

**State Of Alaska
Broadband Workforce Development Plan
Broadband Equity Access and Deployment
Grant Program**



**Department of Commerce, Community, and Economic
Development
Alaska Broadband Office
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Introduction

Broadband Expansion to Reach All Alaskans

The 2021 Infrastructure Investment and Jobs Act (IIJA) included \$42.45 billion to the National Telecommunications and Information Administration (NTIA) for the Broadband Equity, Access, and Deployment (BEAD) program to expand high-speed broadband internet to unserved and underserved communities throughout the nation.

The BEAD program, also known as “Internet For All”, represents a once-in-a-generation opportunity to achieve universal access to affordable high-speed internet and close the *Digital Divide – the gap between those with and without access to affordable broadband*. Skilled workers will be needed to ensure the broadband is built to last at least 20 years. Thousands of broadband construction and deployment jobs will be created in Alaska, and tens of thousands created nationwide by this program. Every state and U.S. territory receiving BEAD funds will be recruiting, training, and competing for workers.

In addition to the \$1,017,139,672.42 allocated to Alaska for BEAD, just under \$1 billion has been awarded for broadband infrastructure from other federal programs through the U.S. Departments of Treasury and Agriculture as well as the NTIA. These include the ReConnect Program, Coronavirus Capital Projects Fund, Enabling Middle Mile, and Tribal Broadband Connectivity.¹

The Alaska Broadband Office² (ABO) estimates that more than 6,000 miles of fiber cable may be installed in Alaska to connect 182 rural communities by the year 2030. Broadband expansion is expected to create at least 3,300 temporary, and 225 permanent³, high paying construction and telecommunications jobs in Alaska. When the work is complete, thousands of Alaskans who do not currently have high speed internet will be able to learn online, shop, meet with health care providers, start a business, and work from home.



Image Credit: Alaska Telecom Association

Workforce Plan Requirement

To receive BEAD funds, the state was required to submit a 5-Year Action Plan to the NTIA detailing how the ABO will facilitate broadband infrastructure expansion.⁴ The BEAD Final Proposal must include a broadband workforce development plan that meets the NTIA’s *Internet for All* guidelines to “develop an equity driven telecommunications workforce that offers better jobs and career opportunities for workers, especially for historically underserved populations.”

The NTIA’s instructions call for extensive research about the Alaska broadband construction and telecommunications sectors, the state’s workforce landscape, industry occupational labor supply and demand, public and private sector industry training capacity, and implications of BEAD construction on

¹ [Programs | Internet for All](#)

² Alaska’s BEAD program is managed by the Alaska Broadband Office in the Alaska Department of Commerce, Community and Economic Development.

³ See projections on page 16.

⁴ https://broadbandusa.ntia.doc.gov/sites/default/files/2022-09/BEAD_Five-Year_Action_Plan_Guidance.pdf

the *cross-industry* workforce⁵, along with the goals and strategies for reaching, training, and employing a diverse and inclusive broadband workforce.

The Planning Process

The ABO convened an advisory partner group to provide guidance and feedback in development of the Plan. Partners represent a variety of constituencies, including telecommunications and construction trade associations, public and private secondary and postsecondary education/training, Alaska Native organizations, regional training centers, labor unions, apprenticeship training programs, non-profits, and state agencies. Advisory group members are listed in Appendix 1. The Alaska Broadband Workforce Development Plan (ABWD Plan or “the Plan”) was informed through regular contact with the advisory group via email, virtual and in-person meetings, web-based surveys, and forums. Over 75 entities, representing more than 13,000 Alaskans, were contacted directly via email, virtual or in-person meetings, online surveys, and conference presentations⁶. Plan research included a detailed look at economic and labor conditions today and projects for the next few years.

Alaska’s Growing Economy

Alaska has a strong and growing economy. The state added about 6,000 new jobs in 2023 and is expected to add 5,400 more in 2024 and another 5,000 in 2025⁷. These job estimates do not account for IIJA projects including broadband expansion nor do they account for the potential of \$20 billion in state, federal, national defense, utility, oil and gas, mining, and private development projects.



Image Credit: ASTAC

Labor Shortage Concerns

Alaska also has widespread labor shortages today. In September 2023, there were more than 20,000 job openings and about 14,000 applicants in AlaskaJobs, the state’s labor exchange system. This equates to about 0.67 applicants for each opening.⁸ Alaska’s workforce is shrinking and growing older. The percentages of those aged 18 and under and those aged 65 and over are roughly equal. From 2012-2022, the number of residents 18-64 declined by 30,000, from 479,000 to 449,000. Alaska out-migration has exceeded in-migration for 10 straight years. Only West Virginia and Wyoming lost a larger share of working-age populations over that same decade.⁹ More than 50% of high school students leave Alaska after graduation and many do not return.

Concurrent Broadband & Regional Workforce Planning

Concerns about cross-industry labor shortages have led to the initiation of efforts concurrent to BEAD workforce planning and plan development: the Alaska Department of Transportation & Public Facilities is developing a workforce plan for construction work related to IIJA funding; the Alaska Department of Labor and Workforce Development (DOLWD) and the Alaska Workforce Investment Board (AWIB) sponsored a two-day Workforce Convening conference in October 2023 to embark on a statewide Cross-Industry Workforce Plan facilitated by the Alaska Safety Alliance with support from the Denali

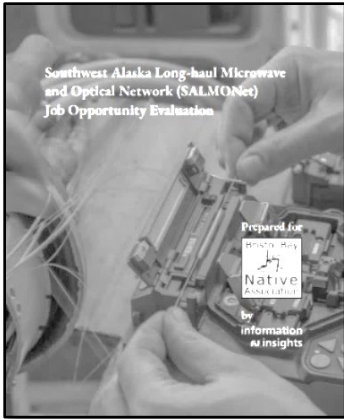
⁵ Workers who have skills that are needed in a variety of industries such as oil and gas, energy, mining, maritime, utilities, infrastructure operations, and transportation.

⁶ ABWD_Outreach_Database_10.19.23, Appendix 2.

⁷ [DOLWD Press Release \(alaska.gov\)](https://www.dolwd.alaska.gov/press-releases/)

⁸ Alaska Department of Labor and Workforce Development, Division of Employment and Training Services data.

⁹ Alaska Economic Trends Magazine, March 2023. <https://live.laborstats.alaska.gov/trends-magazine/2023/March/the-decline-in-working-age-alaskans>



Commission; and several regional and subregional workforce planning efforts are underway in the Bering Straits for the Arctic Deep Sea Port Project, Interior region for a multitude of projects, and in the Southwest region.

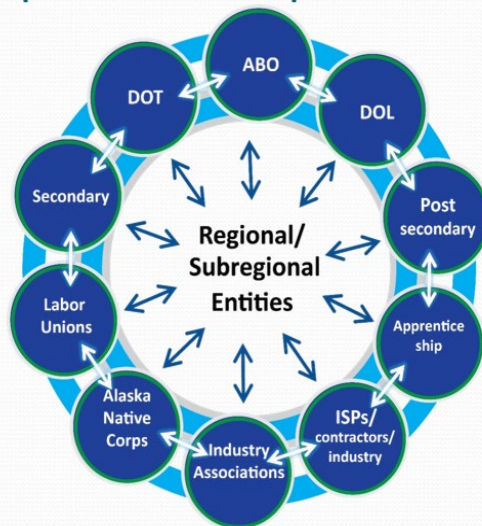
The Bristol Bay Native Corporation (BBNC) and regional communities are planning for broadband jobs across the Bristol Bay region in a document called Southwest Alaska Long-haul Microwave and Optical Network (SALMONet) Job Opportunity Evaluation¹⁰. BBNC is also developing a workforce plan to build a regional workforce to support communities.

A New Industry Sector Workforce Development Plan Model

Nearly every part of Alaska is experiencing out-migration of working age residents and high school graduates with significant labor shortages in a wide range of occupations. Regional broadband workers will be trained and employed in jobs where they gain transitional skills for other jobs in the region once broadband is deployed.

Workforce Development Concept Model

- Outer ring all connected
- Regional/subregional entities are at the center of workforce development.
- Center connected with all
- Additional partners will be added as workforce development continues.



These circumstances led the ABO’s workforce development team to create an industry strategic workforce model where regional workforce development partners are central to attracting, training, and supporting local workers versus industry relying on a centralized state-driven workforce delivery system. Placing regional workforce partners at the center of action with two-way communication among all entities will create

a more fluid delivery of state workforce resources and the ability to leverage regional assets that support local hire. With communities at the hub of the regional labor supply wheel, contractors can connect with communities well ahead of projects and empower these communities to help deliver workers on time. Pre-job discussions will not only help contractors to complete projects on time and on budget, but simultaneously will build a regional *cross-industry* workforce with skills to meet a variety of other community and regional workforce needs.

¹⁰ Bristol Bay Native Association Southwest Alaska Long-haul Microwave and Optical Network (SALMONet) Job Opportunity Evaluation, https://bba.com/wp-content/uploads/2023/08/SALMONet-Job-Opportunity-Evaluation_Reduced.pdf

Broadband Workforce Plan Vision, Mission, Goals, Strategies, and Actions

Vision: Alaskans from every region of the state will have opportunities to learn about, train for, and fill broadband construction and deployment jobs to meet the labor supply needs of industry employers.

Mission: Alaska's Broadband Workforce Development Plan will support development of a diverse and inclusive skilled labor force to meet the needs of employers who build, operate, and maintain telecommunications infrastructure in every region of Alaska.

Goals:

1. Increase the number of Alaskans qualified to fill broadband construction and operations occupations,
2. Develop a diverse and inclusive regional broadband industry workforce, and
3. Strengthen and expand post-deployment capacity for residents to learn about and navigate education, training, and career opportunities, including self-employment, available using high-speed broadband access.

Strategies and Actions

Strategy 1. Implement the Broadband Workforce Development Plan and build a sustainable standards-based program, with a focus on public and private partnerships to produce a highly skilled and technically trained workforce that can meet industry labor supply challenges.

Objective: The Plan will be adopted by the Alaska Workforce Investment Board, and the Alaska Broadband Office (ABO) will determine what entity will be charged with initial implementation of the Plan to drive and coordinate action and raise and utilize resources to achieve the goals and objectives of the Plan.

Actions:

1. The Alaska Workforce Investment Board (AWIB) will review and adopt the Broadband Workforce Development Plan.
2. ABO will determine what agency or entity will initially implement the Broadband Workforce Development Plan in 2024 and provide resources to start activities.
3. ABO will continue convening the Broadband Workforce Development Team and augment the group with broadband/telecommunications employers and contractors.
4. Plan implementation lead(s) will establish regular methods of communication to, from, and among stakeholders and the public.
5. ABO or a qualified third party will develop a data collection and analysis system that measures strategy inputs and outputs and create an assessment and evaluation process to measure goal progress and identify areas that need improvement.
6. Public private partnerships will establish sustainable funding to provide ongoing broadband training and workforce efforts through the completion of the BEAD program.

Strategy 2. Build upon existing construction industry training and workforce efforts.

Objective: Each region will implement a broadband construction and telecommunications workforce development network that involves industry employers, educators, trainers, and support service providers who work together to prepare students and potential job seekers for industry employment.

Actions:

1. Connect regional construction training efforts, including secondary and postsecondary Career and Technical Education (CTE), job training, and apprenticeship programs, to form a construction and broadband training network.
2. Determine regional broadband construction and deployment occupational labor gaps and focus outreach and training to prepare workers to fill job demand.
3. Assess the regional training network strengths and weaknesses to identify gaps, challenges, and needs for developing the broadband workforce and develop strategies to overcome deficiencies.
4. Merge new broadband construction and telecommunications CTE programs and training into the regional talent network.
5. Identify transferable skills students and potential workers need for cross-industry jobs and adjust training to meet those needs.
6. Connect regional and state support service providers and create a process and delivery system to assist students and trainees to attend training in and out of the region and as they transition to employment.

Strategy 3. Increase career awareness and information about telecommunications occupations and employment.

Objective: Create a statewide marketing campaign that increases student and potential worker awareness about the broadband construction and telecommunications industry and broadband expansion employment opportunities, and connect them to career education, training, and services that prepare them for industry jobs.

Actions:

1. Develop a broadband workforce brand and outreach marketing campaign to raise public awareness about industry jobs and careers, including the training, skills, and certifications required for employment and how to access them.
2. Identify effective career awareness models that can be adapted to broadband messaging that increases career awareness among students, school counselors, parents, and job seekers.
3. Develop an industry career guide program to inform and support school counselors, teachers, industry employers, and Type M¹¹ instructors who engage with students about industry jobs and careers.
4. Expand the Alaska Career Information System (AKCIS) and AlaskaJobs to inform students and job seekers about broadband and telecommunications occupations and employment opportunities.

¹¹ Type M is a limited teaching certificate through the Alaska Department of Education and Early Development for individuals who can demonstrate subject matter expertise and teaching competency in one of three specialty areas (Alaska native language or culture, military science, vocational or technical course) as verified by a local school district, but do not have a bachelor's degree because a program is not sufficiently available.

5. Train and provide Digital Navigators¹² to help individuals navigate online education, training, support services, employment opportunities (including entrepreneurship), and other personal opportunities available with high-speed Internet access.

Strategy 4. Increase education and training programs that prepare students and adults for apprenticeship and entry-level employment in telecommunications occupations.

Objective: Increase the number of broadband construction and telecommunication apprentices and individuals enrolling in postsecondary education courses to help diversify the workforce and fill the wide variety of occupations needed to construct and deploy broadband infrastructure and fill cross-industry jobs in every region of Alaska.

Actions:

1. Create a working group of industry employers, educators, trainers, and apprentice sponsors to assist the Department of Education and Early Development (DEED) with the creation of a Broadband/Telecommunications Career and Technical Education Program of Study (CTEPS) that can be used by school districts across the state.
2. Identify and/or develop qualified industry instructors, including Type M Certified instructors, to support teachers or deliver instruction in secondary CTE programs.
3. Provide support and technical assistance for industry-related registered apprenticeship sponsors to create programs or scale up recruitment and training for existing ones.
4. Provide support services for applicants entering apprentice, postsecondary, and higher education programs.
5. Introduce new broadband construction and telecommunications courses through Alaska Construction Academies and the Alaska Department of Corrections.
6. Support broadband/telecommunications pre-apprenticeship training.
7. Engage out-of-state industry trainers that offer basic broadband courses to serve every region.
8. Develop a broadband construction and telecommunications train-the-trainer program that can increase the supply of qualified instructors.

Strategy 5. Put in place recruitment, training, and employment efforts focused on historically underrepresented groups¹³.

Objective: Alaska’s construction and broadband industry will employ a more diverse, equitable, and inclusive workforce to build broadband infrastructure and operate telecommunications systems.

Actions:

1. Work directly with agencies and organizations that already work with historically underrepresented groups to build avenues to the broadband industry talent pipeline and jobs.

¹² Individuals who address the entire digital inclusion process — home connectivity, devices, digital skills, and digital opportunities — with community members. Navigators may be paid staff or volunteers.

¹³ Historically underrepresented groups for the Alaska Digital Equity Plan and BEAD Workforce Plan are: 1) Low-income individuals (at or below 150% of poverty level); 2) Individuals aged 60 or older; 3) Incarcerated individuals, other than in a Federal facility; 4) Veterans; 5) Individuals with disabilities; 6) Individuals with a language barrier; 7) Members of a racial or ethnic minority group; and 8) Rural Alaskans.

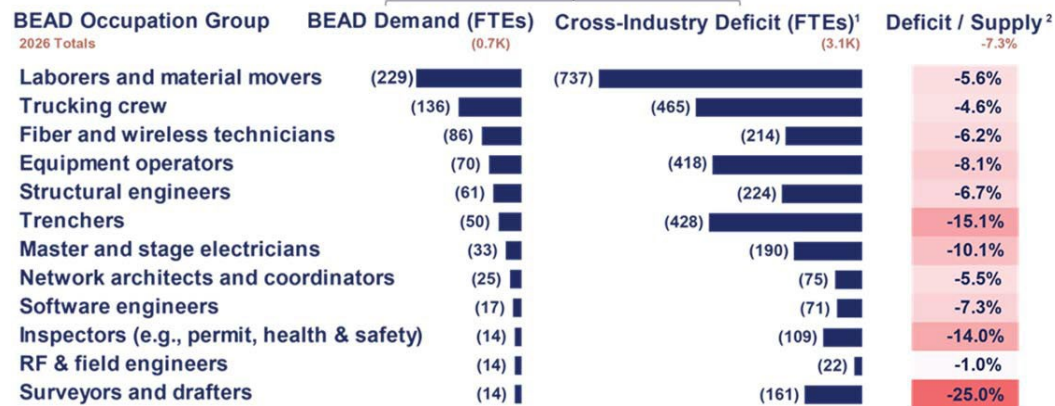
2. Meet with industry employers to learn about their workforce needs and develop relationships that lead to employment opportunities for specific populations within historically underrepresented groups.
3. Use agency and partner communications processes to increase system-wide awareness about special population employment opportunities and ways to connect clients to talent pipelines.
4. Develop industry-focused outreach, training, and employment agency and partner action plans that connect clients to appropriate education, training, and support services.
5. Organize and support a coordinated effort with Alaska Job Centers, Alaska Native entities, and other agencies to provide support services for individuals.

A National and State Construction, Broadband, and Cross-Industry Workforce

Congress’ investment of over \$1.2 trillion in IJA projects could produce a new generation of skilled workers for the construction industry and build a national cross-industry workforce for other industries that need common occupational skills such as oil & gas, energy, mining, maritime, utilities, infrastructure operations, and transportation. Each industry has significant labor shortages, and the current need is for 409,000 new workers with skills found in the construction industry according to the U.S. Bureau of Labor Statistics February 2024 Job Openings and Labor Turnover Report.

The NTIA prepared a BEAD labor gap outlook for the ABO. Based on the NTIA labor gap, the workforce development team calculated a *minimum estimated deficit* of 1,017 workers in the core broadband occupations in 2026. The NTIA estimated worker shortages due to BEAD demand at 25% of Alaska’s statewide total cross-industry deficit.

