Alaska Statewide Broadband Advisory Board – May 10, 2024 – 10:00am
Special Board Meeting

Alaska Department of Commerce, Community & Economic Development

This meeting will be virtual only.
Online Meeting Details: Join the meeting now
Meeting ID: 281 324 238 876; Passcode: zNKSDB
Call In: 907-202-7104; Phone Conference ID: 268 192 285#

AGENDA

I. Call to Order and Roll Call

II. Approval of Agenda

III. Declarations of Conflict of Interest

IV. Approval of Minutes from Prior Meetings (None)

V. Subcommittee Reports (None)

VI. Staff Reports (None)

VII. Requests to the Technical Working Group (None)

VIII. Unfinished Business (None)

IX. New Business

a. Approval of Alaska Broadband Workforce Development Plan

X. Public Comment

XI. Board Member Business from the Floor

XII. Next Meeting Date

a. Next Regularly Scheduled Meeting – June 17,2024

XIII. Adjournment

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

Department of Commerce, Community, and Economic Development
Alaska Broadband Office
April 19, 2024

Contents

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 Office[2] (ABO) estimates that more than 6,000 miles of fiber cable may be installed to connect 182 rural communities by the year 2030. Broadband expansion is expected to create at least 3,300 temporary, and 225 permanent[3], 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 on-line, shop, meet with health care providers, start a business, and work from home.

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* workforce[5], 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 presentations[6]. 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 2025[7]. These job estimates do not account for IIJA projects including broadband expansion or for the potential of $20 billion in state, federal, national defense, utility, oil and gas, mining, and private development projects.

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.

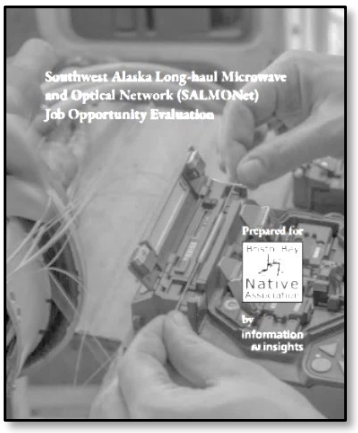
[6] ABWD_Outreach_Database_10.19.23, Appendix 2.

[7] DOLWD Press Release (alaska.gov)

[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

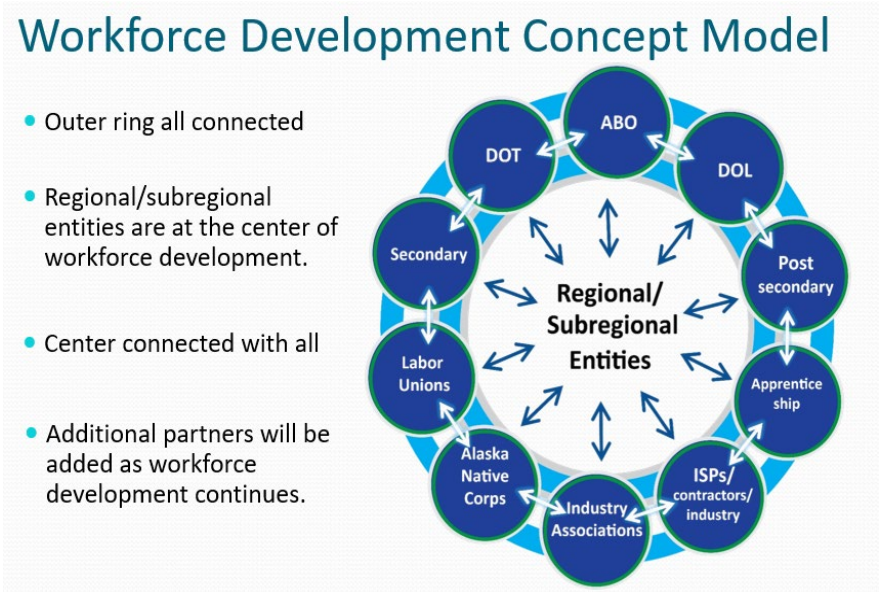
Commission; and several regional and subregional workforce planning efforts are underway in the Bering Straits for the Arctic Deep Sea Port Project, Interior region for a multitude of projects, and in the Southwest region.



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 Evaluation[10]. BBNC is also developing a workforce plan to build a regional workforce to support communities.

A New Industry Sector Workforce Development Plan Model

Every region 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.



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 vs. 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 complete projects on time and on budget, but simultaneously

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

build a regional *cross-industry* workforce with skills to meet a variety of other community and regional workforce needs.

Broadband Workforce Plan Vision, Mission, Goals, and Strategies[11]

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 telecommunication 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

1. Implement the Broadband Workforce Development Plan and build a sustainable, standards-based program, with a focus on public-private partnerships to produce a highly skilled and technically trained workforce that can meet industry labor supply challenges.
2. Build on the existing construction industry training and workforce efforts.
3. Increase career awareness and information about telecommunications occupations and employment.
4. Increase education and training programs that prepare students and adults for apprenticeship and entry-level employment in telecommunications occupations.
5. Put in place recruitment, training, and employment efforts focused on historically underrepresented groups.

A National and State Construction, Broadband, and Cross-Industry Workforce
Congress' investment of over $1.2 trillion in IIJA 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 today, 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.

[11] For details on strategies and action items, please see Appendix 3.

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

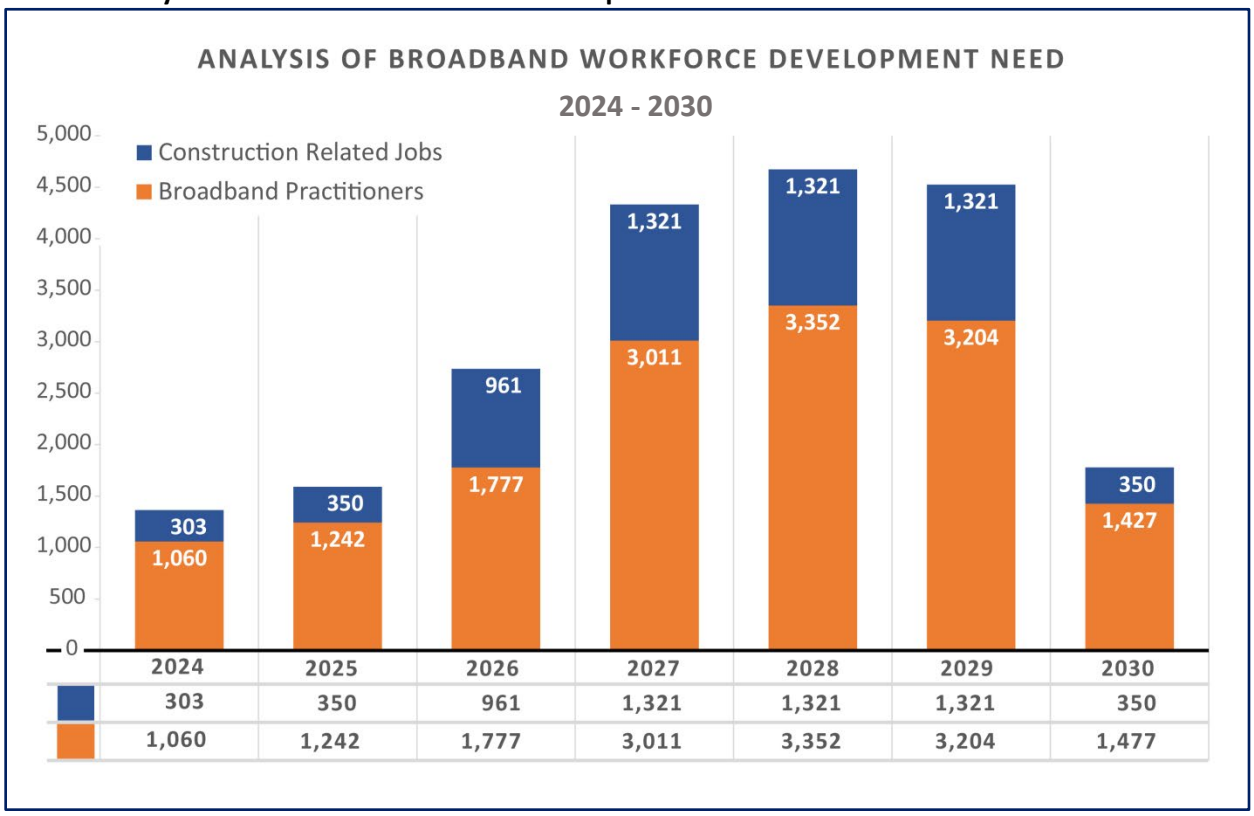
BEAD Occupation Group (2026 Totals)	BEAD Demand (FTEs) (0.7K)	Cross-Industryicit (FTEs) [1] (3.1K)	Deficit / Supply [2] -7.3%	Minimum Est. * Core BB Need
Laborers and material movers	(229)	(737)	-5.6%	
Trucking crew	(136)	(465)	-4.6%	
* Fiber and wireless technicians	(86)	(214)	-6.2%	214
Equipment operators	(70)	(418)	-8.1%	
* Structural engineers	(61)	(224)	-6.7%	224
Trenchers	(50)	(428)	-15.1%	
* Master and stage electricians	(33)	(190)	-10.1%	190
* Network architects and coordinators	(25)	(75)	-5.5%	75
Software engineers	(17)	(71)	-7.3%	
* Inspectors (e.g., permit, health & safety)	(14)	(109)	-14.0%	109
* RF & field engineers	(14)	(22)	-1.0%	22
* Surveyors and drafters	(14)	(161)	-25.0%	161
			Minimum Est.	1,017

Notes: BEAD deployment role(s) tagged to each BEAD Occupation Group included in appendix mapping table; 1) Includes 2020 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 4 on page 16 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. To see a detailed look at all the occupations within the specific categories, see the complete table in Appendix 5.

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 IIJA 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
1st 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 4. Below are some highlights.

