

Regional Public Owners Construction Workforce Analysis 2022 Update

May 26, 2022

Executive Summary

Regional Supply and Demand Forecast

- Regional demand for construction workers is projected at **about 159,000 workers per year** on average between 2022 and 2026. **Note:** For this study, the terms FTE and worker are interchangeable.
- Overall, the projected average annual gap for the Tri-County region is about **8,400 workers or 5.6% of average annual construction supply**.
- **Construction laborers, carpenters, and supervisors** are each projected to have an average annual gap of more than 700 workers between 2022 and 2026.

Regional Public Owners (RPO) Demand Forecast and Projected Gap

- The RPO agencies are projected to spend about **\$10.3 billion on construction projects** over the period from 2022 to 2026.
- RPO construction spending represents about **4.5% of forecasted regional spending** from 2022 to 2026.
- RPO construction projects are projected to require **6,200 construction workers in 2022** and average **5,400 workers per year through 2026**.
- **RPO construction employment demand represents 5%** of total regional construction demand.
- Between 2022 and 2026, **construction laborers,**

carpenters, and operating engineers are projected to have the highest demand from RPO agencies.

- Of the highest demanded occupations by RPO agencies, the supply for the **construction laborers occupation** is expected to fall 1,500 workers behind the regional demand for the occupation.

Apprenticeship

- Among all occupations, **carpenters, laborers, and construction electricians** represent the largest number of projected apprentice completions in the tri-county region. These occupations represented about 42% of total projected completions.
- **Apprenticeship demand for RPO construction occupations is projected at about 1,000 apprentices per year** on average between 2022 and 2026. This is roughly a 19% apprentice utilization rate.

Pandemic Impacts

- The **construction industry rebounded quickly** during the pandemic induced recession.
- Demographic groups, including **Pacific Islander, Native American, and Black workers** within the construction industry have been impacted disproportionately since the onset of the pandemic, recording the highest rates of continued UI claims since April of 2020.

Terms and Concepts

- The **RPO (Regional Public Owner group)** includes the City of Seattle, King County, Port of Seattle, Sound Transit, and the Washington State Department of Transportation.
- The **study region** referred to as the “**Tri-County Region**” throughout this report includes King, Pierce, and Snohomish counties.
- The **regional construction industry forecast** describes the anticipated equilibrium of future labor market supply and demand in the construction industry.
- For the purpose of this workforce analysis, the **construction industry** includes all occupations with employment in North American Industry Classification System (NAICS) code 23 and uses the Occupational Employment Statistics (OES) data from the Washington State Employment Security Department. This definition of the construction industry includes residential, industrial, and commercial construction.
- In the industry forecast, **total demand** includes new openings and retained workers. The retained workforce includes turnover within the industry and region while new openings are entirely new jobs. **Total supply** represents the pool of qualified workers and includes existing workers from previous year (retained workforce), Unemployment Insurance (UI) claimants previously employed in construction occupations, and educational program completions in programs related to construction. A negative **gap between demand and supply** indicates a shortage in the overall labor in the region, as employment demand exceeds regional supply. The occupational gap presented in this report represents **the gap across the entire construction industry** for each given occupation.
- For this report, the **terms worker and FTE are interchangeable**. An FTE is assumed as someone who works 1,860 hours per year.

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Introduction

Background and Purpose

The purpose of this analysis is to analyze the Tri-County (King, Pierce, and Snohomish counties) construction workforce supply and demand for the Regional Public Owners (RPO) from 2022 through 2026. The RPO group consists of City of Seattle, King County, Port of Seattle, Sound Transit and Washington State Department of Transportation (WSDOT). The analysis will enable RPO agencies to make more informed decisions with respect to workforce development investments, partnerships, and project planning.

The COVID-19 pandemic has impacted workers across all industries. This analysis will also evaluate if and how the pandemic has impacted the regional construction workforce, particularly for underrepresented workers including people of color, women and residents of economically distressed ZIP codes.

Methods

Analysis will leverage and update construction workforce assessments previously done by Community Attributes Inc. (CAI) for RPO agencies, along with new data provided by each RPO agency on projected labor hours by project and updated federal and state data specific to construction.

The analysis of construction workforce supply and demand speaks directly to the needs and impacts of RPO projects. Projected employment demand and supply in construction includes breakouts by construction occupations and specifically calls out those jobs and occupations needed to fulfill RPO projects.

Further details about data sources and methodology is included in the Technical Appendix to this report.

Regional Construction Demand, Supply and Occupational Gaps

Projected Construction Spending

Projected Construction Spending By Year, Billions \$, King, Pierce and Snohomish Counties, 2022-2026



Sources: RPO Agencies, 2022; Washington State Employment Security Department, 2022; Washington State Economic and Revenue Forecast Council, 2022; Washington State Department of Revenue, 2022; Community Attributes Inc., 2022.

Note: Projected spending includes residential, industrial, and commercial construction.

Projected regional construction spending is comprised of predominately non-RPO sources. On average, regional public owner spending represented 4.5% of region-wide spending from 2022 to 2026.

Regional spending forecasts follow construction employment forecasts, which foresee a slight decrease in construction employment through 2024, before rising again in 2025 and 2026.

Projected Construction Spending

The projected construction spending for the region does not include spending that will be generated by the federal infrastructure bill signed into law in late 2021 and Washington's transportation budget adopted earlier this year.

The federal infrastructure bill will provide \$1.2 trillion in spending, \$550 billion of which will be new federal spending, to be allocated over the next 5 years throughout the United States. Among this spending, transportation and infrastructure investment allocation looks as follows:

- Roads and Bridges: \$110 Billion
- Public Transit: \$39 Billion
- Railways: \$66 Billion
- Electric Vehicles: \$7.5 Billion
- Electric Buses and Ferries: \$7.5 Billion
- Airports and Waterways: \$42 Billion
- Transportation Safety: \$11 Billion
- Power Grids: \$73 Billion

Of the bill's total funding, Washington is set to receive \$8.6 billion.

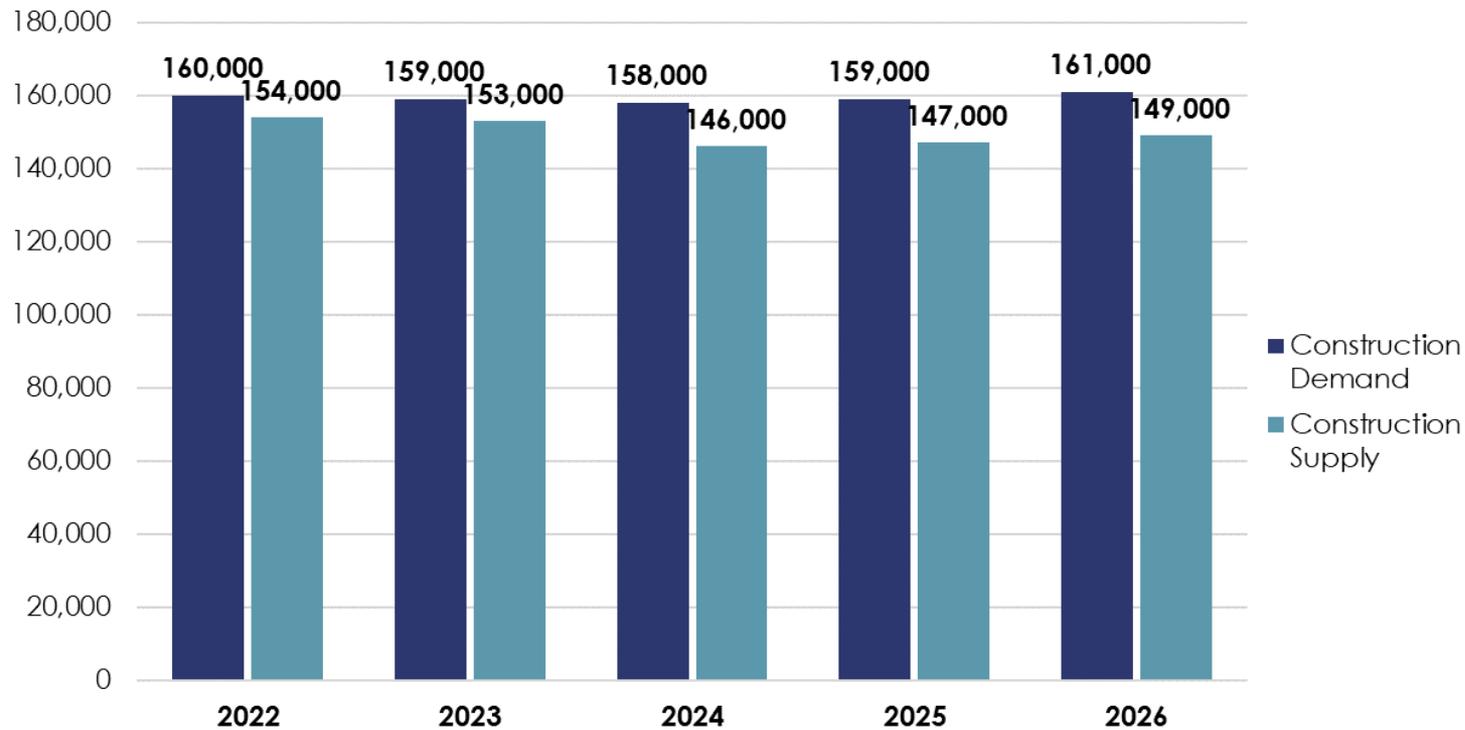
Move Ahead Washington, Washington State's \$16.8 billion transportation budget, includes historic levels of funding for public transportation, bicycle and pedestrian safety, road preservation and maintenance, and climate mitigation. A bulk of the funding comes from the carbon cap-and-trade fee, contributing \$5.4 billion. Among the future spending, public transit will receive \$3 billion of the budget, while pedestrian and bicycle improvements are set to receive \$1.3 billion.

At the time of this study, there was limited information on the distribution and timelines of funding through the federal infrastructure bill and Move Ahead Washington to allow for inclusion in this analysis.

Sources: "Infrastructure Bill", EY, 2021; "The States Benefiting the Most From the Infrastructure Deal", U.S. News, November 19, 2021; "Here's what is included in the state's \$64 billion supplemental budget", King 5, March 11, 2022; "No increased WA gas tax in 'unprecedented' \$16.8B transportation budget", Crosscut., March 3, 2022.

Projected Construction Demand and Supply

Projected Construction Employment Demand and Supply, King, Pierce and Snohomish Counties, 2022-2026



Sources: Washington State Employment Security Department, 2022; NCES IPEDS, 2022; Community Attributes Inc., 2022.

Region-wide construction supply is projected to fall short of demand from 2022 through 2026. **Supply shortages during this time period range from 6,000 to 12,000 workers.**

Demand is projected to stay relatively constant from 2022 to 2026, while supply is projected to decrease. Supply and demand estimates include workers across residential, industrial, and commercial construction.

Projected Occupational Gaps

Projected Regional Construction Openings and Gap by Occupation

Total construction employment demand in the Tri-County region is projected at 160,000 in 2022 and 161,000 in 2026. Overall, the projected average annual gap for the Tri-County region for the entire construction industry (commercial, industrial, and residential) is about 9,600 workers.

Average annual openings in the construction industry include openings created due to growth within an occupation as well as openings created by separations. Separations openings are created by workers exiting the labor force or transferring to an occupation within a different occupational code.

Supply is comprised of two elements. Historic rates of unemployment claimants within each occupation and graduates from programs where graduates have historically filled the occupation.

The occupational gap is the difference between supply and demand.

Construction laborers are among the largest regional occupations, with an average annual demand of 24,600 workers in the construction industry between 2022 and 2026. Laborers have the greatest projected average annual openings and are forecasted to have the largest annual average gap (1,730).

Carpenters and **Supervisors** are each projected to have an average annual gap of more than 700 workers available from the Tri-County region.

Other occupations with a projected regional gap greater than 200 workers include: **Painters, Electricians, Roofers, Cement Masons, Plumbers, and HVAC Installers.**

Projected Occupational Gaps

Construction Employment and Talent Pipeline, King, Pierce and Snohomish Counties, 2022-2026

Occupation	% in Const Industry	Average Annual Demand	Average Annual Openings	Average Annual Supply (UI+Grads)	Average Annual Gap	Gap as a % of Avg Annual Demand
Construction Laborers	90%	24,600	2,460	730	(1,730)	(7%)
Carpenters	86%	19,200	1,390	690	(700)	(4%)
Painters	94%	9,700	640	200	(440)	(5%)
First-Line Supervisors of Construction Trades	88%	9,500	820	100	(720)	(8%)
Electricians	85%	8,800	820	450	(370)	(4%)
Construction Managers	85%	8,500	670	390	(280)	(3%)
Plumbers	86%	4,500	410	200	(210)	(5%)
Roofers	100%	4,500	390	120	(270)	(6%)
Operating Engineers	84%	4,100	400	290	(110)	(3%)
Cement Masons and Finishers	99%	4,000	340	110	(230)	(6%)
Drywall and Ceiling Tile Installers	98%	4,000	240	70	(170)	(4%)
HVAC Installers	79%	3,900	320	110	(210)	(5%)
Cost Estimators	60%	2,300	170	240	70	3%
Tapers	100%	2,100	100	60	(40)	(2%)
Sheet Metal Workers	67%	1,600	140	150	10	1%
Welders, Cutters, Solderers, and Brazers	34%	1,400	120	60	(60)	(4%)
Tile and Marble Setters	100%	1,200	70	30	(40)	(3%)
Fence Erectors	86%	1,100	100	0	(100)	(9%)
Brickmasons	98%	1,000	90	70	(20)	(2%)
Glaziers	94%	1,000	100	70	(30)	(3%)
Ironworkers	97%	1,000	100	150	50	5%
Heavy Equipment Mechanics	34%	800	70	10	(60)	(8%)
Paving Equipment Operators	96%	700	70	60	(10)	(1%)
Insulators	99%	600	40	10	(30)	(5%)
Lineworkers	53%	600	40	10	(30)	(5%)
All Other Construction Occupations		38,300	3,890	1,220	(2,670)	(7%)
Total		159,000	14,000	5,600	(8,400)	(5%)

This table shows occupations with an average annual demand of 600 workers or more between 2022 and 2026 and with more than a third of all regional employment for that occupation within the construction industry.

