and retention efforts with contractors and labor/community oversight teams.** Specific budget allocation can be provided to this effort and can help establish onsite support system that augments community and apprenticeship program efforts.

Recommendation 2: *Establish oversight committees and sustained labor management committees to address challenges and share best practices.* Invest in effective project administration through labor and community oversight to monitor and hold contractors accountable for equity goals.

- ✓ **Establish Project Oversight Committees to monitor and address workforce utilization challenges effectively.**
 - Allocate financial resources for a sustained Labor Management Community Committee (LMCOC) process, involving community partners, labor, workforce advocates, and contractors. This fosters ongoing dialogue, collaboration, and addresses challenges, supporting community participation.
 - Leverage LMCOC, as modeled in the Regional Workforce Equity Agreement (RWEA), to provide a structured platform for public agency monitoring and remediation. This ensures transparency and stakeholder engagement.

- ✓ **Ensure that community partners have the necessary funding to sustain their participation in labor-community-management tables.** Since projects often span several years, community organizations, particularly those serving low-income, women, and communities of color, require additional resources to support their involvement in these committees. Adequate compensation for their time and expertise is essential.

Recommendation 3: *Use procurement processes to ensure contractor compliance on respectful workplaces, inclusion, and anti-harassment initiatives.* Procurement processes can be designed to establish contractual obligations for jobsite training and monitoring.

- ✓ **As described in the Safe from Hate Pledge, public agencies can establish specific and time-bound mandates on onsite respectful workplaces training on a project.** Some provisions could include:
 - All onsite employees, specifically supervisory and management, journey level craft persons, and apprentices shall receive the positive jobsite culture education as part of their orientation processes, but no later than one week of their hire date.
 - Apprentices will receive training within one month of their enrollment date.
 - Unions will provide journeyworker "upgrade" trainings.
 - Pre-Apprenticeship Training Programs will provide training to program participants in their training models.
 - Employees will receive ongoing training or "refreshers" annually at a minimum.
 - Adopt a regional model like Seattle, which includes Acceptable Work Site training and mandates anti-harassment initiatives during pre-bid meetings for contracts exceeding a certain project cost threshold.

5. Increase communication and education for project managers and contractors.

Recommendation 1: *Enhance Project Communication and Expectations between public administrators and contractors.* Effective and frequent project communication between and among contractors, agency staff, compliance teams and oversight committees has been noted as a significant contributor to meeting equity goals.

- ✓ **Set clear expectations and improve project communication regarding the importance of equity standards. Host contractor orientation sessions to familiarize prospective firms with the expectations regarding workforce equity policies.**
 - Conduct regular briefings or workshops at the project outset to communicate the significance of equity goals, fostering a shared understanding among all stakeholders.
- ✓ **Assist contractors in connecting with community partners and training agents to assist with meeting inclusive workplace goals.**

Recommendation 2: *Allocate resources for training opportunities and internal support tailored to project managers, focusing on advancing equity in construction projects.*

- ✓ **Develop workshops and training sessions for public agency staff/project managers to enhance their understanding of equity goals and make them better advocates for equity outcomes.** They seek more tools to effectively implement and communicate these standards to contractors and stakeholders.
- ✓ **Provide opportunities for project managers across projects within an agency to align their equity efforts, share best practices and troubleshoot issues together.** Project managers noted in interviews that this cohesive approach within an agency leads to better outcomes and a deepening of commitment to delivering on equity goals.

6. Continue to explore and address Professional, Technical and Engineering (PTE) equity opportunities.

While the current demand for PTE (Professional, Technical, and Engineering) occupations may not be immediately apparent, future training needs can be addressed through collaboration with existing higher education partners, as indicated by this study's interviews. **Despite the existing capacity, there is a notable lack of diversity in the current PTE workforce.** It is crucial to recognize that the diversity and inclusion efforts concentrated on the trades can be equally applied to PTE roles, serving as a strategic approach to foster inclusivity and diversify the PTE workforce. By extending these recommendations to PTE occupations, pathways can be created to encourage and support a more diverse pool of workers, aligning with broader diversity, equity, and inclusion goals across the industry.

Recommendation 1: *Work with local and state educational institutions, students, and employers to identify the key barriers and solutions to more diversity in PTE jobs.*

- ✓ Similar challenges have been noted in our study including job site culture, lack of mentorship, struggle finding quality and affordable childcare, and financial challenges.
- ✓ Establish pathways to internships and employment with firms working on large-scale public projects.

Recommendation 2: *Fund and grow comprehensive support services programs that can help a new generation of diverse workers grow in the PTE sectors.*

- ✓ Work with workforce partners and educational institutions to plan and build up recruitment and retention efforts into quality careers. Include funding for internships within engineering, technical, and construction firms on large-scale public projects to build up valuable on the job experience.
- ✓ Support mentorship opportunities among key professions in the sector. ■

CONCLUSION

Meeting the increasing demand for a skilled construction and PTE workforce necessitates coordinated efforts on a regional scale, addressing entry and retention barriers faced by workers often marginalized in the sector. Successful strategies involve participating in regional collaborations to establish diverse worker and apprentice goals, collectively investing in recruitment and retention initiatives, identifying, and implementing culturally specific strategies tailored to the unique needs of workers, especially women and people of color, and addressing the challenge of affordable childcare. With leadership from the federal government and locally, the IBR project has an historic opportunity to incorporate these promising practices into its equity strategy and community benefit outcomes. ■



Photo: Worksystems 2019

Making the Case for Innovation and New Practices

The Portland-Vancouver metropolitan region foresees a need for thousands of construction workers over the next five years. A significant challenge to meeting this demand is that more than forty percent of the current labor pool in the region is aged 45 years or older. Notably, Oregon's demographics are swiftly changing, driven by the Portland-Vancouver metro region, where communities of color have grown by 45% in the last decade. As the region's labor pool becomes more diverse and the demand for construction workers remains high, a new era is emerging in the construction sector. This shift brings the opportunity for women and workers of color to play a prominent role in the workforce.

It is crucial for businesses, governments, and unions to fully integrate these communities as vital contributors to the expanding construction workforce. A strategic effort that actively connects underrepresented communities, especially women and people of color, with the growing industry holds numerous advantages for the region's infrastructure developments and economic prosperity. Recognizing the need for a more diverse talent pool, contractors and industry stakeholders are aligning efforts to cultivate a workforce that reflects the community's growing diversity, striving for success through an expanded pool of skilled workers, equitable job access on publicly funded projects, and a construction workforce that mirrors our regional demographics. This diversification not only addresses the industry's need for a robust workforce but also directly confronts issues of poverty and elevates economic mobility within communities of color and working families in the region.

The construction sector has not kept up with the rapidly diversifying workforce, especially in the numbers of women and workers of color working in the broader workforce. In Section 1 of our findings, we noted that ninety-five percent of construction workers are male, with sixty-six percent being white. And women constitute just 5% of the construction workforce, despite making up 47% of the total workers in the metro area. Additionally, workers of color hold 26% of construction sector jobs while representing 36% of the overall workforce in the region. While women and workers of color are crucial for meeting the construction demand in the next decade, the industry needs to invest more in recruiting and retaining them. For instance, only 34% of Black apprentices complete their training compared to 58% of white males.

Although the construction sector can attract a more diverse workforce, addressing deeply embedded barriers for women and people of color is essential. A recent study found a hopeful trend, showing that between 2016 and 2019, the number of Latina apprentices in the trades almost doubled, and the number of Black women apprentices grew by almost 50 percent. However, the same study revealed that many women, especially women of color, face discrimination and harassment on the job, making them less likely to complete their apprenticeships and more likely to leave the industry.

Barriers to building a diverse and inclusive construction workforce are multifaceted and include issues related to a culture of exclusion on job sites, insufficient financial and programmatic support for apprentices, (especially access to childcare,) and lack of pathways highlighting the quality and desirability of jobs in the skilled trades. As noted in our Section 3 report from focus groups with current construction workers and apprentices, many workers face numerous barriers based on their gender and racial and ethnic backgrounds. Some barriers for women include inadequate restroom and lactation facilities, limited access to mentorship and training opportunities, and difficulties in achieving work-life balance. The lack of support for parents, especially mothers, is evident in the absence of childcare accommodations and resources, and the stress associated with managing work that conflicts with parenting responsibilities. Financial hardships further exacerbate the challenges, with some workers facing struggles such as the inability to take medical leave and precarious financial situations impacting their overall well-being.

