IMPACT THROUGH INSIGHT

FEBRUARY 2025

Oregon Housing Production Workforce Assessment

Prepared for: Oregon Higher Education Coordinating Commission

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Table of Contents

Executive Summary

Study Background and Purpose

On her first day in office, Governor Tina Kotek signed an executive order establishing a goal for Oregon to produce 36,000 housing units per year for the next 10 years, a large increase relative to recent levels of 20,000 or fewer units per year.[1] A council of experts subsequently developed an action plan to meet the new target, including recommendations on workforce strategies. To build on that work, the Oregon Higher Education Coordinating Commission (HECC) and its Office of Workforce Investments (OWI) sought an assessment of Oregon's housing production workforce. This report summarizes that assessment, combining robust quantitative data analysis with meaningful engagement of industry representatives and training providers. Paired with a companion report by MBCB Consultants, the study supports HECC's goals of fostering a robust, inclusive, and sustainable workforce.

The report includes chapters that (1) define and describe the housing production workforce, including demographic analysis; (2) quantify the workforce needed to reach the goal; (3) summarize the survey, interviews, and focus groups conducted for the study; (4) provide an inventory and summary information about Oregon's current education and training programs relevant to housing construction; and (5) recommend strategies and activities to expand and support Oregon's housing production workforce.

Oregon's Housing Production Workforce

The housing production sector spans many industries, such as construction of buildings, manufactured home and prefabricated wood building manufacturing, architectural services, building inspection, and land surveying. Within the construction industry, housing production falls primarily to residential building construction and specialty trade contractors. Specialty trade contractors, however, service all manner of construction activity, including remodeling and commercial construction, in addition to residential construction.

In 2023, Oregon's housing production sector employed 92,800 workers, with wide variation in average pay across industries, particularly between non-residential and residential construction (see Exhibit ES-1). Oregon's construction industry grew steadily out of the recessionary trough over the past decade; annual employment increased by approximately 5 percent annually from 2013 to 2023, compared with Oregon's overall annual employment growth of 2 percent.

[1] See Executive Order 23-04, https://www.oregon.gov/gov/eo/eo-23-04.pdf. The target was based on the Oregon Housing Needs Analysis (OHNA). The most recent OHNA revised the production target to 29,522 units per year for 10 years. https://www.oregon.gov/das/oea/Documents/OHNA-Methodology-Report-2024.pdf

Exhibit ES-1. Employment and Payroll by Industry, Oregon, 2023

Data source: OED QCEW, 2023

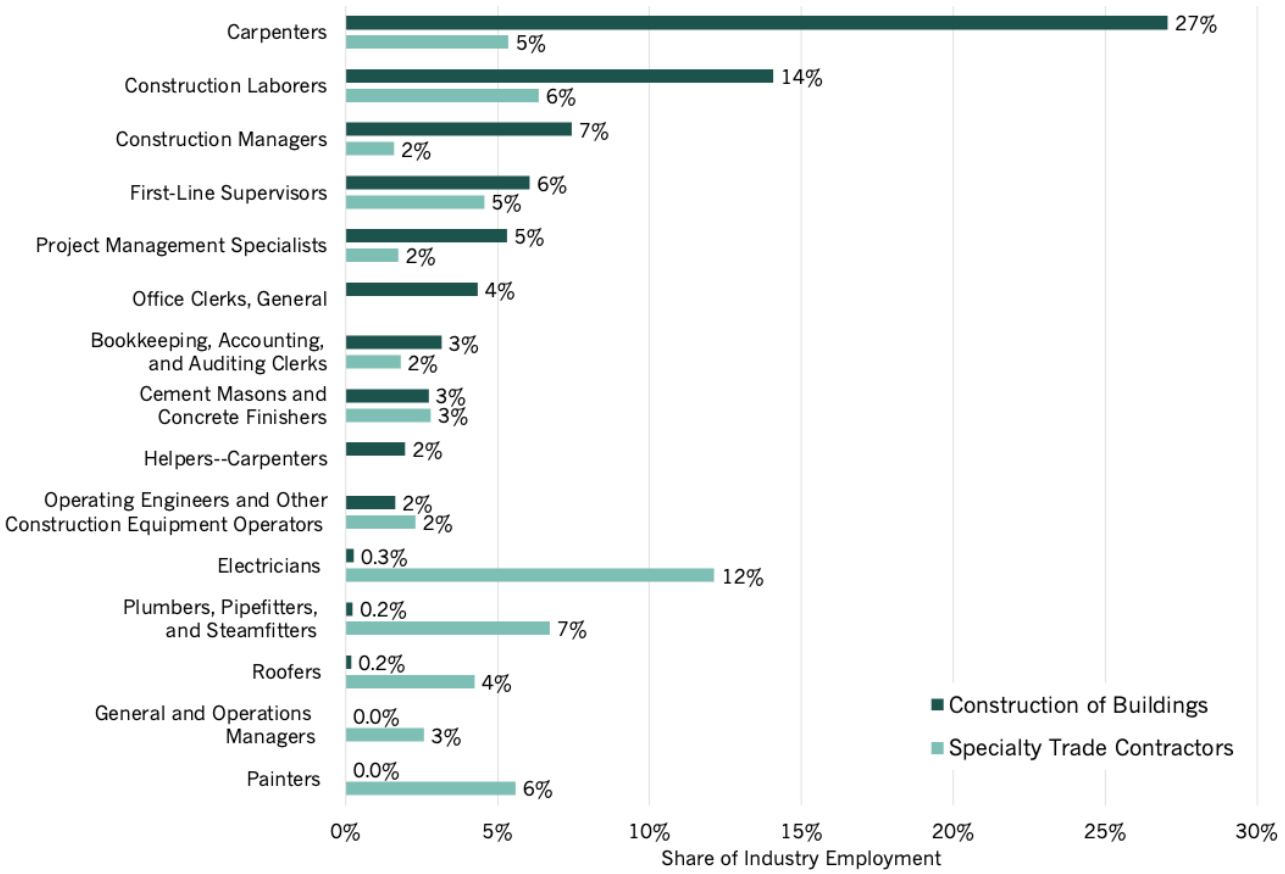
Housing construction firms are relatively small compared to firms in the rest of the construction industry, which, in turn, has more smaller firms than the state's economy overall. Nearly half—45 percent—of residential construction firms have five or fewer employees, compared to 10 percent of all firms in the state.

Housing construction employment is somewhat more concentrated in the Clackamas, Mid-Valley, and East Cascades regions than in the Portland Metro and Lane regions. Industry growth has also varied across Oregon over the past decade, with Mid-Valley and Rogue Valley experiencing the greatest annual growth.

Occupations and Workforce Characteristics. The housing construction workforce relies on well over 100 occupations spanning a wide range of skill sets but is highly concentrated in construction-specific occupations. Almost 60 percent of building construction and specialty trade workers are in construction occupations. Business, management, and administrative support occupations each account for between 5 and 10 percent of employment. We identified 28 occupations as key to the industry, due either to prevalence in the industry or importance of role to housing construction. Exhibit ES-2 displays the 15 most common occupations in the industries.

The median wage for construction occupations in Oregon is $63,100 versus the overall statewide median wage of $51,600. Among the top occupations, first-line supervisors, electricians, and plumbers earn significantly more than the median wage for all construction occupations. Carpenters earn closer to the median for construction while laborers earn less than even the statewide median for all occupations. Wages vary be region, which has implications for each region's ability to attract workers.

Exhibit ES-2. Share of Building Construction Employment by Top Occupations, Oregon



Data source: Oregon Employment Department, 2022

Housing construction employment is less reliant on lengthy postsecondary pathways, such as bachelor's or master's degrees, than is the economy as a whole—nearly two thirds of Oregon employees in construction and extraction occupations have a high school diploma or equivalent as their highest educational attainment.

The housing construction industry is host to many disparities related to race, ethnicity, gender, and wages. These inequities reflect broader systemic challenges and historical patterns—of exclusion, occupational segregation, and uneven access to training and resources—and highlight the need for targeted interventions to build a more inclusive and equitable construction workforce. Workers from diverse racial and ethnic backgrounds are present in many roles, but systemic barriers often limit their access to or advancement in higher paying positions. Similarly, gender inequities are pronounced, with women underrepresented across most occupations, particularly in skilled trades.

- Race/Ethnicity: Hispanic or Latino workers represent 18 percent of the construction industry workforce—with higher shares in construction, installation, maintenance, and repair—compared to 14 percent in the overall Oregon workforce. Management and business and financial occupations have the lowest shares of Black, Indigenous, and People of Color (BIPOC) workers, 14 percent and 20 percent, respectively.

- Sex: Women represent a relatively small proportion of the workforce: 12 percent compared to 47 percent in the overall Oregon workforce. Women are in about 4 percent of construction labor roles and 77 percent of administrative support roles.

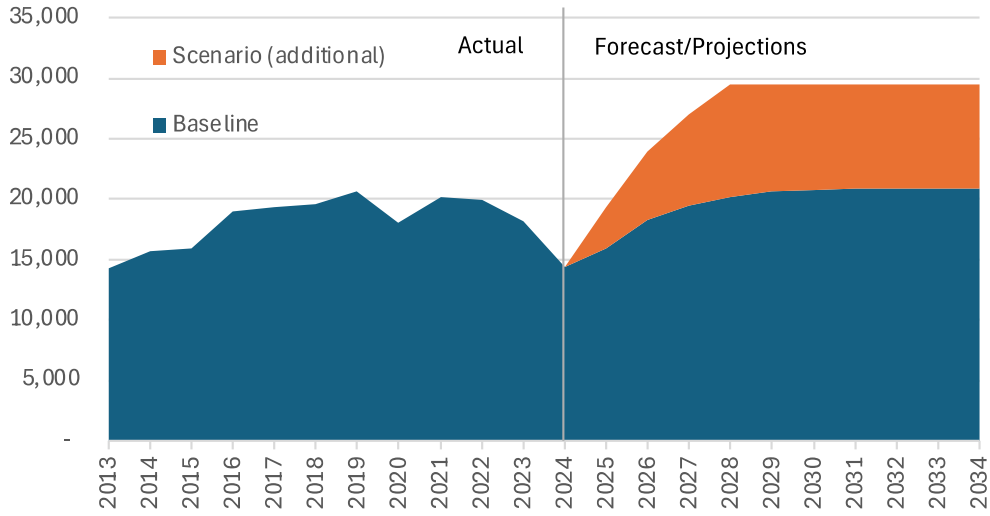
Our analysis shows that lower-wage occupations typically correspond with a higher prevalence of BIPOC workers and that occupations that require higher levels of educational attainment, technical skills, or managerial responsibilities (e.g., construction managers and civil engineers) tend to have lower BIPOC representation, often below 20 percent.

Women are also more strongly represented in lower-paying housing construction occupations. Efforts to recruit and retain women workers, particularly in skilled trades, could improve overall gender diversity and address labor shortages in certain roles. BIPOC and women workers also earn lower wages than their non-Hispanic white and male counterparts, respectively, when working in the same roles.

Workforce Demand

To estimate the number of additional workers the state needs to meet its housing production goal, we assumed a four-year ramp-up period for housing starts and calculated the number of workers needed for this level of construction activity (Exhibit ES-3 displays the housing start baseline and scenario). The analysis suggests the goal will require an average of 12,700 additional workers per year from 2028–34, above and beyond forecasted employment levels, with lower need during the ramp-up period.

Exhibit ES-3. Housing Starts: Actual and Needed to Meet Oregon's Housing Production Goal



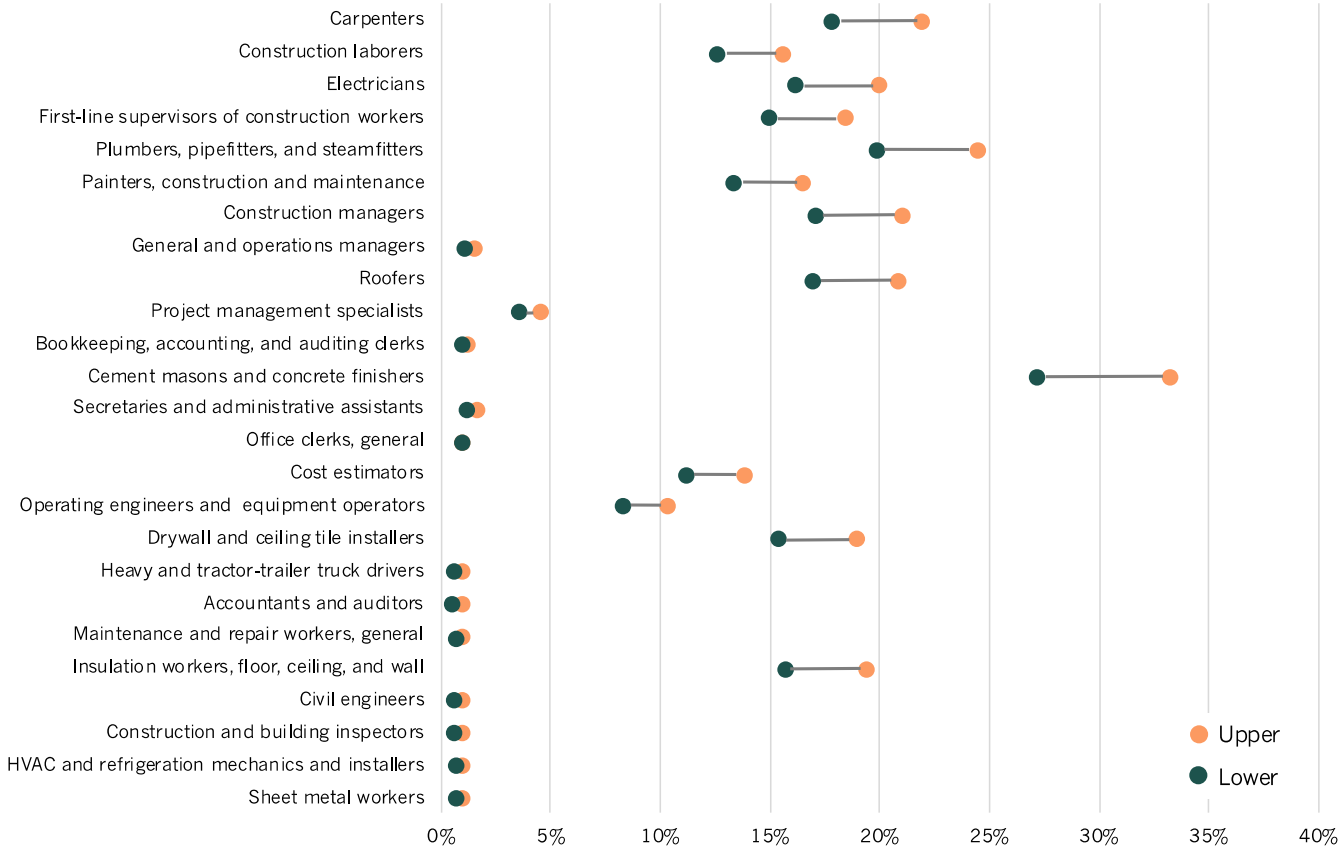
Data source: OEA

Under baseline conditions, the state will have about 15,600 residential construction workers and 85,200 specialty trade contractor workers in 2034. To meet the housing production goal, Oregon will need, on average, 5,300 additional residential construction workers and 7,500 additional specialty trade contractor workers per year from 2028–34.

We allocated the additional 12,700 jobs across occupations and calculated the additional employment needed to meet the 2028 goal for selected occupations. Due to retirement and occupation changes, the actual number of individuals needed for these jobs could be somewhat higher.

Exhibit ES-4 displays two measures of additional need, expressed as a share of annual openings projected by OED for each occupation: the number of additional employees needed to meet the production goal (Lower) and a plausible estimate for the number of individuals needed to fill the needed positions (Upper). For many occupations, the additional housing production would likely result in a large increase in job openings. Not included in this chart are building code professionals, including inspectors, as data regarding these positions is sparse. It's estimated that meeting the goal would require about 400 more local government employees in each year the production goal is met.

Exhibit ES-4. Additional Annual Need as a Share of Baseline Annual Openings



Data source: OED. Sorted by average annual number of additional openings needed to meet the goal.

On an annual basis, the year-over-year increases in housing starts and employment associated with the scenario are not unprecedented, but the state has not experienced this level of growth over multiple years and residential construction employment has actually declined slightly from a peak in 2022, suggesting the need for extraordinary efforts to meet the housing production goal within the next few years. Proposed tariffs and immigration reform could create additional, strong, headwinds. Once the workforce is in place (2028 in

the scenario described above), however, the additional need for housing production workers would return to levels more consistent with the current status quo.

Study Engagement

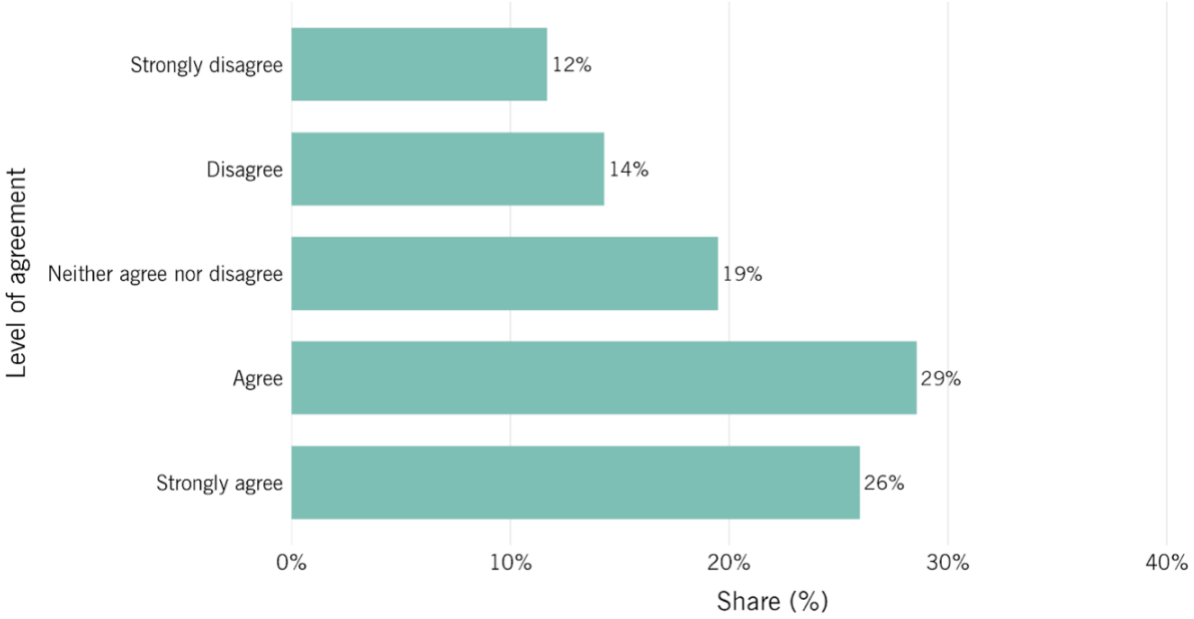
The study engagement included a survey of construction firms and interviews and focus groups with representatives from a range of interested parties.

Survey Findings

More than half of survey respondents—55 percent—reported significant challenges with workforce attraction, hiring, or retention during the past year (see Exhibit ES-5). The main cause of these challenges is a shortage of candidates with the skills employers need, with some variation in responses by geographic location and COBID-certification status.

Exhibit ES-5. Difficulty with Attracting, Hiring, and Keeping Employees

Survey Question: Please indicate your agreement with this statement: Attracting, hiring, and/or keeping employees has been a significant challenge for my company in the past 12 months.



Respondent companies reported struggling to fill a variety of hourly and salaried positions, including carpenters, equipment operators, project managers, mechanics, foremen, estimators, and superintendents. Employers cited work experience and advanced skills as the most lacking among job applicants. Top retention challenges include competition from other industries, reliable transportation for workers, and affordable housing.

Respondents cited employee referrals and apprenticeship programs as the most reliable sources of skilled workers for their companies, indicating a strong reliance on informal networks and on-the-job training.

Three quarters of respondents reported that their companies are actively trying to diversify their workforce. Respondents reported more difficulty achieving gender diversity in their workforce compared to racial or ethnic diversity.

To address labor shortages, the State's improvement efforts should focus on education in elementary, middle, and high school to shift the cultural narrative and communicate to young people the viability of career paths in the trades.

Half of respondents were skeptical that the State's housing production goal would be met. Another quarter expressed neutrality. The relatively low confidence levels signal concerns among respondents about the feasibility of scaling up housing production in the face of workforce shortages, governmental delays, and other development hurdles.

Interview and Focus Group Findings

We conducted six targeted interviews with workforce boards, labor unions, and construction employers, and three focus groups with representatives from community colleges, apprenticeship programs, and permitting offices.

Building Code Professionals: Oregon has a shortage of building code professionals. Only 45–50 individuals graduate annually from the state's three programs in this field, far below the 155 needed. Some students are deterred by program costs and the time commitment. The Oregon Building Officials Association is developing an apprenticeship-style program as an alternative pathway.

Apprenticeship Programs: Oregon's union apprenticeship programs can scale to meet workforce demand but depend on consistent construction activity. Training centers in Coos Bay and Newport, for instance, have long waitlists due to limited local jobs. Union programs value the 1:1 apprentice-to-journey-level ratio for quality and safety, while non-union employers, especially in rural areas, make the case for higher ratios.

Evolving Career Pathways: Career transitions, such as from trades to building inspector or superintendent roles, are less attractive due to lower wages in office-based roles. Emerging pathways include permit technicians advancing to inspector roles and graduates of four-year construction programs being hired as "field engineers," progressing into supervisory roles.

Gender Inclusivity in the Workplace: Women face challenges in the male-dominated construction industry, from proving competence to navigating job site accommodations. Some firms are improving inclusivity through flexible policies and support from programs like COBID, though concerns about broader industry culture persist.

Perceived Gaps in Current Program Offerings: Employers noted a disconnect between the skills new hires bring and workplace demands, particularly the balance of technical, practical, and essential skills.

Program Inventory

While the Oregon housing production workforce is not exclusively trained by programs in Oregon, the state's programs and pathways are key to the stability and expansion of the sector's workforce. Each region of the state has at least one construction-related program.

Career and Technical Education (CTE) Programs. In the 2024-25 school year, 100 high schools across Oregon had one or more CTE programs in the Architecture & Construction (A&C) CTE Career Cluster: 86 high schools had general architecture and construction programs, 10 had carpentry programs, and 9 had architectural design programs.

Apprenticeship and Pre-Apprenticeship Programs. In 2023, Oregonians completed about 1,500 construction-related apprenticeships, a number well below OED's anticipated annual openings (see Exhibit ES-6).

Exhibit ES-6. Active Apprentices and Completed Apprenticeships, Construction Industry, Oregon

Occupation Title	Active (as of 9/20/2024)	Completed (2023)
Electricians	3,132	686
Plumbers, pipefitters, and steamfitters	1,498	346
Carpenters	659	167
Sheet metal workers	398	66
Drywall and ceiling tile installers	327	89
Construction laborers	257	54
Heating/air cond./refrigeration mech., installers	211	27
Roofers	198	24
Oper. engineers / construction equip. operators	107	9
Cement masons and concrete finishers	84	16
Maintenance and repair workers, general	83	18
Painters, construction and maintenance	67	10
Glaziers	37	12
Insulation workers, floor, ceiling, and wall	25	7
Tile and stone setters	19	4
Total	**7,102**	**1,535**

Data source: Oregon BOLI

Apprenticeship programs can help increase diversity in the sector, as apprentices are more diverse by race/ethnicity than is the current workforce. Apprenticeship program completion rates, however, are lower for people of color and for women than for white individuals and men. Targeted investments designed to diversify recruitment and increase completion rates could help the state increase the size of the sector's workforce.

Nearly 1,000 individuals across Oregon were enrolled in pre-apprenticeship programs in 2024. In recent years, 77 percent of pre-apprenticeship participants graduated from their programs, and 11 percent entered apprenticeship programs. Among 2023 completers of a carpentry apprenticeship, about 20 percent had previously completed a pre-apprenticeship. Pre-apprentices are also more diverse than is the employment in the relevant occupations.

Postsecondary Credential Programs. As with apprenticeships, average annual completions for Oregon's colleges and universities are small in number compared to the need associated with the housing production goal (see Exhibit ES-7). More than half of the credentials are short-term certificates (less than one academic year). Nearly half of the average annual completions are in the construction trades, followed by HVAC and refrigeration maintenance technicians (43 completions); building/home/construction inspectors (19); and building/construction site managers (15).

Exhibit ES-7. Completions in Core Housing Production Programs, by Institution, Oregon

			Annual Average Completions (2019 - 2023)			
Institution	Region	Number of Programs	Short-Term Certificates	Certificates	Associates	All Completions
Portland CC	Portland-Metro	4	73	0	31	**105**
Mt Hood CC	Portland-Metro	2	11	1	16	**29**
Lane CC	Lane	3	24	0	4	**29**
Chemeketa CC	Mid-Valley	2	0	0	11	**11**
Treasure Valley CC	Eastern Oregon	1	0	10	0	**10**
Linn-Benton CC	Mid-Valley	1	0	4	4	**7**
Columbia Gorge CC	East Cascades	1	4	0	0	**4**
Umpqua CC	Southwestern Oregon	1	0	0	2	**2**
Blue Mountain CC	Eastern Oregon	2	2	0	0	**2**
Clackamas CC	Clackamas	1	0	0	1	**1**
Inst. of Tech.	Mid-Valley	1	0	0	0	**0**
Rogue CC	SW Oregon	1	0	0	0	**0**
Total			**115**	**16**	**68**	**200**

Data source: IPEDS. Notes: Rogue Community College had at least one relevant completion in earlier years. Averages are taken over the span of 5 years; some programs may not be operational every year.

Recommendations

The following recommendations address Oregon's housing production workforce needs, emphasizing the importance of collaboration, diversity, and training/education access. While workforce development is essential, it must occur alongside efforts to ensure consistent residential construction work amid challenges like investor caution, high material costs, limited insurance access, and market uncertainty.

- **Encourage collaboration among training programs and employers**
  - Build strong relationships between training providers and employers to ensure education aligns with industry needs
  - Promote and scale existing models and foster regional collaboration to improve training outcomes and address local workforce needs
- **Support early and ongoing development of a skilled, diverse workforce**
  - *K-12 education*: Introduce students to housing production careers through early exposure, project-based learning, CTE, and mobile classrooms
  - *Pre-apprenticeships and apprenticeships*: Expand programs to underserved populations, provide targeted wraparound services to help improve completion rates, and introduce new programs (e.g., for building inspectors)

- *Other credentials*: Promote four-year degree programs and implement micro-credentials and stackable certifications for skill-based training, to provide additional affordable and flexible learning options

- **Open more doors to housing production work**
  - Consider revising licensing policies, introducing a multi-skill construction license, and expanding reciprocity agreements to reduce barriers for out-of-state workers
  - Ensure equitable access to training and job opportunities for women and BIPOC workers
  - Track wage and training outcomes to help identify and address disparities
- **Continue efforts to link CTE, apprenticeship, and employment data**
  - Coordinate data collection and sharing between agencies like ODE, BOLI, HECC, and OED to continually assess program, investment, and system outcomes
  - Further the analysis included in this study to quantify training/credential gaps, program-level contributions, and employment outcomes for housing production-related program completers
  - Use data analysis to guide decisions on scaling successful programs and targeting resources
- **Modify the apprentice-to-journey-level-worker ratio**
  - Adjust the 1:1 ratio to allow two apprentices per journey-level worker in particular circumstances, such as in rural areas, for selected trades, and/or over a specific time period
  - Evaluate the effect of any change on training capacity, workforce growth, and apprentice/journey-level worker experience

Next Steps

A collaborative structure will provide structure in which to implement and evaluate strategic efforts. A working group or coordinating body should include three teams:

- **Workforce Entry**: Pathways into jobs in the sector
- **Ongoing Skill Development**: Progressing within the sector and training others
- **Innovation/Productivity**: Workforce needs of new, innovative, or productivity-focused activities, such as modular and manufactured housing

Industry, training/education, and government representatives must work together to design programs, collect and analyze data, and foster strategies that lead to sustained and equitable workforce growth.

Acknowledgments

ECOnorthwest prepared this report for the Oregon Higher Education Coordinating Commission (HECC). The authors wish to thank staff from HECC and the Office of Governor Tina Kotek as well as the study steering committee members for their guidance and involvement. We also thank the Oregon Bureau of Labor & Industries for providing apprenticeship and pre-apprenticeship data and MBCB Consultants for their insights.

We are especially grateful to all those who participated in the survey, interviews, and focus groups that were part of this study. We greatly value your time and insights.

ECOnorthwest is responsible for the content of this report. Any statements nonfactual in nature constitute the authors' current opinions, which may change as more information becomes available.

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- Jenn Kovitz, Hayden Homes
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1. Oregon's Housing Production Workforce

Oregon's housing production sector consists of several related, interconnected industries, employing individuals with a wide variety of skills and educational and training backgrounds. In this chapter, we first define and describe the housing production sector to provide a sense of scale for the sector's current footprint in Oregon. We then describe the occupational composition of the sector's workforce, focused on the construction subsectors most relevant to housing production, and present a demographic profile of the incumbent workforce. This information serves as a foundational input to subsequent chapters that assess the strength of Oregon's housing-production training pathways and their alignment with current and anticipated needs, in light of Oregon's ambitious housing production goals.[2]

Housing Production Sector Definition

The housing production sector spans several core industries. These include portions of the broad construction industry, manufactured home manufacturing, prefabricated wood building manufacturing, architectural services, building inspection, and land surveying.

Within the construction industry, housing production falls primarily to residential building construction and specialty trade contractors. Specialty trade contractors, however, service all manner of construction activity, including remodeling and commercial construction, in additional to residential construction. This chapter focuses on the housing and building construction industries, as other industries are relatively small and play specialized roles in the housing production sector. Exhibit 1 details the broad housing production sector as defined for the purposes of this report as well as the narrower definitions used throughout this chapter: "housing construction" where the data allow; otherwise, "building construction."[3]

Residential building construction consists of businesses that build new single-family and multi-family residential structures.[4] These firms oversee all stages of homebuilding, from site preparation and foundation work to roofing, exterior finishing, and interior installations. General contractors and homebuilders are central to the coordination of every phase of a residential construction project, seeking to ensure that homes are completed on time, within budget, and in compliance with local building codes.

[2] Statewide Housing Production Goal: https://www.oregon.gov/gov/eo/eo-23-04.pdf
[3] Later chapters will address the smaller industries and activities (e.g., local government planning and permitting) that are part of the housing production sector.
[4] Residential construction also includes residential remodelers. Wherever possible, residential remodelers (NAICS 236118) are excluded from the analysis as they are not directly involved in housing construction.

Specialty trade contractors include businesses that perform specific tasks, such as electrical work, plumbing, and painting. These contractors often operate as subcontractors under general contractors but may also contract directly with homeowners, especially for smaller renovations and repair work.

The housing production sector also includes manufacturers of pre-assembled homes. Manufactured homes are built in a manufacturing facility and then transported to their destination for final assembly and connection to utilities. Prefabricated wood building manufacturing produces wood sections, panels, and other prefabricated components that are transported to construction sites for final assembly.[5] This approach allows homes to be partially manufactured off-site, contributing to streamlined project timelines and efficient use of resources.

Exhibit 1. NAICS-Based Definitions of Housing Production and Construction

Industry Name (NAICS)	Description	2023 Oregon Employment (1,000s)	Housing Production	Housing Construction	Building Construction
Construction (23)	Building construction, engineering projects, site preparation, and land subdivision.	124.0			
Construction of Buildings (236)	Construction of residential and nonresidential buildings, including new work, additions, alterations, or maintenance and repairs.	34.2			✓
Residential Building Construction (236115-236117)	***Businesses responsible for the entire construction of new single-family or multi-family housing, including for-sale builders.***	***14.0***	✓	✓	
Residential Remodelers (236118)	Businesses remodeling and renovating existing residential buildings.	7.5			
Non-Residential Construction (2362)	Businesses responsible for the construction of nonresidential buildings, such as commercial, industrial, and institutional buildings.	12.8			
Specialty Trade Contractors (238)	***Specialties in plumbing, electrical work, and site preparation, rather than managing whole projects***	***73.2***	✓	✓	✓
Manufactured Home Manufacturing (321991)	*Mobile home manufacturing*	*1.2*	✓		
Prefabricated Wood Building Manufacturing (321992)	*Prefabricated wood buildings and components manufacturing, residential and nonresidential*	*0.3*	✓		
Architectural Services (541310)	*Planning and designing residential, commercial, and industrial buildings/structures*	*3.2*	✓		
Building Inspection (541350)	*Businesses providing building inspection services*	*0.3*	✓		
Land Surveying (541370)	*Surveying and mapping services of the surface of the earth, including the sea floor*	*0.6*	✓		

Source: ECOnorthwest. NAICS = North American Industry Classification System. Note: Housing Production is the broadest definition used in this report. Housing Construction is the focus of this chapter, however, datasets have

[5] These products are used for various purposes, one of which is housing production.

limited industry resolution beyond three-digit NAICS. Thus, where noted, the broader Building Construction or other definitions are used.

Housing Production Sector Profile

In 2023, Oregon's housing production sector employed 92,800 workers, with roughly 73,200 of these workers in specialty trade contractors, 14,000 in residential construction, 1,500 in manufactured homes, and 4,100 in professional services associated with housing production. Exhibit 2 shows employment and pay per employee for the housing production sector, illustrating both the relative size of each industry and wide variation in average payroll across them, particularly between non-residential and residential construction.

Housing production subsectors with average pay per employee that exceeds the statewide average of $64,400 include specialty trade contractors, non-residential (commercial) construction, and architectural services. Average pay per employee in residential construction is approximately $6,000 below the state average and nearly $30,000 below that of non-residential construction.

Exhibit 2. Employment and Payroll by Industry, Oregon, 2023

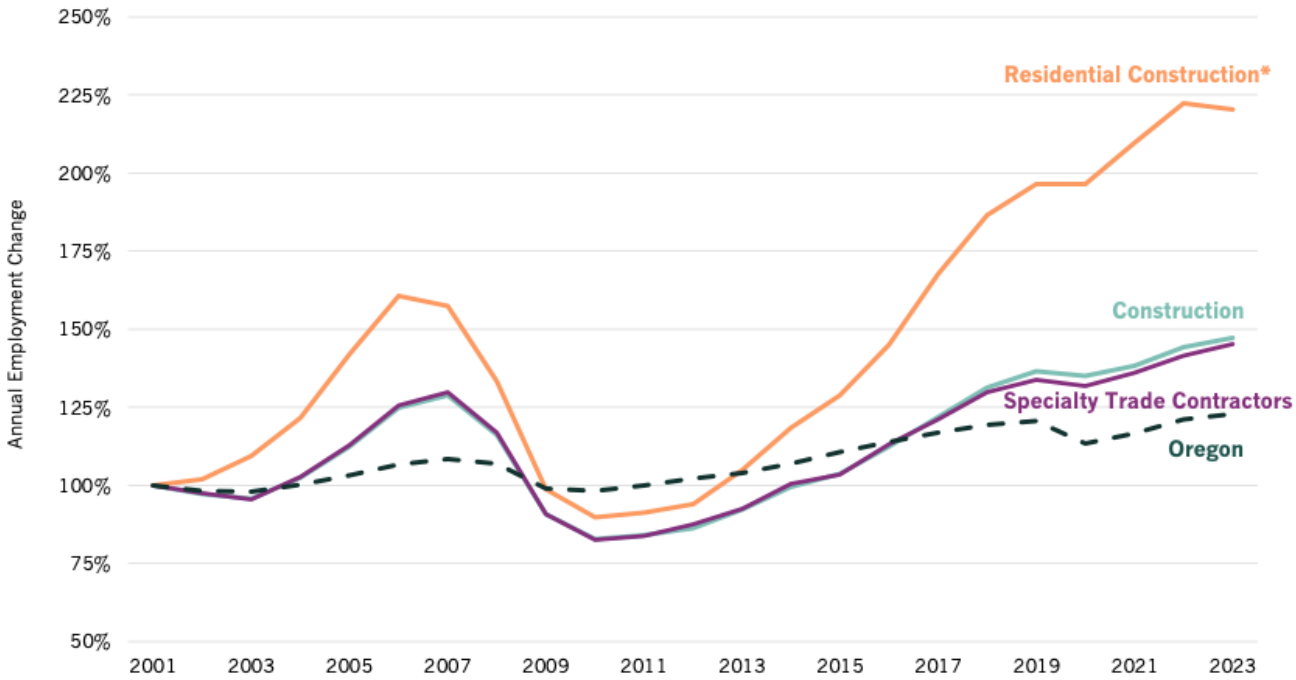
Data source: OED QCEW, 2023

Oregon's construction industry grew steadily out of the recessionary trough over the past decade; annual employment increased by approximately 5 percent annually from 2013 to 2023, compared with Oregon's overall annual employment growth of 2 percent (see Exhibit 3). During the same period, residential construction grew at an average annual rate of 9 percent.[6] The 2008 recession caused a considerable decline in construction employment,

[6] Manufactured home and Prefab wood building manufacturing industries grew by 5.3 and 3.4 percent annually from 2013 to 2023 (not shown in Exhibit 3).

particularly residential. The construction industry recovered to pre-2008 employment levels around 2018.

Exhibit 3. Housing Construction Employment Growth, Oregon, 2001-2023



Data source: OED QCEW, 2001-2023. Note: *Residential construction includes remodelers.

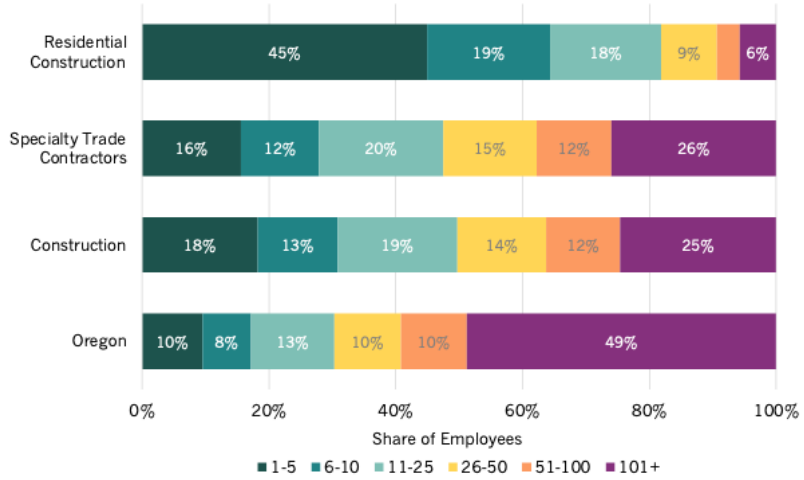
Housing construction firms are relatively small compared to firms in the rest of the construction industry, which, in turn, has more smaller firms than the state's economy overall (see Exhibit 4). Nearly half—45 percent—of residential construction firms have five or fewer employees, compared to 10 percent of all firms in the state.

The industry is of course more concentrated in more-populated regions of the state—more than one third (37 percent) of the state's housing construction employment is in the Portland Metro workforce region. Relative to the size of total employment in each region, housing construction employment is somewhat more concentrated in the Clackamas, Mid-Valley, and East Cascades workforce regions than in the Portland Metro and Lane workforce regions (see Exhibit 5). Industry growth has also varied across Oregon over the past decade, with areas such as Mid-Valley and Rogue Valley experiencing the greatest annual growth (11 percent).

Exhibit 6 illustrates the variation in housing construction wages across the state. The Portland Metro region has the highest payroll per employee—$75,900 for residential construction and $90,800 for specialty trade contractors—well above the statewide average. The Clackamas region also has relatively high pay per employee, particularly for specialty trade contractors, while the East Cascades region falls at about the statewide average for both industries. Most of the other regions of the state have much lower housing construction

wages. These differentials have important implications for each region's ability to attract the workforce necessary to reach ambitious housing production goals.