Telecommunications

The telecommunications workforce is engaged in phone, cellular phone, and broadband operations and maintenance. There are 53 Internet Service Providers (ISPs) in Alaska. In 2022, Dun & Bradstreet data showed the primary ISPs generated gross revenues of $1,458,091,591[12] and employed 2,937 workers. In November 2023, a cursory review of the individual ISP websites indicates more than 150 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

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

1,531 of the 2,937 ISP workforce, and respondent profiles closely mirror the majority ISP profile (see discussion in Appendix 4).

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 staged 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 occupations ISPs and contractors found most difficult to fill *now* and reported needing *now* and *next year* appears in Appendix 4. 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.

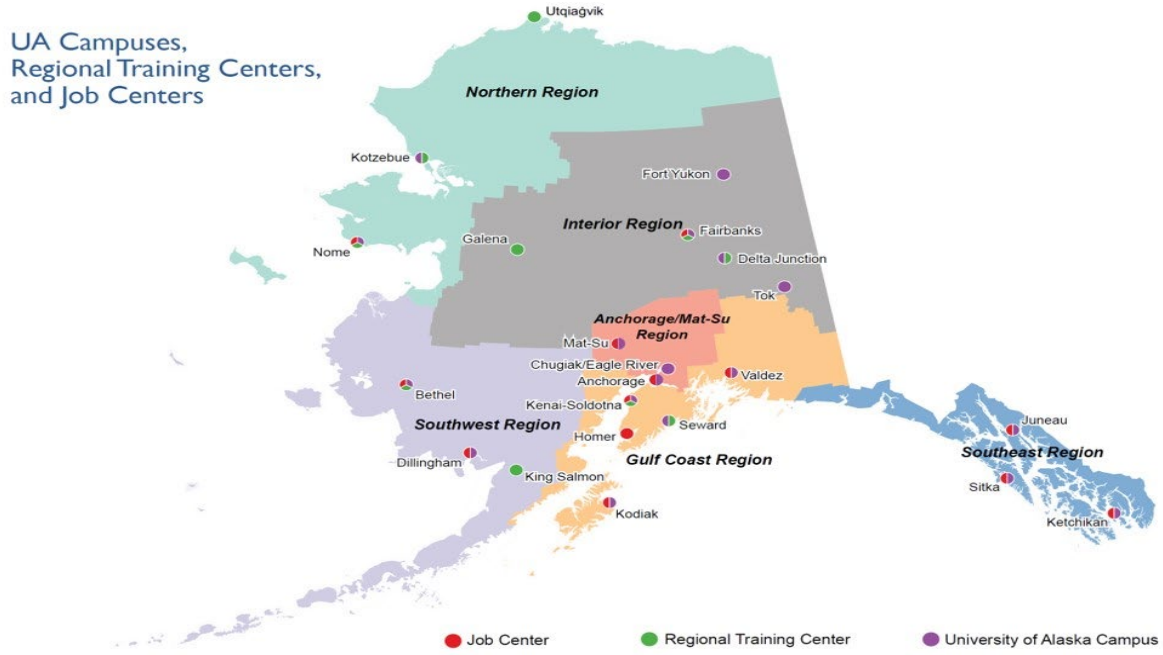
Construction training and skills form a foundation for more specific broadband and telecommunications training, and ultimately employment. While there are currently few broadband or telecom-specific training programs in Alaska, construction training programs are offered in high schools, University of 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 5 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. More details about these programs and others are in the full plan.

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 IIJA and BEAD projects will build a new and inclusive generation of construction workers. Congress directs IIJA 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 require employers to hire *underrepresented* and *underserved* 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 *underserved* populations in the BEAD workforce plan. The NTIA has identified these populations as:

1. Low-income individuals (at or below 150% of poverty level)
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.

The 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 IIJA method for training and employing a new diverse and inclusive workforce. There are more than 1,600 trade and telecommunication apprentices in Alaska today[13], and union and non-union sponsors are on pace to enroll 600 or more annually over the next several years.[14] 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. These and other barriers to recruitment, training, and employment for individuals, training providers, and employers are provided in more detail in the full Plan.

[13] Alaska Apprenticeships, August 2023, Alaska Department of Labor and Workforce Development, Appendix 6.

[14] Based on research, surveys, and interviews with apprenticeship sponsors.

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

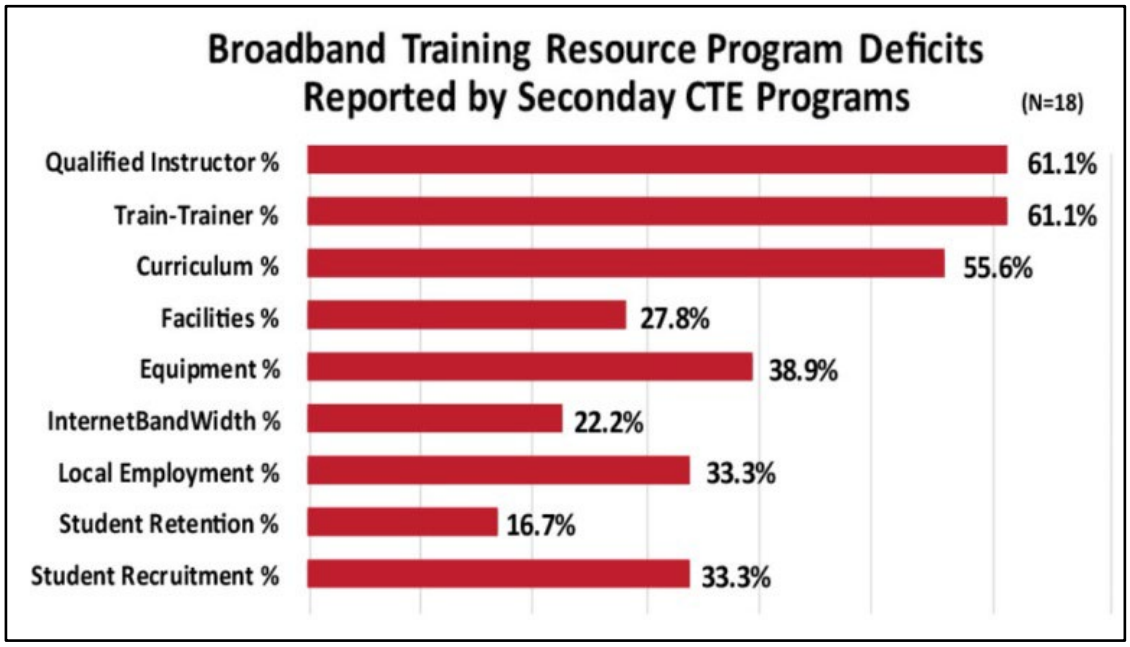
Although most students, educators, parents, and potential workers use phones and the internet, there is little awareness about broadband as an industry. The state has no Broadband-specific Career and Technical Education Program of Study (CTEPS). Without such a pathway, there is no identified *starting 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 3 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 3: Broadband Training Resource Deficits Reported by Secondary CTE Programs



Alaska's K-16 public education system has experienced level funding 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 limited 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.[15]

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

[15] Alaska Department of Education and Early Development Statistics and Reports, https://education.alaska.gov/data-center#

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.

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.

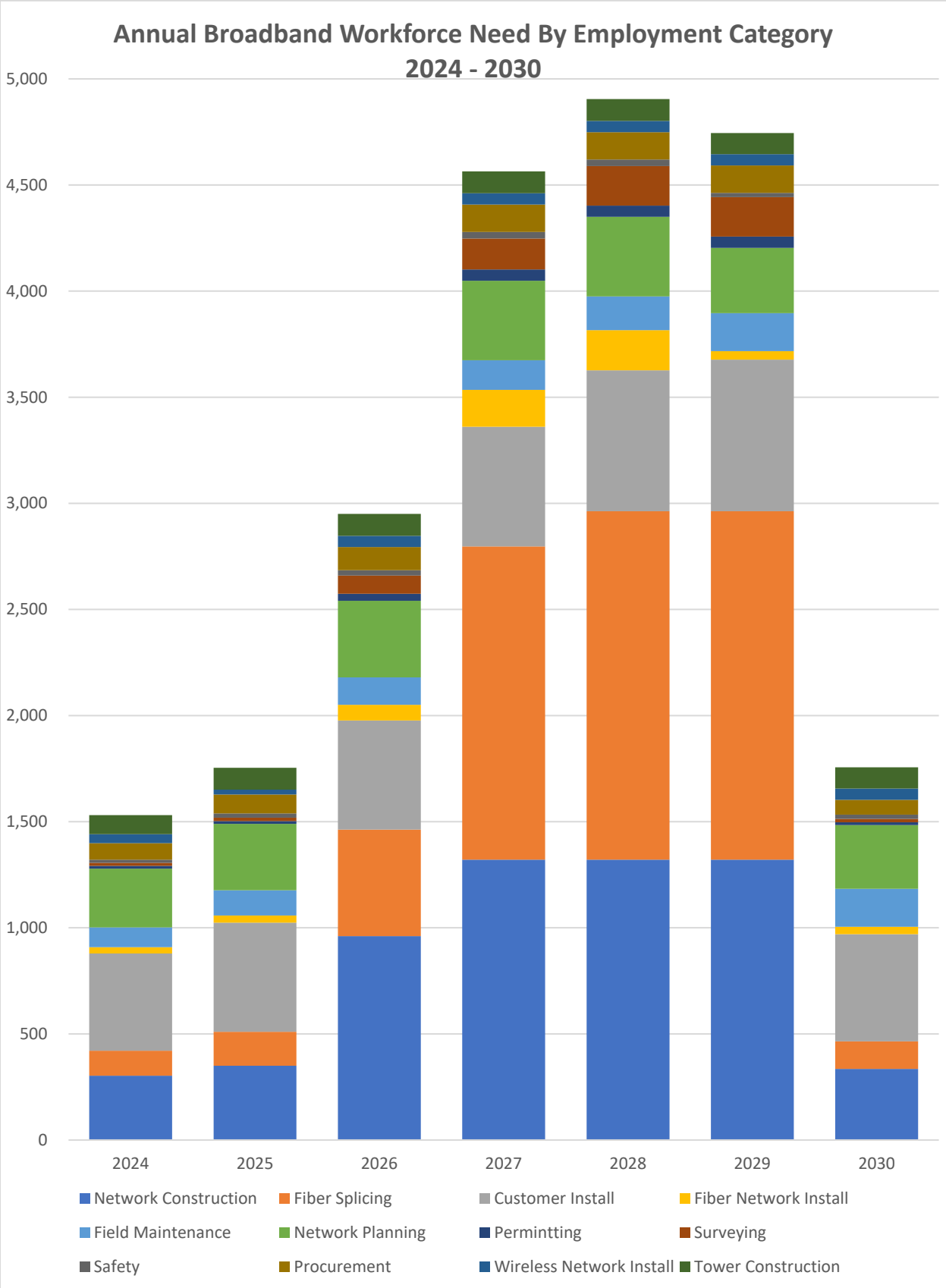
Recommendation #2. The ABO establishes an industry advisory working group contract with a Workforce Intermediary to implement the Plan and coordinate activities among partners.

