# Creating and Expanding
# a Diverse Broadband Workforce
# with Good Jobs and Career Pathways:

## *Broadband Equity, Access, and Deployment (BEAD) Program Playbook for Eligible Entities*

**June 22, 2022**

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## Acknowledgements

## Executive Summary

The Infrastructure Investment and Jobs Act of 2021 allocated a one-time $65 billion investment in broadband, $42.45 billion of which is for the Broadband Equity, Access, and Deployment (BEAD) Program. The BEAD Program "provides federal funding for grants to Eligible Entities for broadband planning, deployment, mapping, equity, and adoption activities."[1] On May 13, 2022, the National Telecommunications and Information Administration, an agency within the Department of Commerce, issued a Notice of Funding Opportunity (NOFO) for the BEAD program, outlining requirements and recommendations for Eligible Entities applying for funding.

The BEAD NOFO has included workforce development as a critical component of state plans and applications for funding—and appropriately so, as creating good jobs and developing the broadband workforce necessary to deliver on this historic investment is a critical first step for any state or territory seeking to expand broadband to its unserved and underserved residents. Most states have not yet prioritized a workforce development strategy to support broadband implementation, and the Department of Commerce is absolutely right to require a workforce plan as part of larger broadband plans needed to secure federal funding. Without a job-ready workforce on needed timelines, projects may be delayed over the long term or, worse, impossible to realize.

A deep dive into the research—and interviews with several dozen key stakeholders in the field—makes several points clear. First, we as a nation likely do not have a large or diverse enough workforce to make good on this investment—without taking significant steps, including engaging unemployed and underemployed workers from this sector and adjacent sectors. This is especially true in the communities and regions that need it the most. Moreover, the country will need to grow and diversify the current broadband workforce, including by re-engaging workers who have left the field, to meet the steep and sudden increase in broadband funding. Finally, workforce development, if not appropriately addressed now, will be a bottleneck issue for expanding broadband to the millions of people who need it.

While the first edition of this report is intended primarily for states and territories (Eligible Entities) applying for BEAD Program funding, it is also intended for a range of audiences who will have a role

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1       BEAD NOFO (Section I—page 5)

to play, including federal agencies, philanthropy, employers, employer associations, organized labor associations, nonprofit organizations, institutions of higher education, and more.

Specifically, this report examines the Five-Year Action Plan requirement in the Department of Commerce's NOFO, as well as the subsequent Initial and Final Proposals, due later in the application process. It then recommends six categories of important steps applicants should consider taking, beginning immediately. The six steps include:

1. Appoint a Broadband Workforce Director and Staff and Develop a Broadband Workforce Strategic Plan;
2. Convene Employers and Other Key Stakeholders To Advance Meaningful Collaboration and Mutual Commitments;
3. Collect, Analyze, and Use Current and Needed Broadband Workforce Data;
4. Identify Additional Funding Sources to Support Broadband Workforce Development;
5. Working with Employers, Build and Scale Evidence-Based Programs and Practices with Measurable Job Outcomes to Train New and Existing Broadband Workers; and
6. Recruit And Grow A Skilled, Diverse Broadband Workforce

One central recommendation in this report is to deploy and align workforce systems and programs, measured partly by employment outcomes, to support specific projected hiring needs for broadband implementation. A second recommendation is to bring employers to the table, intermediaries that work with multiple employers, and the workers themselves—working in partnership to create a broadband workforce development ecosystem that benefits employers, workers, and residents in need of broadband alike, ultimately bringing the country closer to the goal of high-speed internet access for all.

To do so, states and the federal government should secure meaningful commitments from employers to help make this strategy successful—and provide employers with a coherent, value-add approach. This includes understanding and addressing employer hiring needs and needed skills and competencies; supporting intermediaries that provide needed technical assistance and coordination support to employers; connecting employers with education and training providers who support those hiring needs while collaborating in building programs and curricula effectively serving diverse populations; measuring program impact on employment outcomes; integrating learning and educational programming into participants' schedule and daily work; and aligning funding to effective programs.

Employer commitments can help make a workforce strategy a success. Examples of employer commitments include:
- Establishing contingent hiring goals;
- Reviewing and modifying HR policies to ensure inclusive practices;
- Helping form or support collaboratives/intermediaries to address and help coordinate shared workforce needs and provide technical assistance to employers;
- Engaging in a sector partnership to expand broadband career pathways and develop consistency across employers on needed hiring levels by type of job and skillset, job titles, required skills, certifications, and education levels;

- Partnering with local community colleges and other higher education and workforce providers;
- Providing easy to access scholarships and earn and learn opportunities to help individuals, particularly from low-income or underrepresented backgrounds; and
- Providing in-kind participation of senior leaders.

Moreover, any workforce strategy for broadband should not only address the needs for hiring workers for federally funded projects—but should ensure the skilled, diverse workforce needed to support universal broadband implementation. While federal implementation funding will focus on support for federally funded projects, a state's broader workforce strategy should be looking ahead to broader and longer term broadband needs for states and territories—not just on how to meet the needs of the BEAD Program investments. Broadband is and will be a bigger endeavor than this historic investment.

This report is a nonpartisan, independent and objective analysis on the best methods of creating and expanding the nation's broadband workforce. It is intended to provide a full and fair exposition of the relevant facts to enable Eligible Entities as well as other key stakeholders, to form an independent opinion of the issues raised. It does not express a point of view on any specific legislative proposal but does discuss a variety of actions that should be considered to ensure that a skilled and diverse pool of broadband workers is available. This report is intended to be *catalytic*. It presents, in brief, the key issues and opportunities, which can be further developed and explored in greater depth by key stakeholders.

# I. Methodology

This report draws on desk research, one-on-one consultation, and three advisory sessions with more than 30 stakeholder organizations from the public, private, non-profit and philanthropic sectors at the national, state and local level. These stakeholders include national, state and local government officials responsible for broadband deployment and workforce development; employers and industry associations; unions and worker-serving organizations; community colleges and other training providers; and organizations representing rural communities, Black and Indigenous people of color, and other communities of color.

This report does not take a position on which technical approaches are best to expand broadband availability. While those are crucial topics, this report focuses exclusively on the importance of a workforce strategy and what actions may be most effective in ensuring that a skilled and diverse workforce is available regardless of the technical solutions chosen by states and other stakeholders.

## II. Key Definitions

**BEAD Program:** The Broadband Equity, Access, and Deployment (BEAD) Program, created by the Infrastructure Investment and Jobs Act of 2021 (IIJA), provides $42.45 billion to expand high-speed internet access by funding planning, infrastructure deployment and adoption programs in all 50 states, Washington D.C., Puerto Rico, the U.S. Virgin Islands, Guam, American Samoa, and the Commonwealth of the Northern Mariana Islands.[2]

**Broadband/Broadband Network:** The BEAD Program defines broadband as "a mass-market retail service by wire or radio that provides the capability to transmit data to and receive data from all or substantially all internet endpoints, including any capabilities that are incidental to and enable the operation of the communications service, but excluding dial-up internet access service. This term also encompasses any service that the [FCC] finds to be providing a functional equivalent of the service described in the previous sentence or that is used to evade the protections set forth in this part."[3]

**Broadband Industry:** According to the Federal Communications Commission (FCC), the term broadband commonly refers to "high-speed internet access that is always on and faster than the traditional dial-up access." This includes several high-speed transmission technologies such as:
- Digital Subscriber Line (DSL)
- Cable Modem
- Fiber
- Wireless
- Satellite
- Broadband over Powerlines (BPL)[4]

For the purposes of this report, the term "broadband industry" is a subsection of the telecommunications sector and includes any and all organizations working to build, maintain, operate, and/or administer high-speed internet. This includes, but is not limited to private Internet Service Providers (ISPs)[5] and publicly run, municipal high-speed internet.

**Broadband Workforce:** This report uses "broadband workforce" to refer to workers directly engaged in the physical construction, maintenance, operation, administration, or sale of the broadband network or services of the network. However, it should be noted that the BEAD NOFO defines "project workforce" as those employees of the subgrantee, its contractors, or subcontractors directly engaged in the physical construction of the broadband network."[6] Some BEAD funds can also be used to staff an Eligible Entity's broadband coordinating office (more below) and some discussion is included regarding this staffing.

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2       Department of Commerce
3       BEAD NOFO (Section I.B.2.C.c—page 11)
4       Federal Communications Commission
5       This may include larger telecommunications providers who provide additional services in addition to high-speed internet.
6       BEAD NOFO (Section IV.C.1.e—page 58)

**Eligible Entity:** As defined in the BEAD NOFO, refers to "any State of the United States, the District of Columbia, Puerto Rico, American Samoa, Guam, the U.S. Virgin Islands, and the Commonwealth of the Northern Mariana Islands or, in the case of an application failure, a political subdivision or consortium of political subdivisions that is serving as a Substitute Entity."[7]

**Employers:** This report discusses in detail the important role that employers will play in a broadband workforce development strategy. While employers in this field (and therefore the eventual BEAD Program contractors and subcontractors) will largely consist of Internet Service Providers (ISPs) they are not limited to ISPs and may include other organizations whose workers will assist in the physical construction of the broadband network.

**Good Job:** The Department of Commerce describes a good job (alternatively: "quality job" or "high-paying job") as "a job that exceeds the local prevailing wage for an industry in the region, includes basic benefits (e.g., paid leave, health insurance, retirement/savings plan) and/or is unionized, and helps the employee develop the skills and experiences necessary to advance along a career path. 'Prevailing wage' is defined by the Department of Labor as 'the average wage paid to similarly employed workers in a specific occupation in the area of intended employment.'" For further framework, see the Urban Institute's *Understanding Good Jobs: A Review of Definitions and Evidence* report.

**High-Speed Internet:** The IIJA requires a "minimum of 100 Mbps download speeds and 20 Mbps upload speed to ensure Americans can effectively access the most innovative products and services in the digital marketplace."[8]

**Intermediary:** in this document, we use the term intermediary to refer to any entity—non-profit organization, governmental agency or office, workforce board, quasi-governmental agency, labor organization, industry association, or higher education system or institution—that proactively addresses workforce needs of employers and trainees/workers and helps connect the different pieces of the broadband workforce ecosystem, in service of increasing capacity of the workforce to meet broadband needs. The intermediary functions are described in more detail in the "Activating and Engaging Intermediaries" section below.

## III. Why Workforce Matters for Universal Broadband

The Infrastructure Investment and Jobs Act of 2021 (IIJA) guarantees a one-time, $65 billion investment in broadband across multiple programs, including notably $42.45 billion for the Broadband Equity, Access, and Deployment (BEAD) Program at the Department of Commerce, to help ensure that every American has access to reliable high-speed internet through a historic investment in broadband infrastructure deployment. The Act will also help lower prices for internet service and help close the digital divide, so that more Americans can afford and connect to internet access.[9] When it comes to broadband and a number

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7  BEAD NOFO (Section J—page 2–3)
8  The US Chamber of Commerce (4/14/22)
9  The White House (11/6/2021)

of other investment areas, the IIJA, "offers an unprecedented opportunity to accelerate momentum around careers that pay higher wages, require shorter-term credentials, and need a new generation of talent."[10]

This investment comes at a time when nearly 20 million people (and perhaps as many as 40 million people) from all backgrounds lack access to even low-grade broadband. (More precise maps are on the way—the FCC is updating its current broadband maps with more detailed information on the availability of fixed and mobile broadband services, which will be available this fall.[11]) We also know that rural, urban, Black, Brown, Native, and low-income Americans are among the most likely to face the highest barriers to access the internet. COVID-19 has made this crisis all the more urgent, as high-quality, high-speed internet has become essential for health, education, work, public safety, social connection, and more in an increasingly digital world. Furthermore, in addition to creating direct employment opportunities in planning, construction, operations, and maintenance of these broadband systems, this upcoming expansion is also predicted to lead to significant indirect job creation—new jobs made possible by the existence of broadband.

However, without a diverse and skilled labor force to deliver on these investments, and to do so quickly, the country will, at best, experience delayed deployment and at worst, fail in its mission to expand high speed internet access to all. It will also fall short in expanding access to good jobs for more people, especially those underrepresented in fields like broadband. While the majority of funds are unlikely to be dispersed until 2024, action can and must be taken now to ensure our nation has the workforce to deliver when funding is released.

Although time is relatively short, states and territories ("Eligible Entities") should have enough time to develop and begin implementation of a broadband talent and workforce development strategy that can meet the needs of increased investment in Broadband expansion. Once funding is obligated, Eligible Entities will have to meet a certain deadlines to allocate the funds. If they fail, the Department of Commerce may reallocate the unused dollars to other Eligible Entities, so advance planning now to mobilize the necessary workforce is critical. The structure and timeline of the BEAD NOFO makes it all the more essential to act now, and quickly, to develop broadband workforce plans.

Ensuring a diverse, talented workforce for this large scale endeavor is a critical and time sensitive challenge. While a more up-to-date, detailed analysis of state-by-state workforce needs and capacities will be recommended in this report, available projections and research point to a burgeoning, unmet need for more broadband workers. Additionally, with other infrastructure funding, there will likely be increased competition for workers, even with previously laid off workers re-entering the field.

A 2020 report on broadband workforce readiness from the FCC's Broadband Infrastructure Deployment Job Skills and Training Opportunities Working Group found that considerable doubt had arisen among

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10      The Brookings Institution (2/23/22)
11      The IIJA requires NTIA to use the Federal Communications Commission's (FCC) new broadband maps, when they are
        available, to determine whether a location is unserved or underserved and therefore eligible for funding from the BEAD
        program. NTIA should not award funds until the FCC's broadband maps are completed, with challenges adjudicated.
        (U.S. Senate Committee on Commerce, Science & Transportation, 04/26/22)

broadband infrastructure industry stakeholders as to whether they can meet build-out projections due to current workforce challenges. A few months later, a March 2021 Brookings Institution report looked at the impact of a proposed $80 billion broadband infrastructure investment. According to their analysis, "this spending would create approximately 200,000 job-years in about 130 occupations, principally in Installation, Maintenance, and Repair occupations." As the analysis points out, many of these jobs might be filled by tapping into the pool of underemployed and unemployed workers who have prior experience in the broadband field, and those groups should be prioritized in outreach and hiring.

However, the realities of an aging workforce, the expanding number of alternative job opportunities in adjacent occupations (particularly in other infrastructure-related areas), and the continued growth in other public and private investments into broadband, reflect the need to fill many more jobs in the coming years and the opportunity to do so by providing expanded broadband career opportunities to a more diverse population.

Compared to early 2021 when the Brookings analysis was completed, the 2022 economy looks different with unemployment rates cut nearly in half. As of April 2022, "job openings and the number of people leaving a job voluntarily are near record highs. Wage growth is its strongest in years as businesses compete for talent."[12] An updated analysis on a $42.45 billion investment in today's economy is a critical first step.

Even as unemployment rates have decreased to near pre-pandemic levels, many groups are still disproportionately facing employment issues—including people of color, women, and young workers. And while rural employment has generally rebounded since taking a dive during the pandemic, labor force participation in rural communities has fallen more than in metro areas (and had not recovered from the Great Recession when the pandemic hit). At the same time, many industries are reporting difficulties finding workers. While the "Great Resignation" has garnered significant attention, most workers taking part are quitting low-wage work, and most already have new jobs lined up when they leave their current jobs. However, other workers are leaving the job market altogether (like retiring baby boomers) or are getting pushed out by a lack of support (like working parents facing a child care squeeze).