Exhibit 4. Industry Employment by Firm Size, Oregon



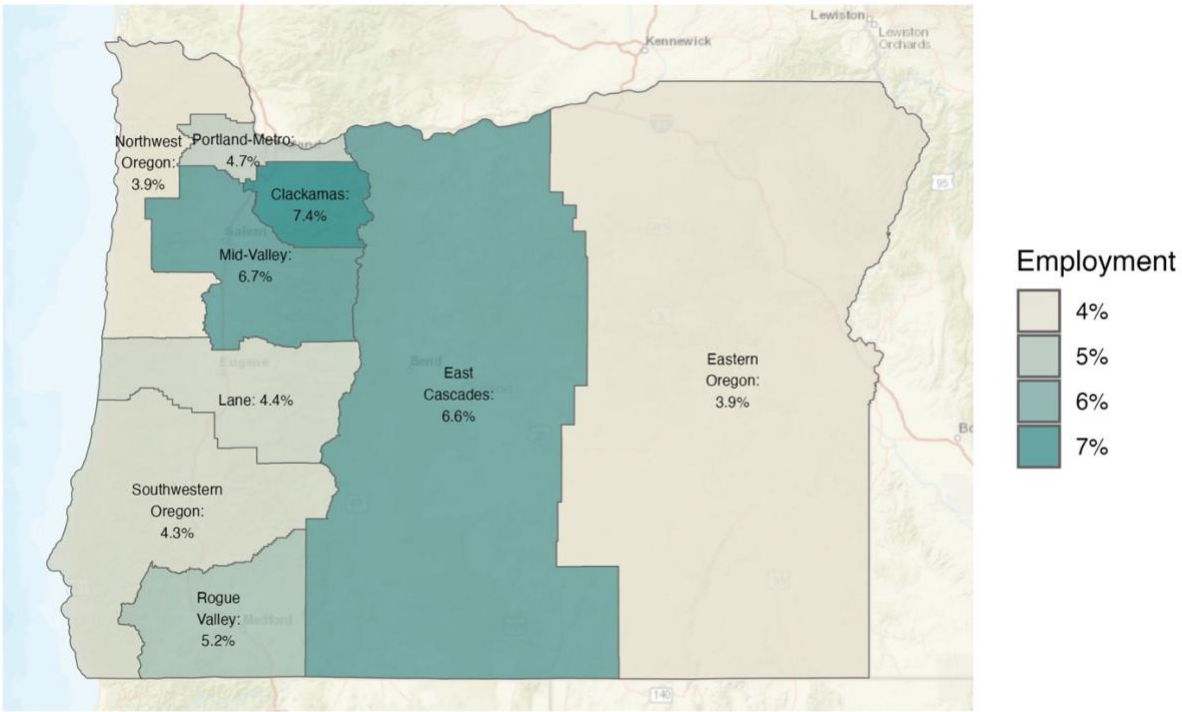
Data source: OED QCEW Data, 2023. Note: Residential construction excludes remodelers.

BUSINESS SIZE BY REGION

Average business size varies by region, with firms in the Portland area having two to three times as many employees than do firms in less populated regions of the state.

Region	Residential Construction	Specialty Contractors
Clackamas Area	5	13
East Cascades Area	10	15
Eastern Oregon Area	4	6
Lane Area	3	12
Northwest Oregon Area	5	6
Rogue Valley Area	4	8
Southwestern Oregon Area	3	7
Mid-Valley Area	4	12
Portland-Metro Area	8	26
Oregon	**6**	**15**

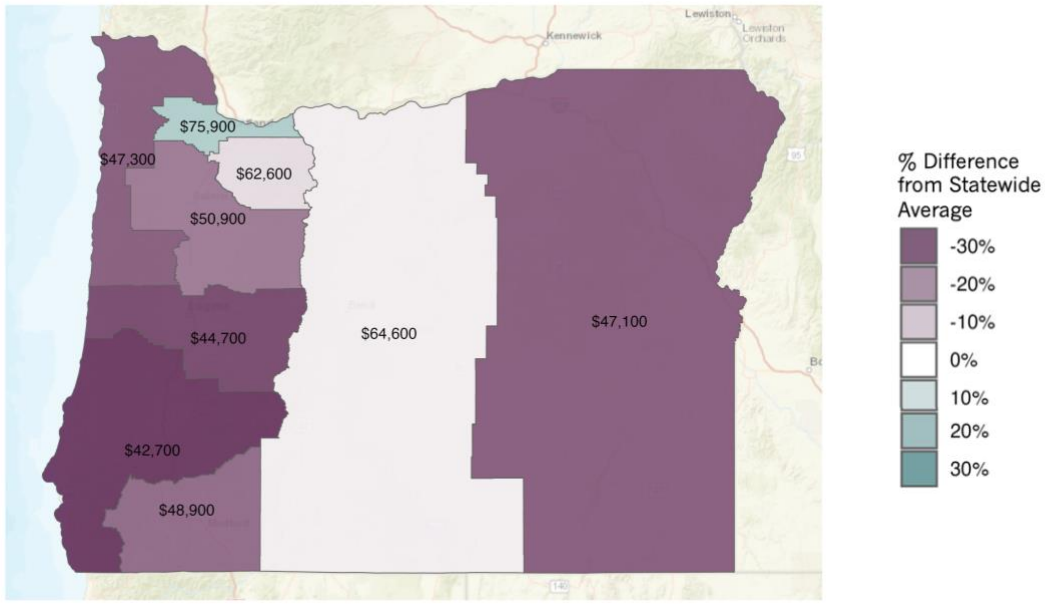
Exhibit 5. Housing Construction Employment as a Share of Total Employment



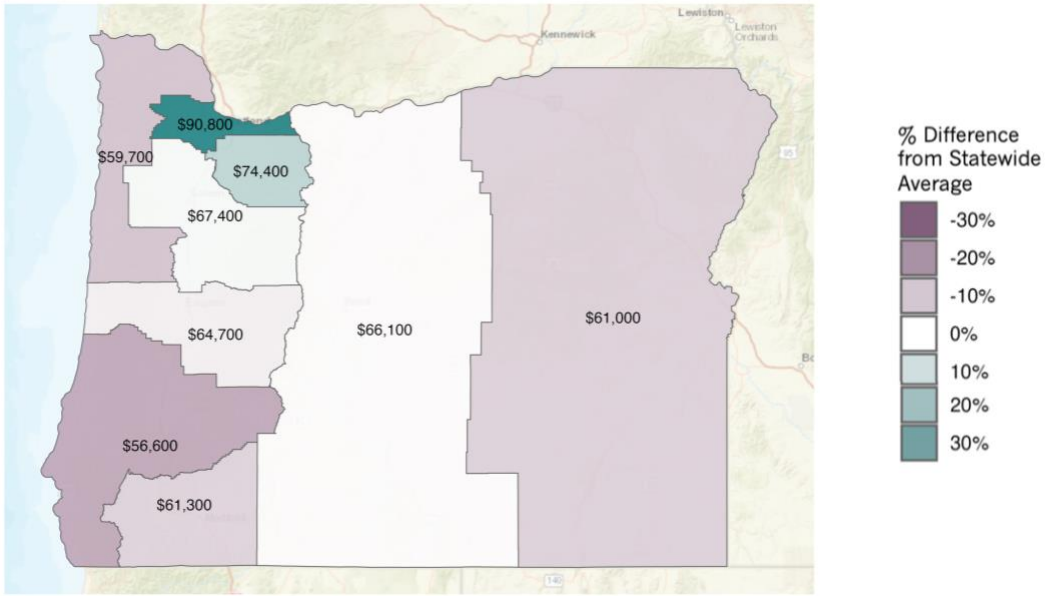
Data sources: OED QCEW Data, 2023

Exhibit 6. Regional Variation in Payroll Per Employee

Residential Building Construction



Specialty Trade Contractors



Data sources: OED QCEW Data, 2023; OED, County Workforce and Economic Research.

Housing Construction Occupations

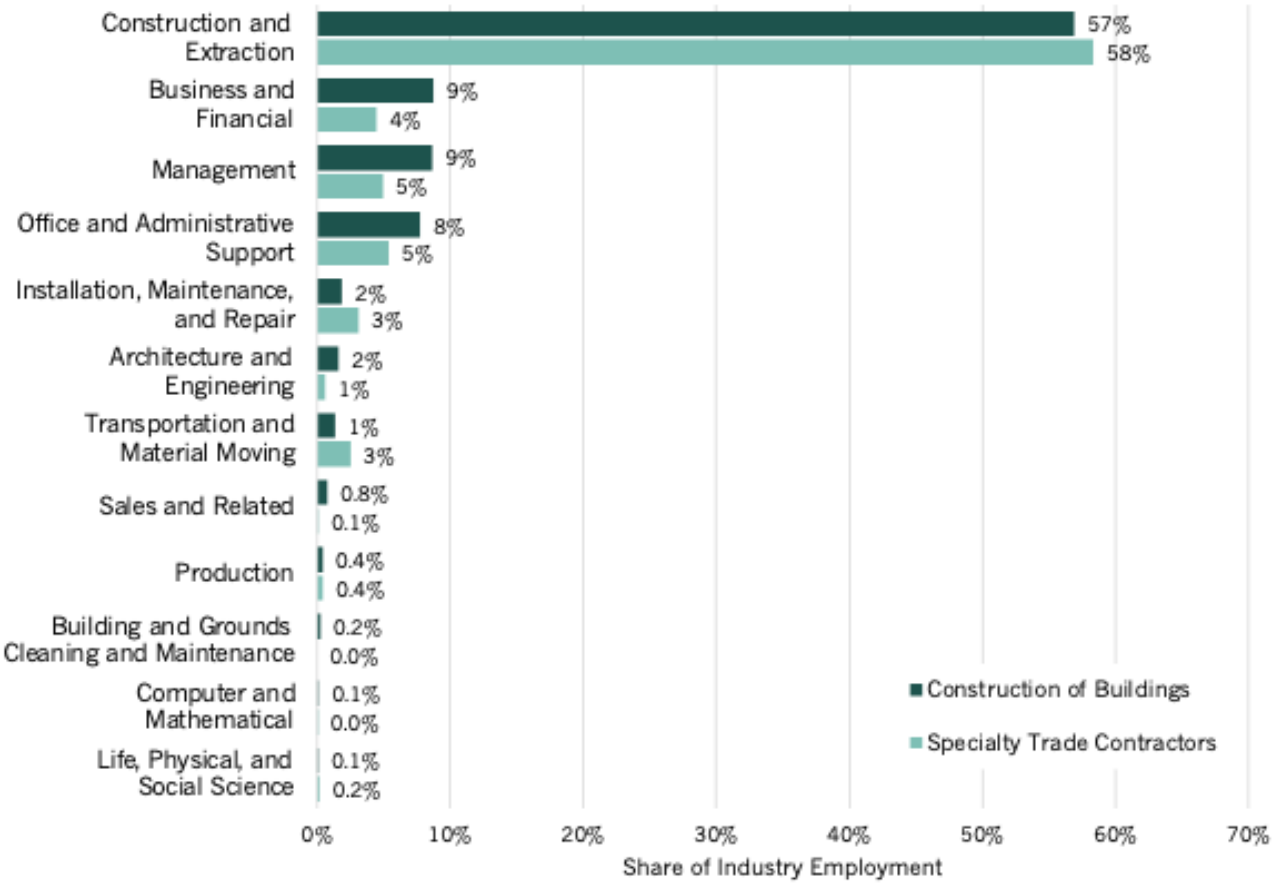
The housing construction workforce relies on well over 100 occupations spanning a wide range of skill sets but is highly concentrated in construction-specific occupations (see Exhibit 7).[7] The exhibit displays aggregate employment shares by occupational group in the building construction industry. The majority (almost 60 percent) of workers in these industries are in construction occupations, such as carpenters, laborers, and electricians.

[7] Oregon Employment Department, *Industry-Occupation Matrix Data, Oregon, Industries 236, 238*. 2022.

Business, management, and administrative support occupations each account for between 5 and 10 percent of employment, with other occupational groups accounting for much smaller shares of employment.

Due to confidentiality constraints the displayed occupational groups account for only 89 percent of employment in building construction and 80 percent of employment in specialty trade contractors, although unredacted national data leads to similar conclusions. Construction and extraction and management occupations account for the largest shares of the nation's building construction industry employment (54 and 14 percent, respectively).[8]

Exhibit 7. Share of Building Construction Employment by Occupational Group, Oregon



Data source: Oregon Employment Department, 2022

Over the past few decades, the share of the overall construction workforce directly involved in building activities has declined, both in the U.S. and in Oregon, while the proportion of management and overhead roles has increased.[9] As measured by the share of the industry's employment within an occupational group in the U.S., management occupations increased from roughly 10 percent to close to 20 percent of industry employment, while the

[8] U.S. Bureau of Labor Statistics. *Employment Projections: Industry-Occupation Matrix Data, Construction of Buildings (NAICS 236000).* 2023. https://data.bls.gov/projections/nationalMatrix?queryParams=236000&ioType=i

[9] Construction is represented by NAICS 23. Due to U.S. Census Bureau industry classifications, no further disaggregation of the construction industry is possible.

construction occupational group share declined from roughly 70 percent to below 60 percent between 2000 and 2020.[10] In the Oregon construction industry, the share of construction occupations declined by about 4 percentage points while the management share increased by the same amount between 2018 and 2023.[11]

These trends may present headwinds as the state seeks to ramp up housing production in the coming years. Possible explanations include changes in industry consolidation, outsourcing to subcontractors or temporary workers, shifts in project types, and increased regulatory demands.[12] These factors may contribute to a lack of productivity gains and a growing gap between payroll jobs and self-employment, complicating workforce analysis in the construction sector.

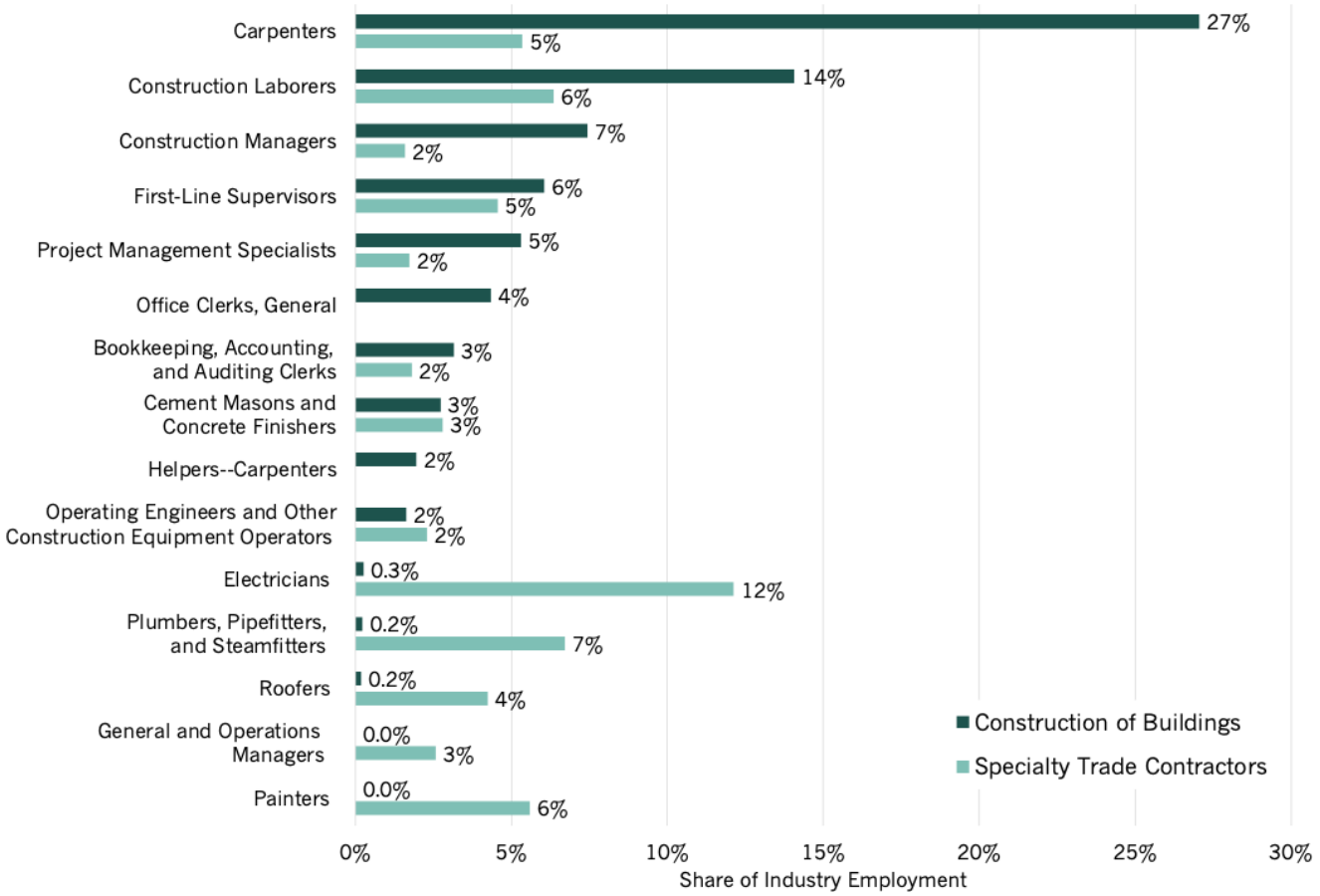
Based on the industry employment shares within occupations and input from HECC and other stakeholders, we identified 28 occupations as key to the industry, due either to prevalence in the industry or importance of role to housing. Employment in these occupations accounts for 80 percent of construction of buildings, 73 percent of residential construction, and 66 percent of specialty trade contractors (see Appendix for details):

- Accountants and auditors
- Administrative assistants
- Bookkeeping, accounting, and auditing clerks
- Carpenters
- Cement masons and concrete finishers
- Civil engineers
- Construction and building inspectors
- Construction laborers
- Construction managers
- Cost estimators
- Drywall and ceiling tile installers
- Electricians
- First-line supervisors of construction workers
- General managers
- Glaziers
- Heating, air conditioning, refrigeration installers
- Heavy and tractor-trailer truck drivers
- Insulation workers
- Maintenance and repair workers
- Office clerks, general
- Operating engineers and construction equipment operators
- Painters, construction and maintenance
- Plumbers, pipefitters, and steamfitters
- Project management specialists
- Roofers
- Sheet metal workers
- Surveyors
- Tile and stone setters

[10] Oregon Office of Economic Analysis. *Addressing Oregon's Housing Shortage: Examining Supply and Affordability Challenges.* September 2022. https://oregoneconomicanalysis.com/wp-content/uploads/2022/09/addressing-oregons-housing-shortage.pdf
[11] U.S. Census Bureau, *American Community Survey 1-year Estimates.* 2018-2023.
[12] Oregon Office of Economic Analysis. *Addressing Oregon's Housing Shortage: Examining Supply and Affordability Challenges.* September 2022. https://oregoneconomicanalysis.com/wp-content/uploads/2022/09/addressing-oregons-housing-shortage.pdf

From this list, Exhibit 8 presents the 15 most common occupations in the construction of buildings industry and among specialty trade contractors. Together, these occupations account for 74 percent of construction of buildings employment and 58 percent of specialty trade contractor employment. Carpenters account for the largest share of employment in construction of buildings in Oregon, representing 27 percent of industry employment.[13] Construction laborers and electricians are also heavily concentrated in one or both of these industries.[14] Similarly, plumbers, pipelayers, and steamfitters, as well as roofers, have a stronger presence in specialty trade contractors, accounting for 7 and 4 percent, respectively.

Exhibit 8. Share of Building Construction Employment by Top Occupations, Oregon



Data source: Oregon Employment Department, 2022

Exhibit 9 displays the U.S. share of employment in the residential construction and specialty trade contractors industries and the share of each occupation working within those industries for the top ten most prevalent occupations.[15] The figure illustrates the

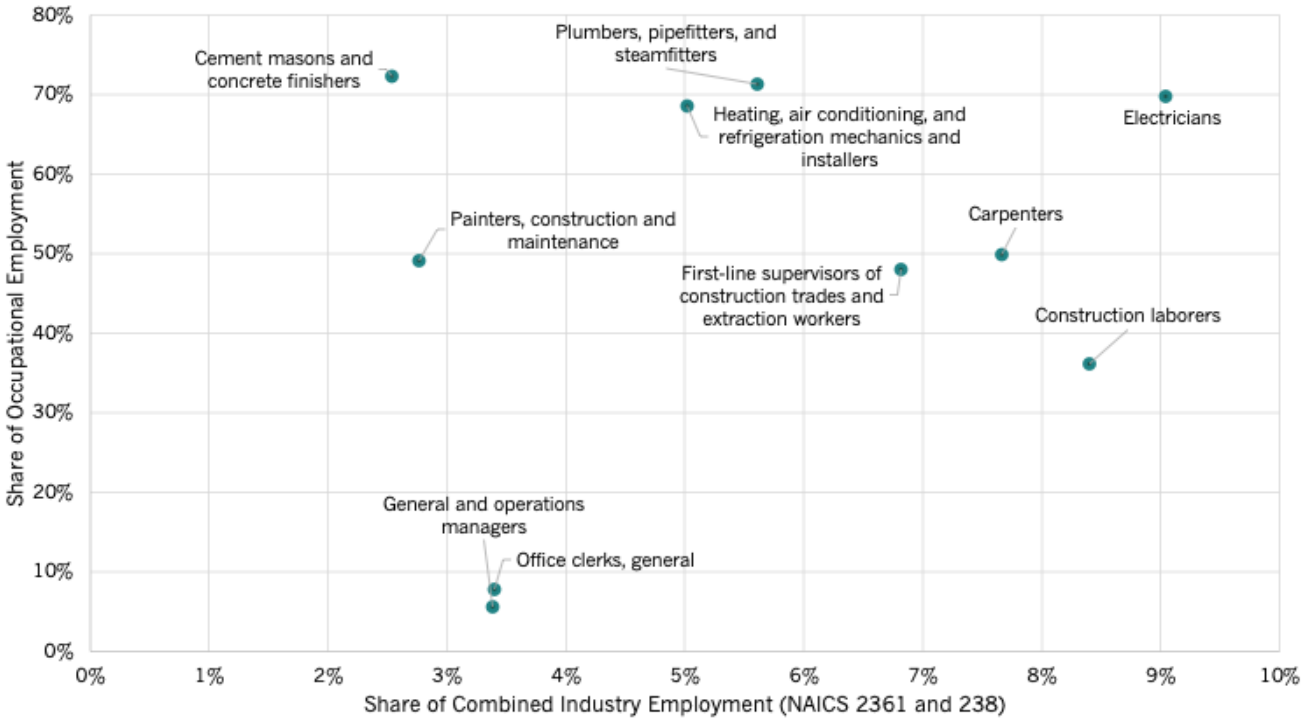
[13] In the residential building construction industry (NAICS code 2361), carpenters make up 31 percent of employment. The Oregon Employment Department cannot report the full breakdown of occupations within the residential construction industry due to confidentiality constraints.

[14] At the national level, electricians make up roughly one percent of the construction of buildings industry, as reported by the Bureau of Labor Statistics.

[15] Oregon's distribution of occupations within the housing construction industries is similar to the distribution seen at the national level. The Bureau of Labor Statistics publishes the national distribution and faces fewer

important point that some occupations are more important, in terms of numbers, to the construction industry than the construction industry is to an occupation. For example, electricians are the most common occupation in the national housing construction industry, and about 70 percent of electricians are employed in the industry. General and Operations managers, although less common in housing construction, are still among the ten most common occupations, but well under 10 percent of the occupation is employed in housing construction. These differences are important considerations in assessing the capacity of the state's training capacity and options for improving the state's training pathways to best support the industry.

Exhibit 9. Share of Occupational Employment in Housing Construction Industry vs. Industry Employment for Top Occupations, U.S.



Data source: BLS, 2023. Note: Housing construction industry includes residential remodelers.

To provide a sense of scale, Exhibit 10 provides an employment summary for the most common housing construction occupations and occupational groups within the building construction industry. It includes total occupational employment in 2023 and the share of each occupation's/group's total employment that occurs within the construction of buildings and specialty trade contractors industries. Skilled trades such as electricians and plumbers exhibit the highest concentration within these industries, with 77 and 81 percent of their respective employment tied to building construction. Carpenters and first-line supervisors of construction workers also show strong representation (65 and 63 percent,

confidentiality issues. Cross-referencing Oregon-specific data with U.S. data provides a more-detailed understanding of the industry. This comparison allows for a focus specifically on the residential construction industry (NAICS 2361) rather than the broader construction of buildings industry (NAICS 236). Additionally, it incorporates more up-to-date data from 2023 instead of 2022.

respectively). In contrast, broader occupational groups are much less concentrated in construction-related industries.

Exhibit 10. Employment in Top Housing Construction Occupations and Occupational Groups, Oregon

OCCUPATION/GROUP	BUILDING CONSTRUCTION EMPLOYMENT	SHARE OF TOTAL OCCUPATIONAL EMPLOYMENT
Carpenters	14,980	65%
Construction laborers	13,090	50%
First-line supervisors of construction workers	10,160	63%
Electricians	9,260	77%
Plumbers, pipefitters, and steamfitters	4,830	81%
Construction and Extraction Occupations	75,854	63%
Office and Administrative Support Occupations	168,500	4%
Management Occupations	107,540	6%
Business and Financial Occupations	87,490	8%
Installation, Maintenance, and Repair Occupations	38,640	7%

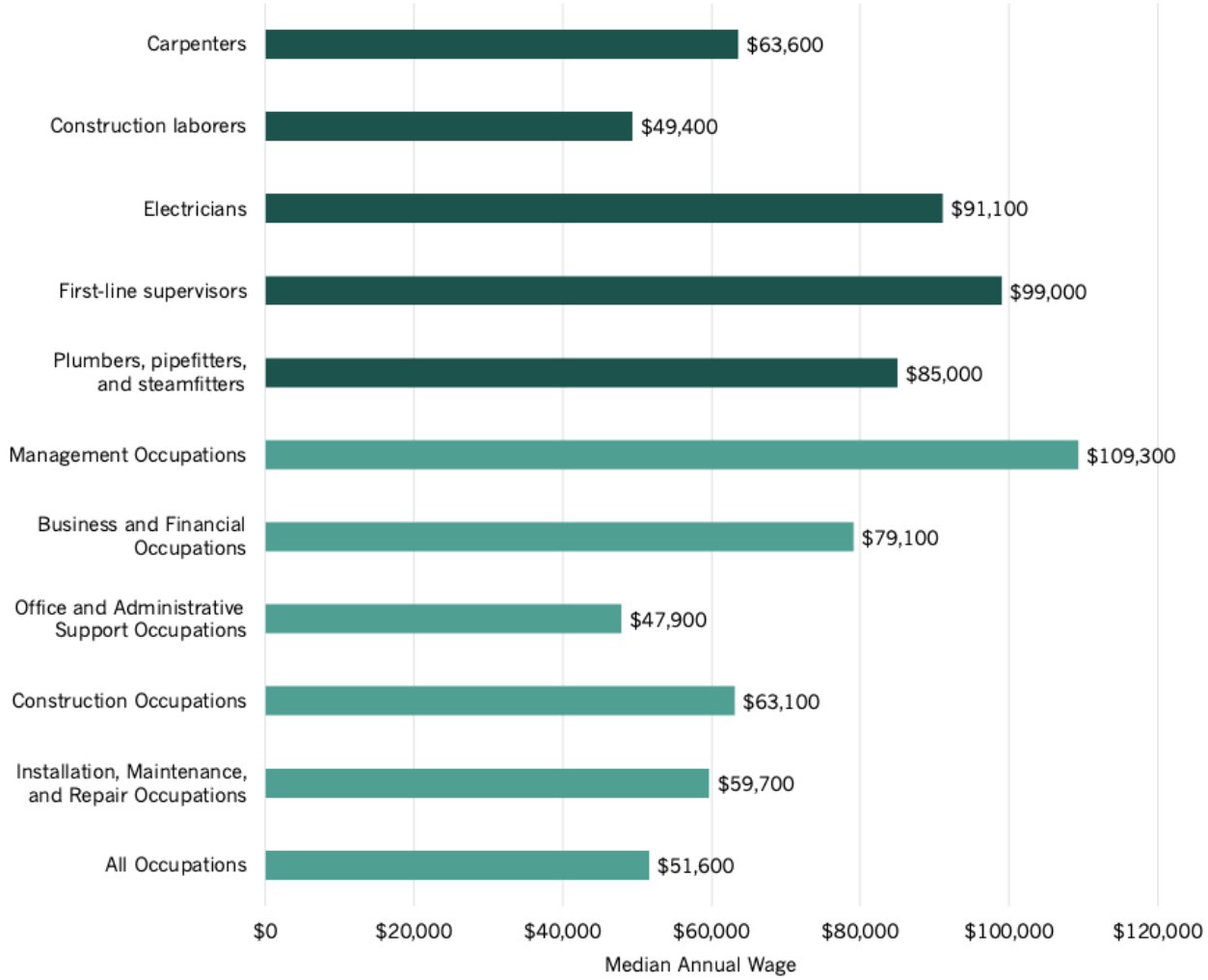
Data source: Oregon Employment Department, 2023 (employment) and 2022 (shares). Note: Occupational group employment totals do not represent the entire group, rather, they represent employment within specific occupations relevant to housing construction. For instance, "management occupations" includes roles such as construction managers, financial managers, and other managerial positions specifically associated with housing construction industries.

Occupational Wages in the Housing Construction Industry

In Oregon, the median wage for construction occupations is $63,100, versus the overall statewide median wage of $51,600 (see Exhibit 11). In the top housing construction occupations, first-line supervisors, electricians, and plumbers earn significantly more than the median wage for all construction occupations, indicating specialized and skill-intensive work conducted by these workers. Carpenters earn closer to the median wage for all construction occupations while construction laborers earn less than even the statewide median wage for all occupations.

At the occupational group level, management and business and financial occupations have the highest median wages, between 1.5 and 2 times higher than the statewide median wage. Installation, maintenance, and repair occupations earn slightly above the statewide median, while office and administrative occupations earn below.

Exhibit 11. Median Wages for Top Housing Construction Occupations and Occupational Groups, Oregon

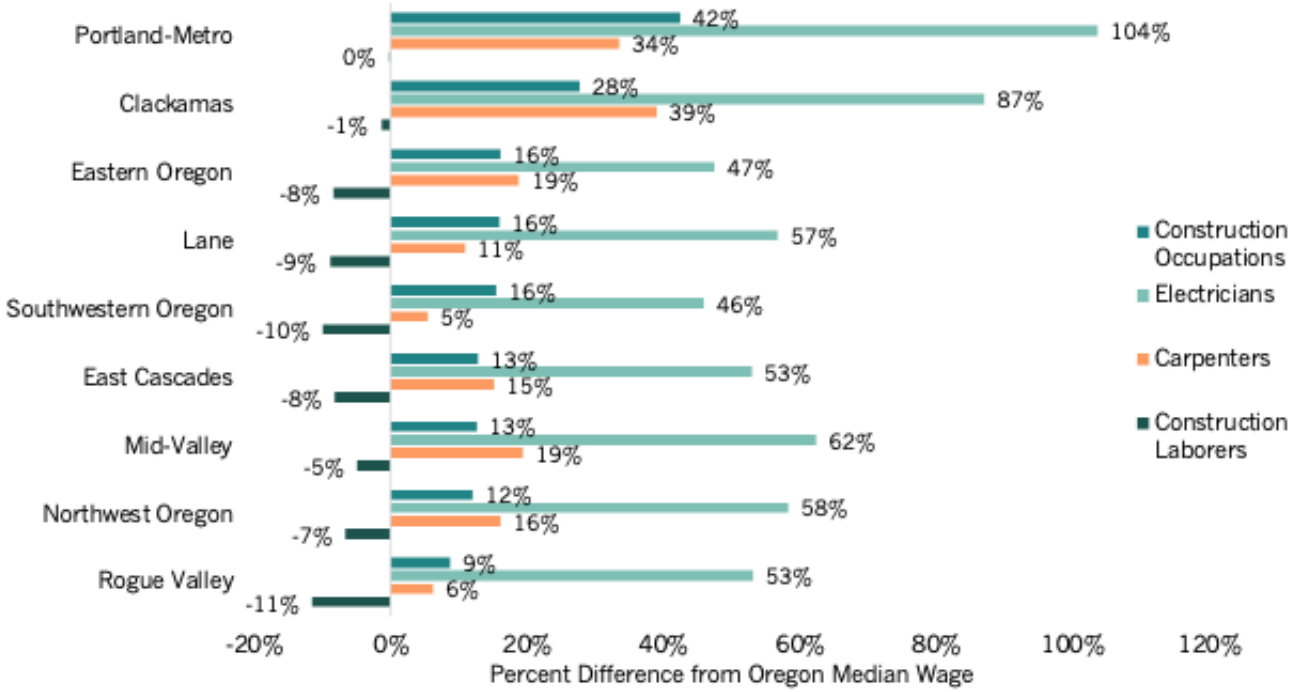


Data source: Oregon Employment Department, 2024. Note: Median wages are for occupations and occupational groups across all industries.

Comparing wages to the statewide median wage highlights occupation-specific and geographical differences (see Exhibit 12). As is shown in Exhibit 6, significant variation exists in residential construction and specialty trade contractor wages across Oregon.

Construction occupations as a whole consistently exceed the state median wage in all workforce regions, with the largest differences in the Portland-Metro (42 percent) and Clackamas (28 percent) regions. Electricians show relatively large wage differentials, with their wages exceeding the median by 46 to 104 percent depending on the region. Carpenters demonstrate significant regional variability, with their wages surpassing the median by as much as 39 percent in the Clackamas region. Construction laborers tend to earn below the statewide median wage, with the largest differential in the Rogue Valley region, where construction laborers earn 11 percent less than the median wage.

Exhibit 12. Workforce Board Regional Wage Differentials in Housing Construction Occupations, Oregon

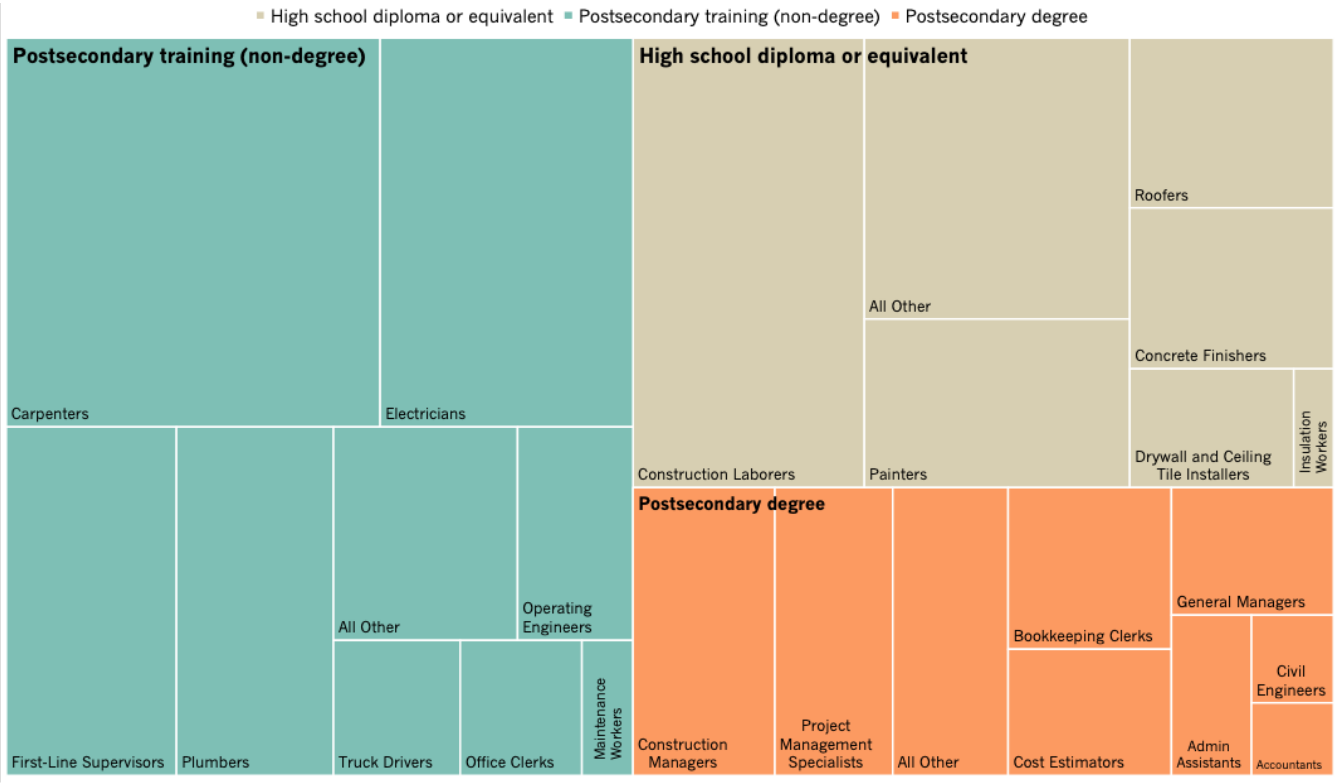


Data source: Oregon Employment Department, 2024. Note: Construction Occupations is the construction occupational group. Regions are ordered by the median wage of construction occupations.

Occupational Education Requirements

Exhibit 13 illustrates the competitive educational levels for the 28 selected and all other known housing construction occupations. Less-specialized housing construction occupations have the lowest educational attainment requirements and make up 27 percent of Oregon's housing construction employment, including construction laborers (9 percent of industry employment), painters (4 percent), and roofers (3 percent). Close to 40 percent of industry employment has a competitive education of postsecondary training (non-degree), including apprenticeship training, certificates, and licenses. This education level is critical for skilled trades like carpenters (12 percent), electricians (8 percent), and plumbers (5 percent). Supervisory and technical positions, such as first-line supervisors (5 percent) and operating engineers (2 percent), also benefit from this level of training. This analysis suggests that 67 percent of housing construction employment is in occupations that require high school or postsecondary (non-degree) training, whereas 58 percent of employment across all Oregon industries has similar requirements. In short, employment in the housing construction industry is less reliant on lengthy postsecondary pathways, such as bachelor's or master's degrees, than the economy as a whole.

Exhibit 13. Competitive Education Level for Housing Construction Occupations, Oregon



Data source: Oregon Employment Department, 2023. Note: The size of each rectangle corresponds to the occupation's share of industry employment (construction of buildings and specialty trade contractors industries). Some occupations are missing due to suppressed employment information.

Housing Construction Workforce Characteristics

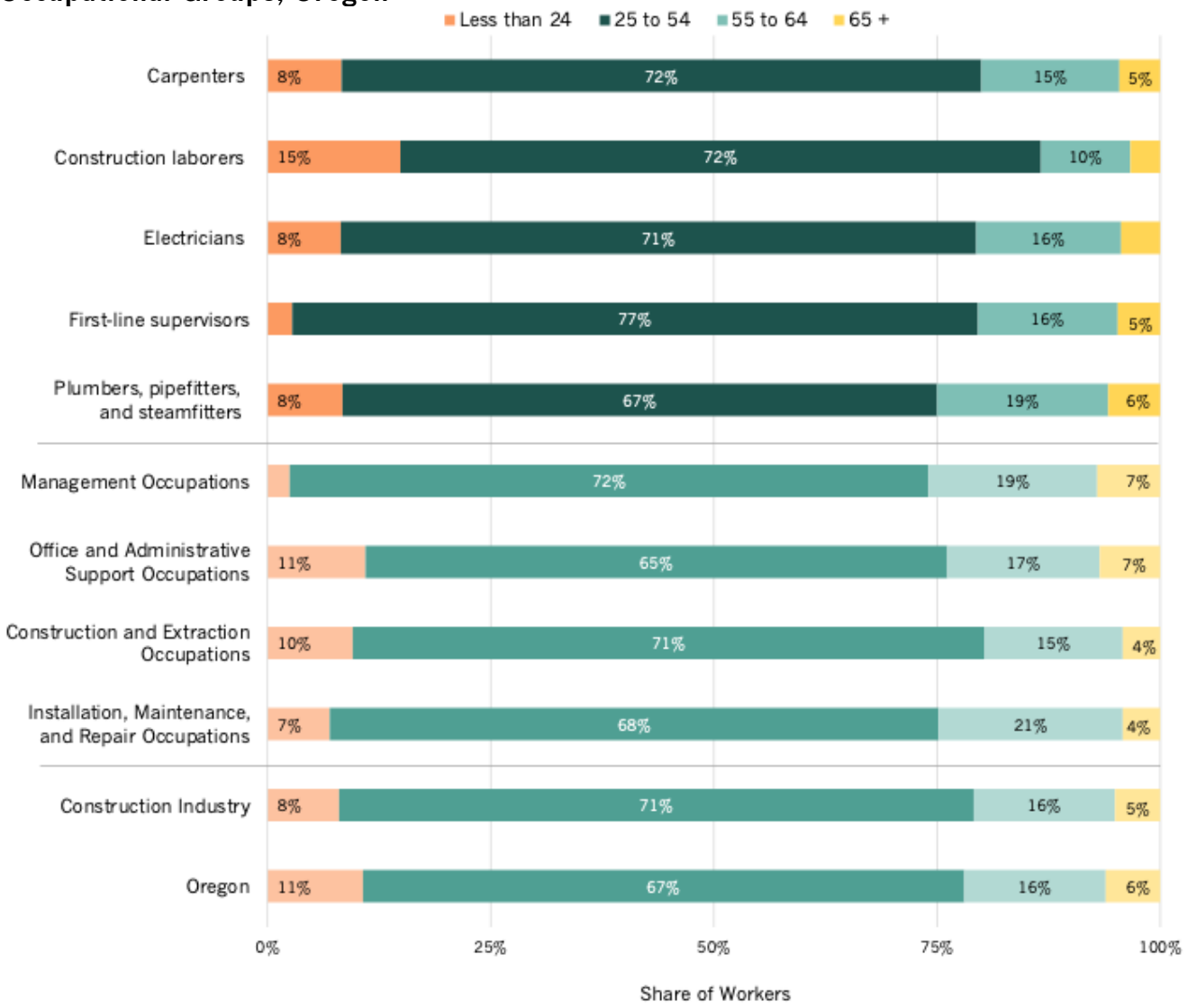
The housing construction industry is host to many disparities related to race, ethnicity, gender, and wages. These inequities reflect broader systemic challenges and historical patterns—of exclusion, occupational segregation, and uneven access to training and resources—and highlight the need for targeted interventions to build a more inclusive and equitable construction workforce. Workers from diverse racial and ethnic backgrounds are present in many roles, but systemic barriers often limit their access to or advancement in higher paying positions. Similarly, gender inequities are pronounced, with women underrepresented across most occupations, particularly in skilled trades. This section explores these dynamics.