Recommendation #3. The ABO provides resources for a data collection and analysis system to measure progress toward reaching the three Plan goals and analysis for improving Plan activities. 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 Workforce Intermediary funds and implements 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 Workforce Intermediary conducts a long-term Broadband Community Economic Impact Study (see a recommended framework in Appendix 7).

Chart 4: Detailed Annual Workforce Need



Appendix 1 – Advisory Committee 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 Bargen	Deputy Director	Alaska Broadband Office
Kristina Woolston	Broadband Fellow	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://jmwalshco.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://nacteconline.org/?fbclid=IwAR0RommMGSt-gqOQMwQDNjDfCDE63WoHEQhCVAEzabxW73OjnNHGbTcKGBJU
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.frbservices.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://ykdtribalbroadband.org/
	SumTotal	**13,297**		

Appendix 3

Pilot and Demonstration Program for Broadband Construction & Telecommunications Workforce Development

This overview of the proposed Pilot & Demonstration (P&D) Program for Broadband Construction & Telecommunications Workforce (BCTW) Development rests on the Broadband Workforce Development Plan found in the Alaska Broadband Office's *Alaska's Broadband Workforce*.

BEAD funding provides a unique opportunity to investigate pilot and demonstration (P&D) projects that can reshape how workforce development in Alaska is accomplished. A two-pronged approach using traditional institutional deployment for workforce development and selected P&D projects offers the best opportunity for future success.

The *Strategic Workforce Plan,* submitted November 20, 2023, is referenced in the P&D overview and appears below in its entirety. The Plan is followed by the P&D overview titled *P&D Program for Broadband Construction & Telecommunications Workforce Development* (beginning on page 9), in which small-scale innovative P&D projects are described for development and funding to kickstart potential new directions.

Meeting Our Challenges – The Broadband Workforce Development Plan

Submitted to ABO November 20, 2023

NTIA's "Internet for All" guidance has helped the Alaska Broadband Office and planning associates focus on strategies to create a new industry sector talent pipeline built upon Alaska's long-established and productive private and public sector construction workforce development system. Plugging into this existing and scalable construction system gives the telecommunications industry a conduit to connect with Alaska's existing outreach, education, training, and support assets in one concerted effort aimed at filling projected labor gaps. Alaska understands that workforce development does not happen automatically but requires planning and implementation of specific actions and methods.

NTIA's directives to build a more diverse, inclusive, equitable, and qualified labor force through BEAD-funded projects gives Alaska the opportunity to tap into a rich vein of underrepresented talent including women, graduating students, rural Alaskans, individuals with disabilities, those in the criminal justice system, unemployed and underemployed workers, as well as workers seeking better jobs. Plan strategies and action steps will draw them into the talent pipeline and equip them with the tools they need to fill industry jobs and give them skills that last a lifetime.

The Broadband Workforce Development Plan seeks to lay out strategies and action steps that, if implemented, will lead to a well-trained, diverse, and resident workforce. Success will take a statewide effort by multiple committed partners.

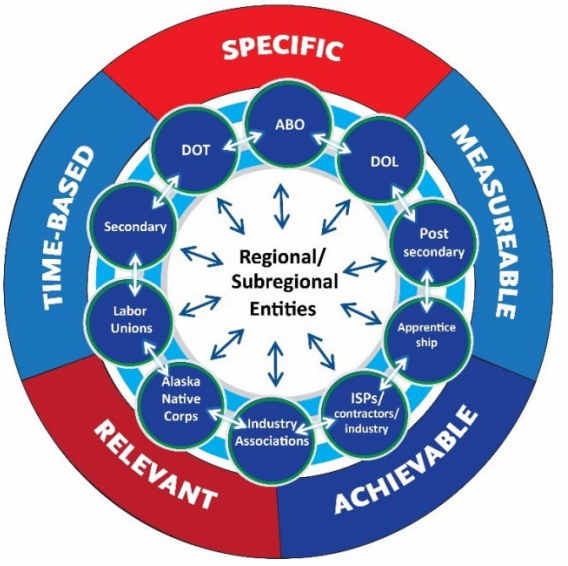
Vision, Mission, Goals, Strategies, Action Steps, and Performance Measures

Vision: Alaskans from every region of the state will 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 telecommunication infrastructure in every region of Alaska.

The goals, strategies, and actions steps are presented below. The goals are specific, measurable, achievable, relevant, and time-bound (SMART). As the diagram illustrates, the goals envelop and support the Workforce Development Plan concept model.

Disciplined methods for setting and measuring goals are required to determine if the intended purposes are achieved. Generally, these methods involve pre/post annual enumerations or counts of achievements.



After gathering data, obtaining input from the advisory committee, and getting feedback from stakeholders through in-person meetings and web-based surveys, the following goals, strategies, action steps, and metrics should be implemented to address Alaska's broadband workforce needs and mitigate training and employment challenges.

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.
3. Develop post-deployment capacity for residents to learn about and navigate training and career opportunities, including self-employment, and other opportunities available using high-speed broadband access.

Strategies and Action Steps

Strategy 1. Implement the Broadband Workforce Development Plan, coordinate action steps, and build a sustainable industry-led program that continually focuses in on public and private partnerships that can meet industry labor supply challenges and produce a highly skilled and technically trained workforce.

Objective: The Broadband Workforce Development 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.

Action Steps

1. The Alaska Workforce Investment Board (AWIB) will review and adopt the Broadband Workforce Development Plan.
2. ABO will determine what agency, entity, or company will initially implement the Broadband Workforce Development Plan in early 2024 and provide resources to start activities.

3. ABO will convene broadband/telecommunications employers and contractors to discuss, deliberate, develop, or assign an Industry Workforce Intermediary organization.
4. ABO will provide start-up resources to establish a Workforce Intermediary and employ a full-time Coordinator / Director to implement the Plan.
5. Plan implementation lead(s) will establish regular methods of communication to, from, and among stakeholders.
6. ABO or the designated Workforce Intermediary 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.
7. ABO or the designated Workforce Intermediary will maintain and refresh the akbroadbandworkforce.org website to provide communication avenues, including user forums, to provide updated information and inform the public.
8. ABO, AWIB, and the broadband Workforce Intermediary will establish sustainable funding to provide ongoing broadband training and workforce efforts.

This is the most critical strategy of the plan. The ABO has led the creation of a Broadband Workforce Plan that will become part of the State's BEAD Five-Year Action Plan and the Final Proposal submissions to the NTIA. The Plan will be adopted by the Alaska Workforce Investment Board as a Broadband Workforce Development Plan. ABO must determine who will implement the plan and consider providing resources to start activities. Industry must take some ownership of the plan, play a direct role, and assist with plan implementation. A full-time person should be employed to coordinate plan action steps, communicate with ABO and industry and workforce partners, and work with agencies and entities to develop and deliver successful programs that develop the workforce needed in every region of the state.

Strategy 2. Build on 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**.**

Action Steps

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.

An Alaska Broadband Office (ABO) Broadband Workforce Advisory Group or Industry Workforce Intermediary will lead implementation of the Broadband Workforce Development Plan and coordinate statewide and cross-region activities. Alaska Department of Labor and Workforce Development (ADOLWD) Research & Analysis (R&A) will annually research state and regional industry labor market occupational labor supply / gap data. Regional workforce partners will choose a Broadband Workforce lead to help form the education, training, and support service network and carry out action steps.

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.

Action Steps

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 M 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 careers and employment opportunities.
5. Train and provide Digital Navigators[1] to help individuals navigate online education, training, support services, employment opportunities (including entrepreneurship), and other personal opportunities available with high-speed Internet access.

New industry-branded outreach (marketing products) will be created with the help of a marketing consultant and used to promote career awareness and prepare career guides. WeBuildAlaska (https://webuildalaska.com/) and Maritime Works (https://www.alaskasafetyalliance.org/asa-programs/maritime-works/) are two models. Where feasible, existing and new courses will be introduced by school districts and students will be enrolled in courses. Programs like Alaska Excel (https://alaskaexcel.org/) and ANCEP (https://www.ansep.net/) and innovative programs created by schools (like the Anchorage and Lower Yukon School Districts partnership

[1] 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.

(https://alaskapublic.org/2019/03/22/lower-yukon-school-district-partners-with-anchorage-to-bring-rural-students-to-cte-classes/) will be used to provide students with career awareness opportunities. Digital navigators will assist students and job seekers as needed (if available) to assist students, teachers, career guides, and job seekers with developing digital skills and using online resources. ADOLWD and the Alaska Department of Commerce, Community, and Economic Development (DCCED) will work together to include industry information in the existing AKCIS and AlaskaJobs online information systems. The ABO or Industry Workforce Intermediary will collaborate with regional and sub-regional workforce partners to support introduction of CTE career awareness activities and courses and help connect Digital Navigators with students, schools, community organizations, and community members to learn and use digital skills.