Many workers, both in our focus groups and across national studies, describe construction sites with pervasive jobsite harassment. There, they face discriminatory comments, gender-based challenges, and experience unequal treatment overall, collectively contributing to a hostile work environment. Experiences of more subtle exclusion and discrimination can also include being the sole representative of a particular demographic on a jobsite to encountering obstacles in accessing mentorship, training, and job opportunities. Addressing these problems with management can prove challenging, as individuals may fear negative repercussions or reprisal for reporting incidents, which fosters a culture of silence around jobsite harassment and discrimination. The cumulative effect of these barriers underscores the urgent need for comprehensive initiatives to promote diversity, equity, and inclusion within the construction industry.

This section highlights the promising practices both across the country and in our own region that address the culture of exclusion on job sites, insufficient financial and programmatic support for apprentices (especially access to childcare), and lack of pathways highlighting the quality and desirability of jobs in the skilled trades.

New Federal Guidance Advances Equity in Infrastructure Investments

The Bipartisan Infrastructure Law (BIL) / Infrastructure Investment and Jobs Act (IIJA) authorizes \$1.2 trillion in transportation infrastructure funding to states. This act focuses on grants as a primary funding mechanism for critical infrastructure projects. While the legislation incorporates labor and workforce standards, the realization of quality jobs and equitable access depends on policy decisions on specific projects. Federal agencies are providing greater guidance and oversight, emphasizing factors such as fair wages, union representation, employment access, workplace safety, training opportunities, and discrimination-free environments. The federal government, through the U.S. Department of Labor (DOL), also plays a vital role in supporting agencies to achieve equity and job quality goals by evaluating applicants' plans and enforcing standards and data collection.

From the USDOL Women's Bureau, [Tools for Building an Equitable Infrastructure Workforce GENDER EQUITY STRATEGIES AS A MODEL](#), September 2023:

There are a range of federal funds that can be used for supportive services as part of workforce development. Many federal grant opportunities allow for spending on supportive services, but do not require a certain amount to be drawn down for these purposes. This means that it is at the discretion of the grant recipient to set the amount and create a line item for supportive services expenses in their budgets. As a result, there is a discrepancy between those who need supportive services and those who receive them, and stakeholders will likely need to braid and blend funds to meet the supportive service needs. Federal funds are available through various funding opportunities that can be used to provide supportive services for participants going through pre-apprenticeship, apprenticeship, and on-the-job-training programs.

EXAMPLES OF GRANTS AND FEDERAL FUNDING OPPORTUNITIES THAT ALLOW FOR SUPPORT INCLUDE:

- The Department of Transportation (DOT) released guidance noting that, under the Bipartisan Infrastructure Law (BIL), workforce development-related activities are funded at 100% federal share and expands the types of activities eligible to be paid for using formula funding to include counseling, transportation, and childcare services (among others). DOT funding opportunities and other BIL resources can be found on DOT's Bipartisan Infrastructure Law webpage.
- The Department of Labor also offers a number of other grants administered by the Employment and Training Administration that support workforce development activities. The allowable use of funds for supportive services differs by grant program but typically ranges from 10%–20% of grant funds.
- The Department of Labor's Office of Labor-Management Standards Labor-Management Partnership. The program highlights examples of and demonstrates the importance of having employers and workers joining together and working collaboratively.
- The Department of Labor's Office of Federal Contract Compliance Programs' (OFCCP) Mega Construction Project (Megaproject) Program includes an intensive "front-end" approach from the earliest stages of a designated project that regularly engages a wide range of stakeholders to regularly participate in Equal Employment Opportunity (EEO) Committees. The EEO Committees promote a diverse pool of qualified workers and remove barriers to equal employment opportunities for applicants and workers from underrepresented communities.
- The WB's WANTO grantees can, and do, use up to 25% of grant funds on wraparound supportive services to assist individuals to participate in grant-funded activities. WANTO grantees also provide counseling and resource referral about other funding sources that could provide supportive services needed for women to be successful in apprenticeship and non-traditional occupations. These include programs such as the Temporary Assistance for Needy Families, Supplemental Nutrition Assistance Program, Childcare and Development Fund, Head Start and Early Head Start.
- Supportive services are an allowable expense for Workforce Innovation and Opportunity Act (WIOA) Adult, Dislocated Worker, and Youth program participants. However, Title I of WIOA (Adult and Dislocated Worker Programs) makes supportive services, including needs-related payments, optional and supportive services may be limited in some local workforce development areas due to local funding or policy choices.

1. Grow a diverse regional construction workforce through multi-jurisdictional collaboration, coordination, and targeted investments.

THE CONSTRUCTION CAREERS PATHWAYS FRAMEWORK (CCPF), PORTLAND METRO REGION

- The Construction Career Pathways Framework (CCPF) outlines key strategies for cultivating a diverse construction workforce, providing high-level guidance to public owners committed to meeting growing construction demands. It emphasizes cross-sector collaboration involving public agencies, labor, community-based organizations, contractors, and educational institutions for regional impact. As of 2023, nine agencies, including Metro, Prosper Portland, Clackamas County, Multnomah County, Washington County, City of Portland, Portland Public Schools, Portland Community College, and TriMet, have adopted the CCPF to varying extents. Each agency, considering its unique size and capacities, sets specific thresholds for their goals. The Framework centers on seven essential points for Public Owners to integrate into their practices including setting clear diversity goals, establishing project thresholds, tracking progress, developing workforce agreements, implementing worksite anti-harassment and culture change strategies, collectively investing in workforce supply, and establishing regional collaboration to build toward workforce goals together in the region.

“The cornerstone of the Construction Career Pathways Framework is creating demand for a diverse workforce by setting consistent goals across a region. Goals are based on the current availability of workers as well as local demographic data in order to be realistically ambitious. Inter-agency coordination strengthens the effectiveness of these goals by establishing consistent standards among public projects.” Construction Careers: Case Study in Job Creation for Just Society, 2022

REGIONAL COLLABORATIVE COMMITTEE

The Regional Collaborative Committee (RCC) plays a pivotal role in advancing workforce equity through collaboration among approximately 30 organizations, including labor representatives, contractor associations, and other workforce stakeholders.

The RCC has consistently involved at least nine public agencies over the past three years, fostering collaboration and shared objectives in workforce development. Three key areas of work among the thirty participating governments and organization include:

- Coordination on developing and delivering a respectful workplace and anti-harassment training curriculum; training providers who are deployed to local construction jobs sites to foster safe and inclusive job sites, particularly for women and people of color.
- Coordination of public tracking and data sharing on achieving workforce goals on projects, which includes creating a clearinghouse for workforce data that all entities can use for planning and program development purposes, and assists participating agencies in acquiring and utilizing software to monitor labor demographics and other data components on projects.
- The development of workforce equity agreements between public agencies and the construction trades. Notably, the RCC efforts in fostering trust and collaboration among diverse stakeholders helped deliver the groundbreaking multijurisdictional workforce equity agreement, Regional Workforce Equity Agreement, in 2022.

PUBLIC AGENCY FUNDER COLLABORATIVE

The Regional Collaborative has launched a multi-jurisdictional Funder Collaborative to strategically invest in training, outreach, wrap around services and other retention strategies for diverse workers in the region. The collaborative has already invested over \$3 million dollars to advance workforce equity in the Portland Metro region. This collaboration has made it possible to regionally scale up investments into culturally relevant recruitment, training, and retention programs that help build a diverse supply of skilled labor. Research, including findings from Section 3 of this study, affirm the need for and the impact of robust investments in supportive services such as childcare and rental assistance in helping women and people of color complete their apprenticeship programs.