Workforce Demographics

The age distribution of the construction workforce reflects distinct patterns across different roles (see Exhibit 14). Younger workers, those under 24, often work in entry-level positions; they make up a slightly larger share of construction laborers compared to their representation in Oregon's overall workforce (15 percent compared to 11 percent). Other occupations and groups (e.g., plumbers and management roles, installation) have slightly higher-than-average shares of employees aged 55 and above. Overall, the construction

industry will face the challenges presented by an aging workforce similar to those in other industries.

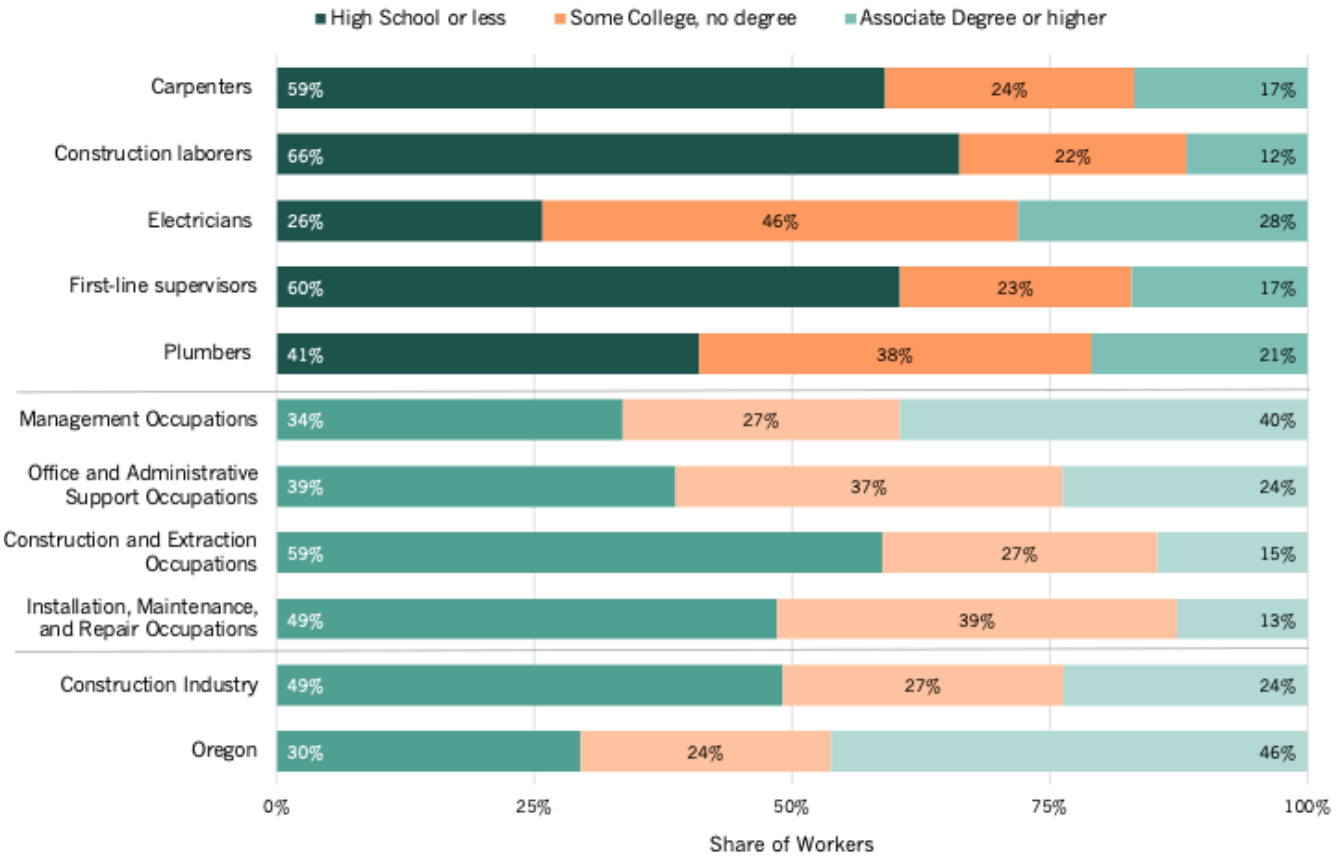
Exhibit 14. Age Distribution of Workers in Housing Construction Occupations and Occupational Groups, Oregon



Data source: U.S. Census Bureau (2022) American Community Survey, 5-year Estimates. Note: Shares for occupations are across all industries; shares for occupational groups are within the construction industry.

Educational attainment levels among workers in top housing construction occupations illustrate workforce specialization (see Exhibit 15). More than half (59 percent) of employees in construction and extraction occupations have a high school diploma or equivalent. In contrast, 40 percent of workers in management roles hold postsecondary degrees. Many workers in specialized trades attend some college or technical programs (e.g., 46 percent of electricians and 38 percent of plumbers). This trend underscores the importance of trade-specific training and certifications for many roles, even as the sector increasingly relies on technical expertise in management positions.

Exhibit 15. Educational Attainment of Workers in Housing Construction Occupations and Occupational Groups, Oregon



Data source: U.S. Census Bureau (2022) American Community Survey, 5-year Estimates. Note: Shares for occupations are across all industries; shares for occupational groups are within the construction industry.

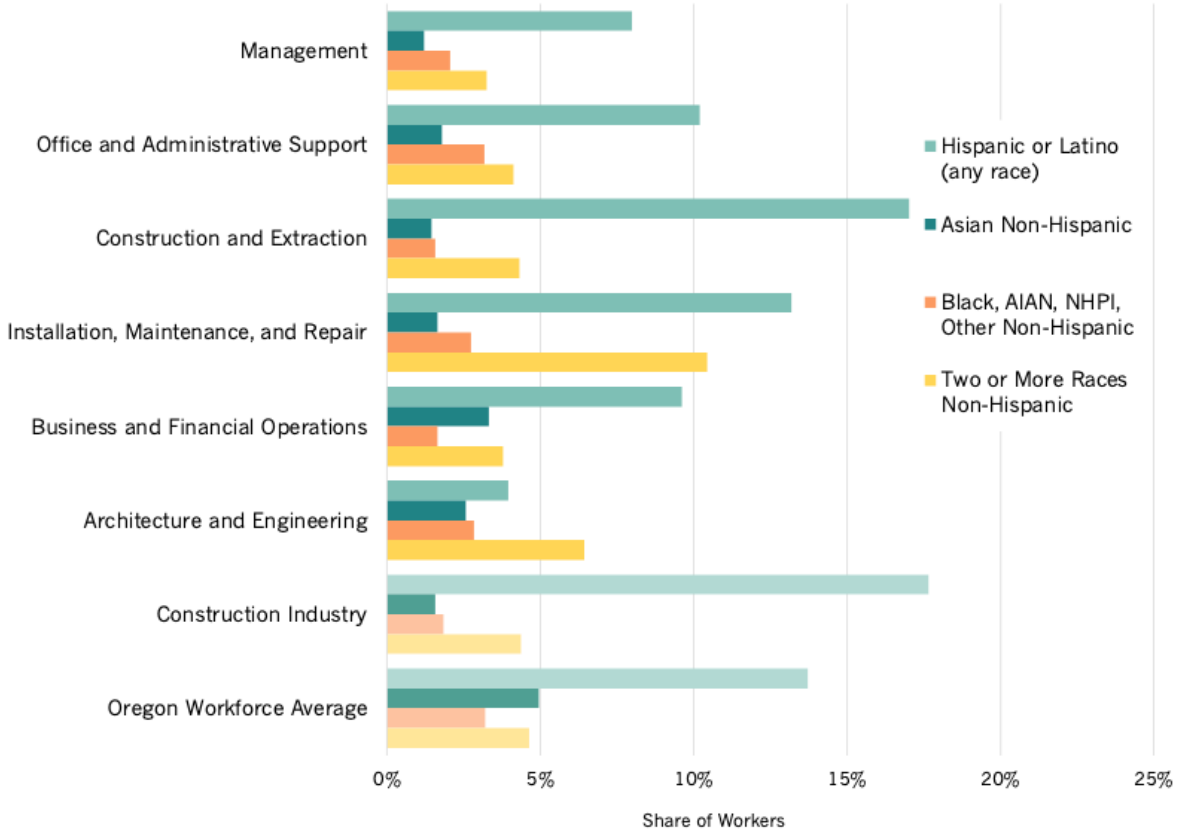
Exhibit 16 displays the share of housing construction occupational groups that are Hispanic or Latino (any race); Asian Non-Hispanic; Black, American Indian and Alaska Native (AIAN), Native Hawaiian and Other Pacific Islander (NHPI), or Other Non-Hispanic; and Two or More Races Non-Hispanic. The chart also includes shares for the construction industry and the overall Oregon workforce.[16] The composition of the construction industry in Oregon differs from the overall workforce, in that Hispanic or Latino workers make up a larger share of the workforce and workers that identify as Asian, Black, AIAN, or NHPI account for a smaller share.[17] Hispanic or Latino workers represent 18 percent of the construction industry workforce compared to 14 percent in the overall Oregon workforce.

Across occupational groups, Hispanic or Latino workers represent a higher share of construction and installation, maintenance, and repair occupations, with employment shares of 24 percent and 13 percent respectively. Management and business and financial

[16] The U.S. Census Bureau American Community Survey publishes worker demographics only for the overall construction industry (NAICS 23), which is used for this analysis.
[17] In subsequent exhibits these races/ethnicities are grouped together as BIPOC to increase data reliability. These groupings all non-Hispanic.

occupations have the lowest shares of Black, Indigenous, and People of Color (BIPOC) workers, 14 percent and 20 percent, respectively.

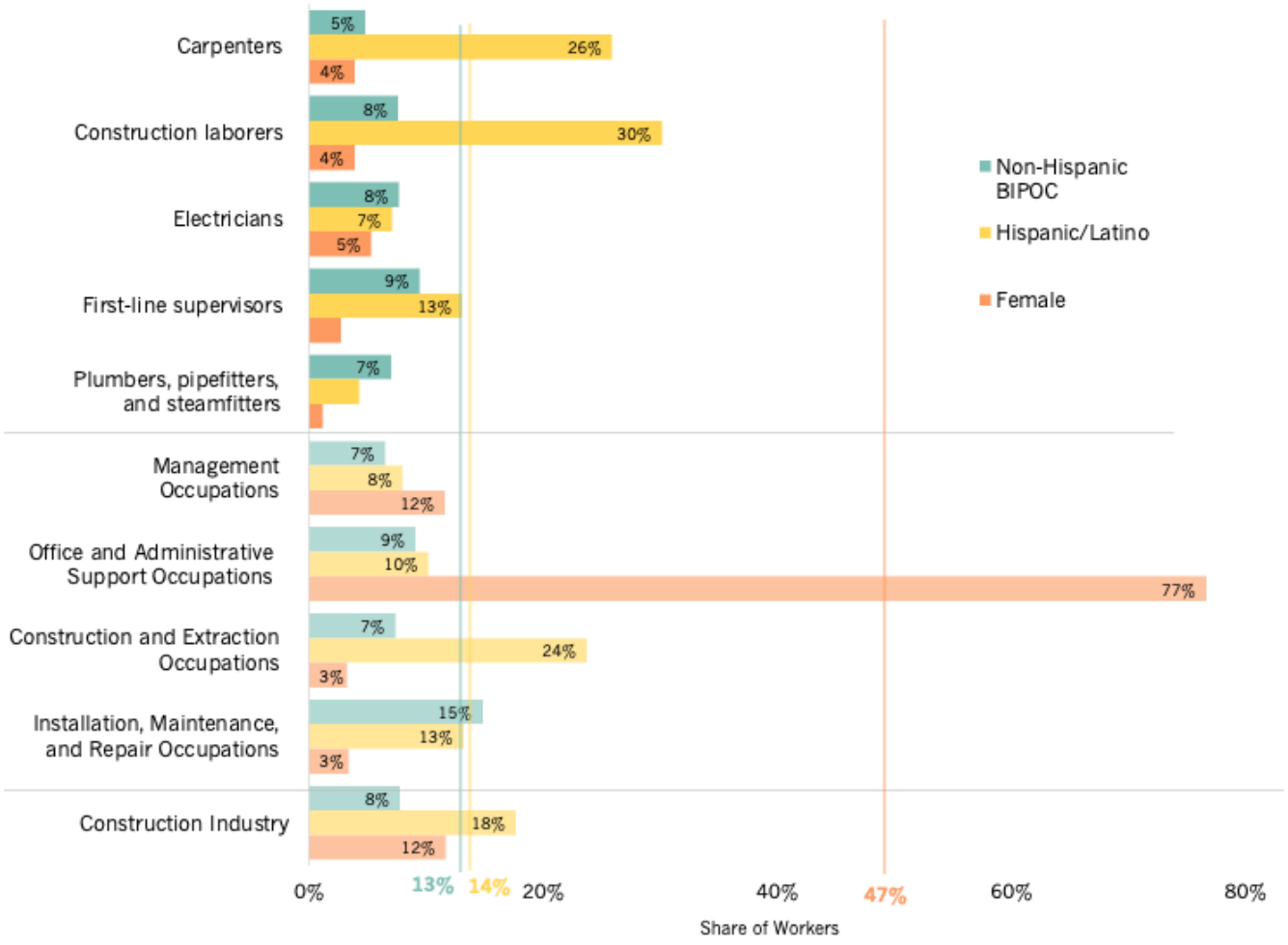
Exhibit 16. Race/Ethnicity of Workers in Occupational Groups in the Construction Industry, Oregon



Data source: U.S. Census Bureau (2022) American Community Survey, 5-year Estimates. AIAN = American Note: Indian and Alaska Native, NHPI = Native Hawaiian and Other Pacific Islander. Shares are calculated within the construction industry.

Exhibit 17 elaborates on this, showing that occupations such as carpenters and construction laborers consist of 26 percent and 30 percent Hispanic/Latino workers respectively, versus the Oregon workforce average of 14 percent. In contrast to racial and ethnic diversity, the housing construction workforce is much less diverse with respect to gender than the overall workforce. As shown in Exhibit 15, female workers represent a relatively small proportion of the workforce (12 percent compared to 47 percent in the overall Oregon workforce). In construction labor roles, women represent approximately 4 percent of the workforce, while in administrative support occupations, their representation is 77 percent.

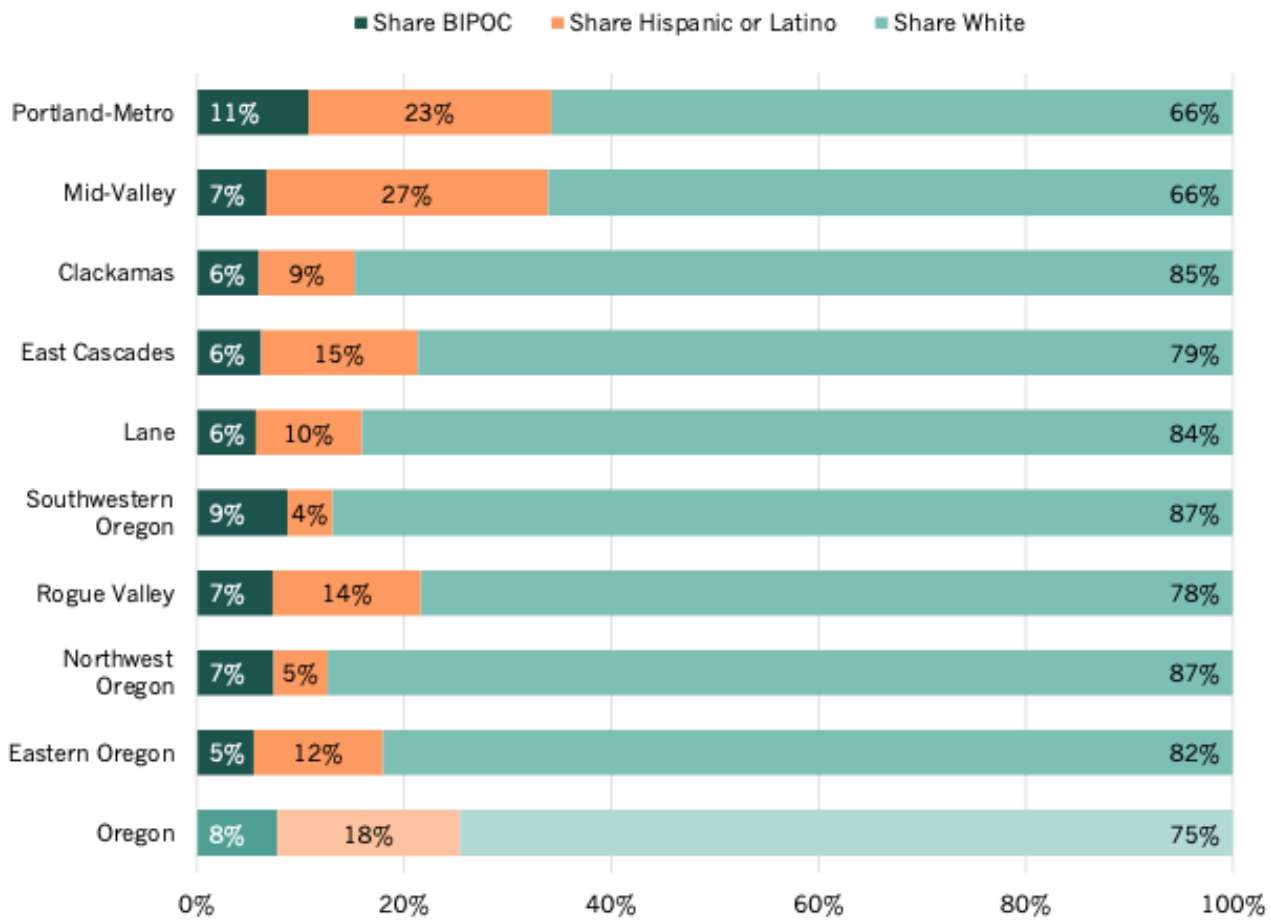
Exhibit 17. Demographics of Workers in Housing Construction Occupations and Occupational Groups, Oregon



Data source: U.S. Census Bureau (2022) American Community Survey, 5-year Estimates. Note: Shares for occupations are across all industries; shares for occupational groups are within the construction industry. Vertical lines represent statewide shares.

The proportion of BIPOC and Hispanic workers varies widely by region, reflecting local demographic and economic conditions (see Exhibit 18). Less-populated regions such as Southwestern and Northwest Oregon have lower proportions of BIPOC and Hispanic or Latino workers than do more densely populated areas such as the Portland Metro or Mid-Valley areas. These regional disparities suggest the need to tailor workforce diversity initiatives to local conditions to support diversity goals while allowing the state to meet housing production goals.

Exhibit 18. Race/Ethnicity of Workers in the Construction Industry, by Workforce Region



Data sources: U.S. Census Bureau (2022) American Community Survey, 5-year Estimates. Note: Shares are calculated within the construction industry (NAICS 23).

Wages by Demographic

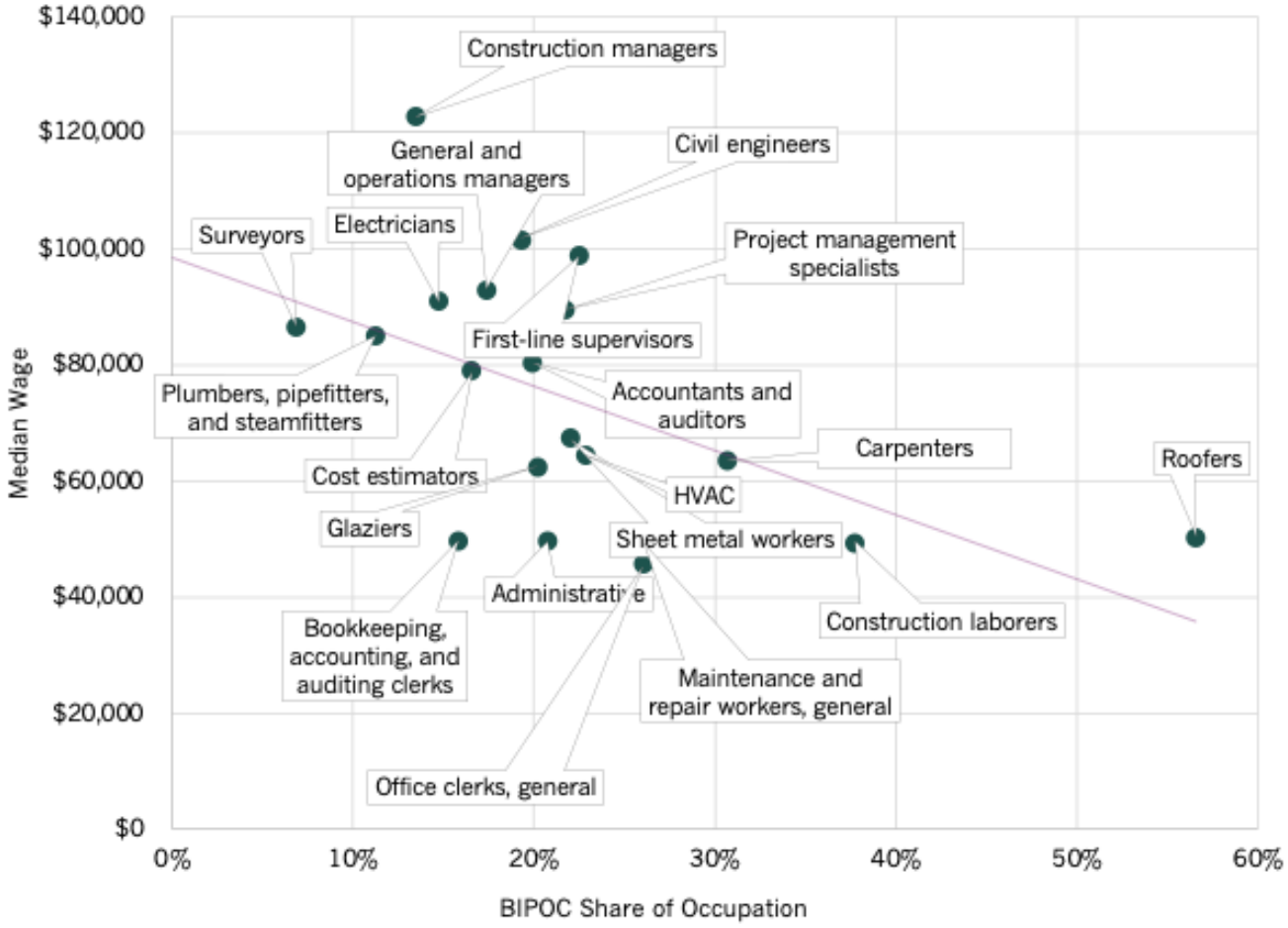
Examining wages by race and gender is critical to understanding systemic inequities within the housing construction industry. Wage disparities can reveal how structural barriers, access to opportunities, and occupational segregation affect workers' economic outcomes. Highlighting these differences helps identify areas where targeted interventions can promote equity across the industry.

Exhibit 19 displays the median wage for selected housing construction occupations versus the share of workers within each occupation that identify as BIPOC. The trendline shows that lower-wage occupations typically correspond with a higher prevalence of BIPOC workers. Certain roles, such as roofers and construction laborers, exhibit a high concentration of BIPOC workers, with proportions of 57 and 38 percent, respectively. Median wages in these roles are about $50,000, close to Oregon's median wage of $51,600.[18] In contrast, occupations that generally require higher levels of educational attainment, technical skills, or managerial responsibilities tend to have lower BIPOC representation, often below 20

[18] Oregon Employment Department. "Oregon Wage Information." 2024. https://www.qualityinfo.org/data/

percent (e.g., construction managers and civil engineers). Median wages in these roles are above $100,000, nearly double the state median wage.

Exhibit 19. Median Wage vs. BIPOC Share of Workers in Housing Construction Occupations, Oregon

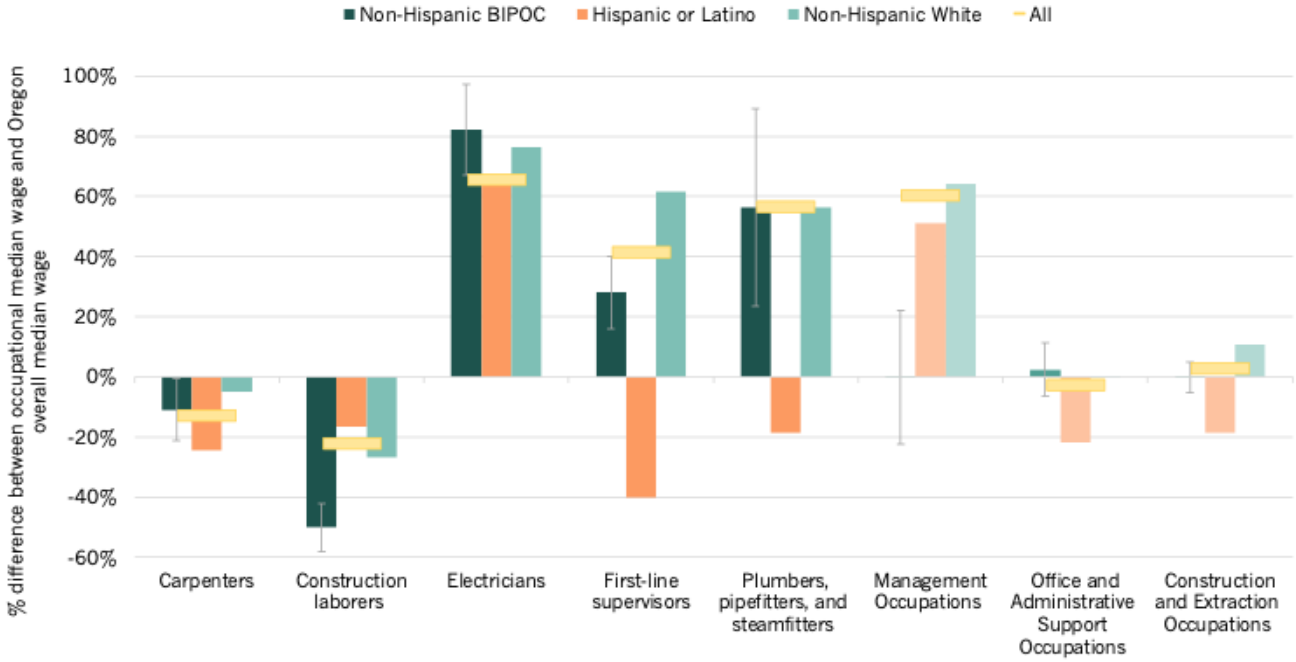


Data sources: U.S. Census Bureau (2022). American Community Survey, 5-year Estimates. Oregon Employment Department, 2024. Note: Share of occupation is calculated within all industries. Looking within only the construction industry yields similar results, but estimates are less reliable (see Appendix A).

For BIPOC and Hispanic or Latino workers, wage differences are evident, even within the same roles, when compared to their non-Hispanic white counterparts (see Exhibit 20). In management occupations within the construction industry, for example, non-Hispanic BIPOC workers earn Oregon's overall median wage, whereas Hispanic or Latino worker wages are 51 percent higher and non-Hispanic white worker wages are 64 percent higher than Oregon's median wage. Such differences underscore persistent wage disparities that

may stem from factors such as access to high-paying projects, tenure, or promotional opportunities.[19]

Exhibit 20. Race/Ethnicity Wage Differentials in Housing Construction Occupations and Occupational Groups, Oregon

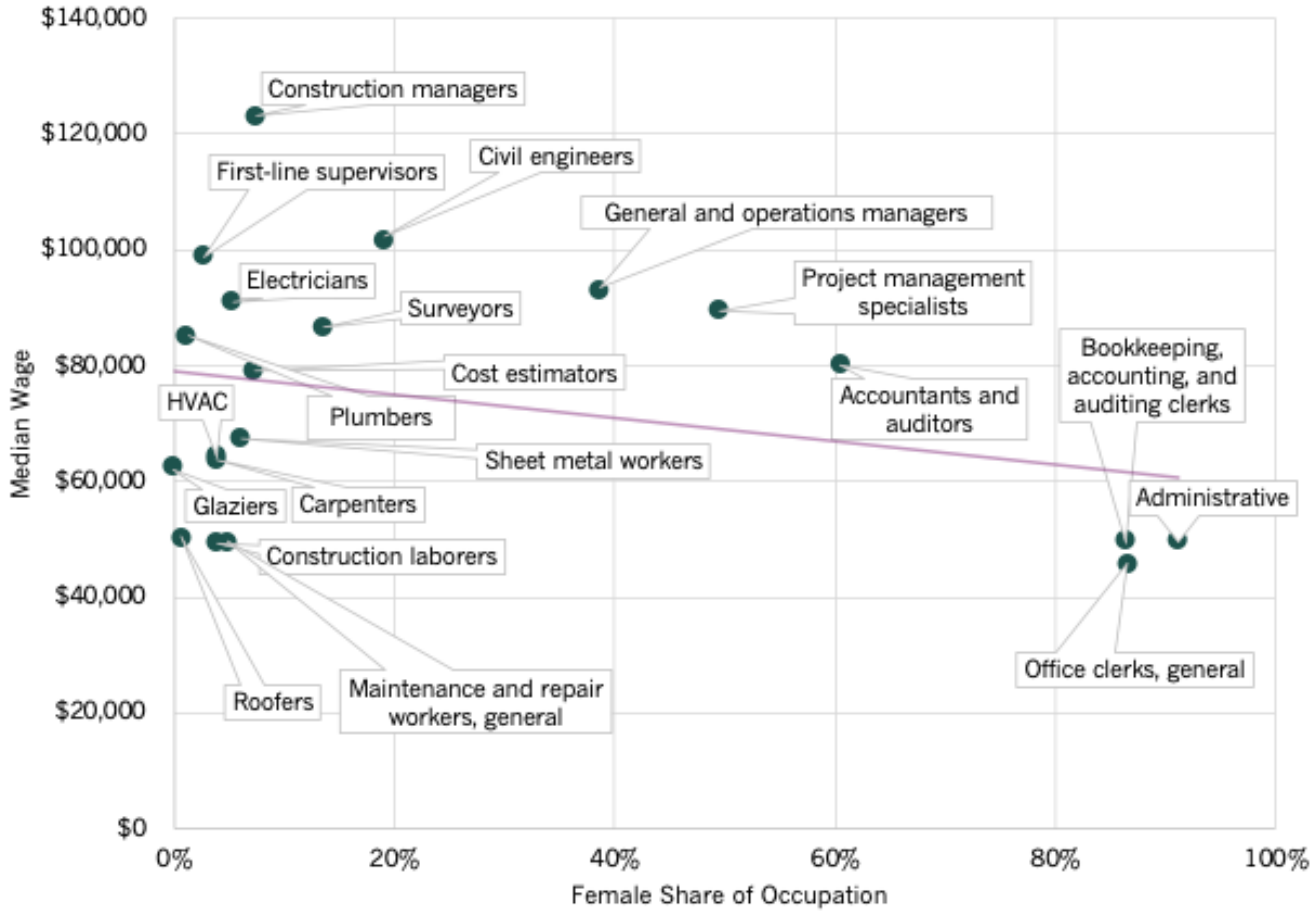


Data source: U.S. Census Bureau (2022). American Community Survey, 5-year Estimates. Note: Median wages for occupations are across all industries; median wages for occupational groups are within the construction industry.

Exhibit 21 shows median wages versus female share of workers in housing construction occupations. Female representation in many occupations remains low compared to the statewide rate of 47 percent. Administrative support positions have a relatively high proportion of female workers (91 percent) while construction laborers have a low female share (under 5 percent). Median wages in these roles are similar, slightly below $50,000. Managerial roles, such as construction managers and first-line supervisors, have 7 percent and 3 percent female workers, respectively, and median wages around $100,000. Women are more strongly represented in lower-paying housing construction occupations. Such disparities result in part from gender-based occupational segmentation within the industry. Efforts to recruit and retain female workers, particularly in skilled trades, could improve overall gender diversity and address labor shortages in certain roles.

[19] Andrew Clarkwest, Tresa Kappil, Deena Schwartz, Marissa Hashizume, and Karin Martinson. "Wage Growth Disparities by Gender and Race/Ethnicity Among Entrants to Mid-Level Occupations in the United States." *Department of Labor.* 2021.

Exhibit 21. Median Wage vs. Female Share of Workers in Housing Construction Occupations, Oregon



Data sources: U.S. Census Bureau (2022). American Community Survey, 5-year Estimates. Oregon Employment Department, 2024. Note: Share of occupation is calculated within all industries. Looking within only the construction industry yields similar results, but estimates are less reliable (see Appendix A).

Gender-based wage gaps are also pronounced within occupations. In each occupation and group reported in Exhibit 22, women earn median wages that are lower than those of men in the same jobs. For instance, in administrative support occupations where female representation is relatively high, female workers earn approximately 13 percent below Oregon's median wage whereas male workers in the same roles earn 22 percent above the median.

Exhibit 22. Gender Wage Differentials in Housing Construction Occupations and Occupational Groups, Oregon

Source: U.S. Census Bureau (2022). American Community Survey, 5-year Estimates. Note: Median wages for occupations are across all industries; median wages for occupational groups are within the construction industry.

Conclusion

Oregon's housing construction industries employ individuals with a wide variety of skills and educational and training backgrounds. Key occupations range from carpenters to clerks to engineers. Representation and wage disparities exist by race and ethnicity, and the workforce lacks in gender diversity—only 12 percent of construction industry workers are women.

This chapter serves as a foundational input to subsequent chapters that assess workforce demand and the strength of Oregon's housing-production training pathways. The state's housing production goal will increase demand for key occupations and shifting policy landscapes will have additional effects on the housing production sector.

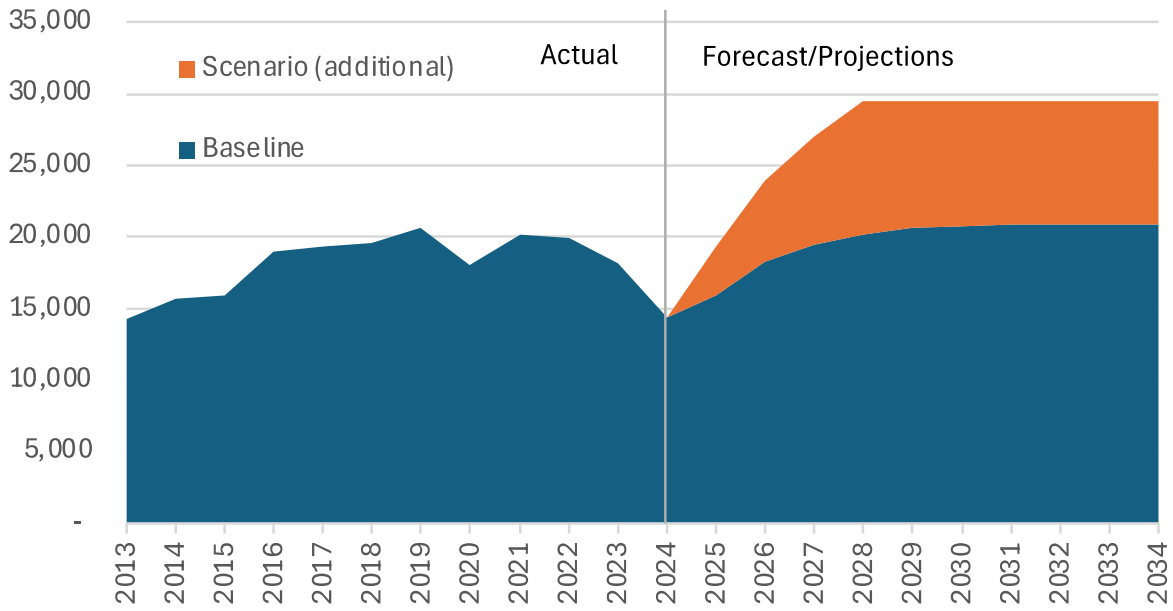
2. Workforce Demand

The pace of housing construction drives demand for the housing production workforce. Through an executive order, Governor Kotek established a goal for Oregon to produce 36,000 housing units per year for the next 10 years, a large increase relative to recent levels of about 20,000 or fewer units per year.[20] The target was based on need estimated in the Oregon Housing Needs Analysis (OHNA), through which the State estimates its housing needs to keep up with population changes and past underproduction. The most recent OHNA revised the production target to 29,522 units per year for 10 years.[21]

Housing Starts

Exhibit 23 depicts housing starts—the number of new residential construction projects that begin in a given time period—annually in Oregon from 2013 through 2024, dipping down to 14,416 in 2024. The December 2024 Oregon Office of Economic Analysis (OEA) economic forecast indicates a rebound in construction, with the number of housing starts per year increasing through 2034, from nearly 16,000 in 2025 to nearly 21,000 by 2034. The exhibit also shows that housing starts need to reach the revised production goal of 29,522 per year by 2028, after a four-year ramp-up period (orange region of chart).

Exhibit 23. Housing Starts: Actual and Needed to Meet Oregon's Housing Production Goal



Data source: OEA

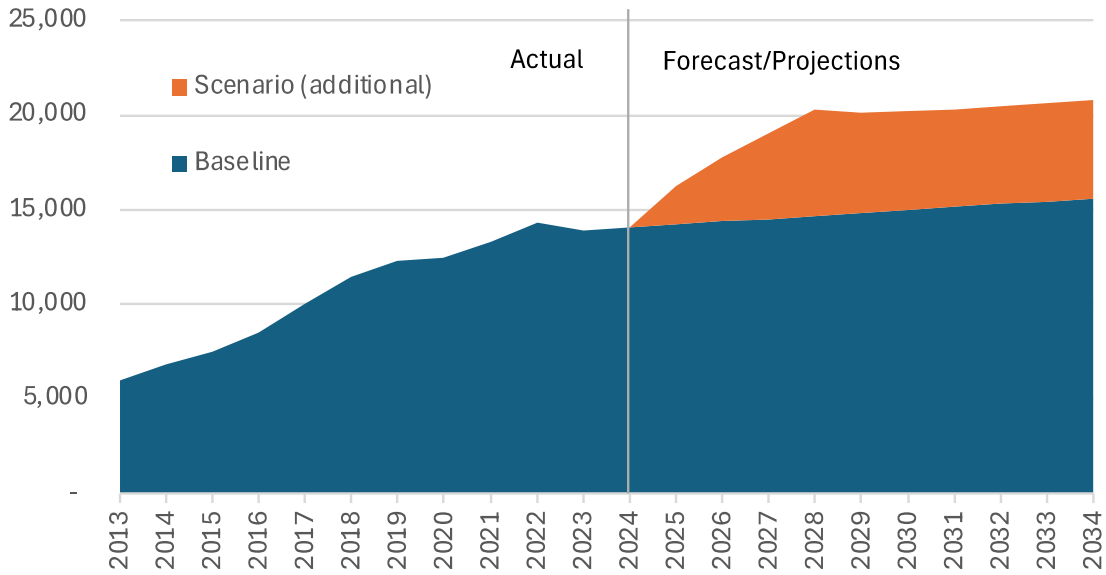
[20] Statewide Housing Production Goal: https://www.oregon.gov/gov/eo/eo-23-04.pdf
[21] OHNA Methodology, https://www.oregon.gov/das/oea/Documents/OHNA-Methodology-Report-2024.pdf

Employment Need

To estimate the number of additional workers the state needs to meet its housing production goal, we assumed a 4-year ramp-up period to 2028 for housing starts (see previous exhibit). We calculated the number of workers needed for this level of construction activity assuming 1.45 jobs per housing start.[22] We allocated these workers between residential building construction and specialty trade contractors using historical data on housing starts and employment in the two industries. The analysis suggests the goal will require an average of 12,700 additional workers per year from 2028-34, above and beyond employment levels from OEA's December 2024 employment forecast, with lower need during the ramp-up period.

Exhibits 24 and 25 illustrate this scenario for residential construction and specialty trade contractor employment, respectively. Residential construction employment increased steadily from 2013 to 2022 (see also Exhibit 3) and leveled out at about 14,000 workers in 2023. Moving forward, OED projects that residential building construction employment will grow by 11 percent between 2023 and 2033, or 1.0 percent annually. Under these baseline conditions, the state would have about 15,600 residential construction workers in 2034 (excluding remodelers). To meet the housing production goal, Oregon would need, on average, 5,300 additional residential construction workers per year (2028-2034).