The average annual gap represents the gap for each occupation across the entire regionwide construction industry, including commercial, industrial, and residential.

Sources: RPO Agencies, 2022; Washington State Employment Security Department, 2022; Washington State Department of Revenue, 2022; NCES, 2022; Bureau of Labor Statistics, 2022; Community Attributes Inc., 2022.

Note: Construction laborers includes flaggers.

RPO Demand, Supply and Occupational Gaps

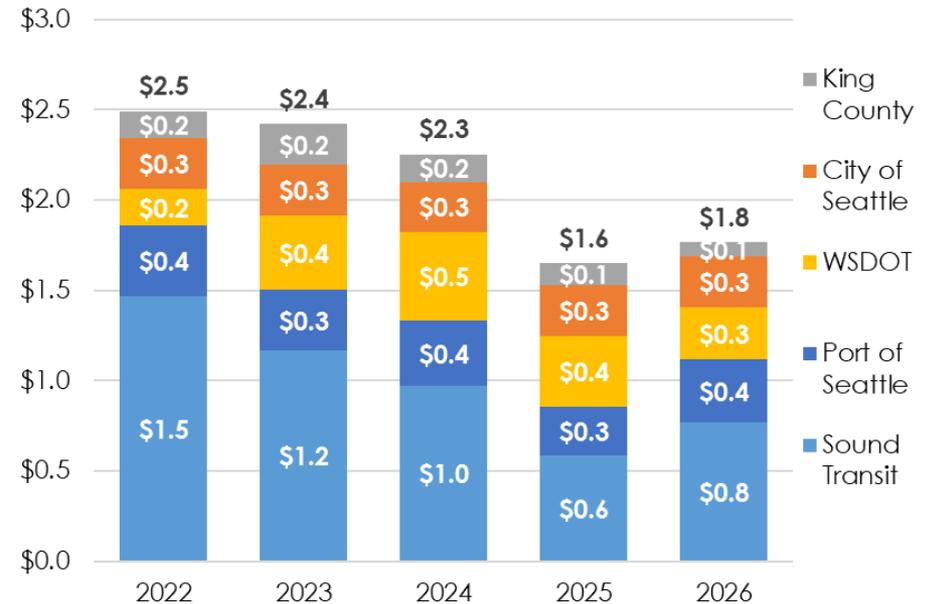
RPO Construction Spending Forecast

Projected RPO Construction Spending

The RPO agencies are projected to spend **\$10.6 billion on construction projects over the period from 2022 to 2026**. The spending is expected to be highest in 2022 at \$2.5 billion and drop to \$1.6 in 2025 before increasing to \$1.8 in 2026. Due to data limitations for RPO projections, there is less certainty for RPO construction expenditures beyond 2024, which could be the reason for the decrease in 2025 and 2026.

Sound Transit forecasts they will spend roughly \$5 billion on construction projects between 2022 and 2026, the most of all RPO members. The four largest projects that make up almost 70% of the five-year estimated spending include the Federal Way Link Extension, Lynnwood Link Extension, Downtown Redmond Link Extension, and I-405 Bus Rapid Transit.

Projected RPO Construction Spending By Year, Billions \$, King, Pierce and Snohomish Counties, 2022-2026



Sources: RPO Agencies, 2022; Washington State Employment Security Department, 2022; Community Attributes Inc., 2022.

Note: RPO projected construction spending does not include construction spending that will be funded by the federal infrastructure bill and Move Ahead Washington.

RPO Construction Spending Forecast

The projected construction spending for the Washington State Department of Transportation (WSDOT) is \$1.8 billion for the five-years to 2026. The SR 520 Portage Bay Viaduct and Roanoke Lid bridge replacement project, the I-405, Brickyard to SR 527 Improvement Project, and the I-405/NE 85th Street Interchange and In-line BRT Station Project Phase 2 account for roughly 50% of the \$1.8 billion.

The forecasts for WSDOT are based on data provided by the agency which includes contracts that are planned for advertisement by WSDOT for February 2022 to January 2023. Project information is subject to change and projects are dependent on funding availability.

The Port of Seattle expects to spend \$0.4 billion in 2022, and the five-year projection totals to \$1.7 billion. The projected construction spending was provided by the Port. Notable projects, obtained from the Port's capital improvement plan, include North Main Terminal Development at Seattle-Tacoma International Airport (SEA), SEA Main Terminal Improvements Program, Terminal 46 North Pier Structure Replacement and others.

The City of Seattle is projected to spend on average \$281 million per year on construction projects between 2022 and 2026. This estimate is derived from historic data on construction spending

provided by the city from 2016 to 2021. The largest projects include the Ship Canal Water Quality Project (SCWQP) Ballard Tunnel Effluent Pump Station, Waterfront Seattle-Pier 58 Improvements and Pier 53 Demolition, and Pike Pine Streetscape & Bicycle Improvements.

Estimates for King County spending on construction projects total \$0.7 billion during the period from 2022 to 2026. Spending is projected to be highest from 2022 through 2024. After 2024 spending is projected to decrease as 55% of the projects in the pipeline are expected to be delivered by the end of 2024. Project highlights during this period include South County Recycling & Transfer Station, Lake Hills and NW Lake Sammamish Interceptor Upgrade, Coal Creek Trunk Pipeline Replacement, RapidRide I Line, Harborview Medical Center Maleng Building Single Patient Rooms, and others.

King County estimates only include the Harborview Maleng Building Single Patient Rooms Project funded from the \$1.74 billion in phased general obligation bond funding for health and safety improvements at King County's Harborview Medical Center campus approved by King County voters in November 2020. No other information was available at the time of this study about construction costs and timeline for other projects that will be funded by this bond.

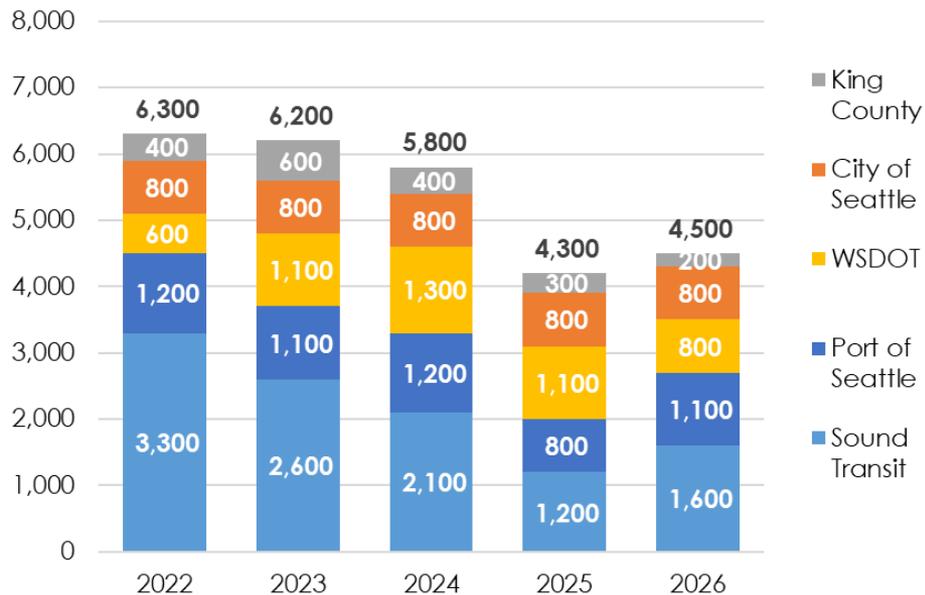
RPO Construction Demand Forecast

Projected RPO Construction Employment

RPO construction projects are projected to require **6,300 construction workers in 2022 and average 5,400 workers per year to 2026.** From 2022 to 2026, employment demand for RPO projects ranges from 6,300 to 4,300.

Sound Transit's share of the total annual RPO demand decreases from 52% in 2022 to 28% in 2025. Sound Transit is projected to demand roughly 2,200 workers on average from 2022 through 2026. Port of Seattle average the next highest demand with 1,080 workers, followed by WSDOT with 980 workers.

Projected RPO Construction Employment Demand By Year, King, Pierce and Snohomish Counties, 2022-2026



Sources: RPO Agencies, 2022; Washington State Employment Security Department, 2022; Washington State Department of Revenue, 2022; Community Attributes Inc., 2022.

RPO Construction Demand Forecast

Projected RPO Construction Occupational Demand

Between 2022 and 2026, construction laborers, carpenters, and operating engineers are projected to have the highest demand from RPO agencies.

Construction demand projections by occupation for RPO members are driven by the types of projects funded by each agency.

Other occupations with an average annual demand lower than 100 jobs between 2022 and 2026 can be found in the appendix.

Projected RPO Construction Occupational Demand By Year, King Pierce and Snohomish Counties, 2022-2026

Occupation	2022	2023	2024	2025	2026	Average 2022-2026
Construction Laborers	1,600	1,700	1,500	1,100	1,100	1,400
Carpenters	1,000	1,000	1,000	700	700	900
Operating Engineers	1,000	1,000	900	600	700	800
Electricians	600	600	600	500	500	600
Ironworkers	400	300	300	300	300	300
Truck Drivers	400	300	300	200	200	300
Plumbers	200	200	200	200	200	200
Cement Masons and Finishers	200	200	200	100	100	200
Sheet Metal Workers	100	100	100	100	100	100
Painters	100	100	100	100	100	100
<i>Other Occupations</i>	700	700	600	400	500	500
Total Demand	6,300	6,200	5,800	4,300	4,500	5,400

Sources: RPO Agencies, 2022; Washington State Employment Security Department, 2022; Washington State Department of Revenue, 2022; Community Attributes Inc., 2022.

Notes: Employment demand represents a headcount of employees. Construction laborers includes flaggers.

RPO Construction Demand Forecast

Projected RPO Construction Occupational Demand by Agency

Average demand by agency from 2022 to 2026 ranges from 400 to 2,200. **The highest demanded occupation by each agency is construction laborers, possessing an average demand ranging from 100 to 500 workers.** The degree of demand for the other top demanded occupations varies depending on the agency.

Projected RPO Construction Occupational Demand By Year and Agency, King Pierce and Snohomish Counties, Average 2022-2026

Occupation	Sound Transit	City of Seattle	King County	WSDOT	Port of Seattle
Construction Laborers	500	200	100	300	200
Carpenters	350	150	50	200	150
Operating Engineers	350	100	100	150	100
Electricians	200	50	50	100	200
Ironworkers	100	50	0	50	100
Truck Drivers	200	40	30	10	30
Plumbers	50	50	0	0	100
Cement Masons and Finishers	100	50	10	30	10
Sheet Metal Workers	20	10	10	0	60
Painters	20	20	10	30	20
<i>Other Occupations</i>	<i>310</i>	<i>80</i>	<i>40</i>	<i>130</i>	<i>130</i>
Total	2,200	800	400	1,000	1,100

Sources: RPO Agencies, 2022; Washington State Employment Security Department, 2022; Washington State Department of Revenue, 2022; Community Attributes Inc., 2022.

Notes: Employment demand represents a headcount of employees. Construction laborers includes flaggers. Totals and column sums may not align due to rounding.

RPO & Regional Occupational Demand

Projected RPO and Regional Construction Occupational Demand

Regional demand for construction workers for all RPO occupations is projected at about 100,000 workers per year on average between 2022 and 2026. Of this demand, RPO agencies are projected to represent about 5,400, or 5% of total regional demand.

Of the most highly demanded occupations by RPO agencies, RPO demand for ironworkers, truck drivers, and operating engineers represents the largest proportion of regional demand. RPO demand for the two largest occupations regionally - construction laborers and carpenters - represents 6% and 5% of projected regional demand, respectively.

The average annual gap for the region is presented in the far-right column.

Construction laborers are expected to have the largest annual gap regionally from 2022 through 2026 and are also among the highest demanded construction occupations.

Projected Construction Demand by Occupation, King, Pierce and Snohomish Counties, 2022-2026

Title	Average Annual Demand 2022-2026			Regional Annual Average Gap
	RPO	Regional	% of Regional	
Construction Laborers	1,400	24,600	6%	(1,730)
Carpenters	900	19,200	5%	(700)
Operating Engineers	800	4,100	20%	(100)
Electricians	600	8,800	7%	(370)
Ironworkers	300	1,000	30%	50
Truck Drivers	300	1,300	23%	(100)
Plumbers	200	4,500	4%	(210)
Cement Masons and Finishers	200	4,000	5%	(230)
Sheet Metal Workers	100	1,600	6%	10
Painters	100	9,700	1%	(440)
<i>Other Occupations</i>	<i>500</i>	<i>21,600</i>	<i>2%</i>	<i>(970)</i>
Total Demand	5,400	100,400	5%	(4,790)

Sources: RPO Agencies, 2022; Washington State Employment Security Department, 2022; Washington State Department of Revenue, 2022; NCES, 2022; Bureau of Labor Statistics, 2022; Community Attributes Inc., 2022.