REGIONAL WORKFORCE EQUITY AGREEMENT

A significant achievement of regional collaboration is the creation and adoption of the Regional Workforce Equity Agreement (RWEA), one of the nation's first multi-jurisdictional workforce agreements. The RWEA delivers a crucial component of the CCPF's regional strategy of utilizing Workforce Agreements to embed equity goals into enforceable contracts governing employment terms on construction projects. This agreement covers specified projects undertaken by Metro, Multnomah County, and the City of Portland over the next five years. Developed by Metro, City of Portland, and Multnomah County in collaboration with the Columbia Pacific Building Trades Council and Southwest Mountain States Regional Council of Carpenters, this enforceable contract safeguards diversity goals and embeds key components of the construction careers framework into union agreements, further ensuring contractors will be held accountable for delivering on equity goals and standards. The RWEA uniquely protects both union and non-union/minority contractors, promoting equitable practices to foster a diverse workforce. As of 2023, the RWEA will cover an estimated \$728 million in projects in the region, embedding specified workforce goals and opening avenues for new workers to advance construction careers for women and people of color while ensuring quality jobs on public projects.

RWEA SUCCESS STORY: MULTNOMAH COUNTY'S LIBRARY OPERATIONS CENTER

Multnomah County has been a regional leader in integrating diverse and inclusive strategies in its public construction projects. Their commitment to addressing disparities in the construction workforce is evident through a willingness to advance innovative workforce equity policies paired with strategic investments.

Multnomah County was an early adopter of the Construction Career Pathways Framework as well as an original signatory to the Regional Workforce Equity Agreement. The County's first project under the newly signed RWEA was the Library Operations Center, a bond-funded construction project.

The Library Operations Center project showcases Multnomah County's exemplary utilization of the RWEA levers and partnership with construction unions, resulting in stellar results in and surpassing diversity goals. **Led by Fortis Construction as the prime contractor, workforce utilization goals outpaced projections, with 43.3% of construction hours performed by people of color and 20.44% by women. More than half of all apprentices were people of color and 48% women. Simultaneously, they achieved 36.7% (Certified and Qualified Business Enterprise Inclusion and Diversity–COBID) utilization, with over 19% earned specifically by minority-owned firms (MBEs), far surpassing their target goal of 25%.**

The Regional Workforce Equity Agreement (RWEA) and its process for active dialogue and communication among contractors, unions, workforce partners and the County improved dialogue and problem solving in a proactive way. Conversations were happening regularly with all parties understanding the goals and metrics the project sought to achieve. These conversations included those between union and non-union contractors as well. The RWEA set the expectations for collaboration rather than competition and blaming.

The County took a firm approach to their workforce equity goals and considered them a requirement, instead of aspirational. Incorporating these workforce equity goals into labor agreements like the RWEA helped the county solidify their position with contractors and drive accountability.

Tracking systems were indispensable tools to foster accountability and responsibility for contractors. The County employs robust tracking systems, such as LCP Tracker and B2G, for comprehensive analysis of workforce and contractor utilization data. LCP Tracker captures worker demographics and prevailing wages, allowing detailed tracking by trade. B2G is utilized for prime contractors to manage payments and track business certifications.

A diligent Labor Compliance Program ensured verification of workforce components. Volunteers conducted site visits to interview workers, confirmed pay details and analyzed documentation for alignment.

The utilization of Labor Management Community Oversight Committees (LMCOC), which are written into the RWEA, provided a structured platform for public agency monitoring and remediation of workforce utilization challenges. Monthly public-facing meetings with prime contractors encouraged transparency and stakeholder engagement, offering external voices an opportunity to contribute to project discussions.

TABLE 10: Library Operations Center–Workforce Participation Outcomes

	PERSONS OF COLOR (21% GOAL)	WOMEN (8% GOAL)
Overall Total	43.4%	20.44%
Apprentice Level	51.16%	48.22%
Journey Level	40.30%	9.71%

Source: Multnomah County

2. Improve retention through addressing jobsite culture and other challenges.

THE SAFE FROM HATE ALLIANCE, PORTLAND METRO REGION

The Safe from Hate Alliance is a collective effort comprising employers, trade associations, unions, public agencies, community organizations, and tradesworkers, united to confront the detrimental culture prevalent on construction jobsites that contributes to the attrition of skilled craft workers, particularly impacting women and people of color. Originating from a disturbing incident in May 2020 when a noose was discovered on a downtown Portland construction site, the alliance, led by the Metropolitan Alliance for Workforce Equity (MAWE), has garnered support from numerous stakeholders who have committed to the Safe from Hate Positive Jobsite Culture Pledge. This pledge mandates a zero-tolerance policy for job site discrimination, the enforcement of reporting mechanisms, the implementation of positive work environment training, and the promotion of workforce diversity and minority leadership.

The program prioritizes psychological safety alongside physical safety, fostering a workplace that actively recruits, retains, and mentors diverse workers, advancing women and people of color into leadership roles. Recognizing the financial impact of worker attrition on construction firms, the alliance emphasizes the importance of respectful workplaces for minimizing lost time, reducing project costs, enhancing productivity, supporting safety, engaging employees, retaining a skilled workforce, and promoting the health and wellness of workers. The coalition strives to transform the historically toxic jobsite culture in the construction industry, working towards creating safe and respectful environments for every worker.

3. Targeted strategies to recruit and retain diverse workers:

INVESTING IN CHILDCARE AS A WORKFORCE AND COMMUNITY BENEFIT

Affordable and reliable childcare is essential to building a sustainable workforce for the construction industry. Childcare is the work that makes all other work possible and is an important (albeit usually invisible) part of our nation's essential infrastructure. In discussions with workers, contractors, unions, and training partners, the absence of affordable, high-quality, and flexible childcare emerges as a key factor influencing retention rates, workforce participation, and absenteeism.

In Washinton, 62% of children under six are cared for by working parents. In Oregon, one-third of the workforce has a child under 18, and their ability to work is significantly influenced by the availability of childcare, school, summer camps, and traditional operating hours of childcare programs. An impactful statistic reveals that 89% of mothers with access to childcare were employed, highlighting the correlation between childcare availability and workforce participation.

The escalating cost of childcare poses a financial burden on families.

In Washington state, childcare providers of all types reported increases in the rates they charge families for their services in every geographic area and child age category. Despite notable increases in subsidized childcare rates in recent years, they are not matching the upward trend reported by providers in the private market. **In Oregon and Washington, parents face costs ranging from \$7,000 to \$14,000 per child.** This financial strain often forces mothers to leave the workforce or reduce their working hours. Since 2000, childcare costs have risen by 115%, exceeding inflation rates. Additionally, childcare needs are not confined to traditional 9-to-5 work hours, impacting nearly 5 million children under six whose parents work non-traditional hours. Unfortunately, only 8% of childcare centers offer care during these non-traditional hours.

The shortage of childcare slots further exacerbates the problem. Low wages for childcare providers, with a median of \$13.22 per hour, contribute to high turnover rates, particularly in for-profit centers. These challenges are intertwined with racial and gender justice issues, as the majority-female childcare workforce, especially women of color, faces significant wage inequities. Businesses also suffer, losing an estimated \$13 billion annually due to employees' childcare challenges, demonstrating the need for a comprehensive public childcare system to ensure a stable and diverse workforce for the semiconductor industry and beyond.

Access to stable and affordable childcare impacts working parents and businesses. It significantly affects the economic stability and workforce participation of parents, particularly mothers. Childcare challenges in Oregon and Washington closely parallel those faced nationwide. Currently, 58% of Oregon children under the age of three are placed in non-parental childcare arrangements. This includes 42% in informal care with family, friends, or neighbors (FFN care) and 16% in organized childcare settings like centers, family childcare homes, or other organized care.

Stable access to childcare emerges as a key factor in reducing employee absences by 30% and decreasing job turnover by 60%. The implications for businesses are substantial, with a lack of childcare leading to a 20% cost in turnover for hourly employees and potentially up to 150% for managerial positions. This issue is especially pertinent for mothers, as 42% express the desire to enhance their earnings and explore new job opportunities if they had better access to childcare. The impact is more pronounced for women of color, with over half of African American mothers and 48% of Hispanic mothers indicating that improved childcare access could lead them to seek higher-paying employment.

To learn more about childcare costs in every state:

The National Database of Childcare Prices (NDCP) is the most comprehensive federal source of childcare prices at the county level. The database offers childcare price data by childcare provider type, age of children, and county characteristics.