Exhibit 24. Residential Construction Employment: Baseline and Additional Needed to Meet Oregon's Housing Production Goal

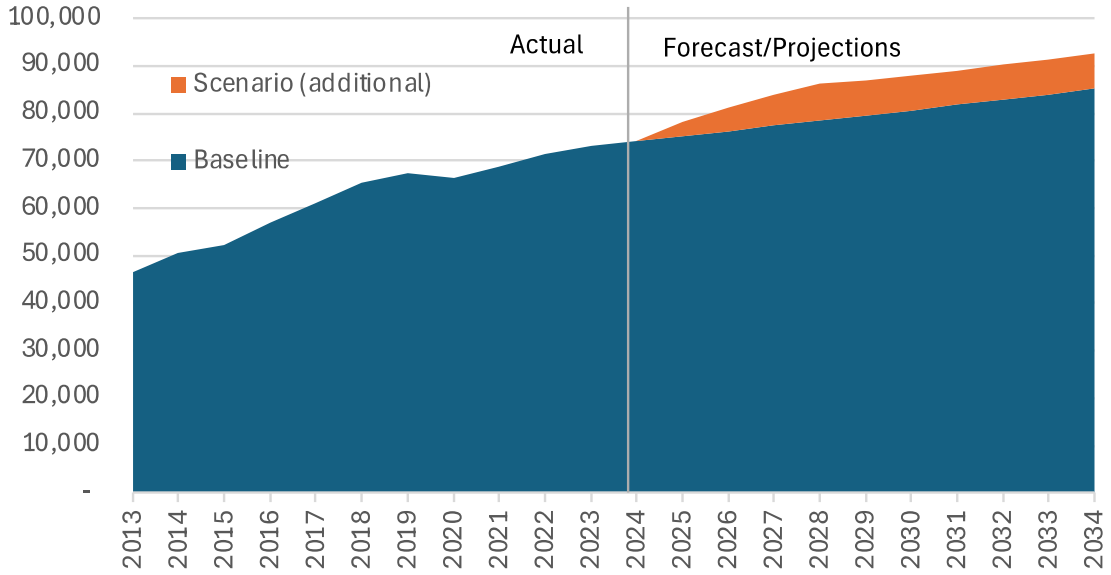


Data source: OED. Note: Residential construction employment excludes remodelers.

[22] OEA developed this assumption based on data from the National Association of Home Builders and analysis of industry spending patterns. See https://oregoneconomicanalysis.com/2022/09/20/addressing-oregons-housing-shortage-workforce-needs/. Note that a housing unit started in one year is not necessarily completed in that year. For simplicity we assume a start is equivalent to a unit completed during that year. In addition, single and multifamily units may require a different level of staffing per unit. The scenario does not address the mix of housing units by type (single or multifamily).

Specialty trade contractors, a much larger industry, had employment of about 47,000 in 2013. Moving forward, OED projects that specialty trade contractor employment will grow by 15 percent between 2023 and 2033, or 1.4 percent annually. Under these baseline conditions, the state would have 85,200 specialty trade contractor workers in 2034. To meet the housing production goal, Oregon would need, on average, 7,500 additional specialty trade contractor workers per year (2028-2034).

Exhibit 25. Specialty Trade Contractor Employment: Baseline and Additional Needed to Meet Oregon's Housing Production Goal



Data source: OED

Occupation Allocation

We allocated the additional 12,700 residential building construction and specialty trade contractor jobs across occupations using state and national data regarding the prevalence of specific occupations in these two industries.[23] We then calculated the additional annual employment needed to meet the 2028 housing production goal for selected occupations. This calculation provides the number of jobs in these occupations the state would need to add each year through 2028 to meet the goal. Due to retirement and occupation changes, the actual number of individuals needed for these jobs could be somewhat higher.

Exhibit 26 displays for each occupation the number of additional employees needed to meet the production goal and a higher number, based in part on OED's occupational openings projections, that provides a plausible estimate for the number of individuals needed to fill the needed positions. This and the following exhibit are sorted from top to bottom by the average annual number of additional openings needed to meet the goal.

[23] OED, Oregon Industry-Occupation Matrix, 2022; U.S. BLS, Industry-Occupation Matrix, 2023.

Exhibit 27 displays both measures of additional need, expressed as a share of annual openings projected by OED for each occupation.

Exhibit 26. Current Employment, Projected Openings, and Additional Annual Openings Needed to Meet the Housing Production Goal

Occupation Title	2023 Employment	Annual Openings	Additional Annual Openings	Additional Openings + Churn
Carpenters	19,753	1,857	348	424
Construction laborers	18,041	1,922	260	318
Electricians	10,029	1,162	199	243
First-line supervisors of construction trades and extraction workers	11,128	1,065	169	206
Plumbers, pipefitters, and steamfitters	5,185	543	113	138
Painters, construction and maintenance	7,164	736	105	128
Construction managers	5,622	542	98	119
General and operations managers	48,582	4,537	92	112
Roofers	4,498	399	71	87
Project management specialists	18,384	1,573	71	86
Bookkeeping, accounting, and auditing clerks	27,825	3,072	54	66
Cement masons and concrete finishers	2,405	189	53	65
Secretaries and administrative assistants, except legal, medical, and executive	24,289	2,292	49	59
Office clerks, general	27,894	3,152	47	57
Cost estimators	4,106	386	47	57
Operating engineers and other construction equipment operators	4,914	490	45	55
Drywall and ceiling tile installers	2,335	215	35	43
Heavy and tractor-trailer truck drivers	27,138	3,042	30	37
Accountants and auditors	15,157	1,297	17	21
Maintenance and repair workers, general	17,772	1,868	13	16
Insulation workers, floor, ceiling, and wall	593	63	11	13
Civil engineers	4,591	369	6	7
Construction and building inspectors	1,331	155	2	2
Heating, air conditioning, and refrigeration mechanics and installers	4,373	483	1	1
Sheet metal workers	2,592	275	1	1

Data source: OED

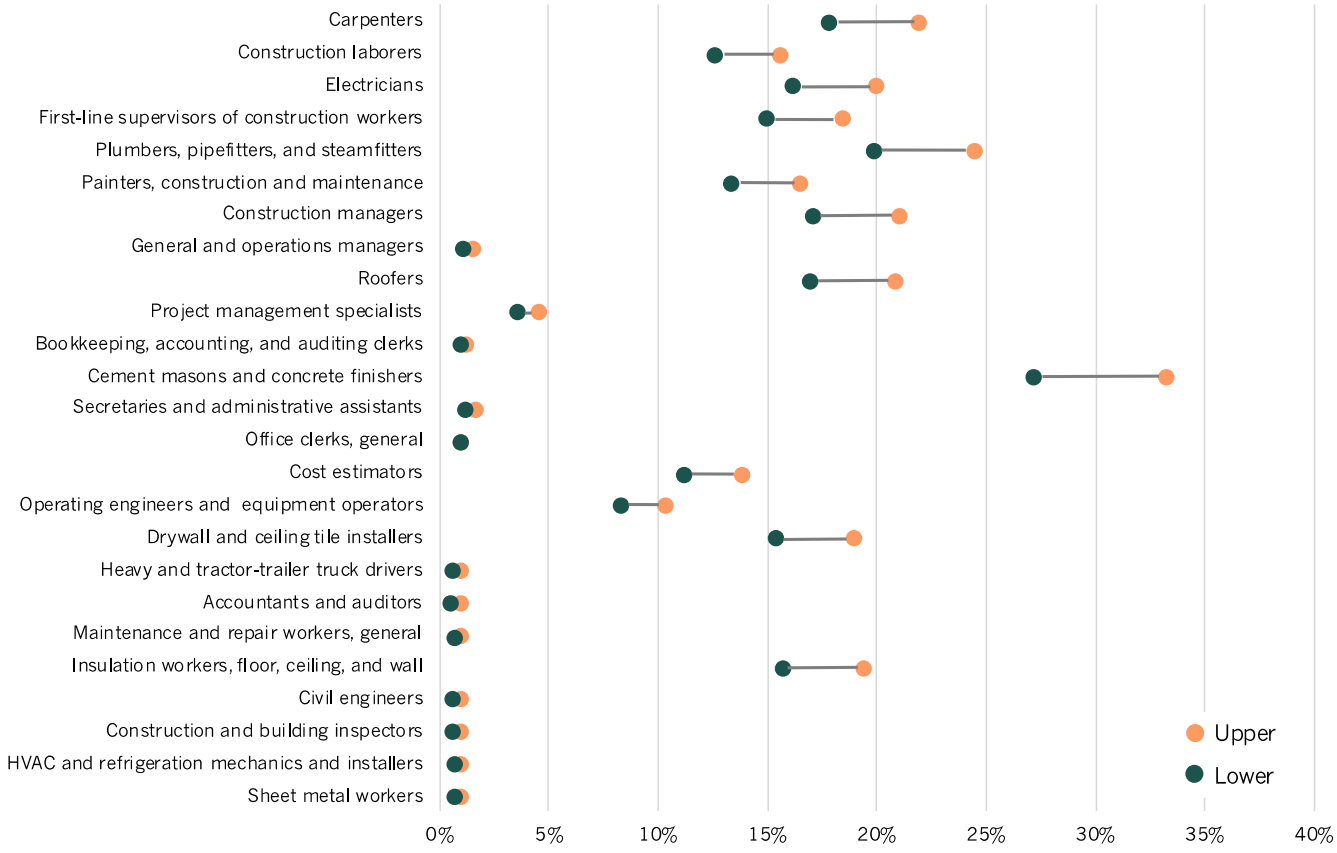
For many occupations, the additional housing production would likely result in a large increase in job openings, relative to the OED projections baseline, as illustrated in the exhibit. For example, meeting the goal would increase the number of annual openings expected for cement masons and concrete finishers through 2028 by about one-third, and for carpenters, electricians, and plumbers by close to one-fifth or more.

On an annual basis, the year-over-year increases in housing starts and housing production employment associated with the scenario are not unprecedented, but the state has not experienced this level of growth over multiple years in the available historical data, and residential construction employment has declined slightly from a peak in 2022, suggesting the need for extraordinary efforts to develop the workforce needed to meet the production goal within the next few years. Proposed tariffs and immigration reform could create additional, strong, headwinds. Once the workforce is in place (2028 in the scenario described above), however, the additional need for housing production workers would return to levels more consistent with the current status quo.

The exhibits above omit a few critical occupations called out in the recommendations report of the Oregon Housing Production Advisory Council (HPAC) and in our engagement

with employers for this project: building code professionals.[24] The limited availability of building inspectors, local government permitting staff, and other local government employees has been identified as an important barrier to ramping up housing production, regardless of how many carpenters and electricians are ready for work. Data regarding the number and workload of such positions that are associated with housing production is sparse. However, based on OEA analysis, meeting the goal described in the scenario would require about 400 more local government employees in each year the production goal is met, many of whom would be building inspectors.[25]

Exhibit 27. Additional Annual Need as a Share of Baseline Annual Openings



Data source: OED

[24] Housing Production Advisory Council, State of Oregon Housing Production Advisory Council Recommendations Report. https://www.oregon.gov/gov/policies/Documents/HPAC%20Final%20Report%20February%202024.pdf

[25] OEA, Addressing Oregon's Housing Shortage, Workforce Needs. https://oregoneconomicanalysis.com/2022/09/20/addressing-oregons-housing-shortage-workforce-needs/

3. Engagement Summary

Insights from Industry Professionals

ECOnorthwest's engagement approach included a survey, interviews, and focus groups. The following sections detail the survey distribution and interview/focus group approach and findings, including participant characteristics.

Survey

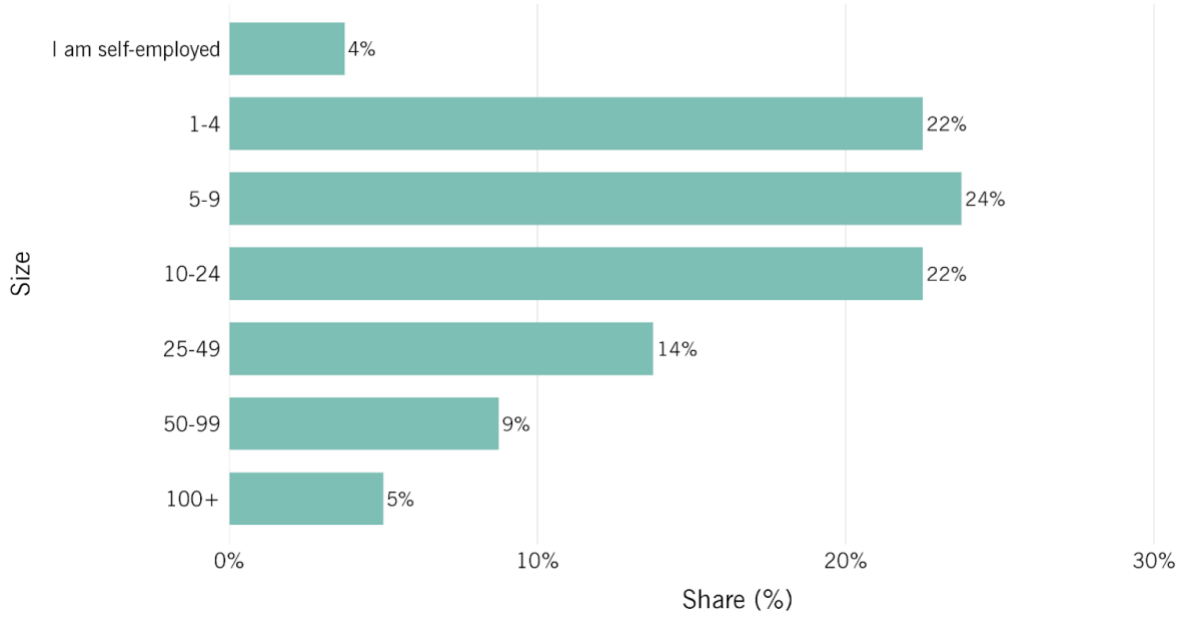
ECOnorthwest designed and administered a survey to gather detailed insights into workforce challenges and opportunities, capturing the perspectives of those actively involved in Oregon's housing construction industry.[26] The survey was distributed through key partners, including the steering committee, Associated General Contractors (Oregon Columbia Chapter), Oregon Construction Contractors Board, Business Oregon's COBID Office (Certification Office for Business Inclusion and Diversity), directors of the Oregon State Regional Home Builders Association, community colleges, apprenticeship programs, the National Association of Minority Contractors, LatinoBuilt, Oregon Tradeswomen, and the Statewide Chamber of Commerce.

The survey was open from October 30th until December 4th and received 83 responses—81 in English (38 through the original survey and 43 through a separate distribution to COBID-certified firms) and two in Spanish (both from the original survey). Twenty percent of respondents were union signatory contractors.[27] When describing the type of construction work they do, respondents selected a mix of residential and commercial construction (see Appendix). Two thirds (65%) of respondents work on single-unit, townhome, or small-plex residential construction, and just over half (54%) work on apartment or other multi-unit buildings. Asked to further describe the nature of their work, the largest individual shares of respondents selected "general contractor" (55%), "other" (51%) (a category encompassing a wide variety of specialized work), and "carpentry" (22%). Most respondents (72%) were presidents/CEOs, vice presidents, COOs, CFOs, or general managers, and most (68%) work for companies employing fewer than 25 people (Exhibit 28). More than half (57 percent) of respondents from COBID-certified companies reported that they employ fewer than 10 employees at their busiest times, compared to 38 percent of those with undetermined certification status.

[26] This survey is specific to the housing construction industry; interviews and focus groups looked further at topics covered in this survey as well as local government planning and permitting.
[27] Respondents identifying as union signatory contractors indicated involvement in local chapters of the International Union of Painters and Allied Trades; the International Brotherhood of Electrical Workers; the International Association of Bridge, Structural, Ornamental, and Reinforcing Ironworkers; and the Laborers' International Union of North America.

Exhibit 28. Respondent Company Size

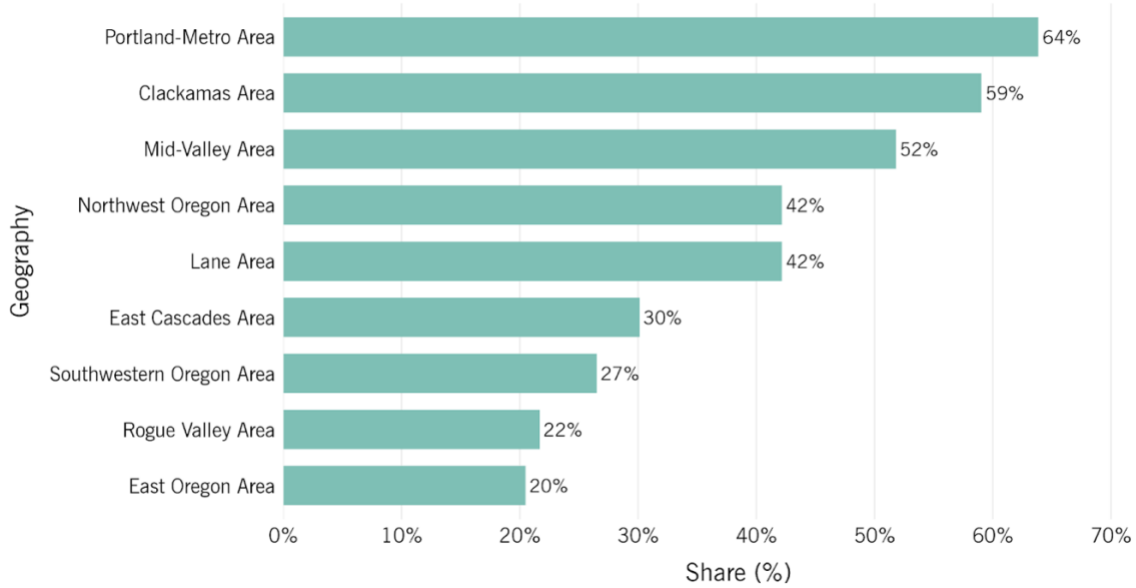
Survey Question: How many people does your company employ at its busiest time? Select one.



Respondents' companies operate across the state, with a significant portion (77%) reporting work in 2 or more regions, and more than half (54%) reporting work in 3 or more regions. The highest share of respondents indicated that their companies operate in the Portland Metro, Clackamas, and Mid-Valley areas, reflecting a concentration of companies working in Oregon's most populous counties (Exhibit 29).

Exhibit 29. Respondent Company Locations

Survey Question: In which area(s) does your company work? Select all that apply.



Note: Portland-Metro includes Washington and Multnomah counties; Clackamas includes Clackamas County; Mid-Valley includes Yamhill, Polk, Marion, and Linn counties; Northwest Oregon includes Benton, Clatsop, Columbia, Lincoln, and Tillamook counties; Lane includes Lane County; East Cascades includes

Wasco, Hood River, Sherman, Gilliam, Jefferson, Wheeler, Crook, Deschutes, Klamath, and Lake counties; Southwestern Oregon includes Coos, Douglas and Curry counties; Rogue Valley includes Josephine and Jackson counties; and Eastern Oregon includes Baker, Grant, Harney, Malheur, Morrow, Umatilla, Union, and Wallowa counties.

The small sample size of 83 respondents presents limitations that should be considered when interpreting results. A small sample size can introduce variability and reduce the statistical significance of results, making it challenging to generalize findings to the broader housing construction industry. This limitation is especially pronounced when examining cross tabulations by region, company size, or other subcategories, as the number of responses in certain groups may be too small to draw meaningful conclusions. Results should be viewed as indicative rather than definitive, providing valuable insights into the views of this specific pool of respondents rather than providing conclusive evidence of trends at large.

Note that in many survey questions, respondents could select more than one answer. Therefore, the sum of response counts often exceeds the total number of respondents. The cross tabulation charts displayed in this analysis include the number of responses associated with each possible combination of answers (denoted by "n = #" on y-axis labels).

Key Survey Findings

INDUSTRY CHALLENGES

Construction companies in Oregon face a variety of challenges. Respondents were asked whether their company regularly experiences any one of several issues related to project timelines and financial constraints (Exhibit 30). The most common challenges facing respondents' companies include project halts or redesigns (56%), governmental delays (52%), and high interest rates causing developers to hesitate (48%). Supply chain issues, such as equipment shortages and delivery delays, are each reported by about a quarter of respondents. "Other" responses included long wait times for materials like lumber, increased cost of supplies, a lack of skilled labor, and a lack of available projects. These responses generally highlight regulatory and financial barriers as key factors affecting construction timelines.

WORKFORCE CHALLENGES

More than half of respondents experienced challenges with workforce attraction, hiring, or retention during the past year. Fifty-five percent of respondents reported difficulty attracting, hiring, and/or retaining employees in the past 12 months (Exhibit 31). Of those who identified this as an issue, approximately 70 percent cited a shortage of skilled candidates as their primary workforce challenge (Exhibit 32). Smaller shares reported a lack of contracts (14%), factors such as childcare and housing (5%), and other factors (12%), including responses such as people not wanting to work and 1:1 apprentice to journey-level worker ratios.

Exhibit 30. Construction Industry Challenges

Survey Question: Does your company regularly experience any of the following?

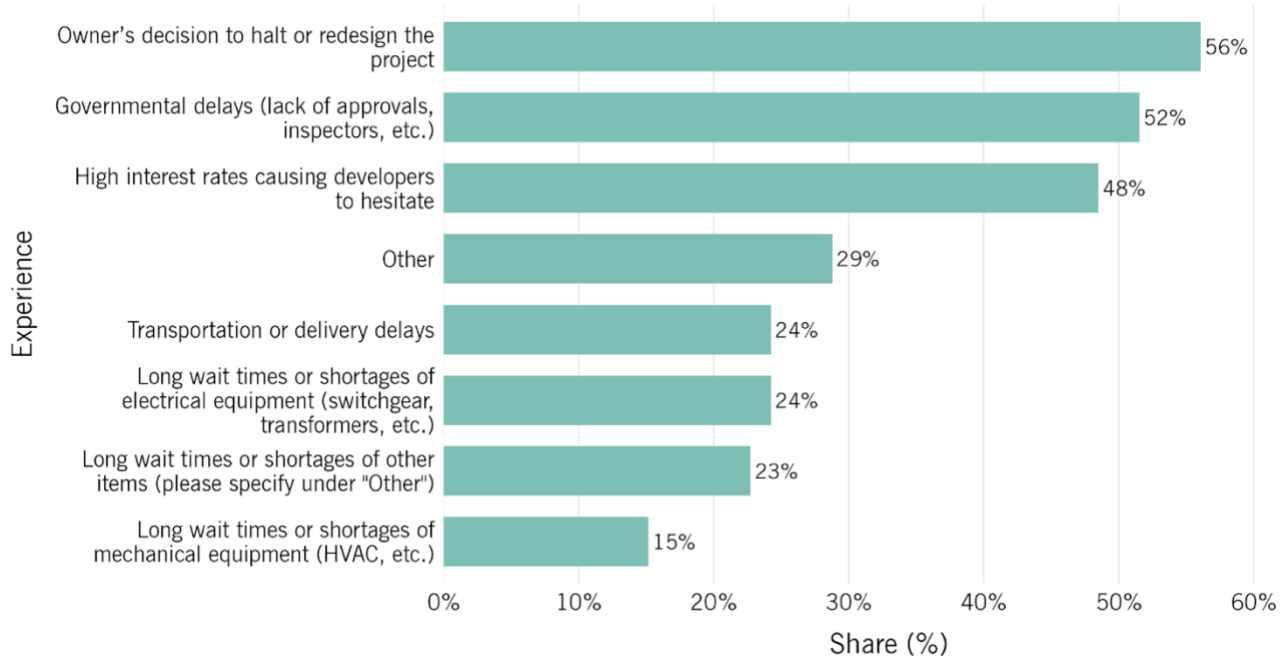


Exhibit 31. Difficulty with Attracting, Hiring, and Keeping Employees

Survey Question: Please indicate your agreement with this statement: Attracting, hiring, and/or keeping employees has been a significant challenge for my company in the past 12 months.

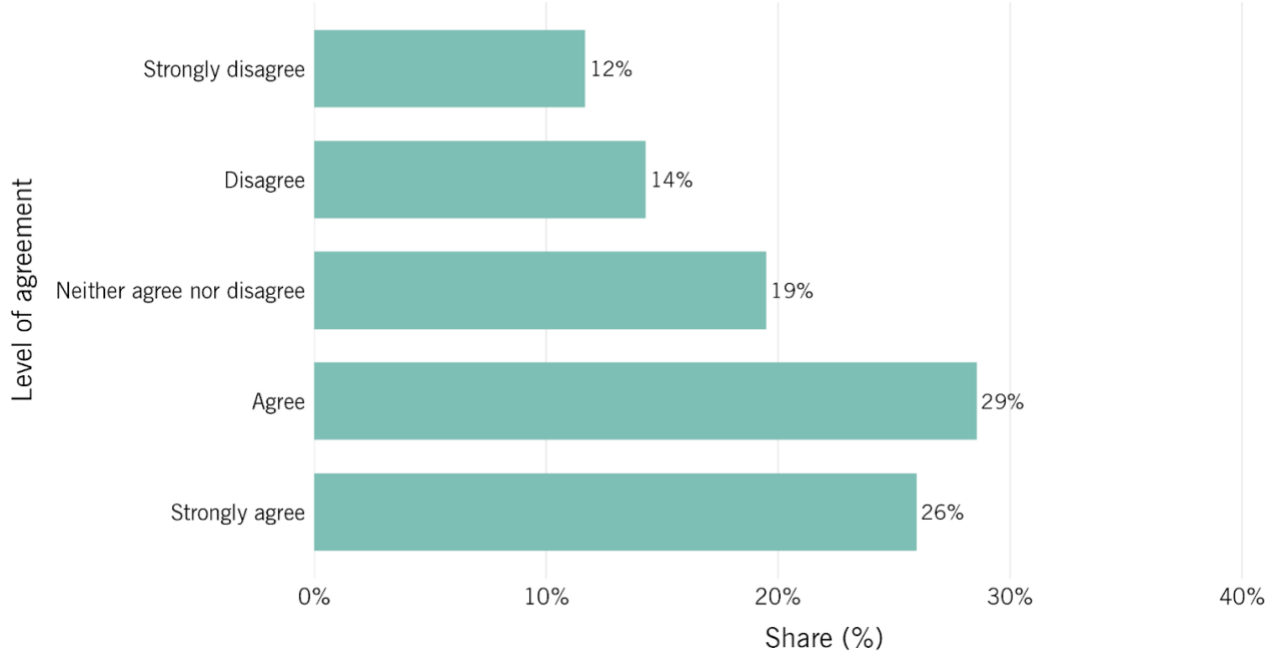
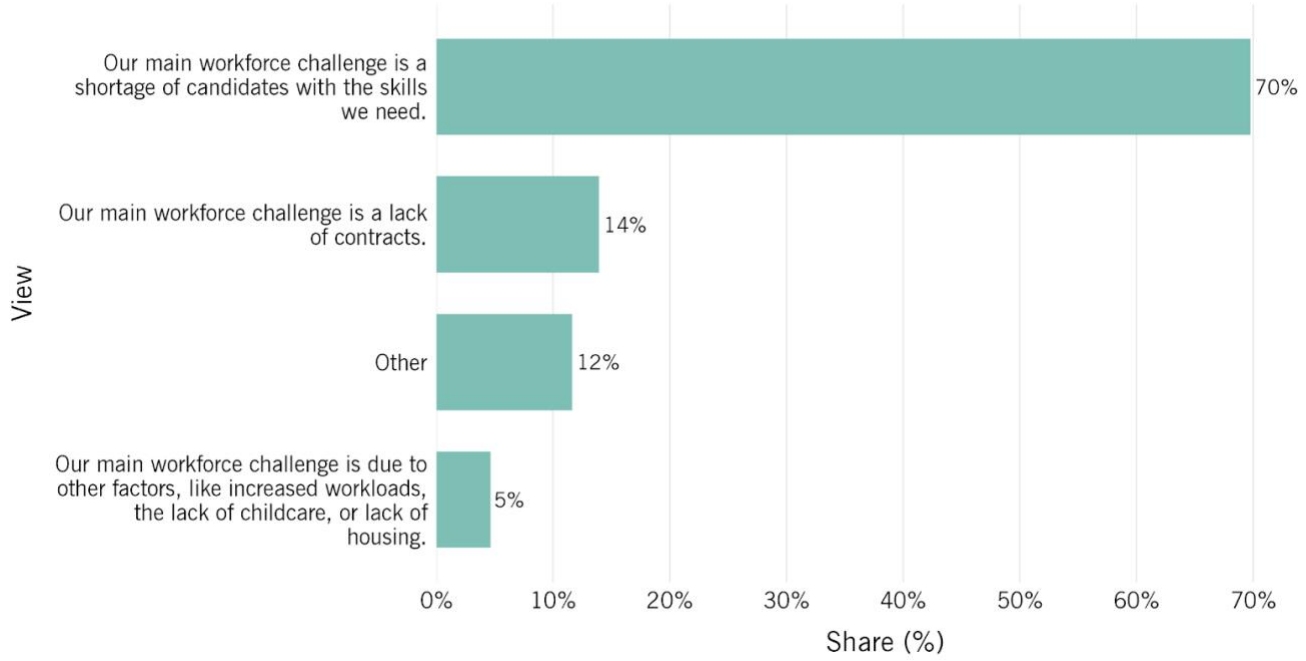


Exhibit 32. Main Workforce Challenges

Survey Question: Which statement best represents your view? (Question asked of those responding "agree" or "strongly agree" to the statement in the previous exhibit.)

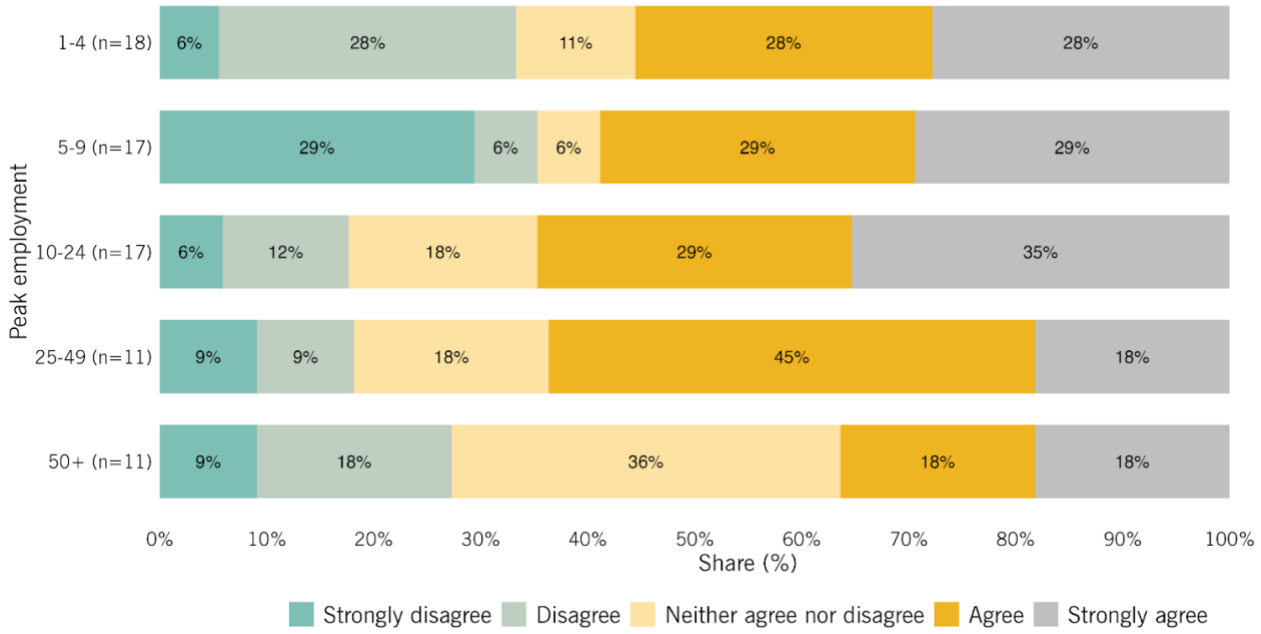


Those who disagreed or neither agreed nor disagreed with the statement "Attracting, hiring, and/or keeping employees has been a significant challenge for my company in the past 12 months" were asked what—if any—workforce challenges they've faced over the past year (open-ended response). Respondents indicated there was not enough work or that they were struggling to acquire government projects. Rising operating and material costs were also mentioned multiple times.

The presence of recruitment, hiring, or retention issues varies somewhat by company size. Respondents from companies with 10–24 employees had the highest levels of agreement about challenges (Exhibit 33). Smaller companies (1–4 and 5–9 employees) show variation, with 29 percent of 5–9 respondents selecting "strongly disagree" compared to 6 percent of 1–4 respondents. Larger companies (50–99 and 100+ employees) exhibit more neutrality or disagreement, though their responses are less generalizable due to limited sample sizes.

Exhibit 33. Attraction, Retention, and Hiring Challenges by Company Size

Survey Question: Please indicate your agreement with this statement: Attracting, hiring, and/or keeping employees has been a significant challenge for my company in the past 12 months.

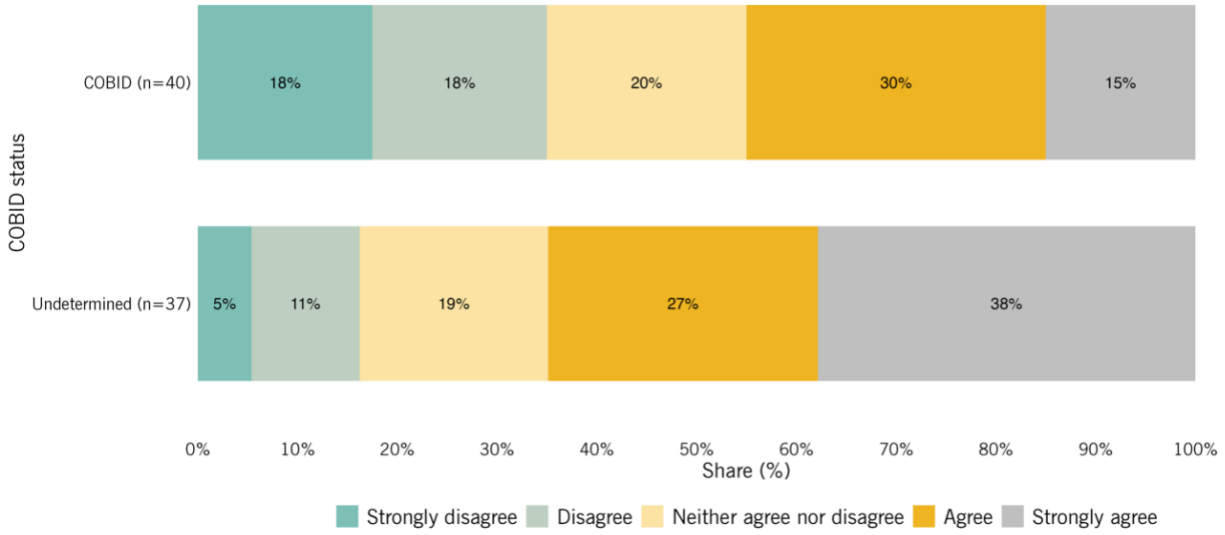


There were few differences in responses to this question by geographic location. About half of respondents in each region agreed or strongly agreed that attracting, hiring, or keeping employees has been a challenge. This distribution of responses could suggest that workforce improvement efforts should be broadly distributed across Oregon rather than limited to any one region. However, responses from firms operating in multiple areas may be obscuring regional variations. Most responses were not specific to one region; a large share of respondents reported operating in at least three regions, and some in up to six regions. Their experiences likely span multiple regions, complicating the interpretation of regional distinctions in the survey results.

Respondents representing COBID-certified companies and those from companies with undetermined COBID certification status expressed differing views on attracting, hiring, and retaining employees. A sizeable share of respondents with undetermined certification status (65 percent) reported that these aspects had been a challenge for their company over the past 12 months, compared to 45 percent of COBID-certified respondents. Conversely, about 36 percent of COBID-certified respondents stated that attracting, hiring, and retaining employees had not been a challenge—nearly twice the share of those with undetermined certification status. Approximately 20 percent of respondents in both cohorts remained neutral on the issue (Exhibit 34).

Exhibit 34. Attraction, Retention, and Hiring Challenges, by COBID Status

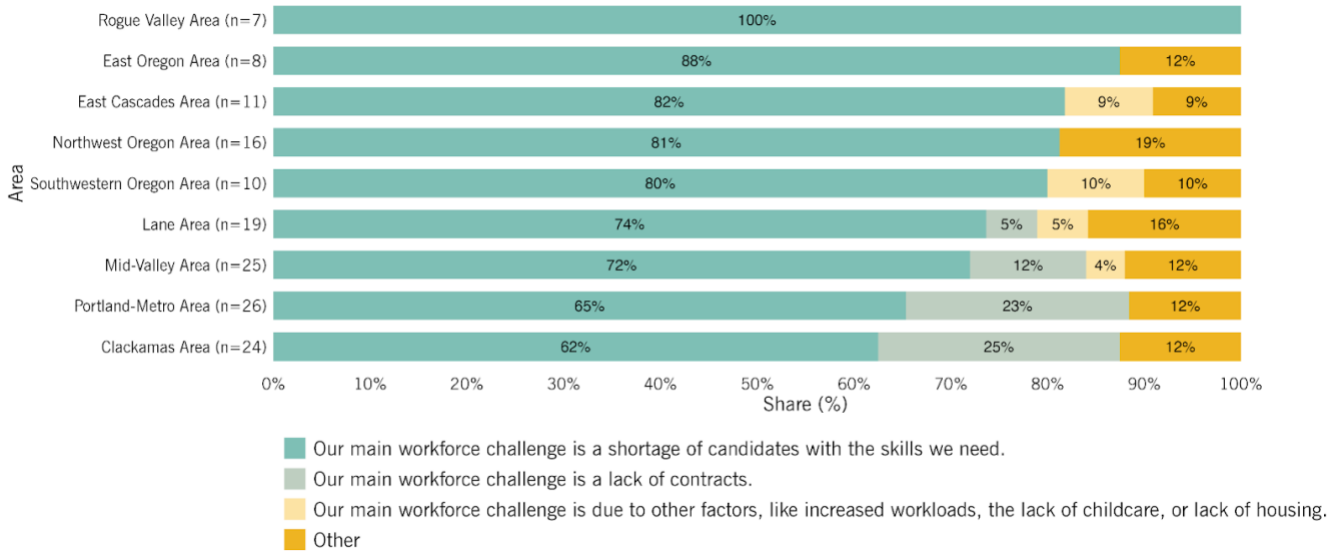
Survey Question: Please indicate your agreement with this statement: Attracting, hiring, and/or keeping employees has been a significant challenge for my company in the past 12 months



There is some variation in the reported causes of workforce challenges by geographic location. As noted above, most respondents who answered this question (70%) identified a shortage of candidates with the necessary skills as their main workforce challenge. Across regions, this share ranged from 62 to 100 percent, with highest-response (and most populous) regions on the lower end of this range (Exhibit 35). About a quarter of respondents in these regions reported a lack of contracts as their main workforce challenge. These variations in responses may or may not reflect actual differences in workforce challenges between urban and rural areas for the reasons noted above. Further outreach would be needed to determine the broader consistency of these trends.

Exhibit 35. Main Workforce Challenges by Location

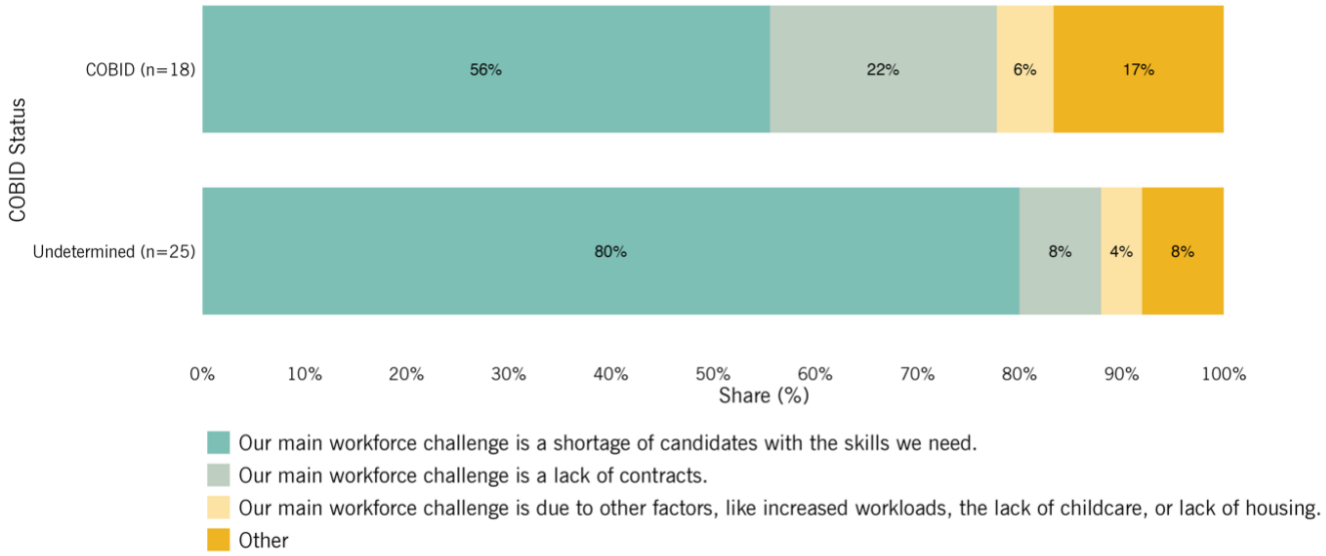
Survey Question: Which statement best represents your view?