Note: Construction laborers includes flaggers. Total demand represents demand for the occupations required by RPO agencies, this does not include the total list of occupations included in the regional construction industry.

Historic and Projected Construction Apprenticeships

Historic Construction Apprenticeships

Apprenticeships by Status

In the past 6 years, **active apprentices among RPO occupations reached a peak of 8,160 in 2019**. Active apprentices saw a steady rise during this period, increasing from 5,610 to 8,160 in 2019, before falling slightly in 2020 and 2021 to 7,810 and 7,630, respectively.

Active apprentices have represented between 75% and 81% of total apprentices since 2015. First year apprentices are considered active apprentices and included in the percentages above. Of total apprentices, first year have represented between 18% to 31% since 2015. **First year apprentices peaked in 2018, reaching 2,790.**

Completed apprenticeships have also seen a steady rise since 2015, peaking in 2019 but remaining above 1,000 per year through 2021.

The list of RPO occupations used to create aggregate apprenticeship exhibits can be found in the appendix.

Apprentices by Status, RPO Occupations, King, Pierce, and Snohomish Counties, 2015-2021



Sources: Washington State Department of Labor and Industries, 2022; Community Attributes Inc., 2022.

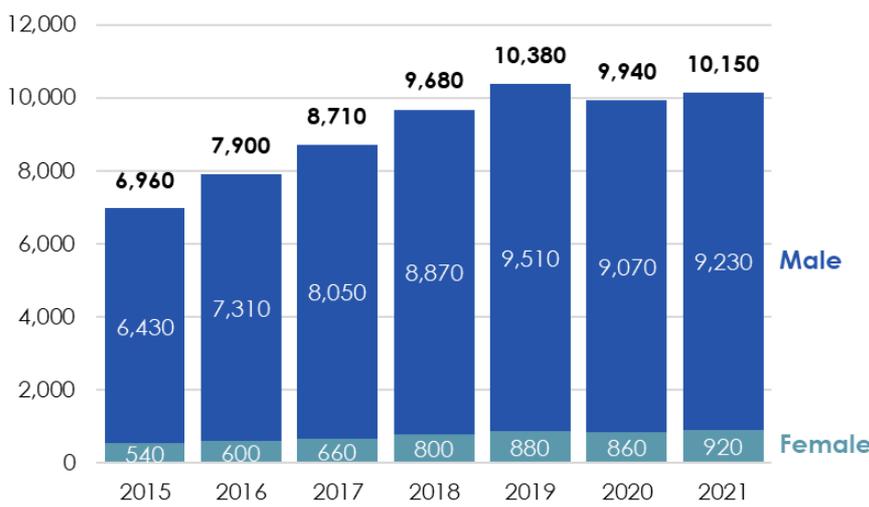
Historic Construction Apprenticeships

Apprenticeships by Gender and Race

Male apprentices represented a disproportional number of total apprentices from 2015 to 2021. During this period, **91% to 92% of total construction apprentices were male.**

Similarly, a large proportion of apprenticeships have been held by white workers. However, from 2015 to 2021 the share of white apprentices has steadily declined from 73% to 65%. During this time period, **Hispanic apprentices have garnered a larger share, growing from 10% in 2015 to 16% in 2021.** The share of apprenticeships held by Black, Pacific Islander, Asian, and American Indian workers has remained relatively unchanged between 2015 and 2021.

Apprentices by Gender, RPO Occupations, King, Pierce and Snohomish Counties, 2015-2021



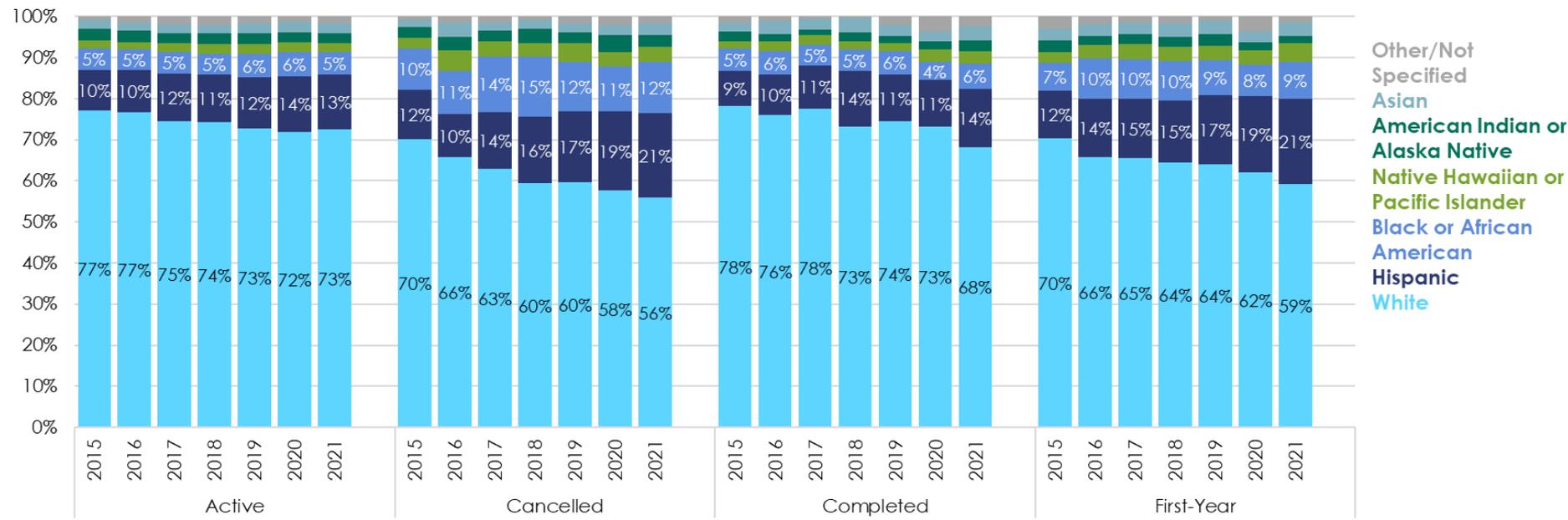
Apprentices by Race, RPO Occupations, King, Pierce and Snohomish Counties, 2015-2021

Race	Share of Construction Apprentices						
	2015	2016	2017	2018	2019	2020	2021
White	73%	71%	70%	68%	68%	67%	65%
Hispanic	10%	11%	12%	13%	14%	15%	16%
Black or African American	7%	8%	8%	8%	8%	8%	8%
Native Hawaiian or Pacific Islander	3%	3%	3%	3%	3%	3%	3%
Asian	3%	3%	3%	3%	3%	3%	3%
American Indian or Alaska Native	2%	2%	2%	2%	2%	2%	2%
Not specified or elsewhere classified	2%	2%	2%	2%	2%	2%	2%

Sources: Washington State Department of Labor and Industries, 2022; Community Attributes Inc., 2022.

Historic Construction Apprenticeships

Apprentices by Race and Status, RPO Occupations, King, Pierce and Snohomish Counties, 2015-2021



Sources: Washington State Department of Labor and Industries, 2022; Community Attributes Inc., 2022.

While diversity has increased over time among active and first-year apprentices, the share of BIPOC apprentices that cancelled the apprenticeship program has increased from 30% in 2015 to 44% in 2021.

For apprenticeship completion, the share of white apprentices has steadily decreased between 2015 and 2020 and dropped significantly in 2021.

Projected Construction Apprenticeships

Projected Apprentices by Status

Construction electricians, carpenters, and laborers are projected to have the highest number of average annual first-year, active and completed apprentices from 2022 through 2026, in the tri-county region.

These three occupations represent 44% of projected first-year apprentices, 46% of active apprentices and 43% of completions annually.

On average, a projected 2,450 apprentices are expected to join annually between 2022 through 2026.

During this period, active apprentices are projected at 4,990 annually. Apprentice completions are projected to total 880 annually between 2022 and 2026.

Projected Apprentices by Status, RPO Occupations, King, Pierce and Snohomish Counties, 2022-2026

Occupation	Average Annual Apprentices (2022-2026)		
	First-Year	Active	Completed
Construction Electrician	410	1,110	160
Carpenter	300	610	120
Laborer	360	560	100
Residential Sheet Metal Worker	120	310	60
Plumber	100	290	30
Ironworker	150	320	40
Sprinkler Fitter	60	160	30
Lathing Acoustical Drywall Systems Installer	150	270	40
Electrician Constructor	30	80	20
Construction Equipment Operator	50	100	30
Elevator Constructor Mechanic	70	210	40
Cement Finishers	140	160	30
Machinist	60	170	40
Roofer	110	100	20
Painter and Decorator	80	80	20
Piledriver Bridge Dock & Wharf Builder	20	50	9
Asbestos Worker	10	40	8
Commercial Glazier	40	90	20
Refrigeration Mechanic	40	80	10
Millwright	6	10	3
Brick Layer	40	50	7
Boilermaker	6	10	4
Plasterer	20	30	2
Heavy Duty Repair Mechanic	9	20	6
Tile/Terrazzo/Marble Finisher	20	20	5
Heating/Air Conditioning Installer & Servicer	8	20	2
Insulation Applicator	30	20	10
All Other Occupations	11	20	14
Total	2,450	4,990	880

Sources: Washington State Department of Labor and Industries, 2022; Community Attributes Inc., 2022.

Projected Construction Apprenticeships

Projected RPO Construction Apprenticeship Demand

Apprenticeship demand for RPO construction occupations is projected at about 1,000 apprentices per year on average between 2022 and 2026. This is roughly a 19% apprentice utilization rate.

Construction laborers, carpenters, electricians, and operating engineers are projected to experience the greatest demand for apprentices between 2022 and 2026. Together, these occupations account for nearly 75% of all projected RPO apprenticeship demand.

Projected RPO Construction Apprenticeship Demand by Occupation, King, Pierce and Snohomish Counties, 2022-2026

Occupation	2022	2023	2024	2025	2026	Average 2022-2026
Construction Laborers	340	320	290	210	220	300
Carpenters	230	210	200	140	160	190
Electricians	180	170	160	110	130	150
Operating Engineers	120	120	110	80	80	100
Ironworkers	90	80	80	60	70	80
Plumbers	50	40	40	30	40	40
Cement Masons and Finishers	40	40	30	20	30	30
Sheet Metal Workers	20	20	20	10	20	20
Painters	10	20	20	10	10	10
<i>Other Occupations</i>	<i>130</i>	<i>120</i>	<i>120</i>	<i>110</i>	<i>100</i>	<i>90</i>
Total	1,210	1,140	1,070	780	860	1,010

Sources: RPO Agencies, 2022; Washington State Employment Security Department, 2022; Washington State Department of Revenue, 2022; Community Attributes Inc., 2022.

Note: Construction laborers includes flaggers.

Regional Construction Employment by Place of Residence

City of Seattle Priority ZIP Codes

Historic Residence of Construction Workers: City of Seattle Priority Hire ZIP Codes

Historically, about 8% of the tri-county region's construction workforce has lived within the City of Seattle's Tier I priority hire ZIP Codes.

Historic Residence of Construction Workers, King, Pierce and Snohomish Counties, 2011 - 2015 and 2016 - 2020

ZIP Code	Neighborhood	Tier	2011 - 2015	2016 - 2020
			Regional Share	Regional Share
98101	Downtown	Tier I	0.1%	0.3%
98102	Capitol Hill/Eastlake	Tier I	0.4%	0.2%
98104	Downtown/ID	Tier I	0.1%	0.2%
98106	Delridge	Tier I	0.5%	0.7%
98107	Ballard	Tier I	0.5%	0.6%
98108	S. Beacon Hill/South Park	Tier I	0.5%	0.3%
98109	Interbay/Queen Anne	Tier I	0.4%	0.3%
98118	Rainier Valley/Rainier Beach	Tier I	0.7%	0.8%
98121	Belltown	Tier I	0.2%	0.3%
98122	Central District	Tier I	0.5%	0.4%
98125	Lake City/Northgate	Tier I	0.5%	1.0%
98126	Delridge/High Point	Tier I	0.5%	0.3%
98133	Bitter Lake/NW Seattle	Tier I	1.1%	0.8%
98144	N. Beacon Hill	Tier I	0.6%	0.5%
98146	White Center	Tier I	0.8%	1.1%
98178	Rainier Beach/Skyway	Tier I	0.5%	0.4%
Sub-Total		Tier I	7.9%	8.3%
All City of Seattle Priority Hire ZIP Codes			21.6%	22.2%

Sources: U.S. Census Bureau American Community Survey 5-year Estimates, 2022; Community Attributes Inc., 2022.

City of Seattle Priority ZIP Codes

Historic Residence of Construction Workers: City of Seattle Priority Hire ZIP Codes

From 2011 to 2020, about 14% of the region's construction workers lived in Tier II ZIP codes, ranging from 14,000 to 18,500 workers during this period.

In total, about 22% of the tri-county region's construction workforce lived in the City of Seattle's priority hire ZIP Codes.