<https://www.dol.gov/agencies/wb/topics/childcare/price-by-age-care-setting>

UNDERSTANDING CHILDCARE NEEDS OF A DIVERSE CONSTRUCTION WORKFORCE

The construction workforce will need a range of childcare options that are high quality, flexible, and meet changing needs. Families often choose childcare arrangements based on factors such as their child's age, developmental needs, working schedules, budget, and personal preferences. A plan to provide reliable, accessible, affordable high quality childcare must provide families with a range of options that meet their diverse needs, including multiple care options for an individual family and care for nontraditional hours in early mornings, nights, and weekends, as well as flexible timing that reflects the nature of their work. Employers can invest in childcare provisions that offer a variety of choices to workers by using a "mixed delivery" model to provide benefits that are tailored to their workers' diverse needs. The four most likely models named are: (1) on-site care, operated by the employer; (2) on-site care, contractor operated; (3) off-site care, cash assistance; and (4) off-site care, provider sponsorship. A multi-pronged approach—combining these and other strategies—is ideal for ensuring families can match with the childcare arrangements that work best for them.

MEETING THE NEEDS OF NONTRADITIONAL HOURS AND CULTURALLY SPECIFIC STRATEGIES

Some families face additional barriers to finding affordable childcare: construction workers, including low-income families; families of infants and toddlers; families who work nontraditional hours; families with a child or family member with a disability; immigrant families and families with limited English proficiency. Oftentimes, home-based childcare providers can best meet the needs of parents who work nontraditional hours and/or seek culturally responsive providers.

Meeting the diverse needs of families in search of childcare involves considering various factors, particularly for those facing additional barriers. Key points include:

■ FLEXIBLE AND CULTURALLY RESPONSIVE OPTIONS

- Family childcare homes and family, friends, and neighbor (FFN) childcare offer flexible options, meeting the needs of parents working nontraditional hours.
- Involvement of trusted individuals within a parent's personal network fosters a sense of trust and familiarity, providing peace of mind.
- These arrangements often provide more individualized and personalized care compared to formal childcare settings.

■ SCHEDULING FLEXIBILITY

- Family childcare and FFN childcare arrangements are typically more flexible in terms of scheduling.
- Providers may accommodate irregular or non-traditional work hours, supporting the varying schedules of working parents.
- Proximity and convenience in the neighborhood or community reduce commuting time and offer a seamless transition between home and childcare.

■ ADDITIONAL EMPLOYER MECHANISMS

- Subsidized or Discounted Childcare Spaces:
 - Employers can provide subsidized or discounted childcare spaces with local providers, addressing financial barriers for families.
 - Consideration is needed to balance employee access with the limited childcare supply impacting the broader community.
- Direct Sponsorships or Financial Contributions:
 - Employers can contribute financially to expand or improve existing childcare facilities, ensuring more availability of high-quality services.
 - This may not directly provide access to care for employees.
- Direct Cash Assistance:
 - Employers can offer direct cash assistance to employees for childcare, but tax implications and limited supply may still pose challenges.
 - Without addressing broader childcare supply issues, securing care remains a challenge even with financial support.

PROFILE OF OREGON: STRONG CHILDCARE AND LABOR PARTNERSHIPS ON THE GROUND.

The state of Oregon and our construction industry have examples of success of current and previous labor-community partnerships in Oregon that have delivered policies and investments into workforce training and childcare infrastructure. Childcare collaborations like the Childcare for Oregon Coalition and The Construction Careers Pathways project have a deep understanding of the unique challenges of skilling up the local workforce while also ensuring adequate local supply of quality childcare to ensure a diverse range of people can access and hold these skilled jobs. They have proven strategies to deliver local and state funding to build a more comprehensive childcare system. These collaborations have successfully brought together local partners in government, community, and workforce arenas to advance funding mechanisms, career pathway plans, and small business investments to address some gaps in childcare and workforce systems.

Oregon's construction workforce and childcare advocates have joined forces to enhance outcomes for BIPOC and women workers. Efforts involve the intentional development of a flexible process and infrastructure capable of accepting funds from various sources, including the state, local governments, and private or public entities. Oregon's Bureau of Labor and Industries puts federal highway transportation dollars to work with Oregon's Employment Related Day Care (ERDC) subsidy program. The ERDC subsidy program utilizes its infrastructure to administer direct childcare subsidies to specific workers who are eligible for this support. In essence, apprentices in targeted trades (painters, operating engineers, ironworkers, carpenters, cement masons, and laborers) are offered childcare subsidies that are paid through the infrastructure of the state's ERDC program using non-ERDC funds. This is preferable not only because it simplifies the process of supporting employees by utilizing existing state infrastructure, but also because Oregon's ERDC program supports families in procuring a wide range of care options that meet their families work schedules, cultural and language preferences, and the range of care needed for children of different ages. This adaptable structure supports the entire ecosystem of childcare providers across the state, facilitating efficient administration of future investments targeted at diverse childcare entities or specific geographic areas.

As part of the regional initiative to diversify the construction trades through CCPF, employers in the Portland-Vancouver region have established a workforce funding collaborative, investing \$3 million to support diverse construction workers. Additionally, Oregon is making strides in fortifying the Employment Related Day Care (ERDC) program and enhancing the financial stability for providers and parents. These initiatives include:

- **Establishment of the Department of Early Learning and Care (DELIC) as an independent agency**, bringing together childcare programs across state government for more seamless alignment for families and providers.
- **State recognition of diverse care settings including in funding of childcare workers** in center-based care, family-home settings as well as by friend, family, and neighbor (FFN) providers.
- **State investments of \$100M in stabilizing and growing the childcare sector:**
 - i. **Increases the quantity of money providers who receive Employment Related Day Care (ERDC) subsidies per child.** On average, providers saw their ERDC rates increase between 18–20%. By allowing for more equitable rates there are more providers participating in Oregon’s subsidy program and more purchasing power for parents.
- **Training funds to grow childcare worker supply.** Invests \$39.3 million to recruit and train new childcare providers and provide capacity-building direct grants to expand existing facilities of all types. These grants are expected to create between 6,000–7,000 new childcare slots across the state through support for over 275 new or existing childcare providers.
- **Investing \$40 million in growing small, minority and women-owned business and nonprofits providing childcare in underserved communities.** This fund is building a community-driven grant process to expand childcare access across the state.

4. Knock down the barriers for women and workers of color face to ensure we have the skilled workforce we need.

WOMEN WORKERS

Guidance from USDOL Women’s Bureau: [Tools for Building an Equitable Infrastructure Workforce GENDER EQUITY STRATEGIES AS A MODEL](#)

The unprecedented levels of federal investment in infrastructure create a unique opportunity to design and implement policies and programs that will ensure equity and inclusion in good jobs that pay family-sustaining wages and meet the demand for workers on a wide range of infrastructure projects. This module provides guidance on strategies and best practices for recruiting and retaining women in construction, manufacturing, and clean energy jobs. These strategies should be viewed as a menu of options and entry points that can and should be used to either initiate new projects and programs and fill the gaps for existing work, depending on their community and workforce needs.

MAKE THE INTENTIONAL CHOICE TO BUILD A DIVERSE WORKFORCE

- Build inclusive local/regional partnerships.
- Intentionally center diversity, equity, inclusion, and accessibility (DEIA).
- Make data-driven decisions.
- Create an intentional regional equity and diversity plan.
- Creating the demand for a diverse workforce.

TARGETED RECRUITMENT AND ADDRESSING BARRIERS TO ENTRY

- Use inclusive language and images.
- Target locations frequented by women.
- Engage and empower women to help recruit other women.
- Build strong partnerships with women-focused pre-apprenticeship programs and tradeswomen organizations.
- Provide comprehensive wraparound supportive services.
- Maintain flexibility in the recruiting process.

RETAINING A DIVERSE WORKFORCE

- Commit to regular and consistent monitoring and reporting on progress.
- Provide equitable training and work opportunities.
- Implement policies and programs to change workplace culture, prevent and address gender-based violence and harassment, and address health and safety concerns.
- Continue investment in wraparound supportive services and benefits.

EXAMPLES

- Building Pathways in Massachusetts has focused their recruitment efforts on conducting outreach where women are, including grocery stores, courthouses, and high school career fairs. Building Pathways partners with the Boston Housing Authority (BHA), whose staff engage residents by calling them to inform them about the pre-apprenticeship program, in addition to hanging flyers in buildings and community centers.
- The New York State Department of Labor has conducted a media campaign to increase diversity in the workforce, including specifically increasing gender diversity in non-traditional occupations: Who Runs the World? Girls: This is Why: Nancy and Heraclio, Highway Maintenance Workers at NYS DOT; This is Why: Wendy, Apprentice; This is Why: Asa, Lineworker; This is Why: Advanced Manufacturing Assembly Lead; This is Why: Truck Driver.
- Union-supported women's committees are another important recruitment tool. They spend a substantial amount of time on recruitment efforts, including attending career fairs, participating in training events, and spending time in communities showing other women that an apprenticeship in the trades is a route to a rewarding, well-paid career.