There is variation in the reported causes of workforce challenges by COBID status. Of those with undetermined status, a considerably large share of respondents (80 percent) expressed that their main workforce challenge is a shortage of candidates with the skills they need. Fewer respondents from the COBID-certified cohort—about 56 percent—expressed the same concern, with the next highest share of respondents in this category (22 percent) identifying a lack of contracts as their main workforce challenge. Although a shortage of skilled candidates constituted the most pressing concern among both groups of respondents, it appears to be less of a concern for COBID-certified respondents than for respondents with undetermined certification status. Note, however, that this question received fewer responses from COBID-certified respondents than from respondents with undetermined status.

Exhibit 36. Nature of Workforce Challenge, by COBID status

Survey Question: Which statement best represents your view?



Respondent companies struggle to fill a variety of hourly and salaried positions. About half of respondents provided responses to the open-ended question "If your company has struggled to fill hourly positions over the past year, what jobs have been the hardest to fill?" Many respondents said general labor positions like carpenters, equipment operators, project managers, mechanics, and foremen. Others had very specific positions they were looking to fill such as low-voltage installation technicians, skilled concrete finishers, or glaziers with a welding specialty. Four respondents said that all positions have been hard to fill.

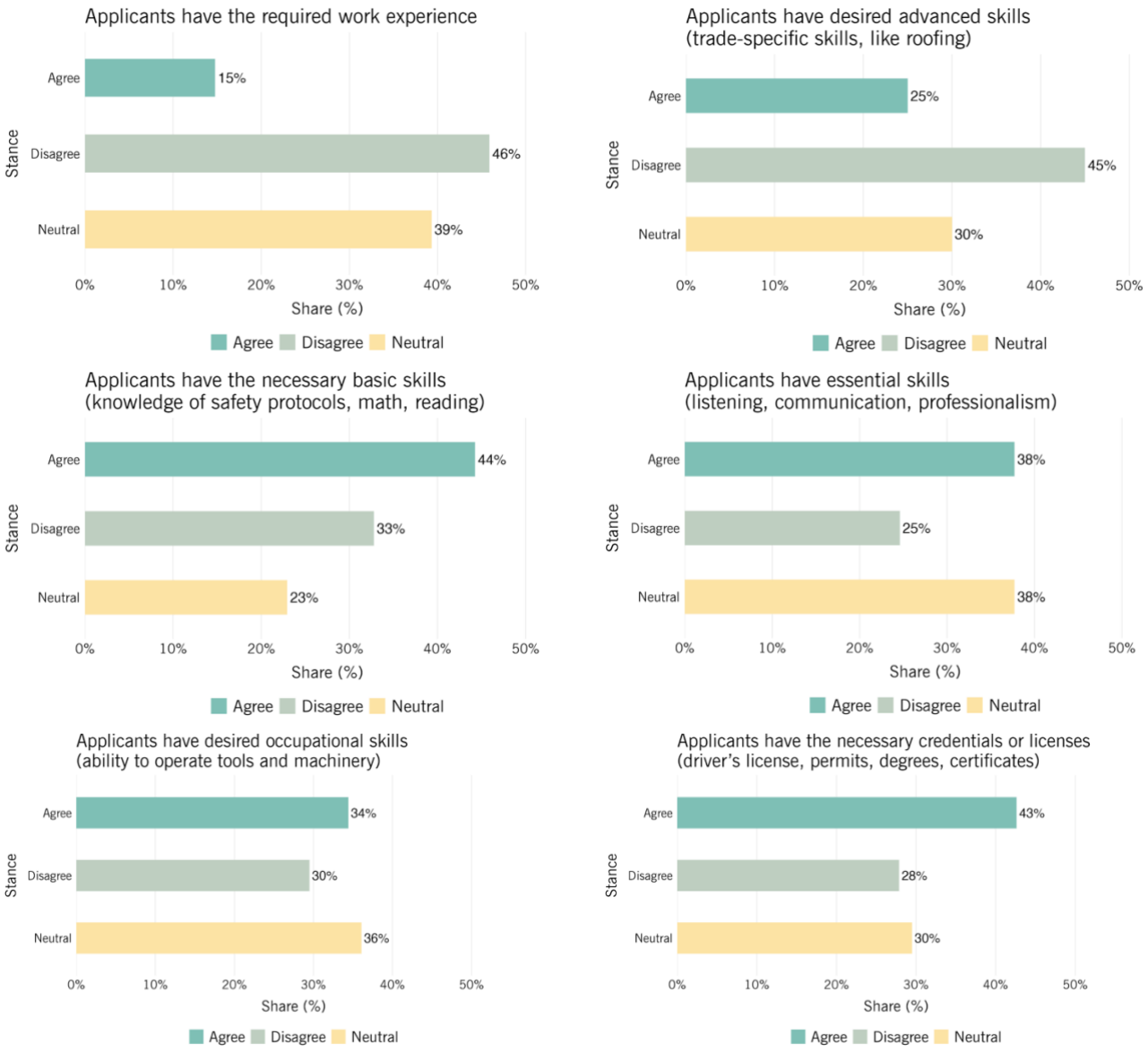
About a quarter of respondents answered the open-ended question "If your company has struggled to fill salaried positions over the past year, what jobs have been the hardest to fill?" The most common responses were project managers, estimators, and superintendents.

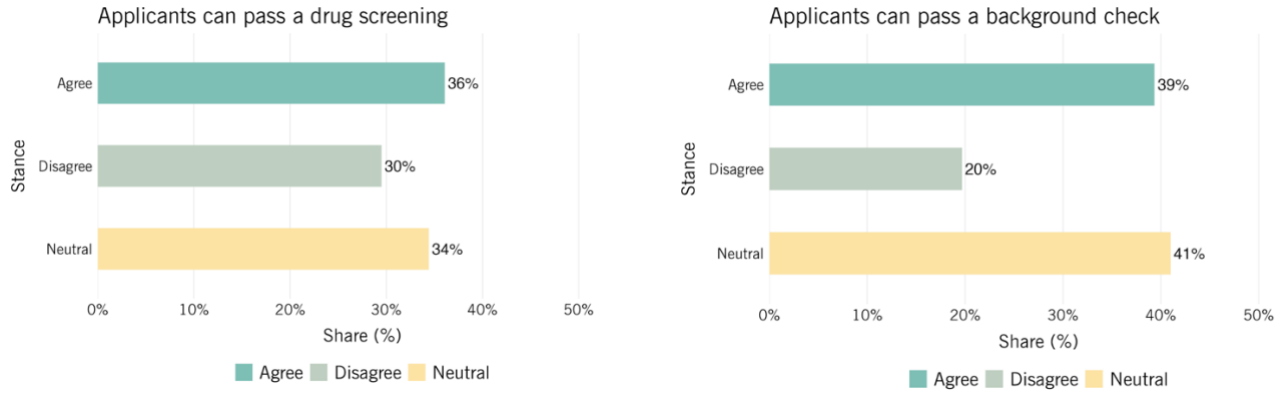
The most lacking applicant characteristics are work experience and advanced skills. Nearly 46 percent of respondents indicated that applicants lack the required work

experience to fill open positions over the past 12 months and 45 percent reported that applicants lack the required advanced skills (Exhibit 37). In both cases, the share of respondents with these views exceeded the share who felt that applicants have the required workforce experience (15%) or advanced skills (25%). Relatively more respondents agreed that applicants were qualified in terms of basic skills (44%), essential skills (38%), and occupational skills (34%), as well as having required credentials (43%) and the ability to pass background checks (39%) and drug screenings (36%). However, there remained a persistently high disagree rate of 20 to 33 percent for these skills/characteristics. While work experience and advanced skills were the top concerns, employers found that applicants often lack even basic skills.

Exhibit 37. Perceptions of Applicants' Skills/Characteristics

Survey Question: Thinking about open positions at your company over the past 12 months, please indicate your agreement with the following statements.



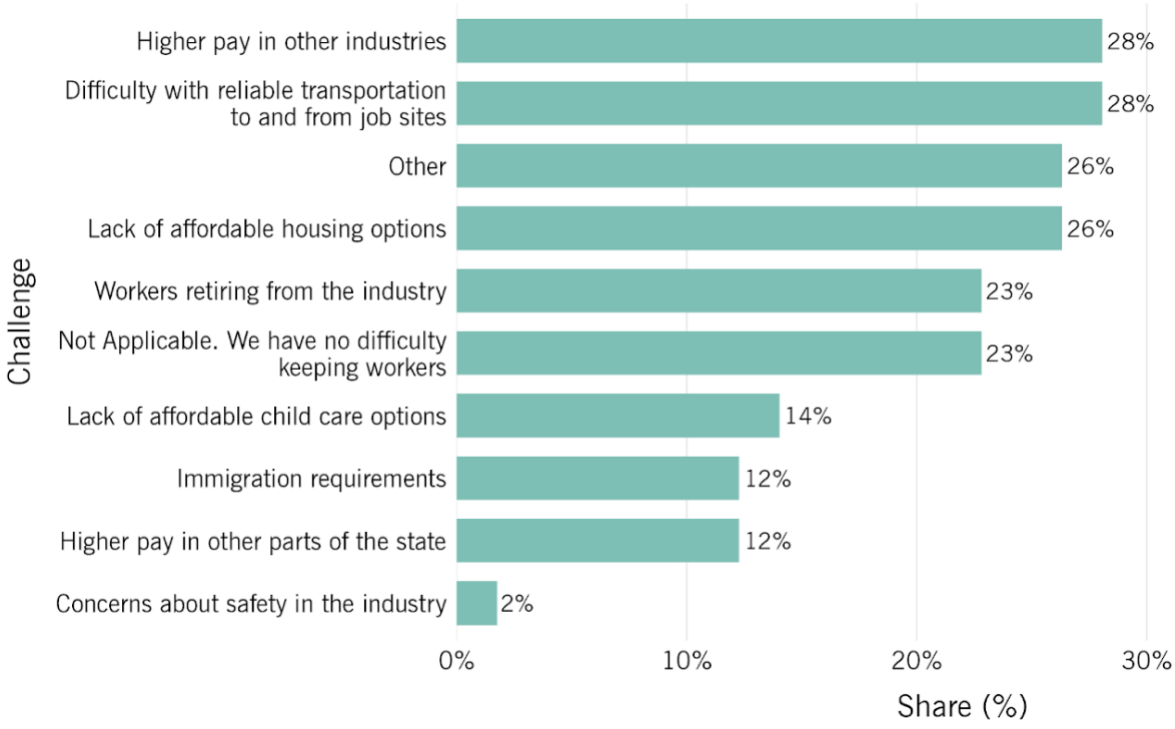


Note: Response options included Strongly Agree and Agree (shown combined as Agree) and Strongly Disagree and Disagree (shown combined as Disagree).

Top retention challenges include competition from other industries, reliable transportation for workers, and affordable housing. Survey respondents report a range of challenges to keeping workers in their company (Exhibit 38). In addition to the top responses of higher pay in other industries (28%), transportation difficulties to and from job sites (28%), and a lack of affordable housing options (26%), top "other" responses (26%) included a lack of demand in the construction industry, leading to layoffs, and a lack of reliable or skilled workers. Many additional factors contribute to employee retention, including workers retiring from the industry (23%), access to affordable child care (14%), immigration requirements (12%), and higher pay in other regions (12%). Just under a quarter of respondents indicated that they have no difficulty keeping workers.

Exhibit 38. Top Retention Challenges

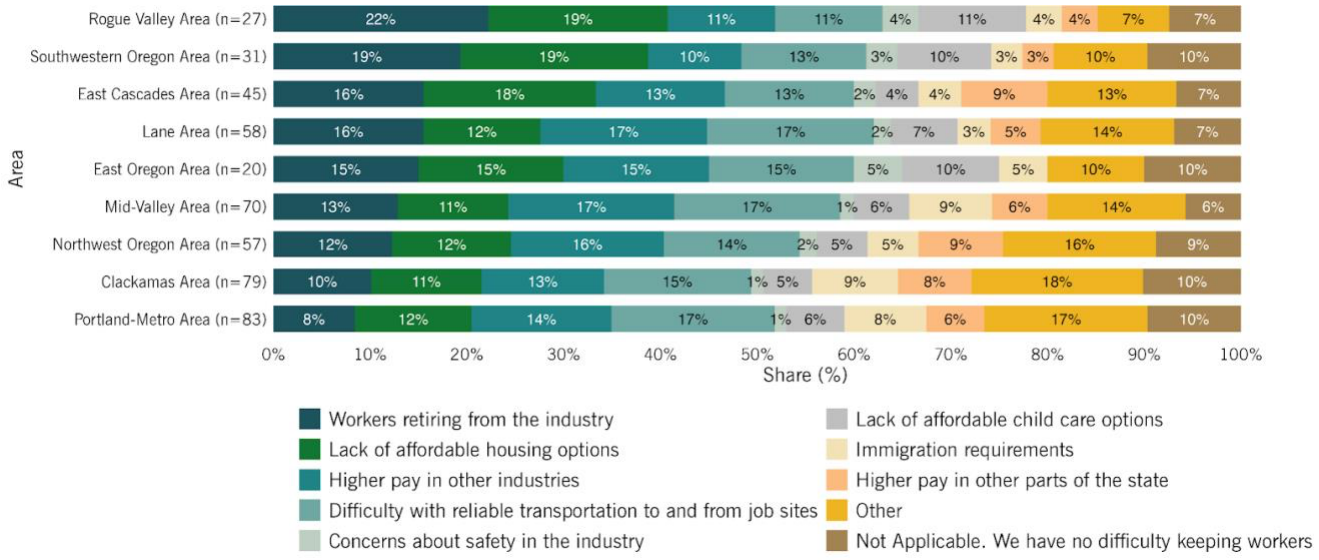
Survey Question: What are the top three challenges to keeping workers in your company? Select up to three.



There is some geographic variance in reported causes of workforce retention difficulties, with similar caveats about interpretability as noted above: regional differences may or may not reflect actual differences in workforce challenges, given small sample sizes in some response groups and respondents operating in multiple regions. Respondents with company operations in relatively rural areas reported workers retiring from the industry, lack of affordable housing options, and higher pay in other industries as top challenges. Respondents with company operations in more-urban areas reported difficulty with reliable transportation to and from job sites, higher pay in other industries, and lack of affordable housing options as top challenges (Exhibit 39).

Exhibit 39. Retention Challenges by Location

Survey Question: What are the top three challenges to keeping workers in your company? Select up to three.



SOURCES OF SKILLED LABOR

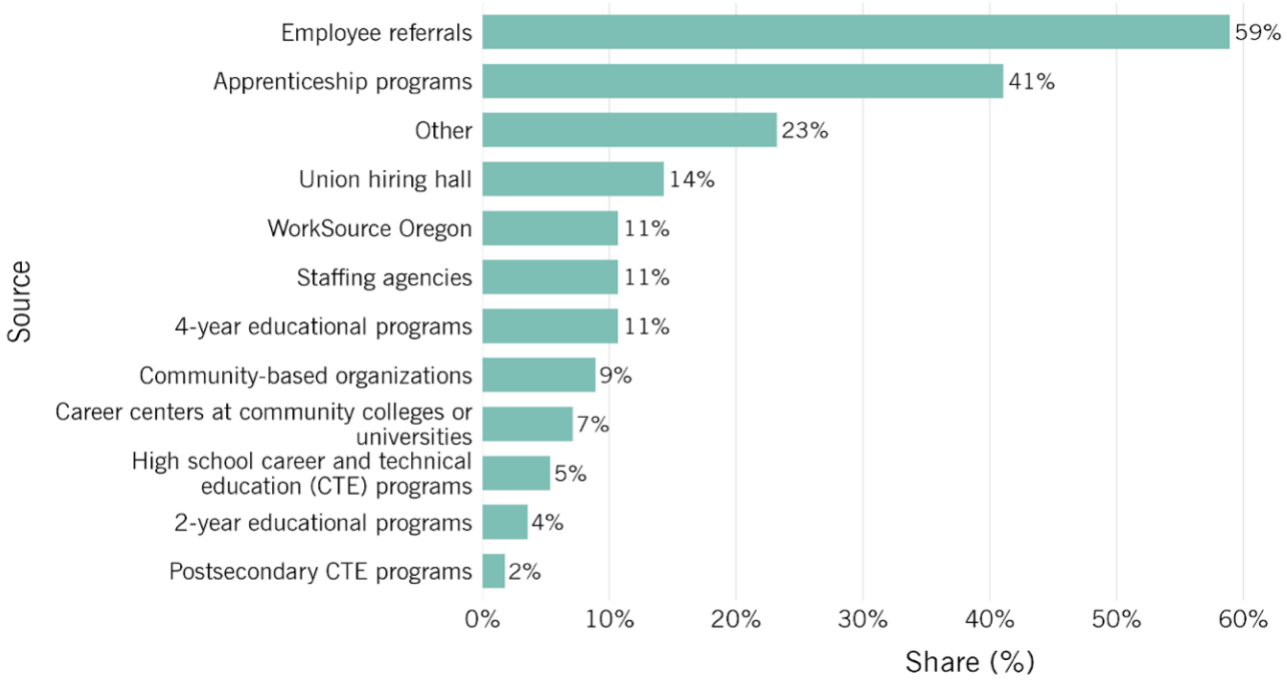
Respondents cited employee referrals (59%) and apprenticeship programs (41%) as the most reliable sources of skilled workers for their companies, indicating a strong reliance on informal networks and on-the-job training (Exhibit 40). Union hiring halls (14%), WorkSource Oregon (11%), and staffing agencies (11%) also contribute, but to a lesser degree. Postsecondary CTE programs and 2-year educational programs are less common sources (2% and 4% respectively). Overall, respondents favor sourcing candidates from existing employee networks. Respondents who selected “Other” indicated sourcing skilled workers through immediate social circles, word of mouth, and websites such as Indeed and ZipRecruiter.

Respondents were also asked to list specific programs or organizations that provide their company with skilled workers. Common responses included referrals, apprenticeship programs, unions, and WorkSource Oregon. Unique organizations mentioned included the

Oregon Association of Minority Entrepreneurs, Alternative Youth Activities, Heart of Oregon, Youth Build, and halfway houses.

Exhibit 40. Sources of Skilled Workers

Survey Question: Which of the following reliably provide your company with skilled workers? Select all that apply.



WORKFORCE DIVERSIFICATION

Most respondents (74%) reported that their companies are actively trying to diversify their workforce (Exhibit 41). Of those who reported workforce diversification efforts, 77 percent indicated that they are trying to diversify by race/ethnicity and 70 percent indicated that they are trying to diversify by gender (Exhibit 42). Respondents indicating "Other" (30%) mentioned being equal opportunity employers who welcome all backgrounds; a few specified trying to increase the number of Spanish-speaking individuals or veterans among their workforce.

Exhibit 41. Diversification Efforts

Survey Question: An increasing number of companies are interested in hiring and keeping employees from diverse backgrounds. Is your company actively trying to diversify its workforce (by gender, race/ethnicity, or other characteristic)?

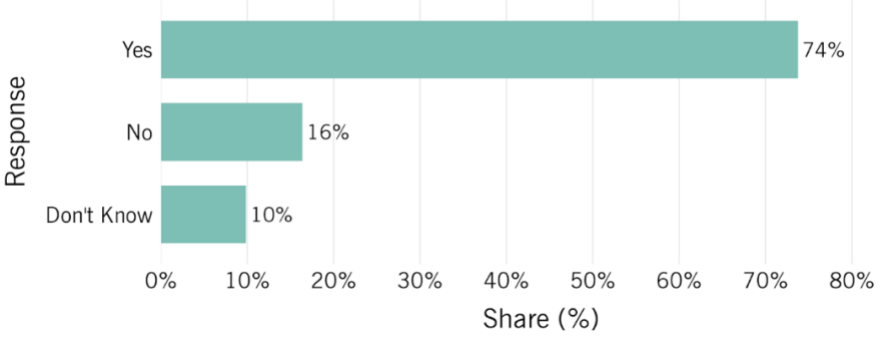
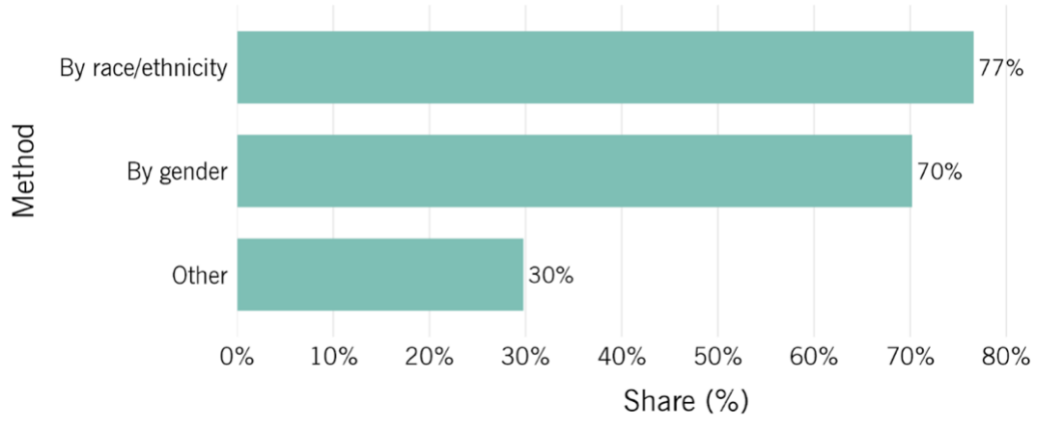


Exhibit 42. Diversification Type

Survey Question: How are you trying to diversify your workforce?



Respondents reported more difficulty achieving gender diversity in their workforce compared to racial or ethnic diversity. Just over one third (36%) of those who are trying to diversify by race/ethnicity note difficulty doing so (Exhibit 43) compared to two thirds (64%) of those who are trying to diversify by gender (Exhibit 44). Nearly half (46%) are having difficulty filling positions with diverse applicants by the other characteristic(s) noted in the previous question (see Appendix).

Exhibit 43. Difficulty Diversifying by Race/Ethnicity

Survey Question: Are you having difficulty filling positions with diverse applicants by race/ethnicity?

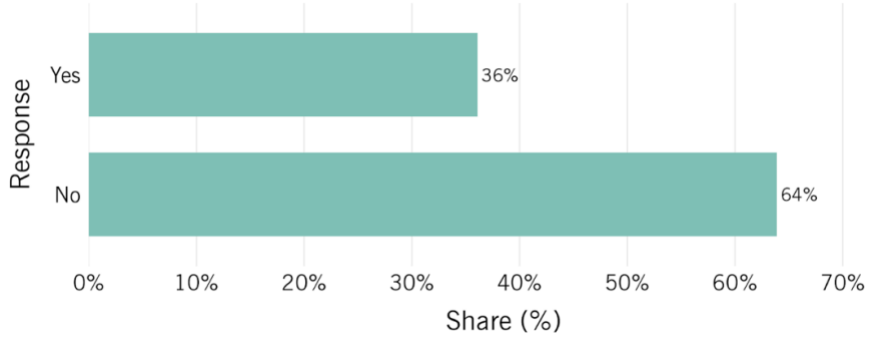
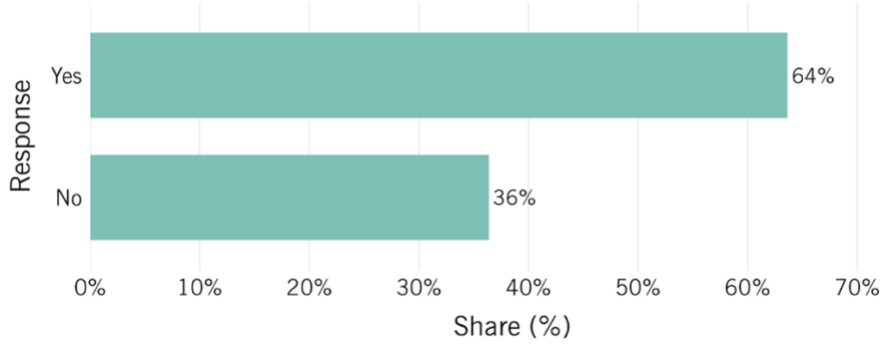


Exhibit 44. Difficulty Diversifying by Gender

Survey Question: Are you having difficulty filling positions with diverse applicants by gender?



Survey takers were asked what strategies industry groups, workforce development providers, or schools could use to help them meet their diversity goals (an open-ended question). Many emphasized the need for outreach to underrepresented communities, suggesting approaches such as early exposure to the trades at the middle school and high school level, promotion of apprenticeship application cycles to diverse youth, mentorship programs, and support for affiliate organizations like the National Association of Women in Construction (NAWIC).

ADDRESSING LABOR SHORTAGES

An open-ended question about addressing labor shortages ("In your opinion, what is the most effective way for companies or the government to address labor shortages?") elicited responses focused on the importance of education in elementary, middle, and high school to shift the cultural narrative and communicate to young people the viability of career paths in the trades. Multiple respondents also remarked that simplifying immigration processes is important to addressing critical labor shortages. Additionally, respondents discussed the importance of lowering the cost of training and receiving certifications for low-income students or individuals through financial assistance or subsidies.

One respondent, considering non-traditional pathways to the trades, commented on the potential for veterans: "I think military to construction, especially for officers, should be a huge focus. Those folks fit in great in our trade and many others." Another remarked on the potential for stronger return-to-work programs for unemployed individuals or trades employees that were injured on the job.

PERSPECTIVES ON THE STATE HOUSING PRODUCTION GOAL

About 40 percent of respondents who answered the open-ended question, "What do you think will be the most important workforce challenge(s) with the expected increase in housing production in response to the State's goal?" mentioned the need for more skilled labor, with one respondent saying that "the current labor shortage would likely get worse with the increased demand [associated with the goal]." There was also recognition that workers' wages need to keep pace with rising costs of living, and that that could help ensure the quality of housing being constructed, which was a concern for multiple respondents

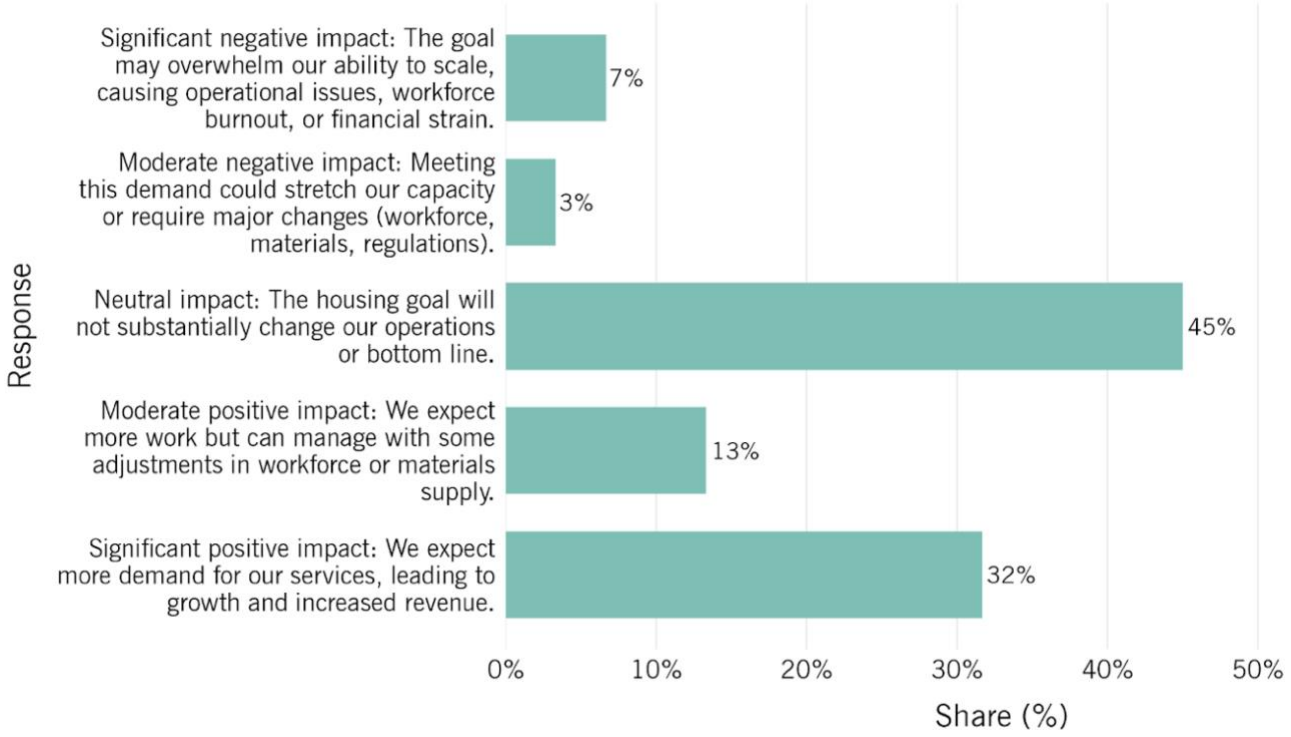
Many discussed the challenges of land availability, getting projects approved, and permitting so that projects can continue to move forward. There was also concern about ensuring that the state would be working with local, small businesses rather than large out-of-state businesses.

Respondents were next asked to assess the potential impact of the State's housing goal on their company's operations. The largest individual share of respondents (45%) felt that the housing goal would have a neutral impact, affecting neither their operations nor their bottom line (Exhibit 45). Only 10 percent anticipated either a moderate negative or a

significant negative impact, and about 45 percent anticipated a moderate positive or significant positive impact (with 32 percent reporting the latter).

Exhibit 45. Perspectives on Potential Impacts of the State's Housing Goal

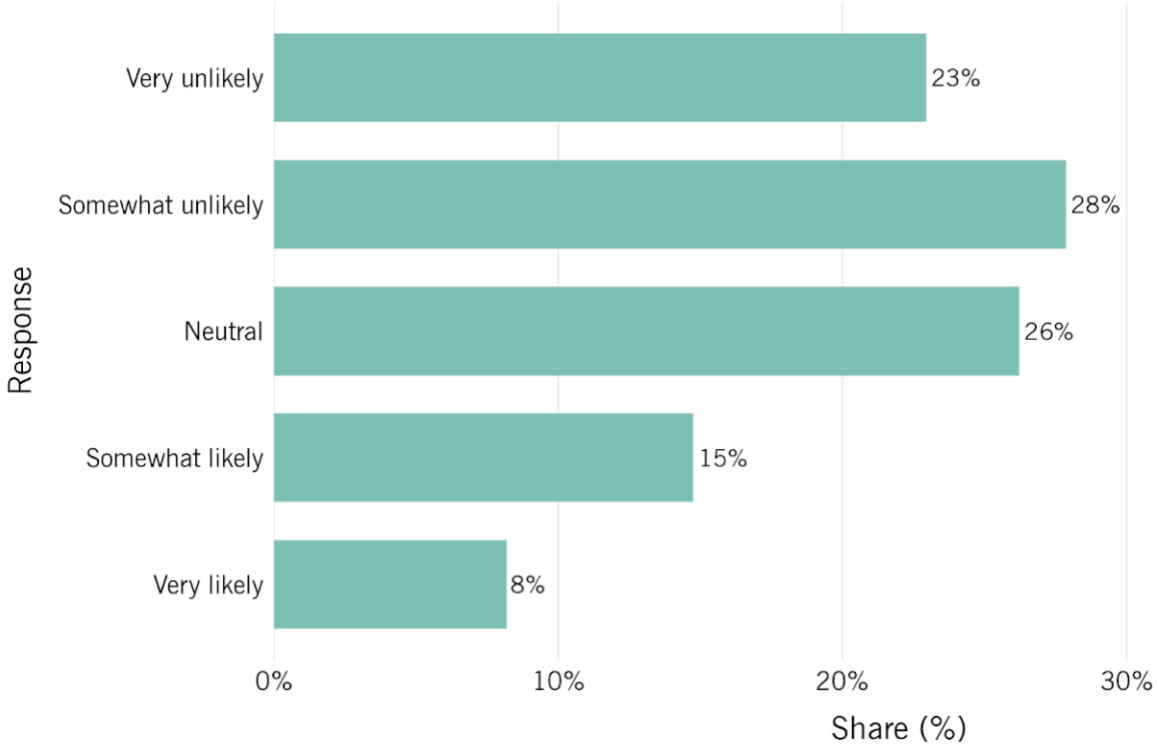
Survey Question: What impact do you believe the State's housing goal will have on your company's operations?



Half of respondents (51%) were skeptical that the State's housing production goal would be met (Exhibit 46). Another quarter (26%) expressed neutrality. The relatively low confidence levels reflected in these findings signal concerns among respondents about the feasibility of scaling up housing production to meet state targets. Such perceptions may reflect underlying challenges identified in earlier survey findings, such as workforce shortages, governmental delays, and other development hurdles, which could impede progress toward meeting the goal within the specified timeline.

Exhibit 46. Perspectives on the Likelihood of Meeting the Housing Production Goal

Survey Question: How likely do you think it is that the State's housing goal will be met, given current industry conditions (workforce availability, supply chain issues, permitting, access to funding, regulations)?



The survey's final question was open-ended: "Please share any additional thoughts on the State's annual housing production target." One respondent summed up many of the major challenges emphasized throughout the survey responses: "Achieving this goal under current industry conditions seems unlikely without substantial changes. We need to address and plan for workforce availability, supply chain issues, permitting processes, access to funding, and regulatory hurdles."

Multiple respondents opined that funding levels would be a deciding factor in the state's success: "It's more about the funding than the goal. The state has to partner with lenders to make the process easier and smoother to fund the housing. Currently there are too many hurdles and the timeline is too long."

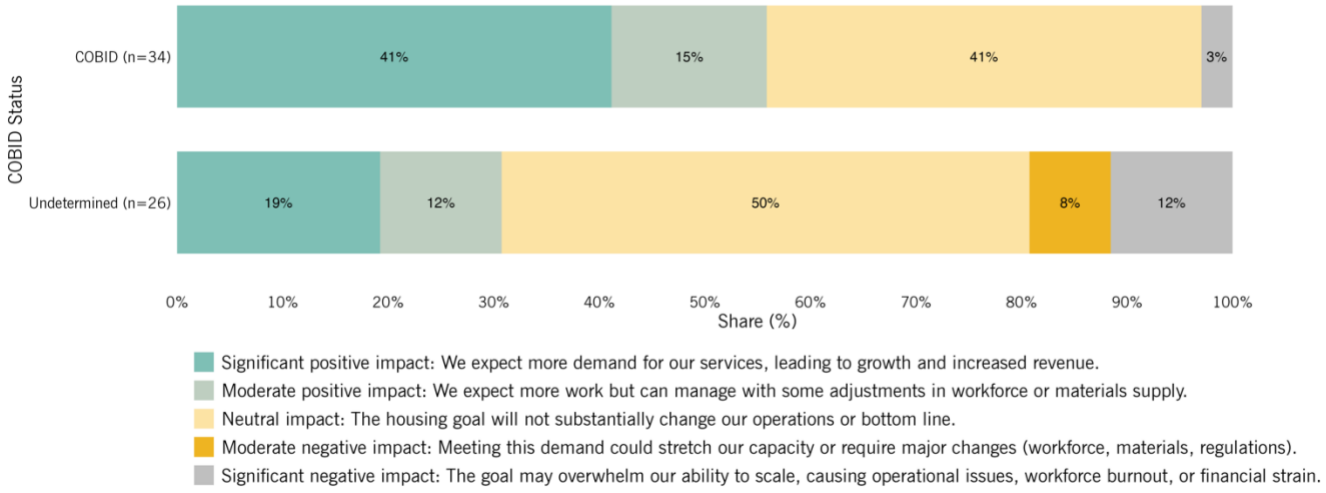
Two respondents raised the point that companies can be limited by their insurance coverage in terms of the projects they can work on. Companies might be prohibited from working on certain housing types, or the cost to get insurance coverage is unaffordable for them. With multiple respondents wanting to see more small, local businesses supported in the industry, State-backed insurance programs for developers and small builders could be something to consider.

The share of COBID-certified respondents who anticipate a significant positive impact from the State housing goal was more than twice that of those with Undetermined status. Among both cohorts, a sizeable share—41 percent of COBID-certified respondents and 50

percent of respondents with undetermined status—anticipate a neutral impact. Very few COBID-certified respondents expect a negative impact, with none anticipating a moderate negative impact and only 3 percent anticipating a significant negative impact. In comparison, among respondents with undetermined status, approximately 8 percent anticipate a moderate negative impact, and 12 percent anticipate a significant negative impact.

Exhibit 47. Perspectives on Potential Impacts of the State's Housing Goal by COBID Certification Status

Survey Question: What impact do you believe the State's housing goal will have on your company's operations?



Interviews and Focus Groups

To gain deeper insights beyond what survey and quantitative data revealed, we conducted six targeted interviews with representatives of key interested parties such as workforce boards, labor unions, and construction employers, to better understand the complexities of the housing production workforce. These conversations provided a nuanced understanding of the challenges and complexities facing Oregon's housing production workforce.

In addition to interviews, we organized three focus group sessions designed as collaborative forums for open dialogue. These sessions brought together diverse perspectives, including community college programs, apprenticeship and pre-apprenticeship programs, union representatives, and planning and permitting offices (e.g., building code inspectors). Each group contributed critical insights that highlighted both common themes and sector-specific challenges.

While outreach efforts were extensive, certain perspectives were ultimately not represented in the engagement activity due to scheduling constraints and the project timeline. Future engagement with additional perspectives could yield additional valuable insights into the housing production workforce.

Housing Production Training Programs and Pathways

Our engagement with employers suggests variation across Oregon's housing production job training programs in terms of availability and student interest. Building code officials reported the most consistent shortfall in trained staff, despite having available programs with spaces for students. Trades apprenticeship programs demonstrate flexibility but remain constrained by external factors, particularly the consistent availability of construction work by which to train students and in some, typically more rural, geographies, enough journey-level workers to fulfill the required 1:1 ratio of apprentice-to-journey-level-worker.

BUILDING CODE PROFESSIONAL TRAINING PROGRAMS

Oregon is not producing enough building code professionals to meet current or future demand. The Oregon Employment Department (OED) estimates that the state needs to produce 155 inspectors annually to replace 145 retirees and add 10 new (growth) positions each year.[28] About 45–50 individuals graduated from Oregon's code professional programs annually in 2020–22.[29] This current annual shortfall of approximately 105 inspectors leaves critical gaps in Oregon's capacity to staff permitting and inspection roles, resulting in bottlenecks in permitting and inspections and hindering housing production.[30] Respondents familiar with the program at Chemeketa Community College suggest that students are deterred from its cost and two-year time commitment. Other jobs in the trades rely on an apprenticeship model where apprentices are trained on-the-job and paid during training. In an effort to eliminate these barriers and encourage more students to pursue a career in inspection, the Oregon Building Officials Association (OBOA) is working on putting together a program that functions like an apprenticeship program for residential code inspectors.

Currently, most inspectors complete a two-year program, obtain certification, and are then employed by jurisdictions. While it is possible to do self-study and take the exams without the program, very few individuals take this path as it is technically challenging and time consuming. A proposed alternative to the school-based program would allow jurisdictions to employ apprentices while they simultaneously take classes and progressively obtain certifications. This approach, potentially sponsored by the OBOA and administered through a JATC, would integrate hands-on experience with classroom instruction, providing a pathway that aligns more closely with traditional apprenticeship programs.

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[28] "Construction and Building Inspectors (474011) Oregon (All Counties)." State of Oregon Employment Department. https://qualityinfo.org/web/guest/oprof?occProfSearchTerm=474011&occProfSearchResults=474011&occProfAreas=4101000000&occprof_RptType=0&occProfName=&occProfJSID=&expandedState=00000110000000&oedPageNumber=undefined&hwolPageNumber=undefined

[29] Chemeketa Community College, Portland Community College, and Building Code Division's Oregon Inspector Training. Dan Carlson. "Building Inspection." Chemeketa Community College. https://prezi.com/view/7Ev1XNuRatPksJy0xEQ9/

[30] "State of Oregon Housing Production Advisory Council Recommendations Report." Housing Production Advisory Council. https://www.oregon.gov/gov/policies/Documents/HPAC%20Final%20Report%20February%202024.pdf

The new model would provide a faster path to employment that is funded and predictable, making it a more viable career path option, while also providing a structured pipeline of trained code professional workers, offering relief to jurisdictions dealing with increased work and workforce shortages.

APPRENTICESHIP PROGRAMS

Unlike the persistent workforce gap for building officials, Oregon's union apprenticeship programs for trades have the scalability to meet workforce demand—if and when sufficient construction work is available. This cyclical relationship between program enrollment and job availability shapes the capacity of these programs to respond effectively to workforce needs. For example, International Brotherhood of Electrical Workers (IBEW) training centers in Coos Bay and Newport operate with 30 to 45 apprentices enrolled and report an additional 50 to 60 individuals on their waiting list. The lack of local construction jobs along the Oregon coast prevents the current apprentices from gaining necessary hands-on experience and limits opportunities for those on the program waitlist. Similarly, the Portland metro area's IBEW training center has 1,600 individuals on its apprenticeship waiting list, 60 unemployed apprentices, and 550 journey-level workers on their out-of-work list due to insufficient job opportunities.