Chart 1: NTIA-Based Alaska BEAD Demand and Cross-Industry Labor Deficits

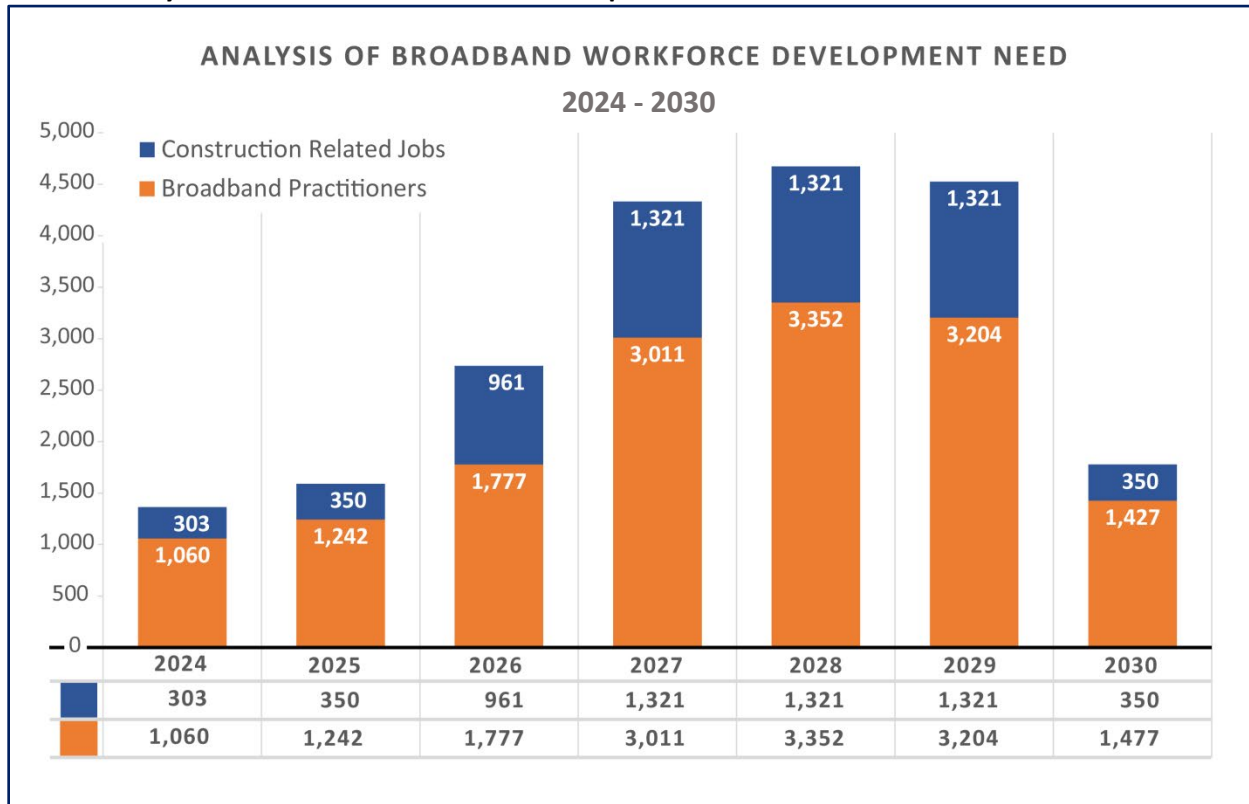


Notes: BEAD deployment role(s) tagged to each BEAD Occupation Group included in appendix mapping table; 1) Includes 2026 baseline forecast + incremental BEAD impact; 2) Cross-industry deficit / cross-industry supply Sources: BLS, PMP, OECD, CBO, CostQuest, Deloitte Analysis

Under BEAD, states are required to estimate the impact of broadband construction labor demand on the cross-industry needs of employers who employ workers with common skills.

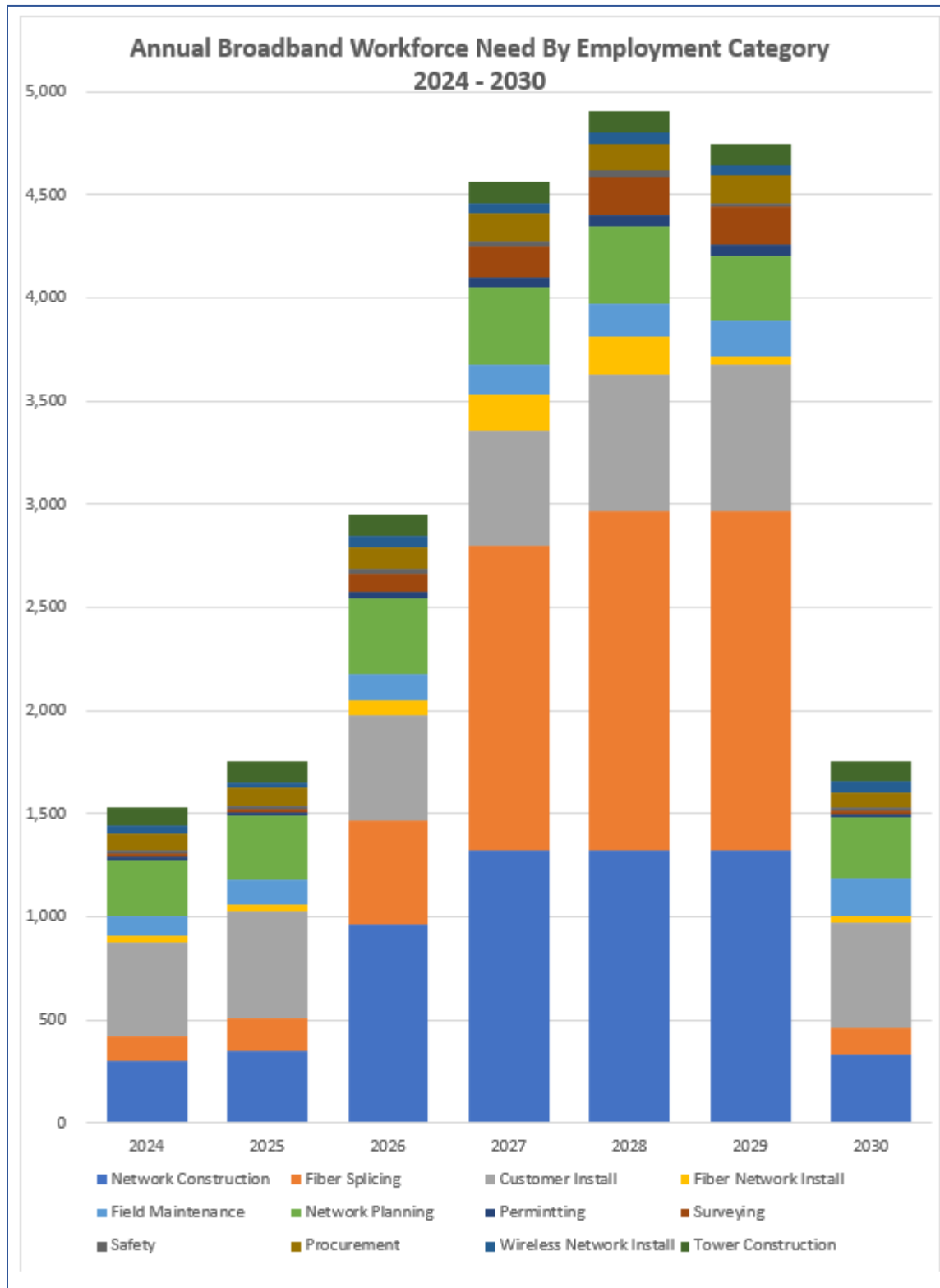
The ABO estimates Alaska will need 4,673 workers at peak demand in 2028, including 3,352 for broadband-specific jobs, such as fiber installers and cable splicers, and 1,321 with construction skills to fill cross-industry jobs, such as heavy equipment operators and electricians, as shown in Chart 2.

Chart 2: Analysis of Broadband Workforce Development Need 2024-2030



The chart displays projected growth and decline in demand for the general categories of broadband practitioners and construction-related jobs between 2024 and 2030. The more comprehensive breakdown displaying individual employment categories in Chart 3 shows the wide variance among specific categories, such as fiber splicing, tower construction, procurement, surveying, and others, from a peak high of 1,642 fiber splicers to a peak low of 31 safety specialists.

Chart 3: Detailed Annual Workforce Need



To see a detailed look at all the occupations within the specific categories, see the complete table in Appendix 4.

The ABO instructed the workforce development team to create a workforce plan that would increase the supply of broadband construction workers with transferable skills for jobs and careers in other industries and lead Alaska’s effort to increase the state cross-industry workforce.

The NTIA labor forecast used a select but not inclusive list of broadband occupations and did not include estimated cross-industry projected labor demand for more than \$20 billion of potential investment in IJJA and capital projects that could occur within the same timeframe.

A preliminary estimate by the workforce development team based on annual job growth models by the Alaska DOLWD Research and Analysis Section for cross-industry construction occupations shows that more than 25,000 new workers may be needed by 2030, as shown in Table 1.

Table 1: Cross-Industry Employment for Selected Occupations 2020-2030			
Occupation	2020 Employment	2020-2030 Forecasted Openings	2030 Projected Employment
Electrical Engineer	236	190	426
Project Manager	309	540	849
Civil Engineering Tech	415	600	1015
Land Surveyor	454	350	804
Pole Surveyor	454	230	684
OSP (Outside Plant) Engineer	1,232	750	1,982
Construction Manager	1,450	830	2,280
Project Management Specialists	309	410	719
1 st Line Trades Supervisors	2,624	720	3,344
Carpenter	4,532	2,280	6812
Operating Engineer (Heavy Eqpt)	5,464	3,230	8694
Truck Drivers	4,539	3,230	7769
Maintenance Technician	5,726	3,740	9466
Laborer	8,416	3,960	12,376
Fiber Optic Technician	951	910	1861
Splicer Technician	360	280	640
Maintenance Technician	5,726	3,740	9,466
Safety Officers	492	380	872
Occ. Safety & Health Specialists	285	120	405
Total	43,974	26,490	70,464

Source: Alaska DOLWD Research and Analysis

Alaska’s Broadband Construction and Telecommunications Sectors

Construction

The very competitive broadband construction sector is engaged in pre-construction, construction, and post-construction for both marine and terrestrial infrastructure, with reliance on a relatively short list of qualified maritime and terrestrial construction contractors.

Broadband construction in Alaska is made more difficult by Alaska's challenges that are unlike anywhere else in the world. Below are some of the unique aspects of building and managing telecommunications in Alaska:

1. Geographic

- a. Tower Construction: Towers are often required in very remote locations that are not accessible by roads. They must be reliable and able to withstand Arctic weather conditions.
- b. Fiber Trenching: Burying cable in Alaska requires covering larger distances and digging into frozen earth, all within a shortened build season.
- c. Undersea Cabling: A vast amount of Alaska is accessible with ease only by water. This requires laying cable undersea. Accessibility to cable beneath ice is limited and the location must account for potential ice shearing.
- d. Logistics: To construct and maintain a network in the Alaskan Arctic requires the movement and coordination of equipment and people using helicopters, airplanes, and barges, all within a shortened build season.
- e. Satellite: Some locations in the Arctic are so remote that they can only receive service via satellite, which requires an understanding of how to incorporate this technology into an existing IT network.

2. Climate

- a. Weather: Weather conditions in Alaska are some of the harshest on Earth, with extremely low temperatures and high winds. Construction and maintenance of infrastructure requires advanced planning and knowledge of the weather patterns.

Employers know that it takes time – several years – to train a skilled, productive, and safe worker, especially one who knows the unique attributes of building infrastructure in Alaska. In online surveys and interviews with Internet Service Provider companies, ABO's workforce development team found that employers said they cannot rely on unskilled labor and are not confident that Alaska's training providers can upskill hundreds of broadband construction workers in time to meet the need. They want the state to help raise career awareness and training for high school students and job seekers as soon as possible so they have better prepared employees that can work and learn on the job as registered apprentices.

A complete profile of the Alaska telecommunications industry appears in Appendix 3. Below are some highlights.

Telecommunications

The telecommunications workforce is engaged in phone, cellular phone, and broadband operations and maintenance. There are 32 primary Internet Service Providers (ISPs) in Alaska. In 2022, Dun & Bradstreet data showed the primary ISPs generated gross revenues of \$1,458,091,591¹⁴ and employed 2,937 workers. In November 2023, a cursory review of the individual ISP websites identified more than 200 open positions.

A web-based ISP/Contractor Workforce Survey was distributed to ISP providers through the Alaska Telecommunications Association (ATA) and to broadband construction contractors through the Alaska-National Electrical Contractors Association (NECA), the Associated General Contractors (AGC) of Alaska, and the Associated Building Contractors (ABC) of Alaska. The ISP/Contractor Survey results represent

¹⁴ Dun & Bradstreet data from Buzzfile.com "Communications sector in Alaska," <https://www.buzzfile.com/Search/Company/Results?parameter=SectorCode--48%2BStateld--2&searchType=4>

1,531 of the 2,937 ISP workforce, and respondent profiles closely mirror the majority ISP profile (see discussion in Appendix 3).

ISPs are concerned about the availability of contractors to build broadband projects; securing materials and equipment for construction; labor shortages; and unpredictable costs for future labor, supplies, transportation, project support, and post-construction operations. Broadband construction contractors' top concerns are about the timing of broadband projects; estimating project costs; availability and cost of construction materials and supplies; and labor supply in an already tight labor market. ISPs and contractors would like the projects staggered to ensure the manpower, equipment, and supplies are available. Broadband contractors report they need more electricians, linemen, engineers, project managers, job-site safety personnel, heavy equipment operators, skilled laborers, permit officers, other skilled trades workers, and technicians today and tomorrow.

A table displaying all of the occupations ISPs and contractors found most difficult to fill *now* and reported *needing now* and *next year* appears in Appendix 3. The greatest need was for fiber and splicer repairers and technicians. Also in short supply are project managers, construction managers, first line supervisors, and estimators.

Workforce Development and Training Assessment

Construction is Largely Unionized

Broadband construction is highly unionized, with most contractors belonging to the National Electrical Contractors of Alaska (NECA) hiring members of Alaska IBEW Local Union 1547. NECA and the IBEW administer registered apprenticeship and journey worker upgrade training through the Alaska Joint Electrical Apprenticeship & Training Trust (AJEATT). Several ISPs also have labor agreements to train telecommunication apprentices. The AJEATT has training centers in Anchorage and in Fairbanks; in 2023, they provided training for over 400 electrical and telecommunication apprentices. This industry partnership represents Alaska's largest broadband construction and telecommunications training enterprise in the state.

Career & Technical Education Construction Programs Can Lead to Broadband Training

Alaska has a widespread and effective construction career and technical education program network that came about, in part, from construction industry employers, educators, trade associations, and trade unions working together.

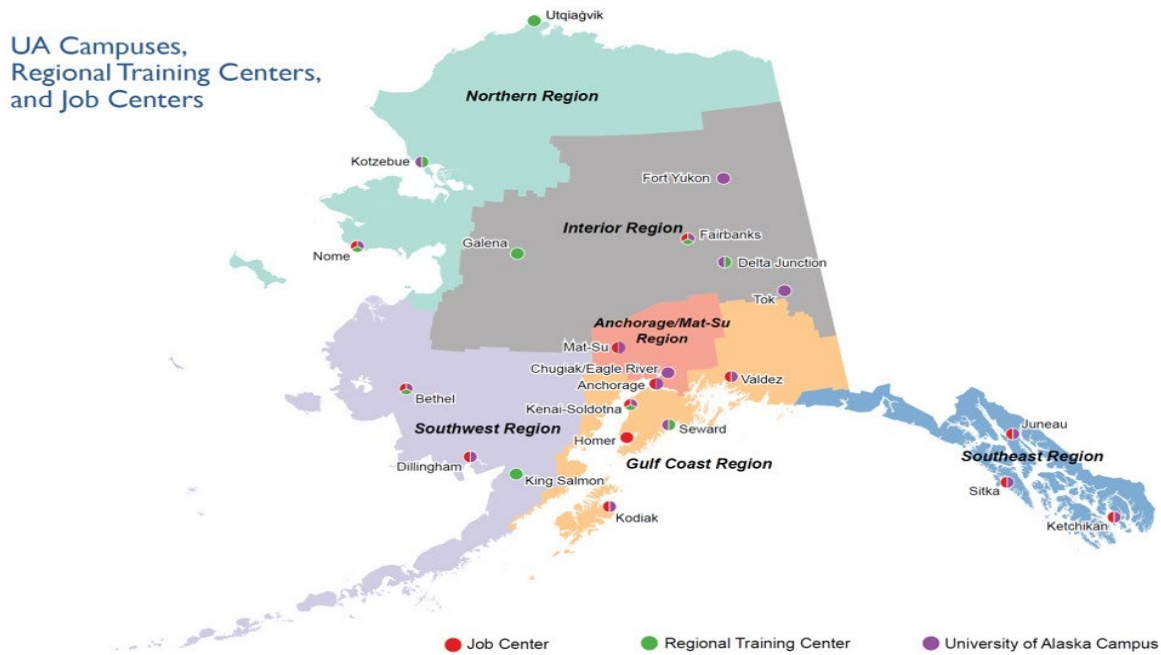
Construction training and skills form a foundation for more specific broadband and telecommunications training and, ultimately, employment. While there are currently few broadband or telecom-specific training programs in Alaska, construction training programs are offered in high schools, University of Alaska's community campuses, the Alaska Vocational Technical Center (AVTEC), Regional Training Centers, correctional facilities, Alaska Native organizations, and non-profit training providers across the state. These existing programs offer a selection of construction trade and information technology courses as well as pre-engineering and engineering courses that have a broadband sector connection. This provides a way to introduce and raise awareness of broadband and telecommunications occupations and opportunities.

Other efforts include the Alaska Joint Electrical Apprenticeship Training Trust (AJEATT) training for several telecommunication firms; Alaska Works Partnership basic skills course for fiber splicing through the Alaska Construction Academies in Fairbanks, Anchorage, and Wasilla; Anchorage King Tech High School's new Electronics and Telecommunications CTE program; the Arviiq Regional Economic Development and

Training Center in Aniak; University of Alaska’s Introduction to Broadband seminars for engineers and project managers; the planned Alaska Electrical Apprenticeship program expansion; and the Alaska Department of Corrections proposal for offering fiber optic technician training in several of their facilities.

Figure 1 shows the locations of UA Campuses, Regional Training Centers, and Job Centers across the state. High schools and other programs mentioned above are located in various locations across the state as well.

Figure 1: Alaska Job Centers, Regional Training Centers, and University of Alaska Campuses



The Supply of Future Broadband Construction and Telecommunications Workers

Most of the middle mile fiber construction will be done by crews with the prerequisite skills, credentials, and experience, with local workers hired from rural communities to support construction and site installation. Recruiting, training, and employing rural residents for broadband expansion jobs is critical for meeting labor demand and for creating a local legacy workforce to support the use of internet services in rural communities after initial deployment.

Talent Pipelines and Capacity

There is an existing broadband construction workforce and most new workers will be drawn from the existing and newly recruited construction workforce. Occupations in demand include surveyors, heavy equipment operators, technicians, and skilled laborers, along with project managers, engineers, safety personnel, and others. New workers without broadband experience and training will need cross-training in broadband construction skills and may require additional occupational certifications.