INVEST IN WRAPAROUND SUPPORTIVE SERVICES AND BENEFITS

Many women who begin such programs will face a benefits cliff: they will earn enough that they no longer qualify for subsidies or public assistance programs, but not enough to afford childcare, transportation, or housing without assistance. Individuals who do not complete their apprenticeships are more likely to report experiencing financial difficulties and report difficulties affording items such as tools and clothing, housing, childcare, and transportation than those who stay in and complete their apprenticeships. Additionally, workers in the construction industry are less likely to have access to paid family leave or paid sick leave than workers in other industries, which can limit women's ability to successfully complete apprenticeships. Caregiving continues to be a significant burden for women entering and staying in the workforce, including and especially in the construction, manufacturing, and clean energy workforces, where workers often face the additional challenge of needing nonstandard hourly care. This makes the continued provision of wraparound supportive services and benefits that support caregivers essential for apprentices and those in on-the-job training programs.

- Provide childcare benefits to workers, especially apprentices.
- Provide access to sick leave and other flexible mechanisms to support caregiving responsibilities.

EXAMPLES

- ODOT/BOLI's Highway Construction Workforce Development Program is one of the few that provides supportive services for apprentices, including a number of supports to assist those in the construction trades with access to childcare. There is the Apprentice-Related Childcare funding, the Pre-Apprenticeship Childcare Initiative, and Labor Littles, a new, privately funded non-profit supported by Oregon's Building Trades, which is helping union tradespeople find union in-home childcare providers willing to provide care to cover the construction workday.
- Ironworkers and the North Central States Regional Council of Carpenters have both introduced paid pregnancy and maternity leave benefits to support pregnant women and new mothers in these unions.

COMMUNITIES OF COLOR

CITY OF SEATTLE REGIONAL COMMUNITY WORKFORCE AGREEMENTS. GREATER SEATTLE AREA, WASHINGTON

The City of Seattle, in collaboration with other regional jurisdictions, has pioneered a regional model for Community Workforce Agreements (CWA) to promote equitable workforce practices in construction projects. These regional partners, known as the Regional Public Owner group (RPO), include the City of Seattle, King County, Port of Seattle, Sound Transit, and the Washington State Department of Transportation. These entities share near-identical policies and labor agreements, with the City and County mandating CWA sign-ons for projects exceeding \$5 million. The program, which has been implemented in 50 projects to date, exemplifies a collaborative regional effort extending to Sound Transit, Washington State Department of Transportation (WSDOT), Seattle Public Schools, Highline School District, and Marysville School District.

EQUITY GOALS AND HIRING REQUIREMENTS

The regional partners prioritize hiring from specific zip codes and aspire to achieve diversity goals for workers of color and women. While the City of Seattle and King County set hiring requirements, Sound Transit, WSDOT, and Seattle Public Schools maintain aspirational goals. WSDOT is developing a statewide priority zip code-targeted hiring program. Seattle Public Schools embeds goals for hiring former students and household members of current students.

In 2022, there was a notable increase in the representation of historically underrepresented workers in construction, marking progress since the initiation of Priority Hire. African-American and Black workers saw an estimated \$1.1 million increase in direct wages. Additionally, Hispanic, or Latino workers surpassed previous performance, constituting 19% of hours compared to the earlier 16%. These shifts indicate a more representative distribution of hours in construction projects, aligning with the broader community's racial and ethnic composition.

Women, however, remain underrepresented in the industry, and wage gaps persist, particularly with white men dominating higher-paying trades. Notably, despite the overall provision of living wages in construction, efforts are needed to address disparities in certain trades, such as power equipment operators, where workers of color and women have lower engagement, impacting overall project performance. Priority Hire's investments in recruitment, training, and support aim to counteract these trends by emphasizing higher-wage construction careers. In 2022, they made intentional investments to better support women entering and staying in construction. These investments included:

- Pre-apprenticeship training programs to train women. Those women participants made up 36% of the pre-apprenticeship graduates who entered a registered apprenticeship.
- Development of a new mentorship program focused on women of color. The new program led with the understanding that when women of color thrive, their families and communities thrive as well.
- Wraparound support in the form of childcare assistance, gas, tools, and work clothes.
- Jobsite training for leaders and workers to identify and respond to bullying, hazing and harassment.

COLLABORATIVE GOVERNANCE

Government agencies, trades associations, and unions convene monthly under this regional model, sharing insights, addressing challenges, and developing joint plans. The partnership, comprising seven primary unions, emphasizes accountability through regular progress tracking meetings, with an annual review involving both contractors and unions. The commitment to measurable outcomes and workforce goals based on hours worked ensures accountability.

ADVANCING EQUITY

Seattle's Priority Hire Guide serves as a resource for public agencies, outlining the impact of the priority hire program and offering a design guide for adoption. The city aims to deepen relationships with the community, workforce, contractors, and training partners to challenge industry norms. The Equity Goals table highlights the highest achieving projects and outlines diversity goals for 2021.

PROCUREMENT AND ANTI-HARASSMENT INITIATIVES

Seattle emphasizes procurement processes and mandates anti-harassment training to retain a diverse workforce. The city provides Acceptable Work Site training during pre-bid meetings for contracts above \$5 million, reinforcing a commitment to fostering an inclusive and respectful work environment.

Seattle's regional model underscores the significance of collaborative governance, measurable outcomes, and proactive initiatives in advancing equity goals within the construction industry.

JUSTICE-INVOLVED AND PEOPLE IN ADDICTION RECOVERY

NORTH COAST HIRE / WCIA, HUMBOLDT COUNTY, CALIFORNIA

The North Coast HIRE (NCH) program based in Humboldt County, CA, and led by the Cal Poly Humboldt Sponsored Programs Foundation (SPF) and Westside Community Improvement Association (WCIA), is dedicated to enhancing economic stability for justice-involved participants. For over seven years, WCIA's on-site Family Resource Center (FRC) has specialized in supporting justice-involved residents in recovery, providing services such as financial analysis, court-ordered debt repayment assistance, childcare and transportation connections, and support for parole, probation, drug court, and treatment completion. Additionally, WCIA offers reentry and expungement clinics, consultations for legal matters, and citizenship classes.

The NCH program, designed to address racial, ethnic, and socioeconomic disparities in the regional labor market, provides paid hands-on construction training. WCIA's work brings together justice involvement, drug rehabilitation services, and the local unions who now recognize the training program, for direct entry to the construction workforce for individuals with a criminal record. WCIA has worked with the Local 324 Laborers Union and Local 3 Operators & Engineers Union for the past several years, placing several graduates into a union career pathway as apprentices.

The target population includes individuals with a history of incarceration, with 86% formerly incarcerated due to drug-related convictions and 48% belonging to Indigenous, Immigrant, Black, Hispanic/Latino, and/or other disproportionately impacted communities.

An innovative feature of the NCH program involves participants in the rehabilitation of blighted, derelict, historic buildings, combining urban blight reversal with skill development. Despite a modest budget of \$235,000–\$250,000 for a 13-week training program, the flexibility in the budget allows the Center to cover initiation fees, food, gas, lodging, and other resources for trainees. The program, often completed by eight students per cohort, includes participant screening, classroom-based instruction, hands-on training, financial literacy coaching, networking with local employers, job placement support, mental health and well-being support, including recovery and post-employment follow-up.

The NCH program, with a focus on justice-involved individuals in recovery, has demonstrated positive outcomes. NCH has successfully conducted nine training cohorts with justice-involved individuals over the past seven years with a high percentage of success connecting people to quality jobs. Data on over 150 WCIA program participants reveals that 37% are employed full-time in their chosen career paths, while 24% are employed full-time in quality jobs providing a living wage. Additional participants are employed part-time, disabled, or face unemployment for various reasons. In addition to being employed, participant successes include those who now own businesses, and those who have joined a trade union as an apprentice and/or journey person. Some have gone on to earn degrees or vocational certificates in the field of their choice, including nursing, carpentry, mill work, mechanics, and truck driving.