"We need the work now so we can be training people. You have to have work in order to build a workforce." – Workforce Board Participant

"A lot of the training you have to watch, be in the environment, and see how it is working." – Construction Employer

Respondents emphasized the hardest part of workforce training in apprenticeship programs is anticipating trends in construction work demand. Overestimating demand risks saturating the labor market, while underestimating it perpetuates shortages in skilled trades. Respondents broadly agree that on-the-job training (OJT) is critical for developing the practical skills necessary in the housing construction industry.

However, opinions diverge around the structure of OJT, particularly regarding apprenticeship programs. Union programs value the strict 1:1 apprentice-to-journey-level-worker ratio for mentorship, safety, and high-quality training. This structure allows apprentices to receive individual attention and hands-on guidance, ensuring they build a strong foundation of skills. Unions also argue this ratio is critical for maintaining safety on construction sites—for both apprentices and the journey-level workers supervising them.

"The purpose of an apprenticeship program is to get a strong foundation and you can only get that with singular mentorship. The quality of training will suffer if there are multiple apprentices to one journeyman." – Union Representative

"[Ratios] are there for the safety of the building being constructed, the journeyman, and apprentice. They can get good training and adequate, safe installations." – Union Representative

Non-union employers and other respondents challenged the 1:1 ratio during our conversations, arguing that it limits flexibility, especially in rural areas where there is already a shortage of journey-level worker. Without sufficient journey-level workers to mentor apprentices, rural employers struggle to expand their workforce. In addition, rural employers struggle to attract new talent because their compensation packages are not as competitive as those in urban regions. Both factors have contributed to making it harder for small, rural construction businesses to stay afloat.

"In rural Oregon, there is limited workforce and only so many journeymen. New electricians can't ever level up because they're bound by this restriction. Once they journeyman out, they find other opportunities with higher pay and unions. The mom and pop shop struggles from this. Most of my subs can't handle that loss." – Construction Employer

Non-union employers also argue that increasing the ratio of apprentices to journey-level workers could help address workforce shortages by training more workers simultaneously. Union representatives refute this argument by expressing concern that increasing ratios prioritizes cost-saving over training quality.

"The impetus to increase ratios is only to have a cheaper workforce to increase workforce to build houses. Apprentices make only a percentage of the journeyman wage." – Union Representative

Unions argue that increasing ratios would dilute the quality of mentorship, leaving apprentices inadequately trained and jeopardizing the safety and integrity of the work. They also stress that training more apprentices without a corresponding increase in available jobs risks creating an oversaturated labor market, leaving apprentices and journey-level workers unemployed or underutilized.

EVOLVING CAREER PATHWAYS

Several significant transformations are underway in the pathways from trades to supervisory or office-based roles. Historically, roles such as building inspectors or superintendents were filled by tradespeople transitioning due to injury, age, or desire for

career changes. But with wages for office-based roles often less competitive than those in the trades, this career pathway has become less appealing to many trades workers who, despite having the desire for change, can't afford to make the change.

Respondents spoke of several emerging pathways that are new to the industry. First is the growth in the advancement of permit technicians—a role traditionally held by women—into building inspector positions, which offers opportunities to diversify the workforce. Building inspector professionals noted this career path as a promising strategy to address gender representation gaps. Similarly, graduates of four-year construction programs bring to employers a great set of business/office/blueprint skills but are less trained in on-site construction skills. Construction companies have increasingly hired such graduates as "field engineers" (an emerging term) with potential to progress into superintendent roles as they grow their construction skills.

Unlike apprenticeship programs with on-the-job training and pay, four-year construction programs have out-of-pocket school costs similar to other four-year degrees. However, a recent graduate we spoke with was comfortable with that debt, given the many job opportunities she found after graduation and their pay level, which allowed her to reduce her debt, live comfortably, and save. She also commented on the growth opportunities she saw in her future in sales, management, or the wide range of careers in the industry. Compared to her friends who graduated with other majors, she considers herself lucky. She described the broader opportunities provided by a construction degree compared to traditional apprenticeship programs:

"Apprenticeships are known to be hands-on. With a construction degree, you can see so much more like project management, bidding, costs, maintenance, etc. A lot of people don't understand the opportunities you have in project management."
– Recent Union Apprenticeship Graduate

These evolving pathways underscore the growing complexity of the housing construction industry and the need to adapt educational and training programs to align with changing career dynamics and industry trends.

GENDER INCLUSIVITY IN THE WORKPLACE

Company work culture plays a pivotal role in shaping women's ability to enter and advance in the historically male-dominated industry of construction. Women employees shared a range of experiences, from positive accommodations to persistent challenges.

A woman building official recounted how her authority and expertise are often questioned by contractors, requiring her to go above and beyond to prove her competence.

"I feel like I have to know 50 percent more than my male counterparts. I will put my first initial instead of my name when signing plans so people won't know I'm a woman." – Building Official, Woman

Some companies described making concerted efforts to create safer, more accommodating environments for women. This includes policies such as flex hours and lactation accommodations as well as on-site accommodations like women-only lockable port-a-potties and increased lighting for safety during early or late hours on job sites.

"I know that I'm a number on the job site and that ups our COBID points." – Construction Employee, Woman

Programs like COBID (Certification Office for Business Inclusion and Diversity) also support workforce diversity by encouraging the employment and retention of underrepresented groups. One woman explained that she feels job security at her place of employment because of these COBID supports.

Another woman business owner spoke of the commitment she is making to ensuring a safe and inclusive environment for women in her firm, but as a small subcontractor, her team is in regular contact with other firms on larger projects and she worries about the "larger construction culture" and how much control she can have on those projects for her crew. Overall, we observed that gender inclusivity was on people's minds and that efforts, slow as they are, are being made.

PERCEIVED GAPS IN CURRENT PROGRAM OFFERINGS

Some employers expressed frustration with the disconnect between the skills new hires bring and the demands of the workplace. They shared the perspective that, while a balance of practical experience and technical expertise is essential, current programs often fail to adequately address both. Employers then feel responsible for bridging the gap through additional OJT.

"Reading blueprints in a college setting is a good base layer. But they still need to see how things get stuck together, there's less of the trades education. We have to do one or the other. If they are coming from the trades, they need to learn technical, Excel stuff. But if they are coming from the other side, then they need to know how to put a nail into wood." – Non-Union Construction Employer

For building inspectors, the level of technical expertise required can vary significantly depending on specialization. Inspections related to energy codes, for example, demand a higher level of technological understanding than do more-traditional plan examination roles. As energy standards evolve, the gap between workforce training and industry needs widens. On the other hand, union apprenticeship programs and community colleges view pre-apprenticeship programs as vital for focusing on essential skills, which apprenticeship

programs may be lacking, and introducing diverse candidates to the industry. These programs cultivate essential skills like communication and teamwork while introducing basic construction practices.

A recurring theme among respondents is the need for holistic programs that integrate practical, technical, and essential skills. Current offerings tend to specialize in one area at the expense of others, forcing employers to choose between candidates with technical knowledge but limited field experience, or those with hands-on expertise but insufficient familiarity with modern tools or processes. We did speak to some successful partnerships between community colleges and industry partners who were working together to build tailored programs to address specific industry needs. Ongoing open communication, OJT training opportunities, and flexible curriculum seem like important factors in ensuring up-to-date worker training.

4. Program Inventory

This chapter includes inventories of three types of education and training programs relevant to Oregon's housing production sector: career and technical education (CTE) in the K12 system, apprenticeship and pre-apprenticeship programs, and postsecondary credential programs. While the Oregon housing production workforce is not exclusively trained by programs in Oregon, the state's programs and pathways are key to the stability and expansion of the sector's workforce.

Importantly, the data and analysis included in this chapter do not identify whether individual program completers work or are available for employment in the state, nor do they definitively determine an individual´s occupation, industry, or specific role as an employee.

Career and Technical Education Programs

In the 2024-25 school year, 100 high schools across Oregon had one or more CTE programs in the Architecture & Construction (A&C) CTE Career Cluster: 86 high schools had general architecture and construction programs, 10 had carpentry programs, and 9 had architectural design programs.[31] Exhibits 48 through 51 provide tabulations of these CTE offerings by region, program type, and program skill level. Nearly all programs have tracks at all three skill levels (advanced, intermediate, and introductory). Program enrollment data were not available at the time of writing.

Exhibit 48. Number of High Schools in Oregon with a CTE Program in the Architecture & Construction Career Cluster, 2024-25

Workforce Area	High School Count	Number of Schools with Skill-Level Program		
		Advanced	Intermediate	Introductory
Clackamas Area	5	4	4	4
East Cascades Area	14	12	14	14
Eastern Oregon Area	5	5	5	5
Lane Area	14	14	14	14
Mid-Valley Area	14	13	11	14
Northwest Oregon Area	9	6	7	7
Portland-Metro Area	25	23	24	24
Rogue Valley Area	5	4	4	4
Southwestern Oregon Area	9	8	8	9
Total	100	89	91	95

Data source: ODE. Note: Includes Architecture & Construction, Architectural Design, and Carpentry programs.

[31] ODE Approved CTE Programs (Detail), https://www.ode.state.or.us/apps/CTEReports/ApprovedPrograms/Details

Exhibit 49. Number of High Schools in Oregon with a CTE Program in General Architecture & Construction, 2024-25

Workforce Area	High School Count	Number of Schools with Skill-Level Program		
		Advanced	Intermediate	Introductory
Clackamas Area	5	4	4	3
East Cascades Area	13	11	13	13
Eastern Oregon Area	5	5	5	5
Lane Area	13	13	13	13
Mid-Valley Area	9	8	7	9
Northwest Oregon Area	5	4	3	5
Portland-Metro Area	23	22	23	23
Rogue Valley Area	4	4	4	4
Southwestern Oregon Area	9	7	8	9
Total	86	78	80	84

Data source: ODE

Exhibit 50. Number of High Schools in Oregon with a CTE Program in Carpentry, 2024-25

Workforce Area	High School Count	Number of Schools with Skill-Level Program		
		Advanced	Intermediate	Introductory
Clackamas Area				
East Cascades Area	1	1	1	1
Eastern Oregon Area				
Lane Area				
Mid-Valley Area	4	4	3	4
Northwest Oregon Area	4	2	3	2
Portland-Metro Area				
Rogue Valley Area	1	0	0	0
Southwestern Oregon Area				
Total	10	7	7	7

Data source: ODE

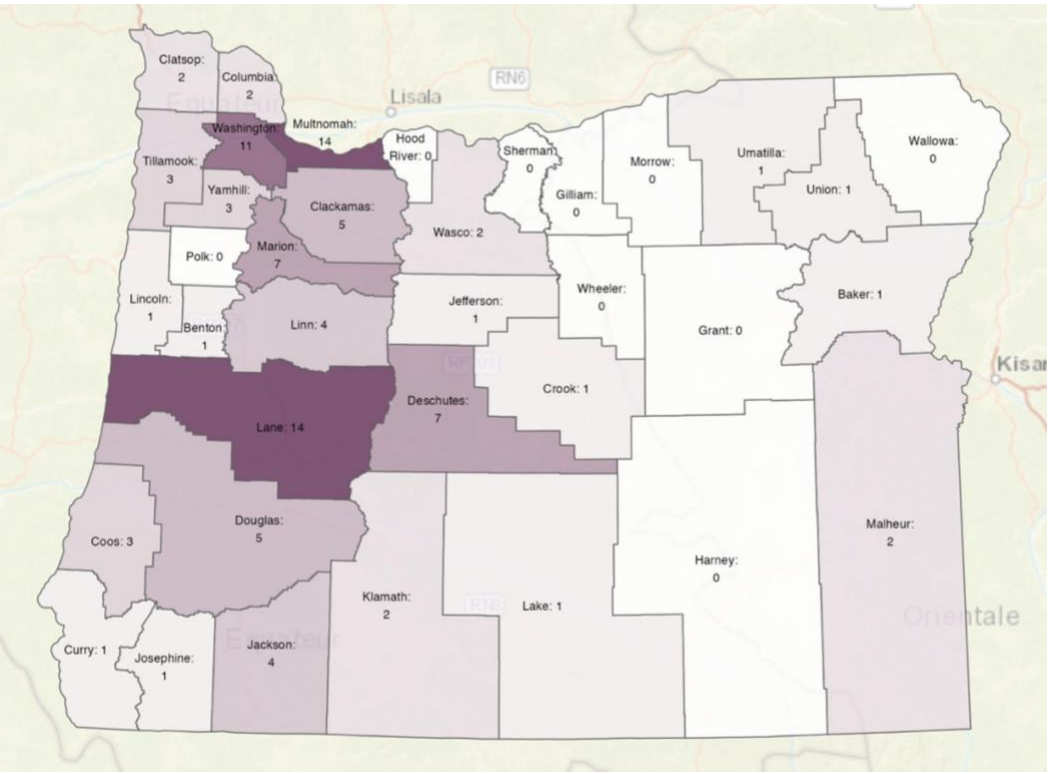
Exhibit 51. Number of High Schools in Oregon with a CTE Program in Architectural Design, 2024-25

Workforce Area	High School Count	Number of Schools with Skill-Level Program		
		Advanced	Intermediate	Introductory
Clackamas Area	1	1	1	1
East Cascades Area				
Eastern Oregon Area				
Lane Area	1	1	1	1
Mid-Valley Area	2	2	1	2
Northwest Oregon Area	1	1	1	1
Portland-Metro Area	3	2	2	2
Rogue Valley Area				
Southwestern Oregon Area	1	1	1	1
Total	9	8	7	8

Data source: ODE

Exhibit 52 displays the number of high schools in each county with an A&C CTE program. Multnomah and Lane counties have the highest number of high schools with programs. Several counties have no high schools with programs. Additional analysis is required to understand the pathways CTE students take after participating in a program. Mobile classrooms such as those employed in Central Oregon Construction Sector Partnership could help extend the reach of CTE programming.

Exhibit 52. Number of High Schools with CTE Programs in the Architecture & Construction Career Cluster, 2024-25



Data source: ODE. Note: Includes Architecture & Construction, Architectural Design, and Carpentry programs.

Apprenticeship and Pre-Apprenticeship Programs

Apprenticeship and pre-apprenticeship programs are a key aspect of the housing production training ecosystem. The data used in this section's analysis were provided by Oregon's Bureau of Labor and Industries (BOLI). We quantify the potential flow into the labor force of individuals who are formally trained apprentices.

Apprenticeship Programs

The tables in this section include apprenticeships registered in 2018 or later and so provide only a partial picture of the apprenticeship pipeline, as many programs require multiple years to complete and most apprentices who began their programs in recent years will require more time to complete. Moreover, the COVID-19 pandemic affected completions and starts in 2020 and subsequent years, making recent changes in trends less informative than they might otherwise have been.

Exhibit 53 provides counts of active apprentices and completed apprenticeships in programs associated with housing construction. The largest category is electricians, with more than 3,000 active apprentices in Oregon as of September 2024, followed by plumbers, pipefitters, and steamfitters. A total of 7,100 apprentices were active in Oregon in late 2024. The column on the right provides a sense of completions per year—in 2023, Oregonians completed about 1,500 construction-related apprenticeships.

Exhibit 53. Number of Active Apprentices and Completed Apprenticeships, Construction Industry, Oregon

Occupation Title	Active (as of 9/20/2024)	Completed (2023)
Electricians	3,132	686
Plumbers, pipefitters, and steamfitters	1,498	346
Carpenters	659	167
Sheet metal workers	398	66
Drywall and ceiling tile installers	327	89
Construction laborers	257	54
Heating/air cond./refrigeration mech., installers	211	27
Roofers	198	24
Oper. engineers / construction equip. operators	107	9
Cement masons and concrete finishers	84	16
Maintenance and repair workers, general	83	18
Painters, construction and maintenance	67	10
Glaziers	37	12
Insulation workers, floor, ceiling, and wall	25	7
Tile and stone setters	19	4
Total	**7,102**	**1,535**

Data source: Oregon BOLI

Exhibit 54 disaggregates the 1,535 completions in 2023 by workforce region and occupation. Each region had completions, and the largest regions (by population) each had completions in all but one or two of the construction occupations.

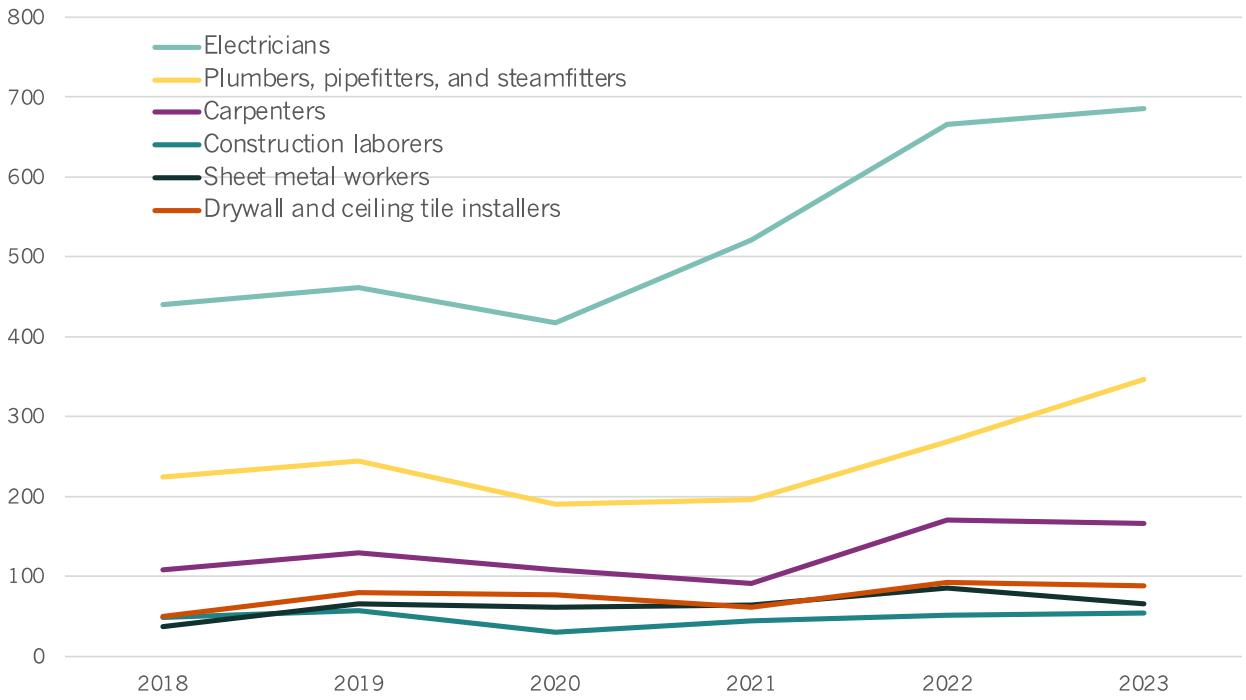
Exhibit 54. Completed Apprenticeships by Workforce Region, Construction Industry, Oregon, 2023

Occupation Title	Clack-amas	East Cascades	Eastern Oregon	Lane	Mid-Valley	NW Oregon	Portland-Metro	Rogue Valley	SW Oregon	Total
Electricians	94	85	16	57	129	50	209	30	16	**686**
Plumbers, pipefitters, and steamfitters	54	34	8	33	68	28	96	17	8	**346**
Carpenters	16	7	1	16	42	6	75	2	2	**167**
Construction laborers	11	6	4	3	3	2	23	2	-	**54**
Sheet metal workers	12	3	-	8	18	3	16	4	2	**66**
Drywall and ceiling tile installers	15	3	-	8	38	4	21	-	-	**89**
Roofers	-	-	-	1	3	-	20	-	-	**24**
HVAC mechanics and installers	2	-	-	3	2	3	14	3	-	**27**
Cement masons and concrete finishers	3	1	-	4	3	-	5	-	-	**16**
Oper. engineers / equipment operators	5	-	-	-	-	1	3	-	-	**9**
Painters, construction / maintenance	1	-	-	-	3	1	5	-	-	**10**
Maintenance and repair workers	7	1	-	1	2	-	7	-	-	**18**
Glaziers	3	-	-	1	2	3	3	-	-	**12**
Insulation workers, floor, ceiling, wall	2	-	-	-	1	-	4	-	-	**7**
Tile and stone setters	1	-	-	-	-	-	3	-	-	**4**
Total	**226**	**140**	**29**	**135**	**314**	**101**	**504**	**58**	**28**	**1,535**

Data source: Oregon BOLI

Exhibit 55 shows trends in completed apprenticeships from 2018 through 2023 for the occupations with the most completions statewide. Completions for most occupations dipped slightly in 2020 then began to increase in 2021, with nearly 700 electrician completions statewide in 2023.

Exhibit 55. Completed Apprenticeships, Construction Industry, Oregon

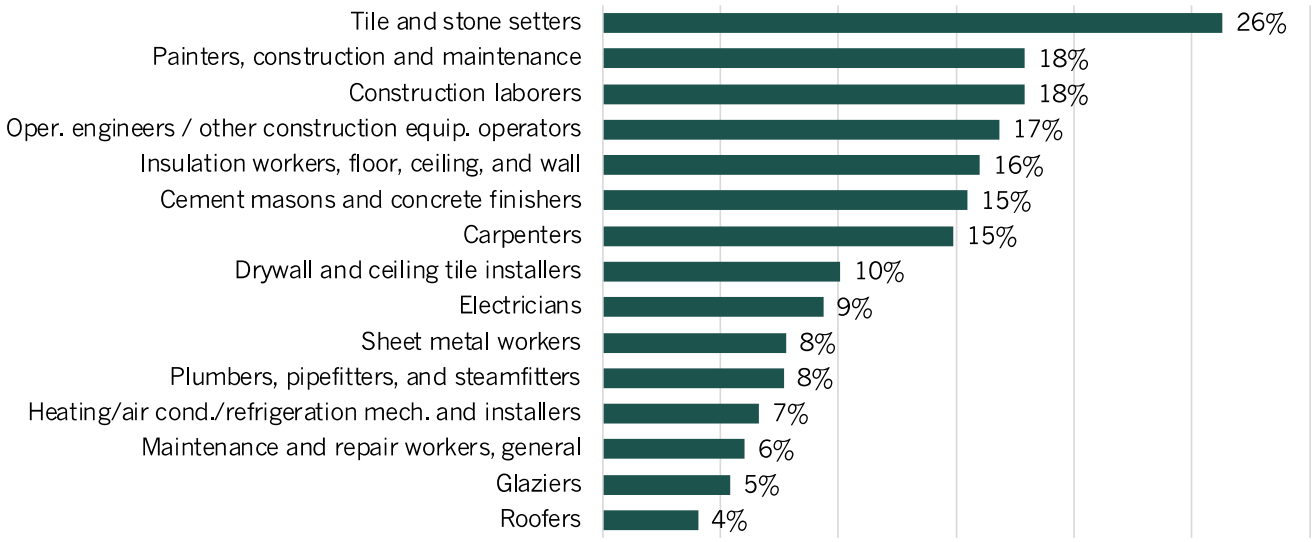


Data source: Oregon BOLI. Note: Showing occupations with the most completions statewide.

The final four exhibits depict apprentice demographics. Women are underrepresented across apprenticeship program participants—they represent just 4 percent of roofer apprentices and below 10 percent for half of the key occupations (see Exhibit 56). Women

make up between 15 and 18 percent of the other half of construction apprenticeships, and 26 percent of tile and stone setters. These figures are somewhat higher than estimates in Exhibit 17 for female representation in construction occupations and occupational groups, an indication of relatively more diversity in the training pathways leading to the occupations. Regardless, there remains much room for growth in female representation in construction occupations in Oregon.

Exhibit 56. Share of Apprentices Who are Women, Oregon, 2024



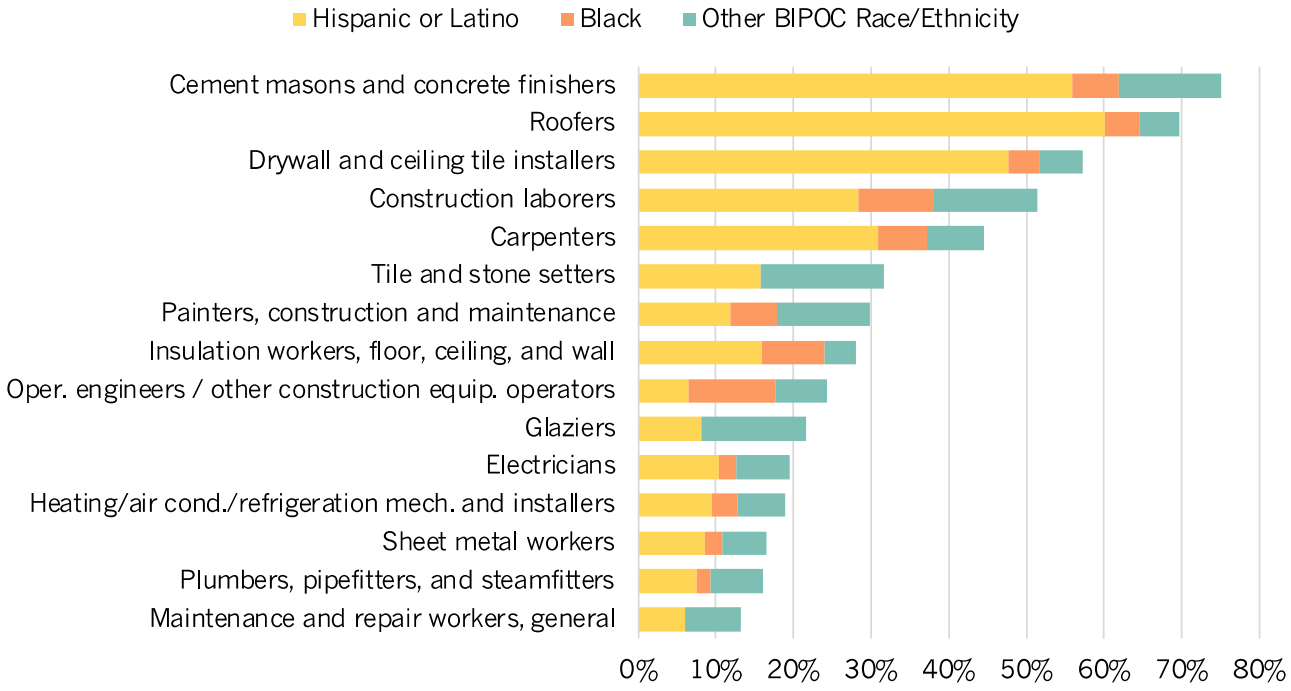
Data source: Oregon BOLI. Note: Active apprentices as of September 2024.

Likewise, Exhibit 57 displays the race and ethnicity of active apprentices, and active apprentices are more diverse than the current workforce in each occupation (see Exhibit 17). For example, 31 percent of carpenters in Oregon are BIPOC, compared to 44 percent of apprentices. As noted elsewhere in this report, occupational and wage differentials by race/ethnicity are important to track, to ensure opportunities across occupation types are available to people from all backgrounds.

The data also allow analysis of completion and termination rates.[32] The two subsequent exhibits provide the status of apprenticeships that began in 2018, 2020, 2022, and 2024, further broken down by sex (Exhibit 58) and race/ethnicity (Exhibit 59). Nearly all apprenticeships that began in 2018 are complete or terminated, with a lower completion rate for women (48%) than for men (58%). This pattern also holds for apprenticeships starting in 2020. Disaggregation by race/ethnicity (Exhibit 59) reveals similar trends and discrepancies. A relatively high share of apprenticeships end in termination, particularly among Hispanic and Black apprentices.

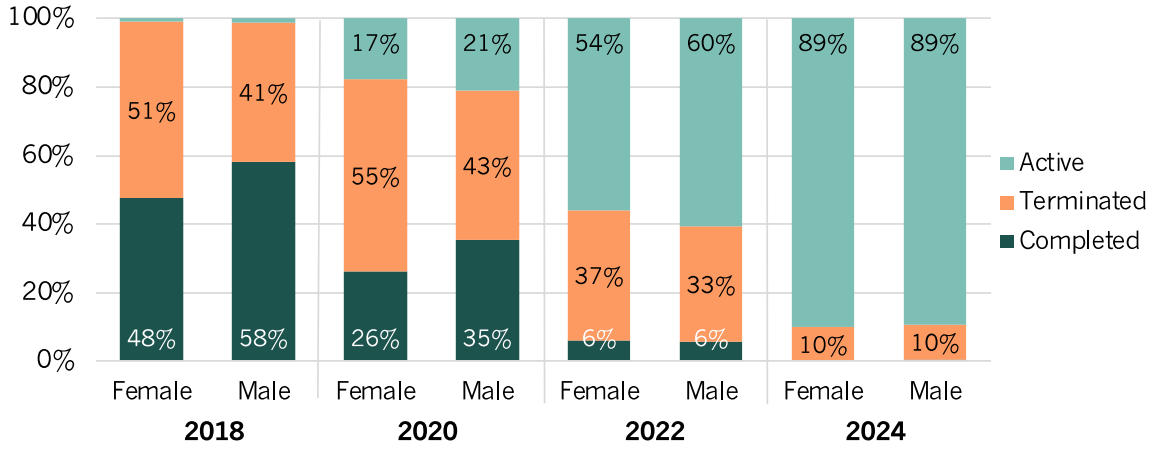
[32] "Termination of an apprentice may be voluntary or involuntary. Voluntary termination is non-disciplinary. Involuntary termination is disciplinary (for post-probationary apprentices, a reason is required; for probationary apprentices, no reason is required)." Source: BOLI.

Exhibit 57. Share of Apprentices Who are BIPOC, Oregon, 2024



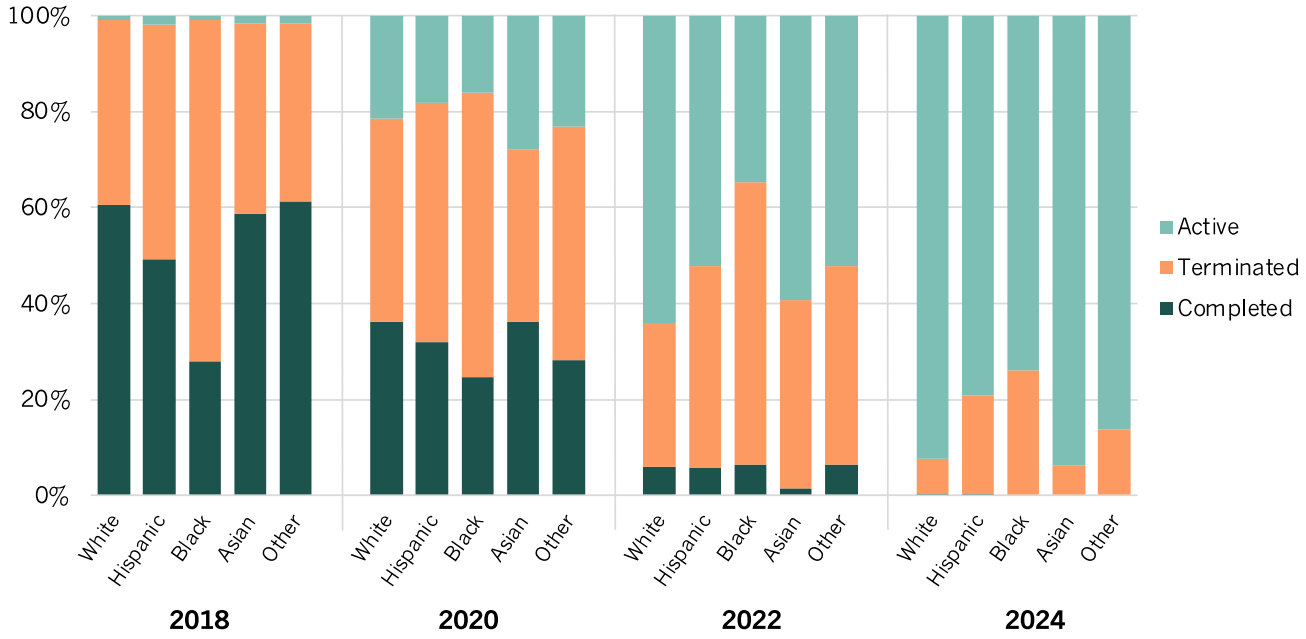
Data source: Oregon BOLI. Note: Active apprentices as of September 2024. BIPOC=Black, Indigenous, or People of Color.

Exhibit 58. Apprenticeship Status as of 9/20/24, by Sex and Starting Year, Construction Industry, Oregon



Data source: Oregon BOLI. Note: Active is as of 9/20/2024.

Exhibit 59. Apprenticeship Status as of 9/20/24, by Race/Ethnicity and Starting Year, Construction Industry, Oregon



Data source: Oregon BOLI. Note: Active is as of 9/20/2024.

The numbers of completed apprenticeships shown in Exhibit 53 are smaller than the numbers of annual openings anticipated by OED (see Exhibit 26). This suggests potentially broader labor market pressures—because the annual number of newly trained workers falls short of anticipated new job openings.[33] At the same time, while availability of fully trained workers may be constrained, apprentices provide capacity for housing construction and will gain relevant skills as they progress. In addition, an apprenticeship is not necessarily a requirement for employment.

Pre-apprenticeship Programs

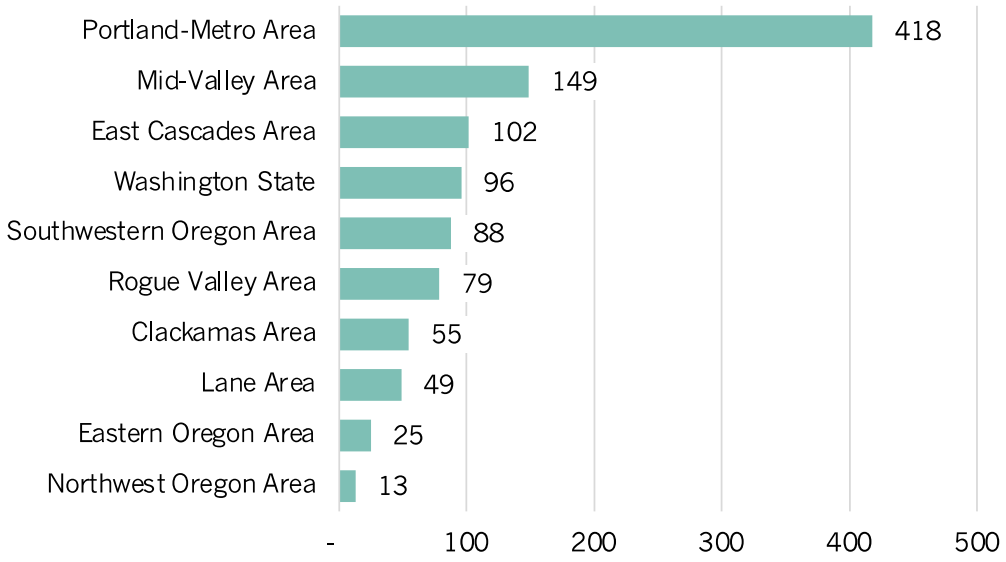
Pre-apprenticeship programs are typically 6-8 weeks long and designed for individuals with little to no experience in construction trades or who experience barriers to employment. Pre-apprenticeships are an important pathway into construction occupations. Among 2023 completers of a carpentry apprenticeship, for example, more than 20 percent had previously completed a pre-apprenticeship.

Pre-apprenticeship data were not available at the occupation level; thus, the following exhibits include data for all pre-apprenticeship programs in Oregon. However, most programs are relevant to the construction trades. Exhibit 60 shows 2024 pre-apprenticeship enrollment numbers by workforce area. About 43 percent of enrollment is in the Portland Metro Area, followed by 14 percent in Mid-Valley and 10 percent in the East Cascades. Nearly 1,000 individuals across Oregon were enrolled in pre-apprenticeship

[33] Due to career changes, migration, and retirement, newly completed apprenticeships do not necessarily represent net new trained workers for the state.

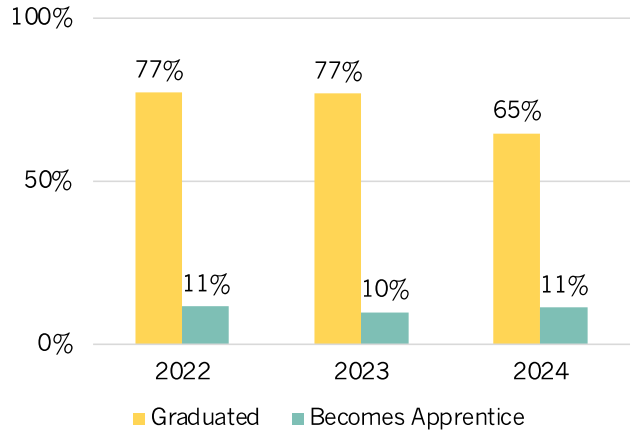
programs in 2024. In recent years, 77 percent of pre-apprenticeship participants graduated from their programs, and 11 percent entered apprenticeship programs (Exhibit 61).

Exhibit 60. Enrollment in Pre-apprenticeship Programs, Oregon, 2024



Data source: Oregon BOLI. Note: Includes all pre-apprenticeship programs, not just construction.

Exhibit 61. Pre-apprenticeship Program Outcomes, by Apprenticeship Start Year, Oregon



Data source: Oregon BOLI. Note: Includes all pre-apprenticeship programs, not just construction.

Pre-apprenticeship and apprenticeship pathways are in many cases more diverse than employment in the relevant occupations. Targeted investments designed to diversify recruitment and increase completions by diverse candidates could help the state increase the size of the sector's workforce.

Postsecondary Credential Programs

Although apprenticeships in the construction trades provide occupation-specific training to a larger share of housing construction workers than do programs provided by Oregon's colleges and universities, these entities nonetheless provide important training pathways into the industry, and opportunities for incumbent workers to increase their skills. Below, we provide an overview of existing programs most relevant to the industry. These programs provide a valuable foundation for expanding Oregon's housing production workforce, whether through improved recruitment, expanded capacity, or additional programs.

The data in this section are from the Integrated Postsecondary Education Data System (IPEDS) and include Oregon institutions only.[34] We used ten Classification of Instructional Programs (CIP) codes to identify core housing construction programs in the following categories:

- Building/Construction Site Management/Manager
- Building Construction Technology/Technician
- Building/Home/Construction Inspection/Inspector
- Carpentry/Carpenter
- Construction Trades, General
- Electrician
- Glazier
- HVAC and Refrigeration Engineering Technology/Tech.
- HVAC and Refrigeration Maintenance Technology/Tech.
- Pipefitting/Pipefitter and Sprinkler Fitter

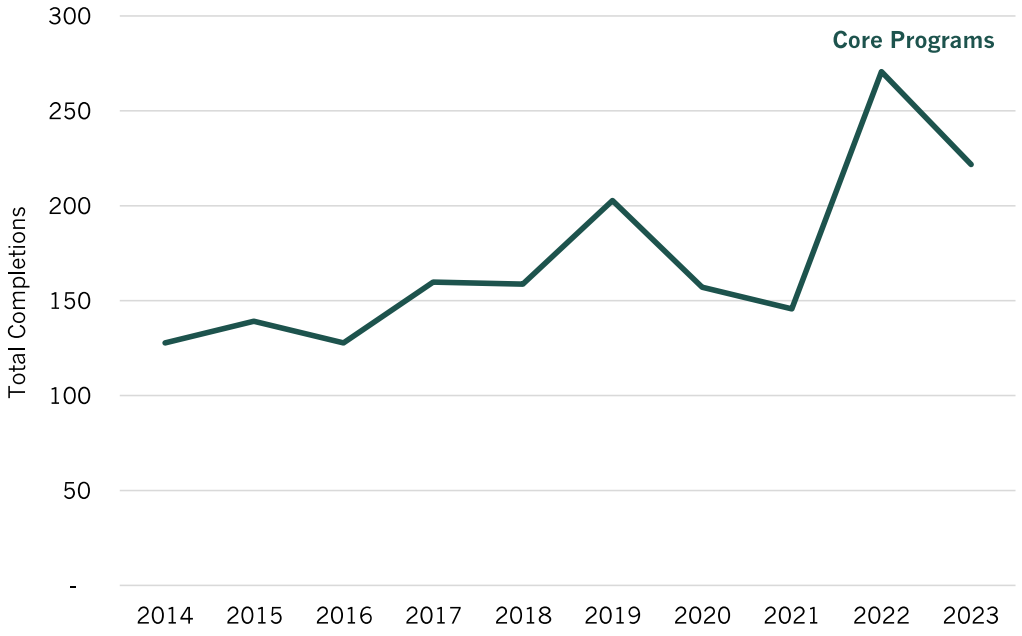
IPEDS data identify 20 programs associated with these housing production CIP codes. The associated programs award certificates and associate degrees (no bachelor's, master's or doctoral degrees). IPEDS data do not identify whether individual completers reside in or are available for employment in the region, nor do they identify an individual's occupation, industry, or specific role as an employee.