It is clear that the broadband workforce will need to grow to meet the needs spurred by the BEAD program, among other large-scale federal and state investments. To meet that need, stakeholders such as states, training providers, and employers should also be focused on expanding the talent pool by increasing the diversity of the broadband workforce. At present, "the typical broadband worker is a prime-age (25 to 54 years old) non-Hispanic white male without a four-year college degree. Compared to the general workforce, broadband workers are more male, older, and have less formal education; they are also better paid, more likely to work full-time, more likely to be represented by a union and face lower barriers to entry."[13]

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12      CNBC (04/07/22)

13      The Brookings Institution (03/17/2021)

The telecommunications sector, like many other sectors,[14] is also struggling with a retiring workforce without enough new, younger workers coming in to replace them. As the FCC notes, "roughly 10,000 baby boomers are reaching the standard retirement age on a daily basis. [...] Telecommunications employees are aging and that could jeopardize the sector's future. There are too few younger employees with sufficient experience to fill the positions within the telecom sector. Workforce turnover is an especially tricky issue for field operations."

Expanded investment in workforce training to create widespread, well-paid jobs is also widely popular—including broadband specifically. According to a 2021 Gallup poll, a strong bipartisan majority (93%) of the public supports a large-scale, ambitious plan to pay people to work and provide them with the skills needed for jobs of the future. Investing in broadband and its workforce has nearly 90% support from both sides of the aisle.[15]

Moreover, any workforce strategy for broadband should not only address the needs for hiring workers for federally funded projects—but should ensure the skilled, diverse workforce needed to support universal broadband implementation. While federal implementation funding will focus on support for federally funded projects, a state's broader workforce strategy should be looking ahead to broader and longer term broadband needs for states and territories—not just on how to meet the needs of the BEAD Program investments. Broadband is and will be a bigger endeavor than this historic investment.

And while the largest tranche of BEAD Program funds may not be dispersed for a year or more and much hiring will be subsequent to that, now is the time to build and launch plans so that all stakeholders are ready to take on this investment and develop the pipelines of talent needed to make this work. In the next section, this report will explore how a variety of actions can be taken to help prepare for the investments that will soon be made in broadband nationwide. When actions are taken together, states, territories, regions, employers, workers, and other stakeholders will all benefit.

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14    "The increasing share of people ages 65 and older contributes to a projected labor force growth rate that is slower than much of recent history, as well as a continued decline in the labor force participation rate, because older people have lower participation rates compared with younger age groups." Bureau of Labor Statistic, U.S. Department of Labor, (09/08/21)

15    Nearly 90% of respondents consider "Expanding access to high-speed internet to people without current access" to be a medium to high priority for a jobs and training initiative. This includes 80% of respondents who identify as a Republican and 97% of respondents who identify as a Democrat.

# IV. BEAD Program Notice of Funding Opportunity (NOFO): Eligible Entities Guide

On May 13, 2022, The Department of Commerce released the Notice of Funding Opportunity (NOFO) for the BEAD Program, with an aim to prioritize expanded internet access to unserved (no access to 25/3 Mbps) and underserved (no access to 100/20 Mbps) locations. A timeline for the program's application components is detailed below.
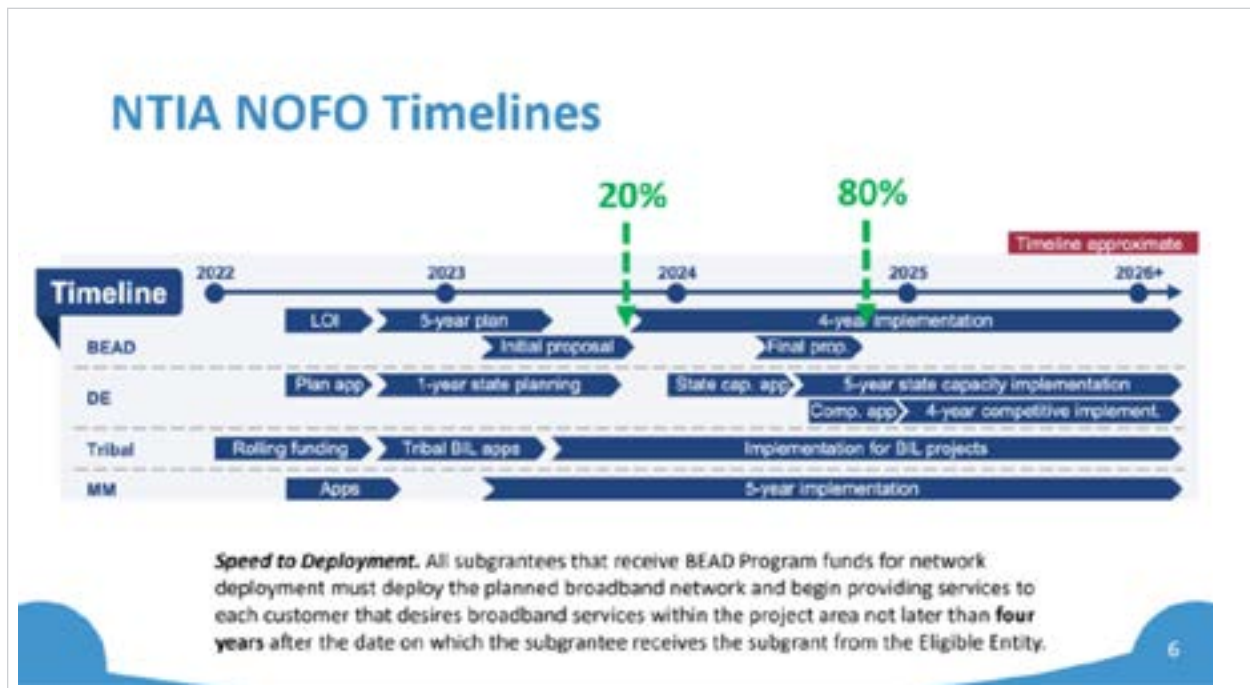


Note: 20% and 80% represent the percentage of the distribution of funds to subgrantees.
Source: Fiber Broadband Association

**NOFO Key Requirements**
This section lists key requirements and dates for Eligible Entities preparing to take part in the BEAD Program. Full requirements are listed in the NOFO, with a summary on page 10 of the NOFO.
A high-level synopsis is provided below:

- **Letter of Intent & Initial Planning Funds:** As a first step, Eligible Entities must submit a Letter of Intent by July 18, 2022. Either with that letter or afterwards, entities may submit a request for Initial Planning Funds.[16] This request must be submitted by August 15, 2022 Various aspects of

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16    "Each State may request up to $5,000,000 of its minimum allocation in Initial Planning Funds. American Samoa, Guam, the U.S. Virgin Islands, and the Commonwealth of the Northern Mariana Islands each are eligible to receive a minimum allocation of $25,000,000. Each of those territories may request up to $1,250,000 of its minimum allocation in Initial Planning Funds. Not less than twenty percent of the total allocation for a State or Territory will be made available at the approval of the Initial Proposal with remaining funds released upon approval of the Final Proposal." BEAD NOFO
(Section K—page 3)

workforce development (both planning and direct action) can fall under eligible uses of these funds For more information on workforce development and Initial Planning Funds, see Appendix A.

- **Five-Year Action Plan:** Eligible Entities receiving Initial Planning Funds must submit a Five Year Action Plan within 270 days of receipt of those funds that "establishes the State or Territory's broadband goals and priorities and serves as a comprehensive needs assessment that will inform the State or Territory's Initial Proposal."[17]

  As noted in the NOFO, "Preparing a Five-Year Action Plan gives Eligible Entities the opportunity to identify their communities' broadband access, affordability, equity and adoption needs and to adopt strategies, goals and initial measures for meeting those needs using BEAD and other funds."[18]

  The NOFO significantly expands upon the requirements included in IIJA with respect to what Eligible Entities must include as part of their Five-year Action Plan. In particular, the NOFO requires Eligible Entities to provide comprehensive strategies related to ensuring an adequate workforce to drive the deployment of broadband across the country.

- **Initial Proposal:** The BEAD Program also requires Eligible Entities to submit an Initial Proposal, which is informed by the Five-Year Action Plan. This proposal also includes specific elements related to workforce development which ligible Entities must address. Initial Proposals are due 180 days from receipt of the Notice of Available Amounts.[19] Of particular note, the Initial Proposal must "describe the competitive process the Eligible Entity proposes to use to select subgrantees to construct broadband projects."[20] Several aspects of this competitive  process relate to having a highly skilled broadband workforce.[21]

- **Final Proposal:** After selecting subgrantees and executing an approved Initial Proposal, Eligible Entities must submit a Final Proposal "describing how it complied with that Initial Proposal and the results of its processes." NTIA will award the remaining funds upon approval of the Final Proposal. "Prior to submission to NTIA the Final Proposal must be made available for public comment."[22]

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17      [BEAD NOFO](#) (Section IV.B.3—page 25)

18      [BEAD NOFO](#) (Section IV.B.3.b—page 26)

19      "On or after the date on which the Broadband DATA Maps are made public, the Assistant Secretary will notify each Eligible Entity of the estimated amount of funding that NTIA will make available to the Eligible Entity under the Program (Notice of Available Amounts) and invite the submission of an initial grant proposal (Initial Proposal) and a final grant proposal (Final Proposal)." [BEAD NOFO](#) (Section IV.B.4.b—page 28)

20      [BEAD NOFO](#) (Section I—page 5)

21      "In drafting its Initial Proposal, an Eligible Entity should keep in mind that it may allocate grant funds for the following: [...] 3. Data collection, broadband mapping, and planning to the extent necessary beyond the planning fund allocation to facilitate the goals and deliverables of the BEAD Program; [...] 6. Training and workforce development;" ([BEAD NOFO](#) Section IV.B.5.b)

22      [BEAD NOFO](#) (Section IV.C.1.c.iv—page 55)

**The NOFO Playbook: Opportunities for Action**

This section outlines six workforce-related planning suggestions and requirements for state leaders to take, aligned with the NOFO and focused on the Five-Year Action Plan. It should be noted that while the Five-Year Action Plan is only one part of the requirements for Eligible Entities (see timeline chart above), it is (after the letter of intent, which many entities have already submitted) also the most immediate requirement. Additionally, the Initial and Final Proposals will significantly be built upon the work in the Five-Year Action Plan.

Each of the six categories details, where applicable:
- Alignment to the Five-Year Action Plan requirements;
- What success looks like;
- Suggested strategies for responding to plan requirements;
- Examples of those doing this or similar work;
- Ideas for how other stakeholders can help (where applicable); and
- Flags for related requirements in the Initial Plan and Final Plans, due later in the BEAD Program application process (where applicable).

Those six categories are as follows:
1. Appoint a Broadband Workforce Director and Staff and Develop a Broadband Workforce Strategic Plan;
2. Convene Employers and Other Key Stakeholders To Advance Meaningful Collaboration and Mutual Commitments;
3. Collect, Analyze, and Use Current and Needed Broadband Workforce Data;
4. Identify Additional Funding Sources to Support Broadband Workforce Development;
5. Working with Employers, Build and Scale Evidence-Based Programs and Practices with Measurable Job Outcomes to Train New and Existing Broadband Workers; and
6. Recruit And Grow a Skilled, Diverse Broadband Workforce

While the NOFO does not explicitly require these actions or strategies, incorporating the points detailed in this section can help Eligible Entities create a larger, more diverse broadband workforce. Additionally, while some strategies may be operationalized simultaneously, they appear in a suggested order. And while the Department of Commerce has not yet established more specific guidelines for what should be included in a workforce plan, we hope and recommend they will do so.

Lastly, some of the suggested actions detailed below may fall into multiple categories, but for organizational purposes they are each listed under only one category. Many of the actions, by nature and by best practice, benefit from an interdisciplinary approach and will produce outcomes in more than one category or are intertwined with other categories.

## 1. APPOINT A BROADBAND WORKFORCE DIRECTOR AND STAFF AND DEVELOP A BROADBAND WORKFORCE STRATEGIC PLAN

> **Five-Year Action Plan Requirement:**
> *"Identify the current full-time and part-time employees of the Eligible Entity who will assist in implementing and administering the BEAD Program and the duties assigned to those employees, as well as any existing contracted support, and any planned expansion of employees or contractors."*
>
> ([NOFO](#) Section IV.B.3.b.4—page 26)

*What Success Looks Like: A central broadband office or agency with designated staff working to coordinate workforce development specifically for broadband jobs in the Eligible Entity. Success includes working closely with employers to understand the needs of the current and future workforce and creating/ scaling up training efforts to meet those needs and connect workers to jobs and career pathways. This director staff could also work closely with an outside intermediary to execute the points in this report. Ultimately, the Eligible Entity should be able to ensure a diverse, trained workforce to deliver on state broadband deployment in time for the deployment of funds.*

**Suggested Strategies for Responding to Plan Requirements:**
The NOFO requires Eligible Entities to identify their "current full-time and part-time employees who will assist in implementing and administering the BEAD Program and the duties assigned to those employees as well as any existing contracted support, and any planned expansion of employees or contractors…". In fulfilling this requirement, Eligible Entities should include those employees who will help ensure the planning and implementation of the many workforce-related needs and requirements spelled out in the overall NOFO. Specifically, Eligible Entities should:

- **Designate or hire a broadband workforce director (or similar position)**.
  This director's job is to work on and coordinate a broadband workforce strategy for the Eligible Entity. This central point of contact could be the head of or part of a state broadband office (or working closely with them), and preferably inside of the Governor's Office—from where all broadband work, including broadband workforce is coordinated. This person should have extensive workforce development expertise and additional support staff with workforce development expertise should be hired or assigned to serve in this office as well.

- **Identify the duties of the director/staff**. This should include leading the effort to create a broadband workforce plan [as required under the BEAD NOFO and set clear objectives and how the office will go about the work, with key elements including:
  - Deciding which responsibilities and/or workstreams will be led and/or executed by the broadband office and what will be done in partnership with an intermediary partner, if applicable (see more below).

- ○ Collaborating with other state agencies such as Departments of Labor, Departments of Education, Economic Development Agency, Departments of Budget, Chief Technology Officers, and others including Workforce Development Boards (WDB) (see here to find WDBs by location)[23] on various aspects of the broadband workforce plan. Examples include:

  - Coordinating with state labor market offices (full list here) so that broadband funding is taken into account when updating state and local job projections; and
  - Leveraging other sources of state and federal funding available to the ligible Entity (more below);

- ○ Working with relevant state legislative committees tasked with broadband expansion;
- ○ Mapping public and private assets across the state with respect to resources and capacity able to contribute toward building a broadband workforce.
- ○ Identifying and understanding the evidence base for what works in workforce development and best practices in broadband workforce training
- ○ Executing data collection and an analysis of the current workforce data and predicted workforce needs, given increased funding, plus a plan for how to collect and use data in ongoing basis;
- ○ Convening and working closely with employers, industry groups, unions, and other community-based organizations to build the diverse, expanded workforce that will be needed to execute state broadband projects; and
- ○ Identifying and initiating best practices for outreach, recruitment, and retention of a diverse group of new broadband workers, including pathways for career advancement within the field.

- **Leverage initial planning funds to build broadband workforce staff.** One of the uses of Initial Planning Funds is listed as "Training for employees of the broadband program or office of the Eligible Entity or employees of political subdivisions of the Eligible Entity, and related staffing capacity or consulting or contracted support to effectuate the goals of the BEAD Program."[24] This funding could help set up any initial broadband workforce staff needed immediately, while five year plans are being put together.