Through a combination of proven training methods, industry certifications, and a novel visual affirmation approach, NCH strives to create lasting impacts on participants' lives by offering genuine pathways to employment and career advancement.

**VINCENTIAN OHIO ACTION NETWORK ARCH PROGRAM,
COLUMBUS, OHIO**

Starting in 2024, the ARCH will train, support, and place returning women into new jobs in the rapidly growing green energy industry located in Central Ohio. The program works with women in in pre-release programs at the Ohio Reformatory for Women and Richland Correctional, providing them with comprehensive solar training. Simultaneously, they have established connections with solar and renewable energy employers in Ohio seeking workers. This approach emphasizes training and employment opportunities before release, enabling justice-involved workers to quickly reintegrate into the community and rebuild their lives through skilled trades work.



Photo: Worksystems 2019

APPENDIX B: INTERVIEW LIST

Projected Demand for Project Specific Workforce: Interviewees

We interviewed representatives from 27 entities, including 17 public agencies, three trade organizations, two academic institutions, two contractor associations, and two individual contractors in Washington and Oregon.

ENTITY NAME	STATE	ENTITY TYPE
Associated General Contractors (AGC)*	OR	Contractor Association
Beaverton School District	OR	Public agency
City of Portland*	OR	Public agency
City of Vancouver*	WA	Public agency
Clackamas Community College	OR	College
Clackamas County	OR	Public agency
Columbia Pacific Building Trades	OR	Labor
Evergreen School District	WA	Public agency
Gresham- Barlow School District	OR	Public agency
Hoffman Structures	OR	Contractor
IBR Project Team*	OR	Public agency
Kiewit	WA	Contractor
Multnomah County	OR	Public agency
Oregon Department of Transportation (ODOT)*	OR	Public agency
Oregon Metro Regional Government	OR	Public agency
Oregon State Building and Construction Trades Council	OR	Labor
Port of Portland	OR	Public agency
Portland Bureau of Environmental Services (BES)*†	OR	Public agency
Portland Bureau of Transportation (PBOT)*†	OR	Public agency
Portland Community College	OR	College
Portland Parks and Recreation*†	OR	Public agency
Portland Water Bureau*†	OR	Public agency
Prosper Portland*	OR	Public agency
Southwest Mountain States Regional Council of Carpenters*	OR	Labor
Southwest Washington Contractors Association	WA	Contractor Association
Tri-Met*	OR	Public agency
Washington State Building and Construction Trades Council	WA	Labor
Washington Department of Transportation (WSDOT)*	WA	Public Agency
C-Tran	WA	Public Agency

* Agencies designated with (*) responded to some or all of the interview questions via email.

† Representatives of the bureaus of the City of Portland convened in a drop-in session to provide responses.

Apprentices and Journeyworker Participants in Focus Groups and Interviews

ENTITY NAME	NUMBER OF PARTICIPANTS
Data Collection	
Vancouver apprentice focus group	9
Portland apprentice focus group	6
Journeyworkers interviews	3
Trade	
Mason	1
Electrician	7
Roofer	3
Ironworker	4
Plumber	1
Laborer	2
Union or non-union	
Union	18
Parent	
Parent	9
Not a parent	9
Race/ethnicity	
White	8
Black/African American	2
Latino/Hispanic	4
Native American	1
Asian	1
Multiracial	1
No response	1
Gender	
Man	5
Woman	11
Non-binary	2
Sexual identity	
Straight	6
Queer	5
No response	7
Age	
Average age	35.5
Age range	20–61
Total number of participants	18

Apprenticeship Programs, Unions, Contractors, Trade Associations, and Educational Institutions: Interviewees

APPRENTICESHIP PROGRAMS
Apprenticeship Programs
Construction Industry Training Council (CITC)
Carpentry
Commercial inside wireman
Residential wireman
Low energy/sound and communications technician
Heavy equipment operators
HVAC
Laborers
Painting
Plumbing
Scaffold erector
Sheet metal
Northwest College of Construction (NWCC)
Carpenters
Laborers
Roofers
Heavy Equipment Operators
Masons
Pacific Northwest Carpenter Institute (PNCI)
Carpenters
Exterior-interior carpenters
Scaffold erectors
Millwrights
Pile driver
Divers
Ironworkers Local 29
National Electrical Contractors Association (NECA) & International Brotherhood of Electrical Workers (IBEW) Local 28
International Union of Operating Engineers Local 701
Heat & Frost Insulators & Allied Workers Local 36
Oregon and Southwest Washington Roofers and Waterproofers Local 49
The Laborers' International Union of North America (LIUNA) Local 335
Bricklayers and Allied Craftworkers (BAC) Local 1

APPRENTICESHIP PROGRAMS
Unions
The Laborers' International Union of North America (LIUNA) Local 737
Pacific Northwest Regional Council of Carpenters (merged with Southwest Mountain States Carpenters)
Contractors
Kiewit
Professional Minority Group (PMG) Abatement Contractor
Trade Associations
LatinoBuilt
Educational institutions
Portland Community College, Construction Management
Portland State University, Civil Engineering
University of Portland, Civil Engineering
Oregon State University, Civil and Construction Engineering

APPENDIX C: CAPITAL PROJECT LIST

PUBLIC AGENCY	ST	PROJECT
Beaverton School District	OR	Beaverton HS Replacement
Beaverton School District	OR	Raleigh Hills ES Replacement
C TRAN	WA	Highway 99 Bus Rapid Transit (BRT) Project
C TRAN	WA	4th Plain Extension Bus Rapid Transit (BRT) Project
City of Gresham	OR	Central Water Treatment Facility
City of Lake Oswego	OR	North Anchor Project
City of Lake Oswego (in partnership with the City of Portland)	OR	Wastewater Treatment Facility Project
City of Portland - Environmental Services	OR	E11531 Inverness Pump Station Forcemain System Replacement
City of Portland - Environmental Services	OR	E11485 - CBWTP WWCL and Hypochlorite Modification
City of Portland - Environmental Services	OR	Carolina FM
City of Portland - Environmental Services	OR	Lower NW
City of Portland - Environmental Services	OR	CBWTP Willamette Building
City of Portland - Environmental Services	OR	Pump Station bundle
City of Portland - Environmental Services	OR	E11038 - CBWTP Blower System\Building Imps
City of Portland - Environmental Services	OR	E10900 Oak Basin A—Sandy Blvd Trunk
City of Portland Water Bureau	OR	Bull Run Filtration Facility
City of Portland Water Bureau	OR	Bull Run Filtration Pipelines
City of Vancouver	WA	New Public Works Operations Campus
City of Vancouver	WA	Fire Station 3 Replacement
City of Vancouver	WA	New VPD Headquarters Facility
City of Vancouver	WA	Office Space Expansion City of Vancouver
City of Vancouver	WA	Community Arts Hub
City of Vancouver	WA	Main Street Promise
City of Vancouver	WA	Water Station 14 PFAS Treatment
City of Vancouver	WA	Water Station 4 PFAS Treatment
City of Vancouver	WA	Water Station 8 PFAS Mitigation
City of Vancouver	WA	Water Station 15 PFAS Mitigation
City of Vancouver	WA	Water Station 9 PFAS Treatment
City of Vancouver	WA	Water Station 3 PFAS Treatment, Reservoirs and Pump Stations
City of Vancouver	WA	Water Station 1 PFAS Treatment
City of Vancouver	WA	Water Station 7 PFAS Treatment
City of Vancouver	WA	Marine Park Solids Forcemain
City of Washougal	WA	Biosolids Handling and Odor Control Facilities
Clackamas Community College	OR	Wacheno Phase II
Clackamas Community College	OR	East Campus Renovations
Clackamas County	OR	County Courthouse
Clark College, State Board for Community and Technical Colleges	WA	Clark College Advanced Manufacturing Center