Historic Residence of Construction Workers, King, Pierce, and Snohomish Counties, 2011 - 2015 and 2016 - 2020

ZIP Code	Neighborhood	Tier	2011 - 2015	2016 - 2020
			Regional Share	Regional Share
98002	Kent/Auburn	Tier II	1.1%	1.4%
98003	Federal Way	Tier II	1.9%	1.7%
98007	Bellevue	Tier II	0.2%	0.4%
98023	Federal Way	Tier II	1.6%	1.7%
98030	East Kent	Tier II	0.7%	1.1%
98031	Northwest Kent	Tier II	0.9%	1.1%
98032	West Kent	Tier II	1.4%	1.1%
98047	Pacific	Tier II	0.2%	0.2%
98055	South Renton	Tier II	0.5%	0.6%
98056	Northeast Renton	Tier II	1.3%	1.1%
98057	Central Renton	Tier II	0.4%	0.3%
98148	Burien	Tier II	0.3%	0.3%
98168	Boulevard Park/Tukwila	Tier II	1.1%	1.0%
98188	SeaTac/Tukwila	Tier II	0.6%	0.8%
98198	Des Moines	Tier II	1.2%	1.4%
Sub-Total		Tier II	13.7%	13.9%
All City of Seattle Priority Hire ZIP Codes			21.6%	22.2%

Sources: U.S. Census Bureau American Community Survey 5-year Estimates, 2022; Community Attributes Inc., 2022.

City of Seattle Priority ZIP Codes

Historic Residence of Construction Workers by Gender

From 2011 to 2020, about 82% of construction workers living in Tier I ZIP codes, were male. The average among Tier I ZIP codes for the periods of 2011 to 2015 and 2016 to 2020 remained relatively steady, despite seeing large changes within specific ZIP codes.

Historic Residence of Construction Workers by Gender, King, Pierce, and Snohomish Counties, 2011 - 2015 and 2016 - 2020

ZIP Code	Neighborhood	Tier	2011 - 2015 Share		2016 - 2020 Share	
			Male	Female	Male	Female
98101	Downtown	Tier I	48.1%	51.9%	66.4%	33.6%
98102	Capitol Hill/Eastlake	Tier I	90.9%	9.1%	94.6%	5.4%
98104	Downtown/ID	Tier I	89.1%	10.9%	38.7%	61.3%
98106	Delridge	Tier I	72.7%	27.3%	88.3%	11.7%
98107	Ballard	Tier I	82.0%	18.0%	37.1%	62.9%
98108	S. Beacon Hill/South Park	Tier I	96.0%	4.0%	93.3%	6.7%
98109	Interbay/Queen Anne	Tier I	76.1%	23.9%	94.5%	5.5%
98118	Rainier Valley/Rainier Beach	Tier I	82.0%	18.0%	87.9%	12.1%
98121	Belltown	Tier I	82.2%	17.8%	95.1%	4.9%
98122	Central District	Tier I	80.7%	19.3%	91.1%	8.9%
98125	Lake City/Northgate	Tier I	83.3%	16.7%	91.1%	8.9%
98126	Delridge/High Point	Tier I	85.7%	14.3%	82.9%	17.1%
98133	Bitter Lake/NW Seattle	Tier I	92.7%	7.3%	94.1%	5.9%
98144	N. Beacon Hill	Tier I	76.7%	23.3%	80.9%	19.1%
98146	White Center	Tier I	92.8%	7.2%	89.9%	10.1%
98178	Rainier Beach/Skyway	Tier I	84.1%	15.9%	86.5%	13.5%
Tier I Average		Tier I	82.2%	17.8%	82.0%	18.0%
Average (All City of Seattle Priority Hire ZIP Codes)			86.8%	13.2%	85.9%	14.1%

Sources: U.S. Census Bureau American Community Survey 5-year Estimates, 2022; Community Attributes Inc., 2022.

City of Seattle Priority ZIP Codes

Historic Residence of Construction Workers by Gender

From 2011 to 2020, about **91%** of the construction workers living in Tier II ZIP codes were men. The share of male construction workers living in Tier I ZIP Codes decreased slightly (by 1.5%) from the period of 2011 to 2015 compared the period of 2016 to 2020.

In total, about **86%** of the construction workforce living in the City of Seattle's priority hire ZIP Codes were men.

Historic Residence of Construction Workers, King, Pierce, and Snohomish Counties, 2011 - 2015 and 2016 - 2020

ZIP Code	Neighborhood	Tier	2011 - 2015 Share		2016 - 2020 Share	
			Male	Female	Male	Female
98002	Kent/Auburn	Tier II	92.0%	8.0%	91.3%	8.7%
98003	Federal Way	Tier II	88.7%	11.3%	96.5%	3.5%
98007	Bellevue	Tier II	95.2%	4.8%	82.5%	17.5%
98023	Federal Way	Tier II	92.9%	7.1%	91.1%	8.9%
98030	East Kent	Tier II	90.4%	9.6%	92.3%	7.7%
98031	Northwest Kent	Tier II	90.6%	9.4%	87.3%	12.7%
98032	West Kent	Tier II	92.6%	7.4%	89.8%	10.2%
98047	Pacific	Tier II	92.1%	7.9%	83.6%	16.4%
98055	South Renton	Tier II	91.7%	8.3%	91.1%	8.9%
98056	Northeast Renton	Tier II	86.5%	13.5%	84.5%	15.5%
98057	Central Renton	Tier II	80.7%	19.3%	100.0%	0.0%
98148	Burien	Tier II	98.6%	1.4%	86.3%	13.7%
98168	Boulevard Park/Tukwila	Tier II	100.0%	0.0%	95.9%	4.1%
98188	SeaTac/Tukwila	Tier II	93.5%	6.5%	90.7%	9.3%
98198	Des Moines	Tier II	88.8%	11.2%	87.9%	12.1%
Tier II Average		Tier II	91.6%	8.4%	90.1%	9.9%
Average (All City of Seattle Priority Hire ZIP Codes)			86.8%	13.2%	85.9%	14.1%

Sources: U.S. Census Bureau American Community Survey 5-year Estimates, 2022; Community Attributes Inc., 2022.

King County Priority Hire ZIP Codes

Historic Residence of Construction Workers King County Priority Hire ZIP Codes

From 2011 to 2020, about 32% of the region's construction workers have lived across King County's 40 priority hire ZIP codes.

Historic Residence of Construction Workers, King, Pierce, and Snohomish Counties, 2011 - 2015 and 2016 - 2020

ZIP Code	City	2011 - 2015	2016 - 2020
		Regional Share	Regional Share
98003	Federal Way	1.9%	1.7%
98023	Federal Way	1.6%	1.7%
98092	Auburn	1.7%	1.7%
98204	Everett	1.4%	1.6%
98208	Everett	2.0%	1.6%
98002	Auburn	1.1%	1.4%
98198	Seattle	1.2%	1.4%
98087	Lynnwood	1.0%	1.4%
98036	Lynnwood	1.1%	1.2%
98032	Kent	1.4%	1.1%
98001	Auburn	1.1%	1.1%
98030	Kent	0.7%	1.1%
98146	Seattle	0.8%	1.1%
98031	Kent	0.9%	1.1%
98125	Seattle	0.5%	1.0%
98168	Seattle	1.1%	1.0%
98103	Seattle	1.0%	0.8%
98037	Lynnwood	0.7%	0.8%
98133	Seattle	1.1%	0.8%
98118	Seattle	0.7%	0.8%
All KC Priority Hire ZIP Codes		31.6%	32.6%

Sources: U.S. Census Bureau American Community Survey 5-year Estimates, 2022; Community Attributes Inc., 2022.

King County Priority Hire ZIP Codes

Historic Residence of Construction Workers King County Priority Hire ZIP Codes

Share within each Priority Hire ZIP code remained relatively stable, similar to the average.

Historic Residence of Construction Workers, King, Pierce, and Snohomish Counties, 2011 - 2015 and 2016 - 2020

ZIP Code	City	2011 - 2015	2016 - 2020
		Regional Share	Regional Share
98188	Seattle	0.6%	0.8%
98043	Mountlake Terrace	0.7%	0.7%
98106	Seattle	0.5%	0.7%
98321	Buckley	0.7%	0.6%
98055	Renton	0.5%	0.6%
98144	Seattle	0.6%	0.5%
98178	Seattle	0.5%	0.4%
98105	Seattle	0.5%	0.4%
98122	Seattle	0.5%	0.4%
98007	Bellevue	0.2%	0.4%
98108	Seattle	0.5%	0.3%
98121	Seattle	0.2%	0.3%
98251	Gold Bar	0.2%	0.3%
98148	Seattle	0.3%	0.3%
98101	Seattle	0.1%	0.3%
98126	Seattle	0.5%	0.3%
98109	Seattle	0.4%	0.3%
98057	Renton	0.4%	0.3%
98047	Pacific	0.2%	0.2%
98104	Seattle	0.1%	0.2%
All KC Priority Hire ZIP Codes		31.6%	32.6%

Sources: U.S. Census Bureau American Community Survey 5-year Estimates, 2022; Community Attributes Inc., 2022.

King County Priority Hire ZIP Codes

Historic Residence of Construction Workers by Gender

From 2011 to 2020, roughly 87% of the construction workers living in King County's priority hire counties were men.

Historic Residence of Construction Workers, King, Pierce, and Snohomish Counties, 2011 - 2015 and 2016 - 2020

ZIP Code	City	2011 - 2015 Share		2016 - 2020 Share	
		Male	Female	Male	Female
98057	Renton	80.7%	19.3%	100.0%	0.0%
98204	Everett	97.3%	2.7%	97.1%	2.9%
98003	Federal Way	88.7%	11.3%	96.5%	3.5%
98168	Seattle	100.0%	0.0%	95.9%	4.1%
98087	Lynnwood	88.0%	12.0%	95.9%	4.1%
98121	Seattle	82.2%	17.8%	95.1%	4.9%
98109	Seattle	76.1%	23.9%	94.5%	5.5%
98133	Seattle	92.7%	7.3%	94.1%	5.9%
98036	Lynnwood	78.8%	21.2%	93.6%	6.4%
98108	Seattle	96.0%	4.0%	93.3%	6.7%
98208	Everett	89.6%	10.4%	93.1%	6.9%
98001	Auburn	96.1%	3.9%	92.7%	7.3%
98030	Kent	90.4%	9.6%	92.3%	7.7%
98002	Auburn	92.0%	8.0%	91.3%	8.7%
98023	Federal Way	92.9%	7.1%	91.1%	8.9%
98122	Seattle	80.7%	19.3%	91.1%	8.9%
98055	Renton	91.7%	8.3%	91.1%	8.9%
98125	Seattle	83.3%	16.7%	91.1%	8.9%
98188	Seattle	93.5%	6.5%	90.7%	9.3%
98146	Seattle	92.8%	7.2%	89.9%	10.1%
Average (All KC Priority Hire ZIP Codes)		87.5%	12.5%	87.4%	12.6%

Sources: U.S. Census Bureau American Community Survey 5-year Estimates, 2022; Community Attributes Inc., 2022.

King County Priority Hire ZIP Codes

Historic Residence of Construction Workers by Gender (cont.)

The proportion of male and female workers saw large changes within certain ZIP Codes, despite the average for all priority ZIP Codes remaining steady from the 2011 to 2015 and 2016 to 2020 period.

Historic Residence of Construction Workers, King, Pierce, and Snohomish Counties, 2011 - 2015 and 2016 - 2020

ZIP Code	City	2011 - 2015 Share		2016 - 2020 Share	
		Male	Female	Male	Female
98032	Kent	92.6%	7.4%	89.8%	10.2%
98106	Seattle	72.7%	27.3%	88.3%	11.7%
98198	Seattle	88.8%	11.2%	87.9%	12.1%
98118	Seattle	82.0%	18.0%	87.9%	12.1%
98031	Kent	90.6%	9.4%	87.3%	12.7%
98178	Seattle	84.1%	15.9%	86.5%	13.5%
98148	Seattle	98.6%	1.4%	86.3%	13.7%
98037	Lynnwood	95.1%	4.9%	86.1%	13.9%
98321	Buckley	94.4%	5.6%	85.1%	14.9%
98043	Mountlake Terrace	86.7%	13.3%	84.0%	16.0%
98105	Seattle	79.4%	20.6%	84.0%	16.0%
98047	Pacific	92.1%	7.9%	83.6%	16.4%
98126	Seattle	85.7%	14.3%	82.9%	17.1%
98007	Bellevue	95.2%	4.8%	82.5%	17.5%
98092	Auburn	85.6%	14.4%	82.0%	18.0%
98144	Seattle	76.7%	23.3%	80.9%	19.1%
98251	Gold Bar	96.9%	3.1%	77.1%	22.9%
98103	Seattle	83.5%	16.5%	76.9%	23.1%
98101	Seattle	48.1%	51.9%	66.4%	33.6%
98104	Seattle	89.1%	10.9%	38.7%	61.3%
Average (All KC Priority Hire ZIP Codes)		87.5%	12.5%	87.4%	12.6%

Sources: U.S. Census Bureau American Community Survey 5-year Estimates, 2022; Community Attributes Inc., 2022.

Pandemic Impacts on Regional Construction Industry

Pandemic Impacts

This section reviews employment, unemployment, and unemployment insurance claims data to assess the impacts of the COVID-19 impact on different demographic groups within the construction industry and compare to other industries.