Historically Underserved Populations

The U.S. Congress expects that IJA and BEAD projects will build a new and inclusive generation of construction workers. Congress directs IJA agencies receiving funds and contractors engaged in projects to employ a more inclusive, diverse, and equitable workforce. The NTIA’s BEAD “Internet for All” workforce plan guidelines encourage employers to hire *underrepresented* populations to the greatest

extent possible. Women and racial/ethnic minorities are *underrepresented* in Alaska’s broadband, construction, and cross-industry workforce. The state Plan must include strategies for outreach and services specifically for *underrepresented* populations in the BEAD workforce plan. The NTIA has identified these populations as:

1. Individuals who live in covered households¹⁵
2. Persons who are 60 years of age or older
3. Incarcerated individuals, other than in a federal facility
4. Veterans and Transitioning Service Members
5. Individuals with disabilities
6. Individuals with a language barrier
7. Members of a racial or ethnic minority group
8. Rural residents

Including underrepresented and underserved populations will significantly help the broadband industry fill jobs and add to Alaska’s social and economic well-being. In addition, the Alaska Department of Corrections has developed an industry sector training plan targeting the broadband expansion.

Telecommunication / Broadband Industry Employee Training

Every telecommunication company and Internet Service Provider invests in training their workforce. Industry technology and regulations change on a regular basis, and training employees is a constant endeavor. Once a person is hired, they attend in-house training delivered by experienced and certified instructors or workshops and courses from out of state vendors using proprietary equipment and technology. Several large ISPs supplement training through the AJEATT.

Registered Apprenticeship Training

Registered apprenticeship is the nucleus of construction industry workforce development, and it will be a primary way to meet the broadband industry labor supply needs. Registered apprenticeship is the federally-preferred IJIA method for training and employing a new diverse and inclusive workforce. There are more than 1,600 trade and telecommunication apprentices in Alaska today¹⁶, and union and non-union sponsors are on pace to enroll 600 or more annually over the next several years.¹⁷ Ongoing apprenticeship outreach and training could add 3,000-4,000 new workers by 2030 for construction, telecommunications, and cross-industry sectors.

Challenges in Training the Broadband Workforce

Funding and Logistics

Over the past decade, there have been significant reductions in public education and workforce training programs, which have stunted workforce development capacity for construction and other industries across the secondary, postsecondary, adult job training, and registered apprenticeship platforms. Trainer capacity problems include a shortage of education and training programs, instructors, and training space in every region. Access to drivers’ education, Commercial Driver’s License (CDL) training, reliable transportation, and affordable and accessible childcare are among the top barriers for trainees.

Alaska’s immense size, geography, climate, and distances, along with inflation, continue to drive training costs up. While IJIA and NTIA encourage using federal Workforce Innovation and Opportunity Act

¹⁵ Covered household is determined by using criteria of poverty established by the U.S. Bureau of Census and means a household, the income of which is not more than 150% of an amount equal to the poverty level.

¹⁶ Alaska Apprenticeships, August 2023, Alaska Department of Labor and Workforce Development, Appendix 5.

¹⁷ Based on research, surveys, and interviews with apprenticeship sponsors.

(WIOA) funds to help with training and support costs, Alaska’s WIOA allocation is not large and has been reduced by 10% each year for the past three years, while the U.S. Department of Labor has placed more restrictions on the use of those funds. The lack of high-speed or any internet in rural Alaska and the corresponding challenges to development of employable and digital skills pose additional obstacles. Vast distances between the rural residents needing training and the location of the training centers will require the state to complement existing sites by implementing mobile training that can be delivered at regional training centers, with some training made available in communities that are prepared to support such training.

Telecommunications / Broadband Industry & Career Awareness

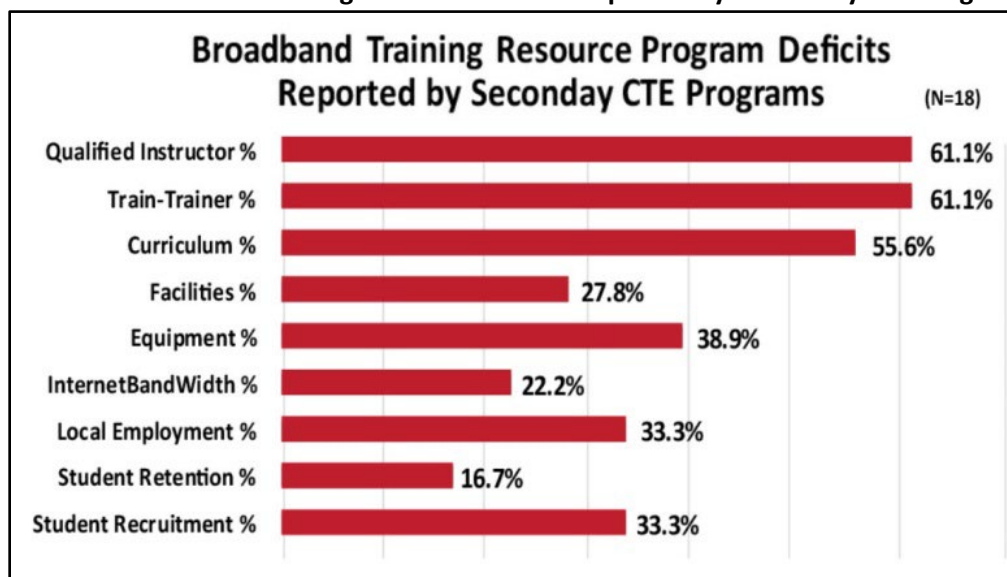
Although most students, educators, parents, and potential workers use phones and the internet, there is little awareness about broadband as an industry. The state has no Broadband-specific Career and Technical Education Program of Study (CTEPS). Without such a pathway, there is no identified *starting point* for Alaska students, parents, and educators to learn about the broadband industry and jobs. To attract and prepare students for broadband jobs and careers, industry, the Alaska Department of Education and Early Development and postsecondary programs should collaborate to create a CTE Program of Study that could be used in every school district and that would articulate to postsecondary training and credentials or directly into employment.

Career & Technical Education Program Challenges

Alaska’s entire public secondary and postsecondary Career and Technical Education (CTE) system has significant challenges in creating new programs or increasing training capacity for construction and telecommunications, especially to the scale needed to prepare thousands of new workers for construction and cross-industry jobs.

During plan development, surveys were completed by 28 secondary and postsecondary CTE programs, representing a combined 9,600 students. As shown in Chart 4 below, 61.1% of secondary CTE programs report deficiencies in qualified instructors and train-the-trainer access, which would need to be addressed to increase broadband training capacity and enable development of the workforce.

Chart 4: Broadband Training Resource Deficits Reported by Secondary CTE Programs



Alaska’s K-16 public education system has had reduced state support for a decade. While there are more construction courses and training programs in place across the state than ever before, secondary, postsecondary, and university campuses report they have scant resources to maintain what they offer now or expand their programs. They have *the will but no wallet* to prepare for the coming construction and telecommunications boom. Currently, only one high school program in the state offers a broadband training program, King Tech in the Anchorage School District.

Building Broadband Construction and Telecommunication Talent Pipeline from the Ground Up

Alaska’s schools, homeschools, and disconnected youth (not in school) represent the largest source of future workers. Schools are located in most Alaska communities. There are 54 school districts across the state with about 40,000 high school students and approximately 10,000 graduates annually.¹⁸

At least forty-three school districts have construction career and technical education programs of study (CTEPS) that offers students information about careers and a sequence of stackable courses along a path from high school to their chosen next step: apprenticeship, postsecondary training, and/or employment. Some industry firms work with local schools to recruit student interns and, though the numbers today are small (perhaps two dozen), there is interest in expanding those programs. There is also increasing interest in visiting schools to talk about industry jobs and careers as well as offering externships so teachers can engage with employers to learn more about the industry.

Conclusion and Recommendations

To achieve success, the State of Alaska must take a leadership role in cultivating the connections created by the Alaska Broadband Office for a strong and scalable telecommunications industry workforce that builds, operates, and maintains broadband infrastructure. The Plan goal of training 1,000 individuals for broadband construction, deployment, and operations – considering a 3,000 worker need for broadband and other cross-industry jobs – is challenging but achievable. Plugging into Alaska’s existing industry sector training system allows the telecommunications industry a quick-connect to well established career and technical education pathways.

A critical piece needed by the broadband/telecommunications industry is a public information campaign that brands its jobs and careers and markets these to students and job seekers along with information about education and training that puts them on a path to employment. With a brand information campaign and a pathway to broadband jobs and careers, industry can work closely with schools to reach students and with Alaska’s Job Centers and workforce entities and non-profits to expand outreach to job seekers, coordinate job training, and deliver support services in a concerted effort to fill labor gaps.

The Plan includes five recommendations:

Recommendation #1. The ABO creates a Memorandum of Agreement (MOA) with state agencies, industry associations, key workforce developers (education, training, support service providers), and regional workforce planners that establishes the resolve to work together to achieve Plan goals. The MOA should describe how MOA participants will provide support to implement the Plan.

Recommendation #2. The ABO identifies a qualified third party to implement the Plan and coordinate activities among partners.

¹⁸ Alaska Department of Education and Early Development Statistics and Reports, <https://education.alaska.gov/data-center#>

Recommendation #3. The ABO provides resources for a data collection and analysis system to measure progress toward reaching the Plan goals, strategies, objectives, and actions. The data collection and outcome analysis system should also measure the effectiveness of the new CTEPS and industry basic skills courses for increasing occupational skills and knowledge, high school completion, advancement to post-secondary programs and employment.

Recommendation #4. The ABO or a qualified third party will implement pilot and demonstration programs/processes to introduce a variety of courses in a variety of settings to test the ability of regional and subregional workforce partners to deliver remote, rural, and urban-located industry training.

Recommendation #5. The ABO or a qualified third party will facilitate a long-term Broadband Community Economic Impact Study¹⁹.

¹⁹ Expectations are that, in the long term, broadband access provides economic benefits that outweigh the investment costs. Increasing access and usage of broadband in rural areas leads to increased job and population growth and higher rates of new business, according to research by the [Federal Reserve Bank of Richmond](#).

Researchers at the Columbia University-based Columbia Institute for Tele-Information (CITI) found that a 10.9 percent growth in broadband penetration drove a .04 percent increase in the US GDP between 2010 and 2020. States with higher speed broadband experienced an additional economic impact of 11.5 percent. [Katz-Columbia University](#)

The Alaska Broadband Workforce Development Plan recommends conduct of a long-term investigation of Alaska broadband economic impact by community built around the Columbia-Katz model. The study would likely rely on readily available state and federal data supplemented with broadband penetration, utilization, speed, and cost data by community using criteria similar to the [2023 ICT UN Development Index](#). Each local Alaska community would be a unit of analysis. Baseline data on each community would be collected in the present, prior to the awarding of BEAD broadband funds, and in predetermined, post broadband deployment (PBD), time increments thereafter (e.g., PBD+1, PBD+3, PBD+5, PBD+10, PBD+20). This would include calculating a baseline and an ICT development index (or similar) for each Alaska community.

The economic data collection for baseline and for each subsequent data collection year would derive from US Census Bureau reports and ADOLWD Research and Analysis reports. Data analysis could involve simple correlation results or more involved multifactor time-based logistic regression calculations. The null hypothesis tested would be no difference in communities pre and post BEAD deployment.

Appendix 1 – Broadband Workforce Development Team Members

Name	Title	Organization
Alicia Amberg	Executive Director	Associated General Contractors of Alaska
Nils Andreassen	Executive Director	Alaska Municipal League
Larry Bell	Executive Manager	National Electrical Contractors Association Alaska
Nicole Borromeo	Executive Vice President and General Counsel	Alaska Federation of Natives
Garrett Boyle	Federal Co-Chair	Denali Commission
Melissa Caress	Statewide Training Director	Alaska Joint Electrical Apprenticeship and Training Trust
Cari-Ann Carty	Executive Director	Alaska Safety Alliance
Teri Cothren	Associate Vice President for Workforce Development	University of Alaska
Alexis Cowell	Executive Director	Alaska Works Partnership
Albie Dallemolle	Vice President of Economic Development and Sustainability	NANA Corporation
Joelle Hall	President	Alaska AFL-CIO
Melissa Kookesh	Tribal Liaison	Alaska Broadband Office
Cathy LeCompte	Director	AVTEC
Richard McDonald	IT Instructor	AVTEC
Frieda Nageak	External Affairs Coordinator	Ilisagvik College
Jennifer Nixon	Director of Health Equity & Workforce Development	Alaska Primary Care Association
Christine O'Connor	Executive Director	Alaska Telecom Association
Brenda Pacarro	Workforce and Shareholder Development Manager	Calista Corporation
Herb Schroeder	Director	Alaska Native Science and Engineering Program (ANSEP) - University of Alaska
Lisa Von Bargaen	Deputy Director	Alaska Broadband Office
Kristina Woolston	Contractor	Rasmuson Foundation

Appendix 2: Alaska Workforce Development Outreach

Row #	Entity or Event	Estimated # of People Represented by Entity (Employees, Members, Students, Clients, Etc.)	Entity Category	Website
1	Adak Eagle Enterprises LLC	20	ISP	https://adaktu.net/
2	Adtell Integration	25	Broadband Installation Company	https://adtellintegration.com/
3	Alaska Association for Career & Technical Education Professional Development Conference	150	Statewide Conference	https://www.acteonline.org/alaska/
4	Alaska Association of School Boards	50	Secondary Education	https://aasb.org/
5	Alaska Career & Technical Education ListServe	200	Secondary & Postsecondary - CTE	cte_coordinators@list.state.ak.us
6	Alaska Career Information System	100	Secondary & Postsecondary - Career Information	https://acpe.alaska.gov/AKCIS
7	Alaska Carpenters Training Trust	150	Union training program	http://www.alaskacarpenterstraining.org/
8	Alaska Department of Corrections	150	State Agency (with training programs)	https://doc.alaska.gov/
9	Alaska Department of Education and Early Development	50	Secondary CTE	https://education.alaska.gov/
10	Alaska Department of Labor & Workforce Development - AWIB	25	State Agency - Alaska Workforce Investment Board	https://awib.alaska.gov/
11	Alaska Department of Labor & Workforce Development - Division of Employment & Training Services	25	State Agency (Job Centers)	https://jobs.alaska.gov/
12	Alaska Department of Labor & Workforce Development - Research & Analysis	10	State Agency - Labor Market Info	https://live.laborstats.alaska.gov/
13	Alaska Division of Vocational Rehabilitation	50	State Agency (working with individuals with disabilities)	https://www.labor.alaska.gov/dvr/home.htm
14	Alaska Infrastructure Development Symposium	30	Statewide Conference	https://akfederalfunding.org/alaska-infrastructure-development-symposium/
15	Alaska Joint Electrical Apprenticeship and Training Trust (NECA/IBEW)	250	Union training program	https://alaskaelectricalapprenticeship.org/
16	Alaska Laborers Training School	150	Union training program	https://www.aklts.org/
17	Alaska Municipal League	100	Nonprofit - statewide organization of 165 cities, boroughs, and municipalities	https://www.akml.org/
18	Alaska Operating Engineers/Employers Training Trust	150	Union training program	https://aoeett.org/
19	Alaska Pacific University	200	Postsecondary (Private)	https://www.alaskapacific.edu/
20	Alaska Safety Alliance	100	Workforce Intermediary and Training Provider	https://www.alaskasafetyalliance.org/
21	Alaska Southcentral/Southeastern Sheet Metal Workers Local Union 23 Joint Apprenticeship Training Committee	150	Union training program	http://local23jatc.org/contact.html
22	Alaska Technical Center/Northwest Arctic Borough School District	160	Postsecondary (RTC)	https://www.nwarctic.org/schools/alaska_technical_center
23	Alaska Telecom Association	20	Industry Association - ISP	http://www.alaskatel.org/
24	Alaska Tribal Administrators Association	30	Alaska Native Organization	https://www.aktaa.org/
25	Alaska Vocational Technical Education Center (AVTEC)	200	Postsecondary (RTC)	https://avtec.edu/
26	Alaska Works Partnership	500	Workforce Intermediary and Training Provider	https://www.alaskaworks.org/
27	Anchorage School District Telecommunications Advisory Board	10	Secondary CTE - Industry Advisory Board	https://www.asdk12.org/Page/8252
28	ANCSA Regional Shareholder Development Group	25	Alaska Native Organization	https://ancsaregional.com/
29	Annette Island School District	100	Secondary CTE	https://www.aisdk12.org/
30	Associated Builders and Contractors (ABC) of Alaska	100	Industry Association	http://www.abcalaska.org/
31	Association General Contractors (AGC) of Alaska	500	Industry Association	https://www.agcak.org/
32	Aviat Networks	250	Broadband Network Provider	https://aviatnetworks.com/
33	Bristol Bay Native Corporation	250	Alaska Native Organization	https://www.bbnc.net/
34	Bristol Bay Regional CTE Consortium	100	Secondary CTE	https://bbrcte.org/
35	Calista Corporation	250	Alaska Native Organization	https://www.calistacorp.com/
36	City of Clarks Point	5	City	
37	Colony High School (Mat-Su Borough School District)	300	Secondary CTE	
38	Copper Valley Telecom	25	ISP	https://www.cvtc.org/
39	C-Tech	20	Training Curriculum Vendor	https://ctechprograms.com/
40	Delta Greely School District	250	Secondary CTE	https://www.dgsd.us/
41	Excel Alaska	100	Secondary CTE	https://alaskaexcel.org/
42	Excel Construction, Inc.	100	Contractor	https://www.excelconstructionak.com/
43	GCI	250	ISP	https://gci.com/
44	Haines High School	85	Secondary CTE	https://www.hbsd.net/
45	Information Insights	15	Consulting Firm	https://infoinsights.com/
46	Infrastructure Summit (IBEW Conference)	300	Statewide Conference	
47	J.M. Walsh Company	5	Lobbyist	https://jmwalthco.wordpress.com/