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 and fill cross-industry jobs in every region of Alaska.

Action Steps

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 from industry, 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 Quality 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.

The ABO or designated Broadband Workforce Intermediary, along with the Alaska Department of Education and Early Development and the telecommunication industry, will develop a new Career and Technical Education Program of Study (CTEPS) that every school can use. King Tech High School's Telecommunications CTE program offers a model. ABO or the Industry Workforce Intermediary will identify and raise new resources with industry, state agencies, regional partners, and grants to support strategic activities and action steps. Some support and activities will be based upon broadband project timing and available regional labor supply and priority occupation demand gaps. The intent is for there to be a method and process to provide an equitable distribution of new resources, based upon regional

needs or opportunities, and that the regional and state trainee support service network is functioning and has support services resources available. This strategy offers state agencies receiving IIJA funding the opportunity to invest federal funds to develop the broadband and cross-industry workforce utilizing regionally located training facilities that meet DEED and the Alaska Commission on Post-Secondary Education standards for offering education and training. Training and support services would be aligned with the ADOLWD Eligible Training Provider List (ETPL) requirements that allow the Alaska Job Centers (AJCs) to issue Individual Training Account (ITA) vouchers and provide case-managed support services. AJCs have an existing and connected support service delivery system that coordinates with Alaska Native Corporation and Tribal Offices for the delivery of support services. Building upon the existing CTE and construction industry workforce development framework and support service delivery network will expedite training and support, reduce duplication of effort, and offer a more cost-effective use of resources. The Plan report provides information about additional ways to implement this strategy.

Strategy 5. Put in place recruitment, training, and employment efforts focused on targeted populations[2].

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

Action Steps

1. Work directly with agencies and organizations that already work with targeted populations, to build avenues to the broadband industry talent pipeline and jobs.
2. Meet with industry employers to learn about their workforce needs and develop relationships that lead to employment opportunities for specific populations.
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 organizations, and other agencies to provide support services for individuals.

Underrepresented and underserved populations can significantly help meet Alaska's workforce supply needs. This strategy involves connecting Plan activities and resources with several state agencies: Alaska Division of Vocational Rehabilitation and Division of Employment and Training Services, Alaska Department of Corrections; Alaska Department of Health, Department of Family and Community Services, and Human Services, and Department of Education and Early Development. These agencies already work closely with Alaska RuralCAP; Regional Alaska Native Organizations and Community Based Organizations. Alaska's Workforce Innovation and Opportunity Act (WIOA)[3] statewide coordinated services plan describes the roles, programs, collaboration, and resources of these agencies and partners to assist targeted populations. The action steps, for the most part, describe what these agencies and

[2] Targeted populations 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.

[3] Alaska WIOA Combined Plan 2022-2023 https://awib.alaska.gov/pdf/WIOA_plan_2022-2023.pdf

partners do, and provide them with a framework for engaging with broadband employers and assisting clients in accessing training and support services that lead to employment. There are also auxiliary programs mentioned in the Broadband Workforce Development Plan report that work closely with the agencies to provide services for underserved populations including women, Veterans, and minority populations. Most of these agencies and partners are part of Alaska's WIOA coordinated services workforce plan and have state and federal approved action plans and resources to assist their targeted populations. Additional support may be needed to provide accommodation, appropriate training, and special needs services.

Broadband Plan Performance Measures 2024 – 2030:

- 1,000 new broadband construction and telecommunications workers recruited and receive pre-employment training.[4]
- 700 broadband construction and telecommunications workers employed.
- A Broadband Industry CTEPS will be developed by July 2024 and ready for use by schools by September 2024.
- Over 50% of BEAD broadband construction and telecommunication jobs are filled by targeted populations.
- By December 2024, Broadband awareness campaign reaches 2,000 Alaskans.
- By December 2025, 500 workers enter training for broadband-related construction and operations jobs.
- By December 2026, 300 new workers are employed in broadband construction and operation jobs.
- By December 2027, 500 new workers are employed in broadband construction and operations jobs.
- By December 2028, 800 new workers are employed in broadband construction and operations jobs.
- By December 2029, 1,000 new workers are employed in broadband construction and operations jobs.

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.

Recommendation #1. The ABO should create 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 the state agencies will provide support to implement the Plan.

[4] See Broadband Construction Workforce & Cross-Industry Labor Supply Projection on page 15 of full Plan

Recommendation #2. The ABO should establish an industry advisory working group and promote creation of a Workforce Intermediary or contract with a designated Workforce Intermediary to implement the Plan and coordinate activities among partners.

Recommendation #3. ABO should provide resources for a data collection and analysis system to measure progress toward reaching the three Plan goals and analysis for improving Plan activities.

Recommendation #4. 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 #5. The ABO or designated Workforce Intermediary should fund and 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.

Early Implementation and Selected Outcomes (2024-2025)

- The AWIB approves the Broadband Workforce Development Plan, and implementation begins 2nd quarter of 2024.
- ABO and partnering agencies provide funding to start plan implementation, coordinate activities, and resource critical plan deliverables (Estimated early 3rd quarter of 2024).
- Regional pilot and demonstration projects are developed for support through potential grants from ADOLWD/AWIB, ABO, and other agencies (Estimated 4th quarter of 2024).
- The Department of Corrections determines what methods of training it will use and where the training will take place (Estimated 4th quarter of 2024).
- Regional broadband planning entities will meet to determine methods for ongoing communications and meetings and provide information about broadband expansion in the region as well as workforce development gaps and needs (July and September 2024).
- Industry and ABO creates or assigns a Workforce Intermediary by October 2024.
- A communications and data collection system is established to measure plan inputs, outputs, and annual progress toward Plan goals (December 2024).
- Annual assessments of education, training, occupation employment, demographics, earnings, and job retention are conducted at the state and six regional levels (June 2025 and annually through June 2030).
- Establish sustainable funding to provide ongoing broadband training and workforce efforts (October 2024 -June 2029).

Pilot & Demonstration Program for Broadband Construction & Telecommunications Workforce Development

The P&D Model. The Broadband Construction & Telecommunications Workforce (BCTW) P&D Program uses a Pilot and Demonstration (P&D) model to move the Broadband Industry Workforce Development Plan into action. The P&D workforce development model has been used by the U.S. Department of Labor (USDOL) for the past two decades (See *Guide for Practitioners* HERE). The model provides the Alaska Broadband Office (ABO) or their designee an approach used by many federal agencies to quickly start a new initiative with activities that develop the collaboration between industry and regional workforce partners needed to build a workforce to scale according to a strategic plan. The P&D-based program directs resources to ramp up activities designed to engage industry, government, and workforce partners. The program promotes buy-in from all entities to mutually contribute resources, utilize regional assets, and leverage workforce supportive services available through Alaska's Job Center Network and Alaska Native Corporations, such as Workforce Innovation and Opportunity Act (WIOA) and State Training and Employment Program (STEP) Individual Training Account (ITA) vouchers.

Workforce Intermediary. The BCTW Program allows ABO to jump start activities recommended in the strategic workforce plan. The first step would be to designate or create an industry workforce intermediary. An intermediary establishes a single point of contact for program deployment, oversight, and administration. That would institute an organized and cost-effective method for equitable distribution of resources and spark action by broadband construction and telecommunication industry workforce partners to achieve the objectives and goals of the strategic workforce plan. The Alaska Broadband Workforce Development website (akbroadbandworkforce.org) would continue in tandem with the intermediary to disseminate information and to collect survey responses and other input from participating industry employers, secondary and postsecondary Career and Technical Education (CTE) programs, and others. Collected information would be used in part to evaluate the effectiveness of the P&D program.

Program Projects. The program offers a portfolio of ventures that will increase the awareness of broadband construction and telecommunications jobs and careers, build on-ramps for students and jobseekers to industry specific training, launch broadband construction and telecommunication CTE programs, and mold regional workforce development partnerships. Program projects will produce effective recruiting strategies to include individuals from underserved and underrepresented populations in education and training and forge local and regional CTE programs and basic skills training leading to industry credentials and pathways to postsecondary education and registered apprenticeship training.

For Discussion: This is a conceptual overview of the program with various projects aligned with the strategic workforce plan action steps designed to achieve the objectives and goals. The overview includes a rough estimate for program project amounts and resource allocations. The overall budget ranges from $4,500,000 - $5,000,000 and has the potential for >50% match when leveraging existing and future workforce resources through a variety of sources such as STEP grants, Technical Vocational Education Program (TVEP) allocations, state appropriation, federal workforce development grant opportunities, and philanthropic grants.

Statewide Projects

1. Develop a Career and Technical Education Program of Study (CTEPS) for Broadband Industry. Involves branding broadband careers, creating outreach and recruitment materials, developing career activities and courses for students and potential job seekers. Led by the Alaska Department

of Education and Early Development (DEED) with industry input. Used by School Districts, Job Centers, Alaska Construction Academies, Postsecondary Providers. $100,000.

2. AVTEC Demonstration Project. AVTEC will develop a Telecommunications Program and offer Cross-Industry Skills Instructor Development and Career Guide Training. The Telecommunications Program would meet Alaska Commission on Postsecondary Education standards and be developed with an industry advisory panel. This would include the creation of a Broadband Train-the-Trainer course aligned with the existing AVTEC Train-the-Trainer program and offer instructor development for cross-industry instructors as Alaska Type M-certified educators who support school district CTE programs. This would create a sustainable statewide telecommunications instructor course available at AVTEC, where temporary housing is available for students. These courses could be distance delivered to support communities where broadband projects occur and increase the supply of certified Type M instructors who can also assist schools as career guides. $400,000. An estimated 100 students will receive training and 20 instructors will be certified as Type M teachers and industry career guides.