- **Consider contracting out certain functions through intermediaries.** Non-government or quasi governmental intermediaries can play an important organizing and coordinating role for expanding the broadband workforce. While some Eligible Entities may employ or partner with intermediaries, it is still recommended that states and territories designate a central broadband workforce director who is responsible for managing the partnership. For more on how intermediaries can play an important role, see below and also "Activating and Engaging Intermediaries."

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23      WDBs direct federal, state, and local funding to workforce development programs. They also oversee the American Job Centers, where job seekers can get employment information, find out about career development training opportunities, and connect to various programs in their area.

24      NOFO Section IV.B.1.b.2—Page 24

- **Ensure the director coordinates the development of the workforce plan aligned to broadband needs.** While many partners should be involved in the development of this plan, the director should be charged with and supported to oversee the development of the plan. This plan should include all of the elements outlined in this report.

*Examples*

- [The Ohio Broadband Strategy](#) includes significant workforce development, led by a central coordinator from the Governor's Office of Workforce Transformation. In its 2021 [Broadband Workforce Strategy Report](#), Ohio listed one of their key goals was to identify an executive branch state agency to house a state broadband office," adding that "the current internet landscape is decentralized in Ohio. No single agency or office has full oversight over internet expansion within the state. The administration will create a new office of broadband in order to optimize expansion efforts and leverage federal programs to expand internet access. This office may serve as a single contact point for state agencies and program managers as well as private businesses and internet providers as they work to expand high-speed internet in Ohio."

- [Vermont Community Broadband Board](#) was established in 2021 and works to develop policies and programs to accelerate community efforts that advance the State's goal of achieving universal access to reliable, high-quality, affordable, fixed broadband achieving speeds of at least 100 Mbps symmetrical. It is led by an Executive Director who is also leading workforce development.

- [Wisconsin Governor's Task Force on Broadband Access](#) advises the Governor and State Legislature on broadband actions and policy, including strategies for expanding high speed internet access to every residence, business, and institution in the state; initiatives for digital inclusion; and pathways to unlocking and optimizing the benefits of statewide, affordable access to broadband for all communities in Wisconsin. It is led by an Executive Director who is also leading workforce development.

*How Other Stakeholders Can Help*

- **Outside (non-governmental or quasi governmental) intermediaries,** as described above, can work closely with state broadband offices and broadband workforce directors to carry out some or all of the actions laid out in the report below, including analyzing workforce needs and the corresponding skills/credentials, finding and scaling workforce development programs aligned with employer needs, working with communities to recruit a diverse workforce and provide career navigation and wraparound support for workers, convening and working with employers, training workforce staff on broadband issues, and convening community partners to accomplish these tasks. (See above, as well as "[Activating and Engaging Intermediaries](#)" for more.)

## 2. CONVENE EMPLOYERS AND OTHER KEY STAKEHOLDERS TO ADVANCE MEANINGFUL COLLABORATION AND MUTUAL COMMITMENTS

**Five-Year Action Plan Requirement:**
*"Include a description of the Eligible Entity's external engagement process, demonstrating collaboration with local, regional, and Tribal (as applicable) entities (governmental and nongovernmental) and reflective of the local coordination requirements outlined herein, including outreach to underrepresented communities and unions and worker organizations. The engagement required must be undertaken both during the development of the Five-Year Action Plan itself and following submission of the plan, reflecting ongoing collaboration throughout the BEAD Program."*

(NOFO Section IV.B.3.b.7—Page 26)

*"1. Eligible Entity Obligations [...]*

*c. Local Coordination*

*Each Eligible Entity must develop a comprehensive local coordination approach that will begin in the development of the Five-Year Action Plan and continue at each stage of the BEAD Program through the awarding of all subgrant funding. Local and Tribal coordination and stakeholder engagement is critical to the BEAD Program's success, to eliminating barriers to broadband access and adoption, and to rapidly and economically building out new broadband networks. […]*

*In evaluating whether local coordination and outreach efforts meet the programmatic requirements, the Assistant Secretary will assess whether plans and activities undertaken ensure: […]*

*(2) meaningful engagement and outreach to diverse stakeholder groups, labor organizations, and community organizations, including to promote the recruitment of women and other historically marginalized populations for workforce development opportunities and jobs related to BEAD-funded eligible activities; [...]."*

(NOFO Section IV.C.1.c—Page 51–52)

*"Throughout its local coordination and outreach activities, each Eligible Entity must ensure that a diverse set of stakeholders is involved in development of its Five-Year Action Plan, Initial Proposal, and Final Proposal. To the extent the Eligible Entity encompasses sovereign Tribal or Native entities, the Eligible Entity must ensure that such entities are involved in development of the Eligible Entity's plans, including, but not limited to a formal Tribal consultation process with the Eligible Entity. In addition, Eligible Entities must coordinate with local stakeholders—such as entities that carry out workforce development programs and labor unions— to provide a written explanation of their approach to ensuring a reliable supply of skilled workers, eliciting feedback on plans for creating good-paying jobs, and to recruiting and hiring women and other historically marginalized groups for the job opportunities created through the BEAD program."*

(NOFO Section IV.C.1.c.ii.—Page 53)

*What Success Looks Like: Eligible Entities working to build their broadband workforce should convene employers as the primary partners in this effort to understand (current and projected hiring needs that employers have in their state or territory and the necessary training, skills, and competencies that those jobs will require. Employers can also help develop and clarify career pathways (see more in #6). Other key stakeholders such as community groups, unions, Tribal governments and others will also play key roles in developing and executing an inclusive growth strategy that meets the needs of the Eligible Entity's broadband expansion projects.*

**Suggested Strategies for Responding to Plan Requirements:**

The NOFO requires Eligible Entities to describe the external engagement process they will take with a diverse set of stakeholders, in both developing their Five-Year Action plan as well as upon submission of the plan, the Initial Proposal and Final Proposal. This must include a "written explanation of their approach to ensuring a reliable supply of skilled workers, eliciting feedback on plans for creating good-paying jobs, and to recruiting and hiring women and other historically marginalized groups for the job opportunities created through the BEAD program."[25] The activities below could be carried out directly by the Eligible Entity or by a partner intermediary on behalf of the Eligible Entity. In carrying out this requirement Eligible Entities should consider:

## Coordination And Collaboration

- **Develop a comprehensive list of the specific external stakeholders most critical for contributing to the design, development and success of the plan.** (These groups will also be useful in recruitment of workers.) This includes but is not limited to those representing:
  - Employers, including:
    - State leadership of major, multi-state ISPs, including cable companies (e.g., Comcast, Cox, Charter), incumbent telephone companies (e.g., Windstream, Frontier, AT&T), and wireless providers (e.g., T-Mobile, Verizon, AT&T)
    - Owners of small, single-state regional ISPs, including RLECs and Electric Cooperatives offering broadband service
    - Owners of broadband construction contractors and installation/technician contractors
    - Owners of major electric companies (these entities often have significant lineworker shortages for key broadband-adjacent deployment tasks such as make-ready)
    - Owners of broadband electronics and materials manufacturers
  - Employer associations including state and local Chambers of Commerce and state business roundtables
  - Organized labor groups
  - Community colleges and other public and private broadband workforce training centers (who have shortages in instructor positions) other training providers and their relevant associations
  - Secondary schools (particularly representatives of Career and Technical Education programs and Dual Enrollment)
  - Trade associations

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- Community-based organizations
- Rural groups such as Rural Electric Cooperatives
- Local governments
- State and Local Workforce Development Boards
- Economic Development Agencies
- Potential workers from underrepresented communities and areas without access to high-speed internet
- Economic development organizations

- **Describe the specific types of information being sought from stakeholders.** For example, input should include insight on:
  - *Macro-workforce needs, pathways and credentials*
    - The workforce and skill needs of the broadband workforce;
    - Examples or strategies to align program degrees and certificates being offered with what is most in demand as verified by employers; and
    - How local workforce systems, including One-Stop Career Centers and Employment Service offices can play a key role in providing accurate and updated labor market information, job openings and training opportunities for those seeking a broadband career.
  - *Training providers and programs*
    - Strategies for connecting employers to potential training providers; and
    - Successful training programs and how Registered Apprenticeship sponsors and apprenticeship intermediaries, can provide standards for training leading to national credentials and career advancement.
  - *Increasing the talent pool*
    - Ideas on how to broaden awareness of broadband careers and expand recruitment of especially women and other historically marginalized groups;
    - Barriers for individuals seeking a broadband career and potential ways to address such barriers (e.g. access to training; supportive services to enable participation in a training program; career support to better understand careers pathways);
    - How community organizations, non-profits, intermediaries and others coordinate efforts to highlight and create opportunities related to broadband careers, especially for "non-traditional" populations; and
    - Working directly with Tribal groups to connect with their workforce offices and build relationships that can help find and train new broadband workers, especially in areas where broadband will be built.

- **Develop on-going lines of communications vs. a single opportunity for input from external groups.**
  For example:
  - Developing an online "suggestion box" as part of the State's broadband office website and linked to relevant stakeholder websites to enable input throughout the process; and
  - Convene directly or through intermediaries, multiple, state, regional and local convenings of stakeholders to facilitate input and generate ideas.

- **Establish targeted working groups to take on some of the most pressing issues related to building a diverse broadband workforce.**

- **Enable public comments to multiple draft versions of the plan to demonstrate commitment to stakeholder input.**

- **Make opportunities for external input specific to workforce issues and not solely as part of general input being gathered on the Five-Year Action Plan.**

*Examples*

- **Alaska's** State Broadband Plan (November 2021) seeks to lift up broadband infrastructure projects that include support for local workforce development, and encourages the State to "partner with existing workforce development programs offered through the university system, technical schools, or apprenticeships. Opportunities to partner with broadband companies to develop job-shadowing programs or other types of training should be pursued."

- **California's** State Broadband Plan (2020) calls for a "multi-layer network of digital inclusion stakeholders to discuss ongoing needs," including workforce development and schools.

- In June 2022, the office held their first Broadband and 5G Sector Partnership meeting. The "Strengthening **Ohio**'s Broadband & 5G Workforce" Strategy (September 2021) underscores the significant public and private investments being made in broadband and 5G at the state and federal level, which in turn is expected to create tens of thousands of jobs in Ohio over the next decade. To ensure that Ohio has a skilled and prepared workforce to fill these kinds of jobs, the strategy outlines a plan for increasing broadband industry career awareness and creating more training and education programs in the state.

*How Other Stakeholders Can Help*

- All the groups mentioned above will play important roles in building an inclusive, diverse broadband workforce strategy. Intermediaries can also play a critical role in helping to bring these groups together and/or leading this work.

## Employer Commitments

**To make this collaboration and mutual commitments effective, states should secure meaningful commitments from employers—and provide employers with a coherent, value-add approach that would help translate those commitments into results.**

To encourage and support employer commitments, states should take on several recommendations outlined in this report. This includes understanding and addressing employer hiring needs and needed skills and competencies; supporting intermediaries that provide needed technical assistance and coordination support to employers; connecting employers with education and training providers who support those hiring needs while collaborating in building programs and curricula effectively serving diverse populations; measuring program impact on employment outcomes; integrating learning and

educational programming into participants' schedules and daily work; and aligning funding to effective programs.

To ensure employer commitments, states can ask and support employers to do the following:

- **Establish an initiative to secure workforce-related commitments from employers within the state likely to play the greatest role in deploying broadband.** The Eligible Entity and any partner intermediary should strongly consider providing technical assistance to employers to assist them in implementing the commitments described below. Examples of such commitments to consider are:

  - *Employers Supporting, Diversifying, and Expanding Broadband Talent Pipelines*
    - Establish contingent hiring goals to increase job opportunities for historically underrepresented populations;
    - Review HR policies for inclusive practices, including but not limited to auditing and refining recruitment, selection, training, performance evaluation and promotion policies and practices;
    - Connect trainees and workers to wraparound services that support persistence and transitions; and
    - Support a statewide awareness campaign around broadband careers and opportunities, including exposure opportunities such as internships.

  - *Employers Partnering with Intermediaries and Broadband Training Providers*
    - Help form or support collaboratives/intermediaries to address shared workforce needs and provide technical assistance to employers;
    - Engage in a sector partnership to expand broadband career pathways and develop consistency across employers on needed hiring levels by type of job and skillset, job titles, required skills, certifications, and education levels;
    - Partner with local community colleges and other higher education and workforce providers on the development and implementation of broadband, and related sectors, training and certification including assisting in:
      - Articulating scaffolded accessible career pathways;
      - Co-developing curriculum and credentials to better align to in-demand; jobs and scaffolded career pathways; and
      - Providing enrollment and persistence supports for trainees and workers
      - Mentorship to trainees and early career employees;
    - Provide opportunities for retiring broadband workers (or temporary assignments of existing workers) to use their expertise to teach a new generation of employees;
    - Provide easy to access scholarships and earn and learn opportunities to help individuals, particularly from low-income or underrepresented backgrounds, afford participation in broadband related workforce development programs;
    - Provide supports for upward mobility of the broadband workforce, including:
      - Further training opportunities for current workforce; and
      - Readiness opportunities (early stage training)

- Provide in-kind participation of senior leaders, such as by having the CEO actively lend their expertise in an advisory function, and promote a professional learning community (PLC) across employers for continuous improvement and spreading best practice;
- Devote a certain percentage of broadband funding toward workforce development related to broadband;
- In addition to including tuition supports and wraparound services, consider how the program design interfaces with underrepresented groups such as women and students of color—including but not limited to:
  - How underrepresented groups are represented in materials;
  - Whether pedagogy considers different learning styles; and
  - The timing of classes and where they are held.

- **Prioritize outcomes-driven programs, by centering outcomes data collection from the start.** In addition to the labor force data collection discussed above, high-quality programs are those that have demonstrable positive outcomes for workers—training programs that successfully train and graduate a diverse group of workers who are then also finding employment in the field, with wage gains compared to their wages before training, as well as over time. Disaggregated outcomes data collection, analysis, and retooling of practices based on outcomes are critical components of high-quality training programs and "public data and accountability are critical in evaluating if workforce and skills training policies support an inclusive economic recovery."[26] Some best practices for equitable workforce training programs outcome data collection, as identified by the National Skills Coalition, include:

  - Requiring that all education and skills training programs include collection of self-reported demographic characteristics of workers so outcomes can be disaggregated by race, ethnicity, gender, English language proficiency, income, and geography;
  - Ensuring that participants in skills training programs know what demographic characteristics are being collected about them, who will have access to personally identifiable information, and how their data will be used;
  - Establishing common outcomes metrics across training programs;
  - Mandating public reporting on skills training and workforce investment outcomes;
  - Providing sufficient funding for linked education and workforce data systems; and
  - Including worker and student voices in the design and evaluation of skills training policies to increase equitable access to and outcomes for these programs.

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26    National Skills Coalition (May 2022)

*Looking Ahead*

| Initial Proposal | *See Five-Year Action Plan Requirement above, which notes a requirement for on-going stakeholder involvement.* |
|---|---|
| Final Proposal | *See the Five-Year Action Plan Requirement above.* |

## 3. COLLECT, ANALYZE, AND USE CURRENT AND NEEDED BROADBAND WORKFORCE DATA

> <u>**Five-Year Action Plan Requirement:**</u>
> *"Identify known or potential obstacles or barriers to the successful implementation of the BEAD Program and the Eligible Entity's corresponding plans to address them."*
>
> (<u>NOFO</u> *Section IV.B.3.b.5—page 26*)

***What Success Looks Like:*** *Eligible Entities develop, validate, and have access to a detailed understanding of the broadband workforce—both existing workforce and gaps employers will need to fill to successfully build broadband infrastructure within the BEAD Program timeframe. Addressing this gap is critical to developing the Five-Year Action Plan, and is the base from which a broadband workforce plan can be created—aligning funding, training programs, and recruiting efforts, including for broadband needs beyond the BEAD Program funding and timeline.*

**Suggested Strategies for Responding to Plan Requirements:**
The NOFO requires Eligible Entities to "Identify known or potential obstacles or barriers to the successful implementation of the BEAD Program and the Eligible Entity's corresponding plans to address them." Given the known challenges with respect to having a well-trained workforce able to deploy broadband, this should be among the leading topics addressed by Eligible Entities.