Appendix 2: Alaska Workforce Development Outreach

Row #	Entity or Event	Estimated # of People Represented by Entity (Employees, Members, Students, Clients, Etc.)	Entity Category	Website
48	Juneau Public Schools	1300	Secondary CTE	https://www.juneauschools.org/
49	Kenai Peninsula College	250	Postsecondary (Public)	https://kpc.alaska.edu/
50	Kenai Peninsula Economic Development District	200	Economic Development Organization	https://kpedd.org/
51	Ketchikan Indian Community	50	Alaska Native Organization	https://www.kictribe.org/
52	King Tech HS - ASD	50	Secondary CTE	https://www.asdk12.org/kingtech
53	KPU Telecommunications	60	ISP	https://www.kputel.com/
54	Lower Kuskokwim School District	1100	Secondary CTE	https://www.lksd.org/home
55	Mat-Su Borough CTE Program	500	Secondary CTE	https://www.matsuk12.us/cte
56	Matanuska Telephone Association (MTA)	300	ISP	https://new.mta.info/
57	NECA Alaska	100	Industry Association (Electrical Contractors)	https://www.alaskaneca.org/
58	Nenana City School District	500	Secondary CTE	https://www.nenanalynx.org/
59	North Slope Telecom, Inc.	40	ISP	https://nstiak.com/
60	Northern Industrial Training	100	Postsecondary (Private)	https://nitalaska.com/
61	Northwestern Alaska Career and Technical Center (NACTEC)	450	Secondary & Postsecondary - CTE (RTC)	https://nacteonline.org/?fbclid=IwARORomMGSt-ggQQMwQDNjDfCDE63WoHEQhCVAEzabxW73OjnNHGbTckGBJU
62	Quintillion Global	17	Broadband Network Provider	https://www.quintillionglobal.com/
63	Rasmuson Foundation	70	Non-Profit - Foundation supporting initiatives to improve life in Alaska	https://rasmuson.org/
64	San Francisco Federal Reserve Community Development office	15	Federal Agency	https://www.frbervices.org/
65	Southeast Island School District	50	Secondary CTE	https://www.sisd.org/
66	State of Reform Health Care Policy Conference	100	Industry Association	https://stateofreform.com/conference/2023-alaska-state-of-reform-health-policy-conference/
67	STG, Inc.	250	Contractor	https://stgincorporated.com/
68	Sturgeon Electric	40	Contractor	https://sturgeonelectric.com/
69	The Kuskokwim Corporation	40	Alaska Native Organization	https://kuskokwim.com/
70	Tundra Utility Construction LLC	10	Contractor	https://tundrautilityconstruction.com/
71	University of Alaska Anchorage	500	Postsecondary (Public)	https://www.uaa.alaska.edu/
72	University of Alaska Fairbanks	250	Postsecondary (Public)	https://www.uaf.edu/uaf/
73	University of Alaska Southeast	250	Postsecondary (Public)	https://uas.alaska.edu/
74	University of Alaska System	500	Postsecondary (Public)	https://www.alaska.edu/research/wd/
75	Wrangell Public Schools	70	Secondary CTE	https://www.wpsd.us/
76	YK Delta Tribal Broadband Consortium	50	Non-profit - Tribal Government-owned organization	https://yktribalbroadband.org/
	SumTotal	13,297		

Appendix 3 - Alaska Telecommunications Industry Overview

There are 32 primary Internet Service Providers (ISPs) in Alaska. In 2022, the primary ISPs employed 2,937 workers and generated gross revenues of \$1,458,091,591¹. These data are derived from: 1) [ISP.me](#) identifies the ISPs; 2) Dun & Bradstreet data from [Buzzfile](#), which provides detailed profiles and financial data for each ISP, and 3) annual reports for Ketchikan Public Utilities and Alaska Power & Telephone Co. The telecommunication industry has more than 200 open advertised as of November 2023² across the spectrum of occupations. This does not include broadband construction openings.

Alaska ISP Profile

Exhibit 1, on page 10, shows wide variability in ISP company sizes, ranging from 1 to 850 employees, and in revenues, ranging from \$36,237 to \$894,733,000. (Included are a few cable TV providers that use lines for internet and phone service as well as for entertainment and tend to be larger companies.) Many smaller ISPs are resellers leasing copper or fiber lines from larger companies and reselling to local users while providing hardwire or wireless connections via last-mile drop lines or service installs.

The top nine Alaska ISPs generated 93.5% of total ISP revenues (Table 1 below, derived from Exhibit 1). The 16 ISPs with 30 or more employees account for 90.9% of the total employees (Table 2, derived from Exhibit 1). The ISP survey results are discussed in detail beginning on page 5.

Table 1: Top 9 Alaska ISPs Account for 93.5% of Reported Revenues

#	ISP Name(s)	2022 Revenue	% Total All ISPs
1	GCI LLC aka Alaska United	\$894,733,000	61.40%
2	Alaska Communications Systems Holdings, Inc.	\$240,569,000	16.50%
3	Matanuska Telecom Association, Incorporated aka MTA	\$78,694,617	5.40%
4	GCI Cable	\$50,371,241	3.50%
5	GCI Fiber Communication Co.	\$21,336,076	1.50%
6	Arctic Slope Telephone Association Cooperative	\$19,957,174	1.40%
7	Ketchikan Public Utilities	\$19,549,800	1.30%
8	Alaska Power & Telephone Company	\$19,000,000	1.30%
9	Alaska Communications Internet, LLC	\$17,273,097	1.20%
SUMS		\$1,361,484,005	93.50%

Table 2 lists Alaska’s largest ISP employers with percentages of overall 2022 industry employment.

Table 2: Top 16 Alaska ISPs Account for 90.9% of Reported Employees

#	ISP Name(s)	2022 Employees	% Total All ISPs
1	GCI Communication Corp aka GCI Holdings LLC	850	28.90%
2	Alaska Communications Systems Holdings, Inc.	569	19.40%
3	Matanuska Telecom Association, aka M T A	300	10.20%
4	GCI Cable	250	8.50%
5	GCI Fiber Communication Co.	124	4.20%
6	United Utilities, Inc.	120	4.10%
7	Alaska Communications Internet, LLC	71	2.40%
8	Alaska Power & Telephone Company	68	2.30%
9	Arctic Slope Telephone Association Cooperative	54	1.80%

¹ Dun & Bradstreet data from [Buzzfile.com](#) “Communications sector in Alaska.”

² [AlaskaJobs Labor Exchange System Advertised Openings for Telecommunications Industry, November 26, 2023.](#)

10	Alasconnect, LLC	48	1.60%
11	Otz Telephone Cooperative	42	1.40%
12	Ketchikan Public Utilities	41	1.40%
13	Telalaska Long Distance, Inc.	38	1.30%
14	ACS of Fairbanks aka ACS	36	1.20%
15	Nushagak Electric & Telephone Cooperative	34	1.20%
16	Interior Telephone Company	28	1.00%
SUMS		2,673	90.90%

Internet Service Providers (ISP) and Broadband Construction Contractor Concerns

ISPs take a long view of what is needed to build and deploy broadband systems. The industry is very competitive, and ISPs rely on a short list of qualified maritime and terrestrial construction contractors to build infrastructure. ISPs are concerned about the availability of contractors to build projects and to secure materials and equipment. They are also concerned about labor shortages and rising labor costs. Sixty percent (60%) of the costs of broadband construction and deployment are labor.³ Additional concerns include unpredictable costs for equipment, material, transportation, project support, and post-construction broadband operations.⁴

Many of the issues and concerns expressed by ISPs are shared by Alaska’s broadband construction contractors, beginning with the current shortage of skilled workers. Most of Alaska’s broadband construction contractors are members of the Alaska - National Electrical Contractors Association (Alaska NECA) and have collective bargaining agreements with International Brotherhood of Electrical Workers (IBEW) Local Union 1547 to supply skilled workers and registered apprentices for their crews. Contractors reported through surveys and interviews that they need more workers now to fill back and front office jobs and field positions. They need more engineers, project managers, job-site safety personnel, and permit officers as well as skilled trades workers and technicians. Other concerns are unpredictable rising project and labor costs, the risk of providing hard money estimates (vs. design build), and a compressed BEAD timeframe (4-5 years) for building broadband infrastructure.

ISPs and contractors hope BEAD construction projects can be spread out (paced) and more time is allowed so Alaska contractors and their crews can complete projects. Timelines and a paced schedule for BEAD projects are crucial for successful broadband expansion as hundreds of millions of dollars’ worth of Tribal Broadband Connectivity Program (TBCP) and ReConnect projects are getting underway before BEAD projects are determined. ISPs and contractors report there is already a long waiting period (months to years) for broadband materials and equipment due to the lingering global impact of the COVID pandemic and federal Buy America Act requirements.

Alaska’s ISPs and construction companies will have to compete with larger companies across the US who may be awarded tens or hundreds of millions of dollars in broadband and BEAD projects. Those firms will have more purchasing power and be prioritized for material and equipment supplies, while Alaska contractors are left waiting, as prices climb, for what they need. Some suggest the state should consider purchasing and storing broadband equipment and materials ahead of time to help contain costs and ensure the products needed to build broadband infrastructure are available. Another concern is rising costs and the amount of time it takes for employees to obtain or update a Commercial Driver’s License (CDL) which is required for most workers engaged in electrical and broadband construction.

³ Jericho Casper, *Failing to Future-Proof Fiber Networks Will Have Costly Return on Investment Effects*, Broadband Breakfast, June 5, 2020.

⁴ ISP and contractor concerns noted in this document were gathered through surveys and interviews conducted during research for the Alaska Broadband Workforce Development Plan.

Contractors know that it takes time – several years – to train a skilled, productive, and safe worker. They do not want to rely on unskilled labor and are not confident that the number of new broadband construction workers (or construction workers in general) needed will be ready in time to build TBCP, ReConnect, BEAD, and other infrastructure projects. They are very anxious about the labor shortfalls and want to know who is doing “boots on the ground” training and how it can be scaled up to get the workforce ready in time. They support developing talent pipelines and on-ramps for high school students, expanding higher education programs for project management, engineers and other professionals, and support outreach to include underrepresented and underserved populations. They add that housing for rural and remote project workers is very scarce or sometimes not available.⁵

Broadband Construction Workforce & Cross-Industry Labor Supply Projections

Two industry sectors are involved in broadband construction and deployment: 1) construction and 2) telecommunications. Broadband construction is a *strand* of the construction industry and closely aligns with skills involved in building power transmission systems and distributing electrical power. Broadband construction involves terrestrial and marine applications. In Alaska, most of the construction is done by union contractors.

Alaska has a broadband construction workforce that has built telecom and broadband infrastructure but does not have enough workers to build over \$2 billion of new broadband systems by 2030. Most new broadband construction workers, except those workers in rural communities employed in last-mile work, will be supplied by International Brotherhood of Electrical Workers (IBEW) Local Union 1547, with support from unions involved in civil construction such as the Teamsters, Laborers, and Operating Engineers. Marine (river and seabed) broadband construction employers will employ workers from a crew of licensed captains and engineers, along with certified underwater divers and underwater welders that are members of the Piledrivers and Divers Union.

⁵ ISP and contractor needs and challenges are summarized here from interviews and surveys.

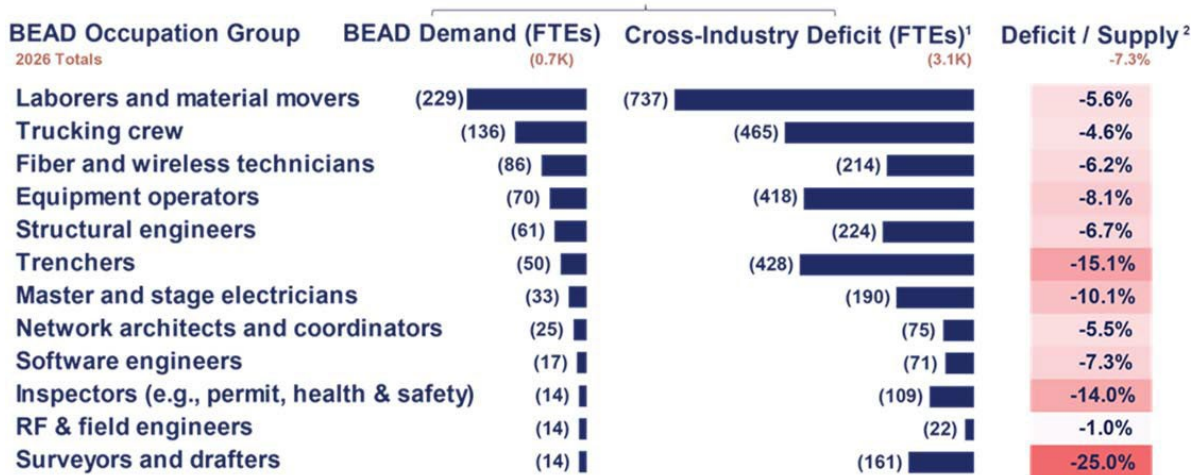
Most of the workers building and deploying broadband will need short-term training to obtain or renew certifications required for employment. BEAD requires that “the subgrantee will ensure the use of an appropriately skilled workforce” with “appropriate training, certification, and licensure.” As broadband systems are completed, many workers will move to another broadband construction project or to other construction and resource development projects. Others will be employed by local ISPs or Telcos to carry out drop line/installation to structures and in legacy jobs operating and maintaining broadband and telecommunication systems.

Broadband Construction, Deployment and Cross-Industry Occupation Assessment

Three workforce projections were involved in determining a workforce plan goal specifying the number of new workers that need to be trained and employed to build and deploy broadband infrastructure and help fill industry and cross-industry labor deficits: 1) NTIA broadband infrastructure workforce projections and labor gaps; 2) state and regional occupational data for broadband construction and cross-industry occupations, and 3) data from ISP/Contractor Surveys.

1. NTIA workforce projections and labor gaps. NTIA prepared a labor shortage outlook for each state. Figure 1 below shows that NTIA estimated worker shortages for Alaska BEAD demand are 24% of Alaska’s cross-industry deficit. Occupations in demand include fiber and wireless technicians, surveyors, heavy equipment operators, truck drivers, laborers, and engineers.

Figure 1: NTIA Workforce Projections and Labor Gaps for Alaska



Notes: BEAD deployment role(s) tagged to each BEAD Occupation Group included in appendix mapping table; 1) Includes 2026 baseline forecast + incremental BEAD impact; 2) Cross-industry deficit / cross-industry supply Sources: BLS, PMP, OECD, CBO, CostQuest, Deloitte Analysis

Regional workforce deficits could differ significantly from those for the balance of state. In some cases, deficits vary by almost a magnitude, e.g., Fiber and Wireless Technicians, which is a 52.4% deficit in one region compared with a 6.2% NTIA statewide deficit. These differences show the local/regional environment ultimately dictates potential labor supply. ISPs and contractors expect they will utilize their current and newly recruited skilled workers to build broadband infrastructure with local workers hired during construction and employed in broadband operations.

2. A review of state data for broadband and broadband related workforce availability by region.

The chart below uses 2022 regional employment occupation data to evaluate BEAD FTE labor supply shortfalls. A more complete picture of the current broadband sector workforce deficiencies in areas

slated for broadband work appears in Exhibit 2 where BEAD communities are listed with 2022 employment data for each of the NTIA targeted broadband occupations.

Figure 2: NTIA BEAD Occupations, Deficit, and Supply for Alaska

BEAD Occupation Group 2026 Totals	State Deficit / Supply ² -7.3%	2022 Jobs In Regions w/ Planned BB Installs	BEAD Demand (FTEs)	Local Deficit / Supply
Laborers and material movers	-5.6%	2,014	(229)	-11.3%
Trucking crew	-4.6%	994	(136)	-13.7%
Fiber and wireless technicians	-6.2%	164	(86)	-52.4%
Equipment operators	-8.1%	2,225	(70)	-03.1%
Structural engineers	-6.7%		(61)	-6.7%
Trenchers	-15.1%		(50)	-15.1%
Master and stage electricians	-10.1%	695	(33)	-04.7%
Network architects and coordinators	-5.5%	70	(25)	-35.7%
Software engineers	-7.3%		(17)	-7.3%
Inspectors (e.g., permit, health & safety)	-14.0%	122	(14)	-11.5%
RF & field engineers	-1.0%		(14)	-1.0%
Surveyors and drafters	-25.0%	113	(14)	-12.4%

Notes: BEAD deployment role(s) tagged to each BEAD Occupation Group included in appendix mapping table; 1) Includes 2026 baseline forecast + incremental BEAD impact; 2) Cross-industry deficit / cross-industry supply Sources: BLS, PMP, OECD, CBO, CostQuest, Deloitte Analysis

3. A review of the ISP/Contractor Survey data collected by the ABWD Team.

A web-based ISP/Contractor Workforce Survey was distributed to ISP providers through the Alaska Telecommunications Association (ATA) and to broadband construction contractors through the Alaska-National Electrical Contractors Association (NECA), the Associated General Contractors (AGC) of Alaska and the Associated Building Contractors (ABC) of Alaska. The ISP/Contractor Survey results represent 1,531 of the 2,937 ISP workforce, and respondent profiles closely mirror the majority ISP profile, demonstrating relevance to the ISP survey results.

Activity	Percent
Surveying	20%
Engineering	50%
Make Ready Construction	40%
Make Ready Engineering	40%
Fiber Construction	80%
Mainline splicing	70%
Service Drops	70%
Drop Splicing	80%
Installing	90%
No Broadband Work	10%
Other Broadband Work	20%

Table 3 shows the percentage of survey respondents (10 respondents, N=10) engaging in the most common broadband activities. In this sample most of the work reported was installing (90%) and related last-mile activities such as drop splicing (80%) and service drops (70%). Make-ready construction and make-ready engineering tasks, often required for installation work, are also relevant middle-mile work, as is mainline splicing and fiber construction. These are backbone skills ISPs and their contractors need for BEAD projects.

Table 4 on page 6 is a display of occupations ISPs and contractors in the survey found most difficult to fill now and reported needing most *now* and *next year*. The greatest reported need was for fiber and splicer repairers and

technicians. Notice that, in the analyses above in **Item 2. State data for broadband and broadband related workforce availability**, fiber and splicer repairers and technicians have the greatest local area deficit. Also in short supply are project managers, construction managers, first line supervisors, and estimators.

Table 4: ISP Contractor Survey Self-Reported Employment by Job Title and Labor Gap for Broadband Related Occupations (N=10)

Job Title	Number Employed Now	% Employers Needing More Now	% Employers Needing More Next Year	% Employers with Difficulty Finding Employees
Fiber Line Installers/Repairers	77	30%	30%	30%
Splicer Technicians	16	10%	10%	30%
Fiber Optic Technicians	25	30%	30%	30%
Maintenance Technicians	61	20%	10%	30%
Fiber Optic Technician	30	20%	10%	20%
Tower/Antenna Foremen	9	20%	10%	20%
First Line Supervisors of Trades	22	20%	0%	20%
Project Management Specialists	62	30%	20%	20%
Construction Managers	43	30%	10%	20%
Land Surveyors	7	20%	10%	20%
Project Managers	49	10%	10%	10%
Estimators	25	40%	20%	10%
Wireless Technicians	42	30%	20%	10%
Wireless Technicians	53	20%	10%	10%
Commercial Divers	9	10%	10%	10%
Laborers	15	10%	10%	10%
Boring Machine Operators	9	10%	10%	10%
Operating Engineers (Hvy Eqpt)	33	30%	20%	10%
Pole/Anchor Foremen	5	10%	10%	10%
First Line Supervisors of Installers / Repairers	21	30%	10%	10%
Compliance Officers	13	10%	0%	10%

See Exhibit 2 showing workforce availability for selected broadband occupations. See Exhibit 3 for a list of broadband jobs with current employment, future demand and a difficulty finding rating for the surveyed ISPs. Pre and post survey interviews with several companies indicated that lack of supervisory staff also impacts bidding and moving forward with *current* projects. All these respondents indicated an intention to participate in BEAD but believe labor gaps will not be filled by the start of construction.