3. Alaska Department of Corrections (DOC) Pilot & Demonstration Project: AK DOC has identified three curriculum providers with programs that could be feasibly implemented within AK DOC facilities: Light Brigade, C-Tech, and the Communications Infrastructure Contractors Association. Though very different with regards to class duration, content focus, and certification outcomes, the programs are all capable of being offered in-person in AK DOC facilities by certified staff and can be delivered entirely off-line. AK DOC would initially pilot 2-3 short-term program cycles (Light Brigade) and 1-2 longer-term program cycles (C-Tech) within 2 AK DOC facilities with distinctly different population demographics. This strategy will enable the Alaska Broadband Office (ABO) and AK DOC to assess logistics associated with the acquisition and transport of instructor(s) and class materials, outcomes of different student demographics, and general ease of implementation of each program. The Department of Corrections full draft document is available HERE for review. (This approach is applicable to other P&D projects such as developing a CTEPS, courses offered by AVTEC, the Alaska Construction Academies, the University system, and regional workforce partnerships. It may be more cost-effective to choose on-the shelf training from one or more of these vendors.)

4. Alaska Construction Academy (ACA) Broadband Pre-Apprenticeship Training. Funds distributed by the Division of Employment and Training Services (DETS) through ITAs for Eligible Training Provider List (ETPL) approved courses. Participants will participate in basic skills courses for entry level jobs or entering registered apprenticeship programs. This will allow Alaska Job Centers to provide individuals enrolled in training support services such as travel to an ACA site, temporary housing, meals, and childcare during training. $500,000 based on an estimated 200 trainees at $2,500 for each course. (Rural trainees are those who do not live in Anchorage, Fairbanks, Palmer/Wasilla, Juneau, or Kenai).

5. Broadband Construction and Telecommunications Apprenticeship Training. Training subsidy for federal registered apprenticeship sponsors to offset first-year course-related instruction costs. Funds would be distributed through DETS to sponsors after the apprentice has completed the required first-year course-related instruction and has been employed in a broadband construction or telecommunications job for a minimum of five hundred hours. $2,500 per registered apprentice. Estimated 200 apprentices = $500,000.

6. University of Alaska Broadband Project. Resources for broadband and telecommunications industry occupational certificate and degree programs. The University will develop a proposal that aligns with its plans to increase training and education to meet industry needs for professions such as engineering, project managers, supervisors, and other professions. The proposal would consider regional and statewide needs. $400,000.

7. Create and Support Workforce Intermediary. Funds will be used to support creating a Workforce Intermediary, within an industry association or with an established industry workforce, and to support the Alaska Broadband Workforce Development website for information dissemination and collection. Information collected through the website would be used in part to evaluate the effectiveness of the P&D program. The Workforce Intermediary will have an advisory council, a full-time paid Director, funds to cover program administration, website maintenance, development of an activity and participant training data collection system, meeting expenses, office space and equipment lease, supplies, a limited travel budget, and an annual program activity and performance assessment report to the ABO. This component should include funds for the Alaska Department of Labor & Workforce Development Research and Analysis section (ADOLWD R&A) to provide annual state and regional labor market information and performance evaluation and contractors to assist with annual report. $1,000,000.

Regional Projects

Regional Broadband Workforce Partnerships. Recommend six (6) grants, one for each economic region of the state. Regional workforce partners designate a qualified grant recipient (regional workforce intermediary) to receive and administer funds, coordinate activities, and report to the ABO-designated Workforce Intermediary. Partners create an advisory committee and a plan for broadband construction and telecommunications education and training, including utilizing a participant data collections system created by the ABO Workforce Intermediary. Funds can be used to create or import relevant training programs, recruit and train workers, and offer digital equity support for persons living in the region. Regional partnerships will work with DEED, AVTEC, University of Alaska, and ACA grantees to provide advice and leverage the statewide ABO program resources to avoid duplication of efforts and utilize the *statewide* program products and resources: Broadband and Telecommunication CTEPS, AVTEC Broadband and Train-the-Trainer & Career Guide programs, and University of Alaska industry higher education programs. $300,000 each x 6 regions = $1,800,000. An estimated 600 individuals will receive training.

All statewide and regional categories have strong potential to leverage existing federal, state, tribal, and private sector workforce development resources as well as future grants from a variety of federal programs or state legislated appropriations. This program assumes the ABO will provide a substantial amount of BEAD funds allowed for workforce development programs to initiate the program and provide a basis for workforce partners to gain additional funding (leverage resources) to sustain and expand the program projects.

Evaluation Design. NTIA requires the state to track, evaluate, and report Alaska's performance as part of the overall IIJA requirements for using BEAD funds to develop a broadband construction and deployment workforce that is inclusive, diverse, and equitable while installing a conduit to increase digital equity for those in communities where broadband infrastructure is built. To accomplish this, the final draft Broadband Equity, Access, and Deployment (BEAD) Workforce Development Plan (11.20.2023) provides a built-in evaluation process of required organizational data collection, online

surveys, interviews, and stakeholders and agency reporting to assess the effectiveness of the state's Plan activities. The P&D projects would be separate, independent efforts with separate evaluations built around P&D workforce development models used by the USDOL for the past two decades (See *Guide for Practitioners* HERE and Exhibit 1.1, below). The hypothesis would be no significant difference pre/post pilot or demonstration. The P&D projects' evaluation outcomes would also be compared periodically with the periodic outcomes derived in the full Plan to determine whether any P&D effort is uniquely effective and worthy of adoption.

Goals, Strategies, Action Steps, and Performance Measures. These are detailed in the final draft Broadband Workforce Development Plan (11.20.2023), excerpted above. Each P&D project described in this overview must address a relevant, meaningful sample of the Plan strategies and performance measures in their proposed pilot or demonstration. For each selected strategy and associated action step, the organization must provide a baseline measure for the pre-project start up and demonstrate methods by which the baseline will be updated periodically during the project period. The P&D projects' evaluation outcomes would then be compared with the periodic outcomes derived in the full Plan to identify any effective projects to serve as models for adoption.

Selected Measures. Selected measures can be simple, but they must have a high-level, comprehensive nature. Research shows that use of simple measures may be nearly as effective as complex measures. for example, see study HERE.

Each project will select measures appropriate for its mission. For example, measures may include:

- job placements
- training completions
- training enrollments, or
- outreach contacts

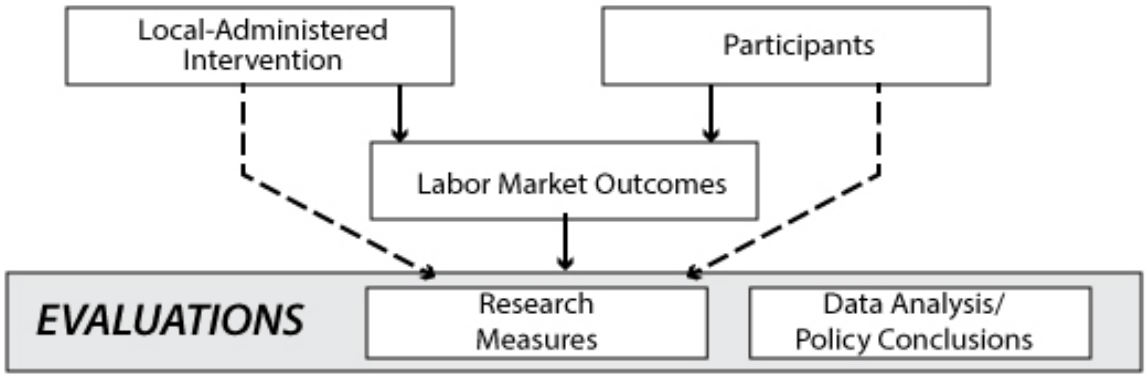
Ultimately, the best measures will correlate with those found in the Broadband Workforce Development Plan. In addition, each project must collect applicable demographic information to allow cross-cutting analyses along variables such as:

- region
- ethnicity
- income
- gender, or
- other appropriate factors

Finally, the ABO and its workforce intermediary must develop uniform data collection and dissemination methods that permit gathering data from all pilot or demonstration projects in a form compatible with data collected in the full Plan.

Statistical Methods. Comparisons of interval measurements will serve as the statistically valid evaluation outcomes for each P&D project, based on paired t-tests and/or repeated measures for within-project comparisons or ANOVA for comparisons among groups. Some binary measures (e.g., Yes/No) may be treated with Chi Square comparisons.

Exhibit 1.1
Structure of Employment and Training Demonstration and Pilot Projects
OPERATIONAL COMPONENTS



"improving the Evaluation of DOL/ETA Pilot and Demonstration Projects: A Guide for Practicioners"
Research and Evaluation Report Series 01-A U.S. Department Of Labor
Employment and Training Administration 2001

Appendix 4 - Alaska Telecommunications Industry Overview

There are 53 Internet Service Providers (ISPs) in Alaska. In 2022, the primary ISPs employed 2,937 workers and generated gross revenues of $1,458,091,591[1]. These data are derived from: 1) ISP.me identifies 53 ISPs in Alaska; 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 positions today[2] across the spectrum of occupations. This does not include broadband construction openings.

Alaska ISP Profile

Attached Exhibit 1 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. (To see the ISPs, speeds/services, and cities, zip codes, boroughs/census areas served, click HERE to view accordion menus under *Who Are Alaska's Local Internet Service Providers (ISPs)?*)

The top nine of 53 identified Alaska ISPs generated 93.5% of total ISP revenues (Table 1 below, derived from Attached Exhibit 1). The 16 ISPs with 30 or more employees account for 90.9% of the total employees (Table 2, next page, derived from Attached 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 M T A	$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%**

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

[2] AlaskaJobs Labor Exchange System Advertised Openings for Telecommunications Industry, October 26, 2023: https://alaskajobs.alaska.gov/vosnet/lmi/profiles/profileDetails.aspx?enc=mLzjSNmrac3CLiUnnSSBIqYSj51xdeJFtfF2BYwhs7lQf7yQX9DJD5QtvsSLRdQoeAzNIMBF4kmRQygSmC2oTIsFcczwW5I0JoqbZ+jMcd4=

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%
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 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.