To fully address this challenge, eligible entities must understand the extent of their current broadband workforce (including employed, unemployed, and underemployed workers in the field), and project the size of the workforce needed to accommodate the region's anticipated broadband investments through data collection and analysis. In carrying out this effort, Eligible Entities should:

- **Build a team of workforce data experts and collaborators.** This may include:
  - State Deptartment of Labor and Deptartment of Commerce staff
  - Researchers and higher education officials and staff
  - Consultants or outside experts

- ○ Unions and/or trade associations
- ○ Training providers

- **Determine which occupations should be included in a broadband workforce study.** This may not be straightforward for several reasons:
  - ○ The nuances of broadband roles are not captured in federal job classification systems (i.e., NAICS codes) and common sources of workforce data. Should the person digging a trench from the right-of-way to a home for an installation be considered a "Construction Laborer" or "Telecommunications Equipment Installer and Repairer" or a "Telecommunications Line Installer and Repairer"? All of those titles are different federal job classifications, and all could be responsible for the task of digging the trench to the home.
  - ○ The roles that will be impacted by investments in construction extend far beyond direct construction jobs, and different jurisdictions may want to analyze different sets of job categories. For example, states with significant broadband materials production may want to include factory workers making fiber in their workforce analysis; states without materials production may not.
  - ○ Job openings in the private sector rarely match job titles as defined in the Standard Occupational Classification (SOC) system used by most federal agencies and researchers.

  Given the above points, Eligible Entities may want to consider the top 15 roles (using SOC nomenclature) impacted by broadband construction spending as a starting point:
  - ○ Construction Laborers
  - ○ Construction Managers
  - ○ Customer Service Representatives
  - ○ Electrical Power-Line Installers and Repairers
  - ○ Electrical, Electronic, and Electromechanical Assemblers
  - ○ Electricians
  - ○ First-Line Supervisors of Construction Trades
  - ○ First-Line Supervisors of Mechanics and Installers
  - ○ Miscellaneous Assemblers and Fabricators
  - ○ Operating Engineers and Other Construction Operators
  - ○ Personal Service Managers
  - ○ Project Management and Business Operations Specialists
  - ○ Sales Representatives of Services
  - ○ Telecommunications Equipment Installers and Repairers
  - ○ Telecommunications Line Installers and Repairers

- **Analyze key characteristics of the state's current broadband workforce which impact a region's ability to increase (train, retain, and attract) broadband construction workforce.** This includes:
  - ○ Total number of roles by occupation category;
  - ○ Five-year trends in total employment in each occupation category;
  - ○ Average age of retirement;
  - ○ Demographic characteristics of occupations (including age, gender, and race);
  - ○ Average salary compared to national salaries and neighboring regions;
  - ○ Location quotient of occupation (essentially, the relative concentration of an occupation

compared to national averages);

- The level of degree, training, and/or certification required for each occupation;
- Typical training progressions for workers coming from feeder occupations or upskilling within the industry
- Current job openings for occupations in the sector (which can be estimated via with job posting data calibrated by interviews with major ISPs and construction vendors); and
- Jobs with similar skills that could act as feeder occupations, as well as next step jobs to identify career pathways.

- **Estimate future additional workforce needs.** This can be done by calculating the sum total of public and private construction investments that are ongoing or anticipated (including likely matching funds) to calculate the total additional jobs required.
  - There are several methodologies that may be useful for this analysis. [Brookings](#) offers a straightforward methodology that can be replicated without significant data analysis skills for a handful of key job categories (such is the case with [Ohio's Broadband Workforce Strategy](#)).
  - Jurisdictions may also use an Input-Output model (internally constructed or from an outside vendor) to understand the workforce implications of construction spending.
  - This analysis then should be validated with employers, who will be able to provide additional nuance with on-the ground experience, as well as could overlay supplemental data (e.g., industry surveys). This employer validation is also critical to give employers confidence that additional broadband workforce programs will focus on the gaps they are experiencing in the field.

- **Use the workforce gap analysis, and an understanding of the extent and characteristics of the current workforce, to better inform broadband workforce plans.** Eligible Entities should be looking to answer the following questions:
  - How many total open positions will need to be filled from now until the BEAD funding is fully deployed?
  - Based on the difficulty of training and the gap between existing and needed workforce, which roles will be the hardest to fill?
  - How many workers are either unemployed or underemployed, but could be recruited (back) to the workforce?
  - How will age and retirement trends continue to impact the workforce over the next 10 years?
  - What workers are already being drawn to this work? What workers need targeted outreach to be included?
  - How competitive are jobs in a particular jurisdiction vs. jobs in other states?
  - What roles can be filled with skills-similar workers (sometimes referred to as "ready workforce") and what roles must be filled with new trainees?

This data can also be used on an ongoing basis as workforce programs are stood up, and as the investment landscape changes. For example, Eligible Entities can use employer validated estimates to set clear goals for state-initiated programs, determine training provider program size and scale, and to inform where workforce funds would have the most impact. Routine communication

about anticipated construction and workforce needs between the public and private sector will ensure the private sector's staffing plans can better anticipate construction needs. Lastly, concrete metrics on job openings can also drive recruiting efforts and inform marketing messaging.

- **Use an understanding of broadband workforce gaps to inform program iterations, and ongoing metrics tracking.** Program goals should align to the identified workforce gaps, be reported on consistently throughout implementation, and be adjusted based on new or changing investment priorities as well as changes in technology in coming years. This data should also be used to understand future broadband workforce needs beyond the lifespan of the BEAD Program, as access to high-speed internet has become a critical necessity in our economy and so many aspects of our lives.

Importantly, Eligible Entities may take this opportunity to think holistically about the broadband workforce beyond what is likely to be required in the BEAD NOFO. Though the BEAD funding is structured to primarily encourage wireline deployments, states have other current and future tele-communication needs that may benefit from be analyzed. For example, states will have increased need for jobs in maintenance, cybersecurity, and digital adoption programming as broadband is deployed.

Also, an additional workforce impact may stem from increased deployment of 5G. A 2017 analysis estimated 1.2 million direct jobs are projected[27], with in-demand occupations including radio frequency engineers, edge and cloud engineers, 5G cybersecurity analysts, site acquisition specialists, and logistics engineers. These highly skilled, high-wage occupations represent a workforce development opportunity, especially as they are likely to continue to grow, even as direct construction jobs wane over the course of the program, and so state broadband offices should include these jobs in their data analysis and projections.

Telecommunications workers are often curious, systems-thinkers who evolve alongside technology, and because technology will always evolve, there will always be new jobs and opportunities in the field. Ensuring that ongoing training and support is available will allow today's trainees to truly have lifelong, rewarding careers in telecommunications.

*Examples*
*Broadband:*
- In 2021, America Achieves supported research by **Emsi Burning Glass** and a subsequent report by the **Brookings Institution** which provided a national estimate of broadband workforce needs taking into consideration a significant new federal investment.

- The **State of Ohio,** subsequently conducted a statewide analysis using a similar methodology to the Brookings report and Emsi Burning Glass analysis. This data was used to develop a plan for expanding career awareness and job training programs to help address the State's growing broadband workforce needs.

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27    Smart Cities: How 5G Can Help Municipalities Become Vibrant Smart Cities (Accenture, 2017)

*Related:*
- To help close the cybersecurity skills gap, **CyberSeek** provides detailed, actionable data about supply and demand in the cybersecurity job market.

*How Other Stakeholders Can Help*
- **Employers, unions, and industry groups** can support these efforts by sharing data on their individual company's employment needs to augment and validate state-led analysis, which can collectively help provide a more holistic understanding of the state's broadband workforce needs.

- **The Department of Commerce, led by the National Telecommunications and Information Agency (NTIA), and the Department of Labor's Bureau of Labor Statistics (BLS)** can work together to leverage existing BLS data to develop data tools and reports focused on the broadband workforce. BLS could also revise current projections of key broadband occupations (several of which are currently projected to have negative growth, likely because they do not take into account upcoming BEAD funding) in order to account for the significant increase in federal funding for broadband deployment. This updated information can be added to the relevant federal websites such as O*NET, BLS Career Outlook, and CareerOneStop.Org, which are the main federal portals for those seeking information on jobs, training and employment opportunities and drive many state and local labor market information and employment websites.

- **The Department of Commerce, other federal agencies and/or philanthropy** can help to ensure all states and territories have relevant, timely and actionable analysis on broadband workforce needs by establishing and funding technical assistance to support broadband workforce data analysis. This could include supporting an organization or partnership to conduct this analysis for and with every state and territory and/or creating a resource center where states and territories can get advice and support from data science experts. These partnerships should also include higher education partners to build local capacity for needed training. Specifically, this technical assistance could seek to address key barriers. These include:
  - The need for greater data analytics capacity to both conduct the analysis and use it to inform their workforce development approach, including establishing metrics and setting goals for building a more inclusive broadband workforce;
  - The need to build long-term, in-house workforce analysis capabilities within state government
  - Lack of standardized terminology around job titles, skills and other key data;
  - Reluctance by employers and industry groups to share and verify data on workforce needs.

    - **Non-profit organizations and workforce-focused private sector organizations** can consider encouraging broadband workers to create profiles on networking sites such as LinkedIn or others, contributing to a richer data environment and helping with future workforce projection capacities.

## 4. IDENTIFY ADDITIONAL FUNDING SOURCES TO SUPPORT BROADBAND WORKFORCE DEVELOPMENT

> **Five-Year Action Plan Requirement:**
>
> *"Identify the funding that the Eligible Entity currently has available for broadband deployment and other broadband-related activities, including data collection and local planning, and the sources of that funding, including whether the funds are from the Eligible Entity or from the federal government."*
>
> (NOFO *Section IV.B.3.b.2—page 26*)

*What Success Looks Like:* Eligible Entities have a full scope of the available funding they can blend and braid to drive the creation and/or expansion of workforce development for the broadband sector and broadband career pathways.

**Suggested Strategies for Responding to Plan Requirements:**
The NOFO requires Eligible Entities to "Identify the funding that the Eligible Entity currently has available for broadband deployment and other broadband-related activities…" This should include the identification of funds related to the broadband workforce that will be necessary to deploy broadband. In carrying out this requirement, Eligible Entities should specifically consider the following:

- **Leverage BEAD grant funding to support broadband workforce initiatives.** The NOFO clarifies that Eligible Entities may allocate BEAD grant funding to support "training and workforce development" (BEAD NOFO Section IV.B.5.b). In addition, the NOFO clarifies that eligible uses of funds for Last-Mile Broadband Deployment Projects may include "Workforce development, including Registered Apprenticeships and pre-apprenticeships, and community college and/or vocational training for broadband-related occupations to support deployment, maintenance, and upgrades." Eligible entities should take advantage of this flexibility through approaches such as:
  - Determine a minimum amount of such funds that will be set-aside to support workforce development activities.
  - Based upon identified needs, map out where funds could best be directed to meet such needs.
  - Set up a competitive grant or grants to distribute some of the funds consistent with some of workforce services described in Section 5, such as setting up or scaling model training programs, providing career navigation supports, launching a marketing campaign for recruiting participants, or building intermediary capacity to execute several of these work streams simultaneously.
  - Allow or require a certain percentage of each subgrant awarded to be used to support workforce training if such training can demonstrate it will increase the workforce necessary to deploy broadband in unmet or underserved areas.

To the extent possible, Eligible Entities should use such funds to leverage existing workforce development resources as identified, along with other funding available for broadband deployment, as required in the Five-Year Action Plan.

- **Identify additional state, federal and other resources available to help build and maintain the necessary workforce to deploy broadband.** Eligible Entities may want to consider working with state legislators and/or governor's offices to allocate additional funding, given the necessity and popularity of this issue. A comprehensive review should include:

  *State Funding*
  - *Job Training:* Historically, State budgets have included limited funding to support workforce training. However, more States have begun to devote significant resources to support individuals seeking training for skills identified as "high-demand. Eligible Entities should identify how these funds may be used to help create opportunities for those seeking training in broadband related fields.
    - Idaho Launch
    - GO Virginia
    - New York Workforce Development Initiative

  - *Apprenticeships:* Many States have been working to expand apprenticeships into new fields and backing up these efforts with new funding. Eligible Entities should identify how these funds could contribute to broadband related apprenticeships (such as TIRAPS, highlighted in Section V below.)
    - Pennsylvania's $11 Million Investment
    - Florida Announces $10.5 million to Expand Apprenticeships

  - *Community Colleges and other Higher Education and Workforce Training Providers:* Some States have significantly increased funding for their community college system to keep up with demand and create new programs. Eligible Entities should work with their community college system—and other higher education and workforce providers—to identify new or existing funds to support broadband-related programs and build career pathways.
    - North Carolina's budget passed in 2021—the largest budget for community colleges in a decade—includes new funding for apprenticeships and short-term training.
    - Alabama's state community college system opened a $10 million workforce training center in February 2022.
    - The Colorado Career and Technical Education Grant provides needs based aid for students in an eligible short-term certificate program not otherwise eligible for Federal Title IV aid.
    - Louisiana will soon invest $10.3 Million into the Louisiana Community and Technical College System system to help increase the number of workers qualified to work in the broadband industry.
    - Vermont committed a $535 million grant for the development of fiber technicians through Vermont Technical College in March 2022.

- *American Rescue Plan (ARP):* Federal COVID-19 funds for State and Local Recovery provide significant flexibility on how funds may be used. Eligible Entities should identify any funds used (or that could be used) to support initiatives to expand broadband workforce training.
  - Nevada's $5 million in ARP funds to support free training
  - Illinois invested $40 million in ARP funds for workforce recovery

*Federal Funding*

The federal government provides billions of dollars every year to support workforce training across multiple agencies and programs. Eligible entities should work to identify the State agencies responsible for administering these programs and the extent to which these funds could be deployed in support of a broadband workforce.

- *Workforce Innovation and Opportunity Act (WIOA):* Administered by the Department of Labor, WIOA represents the federal government's largest investment targeted specifically for workforce employment and training. Separate funding streams for Youth ($912 million), Adults ($867 million) and Dislocated Workers ($1.37 billion) make up the vast majority of these funds. The specific funding available for each State is available here. A portion of funds may be used for State initiatives, while most funds flow through local boards and are accessed by adults through One-Stop Career Centers. Eligible Entities should reach out to their respective State Workforce Development Board to identify how funds may be used to support pathways into the broadband workforce.

- *Apprenticeship grants:* Funding for apprenticeships has grown considerably over the past several years. In the coming year, $235 million will be available to expand opportunities through registered apprenticeships. Eligible Entities can review the grants awarded within their State to determine how they may be used to build a broadband workforce.
  - A full listing of "telecommunications apprenticeships" by city or State may be found on this useful site here.