PUBLIC AGENCY	ST	PROJECT
Evergreen Public Schools	WA	Cascadia Tech Academy 100 Building Replacement Project
Evergreen Public Schools	WA	Cascadia Tech Academy 300 Building
Gresham-Barlow School District	OR	GBSD District Office
Home Forward	OR	Fairfield Apartments Development
I-5 Bridge Replacement Program	WA-OR	I-5 Bridge Replacement Program
Lake Oswego School District	OR	Lake Oswego Middle School Replacement
Lake Oswego School District	OR	Forest Hills Elementary School Replacement
Multnomah County	OR	CMGC Services for Albina Library
Multnomah County	OR	CMGC Services for Midland Library
Multnomah County	OR	CMGC Services for Holgate Library
Multnomah County	OR	CMGC Services for East County Flagship Library
Multnomah County	OR	CMGC Services for Belmont Library
Multnomah County	OR	CM/GC Services for Earthquake Ready Burnside Bridge (EQRB)
ODOT	OR	I-5: Capitol Highway—OR217
ODOT	OR	Portland Metro area 2024–2027 ADA curb ramp construction
ODOT	OR	MULTNOMAH I-5: Northbound Interstate Bridge
ODOT	OR	CLACKAMAS I-205 Abernethy Bridge, Ground Improvements
ODOT	OR	Portland Metro area 2024–2027 ADA curb ramp right of way
OHSU	OR	Inpatient Hospital Addition
Port of Portland	OR	PDX Circulation and Capacity Improvements
Port of Portland	OR	Runway 10L-28R Reconstruction
Port of Portland	OR	Airfield Regulator Buildings (ARB)/Runway LED Upgrades Final Design & Construction
Port of Portland	OR	PDX MX Campus Redevelopment Phase I
Port of Portland	OR	PDX Resilient South Runway - Construction
Port of Portland	OR	Future West RON (Remain Overnight) Ramp
Port of Portland	OR	PDX 2030 Airfield Improvements
Port of Portland	OR	PDXNext PBB Replace Phase 3
Port of Portland	OR	HQP2 & P1 Lighting & Controls Replacement
Port of Portland	OR	BHS Makeup 2 and 3 Replace
Port of Portland	OR	NorthsideSrvceCntrRdvelopment
Port of Portland	OR	DD SE Apron Reconstruction
Port of Portland	OR	HIO Taxiway A Rehab Phase 3 & Taxiway G Reconstruction
Port of Portland	OR	Taxiway A East Rehabilitation
Port of Portland	OR	HIO Taxiway E Construction
Port of Portland	OR	Runway 3—21 Reconstruction & Taxiway C West Rehab

PUBLIC AGENCY	ST	PROJECT
Port of Portland	OR	Taxiway B East and B/C Exits Rehab
Port of Portland	OR	TTD Runway 7–25 Reconstruction and Stormwater Infrastructure Improvements
Port of Portland	OR	Basin 1 Subarea Stormwater System Improvements
Port of Portland	OR	T2 Soil Improvement
Port of Portland	OR	T4 Berth 405–408 Wharfs Demolition
Port of Vancouver	WA	Terminal 1 Marketplace
Port of Vancouver	WA	Port of Vancouver Rail Corridor Improvements
Port of Vancouver	WA	Terminal 1 Dock Replacement
Port of Vancouver	WA	Berth 8/9 Improvement Project
Port of Vancouver	WA	Terminal 5 Overpass Loop Span
Portland Bureau of Transportation	OR	NW Johnson/Kearney: 9th-Broadway
Portland Bureau of Transportation	OR	82nd Ave Major Maintenance Project
Portland Bureau of Transportation	OR	122nd Avenue Safe Streets for All
Portland Community College	OR	Sylvania HT West Renovation
Portland Community College	OR	Sylvania CT Renovation
Portland Community College	OR	Rock Creek B2 Replacement
Portland Community College	OR	Sylvania AM Building Renovation
Portland Housing Bureau	OR	HollywoodHUB BRIDGE Housing
Portland Housing Bureau	OR	The Clifford
Portland Housing Bureau	OR	PCC Killingsworth
Portland Housing Bureau	OR	Barbur Apartments
Portland Housing Bureau	OR	Strong Family Site
Portland Housing Bureau	OR	Portland Value Inn
Portland Housing Bureau	OR	Carey Blvd
Portland Housing Bureau	OR	M. Carter Commons
Portland Parks & Recreation	OR	Mt. Scott Community Center: Build Portland Renovation and Expansion
Portland Parks & Recreation	OR	North Portland Aquatic Center: Development
Portland Public Schools	OR	Jefferson High School Modernization
TriMet	OR	Columbia Bus Base
TriMet	OR	Park Avenue Garage Expansion
TriMet	OR	Hollywood Transit Center & Substation Repl.
TriMet	OR	82nd Avenue Transit Improvements
WSDOT	WA	I-5/179th Street Interchange—Interchange Improvements
WSDOT	WA	I-5/SB NE 179th St to Ridgefield I/C—Concrete Pavement Rehabilitation
WSDOT	WA	I-5/E Fork Lewis River Bridge NB - Replace Bridge

APPENDIX D: DATA NOTES AND METHODOLOGY

Workforce Supply Methodology: Construction and Professional, Technical, and Engineering (PTE) Occupations

GOAL

Quantify and assess the existing workforce that is potentially available for the provided list of 107 major capital projects. The analysis should include breakdowns by sector, occupation, trade, apprenticeship, race, ethnicity, and sex.

PROCESS

The client provided two lists of focus occupations: construction and professional, technical, and engineering (PTE). Due to the differences in occupational training pipelines, we separated the two occupational categories. The data notes and process for occupational, employment, and unemployment data are the same for the two categories. The apprenticeship data and prevailing wage data are specific to construction occupations.

OCCUPATION DATA

We pulled occupation level data from Lightcast (formerly EMSI) for the twenty-six construction occupations identified by the client. Additional data sources are noted below. All data is for 2022 unless otherwise noted. Occupation-specific data includes:

- Total employment
- Residential construction employment
- Resident workers
- Projected employment (2023), including replacement openings
- Typical and competitive education
- Wage percentiles
- Oregon Prevailing Wages

SOURCES

Occupational Employment: *Lightcast, based on industry and occupational data from the Bureau of Labor Statistics.*

Wages: *Lightcast, Based on data from the Bureau of Labor Statistics' Occupational Employment and Wage Statistics; and the U.S. Census Bureau's American Community Survey.*

Occupation Residence: *Lightcast, based on Data from the U.S. Census Bureau's Origin-Destination Employment Statistics (LODES).*

Competitive Education: *The Oregon Employment Department.*

Prevailing Wages: *The Oregon Bureau of Labor and Industries' prevailing wage rates for Oregon non-residential public works projects, effective July 5, 2023. Data are for Region 2: Clackamas, Multnomah, and Washington counties.*

Employed Workforce Demographics: *Lightcast and the U.S. Census Bureau's American Community Survey. All data are for 2022 unless otherwise noted. Demographic data by occupation include age cohort, sex, race, and Hispanic/Latino ethnicity.*

Apprenticeships: *The Oregon Bureau of Labor and Industries.*

Educational Pipeline (degree completers), PTE Occupations: *Lightcast, based on data from the National Center for Education Statistics.*

NOTES

UNEMPLOYED WORKFORCE

To fully capture the available workforce, we gathered unemployment insurance claims data from the Oregon Employment Department and the Washington Office of Employment Security for Multnomah, Washington, and Clackamas counties in Oregon and Clark County in Washington. Data is for week 22, 2023.

Unemployment insurance claims data include occupation, sex, race and Hispanic/Latino heritage.

WORKFORCE DATA – APPRENTICESHIP

We gathered four sets of apprenticeship data for Oregon: new enrollment by occupation (2020-2022), completions by occupation (2020-2022), active apprentices by occupation annually (2020-2022), and active apprentices by occupation as of December 19, 2023.

We were unable to use apprenticeship data from Washington state. Our team connected with Washington Labor and Industries (L&I) multiple times but were told that the data request that included demographic details was not feasible. Additionally, they were not able to fulfill the overall data request in the time period given.

Due to the nature of the data and data sources, there is an overlap between apprenticeship data and workforce data. It is possible that a worker who earned their journey card and is unemployed is also registered with the Oregon Employment Department or may be currently employed and captured on payroll data.

These are robust data sources that can inform insights and the snapshot on the regional construction workforce supply but need to be interpreted with this potential and likely level of overlap in mind.

Workforce Demand Methodology: Construction Occupations

GOAL

Estimate labor demand by occupation for the provided list of 107 major capital projects.