We quantified the number of completers of relevant postsecondary programs at local colleges and universities. Exhibit 62 displays the count of completions in core housing production programs each year since 2014. In 2023 there were 222 completions; the average over the period was 171. As with apprenticeships, these numbers are far below the estimated number of housing production worker openings annually (see Exhibit 26).

Exhibit 63 provides program and credential counts by institution and credential type. The credential counts represent an annual average from 2019–2023. The most completions occur at Portland Community College, followed by Lane and Mt. Hood community colleges. More than half of the credentials are short-term certificates (less than one academic year).

[34] IPEDS is a set of annual surveys administered by the National Center for Education Statistics. The surveys gather data from every college, university, and technical and vocational institution that participates in the federal student financial aid programs.

Exhibit 62. Completions in Core Housing Production Programs Over Time, Oregon



Data source: IPEDS. Note: Includes short-term certificates, certificates, and associate degrees. Average over the period=171 credentials per year.

Exhibit 63. Completions in Core Housing Production Programs, by Institution, Oregon

			Annual Average Completions (2019 - 2023)			
Institution	Region	Number of Programs	Short-Term Certificates	Certificates	Associates	All Completions
Portland CC	Portland-Metro	4	73	0	31	**105**
Mt Hood CC	Portland-Metro	2	11	1	16	**29**
Lane CC	Lane	3	24	0	4	**29**
Chemeketa CC	Mid-Valley	2	0	0	11	**11**
Treasure Valley CC	Eastern Oregon	1	0	10	0	**10**
Linn-Benton CC	Mid-Valley	1	0	4	4	**7**
Columbia Gorge CC	East Cascades	1	4	0	0	**4**
Umpqua CC	Southwestern Oregon	1	0	0	2	**2**
Blue Mountain CC	Eastern Oregon	2	2	0	0	**2**
Clackamas CC	Clackamas	1	0	0	1	**1**
Inst. of Tech.	Mid-Valley	1	0	0	0	**0**
Rogue CC	SW Oregon	1	0	0	0	**0**
Total			**115**	**16**	**68**	**200**

Data source: IPEDS. Notes: Rogue Community College had at least one relevant completion in earlier years. Averages are taken over the span of 5 years; some programs may not be operational every year.

The following exhibit presents the data by CIP designation, an approximation of occupation. Nearly half of the average annual completions are in the general construction trades, followed by HVAC and refrigeration maintenance technicians.

Exhibit 64. Completions in Core Housing Production Programs, by CIP Designation, Oregon

CIP Name	Average Annual Completions (2019-2023) Short-Term Certificates	Certificates	Associates	All Completions
Construction Trades, General	74	2	19	95
HVAC and Refrigeration Maintenance Tech.	34	0	8	43
Building/Home/Construction Inspector	2	0	17	19
Building/Construction Site Mgmt/Manager	0	0	15	15
Carpentry/Carpenter	0	10	0	10
Pipefitting/Pipefitter and Sprinkler Fitter	0	4	4	7
Building Construction Technology/Technician	4	0	0	4
HVAC and Refrigeration Engineering Tech.	0	0	4	4
Electrician	1	0	2	3
Total Core Completions	**115**	**16**	**68**	**200**

Data source: IPEDS. Note: Averages are taken over the span of 5 years; some programs may not be operational every year.

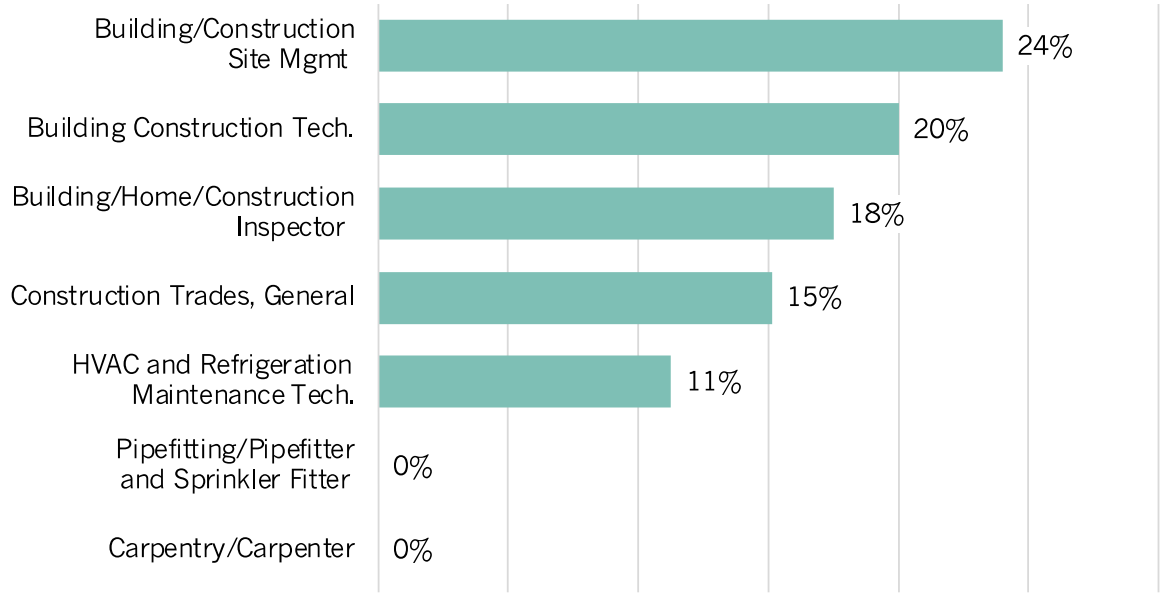
The data also allow disaggregation by race/ethnicity and sex. Among the four CIP designations with the most completions, the share of credentials completed by BIPOC individuals ranges from 22 percent (building/home/construction inspector) to 37 percent (HVAC and refrigeration maintenance technician) (see Exhibit 65). These shares are somewhat lower than those in the apprenticeship programs and may be more aligned with current workforce demographics.

Exhibit 65. Share of Credentials Completed by BIPOC Individuals, Core Housing Production Programs, 2019–2023, Oregon

Data source: IPEDS. Notes: Shares are calculated as an average from 2019–2023. Includes CIP designations with 15 or more average annual completions.

Women complete relatively small shares of housing production credentials (see Exhibit 66). In two CIP designations (pipefitting and carpentry), no completions were by women. Women are currently more likely to receive training in management or office-based roles, such as building/construction site management and inspection occupations.

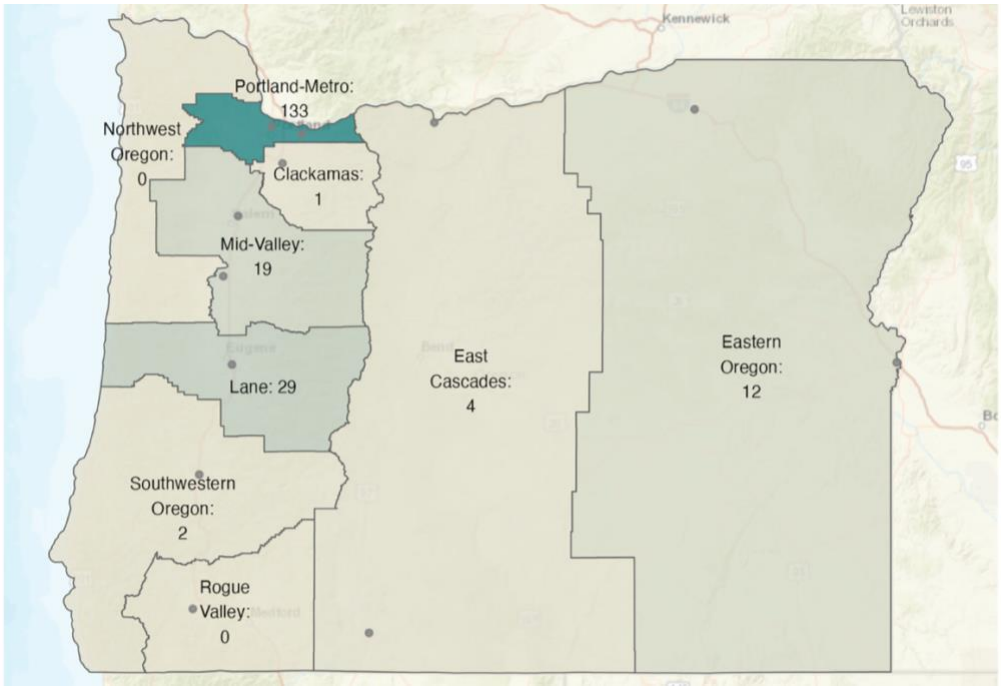
Exhibit 66. Share of Credentials Completed by Women, Core Housing Production Programs, 2019–2023, Oregon



Data source: IPEDS. Note: Shares are calculated as an average from 2019–2023. Includes CIP designations with 10 or more average annual completions.

Credential completions are taking place across the state (see Exhibit 67). However, again, average annual completions are small in number compared to the need associated with the housing production goal.

Exhibit 67. Annual Average Core Completions by Workforce Area, 2019–2023



Data source: IPEDS. Note: Each dot is an institution.

Conclusion

All regions of the state have construction-related training pathways, from high school CTE programs to apprenticeships and community college and university programs. The current capacities of these programs are small compared to anticipated need associated with meeting the State's housing production goal. In addition, the housing production sector will compete with the rest of the market for these credentialed workers.

A possible and logical next step would be the completion of a gap analysis to connect the completion counts included in this chapter with the workforce demand figures in Chapter 3.

5. Recommendations

This chapter first summarizes some best practices research and then offers a set of recommendations based on the findings of this study.

Selected Research and Best Practices

As detailed in Chapter 4, many construction training and education programs are accessible to Oregonians beginning in high school. Researchers in Oregon have studied many of these programs; selected findings and recommendations are highlighted below. The section also includes information about the emerging field of micro-credentials and stackable credentials.

Pre-Apprenticeship and Apprenticeship Programs

Pre-apprenticeship and apprenticeship programs are growing in popularity, provide essential pathways into the construction workforce, and increase diversity within the industry. A study from the University of Oregon Labor Education and Research Center (LERC) found that from 2011 to 2019, enrollment in construction apprenticeships in the greater Portland area more than doubled.[35] Pre-apprenticeship programs have also grown substantially. A 2017 study of 94 pre-apprentices in Oregon construction found that up to 27 percent of program completers entered an apprenticeship within one year.[36] A 2022 PSU study, of programs associated with highway construction, found that individuals who complete pre-apprenticeship programs are more likely to complete an apprenticeship.[37] Financial and non-financial supports had a positive effect on apprenticeship completion.

The same study found that pre-apprenticeship and apprenticeship programs, especially union-based programs, increase diversity in the workforce. A 2021 LERC study found that union apprenticeship programs recruited a higher proportion of women and BIPOC workers and had higher graduation rates than did non-union apprenticeship programs. About half of women and BIPOC graduates entered construction jobs with an average hourly wage of $40 or higher.[38]

[35] Petrucci, Larissa. 2021. "Constructing a Diverse Workforce." University of Oregon, Labor Education and Research Center. https://bpb-use1.wpmucdn.com/blogs.uoregon.edu/dist/a/13513/files/2021/11/Constructing_A_Diverse_Workforce.pdf

[36] Wilkinson, Lindsey, and Maura Kelly. 2017. "Evaluation of Pre-Apprenticeship and Retention Services in the Construction Trades in Oregon." Final report submitted to Oregon Tradeswomen, Inc., and Constructing Hope.

[37] Maura Kelly. 2022. Evaluation of the Highway Construction Workforce Development Program. *Portland State University.* https://www.oregon.gov/odot/Business/OCR/SiteAssets/Pages/Workforce-Development/Program_Evaluation_November_22_FINAL.pdf

[38] Larissa Petrucci. "Constructing a Diverse Workforce."

Increasing Program Accessibility and Diversity

Many programs in Oregon work to support students from diverse backgrounds entering the residential construction industry. For example, Mt. Hood Community College debuted a Construction Pathway program for English Language Learners in 2024, a 12-week, full-time program that fosters a direct pipeline to apprenticeships and jobs.[39] The Portland Opportunities Industrialization Center (POIC) also runs a 12-week paid construction apprenticeship program for post-high school workers, stating that 95 percent of graduates have been placed in jobs.[40] And the Oregon Residential Construction Career Hub has compiled an extensive list of residential construction training and apprenticeship programs at entry, mid, and advanced levels.[41]

The following best practices derive from the 2022 PSU review of BOLI-funded pre-apprenticeship programs and the 2021 LERC report examining construction workforce diversity. These practices primarily center around improving access to pre-apprenticeship and apprenticeship programs and improving construction workforce diversity.

IMPROVING PROGRAM ACCESSIBILITY

- **Expand Comprehensive Support Service:** Provide financial and non-financial aid through a coordinated system with a single point of contact. This could include hardship funds to address emergencies like rent, car repairs, travel subsidies, and tools.
- **Enhance Mentorship and Support Systems:** Encourage apprenticeship programs to pair apprentices with trained mentors who provide guidance and support, particularly for underrepresented groups. Assign an ombudsperson to handle workplace equity and harassment concerns.
- **Improve Childcare and Family Policies:** Offer onsite childcare, subsidies, and schedules that accommodate single parents. Include maternity and paternity leave options to support workers balancing family responsibilities. Take steps to reduce childcare costs to less than 7 percent of household income.

IMPROVING DIVERSITY AND FAIRNESS

- **Broaden Pre-Apprenticeship Opportunities:** Studies show that pre-apprenticeship programs can improve workplace diversity and apprenticeship completion rates. Expand pre-apprenticeship programs that effectively recruit and retain women and BIPOC individuals.

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[39] Keizur, Christopher. "Mt. Hood Community College Debuts New Construction Program for Diverse Students." The Outlook. April 3, 2024. https://www.theoutlookonline.com/business/mt-hood-community-college-debuts-new-construction-program-for-diverse-students/article_52f0dc46-f130-11ee-ac8c-bf19d4eca95c.html#:~:text=Mt.%20Hood%20Community%20College%20debuted%20a%20newly,more%20diverse%20employees%20going%20into%20the%20workforce

[40] Portland Opportunities Industrialization Center. "Construction Pre-Apprenticeship." POIC Employment & Training. https://www.portlandoic.org/employment-training/programs/construction

[41] Residential Career Hub. "Training & Credentials." https://residentialcareerhub.org/training-credentials/

- **Ensure Equitable Work Hour Distribution:** Set clear thresholds for contractors to fairly allocate work hours to women and BIPOC journey- and apprentice-level workers. The Construction Career Pathways Project suggests the following minimums: 14 percent of total work hours for women and 25 percent for people of color.[42] Include flexible scheduling to accommodate family needs and reduce burnout.
- **Foster a Respectful Workplace Culture:** Implement anti-harassment training for all staff and apprentices. Introduce robust reporting systems and enforce policies to ensure a safe and inclusive work environment.
- **Diversify Recruitment Practices:** Review outreach methods to ensure they are inclusive, using gender-neutral language and emphasizing diversity in job postings. Include diverse representatives in recruitment teams to attract a broader applicant pool.

Micro-credentials, Stackable Credentials, and Micropathways

Micro-credentials and stackable credential pathways have promising potential as newer pathway types. Virginia's G3 program is an example of a stackable pathway program where students can stack certifications on a pathway toward an associate degree while also gaining skills with each certificate that are immediately applicable to the job market. Each of Virginia's 23 community colleges has a set of G3 programs, each with stackable credits that align with the local business landscape. A student could graduate from a program, for example, with two certificates and an associate degree. According to the Virginia Community College System, students who completed a G3/stackable credits program earned 60 percent more, on average, in wages.

The Education Design Lab (EDL), a national non-profit that co-designs and tests education-to-workforce models, worked with a group of some of the country's largest community colleges to launch micro-pathways, a new design for stackable micro-credentials. More than 100 employer-validated micro-pathways have been developed since 2021.[43] EDL defines micro-pathways as two or more stackable credentials that can be completed within a year and lead to a job or higher wage once completed. The aim is to provide students greater flexibility to move in and out of training, increase education access for those with greater barriers to four-year universities, and provide more-efficient pathways toward better-paying jobs.

Manufactured Housing Workforce

Workforce training programs are particularly useful when they incorporate industry-specific skill-building initiatives. For example, the Training Manufactured Construction (TRAMCON)

[42] Larissa Petrucci. "Constructing a Diverse Workforce."
[43] Education Design Lab, Micro-pathways. https://eddesignlab.org/micro-pathways/

program developed at the University of Florida focuses on improving workforce skills in the housing prefabrication industry. The TRAMCON program is composed of four levels of training where a participant can earn eight industry-recognized certificates. Researchers conducted a program evaluation of TRAMCON between 2016 and 2018 and found that the program is most useful in areas with manufacturing housing plants.[44]

Recommendations

The recommendations below, based on the findings of this study, focus on meeting the housing production sector's workforce needs and increasing opportunities for Oregonians from all backgrounds and communities to gain employment in the sector. Improved access to education, training, and employment opportunities is essential to increasing the diversity in the sector's workforce and to meeting the Governor's ambitious housing production goal. Success will require large investments and long-term tracking of workforce and talent metrics.

While a well-trained workforce is necessary, it is not sufficient to guarantee housing units will be built. In Oregon, and elsewhere, the housing production sector faces several headwinds not directly related to workforce. These challenges are not the focus of this study but are essential context in which to consider any housing production workforce strategies—efforts to increase the size of the workforce must occur alongside other efforts that ensure a steady pipeline of residential construction work and within the context of conditions that are harder to address through state and local policy.[45] The engagement results presented in Chapter 3 make clear that workforce issues are not the only prominent factor contributing to housing production delays and challenges—some employers report having a ready workforce while lacking enough work to fill their time.

Additional headwinds, many of which interact in complex ways, include investor caution, high interest rates, tight lending standards, high material costs, market uncertainty, and limited access to insurance. Residential infrastructure—the public services and facilities necessary to support residential development—can also slow down development due to extended timelines and high costs. Each of these headwinds is the subject of extensive research and consideration already in Oregon, and the State is addressing a number of challenges through legislation, new or renewed investment, and an overhaul of how local cities and counties plan for housing in a manner that results in more affordable, fair, and equitable housing outcomes.[46] Efforts to address these challenges must continue, simultaneous with workforce development strategies, if the housing production goal is to be met.

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[44] Ahmadzade Razkenari, Mohamad, Andriel Evandro Fenner, Hamed Hakim, and Charles J. Kibert. 2018. "Training for Manufactured Construction (TRAMCON)." Modular and Offsite Construction (MOC) Summit Proceedings. https://doi.org/10.29173/mocs42

[45] See, for example, IPRE (2022). *Barriers to Housing Production in Oregon: Summary Report*. Prepared for the Oregon Department of Land Conservation and Development. https://bpb-us-e1.wpmucdn.com/blogs.uoregon.edu/dist/3/17202/files/2022/11/UO-IPRE-Barriers-to-Housing-Production-Summary-Report_Oct-2022.pdf

[46] Oregon Housing Needs Analysis Recommendations, https://www.oregon.gov/lcd/Housing/Pages/OHNA.aspx

Finally, two federal policy areas with direct effects on residential construction are at particular points of uncertainty at the time of writing: tariffs and immigration.[47] Oregon and the U.S. could face substantial increases in material costs and declines in available workforce if the current administration successfully implements proposed changes in these areas.

A well-functioning workforce system should enable individuals to enter the housing production sector early, gain essential skills, and receive income. This is possible through many pathway types, all of which should be presented as options for potential workers: career and technical education, pre-apprenticeship, apprenticeship, vocational, certificate, associate degree, and bachelor's degree programs. The following recommendations provide possible ways to increase workforce participation and, thereby, employment in the sector.

Encourage collaboration among training programs and employers

The foundation of effective talent development is collaborative relationships between training/education providers and employers. Fuller and Raman (2022) describe "a growing gulf between those who teach and those who hire," particularly in the middle-skills environment, that "underserv[es] the needs of aspiring workers, employers, and ultimately, communities."[48] They recommend the following framework to overcome this disequilibrium:

1. Partner with each other [community colleges and employers] to offer training and education that is aligned with industry needs.
2. Establish relationships with each other that result in the recruitment and hiring of students and graduates.
3. Make supply and demand decisions that are informed by the latest data and trends.

Various initiatives and partnerships throughout the state are examples of this work and could potentially be scaled. Two examples: a long-Central Oregon partnership brings employers and training programs together regularly, has pre-apprenticeship through apprenticeship pathways in place for multiple trades, and uses a mobile classroom.[49] And Klamath Community College partners with high schools in Lake, Douglas, and Josephine counties to run a pre-apprenticeship program, partners with local employers on multiple

[47] 14 percent of Oregon's construction labor force is foreign born. https://www.nahb.org/advocacy/industry-issues/labor-and-employment/immigration-reform-is-key-to-building-a-skilled-workforce/geographic-concentration-of-immigrants-in-construction

[48] Joseph Fuller and Manjari Raman (Dec 2022). *The Partnership Imperative: Community Colleges, Employers, and America's Chronic Skills Gap*, https://www.hbs.edu/managing-the-future-of-work/Documents/research/The%20Partnership%20Imperative_Executive%20Summary_12.12.2022.pdf

[49] Housing Production Advisory Council, *State of Oregon Housing Production Advisory Council Recommendations Report*. https://www.oregon.gov/gov/policies/Documents/HPAC%20Final%20Report%20February%202024.pdf

apprenticeship programs, and helps student connect with employers as they move from pre-apprenticeship to apprenticeship programs.[50]

The State can encourage collaboration by promoting existing successful practices and examples and creating a coordinating structure (see Next Steps below) designed around regional collaboration. An increase in collaboration could result in local training that better meets local employers' needs and more-reliable provision of up-to-date and well-balanced training across skill types (e.g., technical, occupational, essential).

Support early and ongoing development of a skilled, diverse workforce

Potential workers often do not know what opportunities employment in housing production provides to them. To meet the sector's present and future needs, public and private actors within it must think strategically about how to recruit, train, and retain a diverse range of workers in terms of age, language, race, ethnicity, gender, and other characteristics. And programs—vocational, apprenticeship, community college, and university—must be affordable to allow access to the broadest pool of potential workers as possible.

K12 education

Exposure to the sector in the K12 system is key for students to learn about industries and occupations that are open to them. Positive messaging about housing production work could help close awareness gaps and promote the sector. Efforts to strengthen project-based learning and essential workforce skills can begin in early grades and increase in later grades and the CTE programs discussed in the previous chapter. Mobile classrooms can extend the reach of CTE and other training programs.

Apprenticeships

Apprenticeship programs in Oregon play a critical role in developing the state's workforce, particularly for many of the trades central to the housing production sector. National best practices support the expansion of apprenticeship and pre-apprenticeship programs to fill local talent pathways and help disadvantaged populations overcome longstanding barriers to entry in well-paying careers. The State should consider developing apprenticeship programs for occupations that don't yet have one and could benefit from another pathway into the housing production sector.

To help address inspection bottlenecks and the ongoing decline in permitting across the state, Oregon should implement the apprenticeship-style program the Oregon Building Officials Association is developing, ensuring flexibility that addresses local jurisdictions' range of needs (e.g., not all jurisdictions need building code staff to be certified in every

[50] KCC Apprenticeship Partners, https://www.klamathcc.edu/en-US/academics/academic-programs/transport-industry-engineering-agriculture/apprenticeship-related-training/apprenticeship-partners.html

area) and recognizes that not all jurisdictions have the capacity to participate in an apprenticeship program.

Other postsecondary credentials

Given the evolution of pathways to management and local government positions (see Chapter 3), Oregon should continue to promote the benefits of existing four-year degree programs in the state and consider the creation of new programs, perhaps for building code professionals, which would open a pathway into those occupations for students who want to complete a four-year degree.

While not specifically addressed in this study, micro-credentials and stackable credentials have promising potential as newer pathway types that are well-suited to help address barriers to economic mobility experienced by "learner-earners."[51] Micro-credentials are often-accelerated certification programs that require a year or less and provide skill-based training for specific jobs or fields. Some programs feature stackable credentials, in which each credential holds a stand-alone value and can lead to a higher-level credential.

Other strategies to consider include expanding wraparound services to support students from diverse backgrounds working to complete training and education programs, creating pathways for seasoned professionals to participate in training future workforce, and investing in a well-designed marketing campaign to attract potential trainees and workers to the sector.[52]

Open more doors to housing production work

Even absent an ambitious housing production goal, the housing production sector would benefit from efforts to increase the accessibility of employment in the sector. The details matter, and the State can play a key role in opening doors to more individuals in a way that safely and effectively supports this workforce, including through data collection and analysis that monitor progress toward the production goal and program effectiveness.

- Licensing: Oregon should consider specific changes to its licensing policies to widen the pool of eligible workers (e.g., provide a multi-skill construction license, to allow performance of multiple trades under one license). One study indicates "more-consistent employment" as a primary reason for multiskilling among craft professionals.53

[51] Learner-earners are parent learners, students of color, first-generation students, low-income students, and communities long underinvested in. See Education Design Lab, "Micro-pathways: A Gateway to Community College Transformation." https://eddesignlab.org/wp-content/uploads/2022/01/CCGEF_Insights_Brief_01.14.22.pdf

[52] To help address, for example, underenrolled community college programs. https://www.salemreporter.com/2025/01/22/shortage-building-inspectors-oregons-housing-goals/

[53] The National Center for Construction Education and Research (NCCER), *Multiskilling Among Craft Professionals*. https://www.nccer.org/media/2023/03/multiskilling-among-craft-professionals-2.pdf

- Reciprocity: Oregon has relatively few reciprocity agreements in construction, stemming from contractor licensing requirements, protection of local jobs and consumers, and administrative/legal challenges associated with such agreements. If workforce supply in particular occupations remains a concern, the State should examine the details of its current agreements and analyze the costs and benefits of adding agreements.[54]
- Workforce Diversity: The analysis in this study confirms that disproportionate shares of BIPOC and women workers are in relatively lower-paid occupations such as construction laborers, carpenters, and office support workers compared with higher-paid occupations requiring more training, such as electricians, plumbers, and supervisors. Ensuring equitable access for women and people of color to opportunities in housing production requires tracking wage and occupation differentials, equity and affordability within training pathways, and job quality (including job-site culture). Ensuring equity in apprenticeship pathways in particular can help drive diversity of the housing production sector.

Continue efforts to link CTE, apprenticeship, and employment data

Understanding outcomes for CTE, vocational, and apprenticeship program participants is key to improving and scaling programs. Oregon should commit to a data-oriented framework for assessing alignment of training and education offerings with housing production workforce needs. This practice can improve allocation of resources, improve transparency, and lead to programs that better support program participants and industry needs. The approach should compile detailed analysis of labor market information, occupational trends, and potentials gaps in supply relative to demand.

Oregon agencies and researchers regularly work with data from ODE, BOLI, HECC, and OED to create point-in-time looks at training and education pathways and outcomes. Individual studies and recommendations can lead to incremental changes in data collection and data sharing processes, whereas a concerted effort in this area could lead to system-level improvements and analysis that better and more-easily answers the State's questions about program, investment, and system outcomes.

We recommend furthering the analysis included in this study to quantify training/credential gaps for individual occupations, quantify the contributions of specific programs, and analyze employment outcomes (in housing production and in other industries) for core housing production-related program completers.

Modify the apprentice-to-journey-level-worker ratio

One of the most widely discussed—and contested—issues in this study's interviews and focus groups was the current statewide apprentice-to-journey-level-worker ratio of 1:1.

[54] NCCER tracks each state's reciprocity agreements. https://www.nccer.org/programs-crafts/reciprocity-map/

Union representatives felt strongly that this ratio is critical to upholding worker safety and maintaining adequate pay and benefits for workers. Non-union representatives felt stymied by this strict ratio, arguing that high standards of safety, pay, and benefits can be met outside of these ratios and that these ratios are hard to abide by and are detrimental to their ability to grow their workforce. Our resulting recommendation, which is generally aligned with that of the Housing Production Advisory Council, is intended to offer some relief to employers for whom the ratios pose a burden to growth while also maintaining the important role that one-to-one or small-group mentorship provides in construction settings.[55]

Rural employers were most concerned about the ratio and described struggles to find enough journey-level workers to train new apprentices. The trade union representatives described a waiting list of to-be apprentices wanting program placement. Increasing the ratio to two apprentices per journey-level worker would give more apprentices an opportunity for training. We recommend increasing the allowable ratio to two apprentices per journey-level worker under conditions to be determined along the following dimensions:

- Geography: The change could be limited to rural counties only, where effects might be most pronounced.[56]
- Trade/Occupation: The change could be limited to selected trades or occupations (e.g., Limited Residential Plumber and Limited Residential Electrician) to target specific needs connected to housing production.
- Time: The change could be time limited. A change could be piloted for two biennia to ease the current stress in the system. The State should continue to analyze enrollments, terminations, completions, and other metrics that measure the success of apprenticeship programs and collect feedback on the change from employers and apprentices.

Next Steps

Public-private partnerships are key to advancing the recommendations described above. We recommend the creation of a working group or coordinating body to continue researching and addressing housing production workforce questions and needs in Oregon, followed by a permanent coordinating body or intermediary organization to support sector organization and growth and strengthen the housing production talent pool. The organization could initially be a loose structure around existing programs, expanding and formalizing over time, with governance and accountability as crucial considerations. Much of the coordinating work should take place at the regional level, within public/private partnerships, with periodic statewide gatherings to discuss initiatives and assessment.

[55] HPAC, *State of Oregon Housing Production Advisory Council Recommendations Report*. https://www.oregon.gov/gov/policies/Documents/HPAC%20Final%20Report%20February%202024.pdf

[56] One engagement participant recommended a population threshold of less than 35,000 residents or the USDA definition of rural.

A working group or coordinating body with three teams—Workforce Entry, Ongoing Skill Development, and Innovation/Productivity—each with representatives from three groups—Industry, Training/Education, and Government—would provide space for holistic and successful initiatives based on the recommendations above. The three teams would focus on different aspects of the workforce ecosystem: pathways into jobs in the sector (Workforce Entry); opportunities to progress within the sector and train others (Ongoing Skill Development); and workforce needs for new, innovative, or productivity-focused activities, such as modular and manufactured housing (Innovation/Productivity).

	Workforce Entry	Ongoing Skill Development	Innovation/ Productivity
Industry	Team 1	Team 2	Team 3
Training/Education			
Government			

Business and industry, including business organizations that represent and support minority-owned construction firms, must play a major role in this structure, to ensure employer needs and perspectives are central to the work. Each of the three groups could potentially contribute to the working group or coordinating body in many ways, including, but not limited to, the following:

Industry

- Actively participate in the location, design, and implementation of educational and training programs to best address emergent workforce needs
- Offer real-world experiences, internships, and apprenticeships to bridge the gap between education/training and industry needs
- Serve as a conduit for communicating new or innovative approaches to housing production emerging from within the industry

Training/Education

- Develop and deliver relevant and effective training and curricula that align with the needs of housing production employers and the sector's emerging workforce
- Foster research and innovation that can contribute to housing production advancements and productivity
- Establish partnerships and coordinate with employers to facilitate practical learning experiences for individuals with limited exposure or who are new to the industry, such as high school students

Government

- Collect data and conduct analysis that informs program development and improvement

- Provide supportive policies, regulations, incentives, and funding for workforce development and training programs
- Ensure equal access to opportunities for all individuals, regardless of background

This organizational structure will allow for deep discussion of the needs in each of the three areas: workforce entry, ongoing skill development, and innovation/productivity. The group or body could use this study's findings and recommendations as a starting place for their discussions and work.

A collaborative approach will be instrumental in tracking metrics and other approaches to measure the success of ongoing initiatives. Regular assessments and data collection can ensure the continuous improvement and adaptability of programs, fostering innovation, workforce diversity, and sustained growth in the housing production sector.

Appendix A: Occupation Selection and Supplementary Exhibits

The selection of occupations most relevant to the housing production sector was guided by data from the Oregon Employment Department's industry-occupation matrix for the broad construction industry (NAICS 23), construction of buildings (NAICS 236), residential building construction (NAICS 2361), and specialty trade contractors (NAICS 238). National data from the Bureau of Labor Statistics' industry-occupation matrix provided additional context and comparisons. Input from committee members and industry stakeholders helped to refine the list of occupations. This approach ensured the inclusion of occupations considered essential to the broader housing production ecosystem, even if their employment numbers are less prominent in the state-level data.

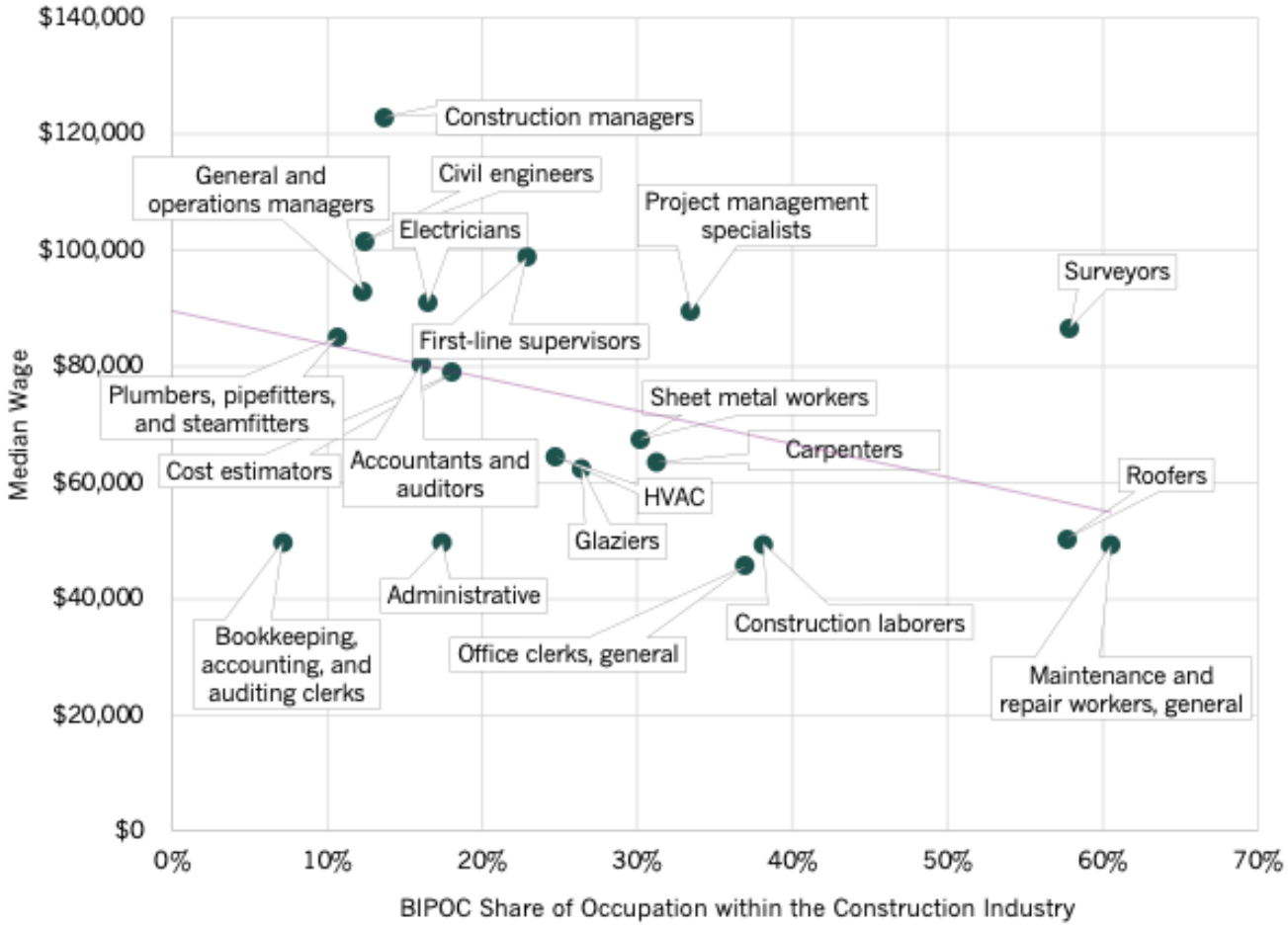
Exhibit A1. Selected Occupations' Share of Employment, by Industry, Oregon, 2022

OCCUPATION	CONSTRUCTION	CONSTRUCTION OF BUILDINGS	RESIDENTIAL CONSTRUCTION	SPECIALTY TRADE CONTRACTORS
Carpenters	11.4%	27.1%	30.9%	5.4%
Construction laborers	9.3%	14.1%	14.9%	6.3%
Electricians	7.6%	0.3%	Not Reported	12.1%
First-line supervisors of construction workers	5.2%	6.1%	5.3%	4.6%
Plumbers, pipefitters, and steamfitters	4.2%	0.2%	Not Reported	6.7%
Painters, construction and maintenance	4.0%	Not Reported	1.7%	5.6%
Office clerks, general	3.7%	4.3%	Not Reported	Not Reported
Construction managers	3.4%	7.4%	6.5%	1.6%
Operating engineers and construction equipment operators	3.0%	1.6%	Not Reported	2.3%
Project management specialists	2.9%	5.3%	3.2%	1.7%
Cement masons and concrete finishers	2.7%	2.7%	2.9%	2.8%
Roofers	2.7%	0.2%	Not Reported	4.2%
Heating, air conditioning, refrigeration installers	2.6%	Not Reported	Not Reported	Not Reported
General managers	2.5%	Not Reported	2.0%	2.6%
Sheet metal workers	2.4%	Not Reported	Not Reported	Not Reported

Bookkeeping, accounting, and auditing clerks	2.2%	3.2%	3.8%	1.8%
Heavy and tractor-trailer truck drivers	2.0%	1.1%	Not Reported	1.6%
Cost estimators	1.8%	1.6%	1.3%	1.8%
Drywall and ceiling tile installers	1.5%	1.5%	Not Reported	1.7%
Admin. assistants	1.5%	Not Reported	Not Reported	1.6%
Glaziers	0.9%	Not Reported	Not Reported	Not Reported
Tile and stone setters	0.7%	Not Reported	Not Reported	Not Reported
Civil engineers	0.6%	1.4%	Not Reported	0.2%
Accountants and auditors	0.6%	0.8%	Not Reported	0.4%
Maintenance and repair workers	0.6%	1.5%	Not Reported	0.1%
Insulation workers	0.4%	Not Reported	Not Reported	0.6%
Construction and building inspectors	0.05%	Not Reported	Not Reported	0.03%
Surveyors	0.01%	Not Reported	Not Reported	Not Reported
Total Industry Employment (2022)	**114,601**	**33,466**	**21,195**	**70,690**
Share of Industry Employment in Selected Occupations	**80.5%**	**80.3%**	**73.1%**	**65.9%**

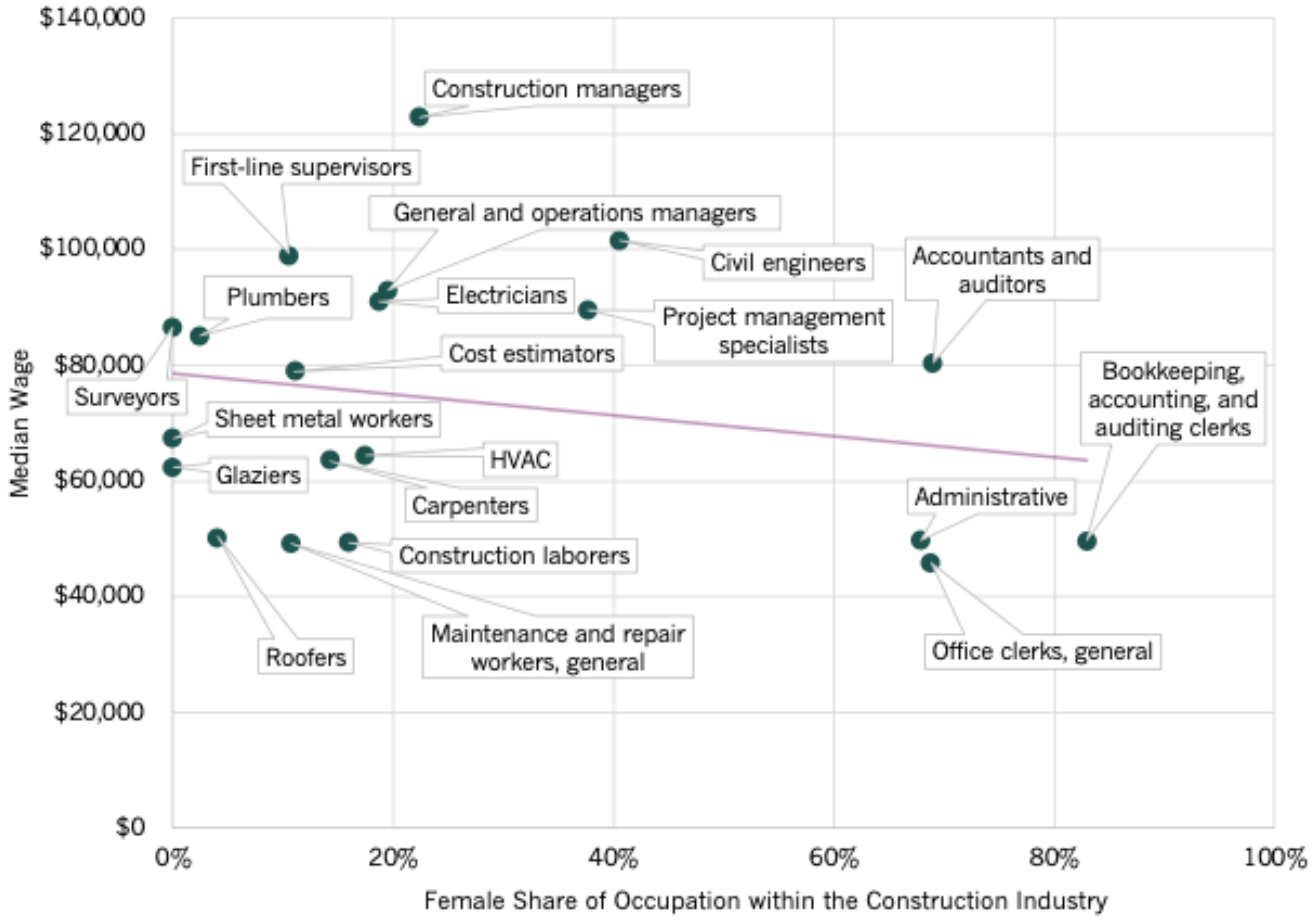
Data source: Oregon Employment Department, 2022

Exhibit A2. Median Wage vs. BIPOC Share of Workers in Housing Construction Occupations, within the Construction Industry



Data sources: U.S. Census Bureau (2022). American Community Survey, 5-year Estimates. Oregon Employment Department, 2024. Note: Share of occupation is calculated within the construction industry (NAICS 23).