- *Department of Labor Competitive Grant programs:* Throughout the year, the Department of Labor also announces competitive grant opportunities related to workforce training Programs, such as the Strengthening Community College Training Grant program, could be resources to support building a future broadband workforce. In addition, Eligible Entities should explore grants that have already been awarded to groups within their State which are, or could be, used to help support broadband-related training.

- *Pell Grants:* Student aid programs make up a bulk of the over $150 billion in annual funding available through the Department of Education. These programs, such as Pell Grants, enable individuals to get the financial support (up to $6,895 for 2022–23) they need to pursue a degree.
  - Although far less common today, Pell grants may also be used toward eligible certificate programs such as the 26 credit Broadband Technology Certificate program at Arapahoe Community College in Colorado, which provides courses in areas such as Service Technician, Fiber Installation and Digital Technician. While certificate programs must be at least 15

weeks in length and meet certain outcomes to be Pell-eligible, Congress is currently considering a bipartisan proposal to allow programs as short as 8 weeks, providing additional pathways toward a broadband career.

○ *Career and Technical Education:* The Perkins Career and Technical Education Act provides over $1.3 billion to States by formula to develop and implement career education programs at the secondary and postsecondary levels. In addition, the Department of Education awards competitive grants for eligible grantees to carry out innovative programs. These funds provide an opportunity for Eligible Entities to work with schools and community colleges to build or expand broadband training programs.

○ *Commerce Department Grants:* Historically, the Department of Commerce has provided only limited funding opportunities to support workforce development programs. However, under the American Rescue Plan, the Economic Development Agency (EDA) within Commerce, was provided $3 billion to help communities rebound from the economic impact of COVID-19 Through the resulting "Investing in America's Communities" challenge grant programs, the EDA has targeted equity focused workforce systems capacity building both directly and through comprehensive regional economic development initiatives that include workforce projects. Although the opportunity to apply for ARP grants has expired, many states have or are likely to receive a portion of these funds and Eligible Entities should review both Good Jobs Challenge applicants and Build Back Better finalists from their State for areas of potential collaboration to build a broadband workforce. Beyond ARP programs, EDA also supports a wide range of smaller competitive grant programs which may also be opportunities to support the deployment of broadband. Eligible Entities may wish to work with state and local economic development contacts to identify such resources.

See Appendix D for more information on these and other funding sources, including how these funds are already being leveraged for broadband workforce development.

*How Other Stakeholders Can Help*
- **The Department of Commerce and other federal agencies,** including the Department of Labor and the Department of Education can provide technical assistance to Eligible Entities detailing all possible federal funding streams that may be used to bolster broadband workforce development—from data to training, to recruitment, retention, and more.

- **Philanthropy and government associations** can also play a role in collecting and disseminating information on other funding opportunities available from the government.

- **Philanthropy and employers** can also provide financial support to evidence-based workforce development for the broadband workforce, as well as the critical supports for participants, such as income support and other wraparound services (see recommendation below for more.)

*Examples*

- ○ [California's State Broadband Plan](#) (2020) highlights the California Governor's Office of Business and Economic Development's "broadband funding identification initiative."

*Looking Ahead*

| Initial Proposal | "In drafting its Initial Proposal, an Eligible Entity should keep in mind that it may allocate grant funds for the following: … <br><br> (6) Training and workforce development; and <br><br> (7) Other uses, including other Digital Equity programs not already included above, proposed by Eligible Entities and approved in advance in writing by the Assistant Secretary that support the goals of the Program." <br><br> ([NOFO](#) Section IV.B.5.b.12—p.33) |
|---|---|

## 5. WORKING WITH EMPLOYERS, BUILD AND SCALE EVIDENCE-BASED PROGRAMS AND PRACTICES WITH MEASURABLE JOB OUTCOMES TO TRAIN NEW AND EXISTING BROADBAND WORKERS

**Five-Year Action Plan Requirement:**

*"Provide a comprehensive, high-level plan for providing reliable, affordable, high-speed internet service throughout the Eligible Entity, including: [...]*

*Strategies to ensure an available and highly skilled workforce (including by subgrantees, contractors, and subcontractors) to minimize project disruptions, including any plans to ensure strong labor standards and protections, such as those listed in Section IV.C.1.e;*

*[...] plans to attract, retain, or transition the skilled workforce needed to achieve the plan's goals,*

*[...] including describing the involvement and partnerships of sub-grantees, contractors, and sub-contractors with existing inhouse skills training programs, unions and worker organizations; community colleges and public school districts; supportive services providers; Registered Apprenticeship programs and other labor-management training programs, or other quality workforce training providers."*

([NOFO](#) *Section IV.B.3.b.10.f—Page 27)*

Note: Section IV.C.1.e, referenced above states in part,—An effective plan for compliance with federal labor and employment laws can include a subgrantee's binding commitment to strong labor standards and protections for the project workforce (including contractors and subcontractors), which include:

- Use of an appropriately skilled workforce, e.g., through Registered Apprenticeships or other joint labor-management training programs that serve all workers, particularly those underrepresented or historically excluded);
- Use of an appropriately credentialed workforce (i.e., satisfying requirements for appropriate and relevant pre-existing occupational training, certification, and licensure); and "…

This section also states:

… "To ensure that subgrantees have the technical and operational capacity to carry out the subgrant, prospective subgrantees must have a plan for ensuring that the project workforce will be an appropriately skilled and credentialed workforce (including by the subgrantee and each of its contractors and subcontractors). For purposes of this section, the "project workforce" includes those employees of the subgrantee, its contractors, or subcontractors directly engaged in the physical construction of the broadband network. The plan for a highly skilled workforce should include the following information:

- The ways in which the subgrantee will ensure the use of an appropriately skilled workforce, e.g., through Registered Apprenticeships or other joint labor-management training programs that serve all workers;
- The steps that will be taken to ensure that all members of the project workforce will have appropriate credentials, e.g., appropriate and relevant pre-existing occupational training, certification, and licensure;"…

*What Success Looks Like: Increasing capacity to train workers with the in-demand skills employers are looking for, as verified by those employers. These programs should include best practices for recruiting and retaining a diverse workforce, breaking down barriers that have historically kept workers, especially "non-traditional" workers, out of the field—such as providing career counseling and navigation, earn and learn programs, including apprenticeships, clear career pathways, stackable credentials, and wraparound services, such a dependent care and transportation.*

**Suggested Strategies for Responding to Plan Requirements:**
The NOFO requires Eligible Entities to include as part of the Five-Year Action plan a comprehensive set of strategies to ensure a highly skilled workforce. In developing this plan, Eligible Entities should:

## Evidence-Based Training Programs

- **Establish and/or scale evidence-based programs which prepare individuals for high-quality broadband careers, where needed.**
  - This could include convening key stakeholders (such as federal partners, employers, industry groups, community colleges, unions and more) and leveraging existing training providers, such as in-house with employers or at community colleges. (Note: see "Activating and Engaging Intermediaries" for more about an evidence-based strategy for developing and scaling effective demand-driven training programs and complementing them with support services.)
  - These efforts could build upon courses and programs already offered by many community colleges, but which may not be comprehensive or packaged around meeting the skills needs of a broadband workforce. For example, while many community colleges offer "lineworker" or "fiber optics" degrees or certificates in similarly adjacent pathways, very few promote or brand these programs around preparing students for a career in broadband. IES's College Navigator allows students to search for colleges based on training programs and award levels, including for "Communications Systems Installation and Repair Technician" programs and majors.
  - These programs should be responsive to employer demand in their area or region, providing employer requested skills and credentials, as verified by those employers. These partnerships can include a wide variety of other stakeholders to ensure programs are widely available, meet the needs of individuals pursuing broadband skills and leverage the work of training providers.
  - Programs can include state and local programs offered by community colleges, as well as in house industry and labor associations, and employers and others which have led to high quality outcomes and can be replicated or scaled in their state or territory.
  - In creating or scaling up training programs, Eligible Entities (and any partner intermediaries) should be guided by best practices in sectoral training. The latest research from Harvard University can be applied directly to the broadband sector and has shown that the most successful programs (with respect to employment and wage gain outcomes) follow key tenets, including:
    - Partner directly with employers to align training and career support with specific in demand jobs and skills;
    - Focus on economic sectors and occupations where jobs are in high demand and offer living wages and upward mobility;
    - Match participants to learning programs and job opportunities most likely to lead to success through effective, proactive career coaching;
    - Drive competitiveness and equity by expanding the pool to traditionally underserved people with transferable, certified skills and job referrals aligned with employer needs for good jobs in growing sectors;
    - Provide intensive career counseling and wraparound support services that are integrated into the training program, including child care, transportation support, emergency funds, legal assistance, mental and behavioral health counseling, literacy training, and ongoing intensive coaching during training, job placement, and on-the-job employment.

- **Work with Employers on developing subgrantee requirements related to a skilled workforce.**
  Eligible Entities must include strategies they will develop to ensure an available and highly skilled
  workforce. They must also ensure subgrantees have plans in place for ensuring an "appropriately
  skilled workforce" and "appropriately credentialed" workforce. Eligible Entities should consider
  working with employers and other stakeholders on how best to demonstrate the extent to which
  subgrantees are meeting these requirements.

*Examples*
*Broadband:*

- **Fiber Broadband Association (FBA) OpTIC program**: A new program being launched
  by FBA, the program is licensed by the Department of Labor and is being developed in
  partnership with Community and Technical Colleges and Veterans' programs nationwide.
  The program pilot launched in March 2022 in partnership with Greenlight Community
  Broadband and Wilson Community College in Wilson, North Carolina.

- **MasTec Network Solutions' Center of Professional Excellence:** MasTec, a large
  infrastructure engineering and construction company with a focus on telecommunications,
  offers in-house training in industry relevant skills, including Occupational Health and Safety
  Administration (OSHA) certifications and more broadband-specific skills like aerial work.
  Other large ISPs and subcontractors offer similar training programs to train new employees
  and help to upskill current employees to meet industry demand.

- **State of Michigan**: Michigan's State Broadband Plan (August 2018) emphasizes the
  importance of improving communication coordination between ISPs and universities,
  colleges and technical training centers, including by developing training programs for highly
  sought after broadband industry skills.

- **Telecommunications Industry Registered Apprenticeship Program (TIRAP):** Built by and
  for telecommunications employers, TIRAP is a competency-based apprenticeship aimed at
  growing the productivity of the workforce. The Wireless Infrastructure Association is the
  National Sponsor of TIRAP, which has developed 13 occupations in underground and
  overhead utility, fiber, and wireless installation and maintenance.

- **Wisconsin Technical College System:** The Broadband Academy at Northwood Technical
  College, offered fully online, is a two-level training program allowing students to build and
  advance their career. The program works directly with the state and employers to build the
  pipeline of needed broadband industry workers and has even begun to work with out-of-state
  employers and workers, due to its fully remote nature. Notably, this program works closely
  with employers to meet their specific training needs.

- Historically, a significant portion of unionized telecom job training has been done **in-house,
  through employers**. "New-hire training at major telecoms is a mix of classroom and field

instruction. The approach is relatively consistent across the country due to the legacy of the Bell System training and operational protocols, and the following description is an amalgam from various regions:

- Initial training is approximately one month and covers a variety of topics including pole climbing, how to run wire, learning protocols on the computer, and more. After that the new technician will ride with an experienced technician. The new technician will go out on their own after management decides they are ready. This could take a couple of weeks or a month or more depending on the technician's previous experience, input from the senior technician, and the workload. The senior technician provides mentorship and is on call to help the trainee when they go out on their own. Once the worker is judged to be competent working independently, they qualify for overtime. (Mid-Atlantic & Northeast)

- New-hire training is approximately 60% hands-on training and 40% computer-based review of training materials, including tests to confirm understanding of circuits and other basic concepts. (Southwest)

- Hands-on training includes simulated real-life scenarios for splicing live fiber (which includes checking continuity across eight splice points, or the equivalent of a couple of miles) and for drilling wire for a home installation. (West Coast; Midwest)"[28]

- The **Louisiana Office of Broadband Development and Connectivity,** added several workforce related requirements as part of its 2021 "GUMBO" grant program to deploy broadband services to unserved areas of the state. Specifically, the grant application included a requirement for "Documentation of a workforce plan prioritizing the hiring of local, Louisiana resident workers, to include a signed letter of intent with a post secondary educational institution that is a member of the Louisiana Community and Technical College System, containing an obligation upon the applicant, and contractors or subcontractors of the applicant, to put forth a good-faith effort to hire, when possible, recent graduates of broadband-related programs."

*Notable State-Run Workforce Training Models:*
- **Forward Delaware**, a training initiative designed to help Delawareans who lost their jobs as a result of the COVID-19 pandemic, worked with the State's Workforce Development Board and Department of Labor to identify key, in-demand industries for training programs. These included construction/trades, healthcare, hospitality, information technology, logistics/transportation and workforce preparation. To date, 89 percent of participants who completed their training received credentials in their chosen field. More than 57 percent of the participants in Forward Delaware were women, according to the counties that reported demographic information. Forty-nine percent were white, 40 percent were Black, and 3 percent were Asian.

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28    Communications Workers of America

- **Rhode Island's Back to Work Program** was created as a direct response to the pandemic and job displacement. The program partners "directly with employers to ensure Rhode Islanders get the skills they need to secure well paying jobs in growing industries." The program makes an effort to remove obstacles to participation from the outset, including by "providing support services like child care and transportation assistance" to ensure "every Rhode Islander is able to take advantage of these opportunities."

- **West Virginia's Learn and Earn Program** allows workers to pay their bills and gain hands-on experience in a part-time job while they study for associate degrees at the state's community and technical colleges. The jobs pay an average of $15.26 per hour (and range from $10 to $27 per hour)—with the state and employers sharing the cost 50/50. The opportunities are aligned to growing fields and economic development priorities. West Virginia University at Parkersburg, for example, has developed programs in chemical and polymer technology, computer information technology, and computer science.

*Other Notable Workforce Training Model:*
- **Merit America** is a national non-profit preparing low-wage, working adults for skilled careers at scale. The program works for people who work (not just the unemployed), combining flexible online learning with best-in class coaching. The program is designed for scale, poised to reach over 10,000 learners annually and drive over $1 billion in wage gains in just three years. Their outcomes have been validated by leading workforce development academics, with an average annual wage gain for career-seeking graduates of over $23,000, (from approximately $26,000 to $50,000 annually).

*NOTE: See Landscape Analysis section for a non-exhaustive list of examples of existing programs and examples.*

*How Other Stakeholders Can Help*
- **Employers, industry groups, and labor organizations** can actively help Eligible Entities build their trained workforce by working with state coordinating offices to expand job training opportunities at community colleges and other training providers, for both new and incumbent employees, including:
  - Assisting with tuition, costs of relevant certification, income supports, and other wraparound services such as transportation and child care;
  - Supplying instructors—which has been flagged as one of the hardest challenges training programs are facing;
  - Partnering on curriculum design;
  - Participating in/offering apprenticeships and other learn-and earn-programs (this could also include working with higher education and intermediaries (see more below) to build out training pipelines that fit their hiring needs directly);
  - Committing to hire or interview potential candidates coming out of employer-verified training programs;
  - Expanding their own training and apprenticeships focused on providing skills and opportunities for those seeking employment in broadband occupations;

- Creating pathways for returning citizens to begin skilled training in entry broadband fields prior to release with pathways to post-release employment; and
- Reaching out to previously employed broadband workers to offer retraining and employment.

- **Philanthropy** can support public-private partnerships to help relocate trained workers to areas where the local workforce is undersized and the potential pool of applicants limited.