Tri-county Region Findings:

- Historically, the **construction industry has seen large dips in employment during and following a recession**. This trend was not felt nearly as significantly during the pandemic induced recession. Relative to other industries, **construction fared well during the pandemic**, seeing just a 2% decrease in employment from November of 2019 to November of 2020 and recovered to pre-pandemic levels in 2021.
- As of 2019, the **construction industry had the largest proportion of male workers (80%)** compared to other industries. Other male dominated sectors included manufacturing (72%) and transportation, warehousing, and utilities (67%).
- Pre-pandemic, the core of the tri-county region's construction employment was between **the ages of 25 and 54 (70%)**. A similar break down by age remained in 2021.
- As of 2019, the tri-county region's construction employment was made up of **73% white workers**, followed by **Hispanic workers (15%)**, and **Asian workers (4%)**. Breakdown by age remained nearly identical in 2021.

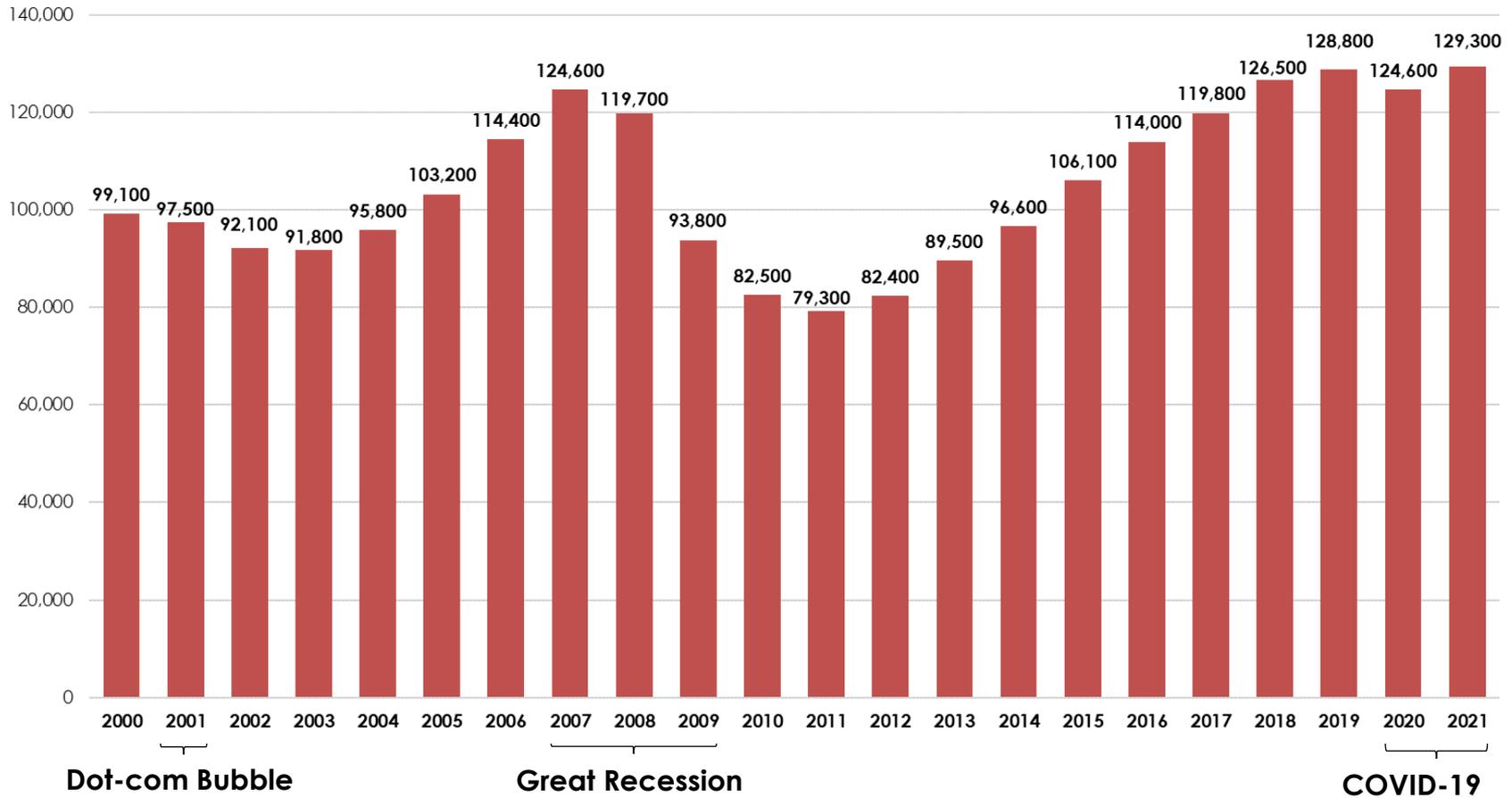
- While white workers submitted the most continued UI claims within the construction industry since April 2020, **Pacific Islander and Native American workers recorded the highest rates of continued UI claims**. At the height of the pandemic, Pacific Islander workers continued UI claims represented 60% of average monthly employment, and Native American workers continued UI claims represented 48% of average monthly employment. This implies BIPOC workers were more impacted for a longer period of time and faced greater barriers to re-entering the construction workforce, compared to white construction workers.

Statewide Impacts:

- Statewide unemployment across all industries has historically been slightly higher among male workers than female workers, although the **rates often only differ by half a percent**.
- Black workers across all industries appeared to be impacted the most by the COVID-19 pandemic. No other race experienced such a large jump, **recording a 12.7% unemployment rate in 2020, 8.5% higher than year prior**.
- Younger workers experience the highest unemployment rates during 2020, **workers aged 20 to 24 experienced the largest percent growth, with their unemployment rate increasing by 120%**.

Pandemic Impacts

Average Construction Employment, King, Pierce, and Snohomish Counties, 2000 – 2021

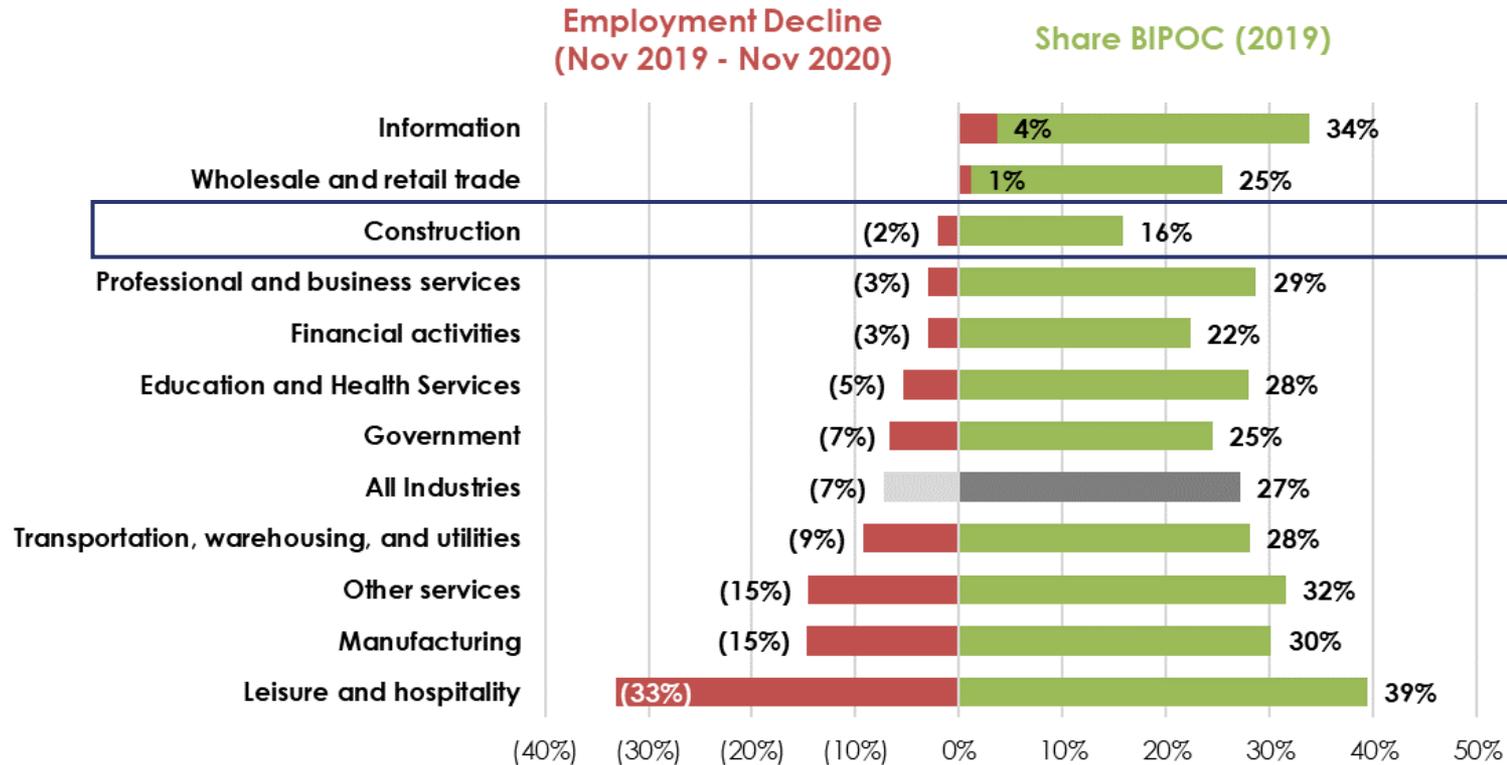


Sources: Washington State Employment Security Department, 2022; Community Attributes Inc., 2022.

Since 2000, construction employment in the tri-county region has fluctuated between 79,300 and 129,300 workers. Following the Great Recession, construction employment hit its lowest point since 2003 before steadily increasing until 2020. Average employment in 2020 totaled 124,600. Employment quickly recovered and slightly exceeded pre-pandemic levels in 2021.

Pandemic Impacts

Employment Decline and Share of Non-white Workers, Major Sectors, King, Pierce, and Snohomish Counties, 2019 – 2020



Sources: Washington State Employment Security Department, 2022; Community Attributes Inc., 2022.

Washington State's **construction industry fared well** compared to the state's other major sectors following the initial stages of the pandemic, **reporting just a 2% decrease in employment from November of 2019 to November of 2020**. Only information and wholesale and retail trade fared better in terms of employment during this time period.

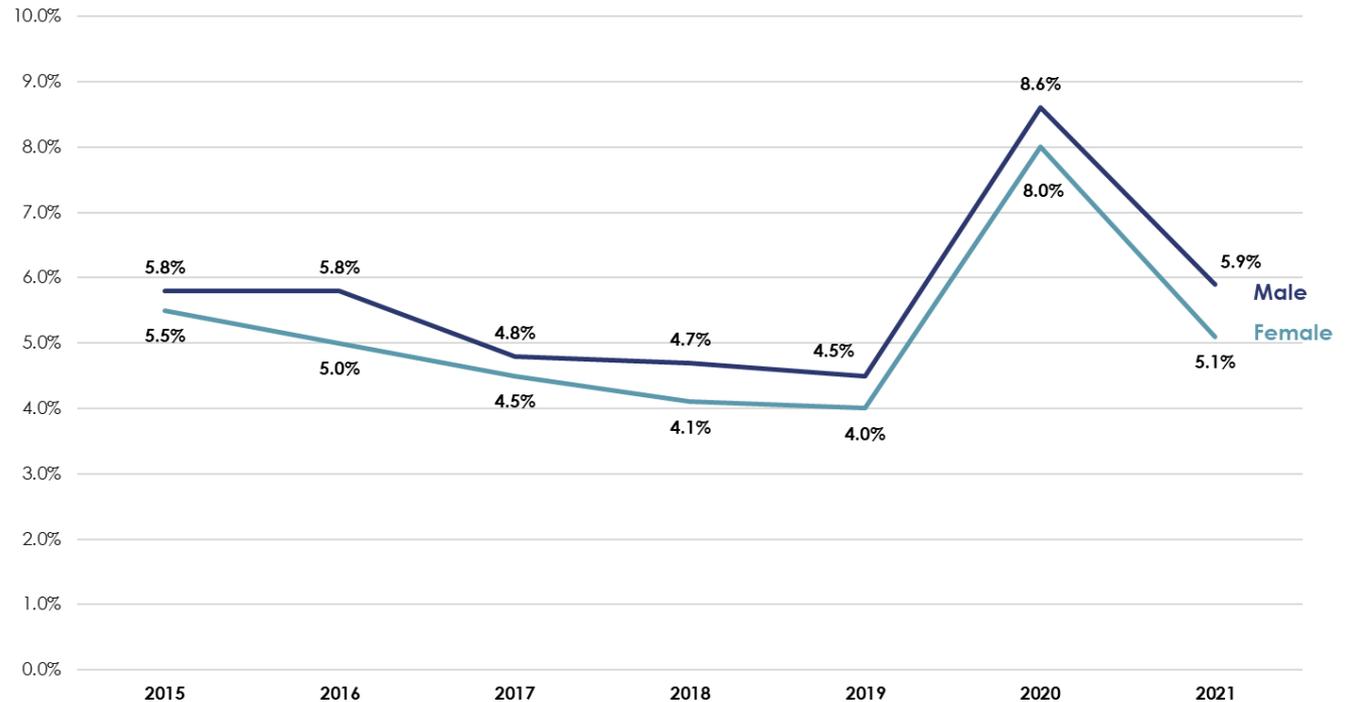
Pandemic Impacts

Unemployment Rate by Gender

Historically, the statewide unemployment rate among men working across all industries has been slightly higher than women.