Exhibit A3. Median Wage vs. Female Share of Workers in Housing Construction Occupations, within the Construction Industry



Data sources: U.S. Census Bureau (2022). American Community Survey, 5-year Estimates. Oregon Employment Department, 2024. Note: Share of occupation is calculated within the construction industry (NAICS 23).

Appendix B: Survey Instrument and Supplementary Exhibits

Survey result charts supplementary to those included in the main narrative

Exhibit B1. Type of Construction Work

Survey Question: What type of construction does your company usually do? Select all that apply.

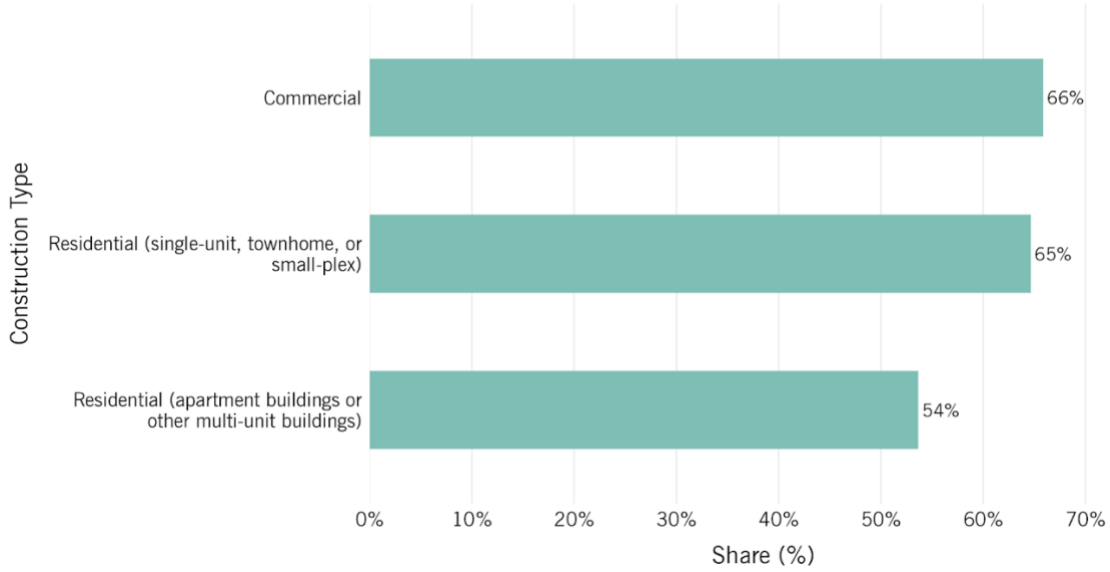
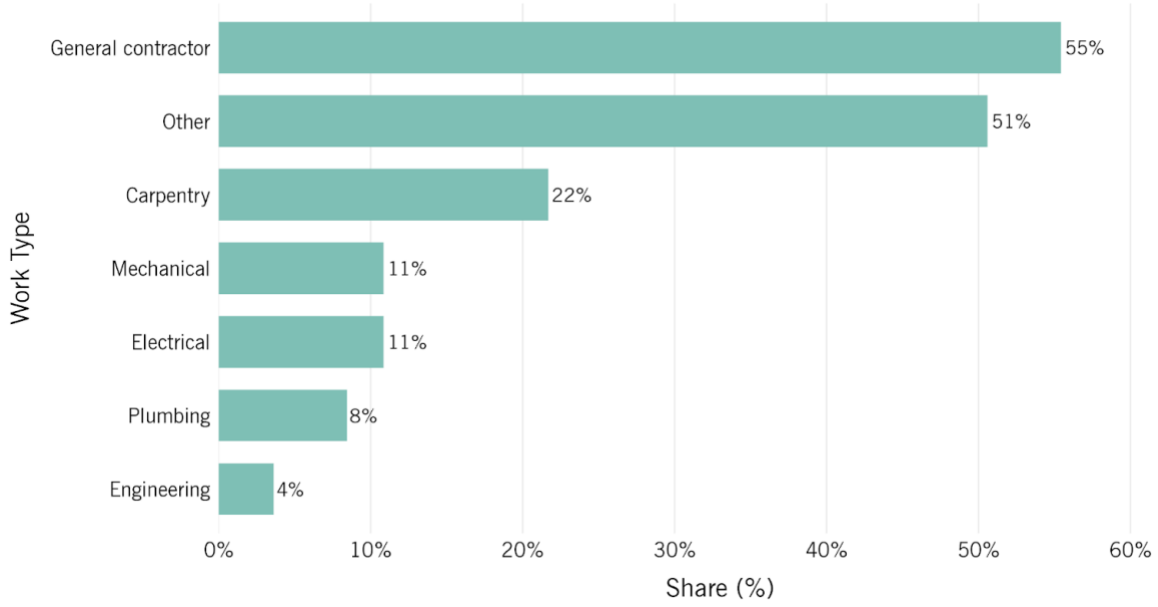


Exhibit B2. Type of Work

Survey Question: What type of work does your company usually do?



Note: “Other” responses included painting, demolition, excavation, insulation, glass, asphalt, and concrete.

Exhibit B3. Union Status

Survey Question: Are you a union signatory contractor?

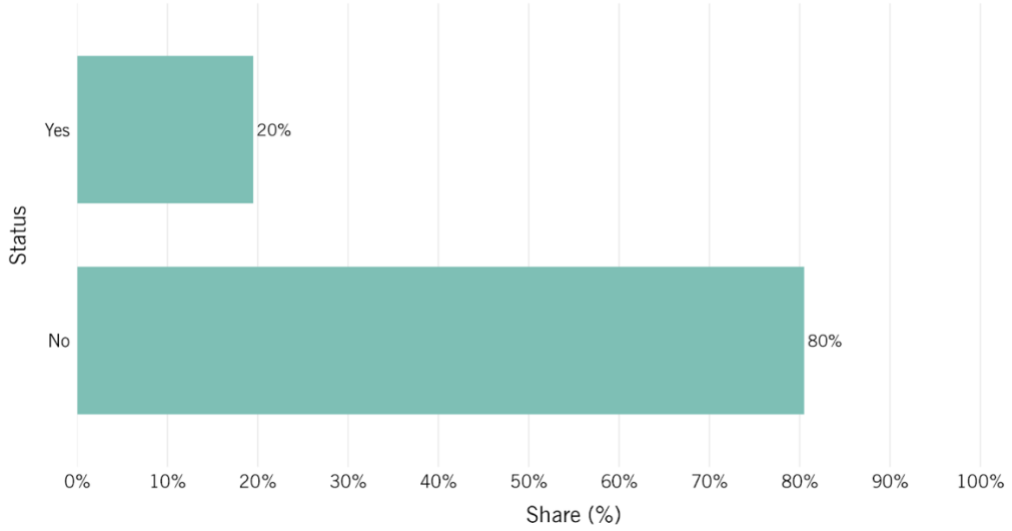


Exhibit B4. Respondent Role

Survey Question: What best describes your role? Select one.

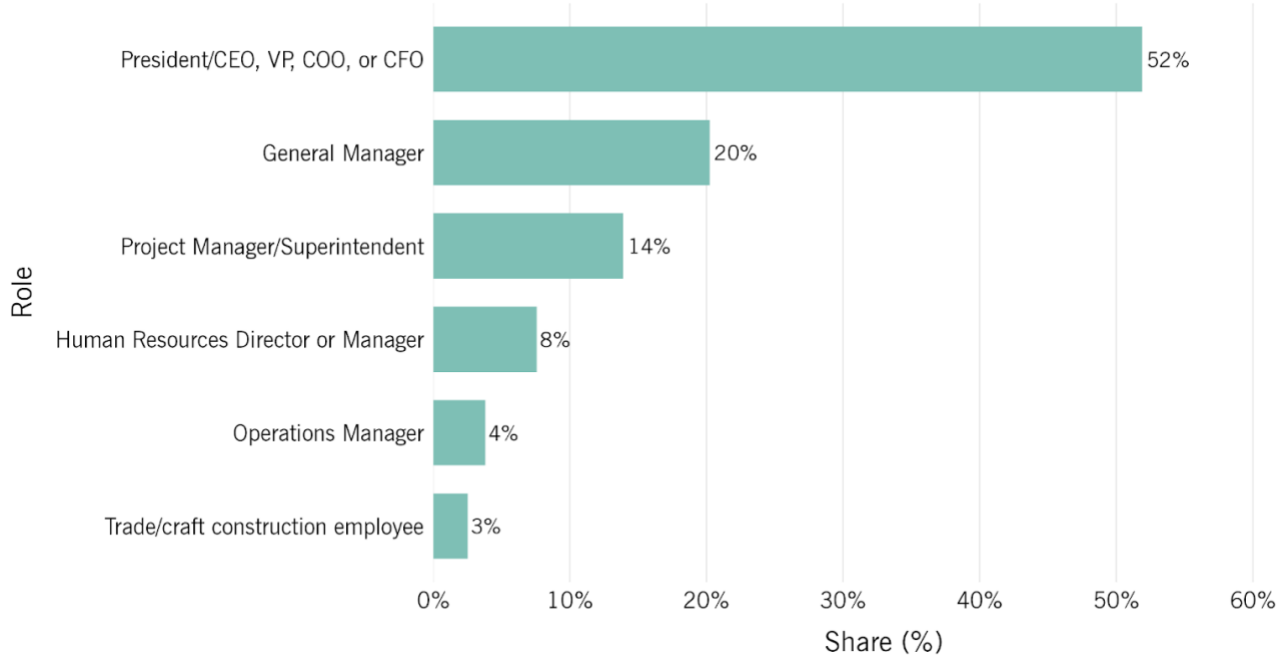
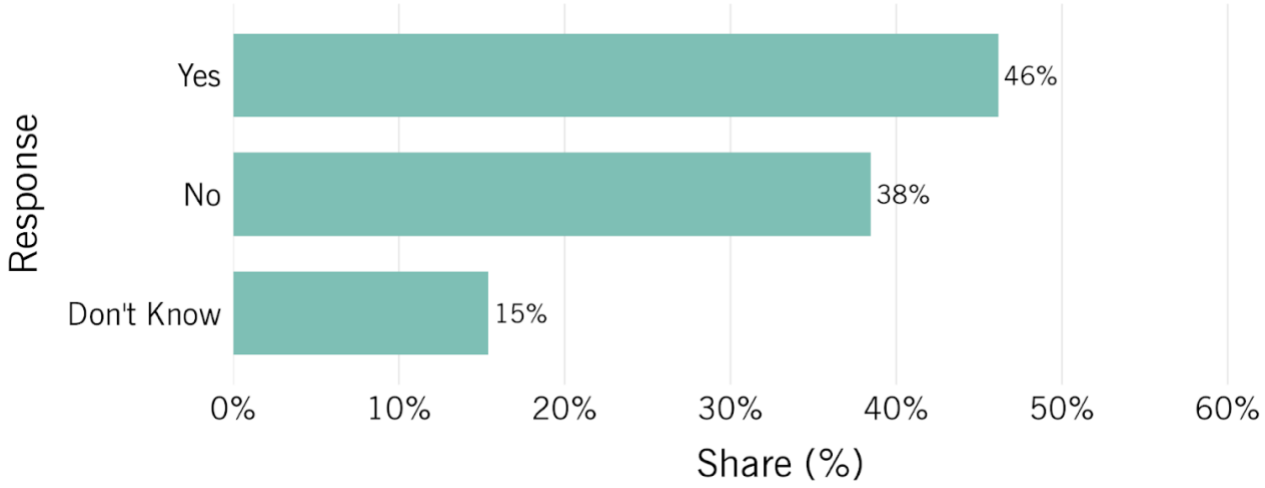


Exhibit B5. Difficulty Diversifying by Other Characteristics

Survey Question: Are you having difficulty filling positions with diverse applicants by the other characteristic(s) you described?



Company Size Cross-tabulations

Exhibit B6. Challenges by Company Size

Survey Question: What are the top three challenges to keeping workers in your company? Select up to three.

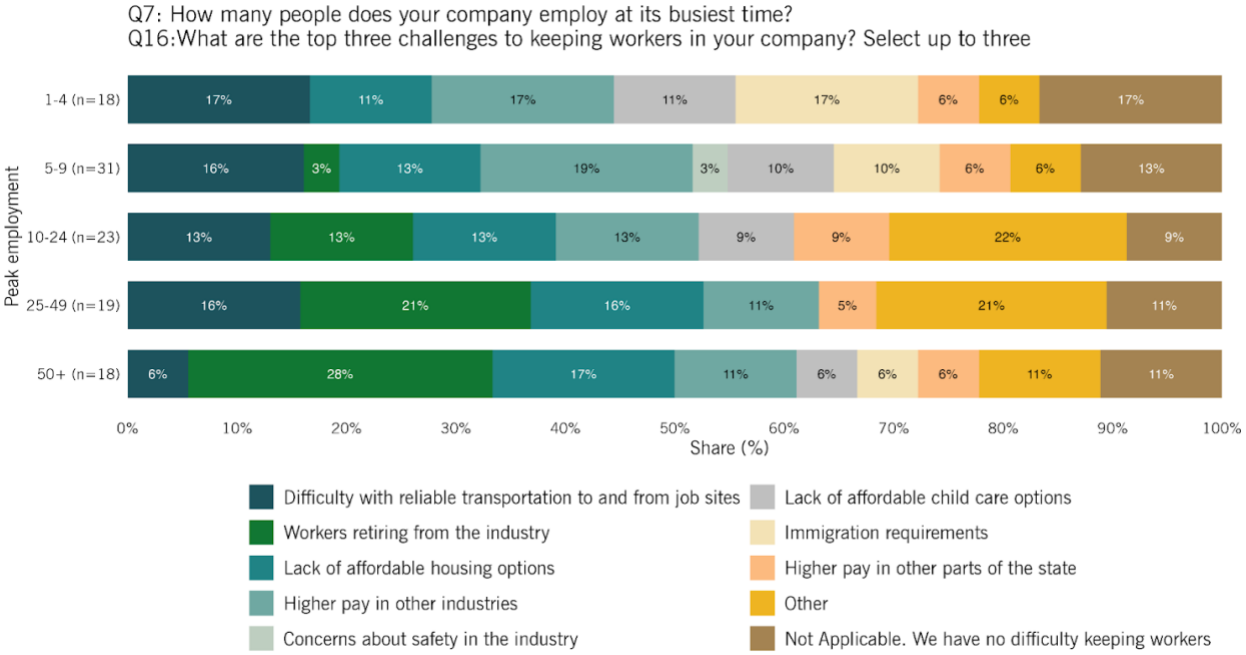


Exhibit B7. Workforce challenges by company size

Survey Question: Which statement best represents your view?

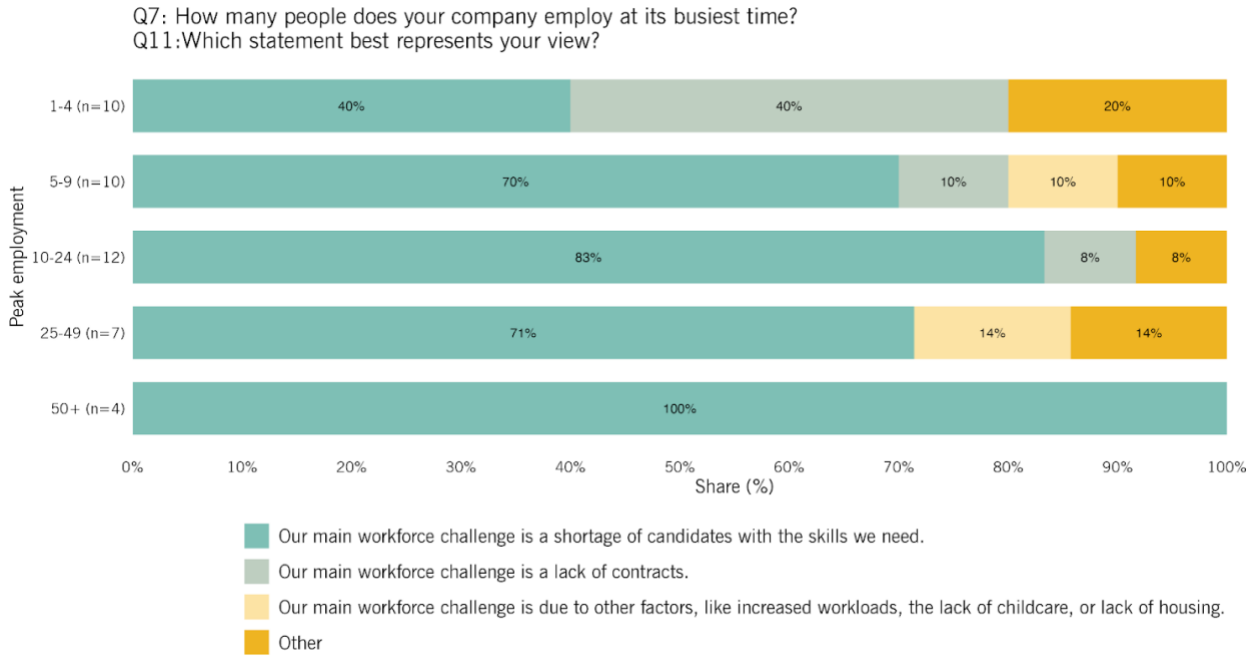
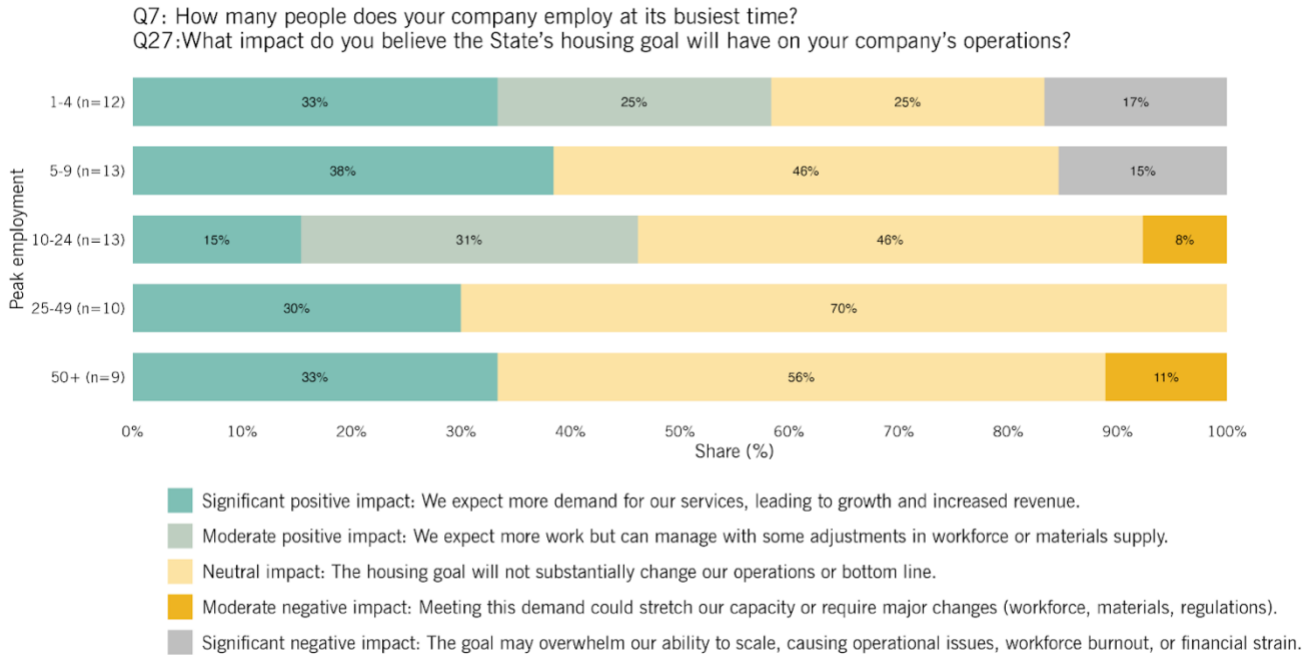


Exhibit B8. Anticipated State Housing Goal Impacts by Company Size

Survey Question: What impact do you believe the State's housing goal will have on your company's operations?



Oregon Housing Production Workforce Assessment Survey

Your participation in this survey will provide important business and industry perspective on Oregon's housing construction workforce and opportunities for improvement. This survey is part of a Housing Production Workforce Assessment being conducted on behalf of Oregon's Workforce and Talent Development Board and Higher Education Coordinating Commission.

In 2023, Governor Kotek set a goal to build **36,000 homes per year for the next ten years**—an 80% increase over current construction trends—with half of them being affordable for households earning less than 80% of the area's median income. Click here for the full text of the order.

Oregon estimates that it needs 12,000 new construction industry workers (net) over the next ten years to meet this goal. About two thirds of these need to work in the trades, the other third in other occupations (installation/maintenance, office and administrative staff, management, cost estimators, permitting, etc.). Workforce needs will differ across the state, based on differences in regional housing needs and current workforce conditions.

This survey is specific to the housing construction industry; interviews and focus groups to follow will look further at topics covered in this survey as well as local government planning and permitting.

Survey questions are asked as they relate to your company; by company we mean your firm or organization. **All responses will be confidential, and all questions are optional.** We expect the survey to take _____ minutes.

Thank you in advance for your contribution to the Oregon Housing Production Workforce Assessment.

...

Draft Survey Questions

1. **What type of construction does your company usually do? Select all that apply.**
    - Residential (single-unit, townhome, or small-plex)
    - Residential (apartment buildings)
    - Commercial

2. **What type of work does your company usually do? Select all that apply.**
    - General contractor
    - Carpentry
    - Electrical

- Mechanical
- Plumbing
- Engineering
- Other (please specify):

3. **Are you a union signatory contractor?**
    - Yes
    - No

If yes,

4. **What unions or crafts are you signed with? [Open ended response]**

5. **In which area(s) does your company work? Select all that apply.**
    - Baker, Grant, Harney, Malheur, Morrow, Umatilla, Union, and Wallowa counties
    - Wasco, Hood River, Sherman, Gilliam, Jefferson, Wheeler, Crook, Deschutes, Klamath, and Lake counties
    - Benton, Clatsop, Columbia, Lincoln, and Tillamook counties
    - Washington and Multnomah counties
    - Clackamas County
    - Yamhill, Polk, Marion, and Linn counties
    - Lane County
    - Coos, Douglas and Curry counties
    - Josephine and Jackson counties

6. **What best describes your role? Select one.**
    - General Manager
    - Project Manager/Superintendent
    - Human Resources Director or Manager
    - Operations Manager
    - Training Director
    - President/CEO, VP, COO, or CFO
    - Trade/craft construction employee

7. **How many people does your company employ at its busiest time? Select one.**
    - I am self-employed
    - 1-4
    - 5-9
    - 10-24
    - 25-49
    - 50-99
    - 100+

8. **Would you like to be interviewed or join a focus group about the housing production workforce in Oregon? If so, please provide your contact information:**
    - Name: _____
    - Company: _____
    - Email address: _____

[Page break]

9. **Does your company regularly experience any of the following? Select all that apply.**

    - Long wait times or shortages of electrical equipment (switchgear, transformers, etc.)
    - Long wait times or shortages of mechanical equipment (HVAC, etc.)
    - Long wait times or shortages of other items (please specify): _____
    - Transportation or delivery delays
    - Governmental delays (lack of approvals, inspectors, etc.)
    - Owner's decision to halt or redesign the project
    - High interest rates causing developers to hesitate

10. **Please indicate your agreement with this statement: Attracting, hiring, and/or keeping employees has been a significant challenge for my company in the past 12 months.**
    - Strongly disagree

- Disagree
- Neither agree nor disagree
- Agree
- Strongly agree

If Agree or Strongly Agree:

11. Which statement best represents your view?

- Our main workforce challenge is a shortage of candidates with the skills we need.
- Our main workforce challenge is due to other factors, like increased workloads, the lack of childcare, or lack of housing.
- Our main workforce challenge is a lack of contracts.
- Other (please specify):

If Neither, Disagree, or Strongly Disagree:

12. What workforce challenges—if any—has your company faced over the past year? (Open Ended Response)

13. If your company has struggled to fill <u>hourly</u> positions over the past year, what jobs have been the hardest to fill? [Open ended with five rows]

14. If your company has struggled to fill <u>salaried</u> positions over the past year, what jobs have been the hardest to fill? [Open ended with five rows]

15. Thinking about open positions at your company over the past 12 months, please indicate your agreement with the following statements. [Strongly disagree, Disagree, Neutral, Agree, Strongly agree]

- Applicants have the necessary basic skills (knowledge of safety protocols, math, reading)
- Applicants have essential skills (listening, communication, professionalism)
- Applicants have desired advanced skills (trade-specific skills, like roofing)
- Applicants have desired occupational skills (ability to operate tools and machinery
- Applicants have the necessary credentials or licenses (driver's license, permits, degrees, certificates)

- Applicants have the required work experience
- Applicants can pass a background check
- Applicants can pass a drug screening

16. What are the top three challenges to keeping workers in your company? Select up to three.

- Not Applicable. We have no difficulty keeping workers
- Immigration requirements
- Concerns about safety in the industry
- Higher pay in other industries
- Higher pay in other parts of the state
- Workers retiring from the industry
- Lack of affordable housing options
- Lack of affordable child care options
- Difficulty with reliable transportation to and from job sites
- Other (please specify):

17. Which of the following reliably provide your company with skilled workers? Select all that apply.

- Apprenticeship programs
- Career centers at community colleges or universities
- Community-based organizations
- Employee referrals
- High school career and technical education (CTE) programs
- Postsecondary CTE programs
- Staffing agencies
- Union hiring hall
- WorkSource Oregon
- 2-year educational programs
- 4-year educational programs
- Other (please specify):

If any response to Q21 is checked,

18. In the previous question, you selected these sources of skilled workers: [list]

Please list up to three specific programs or organizations that provide your company with skilled workers. [Open ended with three rows]

19. An increasing number of companies are interested in hiring and keeping employees from diverse backgrounds. Is your company actively trying to diversify its workforce (by gender, race/ethnicity, or other characteristic)?

( ) Yes ( ) No ( ) Don't Know

If yes,

20. How are you trying to diversify your workforce? Select all that apply.

[ ] By gender [ ] By race/ethnicity [ ] Other (please specify):

If by gender,

21. Are you having difficulty filling positions with diverse applicants by gender?

( ) Yes ( ) No ( ) Don't Know

If by race,

22. Are you having difficulty filling positions with diverse applicants by race/ethnicity?

( ) Yes ( ) No ( ) Don't Know

If other,

23. Are you having difficulty filling positions with diverse applicants by the other characteristic(s) you described?

( ) Yes ( ) No ( ) Don't Know

24. What strategies could industry groups, workforce development providers, or schools use to help you meet your diversity goals? (Open ended)

[Page break]

25. In your opinion, what is the most effective way for companies or the government to address labor shortages? [Open ended response]

[Page break]

In 2023, Governor Kotek set a goal to build **36,000 homes per year for the next ten years**, with half of them being affordable for households earning less than 80% of the area's median income. Click here for the full text of the order.

26. **What do you think will be the most important workforce challenges with the expected increase in housing production in response to the State's goal?** [Open Ended Response]

27. **What impact do you believe the State's housing goal will have on your company's operations?**
    - Significant positive impact: We expect more demand for our services, leading to growth and increased revenue.
    - Moderate positive impact: We expect more work but can manage with some adjustments in workforce or materials supply.
    - Neutral impact: The housing goal will not substantially change our operations or bottom line.
    - Moderate negative impact: Meeting this demand could stretch our capacity or require major changes (workforce, materials, regulations).
    - Significant negative impact: The goal may overwhelm our ability to scale, causing operational issues, workforce burnout, or financial strain.

28. **How likely do you think it is that the State's housing goal will be met, given current industry conditions (workforce availability, supply chain issues, permitting, access to funding, regulations)?**
    - Very likely
    - Somewhat likely
    - Neutral
    - Somewhat unlikely
    - Very unlikely

29. **Please share any additional thoughts on the State's annual housing production target.** [Open Ended Response]

Appendix C: Interview and Focus Group Questions

ECOnorthwest conducted six semi-structured interviews, each lasting 45 minutes, and three semi-structured focus groups, each lasting one hour. Outreach was conducted to engage the following groups:

- Community college programs
- Joint Apprenticeship and Training Committees (JATCs)
- Apprenticeship and pre-apprenticeship programs
- Union representatives
- Trade organizations
- K12 Career and Technical Education (CTE) partners
- Vocational rehabilitation providers
- Construction employers
- Construction staffing agencies
- Nonprofit builders
- Manufactured and modular home builders
- Permitting offices (e.g., building code inspectors)

The interviews were guided by a core set of questions while focus-group-specific questions were tailored to the unique perspectives of each group. For example, we developed questions specific to building inspectors to address their experiences with permitting processes. Additional questions were incorporated as needed, based on insights that emerged during the discussions.

Interview Questions

- Has attracting, hiring, and/or keeping employees has been a significant challenge for your company recently?
  - Follow up: What positions are hardest to fill? What is the biggest challenge? What are you doing about it? How do you see this changing over time? How could the State help this problem?
- Why do you think students in school/workers decide to go into the field of construction?
- Generally, what are some challenges that you have seen new construction workers face in being successful in working in construction?
- What are some instances you know of where schools/construction industry are promoting educational initiatives within the construction industry? How successful have they been?
- Why do students/workers specifically not want to enter or decide to leave the field?

- What would the perfect construction education program look like to you? Why?
- Is your firm a union signatory contractor? Why or why not?
- How important is diversifying your workforce to you? What unique challenges come with efforts to diversify?
    - Follow up: What strategies could industry groups, workforce development providers, or schools use to help you meet your diversity goals?
- How likely do you think it is that the State's housing goal will be met, given current industry conditions (workforce availability, supply chain issues, permitting, access to funding, regulations.
    - Follow up: If not likely, what would need to change to make this goal possible?

Focus Group Questions

Community Colleges, Apprenticeships, and Pre-apprenticeships

- How do you decide what programs are best to start next?
- What would help make your programs more successful, to offer a wider range of programming or recruit more students?
- Are employers getting what they need? What would they like to see?

Building Inspectors

- In 2014 the International Code Council and the National Institute of Building Science (NIBS) partnered on a study to understand what the future of the code profession looked like. During this study it was discovered that about 85 percent of the current code professional workforce was over the age of 45 and many were on the verge of retirement.
    - Is this your experience in Oregon as well?
    - If not, what has drawn younger people into this profession?
    - If so, what is keeping younger people from joining this profession?

Union Representatives

- Do we have a labor shortage or not in Oregon? Is there a lack of folks coming into the trades or is that not a major issue?
- We have also been talking to folks at community colleges and non-union programs. What is your perception of the need for those?
- Code inspectors have told us they are understaffed – how does this affect your work?

Appendix D: Program Inventory Supplementary Exhibits

Exhibit D1. Apprenticeship Completion Rates by Sex as of 9/20/24, Construction Industry, Oregon

	Completed		Terminated		Active	
Start Year	Female	Male	Female	Male	Female	Male
2018	48%	58%	51%	41%	1%	1%
2019	35%	55%	55%	40%	9%	5%
2020	26%	35%	55%	43%	17%	21%
2021	10%	14%	42%	37%	47%	48%
2022	6%	6%	37%	33%	54%	60%
2023	1%	2%	35%	25%	63%	72%
2024	0%	0%	10%	10%	89%	89%

Data source: BOLI

Exhibit D2. Apprenticeship Status as of 9/20/24, by Race/Ethnicity, Construction Industry, Oregon

	Completed					Terminated					Active				
Start Year	White	Hispanic	Black	Asian	Other	White	Hispanic	Black	Asian	Other	White	Hispanic	Black	Asian	Other
2018	61%	49%	28%	59%	61%	38%	49%	71%	40%	37%	1%	2%	1%	2%	2%
2019	56%	48%	29%	63%	42%	38%	47%	65%	33%	53%	6%	5%	6%	5%	5%
2020	36%	32%	25%	36%	28%	42%	50%	59%	36%	49%	21%	18%	16%	28%	23%
2021	14%	14%	12%	8%	16%	34%	47%	55%	34%	49%	51%	39%	32%	56%	31%
2022	6%	6%	7%	2%	6%	29%	41%	59%	38%	41%	64%	52%	35%	58%	51%
2023	2%	1%	1%	2%	4%	22%	33%	50%	29%	28%	75%	64%	48%	68%	65%
2024	0%	0%	0%	0%	0%	7%	20%	26%	6%	13%	92%	78%	73%	94%	84%

Data source: BOLI

Exhibit D3. Pre-apprenticeship Enrollment and Share of Statewide Total, Oregon, 2024

Workforce Area	Count	Share of Total
Portland-Metro Area	418	39%
Mid-Valley Area	149	14%
East Cascades Area	102	9%
Washington State	96	9%
Southwestern Oregon	88	8%
Rogue Valley Area	79	7%
Clackamas Area	55	5%
Lane Area	49	5%
Eastern Oregon Area	25	2%
Northwest Oregon Are	13	1%
California	5	0%
Total	**1,079**	**100%**

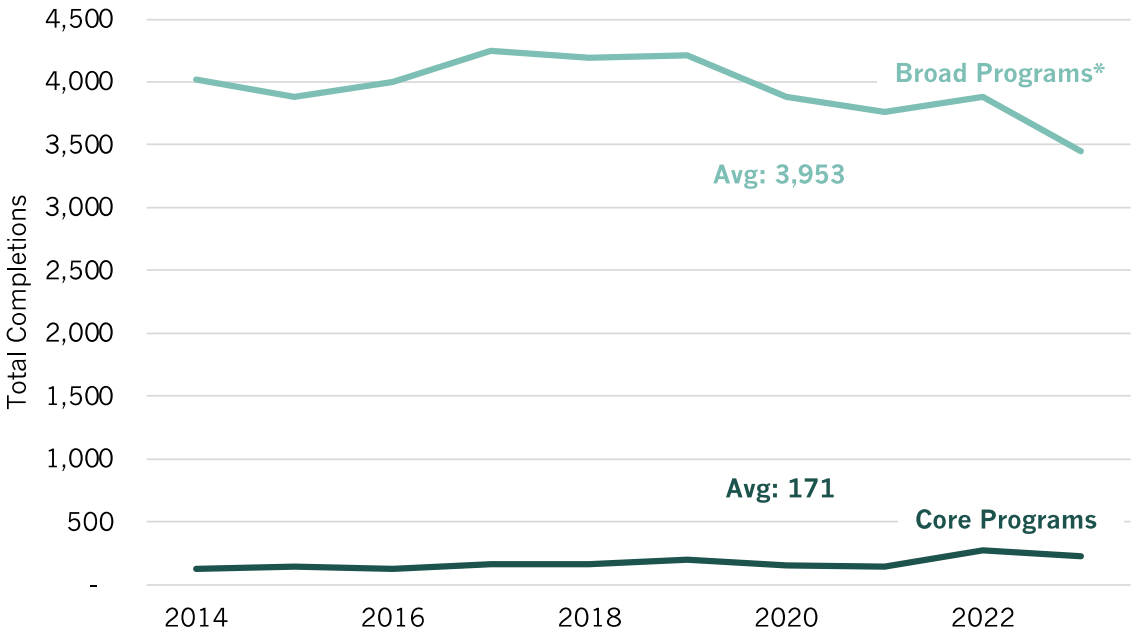
Data source: BOLI

Exhibit D4. Designation of Core and Broad CIP Codes

CIP-Occupation	Group
15.0501-HVAC and Refrigeration Engineering Technology/Tech.	Core
46.0000-Construction Trades, General	Core
46.0201-Carpentry/Carpenter	Core
46.0302-Electrician	Core
46.0403-Building/Home/Construction Inspection/Inspector	Core
46.0406-Glazier	Core
46.0412-Building/Construction Site Management/Manager	Core
46.0415-Building Construction Technology/Technician	Core
46.0502-Pipefitting/Pipefitter and Sprinkler Fitter	Core
47.0201-HVAC and Refrigeration Maintenance Technology/Tech.	Core
14.0801-Civil Engineering, General	Broad
14.0805-Water Resources Engineering	Broad
14.1801-Materials Engineering	Broad
14.1901-Mechanical Engineering	Broad
14.3601-Manufacturing Engineering	Broad
52.0101-Business/Commerce, General	Broad
52.0201-Business Administration and Management, General	Broad
52.0205-Operations Management and Supervision	Broad

Data source: IPEDS

Exhibit D5. Completions in Core and Broad Housing Production Programs Over Time, Oregon



* Broad programs are inclusive of core programs

Data source: IPEDS

Exhibit D6. Completions in Broad Housing Production Programs, by Institution, Oregon

			Average Annual (2019 - 2023)				
Institution	Region	Number of Programs	All Certificates	Associates	Bachelor's	Advanced Degrees	All Completions
Community Colleges							
Rogue Community College	Rogue Valley	3	63	38	-	-	101
Clackamas Community College	Clackamas	3	21	37	-	-	58
Linn-Benton Community College	Mid-Valley	1	-	41	-	-	41
Central Oregon Community College	East Cascades	1	-	57	-	-	57
Portland Community College	Portland-Metro	1	-	54	-	-	54
Lane Community College	Lane	2	-	45	-	-	45
Chemeketa Community College	Mid-Valley	1	3	14	-	-	17
Klamath Community College	East Cascades	1	-	17	-	-	17
Mt Hood Community College	Portland-Metro	2	-	79	-	-	79
Blue Mountain Community College	Eastern Oregon	2	3	12	-	-	15
Southwestern Oregon Community College	Southwestern Oregon	1	-	8	-	-	8
Clatsop Community College	Northwest Oregon	1	2	4	-	-	6
Umpqua Community College	Southwestern Oregon	2	-	3	-	-	3
Oregon Coast Community College	Northwest Oregon	2	-	2	-	-	2
Tillamook Bay Community College	Northwest Oregon	1	-	4	-	-	4
Columbia Gorge Community College	East Cascades	1	-	1	-	-	1
Treasure Valley Community College	Eastern Oregon	1	-	0.2	-	-	0
Community College Total			**93**	**415**	**-**	**-**	**508**
Four-Year Institutions							
Oregon State University	Northwest Oregon	6	7	-	845	221	1,072
University of Oregon	Lane	2	-	-	521	174	695
Portland State University	Portland-Metro	4	15	-	330	125	469
Southern Oregon University	Rogue Valley	2	-	-	117	73	190
George Fox University	Mid-Valley	3	-	-	102	62	165
University of Portland	Portland-Metro	3	-	-	80	41	122
Willamette University	Mid-Valley	1	-	-	-	100	100
Oregon Institute of Technology	East Cascades	3	-	-	95	5	100
Western Oregon University	Mid-Valley	1	-	-	102	-	102
Pacific University	Portland-Metro	1	-	-	42	21	63
Corban University	Mid-Valley	2	1	-	44	28	73
Eastern Oregon University	Eastern Oregon	2	-	-	3	30	34
Bushnell University	Lane	2	-	-	22	11	32
Warner Pacific University Professional and Graduate Studies	Portland-Metro	1	-	-	39	14	53
Linfield University	Mid-Valley	1	-	-	18	-	18
Warner Pacific University	Portland-Metro	1	-	1	11	-	12
Multnomah University	Portland-Metro	1	-	-	7	-	7
Four Year Institution Total			**23**	**1**	**2,377**	**905**	**3,306**
Overall Total			**115**	**416**	**2,377**	**905**	**3,813**

Data source: IPEDS