- **Philanthropy and employers** can help offset program costs—such as tuition, support for earn and learn opportunities, wraparound services, and career counseling, as well as helping to study emerging best practices and programs to understand and improve outcomes.

- **The Department of Commerce and other federal agencies and/or philanthropy** can create a resource hub for effective and promising workforce development approaches and curricula for critical broadband occupations. This resource hub could be a common place where a range of stakeholders including states and territories, industry groups and employers, and labor unions and other worker-serving organizations—can contribute reports, relevant templates, program curricula, and other materials.

   This resource hub could also include a scorecard with state-by-state data, including job openings. The hub could be staffed with relevant experts who could help states and territories identify their needs and adapt the resources to their specific contexts. This could be done on a 1:1 basis and through trainings, webinars and other events addressing key challenges.

   The Administration can direct agencies to identify and commit funding that could be used to support efforts to expand the broadband workforce. This could include agencies such as the Department of Commerce, the Department of Labor, the Department of Education, and the Corporation for National and Community Service. These agencies can take actions such as directing or prioritizing a portion of applicable competitive grants to support these efforts.

   These agencies can also release guidebooks or other information to provide guidance on existing funding opportunities to support broadband workforce development. Some examples of resource hubs include:
   - Build Back Better Regional Challenge Resource Library
   - National Broadband Resource Hub[29]
   - Computer Science for All Initiative: The National Science Foundation funded the creation of instructional materials, assessments, teacher professional-development programs, and teacher resources, including a new introductory computer science high-school course.

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29      Note: This existing hub contains some resources around workforce development, but is primarily focused on other related areas and could serve as the future hub for workforce development as well.

## Activating and Engaging Intermediaries

Intermediaries can play a critical role in identifying workforce development needs, liaising with and coordinating multiple stakeholders, developing and securing agreement on a common strategy, coordinating the different components needed to deepen the talent pool, and supporting development and implementation of training programs and support services. Specific actions Eligible Entities may consider seeking the assistance of intermediaries include:

- **Coordinating and supporting the different stakeholders** (employers, trainees/workers, training providers, support service providers, public and private funders, government, and community-based organizations);
- **Identifying, scaling, and/or developing training programs aligned to employer needs —** this may also include credential identification or development—and facilitate employer participation in articulating needed skills and participating in training program development
- **Recruiting and engaging potential trainees/workers** and provide career navigation services
- **Ensuring the provision of wraparound supports,** such as dependent care or transportation, to increase accessibility, thereby deepening the talent pool; and
- **Providing technical assistance to employers** to facilitate engagement with workforce systems, making the system as responsive as possible to employer needs and also minimizing transactional costs for employers.

- **Consider allocating funds to/engage with an intermediary and consider establishing a statewide intermediary or contracting with an already established group to coordinate broadband workforce efforts.** This intermediary can serve the entire state, or have the responsibility of developing and/or working with regional intermediaries as appropriate. They would also work directly with the designated staff member from the state to make sure there is ongoing alignment with greater broadband deployment work. Note: the lack of intermediary capacity often leaves gaps in the components of a comprehensive workforce system, which means that barriers to participation and persistence may not be addressed, leading to a smaller pipeline of talent.

  While some states, territories, or regions already have intermediaries playing this role for the broadband industry and/or for other sectors, many do not. Many will require support in setting up an effective intermediary if they determine it's the right strategy for them. Some may have the opportunity to expand the role of existing intermediaries—including those that may be supported by the Good Jobs Challenge (awards expected in summer of 2022). Intermediaries may include community college systems, economic development entities, nonprofit organizations, labor organizations, governmental agencies, including effective workforce boards, and others. Some states may work with or through an umbrella intermediary that works with different regions to support regional intermediary capacity.

  Whichever approach for building intermediary capacity is taken, it is likely that a statewide awareness/engagement strategy will be needed to build interest in broadband training opportunities and career pathways, possibly as part of a broader technology/utilities/broadband career opportunities campaign. (See "outreach and marketing" for more.)

*How Other Stakeholders Help*

- **The Department of Commerce and other federal agencies and/or philanthropy** can provide technical assistance, including providing tool kits and exemplars, and support to spur the development of intermediaries where they do not yet exist—or strengthen them where they do.

- **State community and technical college systems** could play the role of intermediary or partner with an intermediary as part of a coherent statewide strategy to meet demand.

- In states, territories, or regions where the employer/provider market is highly fragmented, states may want to use the **U.S. Chamber of Commerce** Talent Pipeline Management model to aggregate demand and training for a fragmented market.

*Examples*

- **Land of Sky Regional Council:** Land of Sky works with providers in the region to address barriers to deployment including workforce. Providers have participated in grants their workforce development department has to fund skills trainings for ISPs. Land of Sky has worked with community colleges and providers as an intermediary to drive conversations around the development of needed trainings for providers to keep up with the demand for broadband deployment over the coming years.

- **State of Ohio:** The Ohio Broadband Strategy serves as a coordinating force to bring high speed internet access to unserved and underserved areas of the state, including by convening key stakeholders to build a broadband workforce. Additionally, the Ohio State University was awarded $3 million in January 2022 to host the Sector Partnership and selected the Wireless Infrastructure Association as the industry intermediary to lead the effort. This announcement is part of a larger effort to grow the workforce needed to expand broadband access and 5G in Ohio.

- **State of Vermont:** The Vermont Community Broadband Board was established by legislation in 2021 to coordinate, facilitate, support, and accelerate the development and implementation of universal community broadband solutions.

- **Wisconsin Technical College System (WTCS):** The WTCS employs multiple education and training modalities based on regional workforce conditions and coordinates the scaling of successful programs with statewide industry and workforce partners. It can quickly replicate its programs throughout the state based on employer demands. For example:
  - Northwood Technical College offers two fully online broadband education options to meet the workforce needs of a large rural area: a one-year apprenticeship and two short term certificates.
  - Northeast Wisconsin Technical College offers stackable postsecondary tele-communications installation and repair credentials that allow its more urban communities to simultaneously work and build their skills and earning power.

*Looking Ahead*

| Initial And Final Proposals | *Requirements. Eligible Entities are required to include in their Initial and Final Proposals: [...]* |
|---|---|
| | *2. A description of how the Eligible Entity will develop and promote sector-based partnerships among employers, education and training providers, the public workforce system, unions and worker organizations, and community-based organizations that provide relevant training (including through Registered Apprenticeships and preapprenticeships that are integrated with Registered Apprenticeships, or other quality work-based learning programs) and provide wrap-around services to support workers to access and complete training (such as child care, transportation, mentorship, etc.), to attract, train, retain, or transition to meet local workforce needs and increase high-quality job opportunities."* |
| | *(NOFO Section IV.C.1.f—Page 58–59)* |

## 6. RECRUIT AND GROW A SKILLED, DIVERSE BROADBAND WORKFORCE

**Five-Year Action Plan Requirement:**

*"Provide a comprehensive, high-level plan for providing reliable, affordable, high-speed internet service throughout the Eligible Entity, including: [...] plans to attract, retain, or transition the skilled workforce needed to achieve the plan's goals,*

*(NOFO Section IV.B.3.b.10—Page 27)*

*What Success Looks Like:* Eligible Entities, working closely with outside stakeholders including employers, unions, industry groups, community colleges, and other training providers undertake marketing and outreach initiatives to increase understanding of broadband career pathways and demand for broadband jobs; highlight channels and platforms for recruitment; to recruit and retain a larger, more diverse workforce.

**Suggested Strategies for Responding to Plan Requirements:**
The NOFO requires Eligible Entities to include as part of their overall comprehensive, high-level plan on providing broadband, a plan to "attract, retain, or transition the skilled workforce needed to achieve the plan's goals." In developing and carrying out this plan, Eligible Entities should:

## Career Pathways

- **Develop clear maps of the career pathways into and within the broadband industry:**
  Clearly mapped and supported pathways can be helpful recruitment tools to highlight the
  opportunities within the sector, but those mapped pathways are largely non-existent and/or
  underutilized where they do exist. This creates barriers for marginalized workers who are looking
  to re-enter the workforce and who represent great potential for growth in the number of trained,
  available broadband workers. What's more, in a field where there is concern about what happens
  to workers after a large burst in hiring and the broadband investments are built out, pathways can
  help make sure that workers are receiving the skills and training along the way to eventually move
  up career ladders and into other occupations, if needed.
  - Eligible Entities, with support from intermediaries, employers, industry associations and
    training providers, can promote a more diverse broadband workforce by being intentional on
    where they recruit and outlining the pathways into and up through the broadband sector.
  - This action, if coordinated with expanded data efforts, can help identify both feeder and next
    step jobs for critical broadband positions needed today, which can help pull in workers from
    adjacent skillsets, and break down barriers to potential workers who may not be aware of
    broadband opportunities or have misconceptions about them.
  - These pathways can also be used as a tool for recruitment and in marketing initiatives to
    demonstrate the types of opportunities available within the broadband sector to those who
    may be unfamiliar with these opportunities especially in light of the pandemic and many
    workers worried about being stuck in jobs without opportunities to advance and are looking
    for pathways to increase their skills and economic mobility.

- **Be deliberate in developing equitable diversification.** Equitable diversification in the job
  pathways feeding into broadband programs and broadband jobs is the best way to ensure a state's
  broadband workforce has ethnic, socio-economic, and geographic diversity.

- **Seek to connect social service, justice advocate, education and healthcare providers to
  broadband opportunity pathways.** These organizations are connected to the broad swath of
  disconnected, discouraged, workers who have the potential to move from receiving services to
  obtaining sustainable skills and work.

*Examples*
*Broadband:*
  - 2021 **Emsi Burning Glass** research on the broadband sector identified pathways into (aka
    "feeder occupations") and out of (aka "destination occupations" or "next step occupations")
    high-demand occupations in the broadband sector. For example, for the position of
    Broadband/Satellite Technician, the analysis found the following:

| Feeder Occupations to Broadband/Satellite Technician | Next Step Occupations from Broadband/Satellite Technician |
|---|---|
| • Insulation Worker<br>• Television/Stateline Television Installer<br>• Telemarketer | • Electrical Substation/Relay Reparer<br>• Network/Systems Support Specialist<br>• Electrician<br>• Avionics Technician |

(More information on the Emsi Burning Glass analysis below in the "Landscape Analysis.")

*Related:*
- In addition to detailed, actionable data about supply and demand in the cybersecurity job market, **CyberSeek** has laid out clear career pathways for cybersecurity, identifying feeder roles to and from entry, mid, and advanced level cybersecurity jobs.

- **Futuro Health** works to build the talent that employers need and create pathways that workers are looking for. Their goal is to graduate 10,000 new licensed and/or credentialed workers by 2024 to meet the nation's critical demand for health care workers. Part of their focus includes recruiting, educating and supporting diverse communities.

*How Other Stakeholders Can Help*
- Community colleges, as well as the NTIA at the Department of Commerce, and/or Department of Labor, can help map and disseminate these career pathways, connecting them to additional opportunities for training and advancement.
  - The **Department of Labor** Career Trajectories and occupational Transitions Dashboard can be updated to feature broadband workers.

## Marketing and Outreach

- **Undertake marketing and outreach initiatives:** In developing plans to attract, retain or transition the skilled workforce, Eligible Entities may want to consider marketing and outreach initiatives to increase understanding of broadband jobs and career pathways through a recruitment campaign with clear prerequisites and entry points. Many stakeholders, including the FCC, report that a key barrier for filling broadband sector jobs is a general lack of knowledge about the broadband sector and available opportunities. Using marketing, outreach, and coordination—especially with employers and community organizations—Eligible Entities can help recruit a diverse set of workers into the field. Data collected on adjacent skill sets ("feeder occupations") can help identify target audiences for these marketing and outreach initiatives.

- **Work with a diverse set of community groups:** Eligible entities should formalize the partnerships between their intermediary feeders, employers and training providing partners, while

incentivizing these partnerships to meet stated equity goals. This will help ensure partnerships are collaborating with a diverse representative population of stakeholder groups to market broadband jobs and employment pathways and to find a larger recruitment pool, while breaking down the barriers many underrepresented groups have traditionally faced in this field.

Groups can include: (but not limited to):
- College and career counselors in middle and high schools and community colleges;
- Tribal organizations centered on workforce development and/or working to expand broadband in Tribal communities; and
- Equity organizations, such as:
  - HBCUs;
  - Women in trades;
  - Racial equity groups;
  - Veterans organizations;
  - Re-entry organizations;
  - Recovery organizations; and
  - Disability workforce organizations[30]

Group equity goals can include: (but not limited to):

- Geographic diversity goals—ensuring citizens from urban, suburban, ex-urban, and rural communities are in the broadband workforce.
- Racial and gender diversity goals—ensuring the broadband workforce in a state reflects that state's ethic and gender diversity.
- Socio-economic diversity goals—ensuring that people below the poverty-line can start a pathway and complete it without incurring unpayable cost.

NOTE: The NOFO requires that "throughout its local coordination and outreach activities, each Eligible Entity must ensure that a diverse set of stakeholders is involved in development of its Five-Year Action Plan, Initial Proposal, and Final Proposal." It also includes a suggested, non-exhaustive list of diverse stakeholder groups (pages 53–54), many of which could provide partnership opportunities for outreach, marketing and recruitment and should be referred to for these purposes.

- **Eligible Entities, aligned with employers, can also support the creation of an awareness campaign** that would seek to "rebrand" broadband jobs and occupations in ways that make them more appealing to workers today—without losing the distinction between different jobs and skills. The campaign should assume no knowledge on the part of prospective workers of what a

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30    The NOFO also states that Eligible Entities are obligated to meet certain programmatic requirements such as "meaningful engagement and outreach to diverse stakeholder groups, labor organizations, and community organizations, including to promote the recruitment of women and other historically marginalized populations for workforce development opportunities and jobs related to BEAD-funded eligible activities. [...] Eligible Entities should track all engagement efforts they conduct and provide a synopsis of the needs identified and if they were addressed (or not) in the appropriate portions of their Initial Proposals, Final Proposals, and reporting to NTIA." BEAD NOFO (Section IV.C.1.c)

broadband job entails, as well as the training to prepare for such jobs and the career paths that might follow. Those seeking to create an awareness campaign should ensure it includes (at a minimum):

- The establishment of clear goals and objectives;
- The identification of target audiences;
- The crafting of top-line messages; and
- Allow community partners to help develop a communications plan that works for their target audiences, including the execution of tactics to get the message out, such as storytelling and ads on social media channels and other platforms

Among the top-line messages entities might consider for such a campaign are these (among others):

- Telling compelling stories that feature current broadband workers, as drawn from diverse backgrounds/lived experiences and a range of roles;
- Raising awareness of the importance of broadband jobs to consumers and the fabric of our communities and nation, including their direct impact on people's health, education and sense of connection, as well as business and the economy
- The direct connection of this work to the lives of young people and older community members alike; and
- The wide availability—and high-quality—of these jobs, including competitive compensation, as well as opportunities for career growth and advancement; and
- Direct connection to training opportunities, especially those with paid training/supportive services.

*Examples*
*Broadband:*

- **Flume Internet** has been able to provide paid training, and job placement for underserved New Yorkers through a partnership with local non-profits and community based organizations who received workforce development grants from the **City of New York**. To date, hundreds of participants in areas of construction and telecommunications have successfully completed the program.

- **Indiana's State Broadband Plan** (February 2020) specifically calls out a career in broadband as an "alternative employment avenue for people who are not looking to spend their career behind a desk," and encourages technical schools—such as Vincennes University and Ivy Tech Community College—to market broadband training programs as such.