In 2020, the average unemployment rates for men and women peaked at 8.6% and 8.0%, respectively.

Unemployment Rate by Gender, All Industries, Washington State, 2015 - 2021



Sources: Bureau of Labor Statistics, 2022; Community Attributes Inc., 2022.

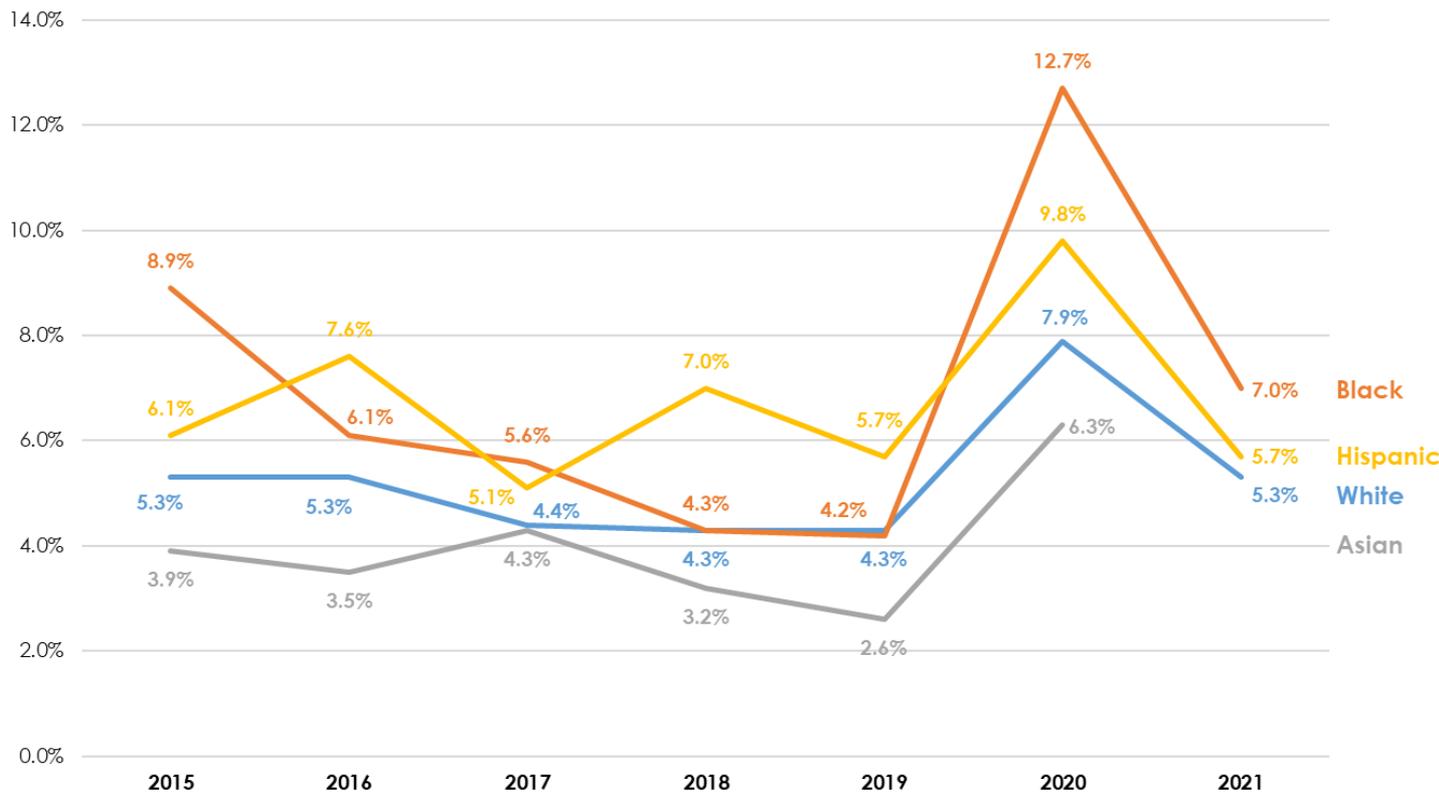
Pandemic Impacts

Unemployment Rate by Race

Washington's black workers suffered the **highest unemployment rate in 2020 with a rate of 12.7%**, despite recording rates near 4% in the two years leading into the pandemic.

Hispanic workers experienced the next highest rate of unemployment in 2020, **9.8%**, but returned to pre-pandemic levels in 2021.

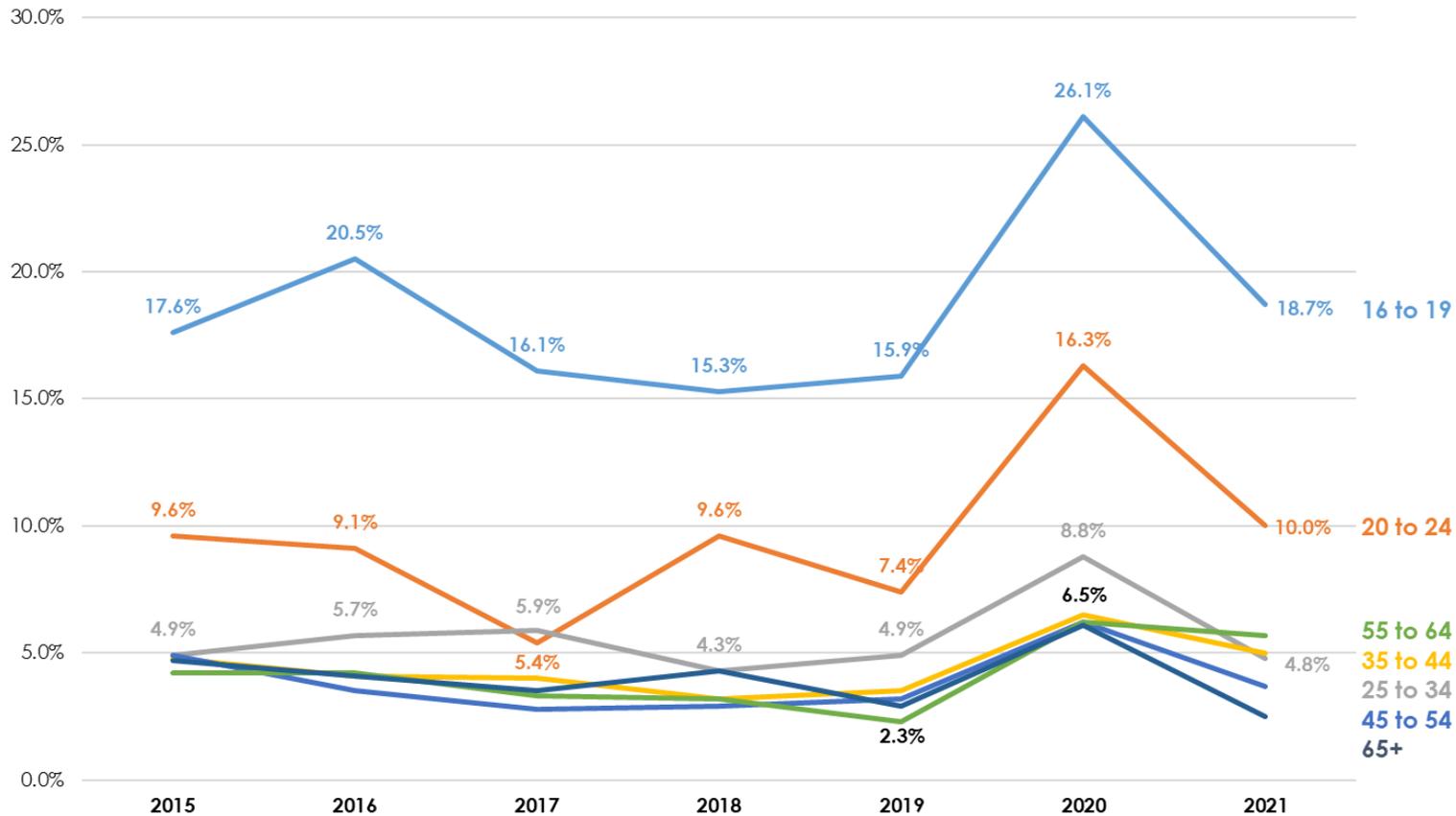
Unemployment Rate by Race, All Industries, Washington State, 2015 - 2021



Sources: Bureau of Labor Statistics, 2022; Community Attributes Inc., 2022.
Note: 2021 Unemployment data for the Asian demographic is currently unavailable.

Pandemic Impacts

Unemployment Rate by Age, All Industries, Washington State, 2015 - 2021

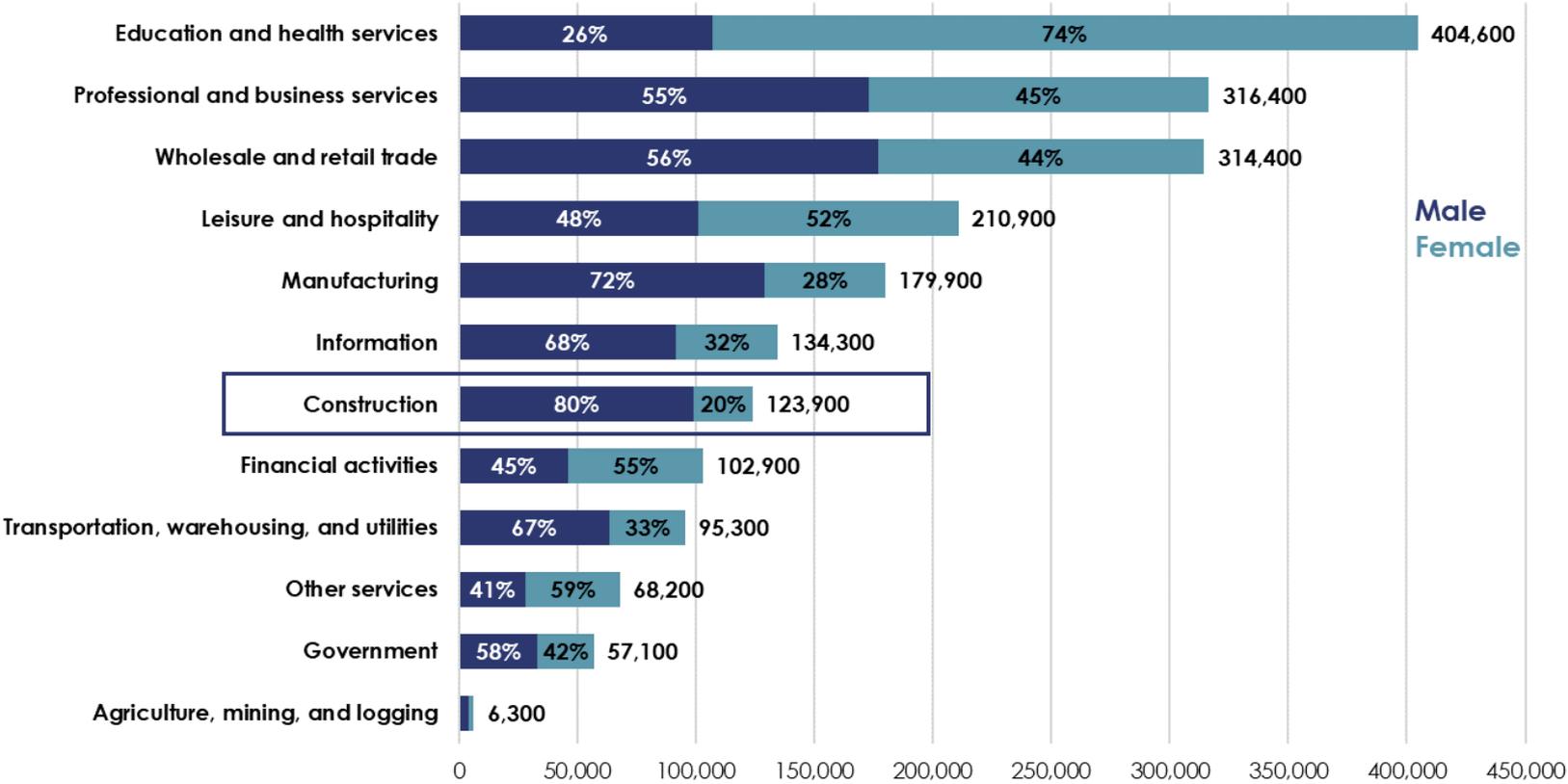


Sources: Bureau of Labor Statistics, 2022; Community Attributes Inc., 2022.

Younger workers, between the ages of 16 and 34, reported the highest rates of unemployment in 2020. Workers 35 and older experienced similar unemployment rates during 2020, peaking at about 6.5%, about 4% higher than pre-pandemic levels.