[3] Jericho Casper, *Failing to Future-Proof Fiber Networks Will Have Costly Return on Investment Effect*s, 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.

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 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.

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.

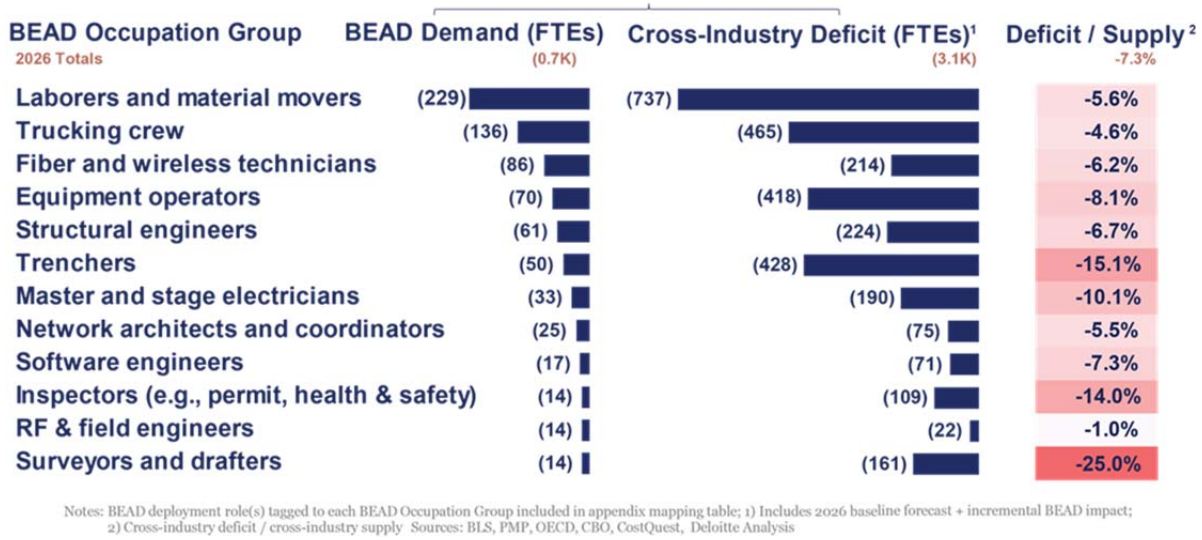
Most of the workers building and deploying broadband will need short-term training to obtain or renew certifications required for employment. BEAD requires that "the subgrantee will ensure the use of an appropriately skilled workforce" with "appropriate training, certification, and licensure." As broadband 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 3 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 3: 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

Considering *local hire* priorities, 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 regionally 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 Appendix Exhibit 2 where BEAD communities are listed with 2022 employment data for each of the NTIA targeted broadband occupations.

Figure 4: 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%		(59)	-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 (see discussion of logistic regression on page 9).

Table 4 - ISP/Contractor Activities (N=10)	
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 4 shows the percentage of survey respondents 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 3 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 3: ISP Contractor Survey Self-Reported Employment by Job Title and Labor Gap for Broadband Related Occupations (N=10)				
Job Title	Number Employed Now	% Needing More Now	% Needing More Next Year	% Difficult to Find
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 Attached Exhibit 2 showing workforce availability for selected broadband occupations. See Attached 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 ADOLWD R&A for broadband essential occupations and cross-industry occupations is that more than 20,000 new workers will be needed by 2030, as shown in Table 6 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 4: 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	1015	245%
Land Surveyor	454	350	804	177%
Pole Surveyor	454	230	684	151%
OSP (Outside Plant) Engineer	1232	750	1982	150%
Construction Manager	1450	830	2280	157%
Project Management Specialist	309	410	719	233%
1st Line Trades Supervisors	2624	720	3344	127%
Carpenter	4532	2,280	6812	150%
Operating Engineer (Heavy Eqp)	5464	3,230	8694	159%
Truck Drivers	4539	3,230	7769	171%
Maintenance Technician	5726	3,740	9466	165%
Laborer	8416	3,960	12376	147%
Fiber Optic Technician	951	910	1861	196%
Splicer Technician	360	280	640	180%
Maintenance Technician	5726	3,740	9466	165%
Safety Officers	492	380	872	177%
Occ. Safety & Health Specialists	285	120	405	142%
Total	**43,974**	**26,490**	**70,464**	
Source: Alaska DOLWD Research and Analysis				

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 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, trade associations as well as several state agencies and Alaska Native Corporations engaged in workforce development.

Industry Trains Their Employees

Every telecommunication 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, SCTE, CISCO, LTR, ANRITSU, and Motorola. Of these, only BICSI and SCTE are product neutral. Only a small portion is done by external resources (110 workers).

Table 5: 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	**1,349**	**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.

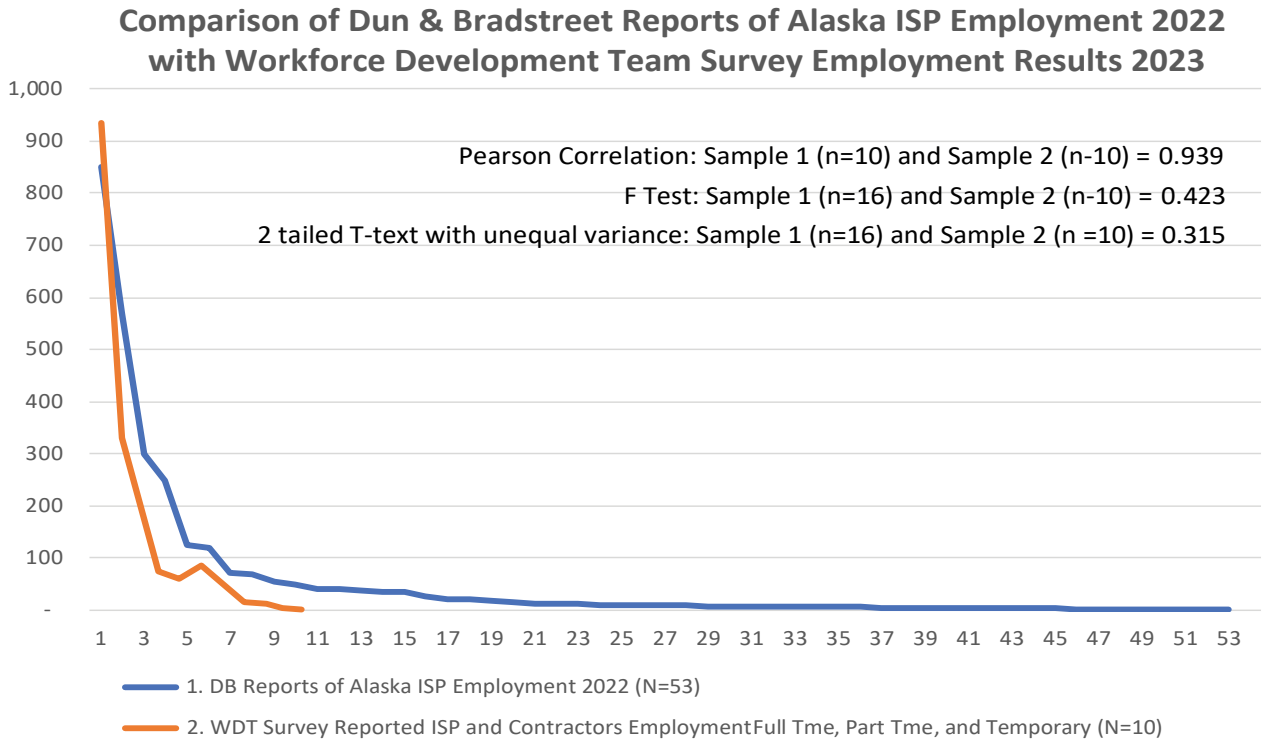
CTE pathways provide opportunities for postsecondary degrees or certificates, industry certifications, apprenticeships, and employment. A career pathway program offers secondary and postsecondary students and job seekers a clear sequence of stackable credits and credentials, combined with support services as needed, which enable them to secure industry skills, certifications, 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 (alaska.edu)

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

The ISP-Contractor Workforce Survey was developed by the workforce development team. The survey was distributed through the Alaska Telecommunications 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 as the line graph representing the D&B reports of Alaska ISPs and the Workforce Development Team's survey data show.



Pearson's Correlation between the DB and Survey samples, when limited to the 10 largest ISPS from the DB dataset show a 90% plus correlation. In addition, the F-test used to determine if the two groups are two different populations is 0.423, allowing acceptance of a null hypothesis of no difference between the groups. A two-tailed T-test using the 16 largest DB ISPs and the 10 workforce development survey participants also shows no significant difference between the two groups. These results are no substitute for a higher survey response rate, but they add credibility to the reported outcomes that follow. Survey collection is still ongoing and it is not impossible more results will follow, but the fact that there is a high correlation between those returning the surveys and the DB results and the fact that just 16 of the DB ISPs accounted for more than 90 percent of employment and revenues should permit consideration of the survey results as being more representative and informative than would be the rejection of these results.