- **Warriors4Wireless** is a nonprofit organization formed to bridge the gap between the demand for trained and deployable wireless technicians and the thousands of qualified service men and women eager to transfer the skills they've learned in the military. The organization provides training, advanced certification and transitional support, giving veterans the building blocks they need for a career in the telecommunications industry.

- The **Orleans Parish Correction Reentry Program** provides a case study in examining the digital literacy acquisition process as it was implemented in an Orleans Parish reentry process as part of their release curriculum. These findings are from a Portland State University research project that interviewed more than 100 participants within a multi-state Broadband Technology Opportunities Program Sustainable Broadband Adoption project focusing on New Orleans, Louisiana.

*Related:*
- The **Alaska Native Science and Engineering Program** (ANSEP) is a statewide effort that begins preparing students for careers in the oil and gas industry as early as middle school, with a strong focus on science and math.

- The **Department of Defense SkillBridge program** is an opportunity for Service members to gain valuable civilian work experience through specific industry training, apprenticeships, or internships during the last 180 days of service. SkillBridge connects Service members with industry partners in real-world, civilian job experiences.

- **Mission Wisconsin** works to help transition veterans and their families into civilian life by connecting them to professional opportunities, resources, and benefits throughout Wisconsin. They also work with businesses in the state to assist with attracting, retaining, and developing veteran and veteran families talent.

- **National Association of Women in Construction** has more than 115 chapters across the country and offers its members education, support and networking to help advance their careers in construction, build their technical skills and help them become leaders.

- **United Airlines Aviate Academy** intends for half of each graduating class of certified pilots to be women or people of color, and de-risks the program for students by offering scholarships, financial aid and job guarantees for successful graduates.

*How Other Stakeholders Can Help*

- **Community organizations** will play a large role in helping to recruit and retain a diverse broadband workforce through their focus on increasing employment and economic mobility.

- **Tribal groups** working to expand broadband and/or increase employment can aid with recruitment and marketing of these opportunities to enrolled members.

- **As part of their partnerships, employers** should be working directly with community partners, colleges and other training providers to advise how to classify, advertise and market broadband training classes across disciplines.

- **The Department of Education, the Department of Labor** and other federal agencies can help make information for marketing purposes clearer, including;
    - The National Council for Education Statistics can work to better define where broadband related classes fit within existing community college programs, or create a more standardized "broadband-related" program area (like STEM-related);
    - Current government information on sources of broadband training and workforce development programs, such as careeronestop.org, is often incomplete, out of date and difficult to navigate; this must be streamlined to incentivize people to use these tools to find in-demand jobs
    - Leverage State and local one-stop career systems, community and technical colleges and other entities able to reach underrepresented populations, so they are aware of the increased demand for broadband workers and are able to provide accurate information on such opportunities to those seeking employment assistance through such systems.

*Looking Ahead*

| Initial Proposal | *"Detail how the Eligible Entity will ensure an available, diverse, and highly skilled workforce consistent with Section IV.C.1.e [Programmatic requirements applicable to Eligible Entities with respect to Fair Labor Practices and Highly Skilled Workforce] of this NOFO."*<br><br>*(*NOFO *Section IV.B.5.b.12—page 32)* |
|---|---|

| Final Proposal | *i. Requirements. Eligible Entities are required to include in their Initial and Final Proposals: [...]*<br><br>*3. A description of how the Eligible Entity will plan to create equitable on-ramps into broadband-related jobs (e.g., how entities plan to engage or partner with stakeholders like State, Territorial, and local workforce boards, training partners, labor and community organizations); maintain job quality for new and incumbent workers engaged in the sector; and continually engage with labor organizations and community-based organizations to maintain worker voice throughout the planning and implementation process;*<br><br>*4. A description of how the Eligible Entity will ensure that the job opportunities created by the BEAD Program and other broadband funding programs are available to a diverse pool of workers, including by engaging in targeted outreach, and seek subgrantees with effective plans for outreach, to populations that have traditionally been underrepresented in broadband and information technology jobs, including but not limited to women and people of color. Eligible Entities should be prepared to report on the demographics of each subgrantee workforce that is engaged on a project or other eligible activity utilizing BEAD grant funding (this will be aggregate workforce data only, not personally identifiable information), and should expect that this data will be made public.*<br><br>(NOFO *Section IV.C.1.f—Page 59*) |
|---|---|

# V. Landscape Analysis

The section below details a synthesis of key research and examples that have helped to inform the report, including many of the points made above, provided with additional detail.

**Current Industry Needs and Broadband Labor Market**

While the lack of standardization among job titles within the broadband field leads to variability in job titles covering the same skills or requiring the same qualifications, there are several broadband job titles that are common across the industry. Based on a high-level review of broadband industry jobs at top telecommunications companies nationwide, the following job titles had the highest "demand", as indicated by number of active job postings across career sites:

- "Broadband Technician"
- "Telecommunications Technician"
- "Field Technician", "Field Service Technician"
- "Installer"
- "Test Engineer"
- "Telecommunications Tower Technician"
- "Lineman"

- "RF Engineer"
- "Small Cell Technician"

In terms of skill needs, the broadband industry heavily relies on credentialing and certification. Beyond common certifications, such as CDL A and OSHA 10-and 30-hour certifications, most other certifications are highly specific to a given job title. Below are several examples of certifications for top broadband jobs (based on this Brookings report and top ISP and subcontractor job postings, mentioned above) that are common, as well as the certifying organization:

- Cable Splicing Certification—Electrical Training Alliance International (ETAI)
- Rigging Certification—OSHA and other entities
- TTT-I or higher—NWS-A
- Authorized Climber & Rescue Certification—OSHA and other entities
- Installer I and II Certifications, Copper and Fiber—Building Industry Consulting International (BISCI)
- Society of Cable Telecommunications Engineers (SCTE) Certification or NetApp Certified Technology Associate
- CAD Certificate—many accrediting entities
- RCDD Certification—BISCI
- Outside Plant Engineer Certification—ETAI

NOTE: For more detailed data and estimates of current and future broadband workforce and skill needs and projected workforce demand, see the Brookings analysis and Emsi Burning Glass data referenced below. As noted in above, additional, up-to-date data for each Eligible Entity is recommended.

**Evidence Base, Existing Efforts, and Lessons Learned**

*Federal, State, and Regional Efforts to Coordinate Broadband Workforce Development*

This section highlights a non-exhaustive list of existing federal, state, and regional efforts. Additional federal, state, and regional efforts are underway and this section should not be viewed as all-encompassing.

- **FCC Broadband Workforce Taskforce:** "In 2019, the Federal Communications Commission (FCC) created a working group within its Broadband Deployment Advisory Committee called the Broadband Infrastructure Deployment Job Skills and Training Opportunities Working Group. The FCC asked the working group to address ways to make more widely available and improve job skills training and development opportunities for the broadband infrastructure deployment workforce."[31]  In October 2020, the working group produced a report addressing these issues. Topline challenges and solutions are below and can be found in full in the report.

| Challenge | Solution |
|---|---|
|  |  |

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| | |
|---|---|
| A broadband identity crisis | Promote the formation of (or adhesion to) a coalition of broadband-related trade associations to jointly advance workforce development initiatives and to centralize and coordinate Industry efforts. |
| A lack of standardized and nationwide training programs | Undertake a targeted outreach initiative to ensure that training programs are being implemented and promoted both in rural and urban areas equally. |
| Unawareness or lack of federal and state funding for training programs | Educate stakeholders and raise awareness around funding vehicles and grant agencies with potential to benefit the broadband workforce development.<br><br>Request that part of the Congressionally-approved $80 billion budget to deploy broadband infrastructure to unserved and underserved communities be directly and urgently appropriated to address telecommunications infrastructure workforce training needs. |
| Lack of standardized job codes, wages, and universal credentialing | Gathering data around wages, career paths; Working with O*NET to include the term broadband in relevant job category titles; creating a framework for a skill-based credentialing system for broadband related careers; Educating local workforce and economic development boards on how broadband jobs and job codes are being applied in the system so that funding opportunities can be made more readily available to the workforce. |
| Unique demands of the work: seasonal, high liability | Address the age requirement of obtaining commercial driver licenses; Explore creation of a governmentally organized small and minority business owners program. |
| Dwindling skilled workforce due to retirement and other reasons | Design and promote initiatives focused on outreach (especially to underrepresented communities), on-campus recruiting, mentoring new hires and recognizing the existing workforce. |

| New environment created by COVID-19 Pandemic | Rapidly launch aggressive outreach initiative; Actively promote Department of Labor-pre approved apprenticeship programs. |
|---|---|

Source: FCC (10/29–30/22)

- **Maine:** ConnectMaine's Broadband Service Strategy emphasizes the importance of cross-sector stakeholder engagement and interagency cooperation for broadband workforce development ConnectMaine holds stakeholder workshops to solicit input on its grantmaking process for community broadband projects: "Funded projects are intended to prepare communities for planning for the expansion of broadband service, which should result in the following: a description of local broadband needs and goals; inventory the existing infrastructure assets; a gap analysis defining the additional broadband infrastructure necessary to meet identified needs and goals."

- **Ohio:** The "Strengthening Ohio's Broadband & 5G Workforce" Strategy underscores the significant public and private investments being made in broadband and 5G at the state and federal level, which in turn is expected to create tens of thousands of jobs in Ohio over the next decade. In an effort to ensure that Ohio has a skilled and prepared workforce to fill these kinds of jobs, the strategy outlines a plan for increasing broadband industry career awareness and creating more training and education programs in the state. This strategy addresses three key issues:
  1. Increasing broadband industry career awareness by exposing middle school, high school, and postsecondary students to the industry through career awareness, curriculum, and internships
  2. Developing and supporting more education and training programs to educate and train Ohioans; and;
  3. Capitalizing on state and federal funding programs, like TechCred and WIOA, to help finance the education and training that will bring to market the talent supply needed for the broadband and 5G industry in Ohio.

Since September 2021, Ohio has announced 10 broadband/5G programs, three of which have already been launched, with the rest launching in summer and fall 2022. Additional programs will also be announced at the end of summer 2022.

- **Vermont:** The Vermont Community Broadband Board (VCBB) was created to accelerate community broadband deployment, including workforce development. The legislation that created the Board also "[instructed] the state's Commissioner of Labor to conduct a workforce needs assessment for the buildout and maintenance of broadband infrastructure, identifying current and future employment opportunities and determining the prerequisite skills needed for widespread worker recruitment and for building a talent pipeline."[32]

*Promising Programs and Practices*

Below are some of the exemplary programs and best practices, highlighted in numerous conversations with stakeholders in the field. This list should not be viewed as exhaustive, but rather examples of what is

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32      National Governors Association (09/13/21)

currently happening in the field.

- **Wisconsin Technical College System**: The Broadband Academy at Northwood Technical College, offered fully online, is a two-level training program allowing students to build and advance their career. The program works directly with the state and employers to build the pipeline of needed broadband industry workers and has begun to work with out-of-state employers and workers, due to its fully remote nature.

- **Telecommunications Industry Registered Apprenticeship Program (TIRAP)**: Built by and for telecommunications employers, TIRAP is a competency-based apprenticeship aimed at growing the productivity of the workforce as directly as possible. The Wireless Infrastructure Association is the National Sponsor of TIRAP, and partners include community colleges, pre-apprenticeship program providers and employers

- In **Ohio,** aligned with their Broadband Workforce Strategy, three program examples include:
  - Five Certified Fiber Optic Technician programs at Tri-County Career Center in Southeast, Ohio.
    - Curriculum is from the Fiber Optic Association and the program length is 40 hours.
  - Three Telecommunications Tower Technician 1 programs in Southeast, North Central, and Northwest, Ohio.
    - Curriculum is from NATE and the program length is approximately 240 hours.
  - Two 5G Readiness Programs at Ashland University (Ashland, Ohio) and Youngstown State University (Youngstown, Ohio).
    - Curriculum is from the Wireless Infrastructure Association and the program length is 80 hours.
- **Wake Tech**: Wake Tech, North Carolina's largest community college, launched an early apprenticeship program to train telecommunications tower technicians through their WakeWorks apprenticeship programming. WakeWorks partners with employers, and funding covers tuition, fees, books, uniforms and tools for the apprentices, and provides at least 2,000 hours of on-the-job training and 144 hours of related classroom instruction. The program works directly with employers to expand apprenticeship opportunities that lead to full-time employment.

- **Fiber Broadband Association (FBA) OpTIC program**: A new program being launched by FBA, the program is licensed by the Department of Labor and is being developed in partnership with Community and Technical Colleges and Veteran programs nationwide. The program pilot launched in March 2022 in partnership with Greenlight Community Broadband and Wilson Community College in Wilson, North Carolina.

Other programs that are not currently focused on broadband specifically but offer successful workforce training models include:

*State and local programs:*
- **Forward Delaware**, a training initiative designed to help Delawareans who lost their jobs as a result of the COVID-19 pandemic, worked with the State's Workforce Development Board and Department

of Labor to identify key, in-demand industries for training programs. These included construction/trades, health care, hospitality, information technology, logistics/transportation, and workforce preparation. To date, 89 percent of program participants who completed their training received credentials in their chosen field. More than 57 percent of the participants in Forward Delaware were women, according to the counties that reported demographic information. Forty-nine percent were white, 40 percent were Black and 3 percent were Asian.

- **Rhode Island's Back to Work Program** was created as a direct response to the pandemic and job displacement. The program partners "directly with employers to ensure Rhode Islanders get the skills they need to secure well-paying jobs in growing industries." The program makes an effort to remove obstacles to participation from the outset, including by "providing support services like child care and transportation assistance" to ensure "every Rhode Islander is able to take advantage of these opportunities."

- **West Virginia's Learn and Earn Program** allows workers to pay their bills and gain hands-on experience in a part-time job while they study for associate degrees at the state's community and technical colleges. The jobs pay an average of $15.26 per hour (and range from $10 to $27 per hour) with the state and employers sharing the cost 50/50. The opportunities are aligned to growing fields and economic development priorities. West Virginia University at Parkersburg, for example, has developed programs in chemical and polymer technology, computer information technology, and computer science.

- Between 2016 and 2017, **One Baltimore for Jobs** (1B4J) sought to connect young Black males, aged 16 to 29, with high-quality jobs in growing industries. The program included targeted training for in-demand careers, through 13 sector training provider grantees that delivered occupational skills training and job placement services to disconnected young adults. Target sectors included construction, health care, manufacturing, office administration, and transportation/logistics. 1B4J included partnerships with neighborhood-based organizations to help expand recruitment in low-income neighborhoods, as well as "community connector" programs that performed outreach, recruitment, assessment, and case management capacity to connect participants with sector-based training and jobs. 1B4J built in barrier removal pilots, designed to test innovative strategies to remove obstacles and strengthen connections between workforce development, adult education, legal services, and child support organizations. It also involved a practice advisory network, partnerships designed to cultivate relationships, explore best practices, align and coordinate services, and build capacity through peer learning and data sharing.

*Non-profit programs:*
- **Generation USA** is a national non-profit organization with the mission of transforming education to employment systems to prepare, place, and support people into life-changing careers that would otherwise be inaccessible. Launched in 2014, Generation USA has graduated over 4,800 adults across 15 professions and 37 cities, with a 72 percent job placement rate within three months of program completion. Graduates immediately earn an average of three or four times their previous earnings. Generation USA serves a population of individuals for whom the existing education-to

employment system has not worked and has extensive experience serving opportunity youth. Eighty-five percent of learners are Black or Latinx; 62 percent have a high school diploma or GED only; 59 percent are female; and 26 percent have dependents. Hallmarks of Generation USA's approach—including a rapid launch process, bootcamp-style training and placement, and individualized education plans with resources and support—position Generation USA to serve the significant newly unemployed population as a result of the global pandemic.