ADOLWDR&A employment projections for broadband and cross-industry employment to 2030

A preliminary estimate based on annual job growth models by Alaska Department of Labor and Workforce Development Labor Research & Analysis (ADOLWD R&A) for broadband essential occupations and cross-industry occupations is that more than 26,000 new workers will be needed by 2030, as shown in Table 5 below, which shows projected employment and openings for 2020 – 2030 for some selected broadband construction and deployment occupations. Most of these workers will be needed by other industries during that same timeframe. Forecasted openings for the 2020 - 2030

decade are displayed with an overall estimate of 28,300 over ten years, or about 2,800 per year.

Table 5: Employment and Projections 2020 – 2030, ADOLWD R&A				
Occupation	2020 Employment	2020-2030 Forecast Openings	2020-2030 Projected Employment	Percent of 2020 Employment
Electrical Engineer	236	190	426	181%
Project Manager	309	540	849	275%
Civil Engineering Tech	415	600	1,015	245%
Land Surveyor	454	350	804	177%
Pole Surveyor	454	230	684	151%
OSP (Outside Plant) Engineer	1,232	750	1,982	150%
Construction Manager	1,450	830	2,280	157%
Project Management Specialist	309	410	719	233%
1 st Line Trades Supervisors	2,624	720	3,344	127%
Carpenter	4,532	2,280	6,812	150%
Operating Engineer (Heavy Eqp)	5,464	3,230	8,694	159%
Truck Drivers	4,539	3,230	7,769	171%
Maintenance Technician	5,726	3,740	9,466	165%
Laborer	8,416	3,960	12,376	147%
Fiber Optic Technician	951	910	1,861	196%
Splicer Technician	360	280	640	180%
Maintenance Technician	5,726	3,740	9,466	165%
Safety Officers	492	380	872	177%
Occ. Safety & Health Specialists	285	120	405	142%
Total	43,974	26,490	70,464	
<i>Source: Alaska DOLWD Research and Analysis</i>				

This projection shows about 2,800 workers needed per year through 2030. Over the six-year BEAD deployment timeframe (2024-2030), that provides an estimated need of roughly 17,000 more Alaska workers to fill broadband and cross-industry jobs. These labor estimates by ADOLWD Research & Analysis and NTIA may seem high, but they predate workforce estimates for all Alaska Infrastructure Investment and Jobs Act (IIJA) projects because those workforce needs have not been identified yet.

Broadband Construction & Telecommunications Education & Training Assessment

This assessment is based upon research examining the availability of construction, broadband construction and telecommunications education and training programs. These programs are offered by public and private schools and trainers involved in secondary and postsecondary education, registered apprenticeship programs, regional training centers (RTC), industry employers, and a sample of outside broadband technology training providers with mobile course capabilities.

Research included web-based surveys of Alaska’s Career and Technical Education providers (secondary, postsecondary and apprentice sponsors), reviews of recent topical reports by the University of Alaska and the annual Alaska Technical Vocational Education Report and interviews with Alaska Pacific University, CTE directors, industry employers, and trade associations, as well as several state agencies and Alaska Native entities engaged in workforce development.

Industry Trains Their Employees

Every telecommunications company and ISP invests in training their workforce. Once a person is hired, they attend in-house training delivered by experienced and certified instructors or workshops and courses from qualified instructors provided by vendors using proprietary equipment, materials, and systems. Another topic of the ISP/Contractor Survey relates to each respondent’s workforce training methods. As Table 5 shows, most workforce training is done internally (1,349 workers) - which includes using out-of-state proprietary training providers. Among the external training resources, several well-known broadband equipment and material suppliers predominate, including BICSI, Society of Cable TV Engineers (SCTE), CISCO, LTR, ANRITSU, and Motorola. Of these, only BICSI and SCTE are product neutral. Only a small portion is done by external resources.

Table 6: ISP/Contractor Survey Training Broadband Related Occupations (N=10)		
BB Workers in Company	Internal BB Training	External BB Training
0	NA	NA
2	1	0
12	Not Reported	Not Reported
14	12	12
44	5	2
50	50	30
55	10	10
65	35	35
314	314	30
931	931	0
Totals	1,459	110

The Alaska Joint Electrical Apprenticeship Training Trust (IBEW- NECA) is also product neutral and provides worker and apprenticeship training for about 25% of those externally trained.

None of the ISPs or contractors in this survey reported any additional training support from Alaska secondary or postsecondary programs. This is possibly because ISPs regard their training as proprietary and don’t share training. The broadband industry is highly competitive. ISPs have not had a lot of engagement with secondary and postsecondary education, though some do visit schools to increase industry awareness and some offer internship opportunities for students. Interviews with ISPs reveal a growing interest in industry-school partnerships to increase career awareness activities and increase internships.

Building Our Talent Pipeline from the Ground Up with Career and Technical Education

Alaska’s secondary and postsecondary Career and Technical Education (CTE) system can play a significant role in developing the broadband talent pipeline and cross-industry workforce. CTE refers to courses and programs that prepare students for careers in current or emerging industries. High school CTE provides students with opportunities to explore a career of interest and gain technical and employability skills that mesh with their academic courses. High school CTE connects with and leads to postsecondary CTE programs or other specialized technical training after high school.

CTE pathways provide opportunities for postsecondary degrees or certificates, industry certifications, apprenticeships, and employment. A career pathway program offers secondary and postsecondary students and job seekers a clear sequence of stackable credits and credentials, combined with support services as needed, which enable them to secure industry skills, certifications and/or credentials, advance to higher education or be enrolled in apprenticeship training.⁶ Alaska already has an effective, connected *construction* industry workforce development system in place that provides a foundation for training broadband construction and telecommunication workers through expansion of existing CTE programs.

⁶ UA Career Pathways Framework_10-7-21.pdf

Discussion of the Validity of ISP/Contract Survey Data Collected by the ABWD Team.

The ISP-Contractor Workforce Survey was developed by the Alaska Broadband Workforce Development (AWBD) Team. The survey was distributed through the Alaska Telecom Association (ATA) and through team contacts. While the 'N' for the survey responses is 10, the number of employees captured in the survey data is 1,531 and shows a profile similar to the majority of the state's ISPs. Consequently, the 10 survey respondents comprise a robust, representative sample of the larger group of Alaska ISPs.

Exhibit 1 to Appendix 3: ISP Labor and Revenues

Short Name	HQ Labor	Other Labor	Total Labor	Rank: Total Labor	Revenues 2022	Rank: Revenues 2022
ACS Total	189	488	677	2	\$265,982,060	2
Adak Total	10	3	13	15	\$2,317,825	18
AK Fibre Total	1	2	3	25	\$618,446	24
AK United Fiber Total	1	0	1	29	\$3,894,992	13
AP&T Total	0	0	68	4	\$19,000,000	6
ASTAC Total	27	27	54	6	\$19,957,174	4
AX-s Total	3	0	3	27	\$119,317	28
BB Cellular Total	1	0	1	30	\$1,219,764	22
BBTC Total	35	4	39	10	\$6,412,818	10
Borealis Total	9	0	9	19	\$744,009	23
Bush Total	0	0	14	13	\$1,887,316	20
CTC Total	13	7	20	12	\$4,704,896	11
Dry Creek Total	1	0	1	32	\$36,237	31
FastWyre Total	66	1	67	5	\$6,533,145	9
Fibre AK Total	1	0	1	31	\$89,613	29
GCI Total	537	841	1378	1	\$985,815,811	1
Grizzly Total	12	0	12	16	\$0	32
KPU Total	8	35	43	7	\$19,783,719	5
Matt and Zahare Total	6	0	6	23	\$521,799	25
MTA Total	148	200	348	3	\$78,694,617	3
Nushagak Total	41	0	41	9	\$8,869,789	8
OptimERA Total	7	6	13	14	\$4,443,612	12
OTZ Total	26	16	42	8	\$10,609,235	7
Prime Time Total	10	0	10	17	\$2,501,247	17
Quintillion Total	31	0	31	11	\$3,863,221	14
Remote Control Total	5	2	7	21	\$2,515,811	16
SpitwSpots Total	10	0	10	18	\$1,582,176	21
Summit Total	7	0	7	22	\$2,515,811	16
Supervision Total	2	0	2	28	\$2,262,090	19
Vertical Broadband Total	5	0	5	24	\$41,767	30
Whitestone Total	8	0	8	20	\$420,144	26
Woreovia Total	3	0	3	26	\$133,130	27
Grand Total	1223	1632	2937		\$1,458,091,591	

Exhibit 2
Broadband Worker Availability by Broadband Expansion Regions by Selected Broadband Occupations

2022 Employment for Selected Broadband Occupations by Region	DOL Employment Data by Region 2022
Broadband Expansion Regions	11288
Aleutians East	121
Carpenters	27
Civil Engineering Technologists and Technicians	0
Civil Engineers	0
Commercial and Industrial Designers	0
Commercial Divers	0
Compliance Officers	15
Computer Network Architects	0
Construction Laborers	30
Construction Managers	0
Cost Estimators	0
Electrical Engineers	0
Electricians	9
First-Line Supervisors of Construction Trades and Extraction Workers	0
First-Line Supervisors of Mechanics, Installers, and Repairers	9
Heavy and Tractor-Trailer Truck Drivers	0
Maintenance and Repair Workers, General	22
Network and Computer Systems Administrators	0
Occupational Health and Safety Specialists	0
Occupational Health and Safety Technicians	0
Operating Engineers and Other Construction Equipment Operators	9
Procurement Clerks	0
Project Management Specialists	0
Purchasing Managers	0
Radio, Cellular, and Tower Equipment Installers and Repairers	0
Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	0
Surveying and Mapping Technicians	0
Telecommunications Equipment Installers and Repairers, Except Line Installers	0
Telecommunications Line Installers and Repairers	0
Aleutians West	451
Carpenters	67
Civil Engineering Technologists and Technicians	8
Civil Engineers	18
Commercial and Industrial Designers	0
Commercial Divers	7
Compliance Officers	15
Computer Network Architects	0
Construction Laborers	60

Exhibit 2
Broadband Worker Availability by Broadband Expansion Regions by Selected Broadband Occupations

2022 Employment for Selected Broadband Occupations by Region	DOL Employment Data by Region 2022
Construction Managers	12
Cost Estimators	0
Electrical Engineers	0
Electricians	32
First-Line Supervisors of Construction Trades and Extraction Workers	0
First-Line Supervisors of Mechanics, Installers, and Repairers	13
Heavy and Tractor-Trailer Truck Drivers	9
Maintenance and Repair Workers, General	110
Network and Computer Systems Administrators	5
Occupational Health and Safety Specialists	0
Occupational Health and Safety Technicians	16
Operating Engineers and Other Construction Equipment Operators	60
Procurement Clerks	0
Project Management Specialists	0
Purchasing Managers	0
Radio, Cellular, and Tower Equipment Installers and Repairers	11
Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	0
Surveying and Mapping Technicians	0
Telecommunications Equipment Installers and Repairers, Except Line Installers	8
Telecommunications Line Installers and Repairers	0
Bristol Bay Borough	148
Carpenters	17
Civil Engineering Technologists and Technicians	0
Civil Engineers	0
Commercial and Industrial Designers	0
Commercial Divers	0
Compliance Officers	0
Computer Network Architects	0
Construction Laborers	24
Construction Managers	0
Cost Estimators	0
Electrical Engineers	0
Electricians	12
First-Line Supervisors of Construction Trades and Extraction Workers	16
First-Line Supervisors of Mechanics, Installers, and Repairers	9
Heavy and Tractor-Trailer Truck Drivers	6
Maintenance and Repair Workers, General	49
Network and Computer Systems Administrators	0
Occupational Health and Safety Specialists	0

Exhibit 2
Broadband Worker Availability by Broadband Expansion Regions by Selected Broadband Occupations

2022 Employment for Selected Broadband Occupations by Region	DOL Employment Data by Region 2022
Occupational Health and Safety Technicians	0
Operating Engineers and Other Construction Equipment Operators	7
Procurement Clerks	0
Project Management Specialists	0
Purchasing Managers	0
Radio, Cellular, and Tower Equipment Installers and Repairers	0
Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	0
Surveying and Mapping Technicians	0
Telecommunications Equipment Installers and Repairers, Except Line Installers	0
Telecommunications Line Installers and Repairers	8
Chugach Census Area	602
Carpenters	39
Civil Engineering Technologists and Technicians	0
Civil Engineers	0
Commercial and Industrial Designers	0
Commercial Divers	0
Compliance Officers	15
Computer Network Architects	0
Construction Laborers	160
Construction Managers	10
Cost Estimators	0
Electrical Engineers	0
Electricians	22
First-Line Supervisors of Construction Trades and Extraction Workers	33
First-Line Supervisors of Mechanics, Installers, and Repairers	7
Heavy and Tractor-Trailer Truck Drivers	48
Maintenance and Repair Workers, General	122
Network and Computer Systems Administrators	6
Occupational Health and Safety Specialists	12
Occupational Health and Safety Technicians	0
Operating Engineers and Other Construction Equipment Operators	92
Procurement Clerks	0
Project Management Specialists	9
Purchasing Managers	6
Radio, Cellular, and Tower Equipment Installers and Repairers	0
Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	0
Surveying and Mapping Technicians	0
Telecommunications Equipment Installers and Repairers, Except Line Installers	10
Telecommunications Line Installers and Repairers	11

Exhibit 2
Broadband Worker Availability by Broadband Expansion Regions by Selected Broadband Occupations

2022 Employment for Selected Broadband Occupations by Region	DOL Employment Data by Region 2022
Copper River Census Area	222
Carpenters	28
Civil Engineering Technologists and Technicians	0
Civil Engineers	0
Commercial and Industrial Designers	0
Commercial Divers	0
Compliance Officers	0
Computer Network Architects	0
Construction Laborers	51
Construction Managers	0
Cost Estimators	0
Electrical Engineers	0
Electricians	0
First-Line Supervisors of Construction Trades and Extraction Workers	0
First-Line Supervisors of Mechanics, Installers, and Repairers	0
Heavy and Tractor-Trailer Truck Drivers	6
Maintenance and Repair Workers, General	70
Operating Engineers and Other Construction Equipment Operators	53
Procurement Clerks	0
Project Management Specialists	0
Purchasing Managers	0
Radio, Cellular, and Tower Equipment Installers and Repairers	0
Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	0
Surveying and Mapping Technicians	0
Telecommunications Equipment Installers and Repairers, Except Line Installers	0
Telecommunications Line Installers and Repairers	14
Haines Borough	188
Carpenters	34
Civil Engineering Technologists and Technicians	5
Civil Engineers	0
Commercial and Industrial Designers	0
Commercial Divers	0
Compliance Officers	7
Computer Network Architects	0
Construction Laborers	53
Construction Managers	8
Cost Estimators	0
Electrical Engineers	0
Electricians	0

Exhibit 2
Broadband Worker Availability by Broadband Expansion Regions by Selected Broadband Occupations

2022 Employment for Selected Broadband Occupations by Region	DOL Employment Data by Region 2022
First-Line Supervisors of Construction Trades and Extraction Workers	0
First-Line Supervisors of Mechanics, Installers, and Repairers	0
Heavy and Tractor-Trailer Truck Drivers	6
Maintenance and Repair Workers, General	26
Network and Computer Systems Administrators	0
Occupational Health and Safety Specialists	0
Occupational Health and Safety Technicians	0
Operating Engineers and Other Construction Equipment Operators	41
Procurement Clerks	0
Project Management Specialists	0
Purchasing Managers	0
Radio, Cellular, and Tower Equipment Installers and Repairers	0
Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	0
Surveying and Mapping Technicians	0
Telecommunications Equipment Installers and Repairers, Except Line Installers	0
Telecommunications Line Installers and Repairers	8
Hoonah-Angoon	134
Carpenters	62
Civil Engineering Technologists and Technicians	0
Civil Engineers	0
Commercial and Industrial Designers	0
Commercial Divers	0
Compliance Officers	0
Computer Network Architects	0
Construction Laborers	40
Construction Managers	0
Cost Estimators	0
Electrical Engineers	0
Electricians	0
First-Line Supervisors of Construction Trades and Extraction Workers	0
First-Line Supervisors of Mechanics, Installers, and Repairers	0
Heavy and Tractor-Trailer Truck Drivers	6
Maintenance and Repair Workers, General	20
Network and Computer Systems Administrators	0
Occupational Health and Safety Specialists	0
Occupational Health and Safety Technicians	0
Operating Engineers and Other Construction Equipment Operators	6
Procurement Clerks	0
Project Management Specialists	0

Exhibit 2
Broadband Worker Availability by Broadband Expansion Regions by Selected Broadband Occupations

2022 Employment for Selected Broadband Occupations by Region	DOL Employment Data by Region 2022
Purchasing Managers	0
Radio, Cellular, and Tower Equipment Installers and Repairers	0
Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	0
Surveying and Mapping Technicians	0
Telecommunications Equipment Installers and Repairers, Except Line Installers	0
Telecommunications Line Installers and Repairers	0
Kenai Peninsula Borough	2699
Carpenters	263
Civil Engineering Technologists and Technicians	10
Civil Engineers	20
Commercial and Industrial Designers	0
Commercial Divers	0
Compliance Officers	29
Computer Network Architects	8
Construction Laborers	750
Construction Managers	47
Cost Estimators	0
Electrical Engineers	10
Electricians	187
First-Line Supervisors of Construction Trades and Extraction Workers	154
First-Line Supervisors of Mechanics, Installers, and Repairers	45
Heavy and Tractor-Trailer Truck Drivers	295
Maintenance and Repair Workers, General	286
Network and Computer Systems Administrators	39
Occupational Health and Safety Specialists	31
Occupational Health and Safety Technicians	11
Operating Engineers and Other Construction Equipment Operators	340
Procurement Clerks	21
Project Management Specialists	25
Purchasing Managers	10
Radio, Cellular, and Tower Equipment Installers and Repairers	0
Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	14
Surveying and Mapping Technicians	50
Telecommunications Equipment Installers and Repairers, Except Line Installers	36
Telecommunications Line Installers and Repairers	18
Kodiak Island Borough	594
Carpenters	77
Civil Engineering Technologists and Technicians	0
Civil Engineers	0

Exhibit 2
Broadband Worker Availability by Broadband Expansion Regions by Selected Broadband Occupations