Appendix Exhibit 1 Alaska ISPs with Employees and Revenues								
Name	Description	SIC Code/ NAICS Code	Locations	Founding Date	HQ	Other	Total	Revenues 2022
Adak Eagle Enterprise aka Adak Telephone Utility	Internet Connectivity Services business / industry within the Communications sector.	4813/517311	Anchorage	2003	10	3	13	$2,317,825
ACS of Fairbanks aka ACS	Telephone Communication, except Radio business / industry within the Communications sector.	4813/517911	Anchorage	1991	36		36	$7,813,991
Alasconnect, LLC	Systems Engineering Consultant, Ex. Computer or Professional business / industry within the Engineering, Accounting, Research, and Management Services sector.	8748/541690	Anchorage	???	48	0	48	
Alaska Communications Internet, LLC	Internet Connectivity Services business / industry within the Communications sector.	4813/517311	Anchorage	2000	60	11	71	$17,273,097
Alaska Communications Systems Holdings, Inc. aka Alaska Communications, Alaska Communications Systems Group	Internet Connectivity Services business / industry within the Communications sector.	4813/517311	Anchorage	1999/2021	92	477	569	$240,569,000
Alaska Fibre	Lumber and other Building Materials business / industry within the Building Materials, Hardware, Garden Supplies & Mobile Homes sector	5211, 1731/ 444110, 238210	Petersburg	1998	1	2	3	$618,446
Alaska Power & Telephone Company	Provides energy and communication services to 40 communities stretching from the Arctic Circle to the southernmost tip of Southeast Alaska. The telecom	4813/517911	Port Townsend WA	1957			68	$19,000,000

Appendix Exhibit 1 Alaska ISPs with Employees and Revenues								
Name	Description	SIC Code/ NAICS Code	Locations	Founding Date	HQ	Other	Total	Revenues 2022
	segment provides local telephone service also in rural areas of Alaska. Services include Internet, power, telephone, broadband, mesh WiFi, Internet support, Wi-Fi hotspot service, and others. Employees and Revenues from Company annual report.							
Alaska United Fiber System Partnership aka Alaska Untd Fibr Opt Cble Syst	Telephone Communication, except Radio business / industry within the Communications sector.	4813/517311	Anchorage	1998	1		1	$3,894,992
Arctic Slope Telephone Association Cooperative aka ASTAC, ASTAC Broadband, ASTAC Internet, ASTAC Wireless	Local Telephone Communications business / industry within the Communications sector.	4813/517911	Anchorage	1977	27	27	54	$19,957,174
AX-S-Anywhere aka Digital Aurora Radio Technolgies, DART	Communication Services, nec business / industry within the Commuications sector.	4899/ 517919	Delta Junction	2008	3		3	$119,317
Bay Cablevision aka Bristol Bay Celluar Partner	Cable Television Services Business /industry within the Communications sector.	4841/ 515210	King Salmon	1985	1		1	$1,219,764
Borealis Broadband	Internet Connectivity Services business / industry within the Communications sector.	4813/517911	Anchorage	2003	9		9	$744,009
Bristol Bay Internet aka Bristol Bay Telephone Coop	Celluar Telephone Services business /industry within Communications sector.	4812, 5999/517312, 443142	King Salmon	1990	14	3	17	$2,356,366
Bristol Bay Telephone Cooperative	Cable Television Services Business /industry within the Communications	4841,4813/ 515210, 517911	King Salmon	1972	21	1	22	$4,056,452

Appendix Exhibit 1 Alaska ISPs with Employees and Revenues								
Name	Description	SIC Code/ NAICS Code	Locations	Founding Date	HQ	Other	Total	Revenues 2022
	sector.							
Bush Tell	Local and Long Distance Telephone Communications business / industry within the Communications sector.	4813/517911	Aniak	1970			14	$1,887,316
Cordova Telephone Cooperative aka Cordova Telecom Cooperative	Cellular Telephone Services business / industry within the Communications sector.	4812, 4813/ 517312, 517911	Cordova	1978	13	7	20	$4,704,896
Dry Creek Internet and Communications	Internet Connectivity Services business / industry within the Communications sector.	4813, 4899, 7389/ 517311, 517919	Delta Junction	2015	1		1	$36,237
Fibre Alaska	Transmitting Tower (Telecommunication) Construction business / industry within the Heavy Construction, Except Building Construction, Contractor sector.	1623, 7373, 7374, 7379/ 237130, 541512, 518210, 541519	Gustavus	2016	1		1	$89,613
GCI	Cable Television Services business / industry within the Communications sector.	4841/ 515210	Nome	1980	5		5	$360,000
GCI	Telephone Communication, except Radio business / industry within the Communications sector.	4813/517911	Anchorage	2018	5		5	$61,256
GCI Cable	Cable Television Services business / industry within the Communications sector.	4841, 7375, 4812/ 515210, 517919, 517312	Anchorage	1996	120	130	250	$50,371,241
GCI Communication Corp aka GCI Holdings LLC	Local Telephone Communications business / industry within the Communications sector.	4813, 4841, 4812, 1731/ 517911, 515210, 517312, 238210	Anchorage	1990	200	650	850	$11,127,984

Appendix Exhibit 1 Alaska ISPs with Employees and Revenues								
Name	Description	SIC Code/ NAICS Code	Locations	Founding Date	HQ	Other	Total	Revenues 2022
GCI Fiber Communication Co.	Telephone Communication, except Radio business / industry within the Communications sector.	4813/517911	Anchorage	2016	124		124	$21,336,076
GCI Industrial Telecom	Internet Host Services business /industry within the Communications sector.	4813/517311	Anchorage	2012	8		8	$246,222
GCI LLC aka Alaska United	Cable and Other Pay Television Services business / industry within the Communications sector.	4841, 4812, 4813/ 515210, 517312, 517911	Anchorage	2001	6	1	7	$894,733,000
Grizzly Merger Sub 1, LLC	Telephone Communication, except Radio business / industry within the Communications sector.	4813/517911	Anchorage		5		5	
Grizzly Merger Sub 2, LLC	Telephone Communication, except Radio business / industry within the Communications sector.	4813/517911	Anchorage		7		7	
Info Structure aka Prime Time Ventures	Internet Connectivity Services business / industry within the Communications sector.	4813/517311	Talent, Oregon	2003	10		10	$2,501,247
Interior Telephone Company	Local Telephone Communications business / industry within the Communications sector.	4813/517911	Anchorage	1991	27	1	28	$2,523,282
Ketchican Public Utilities	Ketchican Internet Services are part of KPU. The following values are derived from the KPU budget plan for 2022.	4813/517911	Ketchican	1886	6	35	41	$19,549,800
Kpunet.net Internet	Internet Connectivity Services business / industry within the Communications	4813/517311	Ketchican	2007	2		2	$233,919

Appendix Exhibit 1 Alaska ISPs with Employees and Revenues								
Name	Description	SIC Code/ NAICS Code	Locations	Founding Date	HQ	Other	Total	Revenues 2022
	sector.							
Matanuska Telecom Association, Incorporated aka M T A,	Internet Connectivity Services business / industry within the Communications sector.	4813/517311	Palmer	1953	100	200	300	$78,694,617
Matthews & Zahare	Internet Host Services business / industry within the Communications sector.	4813/517311	Anchorage	2004	6		6	$521,799
Mukluk Telephone Company	Local Telephone Communications business / industry within the Communications sector.	4813, 1731/ 517911, 238210	Anchorage	1992	1		1	$1,492,966
Nushagak Electric & Telephone Cooperative	primarily operates in the Local Telephone Communications business / industry within the Communications sector.	4813/517911	Dillingham	2001	34		34	$7,875,481
Nushtel Internet aka Nushagak Cooperative	primarily operates in the Online Service Providers business / industry within the Communications sector.	4813/517311	Dillingham	1964	7		7	$994,308
Optimera aka Optimera Wifi	Internet Connectivity Services business / industry within the Communications sector.	4813/517311	Unalaska	2005	7	6	13	$4,443,612
Otz Telephone Cooperative	Local Telephone Communications business / industry within the Communications sector.	4813/517911	Kotzebue	1975	26	16	42	$10,609,235
Pti Communications of Ketchikan, Inc.	Telephone Communication, except Radio business / industry within the Communications sector.	4813/517911	Anchorage	2010	1		1	$325,972
Quintillion	Telephone and Telegraph Wire and Cable business / industry within the Wholesale Trade -	5063/ 423610	Anchorage	2013	3		3	$1,704,354

Appendix Exhibit 1 Alaska ISPs with Employees and Revenues								
Name	Description	SIC Code/ NAICS Code	Locations	Founding Date	HQ	Other	Total	Revenues 2022
	Durable Goods sector.							
Quintillion Networks	Wire Telephone business / industry within the Communications sector.	4813/517311	Anchorage	2012	4		4	$491,380
Quintillion Subsea Holdings LLC	Holding Companies, nec business / industry within the Holding and Other Investment Offices sector.	6719/ 551112	Anchorage	2018	13		13	
Quintillion Subsea Operations, LLC	Local Telephone Communications business / industry within the Communications sector.	4813/517911	Anchorage	2016	11		11	$1,667,487
Remote Control, Inc.	Local Telephone Communications business / industry within the Communications sector.	4813/517911	Fairbanks	1999	5	2	7	$2,515,811
Spitwspots	Internet Connectivity Services business / industry within the Communications sector.	4813/517311	Homer	2008	10		10	$1,582,176
Summit Telephone and Telegraph Company of Alaska aka Summit Telephone Co	Local Telephone Communications business / industry within the Communications sector.	4813/517911	Fairbanks	1979	7		7	$2,515,811
Supervision	Telephone Services business / industry within the Business Services sector.	7389/ 561421	Anchorage	2008	2		2	$2,262,090
Telalaska Long Distance, Inc.	Local Telephone Communications business / industry within the Communications sector.	4813/517911	Anchorage	1960	38		38	$2,516,897
United Utilities, Inc.	Local Telephone Communications business / industry within the	4813/517911	Anchorage	2008	60	60	120	$4,757,673

Appendix Exhibit 1 Alaska ISPs with Employees and Revenues								
Name	Description	SIC Code/ NAICS Code	Locations	Founding Date	HQ	Other	Total	Revenues 2022
	Communications sector.							
Wireovia Wireless	Cellular Telephone Services business / industry within the Communications sector.	4812/517312	Wasilla	2011	3		3	$133,130
Vertical Broadband Llc	primarily operates in the Miscellaneous Homefurnishings business / industry within the Home Furniture, Furnishings and Equipment Stores sector.	5719/ 442299	Delta Junction	2016	5		5	$41,767
Whitestone Community Association aka Whitestone Power and Communications	primarily operates in the Civic Associations business / industry within the Membership Organizations sector.	8641/ 813410	Delta Junction	2003	8		8	$420,144
Yukon Telephone Company, Inc. Holding Company: General Communication, Inc.	Local Telephone Communications business / industry within the Communications sector as a Telecom Reseller.	4813/517911	Anchorage	2010	9	0	9	$2,822,359
					1,223	1,632	2,937	$1,458,091,591