Pandemic Impacts

Pre-pandemic Employment by Gender and Major Sector, King, Pierce, and Snohomish Counties, 2019

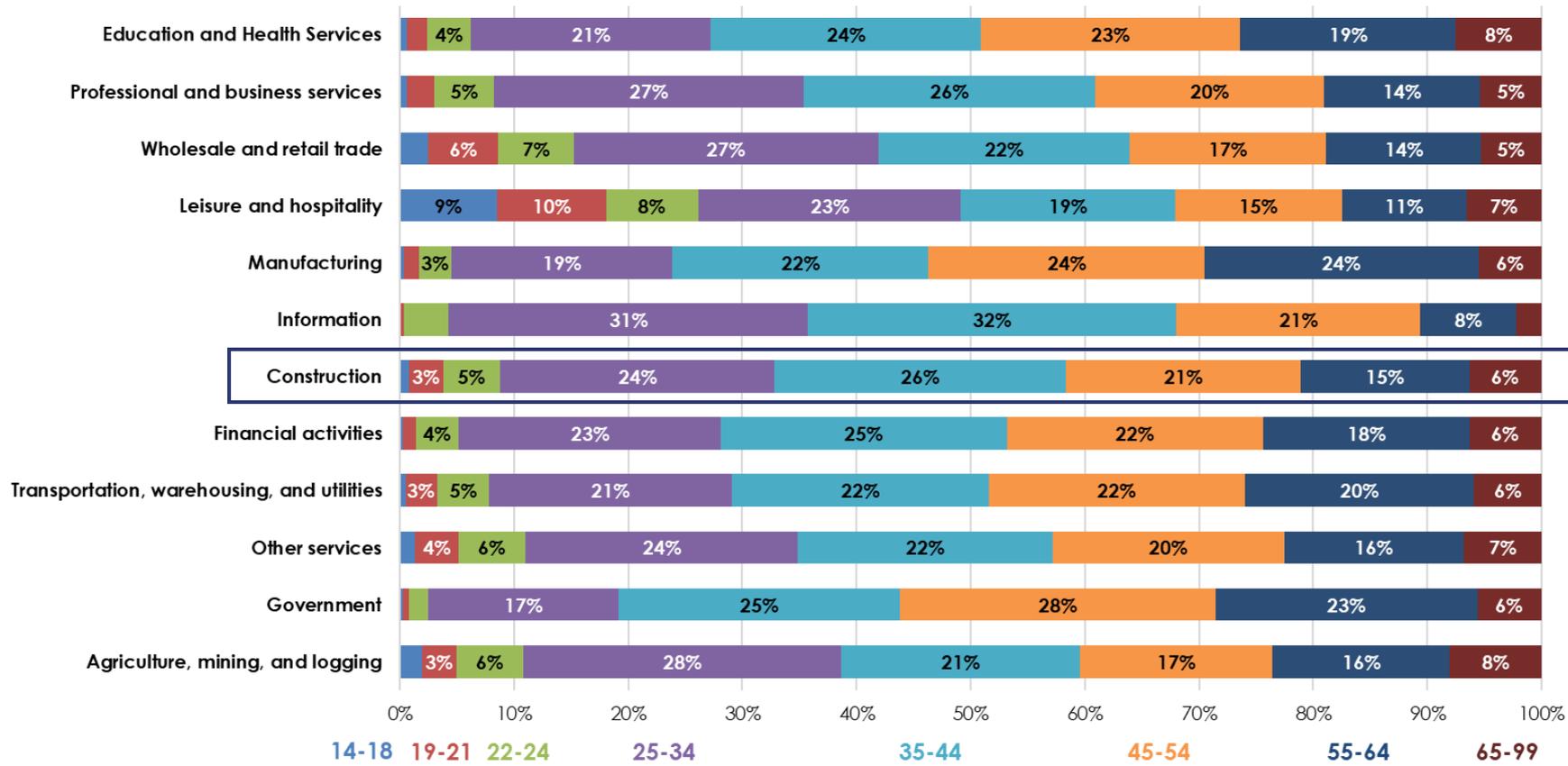


Sources: Washington State Employment Security Department, 2022; Community Attributes Inc., 2022.

The tri-county region’s construction industry reported the **highest share of men** in 2019 across all industries, with **men representing 80% of the nearly 124,000 workers**. Regionally, educational and health services had the largest workforce (404,600) and the largest representation of female workers (74%).

Pandemic Impacts

Employment Share by Age and Major Sector, Tri-county Region, 2021

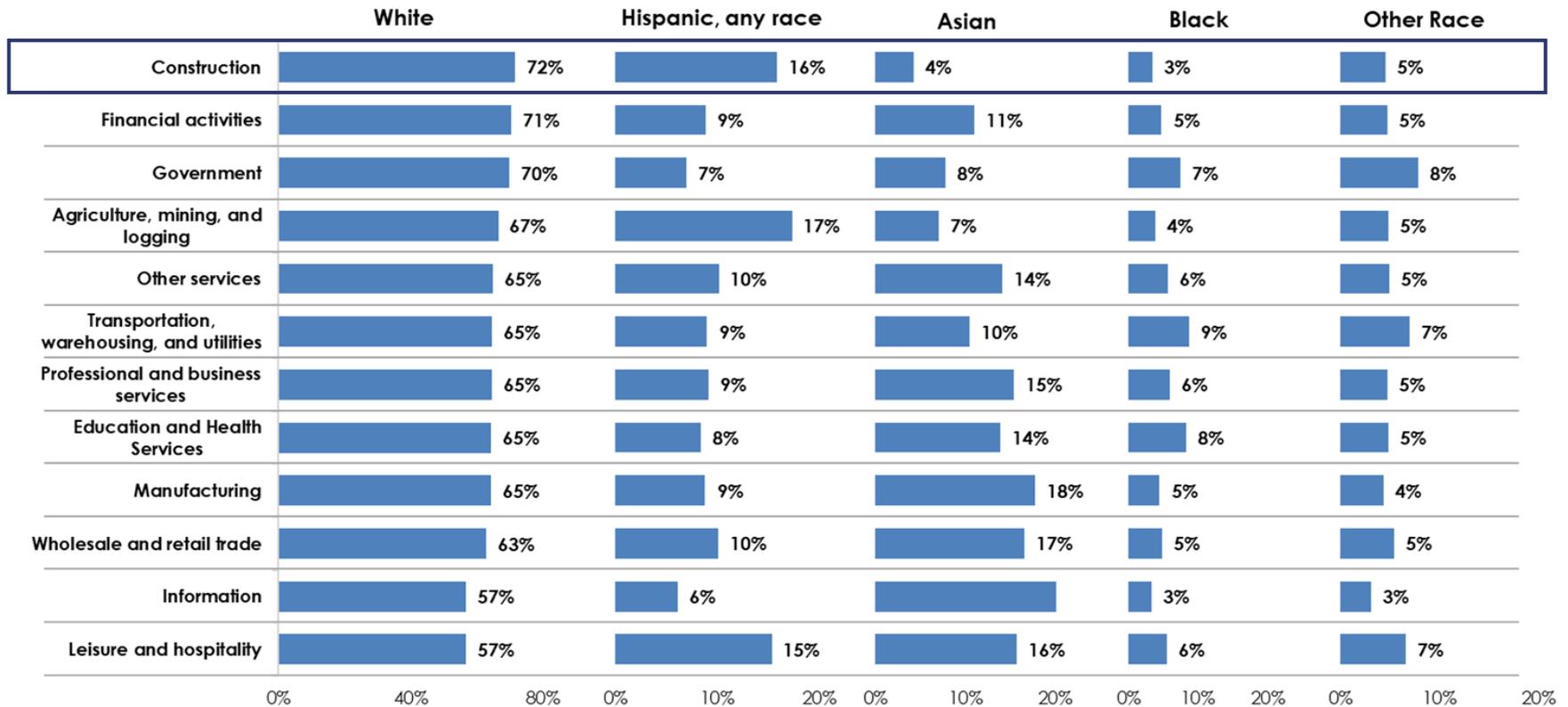


Sources: Washington State Employment Security Department, 2022; Community Attributes Inc., 2022.

Most of the region’s construction workers are between the ages of 25 and 54. This age bracket represented roughly 70% of the industry in 2021. As of 2021, worker’s aged 19 to 24 represented just 8% of the industry total. The age composition of the construction industry remained steady from 2019 to 2021.

Pandemic Impacts

Employment Share by Race and Major Sector, King, Pierce, and Snohomish Counties, 2021



Sources: Washington State Employment Security Department, 2022; Community Attributes Inc., 2022.

Among the major sectors, the construction industry reported the **highest share of white workers as of 2021 (72%)**. Hispanic workers represented the **next highest proportion at 16% of the industry's workforce**, while **black workers represented just 3% of the region's construction workforce**. From 2019 to 2021, the distribution of **construction employment by race remained relatively steady**. The share of white construction workers fell by 1%, while the share of Hispanic workers increased by 1% from 2019 to 2021.

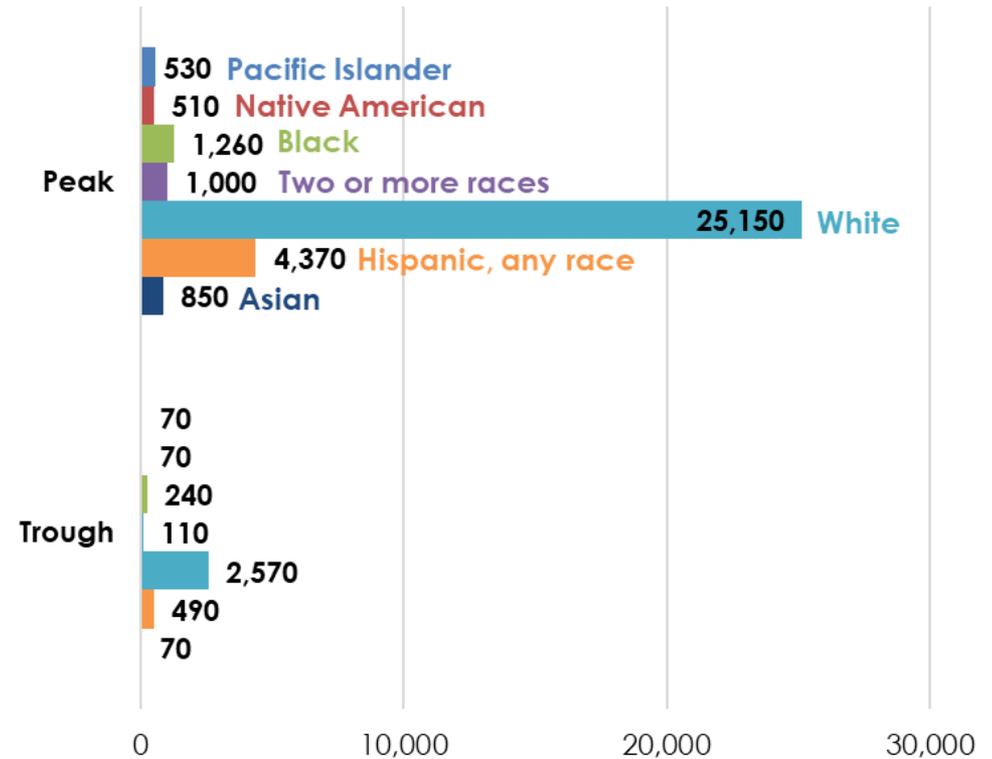
Pandemic Impacts

Continued Unemployment Insurance (UI) Claims within the Construction Industry

Since April 2020, continued UI claims submitted by the Tri-County Region's white construction workforce ranged from 2,570 to 25,150 claims per week. This is the highest of any race, followed by Hispanic workers which ranged from 490 to 4,370 claims per week.

In addition to representing the largest number of UI claims, white and Hispanic workers represented the largest proportion of the Tri-County Region's construction industry, totaling 88% of all construction workers.

Continued Unemployment Insurance Claims, Construction Industry, King, Pierce, and Snohomish Counties, April 2020 - Feb 2022



Sources: Washington State Employment Security Department, 2022; Community Attributes Inc., 2022.

Sources: Washington State Employment Security Department, 2022; Community Attributes Inc., 2022.

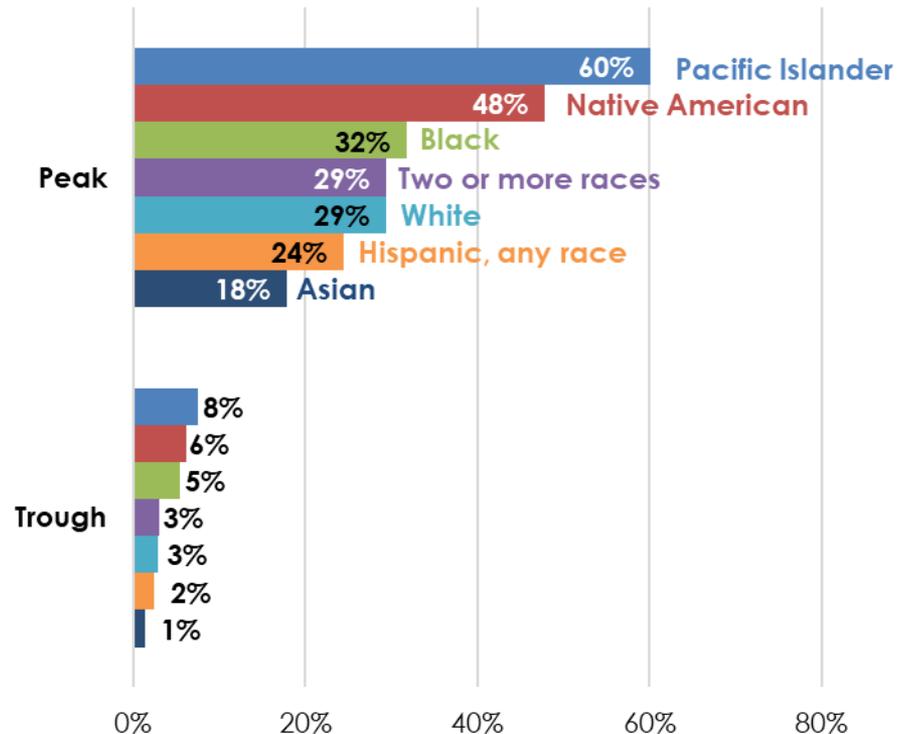
Pandemic Impacts

Continued Unemployment Insurance (UI) Claims as a Share of Construction Employment

Despite reporting the fewest number of continued UI claims, the Tri-County Region's Pacific Islander and Native American workers were disproportionately impacted by the pandemic within the construction industry. As a proportion of total workers by race, the **Pacific Islander construction workforce reported the highest rate of unemployment insurance claims from April 2020 through February 2022 within the Tri-County Region.** Native American and Black construction workers represented the next highest rates.