2022 Employment for Selected Broadband Occupations by Region	DOL Employment Data by Region 2022
Commercial and Industrial Designers	0
Commercial Divers	0
Compliance Officers	0
Computer Network Architects	0
Construction Laborers	137
Construction Managers	11
Cost Estimators	0
Electrical Engineers	0
Electricians	30
First-Line Supervisors of Construction Trades and Extraction Workers	16
First-Line Supervisors of Mechanics, Installers, and Repairers	17
Heavy and Tractor-Trailer Truck Drivers	61
Maintenance and Repair Workers, General	157
Network and Computer Systems Administrators	7
Occupational Health and Safety Specialists	0
Occupational Health and Safety Technicians	0
Operating Engineers and Other Construction Equipment Operators	60
Procurement Clerks	0
Project Management Specialists	10
Purchasing Managers	0
Radio, Cellular, and Tower Equipment Installers and Repairers	0
Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	5
Surveying and Mapping Technicians	0
Telecommunications Equipment Installers and Repairers, Except Line Installers	6
Telecommunications Line Installers and Repairers	0
North Slope Borough	4402
Carpenters	206
Civil Engineering Technologists and Technicians	6
Civil Engineers	9
Commercial and Industrial Designers	0
Commercial Divers	0
Compliance Officers	34
Computer Network Architects	0
Construction Laborers	302
Construction Managers	188
Cost Estimators	0
Electrical Engineers	6
Electricians	294
First-Line Supervisors of Construction Trades and Extraction Workers	424

Exhibit 2
Broadband Worker Availability by Broadband Expansion Regions by Selected Broadband Occupations

2022 Employment for Selected Broadband Occupations by Region	DOL Employment Data by Region 2022
First-Line Supervisors of Mechanics, Installers, and Repairers	30
Heavy and Tractor-Trailer Truck Drivers	463
Maintenance and Repair Workers, General	941
Network and Computer Systems Administrators	13
Occupational Health and Safety Specialists	71
Occupational Health and Safety Technicians	23
Operating Engineers and Other Construction Equipment Operators	1282
Procurement Clerks	14
Project Management Specialists	18
Purchasing Managers	5
Radio, Cellular, and Tower Equipment Installers and Repairers	0
Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	0
Surveying and Mapping Technicians	50
Telecommunications Equipment Installers and Repairers, Except Line Installers	5
Telecommunications Line Installers and Repairers	18
Prince of Wales-Hyder	397
Carpenters	42
Civil Engineering Technologists and Technicians	0
Civil Engineers	0
Commercial and Industrial Designers	0
Commercial Divers	0
Compliance Officers	0
Computer Network Architects	0
Construction Laborers	68
Construction Managers	0
Cost Estimators	0
Electrical Engineers	0
Electricians	0
First-Line Supervisors of Construction Trades and Extraction Workers	19
First-Line Supervisors of Mechanics, Installers, and Repairers	6
Heavy and Tractor-Trailer Truck Drivers	41
Maintenance and Repair Workers, General	159
Network and Computer Systems Administrators	0
Occupational Health and Safety Specialists	0
Occupational Health and Safety Technicians	0
Operating Engineers and Other Construction Equipment Operators	56
Procurement Clerks	0
Project Management Specialists	0
Purchasing Managers	0

Exhibit 2
Broadband Worker Availability by Broadband Expansion Regions by Selected Broadband Occupations

2022 Employment for Selected Broadband Occupations by Region	DOL Employment Data by Region 2022
Radio, Cellular, and Tower Equipment Installers and Repairers	0
Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	0
Surveying and Mapping Technicians	0
Telecommunications Equipment Installers and Repairers, Except Line Installers	0
Telecommunications Line Installers and Repairers	6
Southeast Fairbanks	541
Carpenters	73
Civil Engineering Technologists and Technicians	0
Civil Engineers	0
Commercial and Industrial Designers	0
Commercial Divers	0
Compliance Officers	7
Computer Network Architects	0
Construction Laborers	126
Construction Managers	21
Cost Estimators	0
Electrical Engineers	0
Electricians	80
First-Line Supervisors of Construction Trades and Extraction Workers	39
First-Line Supervisors of Mechanics, Installers, and Repairers	11
Heavy and Tractor-Trailer Truck Drivers	33
Maintenance and Repair Workers, General	56
Network and Computer Systems Administrators	0
Occupational Health and Safety Specialists	0
Occupational Health and Safety Technicians	0
Operating Engineers and Other Construction Equipment Operators	72
Procurement Clerks	0
Project Management Specialists	5
Purchasing Managers	0
Radio, Cellular, and Tower Equipment Installers and Repairers	0
Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	0
Surveying and Mapping Technicians	13
Telecommunications Equipment Installers and Repairers, Except Line Installers	0
Telecommunications Line Installers and Repairers	5
Yukon-Koyukuk	789
Carpenters	161
Civil Engineering Technologists and Technicians	0
Civil Engineers	0
Commercial and Industrial Designers	0

Exhibit 2
Broadband Worker Availability by Broadband Expansion Regions by Selected Broadband Occupations

2022 Employment for Selected Broadband Occupations by Region	DOL Employment Data by Region 2022
Commercial Divers	0
Compliance Officers	0
Computer Network Architects	0
Construction Laborers	213
Construction Managers	7
Cost Estimators	0
Electrical Engineers	0
Electricians	13
First-Line Supervisors of Construction Trades and Extraction Workers	12
First-Line Supervisors of Mechanics, Installers, and Repairers	5
Heavy and Tractor-Trailer Truck Drivers	20
Maintenance and Repair Workers, General	181
Network and Computer Systems Administrators	0
Occupational Health and Safety Specialists	0
Occupational Health and Safety Technicians	0
Operating Engineers and Other Construction Equipment Operators	177
Procurement Clerks	0
Project Management Specialists	0
Purchasing Managers	0
Radio, Cellular, and Tower Equipment Installers and Repairers	0
Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	0
Surveying and Mapping Technicians	0
Telecommunications Equipment Installers and Repairers, Except Line Installers	0
Telecommunications Line Installers and Repairers	0
Non-Expansion Regions	29741
Grand Total	41029

Exhibit 3
ISP Contractor Survey Self-Reported Employment by
Job Title and Labor Gap for Broadband Related Occupations (N=10)

Job Title	Number Employed Now	% Need More Now	% Need More Next Year	% Difficult to Find
NETWORK PLANNING				
Network Planners	31	10%	10%	0%
Network Designers	165	20%	10%	0%
Electrical Engineers	6	20%	10%	0%
Project Managers	49	10%	10%	10%
Civil Engineering Technicians	1	10%	0%	0%
Estimators	25	40%	20%	10%
FIELD MAINTENANCE				
Maintenance Technicians	93	40%	20%	0%
SAFETY				
Safety Officers	10	20%	30%	0%
Occupational S&H Specialists	5	10%	10%	0%
CUSTOMER INSTALLS				
Premise Installation Technicians	201	40%	20%	0%
Customer Support Reps	257	10%	0%	0%
WIRELESS NETWORK INSTALLS				
Electricians	0	0%	0%	0%
Wireless Technicians	42	30%	20%	10%
Antennae Installers	0	0%	0%	0%
OPTICAL NETWORK INSTALLS				
Fiber Optic Technician	30	20%	10%	20%
FIBER SPLICING				
Fiber Line Installers/Repairers	77	30%	30%	30%
Splicer Technicians	16	10%	10%	30%
Fiber Optic Technicians	25	30%	30%	30%
TOWER CONSTRUCTION				
Tower Climbers (Eqpt Installer)	4	0%	10%	0%
Wireless Technicians	53	20%	10%	10%
Tower Technicians (Eqpt Installer)	33	10%	20%	0%
NETWORK CONSTRUCTION				
Commercial Divers	9	10%	10%	10%
Laborers	15	10%	10%	10%
Maintenance Technicians	61	20%	10%	30%
Truck Drivers	8	0%	0%	0%

Exhibit 3
ISP Contractor Survey Self-Reported Employment by
Job Title and Labor Gap for Broadband Related Occupations (N=10)

Job Title	Number Employed Now	% Need More Now	% Need More Next Year	% Difficult to Find
Boring Machine Operators	9	10%	10%	10%
Operating Engineers (Heavy Equipment)	33	30%	20%	10%
Carpenters	6	0%	0%	0%
Tower/Antenna Foremen	9	20%	10%	20%
Pole/Anchor Foremen	5	10%	10%	10%
First Line Supervisors of Installers / Repairers	21	30%	10%	10%
First Line Supervisors of Trades	22	20%	0%	20%
Project Management Specialists	62	30%	20%	20%
Construction Managers	43	30%	10%	20%
PROCUREMENT				
Procurement Lead / Clerks	78	40%	10%	0%
PERMITS				
Compliance Officers	13	10%	0%	10%
SURVEYING				
Outside Plant Civil Engineers	7	10%	10%	0%
Pole Surveyors	0	10%	0%	0%
Land Surveyors	7	20%	10%	20%
SUM	1,531			

Appendix 4 - Analysis of Alaska Broadband Workforce Need

	2024	2025	2026	2027	2028	2029	2030	Total
Cross-Industry Pool Evaluation								
NTIA Assessment		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	
			3,114					
DOLWD Straight line ¹		2,800	2,800	2,800	2,800	2,800	2,800	16,800
ABO Broadband Evaluation								
NTIA Assessment		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Total
			749					
Non-Technical and Non-Customer Support Employees	1,410	1,410	1,410	1,410	1,410	1,410	1,410	
Technical and Customer Support Employees	1,531	1,531	1,531	1,531	1,531	1,531	1,531	
Total Telcom Industry Baseline	2,941	2,941	2,941	2,941	2,941	2,941	2,941	
ABO Assessment of New Employees Needed	369	253	1,165	1,615	341	(160)	(2,989)	225
Sumtotal All Telcom Employee Need	3,310	3,563	4,728	6,344	6,684	6,524	3,535	3,535
Increase/(Decrease)		7.6%	32.7%	34.2%	5.4%	-2.4%	-45.8%	
Increase/(Decrease) Against 2024		107.6%	142.8%	191.6%	201.9%	197.1%	106.8%	

1. The workforce for the BEAD Program will be pulled from the Cross-Industry Pool

Detail :Incremental New Broadband Equity Access and Deployment (BEAD) Positions Needed

Category	Job Title	Number Employed Now	2025	2026	2027	2028	2029	2030	Total
Fiber	NETWORK CONSTRUCTION								
Fiber	Commercial Divers	9	1	40	20	0	0	(60)	10
Fiber	Laborers	15	2	67	33	0	0	(100)	17
Fiber	Maintenance Technicians	61	7	271	136	0	0	(407)	68
Fiber	Truck Drivers	8	0	36	18	0	0	(53)	8
Fiber	Boring Machine Operators	9	1	40	20	0	0	(60)	10
Fiber	Operating Engineers (Heavy Equipment)	33	9	10	10	0	0	(24)	38
Fiber	Carpenters	6	0	5	3	0	0	(8)	6
Fiber	Tower/Antenna Foremen	9	1	0	0	0	0	0	10
Fiber	Pole/Anchor Foremen	5	1	22	11	0	0	(33)	6
Fiber	First Line Supervisors of Installer/Repairers	21	3	20	60	0	0	(81)	23
Fiber	First Line Supervisors of Trades	22	0	0	0	0	0	0	22
Fiber	Project Management Specialists	62	16	50	30	0	0	(90)	68
Fiber	Construction Managers	43	6	50	20	0	0	(70)	49
Fiber	Network Construction Subtotal	303	47	611	361	0	0	(986)	335
Fiber	FIBER SPLICING								
Fiber	Fiber Line Installers/Repairers	77	30	200	600	100	0	(923)	85
Fiber	Splicer Technicians	16	2	42	125	21	0	(187)	18
Fiber	<i>Fiber Optic Technicians</i>	25	10	100	250	45	0	(403)	28
Fiber	Fiber Splicing Subtotal	118	42	342	975	166	0	(1,512)	130
Fiber	CUSTOMER INSTALLS								
Fiber	Premise Installation Technicians	201	56	0	50	50	0	(134)	223
Fiber	Customer Support Reps	257	0	0	0	50	50	(75)	282
Fiber	Customer Install Subtotal	458	56	0	50	100	50	(209)	505
Fiber	OPTICAL NETWORK INSTALLS								
Fiber	<i>Fiber Optic Technician</i>	30	4	40	100	15	(149)	(5)	35
Fiber	Fiber Network Install Subtotal	30	4	40	100	15	(149)	(5)	35
Fiber	FIELD MAINTENANCE								
Fiber	Maintenance Technicians	93	26	10	10	20	20	0	179
Fiber	Field Maintenance Subtotal	93	26	10	10	20	20	0	179
Cross Technology	NETWORK PLANNING								
Cross Technology	Network Planners	31	3	4	1	0	0	0	39
Cross Technology	Network Designers	165	20	15	5	0	(30)	(6)	169
Cross Technology	Electrical Engineers	6	1	1	1	0	(2)	0	7
Cross Technology	Project Managers	49	5	20	5	0	(25)	(1)	53
Cross Technology	Civil Engineering Technicians	1	0	3	2	0	(5)	0	1
Cross Technology	Estimators	25	7	5	0	0	(5)	(1)	31
Cross Technology	Network Planning Subtotal	277	36	48	14	0	(67)	(8)	300
Cross Technology	PERMITS								
Cross Technology	Compliance Officers	13	0	20	20	0	0	(40)	13
Cross Technology	Permitting Subtotal	13	0	20	20	0	0	(40)	13
Cross Technology	SURVEYING								
Cross Technology	Outside Plant Engineers	7	1	30	20	0	0	(50)	8
Cross Technology	Pole Surveyors	0	0	20	20	20	0	(60)	0
Cross Technology	Land Surveyors	7	1	20	20	20	0	(60)	8
Cross Technology	Surveying Subtotal	14	2	70	60	40	0	(170)	16
Cross Technology	SAFETY								
Cross Technology	Safety Officers	10	4	4	5	0	(9)	0	14
Cross Technology	Occupational S&H Specialists	5	1	1	1	0	(2)	0	6
Cross Technology	Safety Subtotal	15	5	5	6	0	(11)	0	20
Cross Technology	PROCUREMENT								
Cross Technology	Procurement Lead/Clerks	78	11	20	20	0	0	(59)	70
Cross Technology	Procurement Subtotal	78	11	20	20	0	0	(59)	70
Wireless	WIRELESS NETWORK INSTALLS								
Wireless	Electricians	0	0	0	0	0	0	0	0
Wireless	<i>Wireless Technicians</i>	42	11	0	0	0	0	0	53
Wireless	Antennae Installers	0	0	0	0	0	0	0	0
Wireless	Wireless Network Install Subtotal	42	11	0	0	0	0	0	53
Wireless	TOWER CONSTRUCTION								
Wireless	Tower Climbers (Eqpt Installer)	4	0	0	0	0	0	0	4
Wireless	<i>Wireless Technicians</i>	53	6	0	0	0	0	0	59
Wireless	Tower Technicians (Eqpt Installer)	33	7	0	0	0	(3)	0	37
Wireless	Tower Construction Subtotal	90	13	0	0	0	(3)	0	100
	TOTAL	1,531	253	1,165	1,615	341	(160)	(2,989)	1,756

ALASKA APPRENTICESHIPS

| August 2023



Prepared for the Alaska Workforce Investment Board

**Alaska Department of Labor
and Workforce Development**

RESEARCH AND ANALYSIS SECTION

Introduction

About this report

Apprenticeships have a long history in the state, and in 2021, Alaska was one of 15 states to receive federal grant funding to expand apprenticeships into new occupations and make them more accessible to historically underrepresented races, ethnicities, genders, and people with disabilities.

This report is a first look at the numbers so far, including several years of baseline data from which progress can be measured. In addition to the nine basic questions and answers that follow, significantly more detail about Alaska apprentices is available in the appendix.

How apprenticeships work

Apprentices work under the guidance of experts in a field, gradually accumulating knowledge and competency and earning wages as they learn. This approach differs from the tuition model of colleges and universities, where students pay to learn a cer-

tain curriculum in mostly academic settings.

Apprenticeships require a significant investment by employers or unions that take on the role of “sponsors.” (See the appendix for a complete list of Alaska sponsors.) Apprenticeship program sponsors determine the minimum qualifications an apprentice must meet to perform the essential functions of the job. There are often additional requirements such as aptitude tests, interviews, and academic courses. Sponsors provide experienced mentors who oversee on-the-job learning until the required competencies are met.

From the first day, apprentices receive a paycheck with regular increases as their competency grows. Apprenticeships typically take from one to six years and include an educational component that sometimes qualifies as college credit.

An apprenticeship is “registered” when it meets the requirements of the U.S. Department of Labor, which has been overseeing apprenticeship programs for more than 75 years. Completion of a registered apprenticeship is a nationally recognized credential.

Are more people beginning and completing apprenticeships?

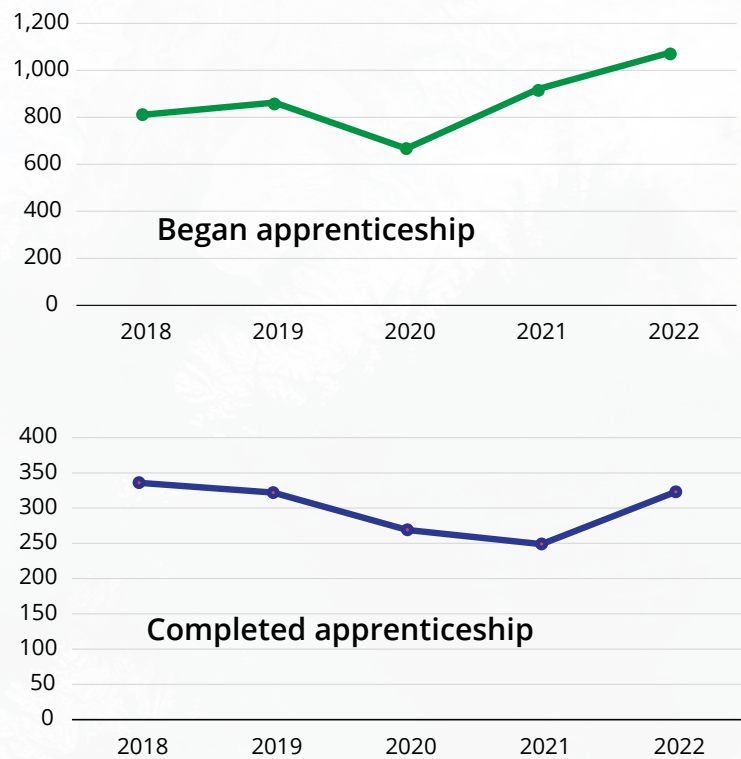
Yes, the number of people who began an apprenticeship rose from 804 in 2018 to 1,069 in 2022.

The number of new apprentices dipped noticeably in 2020 with the pandemic, to 660, but the 2022 count was up 12 percent from 2021 and 8 percent from 2018.