Appendix 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

Appendix 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

Appendix 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

Appendix 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

Appendix 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

Appendix 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

Appendix 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

Appendix 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

Appendix 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

Appendix 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**

Appendix 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%

Appendix 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 5 - Analysis of Alaska Broadband Workforce Need

	2024	2025	2026	2027	2028	2029	2030	
Cross-Industry Pool Evaluation		**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Total**
NTIA Assessment			3,114					
DOLWD Straight line[1]		2,800	2,800	2,800	2,800	2,800	2,800	16,800

ABO Broadband Evaluation		**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Total**
NTIA Assessment			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	*Fiber Optic Technicians*	*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	*Fiber Optic Technician*	*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	*Wireless Technicians*	*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	*Wireless Technicians*	*53*	*6*	*0*	*0*	*0*	*0*	*0*	*59*
Wireless	Tower Technicians (Eqpt Installer)	33	7	0	0	0	(3)	0	37
Wireless	**Tower Construction Subtital**	**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 certain 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?

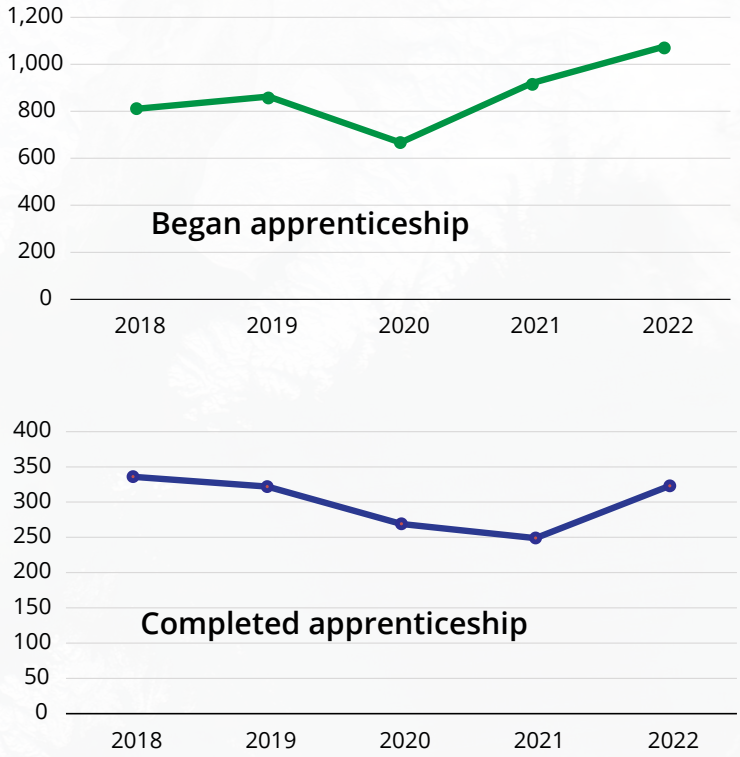
Yes, the number of people who began an apprenticeship rose from 804 in 2018 to 1,069 in 2022.

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.

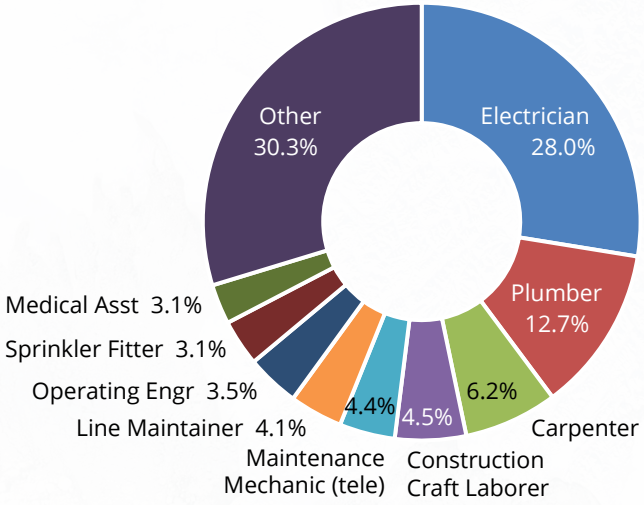
What types of work do apprentices train for?

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



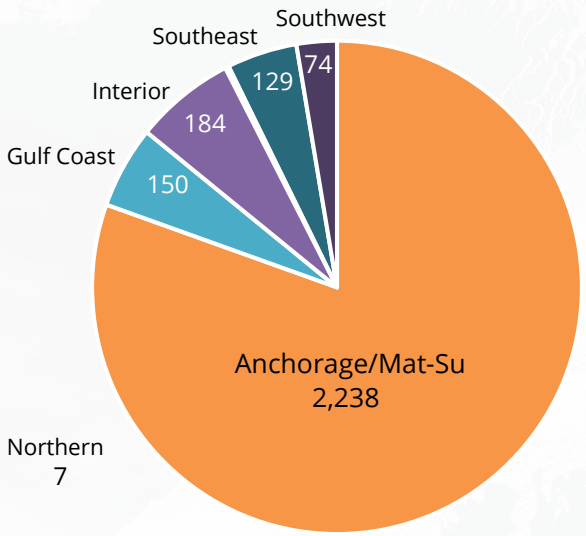
Where in Alaska do apprentices train?

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

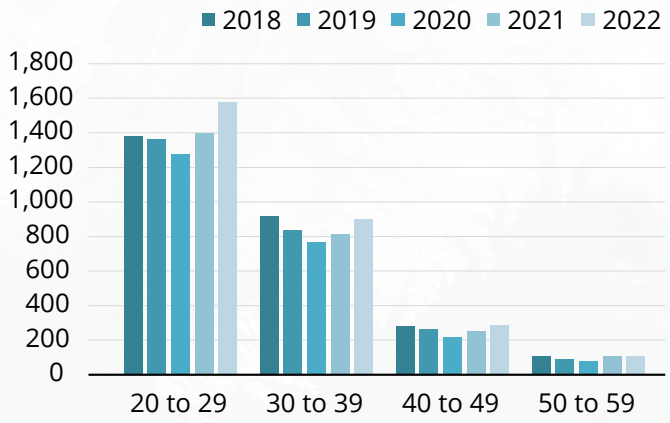


How old are Alaska's apprentices?

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



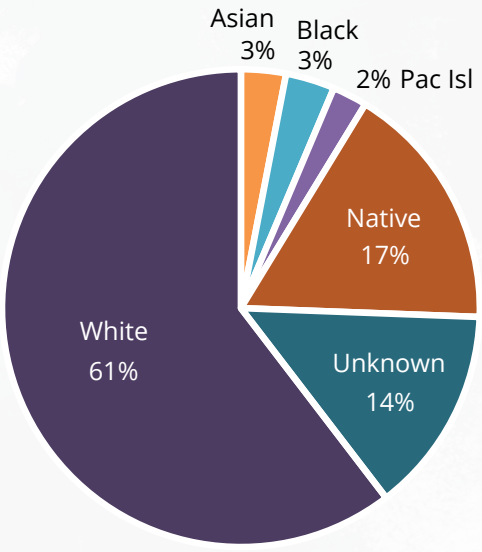
What is the racial makeup of Alaska apprentices?

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.

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

Are the numbers of male and female apprentices similar?

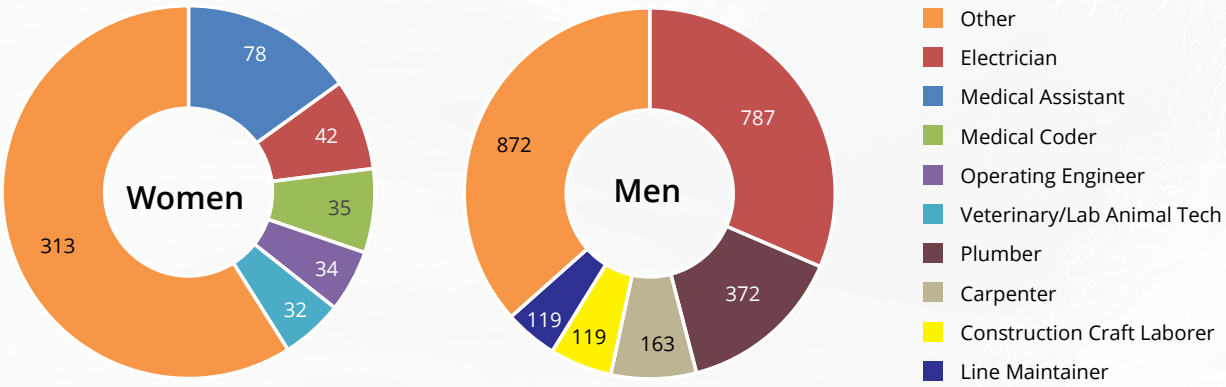
Far more men than women register for apprenticeships. In 2022, 82 percent of all apprentices were men, a percentage that hadn't changed much over the 2018-2022 period.

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.

In the top five lists for men and women, 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.

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
Knikatnu 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

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

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

Apprentices and target occupations by race, 2022

	APPRENTICES* BY RACE			
Target occupation	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.

Appendix 7 - Addendum to Alaska Broadband Workforce Development Plan
January 2024

Recommendation for a Long-Term Investigation of Alaska Broadband Economic Impact by Community

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

Given the expected benefits, 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 annually thereafter until 2030. This would include calculating a baseline and an annual ICT development index (or similar) for each Alaska community.

The economic data collection for baseline and for each subsequent 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.