PROCESS

OCCUPATIONAL DEMAND

Because only 6 (of 107) projects listed detailed staffing needs (number of hours by trade), the team had to estimate worker demand (by trade) for the remaining 101 projects based on data provided by the responsible agencies: project description, projected total or hard costs, and in some cases projected total trades hours and/or projected hard costs.

First, the team estimated total trades hours for the (98) projects that didn't provide total hours:

- For the (49) projects providing hard costs:
 - Labor hours are between 2,800 and 5,000 per \$1 million in hard costs, depending on project type.
- For the (49) projects providing only total project costs:
 - Hard costs are between 70% and 90% of total project costs, depending on project type.

ASSUMPTIONS:

- **Hard costs are 70%-90% of total project costs**
- **Labor hours are 2,800-5,000 per \$1 million in hard costs**

Assumptions were derived from past project data and contractor interviews (from the 2018 Portland Metro Region Construction Workforce Market Study and updated for this report based on additional contractor feedback).

Second, the team estimated the total number of trades hours per project for those (101) projects lacking this level of detail. We applied staffing patterns to each project based on project type. Staffing pattern data came primarily from past projects (project-based) and contractor interviews. For those four project types with no available staffing pattern data, we used national survey data (industry-based) which was then vetted and modified by local contractors.

ASSUMPTIONS:

- **Project-based staffing patterns derived from a sample of projects are representative of all projects**
- **Firm-based national staffing patterns apply to local projects**

Third, the total labor demand was converted from hours to FTEs based on 2,080 hours/year.

ASSUMPTION:

- **Full-time/year-round employment**

HIRING GOALS

Some projects stated explicit hiring goals for women, workers of color, and/or apprentices, or stated they had goals but provided no detail; the majority didn't state goals (blank, 'don't know', 'TBD').

For those projects with stated goals (e.g. 15% women), we applied these to each occupation.

For those projects with no stated goals, we applied the average of the projects with stated goals to each occupation:

Apprentice: 17%
Women: 11%
Workers of Color: 21%

ASSUMPTIONS:

- **All projects have hiring goals**
- **Known project goals apply to projects without stated goals**
- **Hiring goals apply to each trade individually (as opposed to total workforce)**

NOTES

The methodology developed and applied to projects that didn't provide labor data is based on multiple sources and processes, both with public agencies and with contractor estimators. These sources used different terminologies and definitions, including labels for trade categories (e.g. HVAC versus sheet metal, flaggers versus laborers). Some public agencies omitted categories such as truck drivers, HVAC and flaggers, all of which we could assume are critical trades involved in most large construction projects. Given that, this analysis has inherent limitations based on the data that was or was not provided.

Workforce Demand Methodology: Professional, Technical, and Engineering (PTE) Occupations

GOAL

Estimate professional, technical, and engineering (PTE) demand by select occupation for the provided list of 107 major capital projects.

PROCESS

We were unable to estimate PTE demand as no agencies overseeing the identified capital projects were able to supply projected labor needs for the provided list of PTE occupations. Nor was this information available from past projects or contractor interviews (unlike the construction occupations analyzed in this study).

Although we can't estimate demand, we can depict the relationship between PTE and construction (trades) employment. We gathered national, industry-level staffing patterns data for the relevant construction industries (NAICS 2362, 2371, 2373, 238) and for firms that provide design, development, technical support, inspection, and other services to the types of projects identified in the report (NAICS 54133, Engineering Services). We then calculated the ratios of PTE-to-trades jobs, and applied them to the future 20,300 trades jobs needs (out of 22,000 construction jobs) identified in the construction demand analysis. (Construction Managers, Heating, Air Conditioning, and Refrigeration Mechanics and Installers, and Heavy and Tractor-Trailer Truck Drivers were removed for the purposes of this analysis because they are not classified as construction occupations (SOC 47-000) in the staffing pattern data).

ASSUMPTIONS:

- National, industry-based staffing patterns apply to local firms and to the identified capital projects
- The current ratio of construction-to-PTE occupations remains the same over the forecast period

ACKNOWLEDGMENTS

Study Team

This study was collectively conducted by a group of nonprofits and one private consultant, all of which have extensive background in workforce equity policy and research:

Clackamas Workforce Partnership: Clackamas Workforce Partnership is the nonprofit workforce development board serving Clackamas County since 2001 and is an affiliate of the state public workforce system, WorkSource Oregon, and the federal American Jobs Center Network. CWP’s mission is to create a more diverse, equitable, and inclusive workforce through collaboration and investments in people and businesses of Clackamas County. CWP is focused on building an inclusive workforce system that promotes innovation, responsiveness, and transparency, and meets the needs of the people and communities of Clackamas County. CWP works across the nonprofit, public, and private sectors to identify and address critical issues impacting the local workforce system, including barriers to employment faced by historically marginalized communities. CWP facilitates collaborative relationships among stakeholders from a variety of backgrounds, industries, and roles, which help inform the development of programs and services that remove barriers to socio-economic stability; help meet the needs of local employers; and promote equitable economic development.

Estolano Advisors (EA): EA celebrates this unprecedented investment in high-road and inclusive strategies and is eager to capitalize on the opportunity it presents to build a more equitable economy. As urban planners and public policy consultants, our expertise is in addressing precisely those challenging, multifaceted, and knotty issues—jobs, transportation, housing, infrastructure, and the integration of all four—whose untangling leads to a more just, equitable, and climate-resilient future. Since our founding in 2011, we’ve partnered with governments, communities, unions, and employers to pioneer these sorts of inclusive approaches to economic development. With local governments around the country struggling to access new funding programs—often for lack of technical experience—EA can help train our partners and allies on the exact tools and strategies to unlock federal funds. In several cases, we literally wrote the book on these very approaches. Our principled focus on equity, proven success as cross-sector advisors, and penchant for finding pragmatic solutions for achieving shared objectives, constitute our firm’s distinguished skillsets. Estolano Advisors is led by recognized thought leaders supported by a team of diverse technical experts. Cecilia V. Estolano, Richard France, Cynthia Guzmán, Tulsí Patel, Winnie Fong, Ginny Browne, and Raahi Reddy comprise the leadership team.

Oregon Employment Department (OED): The OED Workforce and Economic Research Division is instrumental in the production of accurate, reliable, and timely labor market data through surveys and analyses. Information is disseminated through publications, presentations, media contacts, and responses to customer requests. Workforce development policy makers, businesses and business associations, and educational entities are key Research customer groups.

Portland State University (PSU): Starting in 2011, Dr. Maura Kelly has conducted several research projects on workforce diversity in the construction workforce in Oregon. These projects have included assessing recruitment and retention of a diverse workforce in the construction trades as well as conducting formal evaluations of programs aimed to increase workforce diversity in the construction trades. Findings of this research have been published in research reports for funders (see www.pdx.edu/profile/maura-kelly) as well as in a peer-reviewed journal. Dr. Kelly has experience with a variety of evidence-based research methods in the construction trades context, including interviews and focus groups, which were the primary methods for the PSU researchers’ component of this project.

Workforce Southwest Washington (WSW): WSW, a 501c3 nonprofit, leads the regional workforce development system as the Local Workforce Development Board for Clark, Cowlitz, and Wahkiakum counties. WSW invests in programs and services that equip youth and adults for employment, career advancement, and self-sufficiency. WSW aids in business growth by funding and collaborating with companies to foster recruitment, training, and retention of employees. WSW uses its partnerships with labor market analysts, economic development agencies, industry, and “real-time” labor information tools such as JobsEQ to forecast changes in the area, analyze worker supply and employer demand, and support regional workforce investments. This data-driven, employer-focused approach informs planning, service delivery, implementation and continuous improvement.

Worksystems Inc. (lead): Worksystems, since it formed as an agency in 1999, has worked intentionally to use labor market information from local, state and federal agencies alongside first-hand workforce intelligence gathered from local employers to design workforce development programming that maximally benefits job seekers and employers in the community. The approach requires intensive workforce supply and demand data analysis. Resulting Sector Strategies are industry-driven, data-based plans to improve the quality of the local workforce in high-growth industries. All sector strategies have specific goals related to ensuring underrepresented populations gain access to career exposure, training and quality jobs.

Study Funders

This study was commissioned in May 2023 by the Oregon Department of Transportation and Washington State Department of Transportation for the Interstate I-5 Bridge Replacement program (IBR). ■



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