The number of people who completed an apprenticeship jumped from 249 in 2021 to 323 in 2022, although that number is below the 336 who completed in 2018.

The pandemic likely affected 2022 completions and it will take a few years for the growth in new apprentices to show up in increased completions.

Signups and completers, 2018-22



What percentage of those who start an apprenticeship complete it?

About 30 percent of all the people who begin an apprenticeship in Alaska finish it. The percentages vary by type of apprenticeship but have not changed much over the years this report includes.

That percentage may seem low, but keep in mind that the 70 percent who didn't complete their apprenticeship still earned wages before they quit or failed to meet the standards required to continue. In some ways, the people who didn't complete their apprenticeship are like the large number of people in the state and country who attended college but didn't earn a degree. An important distinction, though, is that the apprenticeship noncompleters did not have to pay tuition or incur debt.

Whether in an apprenticeship program or as a college student, people often find value in discovering the types of work they *don't* want as a career.

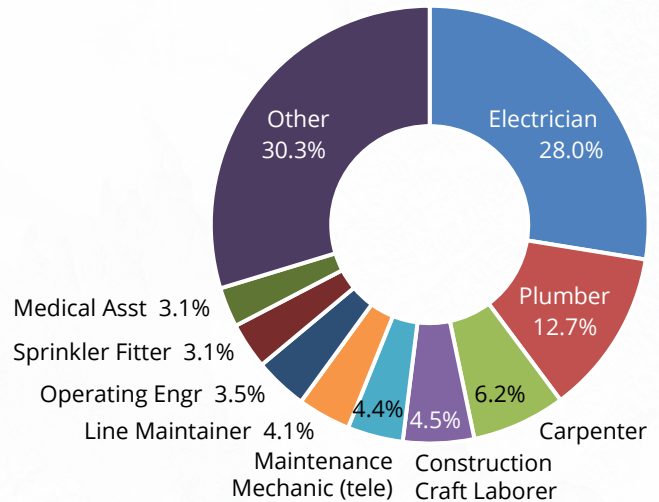
What types of work do apprentices train for?

The 2022 count of apprentices shows the largest percentage working to become electricians, followed by plumbers and then carpenters.

The percentages shown in this chart for 2022 have not changed much over the 2018 to 2022 period.

NOTE: The main occupations making up the "other" category are Maintenance Mechanic (construction; petrol), Structural Steel Worker, Residential Wireman, Sheet Metal Worker, Cement Mason, Medical Coder, and Painter

Alaska apprentices' target occupations in 2022



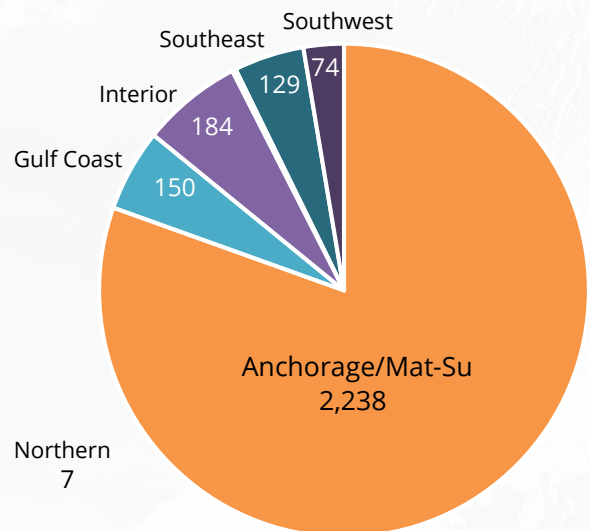
Where in Alaska do apprentices train?

In 2022, 85 percent of apprentices were in Anchorage or the Matanuska-Susitna Borough. That part of the state has about 54 percent of Alaska's population, so a noticeably disproportionate percentage of the apprenticeships are there.

The Interior and Southeast regions have the next-largest shares of apprentices at 5.4 and 5.3 percent, respectively.

The remaining three regions (Gulf Coast, Southwest, and Northern) all have at least some apprentices, although the Northern region had just two in 2022.

2022 apprentices by area

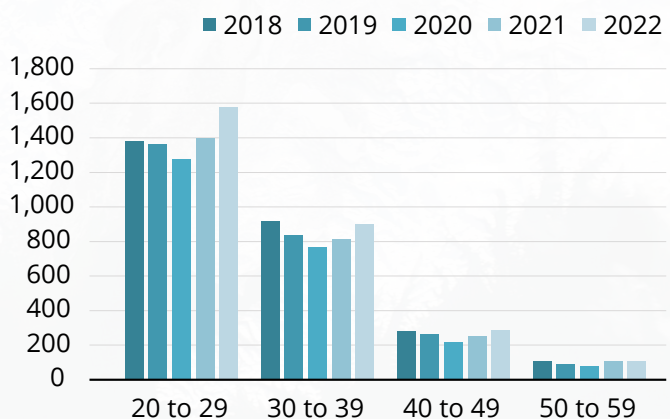


How old are Alaska's apprentices?

The largest percentage of apprentices are in their 20s and the next-largest are in their 30s. A relatively small number start earlier — about 2 percent are aged 16 to 19.

About 6 percent of apprentices are in their 40s and 2 percent are in their 50s. About half a percent are 60 or older.

Number of apprentices by age group



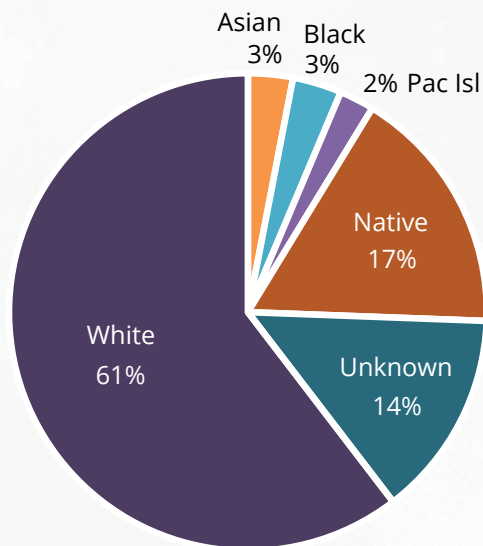
What is the racial makeup of Alaska apprentices?

In 2022, about 61 percent of apprentices were White, although no racial information was available for 14 percent of apprentices.

Alaska Natives made up 17 percent of apprentices, a slight underrepresentation (about 19 percent of the state's population is Alaska Native).

Five percent of apprentices were Black (similar to statewide population), 4 percent were Asian (underrepresented relative to statewide population), and 3 percent were Hawaiian-Pacific Islander (slightly overrepresented).

2022 Alaska apprentices by race and ethnicity



Note: Hispanics can be of any race.

Are the numbers of male and female apprentices similar?

Disability is a new category. In 2021, 14 apprentices signed up with a disability. That jumped to 24 in 2022.

Far more men than women register for apprenticeships. In 2022, 82 percent of all apprentices were men, a percentage that hadn't changed much over the 2018-2022 period.

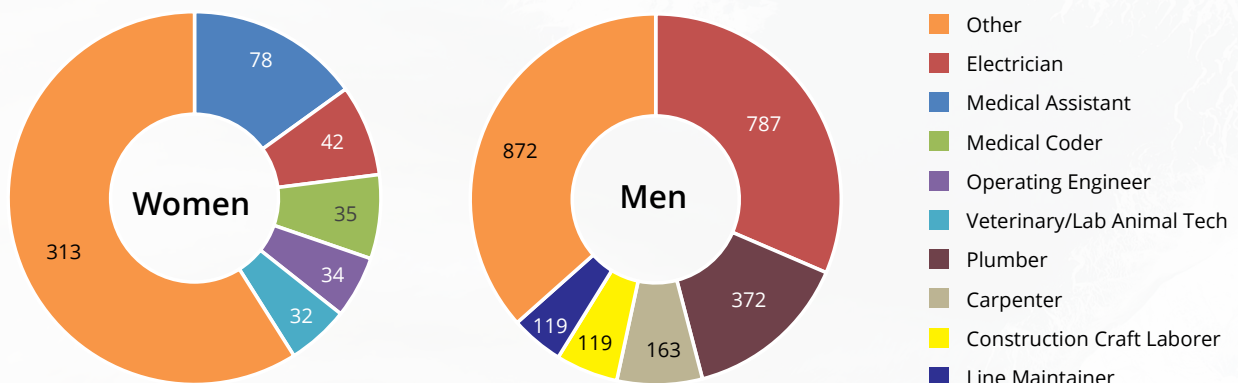
Do men and women choose different types of apprenticeships?

Yes, distinctly. As shown here, the top three apprenticeships for men are electrician, plumber, and carpenter. For women, the top three are medical assistant, electrician, and medical coder.

en, only electrician overlaps. Many other occupations are grouped into the "other" slice shown below. See the footnote for the biggest occupations in that category and the appendix for more detail about the types of apprenticeships men and women choose.

In the top five lists for men and wom-

2022 apprenticeship types by gender



Note: For women, the "other" category is primarily Nurse Assistant, Carpenter, Community Health Worker, Construction Craft Laborer, Medical Secretary, Dental Assistant, and Pharmacist Technician. See the appendix for a full list.

Note: For men, the "other" category is primarily Maintenance Mechanic (both tele and construction/petrol), Sprinkler Fitter, Operating Engineer, Structural Steel Worker, Residential Wireman, and Cement Mason. See the appendix for a full list.

Do those who complete an apprenticeship go to work in Alaska?

Yes, a high percentage of people who complete an apprenticeship then go to work in Alaska.

Among those who completed an apprenticeship in 2021, 96 percent worked for Alaska employers in the next year with an average wage of \$79,000 — well above the overall average wage of \$62,000.



Apprenticeships

APPENDIX

Apprenticeship program sponsors and target occupations, 2022

Program sponsor	Target occupation	Number of apprentices*
Associated Builders and Contractors of Alaska, Inc.	Electrician (Alternate Title: Interior Electrician)	295
Alaska Joint Electrical Apprenticeship and Training Trust	Electrician (Alternate Title: Interior Electrician)	228
Alaska Carpenters Training Trust	Carpenter	178
Alaska Joint Electrical Apprenticeship and Training Trust	Maintenance Mechanic, Tele	134
Alaska Laborers Joint Apprenticeship Training Committee	Construction Craft Laborer	132
Alaska Operating Engineers/Employers Training Trust	Operating Engineer	103
Alaska Joint Electrical Apprenticeship and Training Trust	Line Maintainer (Alternate Title: High Voltage Electrician)	99
Associated Builders and Contractors of Alaska, Inc.	Plumber	87
Alaska Primary Care Association	Medical Assistant	70
Alaska Operating Engineers/Employers Training Trust	Maint Mechanic (Const; Petrol))	57
Fairbanks Area Plumbers & Pipefitters JATC	Sprinkler Fitter (Existing Title: Pipe Fitter)	56
Alaska Ironworkers Joint Apprenticeship Training Committee	Structural Steel Worker	53
Anchorage Alaska Area Pipe Trades Local 367 JATC	Plumber	44
Alaska Trowel Trades JATC	Cement Mason	40
Vannoy Electric	Electrician (Alternate Title: Interior Electrician)	38
State of Alaska Division of Alaska Pioneer Homes	Nurse Assistant	34
Alaska Carpenters Training Trust	Carpenter, Piledriver	32
Alaska Primary Care Association	Community Health Worker	32
New Hope Apprenticeship Training	Electrician (Alternate Title: Interior Electrician)	32
Alaska Southcentral / Southeastern Sheet Metal Workers JATC	Heating, Ventilation, Air Conditioning	31
Anchorage Alaska Area Pipe Trades Local 367 JATC	Sprinkler Fitter (Existing Title: Pipe Fitter)	30
Alaska Primary Care Association	Medical Secretary	27
International Union of Painters & Allied Trades Local 1959 JATC	Painter (Const)	26
Teck Alaska, Incorporated	Plant Operator	23
Alaska Primary Care Association	Medical Coder (Alternate Title: Patient Administration Specialist)	22
Alaska Primary Care Association	Pharmacist Assistant (Alternate Title: Pharmacy Technician)	22
Alaska Clearwater Mechanical, LLC	Plumber	20
Alaska Southcentral / Southeastern Sheet Metal Workers JATC	Sheet Metal Worker	20
Signet Ring Vocational Center	Truck Driver, Heavy	19
Juneau Plumbers Joint Apprenticeship Training Committee	Plumber	17
Premier Electric, LLC	Electrician (Alternate Title: Interior Electrician)	16
Alaska Joint Electrical Apprenticeship and Training Trust	Unknown or unavailable	15
Anchorage Plumbing & Heating, Inc.	Plumber	15
Associated Builders and Contractors of Alaska, Inc.	Sheet Metal Worker	15
Alaska Primary Care Association	Health Information Technology Specialist	13
Alaska Village Electric Cooperative, Inc.	Line Maintainer (Alternate Title: High Voltage Electrician)	13
Happy Tails, Inc. dba Midnight Sun Animal Hospital & Emergency Care	Veterinary/Lab Animal Tech (Alternate Title: Animal Care Specialist)	13
Teck Alaska, Incorporated	Millwright	13
Akiak School	Teacher Aide I	12
Alaska Primary Care Association	Dental Assistant (Alternate Title: Dental Specialist)	12
International Union of Painters & Allied Trades Local 1959 JATC	Glazier	12
Alaska Joint Electrical Apprenticeship and Training Trust	Tree Trimmer (Line Clear)	11
Legacy Builders Painters Academy	Painter (Const)	11
Signet Ring Vocational Center	Peer Specialist	11
Alaska Teamster - Employer Service Training Trust	Construction Driver	10
Foundation Health Partners	Central Sterile Processing Technician	10
New Hope Apprenticeship Training	Residential Wireman	10
Supreme Electric LLC	Electrician (Alternate Title: Interior Electrician)	10
907 Electric Inc.	Electrician (Alternate Title: Interior Electrician)	9
Alaska Department of Corrections	Cook (Any Ind) (Alternate Title: Nutrition Care Specialist)	9
Circle Plumbing and Heating	Plumber	9
Extreme Heating & Air, Inc.	Plumber	9
Fairbanks Area Plumbers & Pipefitters JATC	Plumber	9
Foundation Health Partners	Surgical Technologist	9
Teck Alaska, Incorporated	Maint Mechanic (Const; Petrol)	9
Tesla Electric, LLC.	Electrician (Alternate Title: Interior Electrician)	9
Alaska Department of Corrections	Maintenance Repairer, Build	8
Alaska Department of Corrections	Material Coordinator	8
Alaska Operating Engineers/Employers Training Trust	Lubrication Svc Material Disposal Tech	8
Alaska Primary Care Association	Direct Support Specialist	8
Valley Mechanical Contracting, Inc.	Plumber	8
Western Power Engineering	Electrician (Alternate Title: Interior Electrician)	8
Associated Builders and Contractors of Alaska, Inc.	Carpenter	7
Beckley Mechanical Company	Plumber	7
Fairbanks Area Sheet Metal Workers JATC	Sheet Metal Worker	7
Tier 1 Veterinary Medical Center	Veterinary/Lab Animal Tech (Alternate Title: Animal Care Specialist)	7
Trident Seafoods Corporation	Electrician (Alternate Title: Interior Electrician)	7

Apprenticeship program sponsors and target occs, 2022 (cont.)

Program sponsor	Target occupation	Number of apprentices*
Alaska Power & Telephone	Line Maintainer (Alternate Title: High Voltage Electrician)	6
Anchorage Alaska Area Pipe Trades Local 367 JATC	Heating, Ventilation, Air Conditioning	6
Associated Builders and Contractors of Alaska, Inc.	Sprinkler Fitter (Existing Title: Pipe Fitter)	6
DRS Electric, LLC	Electrician (Alternate Title: Interior Electrician)	6
G2 Construction, Inc.	Electrician (Alternate Title: Interior Electrician)	6
Intel Electric	Electrician (Alternate Title: Interior Electrician)	6
M & J Plumbing & Heating, Inc.	Plumber	6
Moore Heating & Air Conditioning	Plumber	6
Pitcher Electric, Inc.	Electrician (Alternate Title: Interior Electrician)	6
Renewable Energy Systems	Electrician (Alternate Title: Interior Electrician)	6
TEC PRO LTD	Electrician (Alternate Title: Interior Electrician)	6
University of Alaska Anc, Center for Strategic Partnerships and Research	Diesel Mechanic	6
Alaska Carpenters Training Trust	Scaffold Erector (Existing Title: Carpenter, Rough)	5
Alaska Department of Corrections	Baker (Bake Produce)	5
Alaska Heat & Frost Insulators & Allied Workers JATC	Insulator (Thermal) (Existing Title: Insulation Worker)	5
Alaska Ironworkers Joint Apprenticeship Training Committee	Structural Metal Fabricator And Fitter	5
Alaska Native Tribal Health Consortium	Counselor	5
All-Star Plumbing & Heating, LLC	Plumber	5
Alpine Electric	Electrician (Alternate Title: Interior Electrician)	5
Always On Call Mountain Mechanical	Plumber	5
Capstone Electric, LLC	Electrician (Alternate Title: Interior Electrician)	5
Daleco Plumbing	Plumber	5
Ayers Plumbing & Heating, LLC	Plumber	5
Encore Electric, LLC	Electrician (Alternate Title: Interior Electrician)	5
Integrity Electric, Inc.	Electrician (Alternate Title: Interior Electrician)	5
Mat-Su Mechanical, Inc.	Plumber	5
Partusch Plumbing & Heating	Plumber	5
Prism Design & Construction	Electrician (Alternate Title: Interior Electrician)	5
Raven Electric, Inc.	Electrician (Alternate Title: Interior Electrician)	5
Sitka Electric Company	Electrician (Alternate Title: Interior Electrician)	5
SouthEast Regional Health Consortium	Medical Assistant	5
Warbelow's Air Ventures, Inc.	Airframe & Power Plant Mechanic	5
Alaska Vocational Technical Center	Network Support Technician	4
Associated Builders and Contractors of Alaska, Inc.	Unknown or unavailable	4
Boiler Man Plumbing & Heating, Inc.	Plumber	4
CCI Industrial Services - Bristol Bay Industrial	Electrician (Alternate Title: Interior Electrician)	4
Central Mechanical, Incorporated	Plumber	4
Ear Nose & Throat Clinic, Inc.	Medical Coder (Alternate Title: Patient Administration Specialist)	4
Elec-Tek	Electrician (Alternate Title: Interior Electrician)	4
Frontier Electrical Services, LLC	Electrician (Alternate Title: Interior Electrician)	4
Hard Rock Plumbing and Heating, LLC	Plumber	4
Hecla Greens Creek Mining Company	Electrician (Alternate Title: Interior Electrician)	4
Holland America Princess Alaska - Yukon	Diesel Mechanic	4
Hunter Mechanical International Corporation	Plumber	4
Knikatu Inc. dba Last Frontier Electric, LLC	Residential Wireman	4
Miranda Electric, Incorporated	Electrician (Alternate Title: Interior Electrician)	4
North Lit Electric, LLC	Residential Wireman	4
Northern Solutions LLC	Machinist (Alternate Title: Precision Machinist)	4
Safe-T-Way Electric, Incorporated	Electrician (Alternate Title: Interior Electrician)	4
Scott's Heating & Plumbing Services, Inc.	Plumber	4
Solid Ground Electric, LLC	Residential Wireman	4
Teck Alaska, Incorporated	Electrician, Maintenance	4
Yukon Kuskokwim Health Corporation	Electrician (Alternate Title: Interior Electrician)	4

*An apprentice in 2022 includes anyone who engaged in apprenticeship activity that year, whether they started, finished, canceled, or were ongoing.