At the peak of the pandemic, continued UI claims submitted by Pacific Islander construction workers totaled to 60% of total Pacific Islander employment within the construction industry, while Native American and Black workers totaled 48% and 32% of their industry workforce, respectively.

Continued Unemployment Insurance Claims as Share of Construction Employment by Race, Construction Industry, King, Pierce, and Snohomish Counties, April 2020 – Feb 2022



Sources: Washington State Employment Security Department, 2022; Community Attributes Inc., 2022.

Appendix

Data Sources

Data sources:

- Data from RPO members
- Washington State Department of Revenue
- Washington State Employment Security Department
- Bureau of Labor Statistics
- National Center for Educational Statistics

Some RPO members did not provide data on the duration of planned future projects, nor projections of construction labor demand for these projects.

Key Modeling Assumptions

- **Project Completion and Duration**

For all projects where spending by year data was not provided, CAI assumed project spending would occur equally throughout the duration of the project. For example, if a project was expected to last 4 years and cost \$1,000,000, it was assumed that \$250,000 would be spent each year. Project duration assumptions differed by organization, relying on the information provided and available online. Each organization's assumptions were derived using existing historical and forecasted project lengths, considering information such as project budget, and the department to which the project belongs.

- **Worker/job Definition**

An average worker (FTE) is defined as working 1,860 hours per year (36 hours a week over 52 weeks). This assumption was informed by data provided by Sound Transit.

- **GBI/FTE ratio for Washington, NAICS Code 2373**

To translate construction spending to FTEs, CAI assumed a GBI/FTE ratio of \$367,300 per FTE (output per worker) for Washington State construction workers for all RPO projects. This estimate serves as a proxy for construction spending per FTE. This ratio was generated from the 2012 Washington State Input-Output Table.

- **Defining RPO Occupations**

RPO occupations are defined as the unique occupations identified within the historical data provided by each organization which are projected to have demand greater or equal to 1 FTE from 2022 through 2026. In total, this includes 41 occupations following the Standard Occupational Classification (SOC) System.

METHODOLOGY – RPO Spending and Employment Demand Forecast

Forecasting employment demand began by collecting data about future construction projects from RPO members. Given this data, CAI estimated the annual construction spending for each RPO from 2022 through 2026.

- King County construction spending was derived using future projects data provided by the county. No project durations or timelines were provided, so it was assumed each project would begin the same year the project advertisement was released. When available, expected project durations were gathered online and used to create a duration assumption by department. Total spending was then estimated by evenly distributing total project spending over each year of the project's expected duration. Total FTE by year were estimated using the assumed output per worker used for this study.
- WSDOT's future construction spending utilized their ASOP project projections filtered by region. No project durations or timelines were provided, so it was assumed each project would begin the in same year the project advertisement was released. When available, expected project durations were gathered online, otherwise, projects were assumed to span an average duration of 3.4 years. This assumption was informed by WSDOT's historic average project duration. Total spending was then estimated by evenly distributing total project spending over each year of the project's expected duration. Total FTE by year were estimated using the assumed output per worker used for this study.
- The City of Seattle was unable to provide future spending and FTE estimates. Future spending and FTEs were estimated using historic averages from 2016 to 2021. Historic spending and FTE data was provided by the City.
- The Port of Seattle provided future spending and FTE projections through 2025 broken out by year. An average of spending and FTE from 2021 through 2025 was used to create a projection for 2026.
- Sound Transit provided forecasted spending and FTEs through 2026 broken out by year.

To estimate occupational needs, the historical occupational distribution for each organization was applied to total employment demand.

Methodology

METHODOLOGY – Regional Demand, Openings, and Occupational Gap

The regional demand, openings, and occupational gap utilize a talent pipeline that considers annual educational completions, UI claims, and occupational projections.

- Total Regional demand (employment) and average annual openings are derived from the Washington State Employment Security Department (ESD) occupational projections.
- Estimates of regional occupational supply are derived from unemployment claims data from ESD and completions from the National Center for Education Statistics Integrated Postsecondary Education Data Systems (IPEDS).
- The proportion of employment, openings and supply concentrated within the construction industry use the industry to occupation matrix developed by ESD.

In the industry forecast, total demand includes new openings and retained workers.

- The retained workforce includes turnover within the industry and region.
- New openings are entirely new jobs.

Total supply represents the pool of qualified workers and includes:

- Existing workers from previous year (retained workforce)
- Unemployment Insurance (UI) claimants previously employed in construction occupations
- Educational program completions in programs related to construction.

A negative gap between demand and supply indicates a shortage in the overall labor in the region, as employment demand exceeds regional supply. The occupational gap presented in this report represents the gap across the entire construction industry for each given occupation. However, because demand is based on occupational employment projections or projected employment by occupation, it is assumed that other sources of supply will fill the occupational gap. This may include workers from outside the region or new entrants to the workforce not captured in educational program completions.

Projected RPO Construction Occupational Demand

Occupation	2022	2023	2024	2025	2026	Average 2022-2026
Construction Laborers	1,600	1,700	1,500	1,100	1,100	1,400
Carpenters	1,000	1,000	1,000	700	700	900
Operating Engineers	1,000	1,000	900	600	700	800
Electricians	600	600	600	500	500	600
Ironworkers	400	300	300	300	300	300
Truck Drivers	400	300	300	200	200	300
Plumbers	200	200	200	200	200	200
Cement Masons and Finishers	200	200	200	100	100	200
Sheet Metal Workers	100	100	100	100	100	100
Painters	100	100	100	100	100	100
Pile Driver Operators	80	80	70	50	60	70
Roofers	80	70	70	50	60	70
Drywall and Ceiling Tile Installers	70	60	60	50	50	60
Hazardous Materials Removal Workers	50	50	50	30	40	40
Telecommunications Line Installers and Repairers	50	40	50	30	40	40
Surveyors	50	40	40	20	30	40
Elevator Installers and Repairers	40	30	30	20	30	30
Lineworkers	40	30	30	20	30	30
Landscapers	30	30	30	20	20	30
Brickmasons	30	30	30	20	20	20
Glaziers	30	30	30	20	20	20

Sources: RPO Agencies, 2022; Washington State Employment Security Department, 2022; Washington State Department of Revenue, 2022; Community Attributes Inc., 2022.

Notes: Column sums and total may not align due to rounding. Construction laborers includes flaggers.

Projected RPO Construction Occupational Demand (Continued)

Occupation	2022	2023	2024	2025	2026	Average 2022-2026
Millwrights	27	25	25	19	23	24
Insulation Workers, Mechanical	16	14	14	10	13	13
Boilermakers	7	14	16	13	10	12
Fence Erectors	16	14	13	9	10	12
Earth Drillers, Except Oil and Gas	16	13	11	7	8	11
Tile and Stone Setters	15	12	11	7	9	11
Plasterers	12	12	11	9	9	11
Insulators	10	9	8	7	7	8
Structural Metal Fabricators	11	9	7	5	6	8
Electrical and Electronics Repairers	9	9	7	5	6	7
Carpet Installers	7	7	7	6	7	7
Brickmason Helpers	7	6	6	4	5	6
Terrazzo Workers and Finishers	5	4	3	2	3	3
Commercial Divers	3	3	3	2	3	3
HVAC Installers	3	3	3	2	2	3
Construction and Building Inspectors	3	3	2	2	2	2
Motor Vehicle Operators, All Other	3	2	2	1	1	2
Heavy Equipment Mechanics	2	2	2	1	1	2
Highway Maintenance Workers	1	1	1	1	1	1
Machinists	0	1	1	1	1	1
Total	6,300	6,200	5,800	4,300	4,500	5,400

Sources: RPO Agencies, 2022; Washington State Employment Security Department, 2022; Washington State Department of Revenue, 2022; Community Attributes Inc., 2022.

Notes: Column sums and total may not align due to rounding. Construction laborers includes flaggers.

RPO & Regional Occupational Demand

Title	Average Annual Demand 2022-2026			Regional Annual Average Gap
	RPO	Regional	% of Regional Demand	
Construction Laborers	1,400	24,600	6%	(1,730)
Carpenters	900	19,200	5%	(700)
Operating Engineers	800	4,100	20%	(100)
Electricians	600	8,800	7%	(370)
Ironworkers	300	1,000	30%	50
Truck Drivers	300	1,300	23%	(100)
Plumbers	200	4,500	4%	(210)
Cement Masons and Finishers	200	4,000	5%	(230)
Sheet Metal Workers	100	1,600	6%	10
Painters	100	9,700	1%	(440)
Pile Driver Operators	70	100	70%	(10)
Roofers	70	4,500	2%	(260)
Drywall and Ceiling Tile Installers	60	4,000	2%	(170)
Hazardous Materials Removal Workers	40	40	100%	0
Telecommunications Line Installers and Repairers	40	400	10%	(20)
Surveyors	40	20	200%	0
Elevator Installers and Repairers	30	300	10%	(10)
Lineworkers	30	600	5%	(30)
Landscapers	30	20	150%	0
Brickmasons	25	1,000	3%	(20)
Glaziers	25	1,100	2%	(30)

Sources: RPO Agencies, 2022; Washington State Employment Security Department, 2022; Washington State Department of Revenue, 2022; NCES, 2022; Bureau of Labor Statistics, 2022; Community Attributes Inc., 2022.

Notes: Construction laborers includes flaggers. Total demand represents demand for the occupations used by RPO agencies, this does not include the total list of occupations included in the construction industry. Regional demand represents demand for each occupation within the construction industry.

RPO & Regional Occupational Demand

(Continued)

Title	Average Annual Demand 2022-2026			Regional Annual Average Gap
	RPO	Regional	% of Regional Demand	
Millwrights	24	100	24%	0
Insulation Workers, Mechanical	13	400	3%	(20)
Fence Erectors	12	1,100	1%	(100)
Boilermakers	12	-	n/a	0
Tile and Stone Setters	11	1,200	1%	(50)
Earth Drillers, Except Oil and Gas	11	-	n/a	0
Plasterers	11	100	11%	0
Insulators	8	600	1%	(30)
Structural Metal Fabricators	8	200	4%	(20)
Electrical and Electronics Repairers	7	-	n/a	0
Carpet Installers	7	500	1%	(30)
Brickmason Helpers	6	200	3%	(10)
Terrazzo Workers and Finishers	3	10	30%	0
Commercial Divers	3	10	30%	130
HVAC Installers	3	3,900	0%	(210)
Construction and Building Inspectors	2	200	1%	(20)
Motor Vehicle Operators, All Other	2	-	n/a	0
Heavy Equipment Mechanics	2	800	0%	(60)
Highway Maintenance Workers	1	-	n/a	0
Machinists	1	-	n/a	0
<i>Other Occupations</i>	-	200	0%	0
Total Demand	5,400	100,400	5%	(4,790)

Sources: RPO Agencies, 2022; Washington State Employment Security Department, 2022; Washington State Department of Revenue, 2022; NCES, 2022; Bureau of Labor Statistics, 2022; Community Attributes Inc., 2022.

Notes: Total demand represents demand for the occupations used by RPO agencies, this does not include the total list of occupations included in the construction industry. Regional demand represents demand for each occupation within the construction industry.

RPO Occupations

SOC	Title	SOC	Title
47-2061	Construction Laborers	49-9044	Millwrights
47-2031	Carpenters	47-2132	Insulation Workers, Mechanical
47-2073	Operating Engineers	47-4031	Fence Erectors
47-2111	Electricians	47-2011	Boilermakers
47-2221	Ironworkers	47-2044	Tile and Stone Setters
53-3032	Truck Drivers	47-5023	Earth Drillers, Except Oil and Gas
47-2152	Plumbers	47-2161	Plasterers
47-2051	Cement Masons and Finishers	47-2131	Insulators
47-2211	Sheet Metal Workers	51-2041	Structural Metal Fabricators
47-2141	Painters	49-2094	Electrical and Electronics Repairers
47-2072	Pile Driver Operators	47-2041	Carpet Installers
47-2181	Roofers	47-3011	Brickmason Helpers
47-2081	Drywall and Ceiling Tile Installers	47-2053	Terrazzo Workers and Finishers
47-4041	Hazardous Materials Removal Workers	49-9092	Commercial Divers
49-9052	Telecommunications Line Installers and Repairers	49-9021	HVAC Installers
17-1022	Surveyors	47-4011	Construction and Building Inspectors
47-4021	Elevator Installers and Repairers	53-3099	Motor Vehicle Operators, All Other
49-9051	Lineworkers	49-3042	Heavy Equipment Mechanics
37-3011	Landscapers	37-3011	Highway Maintenance Workers
47-2021	Brickmasons	51-4041	Machinists
47-2121	Glaziers		