Note: Includes only sponsors with at least four apprenticeships in 2022

Target occupations for all apprentices enrolled in 2022

Target occupation	Number of apprentices*
Electrician (Alternate Title: Interior Electrician)	845
Plumber	384
Carpenter	188
Construction Craft Laborer	136
Maintenance Mechanic, Tele	134
Line Maintainer (Alternate Title: High Voltage Electrician)	123
Operating Engineer	104
Medical Assistant	93
Sprinkler Fitter (Existing Title: Pipe Fitter)	92
Maint Mechanic (Const; Petrol)	66
Structural Steel Worker	53
Sheet Metal Worker	44
Residential Wireman	43
Cement Mason	40
Heating, Ventilation, Air Conditioning	40
Painter (Const)	40
Unknown/Unavailable	39
Medical Coder (Alternate Title: Patient Administration Specialist)	39
Veterinary/Lab Animal Tech (Alternate Title: Animal Care Specialist)	38
Nurse Assistant	34
Carpenter, Piledriver	32
Community Health Worker	32
Medical Secretary	30
Dental Assistant (Alternate Title: Dental Specialist)	24
Pharmacist Assistant (Alternate Title: Pharmacy Technician)	24
Plant Operator	23
Truck Driver, Heavy	21
Millwright	17
Surgical Technologist	15
Teacher Aide I	14
Health Information Technology Specialist	13
Peer Specialist	13
Glazier	12
Construction Driver	11
Optician Dispensing	11
Tree Trimmer (Line Clear)	11
Central Sterile Processing Technician	10
Diesel Mechanic	10
Cook (Any Ind) (Alternate Title: Nutrition Care Specialist)	9
Direct Support Specialist	8
Insulator (Thermal) (Existing Title: Insulation Worker)	8
Lubrication Svc Material Disposal Tech	8
Maintenance Repairer, Build	8
Material Coordinator	8
Machinist (Alternate Title: Precision Machinist)	7
Airframe & Power Plant Mechanic	6
Baker (Bake Produce)	5
Counselor	5
Laboratory Assistant	5
Scaffold Erector (Existing Title: Carpenter, Rough)	5
Structural Metal Fabricator And Fitter	5
Cosmetologist/Hair Stylist	4
Electrician, Maintenance	4
Network Support Technician	4
Barber	3
Line Erector (Power Line Distribution Erector)	3
Orthotics Technician	2
Welder-Fitter	2
Automotive Mechanic (Existing Title: Automobile Mechanic)	1
Electric Meter Repairer	1
Floor Layer	1
Information Assurance Specialist	1
Power Plant Operator	1
Tile Finisher	1

Apprentices and target occupations by gender, 2022

WOMEN

Target occupation	2022 apprentices*
Medical Assistant	78
Electrician	42
Medical Coder	35
Veterinary/Lab Animal Tech	34
Nurse Assistant	32
Community Health Worker	28
Operating Engineer	28
Carpenter	24
Medical Secretary	24
Construction Craft Laborer	22
Dental Assistant	20
Pharmacist Assistant	20
Maintenance Mechanic, Tele	15
Teacher Aide I	12
Surgical Technologist	11
Health Info Technology Specialist	10
Optician Dispensing	8
Peer Specialist	7
Sprinkler Fitter (Existing Title: Pipe Fitter)	7
Truck Driver, Heavy	7
Central Sterile Processing Technician	6
Direct Support Specialist	6
Plumber	5
Carpenter, Piledriver	4
Counselor	4
Line Maintainer	4
Plant Operator	4
Cosmetologist/Hair Stylist	3
Electrician, Maintenance	3
Laboratory Assistant	3
Material Coordinator	3
Painter (Const)	3
Sheet Metal Worker	3
Structural Steel Worker	3
Construction Driver	2
Maintenance Repairer, Build	2
Millwright	2
Baker (Bake Produce)	1
Barber	1
Cement Mason	1
Cook (Any Ind)	1
Insulator (Thermal)	1
Lubrication Svc Material Disposal Tech	1
Maint Mechanic (Const; Petrol)	1
Network Support Technician	1
Residential Wireman	1
Structural Metal Fabricator And Fitter	1

MEN

Target occupation	2022 apprentices*
Electrician	787
Plumber	372
Carpenter	163
Line Maintainer	119
Maintenance Mechanic, Tele	119
Construction Craft Laborer	113
Sprinkler Fitter (Existing Title: Pipe Fitter)	85
Operating Engineer	76
Maint Mechanic (Const; Petrol)	65
Structural Steel Worker	49
Residential Wireman	42
Cement Mason	39
Heating, Ventilation, Air Conditioning	39
Sheet Metal Worker	39
Painter (Const)	37
Unknown/Unavailable	35
Carpenter, Piledriver	28
Plant Operator	19
Millwright	15
Medical Assistant	13
Truck Driver, Heavy	13
Glazier	12
Tree Trimmer (Line Clear)	11
Diesel Mechanic	10
Construction Driver	8
Cook (Any Ind)	8
Insulator (Thermal)	7
Lubrication Svc Material Disposal Tech	7
Machinist	7
Airframe & Power Plant Mechanic	6
Peer Specialist	6
Maintenance Repairer, Build	5
Material Coordinator	5
Scaffold Erector	5
Baker (Bake Produce)	4
Central Sterile Processing Technician	4
Medical Secretary	4
Pharmacist Assistant	4
Structural Metal Fabricator And Fitter	4
Surgical Technologist	4
Community Health Worker	3
Dental Assistant	3
Health Info Technology Specialist	3
Line Erector	3
Medical Coder	3
Network Support Technician	3
Optician Dispensing	3
Veterinary/Lab Animal Tech	3
Direct Support Specialist	2
Laboratory Assistant	2
Nurse Assistant	2
Orthotics Technician	2
Teacher Aide I	2
Welder-Fitter	2
Automotive Mechanic	1
Electric Meter Repairer	1
Electrician, Maintenance	1
Floor Layer	1
Hair Stylist (Cosmetologist)	1
Information Assurance Specialist	1
Power Plant Operator	1
Tile Finisher	1

*An apprentice in 2022 includes anyone who engaged in apprenticeship activity that year, whether they started, finished, canceled, or were ongoing.

Apprentices and target occupations by race, 2022

Target occupation	APPRENTICES* BY RACE			
	Asian/Pac Islander	Black	Alaska Native	White
Airframe & Power Plant Mechanic	0	0	0	6
Automotive Mechanic (Existing Title: Automobile Mechanic)	0	0	0	1
Baker (Bake Produce)	1	1	0	3
Barber	1	0	0	0
Carpenter	16	11	27	122
Carpenter, Piledriver	0	2	1	29
Cement Mason	14	1	5	20
Central Sterile Processing Technician	2	1	0	7
Community Health Worker	7	9	0	13
Construction Craft Laborer	9	16	31	75
Construction Driver	0	1	0	9
Cook (Any Ind) (Alternate Title: Nutrition Care Specialist)	0	7	0	1
Cosmetologist/Hair Stylist	2	0	0	2
Counselor	0	0	2	2
Dental Assistant (Alternate Title: Dental Specialist)	4	0	8	10
Diesel Mechanic	0	0	1	5
Direct Support Specialist	2	1	0	5
Electrician (Alternate Title: Interior Electrician)	28	31	86	618
Electrician, Maintenance	0	0	4	0
Floor Layer	0	0	0	1
Glazier	0	0	2	9
Health Information Technology Specialist	2	0	1	9
Heating, Ventilation, Air Conditioning	1	0	1	32
Information Assurance Specialist	0	0	0	1
Insulator (Thermal) (Existing Title: Insulation Worker)	2	0	1	5
Laboratory Assistant	1	0	1	0
Line Erector (Power Line Distribution Erector)	1	0	0	2
Line Maintainer (Alternate Title: High Voltage Electrician)	6	0	15	100
Lubrication Svc Material Disposal Tech	0	0	3	5
Machinist (Alternate Title: Precision Machinist)	0	0	1	5
Maint Mechanic (Const; Petrol)	1	1	16	47
Maintenance Mechanic, Tele	8	2	15	104
Maintenance Repairer, Build	0	0	2	5
Material Coordinator	1	2	2	2
Medical Assistant	11	5	14	53
Medical Coder (Alternate Title: Patient Admin Specialist)	6	2	6	19
Medical Secretary	7	2	6	14
Millwright	0	0	14	2
Network Support Technician	0	0	4	0
Nurse Assistant	20	0	0	14
Operating Engineer	4	2	22	75
Optician Dispensing	2	0	1	6
Orthotics Technician	0	0	0	2
Painter (Const)	0	10	2	23
Peer Specialist	3	4	1	0
Pharmacist Assistant (Alternate Title: Pharmacy Technician)	2	0	12	9
Plant Operator	0	0	21	1
Plumber	7	11	38	257
Power Plant Operator	0	0	1	0
Residential Wireman	0	0	6	33
Scaffold Erector (Existing Title: Carpenter, Rough)	1	0	1	3
Sheet Metal Worker	3	3	4	29
Sprinkler Fitter (Existing Title: Pipe Fitter)	1	0	12	74
Structural Metal Fabricator And Fitter	0	0	0	5
Structural Steel Worker	7	5	5	18
Surgical Technologist	0	1	0	11
Teacher Aide I	0	0	13	1
Tile Finisher	0	0	0	1
Tree Trimmer (Line Clear)	0	1	2	8
Truck Driver, Heavy	4	7	0	6
Veterinary/Lab Animal Tech	0	0	2	26
Welder-Fitter	1	0	1	0

*An apprentice in 2022 includes anyone who engaged in apprenticeship activity that year, whether they started, finished, canceled, or were ongoing.

Apprenticeship outcomes by race for those who completed in 2021

WHITE

Target occupation	Completers	Employed within 1 year	Avg wage within 1 yr
Electrician (Alternate Title: Interior Electrician)	212	85.8%	\$87,475
Plumber	54	96.3%	\$81,924
Sprinkler Fitter (Existing Title: Pipe Fitter)	52	92.3%	\$74,525
Operating Engineer	51	96.1%	\$86,130
Construction Craft Laborer	47	93.6%	\$74,924
Line Maintainer (Alternate Title: High Voltage Electrician)	43	88.4%	\$145,955
Carpenter	39	92.3%	\$79,985
Maintenance Mechanic, Tele	38	94.7%	\$99,140
Medical Assistant	24	91.7%	\$42,969
Counselor	19	73.7%	\$52,702
Dental Assistant (Alternate Title: Dental Specialist)	16	68.8%	\$39,563
Carpenter, Piledriver	14	100%	\$102,950
Sheet Metal Worker	13	92.3%	\$82,892
Nurse Assistant	12	75.0%	\$52,904
Structural Steel Worker	12	91.7%	\$74,832
Tree Trimmer (Line Clear)	12	91.7%	\$85,482
Medical Coder (Alternate Title: Patient Administration Specialist)	11	100%	\$48,174
Central Sterile Processing Technician	10	100.0%	\$49,362
Medical Secretary	8	87.5%	\$40,133
Maint Mechanic	7	85.7%	\$101,437
Construction Driver	6	100%	\$97,643
Maintenance Repairer, Build	6	83.3%	\$24,338
Phlebotomist	6	66.7%	Suppressed
Veterinary/Lab Animal Tech (Alternate Title: Animal Care Specialist)	6	100%	\$44,744
Cement Mason	5	100%	\$71,575
Glazier	5	100%	\$68,402
Residential Wireman	5	80.0%	Suppressed
Surgical Technologist	5	60.0%	Suppressed
Cook (Any Ind) (Alternate Title: Nutrition Care Specialist)	4	50.0%	Suppressed
Health Information Technology Specialist	4	50.0%	Suppressed
Heating, Ventilation, Air Conditioning	4	75.0%	Suppressed
Scaffold Erector (Existing Title: Carpenter, Rough)	4	100%	Suppressed
Baker (Bake Produce)	3	0%	\$0
Community Health Worker	3	66.7%	Suppressed
Pharmacist Assistant (Alternate Title: Pharmacy Technician)	3	100%	Suppressed
Surveyor Assistant Instrument	3	100%	Suppressed
Airframe & Power Plant Mechanic	2	100%	Suppressed
Insulator (Thermal) (Existing Title: Insulation Worker)	2	50.0%	Suppressed
Laboratory Assistant	2	100%	Suppressed
Material Coordinator	2	0%	\$0
Able Seaman	1	100%	Suppressed
Cosmetologist	1	100%	Suppressed
Line Erector (Power Line Distribution Erector)	1	100%	Suppressed
Magnetic Resonance Imaging Tech	1	100%	Suppressed
Plant Operator	1	100%	Suppressed

NOTE: Very small numbers must be suppressed to protect confidentiality.

Apprenticeship outcomes by race for those who completed in 2021

ALASKA NATIVE

Target occupation	Completers	Employed within 1 year	Avg wage within 1 yr
Electrician (Alternate Title: Interior Electrician)	24	79.2%	\$74,273
Medical Secretary	17	94.1%	\$46,086
Construction Craft Laborer	15	100%	\$79,496
Operating Engineer (Alternate Title: Heavy Construction Equipment Mechanic)	14	92.9%	\$97,081
Medical Coder (Alternate Title: Patient Administration Specialist)	11	100%	\$61,264
Sprinkler Fitter (Existing Title: Pipe Fitter)	9	100%	\$97,224
Medical Assistant	8	75.0%	\$43,279
Carpenter	7	100%	\$74,430
Millwright	6	100%	\$156,072
Community Health Worker	4	100%	Suppressed
Line Maintainer (Alternate Title: High Voltage Electrician)	4	50.0%	Suppressed
Maint Mechanic (Const; Petrol) (Alternate Title: Heavy-Wheel Vehicle Mechanic)	4	100%	Suppressed
Maintenance Mechanic, Tele	3	100%	Suppressed
Nurse Assistant	3	66.7%	Suppressed
Plumber	3	100%	Suppressed
Carpenter, Piledriver	2	100%	Suppressed
Insulator (Thermal) (Existing Title: Insulation Worker)	2	100%	Suppressed
Plant Operator	2	100%	Suppressed
Construction Driver	1	100%	Suppressed
Cook (Any Ind) (Alternate Title: Nutrition Care Specialist)	1	100%	Suppressed
Cosmetologist	1	100%	Suppressed
Counselor	1	100%	Suppressed
Dental Assistant (Alternate Title: Dental Specialist)	1	100%	Suppressed
Electrician, Maintenance	1	100%	Suppressed
Health Information Technology Specialist	1	100%	Suppressed
Information Assurance Specialist	1	100%	Suppressed
Maintenance Repairer, Build	1	100%	Suppressed
Phlebotomist	1	0%	\$0
Power Plant Operator	1	100%	Suppressed
Scaffold Erector (Existing Title: Carpenter, Rough)	1	100%	Suppressed
Sheet Metal Worker	1	100%	Suppressed
Structural Steel Worker (Alternate Titles: Ironworker Or Structural Ironworker)	1	100%	Suppressed
Surgical Technologist	1	100%	Suppressed
Welder, Combination	1	100%	Suppressed

ASIAN/PACIFIC ISLANDER

Target occupation	Completers	Employed within 1 year	Avg wage within 1 yr
Nurse Assistant	30	76.7%	\$60,837
Medical Secretary	9	77.8%	\$48,651
Electrician (Alternate Title: Interior Electrician)	8	87.5%	\$98,374
Carpenter	6	83.3%	\$71,721
Medical Coder (Alternate Title: Patient Administration Specialist)	6	83.3%	\$75,573
Construction Craft Laborer	3	100%	Suppressed
Operating Engineer	3	100%	Suppressed
Sprinkler Fitter (Existing Title: Pipe Fitter)	3	100%	Suppressed
Central Sterile Processing Technician	2	100%	Suppressed
Counselor	2	50.0%	Suppressed
Dental Assistant (Alternate Title: Dental Specialist)	2	100%	Suppressed
Medical Assistant	2	100%	Suppressed
Plumber	2	50.0%	Suppressed
Structural Steel Worker	2	100%	Suppressed
Community Health Worker	1	100%	Suppressed
Construction Driver	1	100%	Suppressed
Glazier	1	100%	Suppressed
Health Information Technology Specialist	1	100%	Suppressed
Line Maintainer (Alternate Title: High Voltage Electrician)	1	100%	Suppressed
Optician Dispensing	1	0%	\$0
Surveyor Assistant Instrument	1	100%	Suppressed
Truck Driver, Heavy	1	100%	Suppressed

Apprenticeship outcomes by race for those who completed in 2021

BLACK

Target occupation	Completers	Employed within 1 year	Avg wage within 1 yr
Construction Craft Laborer	7	100%	\$55,896
Electrician (Alternate Title: Interior Electrician)	5	80%	Suppressed
Material Coordinator	5	20%	Suppressed
Carpenter	3	100%	Suppressed
Operating Engineer	3	100%	Suppressed
Medical Assistant	2	100%	Suppressed
Sprinkler Fitter (Existing Title: Pipe Fitter)	2	100%	Suppressed
Baker (Bake Produce)	1	0%	\$0
Carpenter, Piledriver	1	100%	Suppressed
Community Health Worker	1	100%	Suppressed
Cook (Any Ind) (Alternate Title: Nutrition Care Specialist)	1	0%	\$0
Counselor	1	100%	Suppressed
Heating, Ventilation, Air Conditioning	1	100%	Suppressed
Nurse Assistant	1	100%	Suppressed
Scaffold Erector (Existing Title: Carpenter, Rough)	1	100%	Suppressed
Community Health Worker	1	100%	Suppressed
Construction Driver	1	100%	Suppressed
Glazier	1	100%	Suppressed
Health Information Technology Specialist	1	100%	Suppressed
Line Maintainer (Alternate Title: High Voltage Electrician)	1	100%	Suppressed
Optician Dispensing	1	0%	\$0
Surveyor Assistant Instrument	1	100%	Suppressed
Truck Driver, Heavy	1	100%	Suppressed

NOTE: Very small numbers must be suppressed to protect confidentiality.