- **Merit America** is a national non-profit preparing low-wage, working adults for skilled careers at scale. Their program works for people who work (not just the unemployed), combining flexible online learning with best-in-class coaching. The program is designed for scale, poised to reach over 10,000 learners annually and drive over $1 billion in wage gains in just three years. Their outcomes have been validated by leading workforce development academics, with an average wage gain for career seeking graduates of over $23,000, (from approximately $26,000 to $50,000 annually).

- **Per Scholas** is a national employment and training program for individuals traditionally underrepresented in technology. It originated in the Bronx, and now has 17 campuses in cities across the U.S. Participants receive 12 to 15 weeks of tuition-free rigorous skills training in a variety of courses, providing professional development, cost-free industry-recognized certifications, and learner support services. Through robust employer connections, Per Scholas graduates move into high growth careers in tech. Two randomized control trials found a sustained impact on wages over time, with an annual increase in earnings of 20 to 30 percent, or approximately $4,000 to $6,000, two to six years after random assignment. One dollar invested in Per Scholas yields an $8 net economic return.

- The **Year Up** program is a workforce training program for low-income young adults who are disconnected from school and work, with more than 90 percent of students identifying as a person of color. Its core model operates in dozens of locations across the country, and allows participants to choose from in-demand career pathways and earn college credits throughout their training. Year Up students also participate in a full-time internship at one of more than 250 corporate partner firms, allowing them to gain critical on-the-job experience and begin building their professional networks. More than 80 percent of its alumni are employed and/or enrolled in college within four months of graduation, with support staff guiding participants through their job search. A 2020 randomized control trial of the program showed earnings gains of 30 to 40 percent ($7,000–$8,000) per year, sustained over four years post-program for individuals assigned to Year Up, relative to the control group. Year Up also develops new models to reach more young adults looking to access meaningful careers, including partnerships with other training providers.

*Additional Research on Sectoral Training Programs*

- **Why Do Sectoral Employment Programs Work? Lessons from WorkAdvance** (Harvard University, 2021): A 2021 study from Harvard University found that sectoral programs are some of the most effective in terms of getting participants into higher wage jobs in high-earning industries and occupations—rather than just increasing employment rates—contributing to long-term economic success. They generate substantial and persistent earnings gains, between 11 and 40 percent, following training.

  According to this study, successful programs:
  1. Partner directly with employers to align training and career support with specific in-demand jobs and skills;
  2. Focus on economic sectors and occupations where jobs are in high demand and offer living wages and upward mobility;
  3. Match participants to learning programs and job opportunities most likely to lead to success through effective, proactive career coaching;
  4. Drive competitiveness and equity by expanding the pool to traditionally underserved people with transferable, certified skills and job referrals aligned with employer needs for good jobs in growing sectors;
  5. Provide intensive wraparound support services that are integrated into the training program, including child care, transportation support, emergency funds, legal assistance, mental and behavioral health counseling, literacy training, and ongoing intensive coaching during training, job placement, and on-the-job employment.

- In January 2022, **America Achieves** released a policy playbook from its State Recovery Now initiative providing state and local governments with innovative, step-by-step strategies for offering people effective pathways to good careers and for helping employers fill in-demand jobs—all grounded in a strong evidence base Titled *Employing Residents in High-Demand Careers: An Evidence-Based Good Jobs-Driven Approach*, the playbook is the first in a suite of action-oriented resources. The detailed guide is intended to support states, counties, and cities as they consider how best to allocate and

implement hundreds of billions in state and local economic aid that is now available for spending from the American Rescue Plan, enacted in 2021.

*Efforts to Map Broadband Access and Workforce Needs*

*Mapping Access*

A handful of states have been mapping broadband access in their state, in addition to FCC mapping currently underway. Some highlighted states include:

- The **Colorado** Broadband Map shows broadband availability in the state with data collected on a biannual cycle. Any ISP that participates or intends to participate in any State of Colorado Broadband grants programs must participate in the Broadband Data Collection. According to the state, this data collection is done in addition to the FCC mapping, as the FCC data collected "is not granular enough for Colorado's needs. In order to collect the data needed for decision making in Colorado, the state collects data directly from ISPs in the state."[33]

- The **Georgia** Department of Public Affairs published the Georgia Broadband Map in 2021, using location-level methodology to precisely map the availability of broadband services to every home and business in the state. Broadband services are defined by the State as a minimum of 25Mbps down and 3Mbps up in speed. When 20 percent of homes and businesses in a census block cannot subscribe to these services, the entire census block is deemed unserved.

- **New York State** is undergoing an ambitious initiative to map the availability, reliability and cost of high-speed internet service across the state. Announced in September 2021, the initiative will be the first time the state takes on the mapping process on its own, in addition to current ongoing FCC mapping, to be completed later this fall. The initiative is led by the Public Service Commission which is working to identify areas at a location level. When the Public Service Commission completes its mapping, it will produce and publish a detailed, interactive public map on its website.

- **Ohio** completed an extensive mapping process in 2021 based on the most recently available data from the Federal Communications Commission and additional detailed information provided by partners at Connected Nation Ohio.

*Mapping the Existing and Projected Workforce*

As detailed above, there are some small-scale efforts to understand current and project broadband workforce needs. However, what does not exist on a national scale, nor disaggregated by state/territory, is a baseline analysis of current workforce capacity, future workforce needs given varying levels of investment, or the delta between those numbers and required skills or certifications. Given that many, if not all, states and territories will need to increase the size of their broadband workforce to meet the needs of incoming

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33          Colorado Broadband Office

investments, a targeted analysis at this level would be useful. (See "Collect And Analyze Current And Needed Broadband Workforce Data" section for recommendations). Below are some of the existing efforts to map the workforce and projected needs.

February 2021, **Emsi Burning Glass** conducted a research sprint on pathways into (aka "feeder occupations") and out of (aka "destination occupations" or "next step occupations") high-demand occupations in the broadband sector. This research was used to help inform the Brookings Institution report (see above). An example occupation profile is highlighted below:

| Critical Occupation Profile | Broadband / Satellite Technician |
|---|---|
| **Estimated Hiring Need** | 26,357 |
| **Ready Workforce** | 14,816 dislocated Broadband/ Satellite Technicians |
| **Potentially Available Workforce** | 15,106 skills-similar dislocated workers |
| **Average Salary** | $56,222 |
| **Projected Growth**[34] | -3.7% |
| **Current Demographics** | 55% White │ 23% Latinx │ 15% Black │ 92% Male |
| **% of Postings Requesting a High School Degree** | 94% |
| **% of Postings Requesting 0–2 years of Experience** | 60% |
| **Certifications** | OSHA Certification<br>BICSI Certification |
| **Feeder Occupations** | Insulation Worker<br>Television/Stateline Television Installer<br>Telemarketer |

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[34]    Projected growth is a five-year occupation projection "produced from a machine learning model combined with an econometric time series method. The model incorporates Emsi Burning Glass postings data and several external data sources. External inputs include occupational projections and historical employment statistics from the US Bureau of Labor Statistics and internet trend data, which indicate how many people have been searching for occupational information." (Emsi Burning Glass, 2021) The projected growth in this report from 2021 does not account for the $42.45 billion from the BEAD program to be released next year\, which is expected to increase projected growth figures.

| Next Step Occupations | Electrical Substation/Relay Reparer<br>Wage Increase: **+$25,558**<br>Change in Education Required from HS: **None**<br>Change in Automation Risk: **-1%**<br>12 Month Demand: **1,130**<br><br>Network/Systems Support Specialist<br>Wage Increase: **+$7,238**<br>Change in Education Required from HS: **Assoc./BA**<br>Change in Automation Risk: **+26%**<br>12 Month Demand: **21,342**<br><br>Electrician<br>Wage Increase: **-$42**<br>Change in Education Required from HS: **None**<br>Change in Automation Risk: **-24%**<br>12 Month Demand: **57,756**<br><br>Avionics Technician<br>Wage Increase: **+$7,475**<br>Change in Education. Required from HS: **None**<br>Change in Automation Risk: **+30%**<br>12 Month Demand: **5,921**<br><br>*Note: A positive automation risk number indicates that the Next-Step Occupation is at higher risk of automation than the original Critical Occupation.* |
|---|---|

- A March 2021 **Brookings Institution** report, with data from Emsi Burning Glass, looked at the impact of a (then-proposed) $80 billion broadband infrastructure investment. According to their analysis, "this spending would create approximately 200,000 job-years in about 130 occupations, principally in Installation, Maintenance, and Repair occupations." Specifically, the six highest-volume, most critical (i.e., those with the highest relative intensity of employment in broadband) occupations are:

| Occupation | Percentage Of Jobs | Number Of Jobs |
|---|---|---|
| Telecommunications Equipment Installers and Repairers, Except Line Installers | 13.5% | 26,357 |
| Telecommunications Line Installers and Repairers | 9.2% | 18,437 |
| Electrical Power-Line Installers and Repairers | 4.1% | 8,282 |
| Electronics Engineers, Except Computer | 2.2% | 4,374 |
| Radio, Cellular and Tower Equipment Installers and Repairers | 0.8% | 1,626 |
| Helpers—Installation, Maintenance and Repair Workers | 0.3% | 582 |

*Source: Brookings Institution*

- The **State of Ohio**, conducted a statewide analysis using a similar methodology to the Brookings report and Emsi Burning Glass analysis. Last year, this data was used to develop a plan for expanding career awareness and job training programs to help address the State's growing broadband workforce needs and the state is now carrying out the plan they created in 2021.

# VI. Conclusion & Next Steps

This first edition of our report highlights six key steps that eligible entities should consider taking as they begin their participation in the BEAD Program. Every state and territory may be starting from different points in their efforts to expand broadband, but the authors of this report feel these steps are critical ones that all Eligible Entities should be thinking about, especially given existing NOFO requirements. These steps alone will not wholly provide the workforce needed, but they are an important foundation, putting Eligible Entities on the right path toward the larger, more diverse broadband workforce the nation needs to deliver on this historic investment.

The BEAD program prioritizes expanded internet access to unserved and underserved locations. Today, more than ever before, access to high-speed internet is crucial for full participation in a modern society. Without it, we risk leaving already marginalized communities even further behind. That is why it is critical that Eligible Entities dedicate their time and resources now to a strategic plan for how to provide the workers employers needed to fill broadband projects—and how to make sure that the jobs created are good jobs with opportunities for advancement—to prevent bottlenecks when it comes time to construct and administer broadband for all.

As noted throughout the report, additional research, coordination, and technical assistance can provide important support to Eligible Entities over the next few years as they develop their BEAD Program plans and turn those plans into action. All the key stakeholders mentioned in this report—from employers to philanthropy to community organizations to unions, training providers, and more—can have a role to play in those next steps.

We look forward to continued feedback—and additional examples of best practices and articulation of other needs in the field—to inform a second edition of this report later this year.

# Appendix

## A. Initial Planning Funds & Workforce Development

The Initial Planning Funds NOFO language details a number of ways that Eligible Entities may use funds, for planning and pre-deployment activities[35]. A number of those uses could include workforce development activities and are suggested below.

| NOFO Language | Possible Usage Could Include |
|---|---|
| 3. Publications, outreach, and communications support related to broadband planning, deployment, mapping, equity and adoption. | Publication, outreach and communication related to the workforce needed for deployment. |
| 4. Providing technical assistance to potential subgrantees, including through workshops and events. | Technical assistance helping to support efforts in how to understand and address workforce needs. |
| 5. Training for employees of the broadband program or office of the Eligible Entity or employees of political subdivisions of the Eligible Entity, and related staffing capacity or consulting or contracted support to effectuate the goals of the BEAD Program. | Building a central broadband office, appointing a broadband workforce director and necessary staff, training existing workforce staff on broadband issues. |
| 7. Asset mapping across the Eligible Entity to catalog broadband adoption, affordability, equity, access and deployment activities occurring within the Eligible Entity. | Mapping workforce assets as well as training assets to prepare the workforce. |
| 8. Conducting surveys of unserved, underserved, and underrepresented communities to better understand barriers to adoption. | Research understanding barriers to having the workforce necessary to complete broadband projects. |
| 11. Other uses approved in advance writing by the Assistant Secretary (including in response to an Eligible Entity's request) that support the goals of the Program.[36] | An opportunity for Eligible Entities to think creatively about how to use these funds, which could include workforce related activities. |

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35      (NOFO Section IV.B.2—pages 24–25)
36      Requests for approval of uses not listed here should be made in writing to the Assistant Secretary and

**B. National Telecommunications and Information Administration: High Impact Opportunities for Action**

The following actions are considered "high-impact" steps that the NTIA at the Department of Commerce could take to help Eligible Entities succeed. These steps should be considered complementary to actions listed above in the report:

- **Improve Data:** Support a national strategy to improve data in order to better understand the existing and future real time broadband labor needs related.
- **Facilitate Career Pathways:** Support state efforts to develop and continuously update career pathway programs in broadband related occupations and facilitate coordinating and sharing of current state efforts to reduce duplication of effort.
- **Leverage Funding:** Devote a percentage or minimum amount of funding made available through the national BEAD administrative set-aside to promote and incentivize State activities around developing a broadband workforce.
- **Convene stakeholders:** At the national level, particularly employers and states to highlight best practices and identify areas where national collaboration would be beneficial.
- **Promote or incentivize the standardization** of job titles, classification and minimum skill and education levels as well as the identification or development of certification reflecting the most in demand skill needed.
- **Seek commitments from national employers**—particularly ISPs.
- **BEAD Funding for Workforce:** Further clarify language in NOFO regarding the use of funds for workforce development where does this fall in terms of first using $ to meet unmet and underserved areas?] and provide examples of ways in which Eligible Entities and subcontractors may use these funds (and how much).
- **Competitive Grant Priority:** Work within the Department of Commerce and across other federal agencies to add a priority in appropriate competitive grants related to building a highly skilled broadband workforce.
- **Launch a nationwide awareness campaign**—linked to any related state campaigns—to promote broadband career and training opportunities.

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submitted through the appropriate Federal Program Officer. Eligible Entities should make such requests on a timely basis to facilitate resolution prior to the point at which the Eligible Entity seeks to make the expenditure or expenditures at issue.

## C. Quick Guides

Below are top-line recommendation summaries for how some of the other key stakeholder groups (who are not Eligible Entities) can help. For the full recommendation—and context for how it fits in with the rest of the NOFO playbook—please see the corresponding section of the report.

**EMPLOYERS**

| Report Section | Opportunity for Engagement |
|---|---|
| 1. Appoint a Broadband Workforce Director and Staff and Develop a Broadband Workforce Strategic Plan | • Working closely with the broadband workforce staff within an Eligible Entity to carry out the goals of the office to meet broadband workforce needs in their state or territory. |
| 2. Convene Employers and Other Key Stakeholders to Advance Meaningful Collaboration and Mutual Commitments | • Participating as an active partner with the Eligible Entity and working with other key stakeholders. |
| 3. Collect, Analyze, and Use Current and Needed Broadband Workforce Data | • Collaboration with states and territories in sharing data on their individual company's employment needs, which can collectively help provide a more holistic understanding of the state's broadband workforce needs. |
| 4. Identify Additional Funding Sources to Support Broadband Workforce Development | • Helping to give financial support to evidence-based workforce development for the broadband workforce, as well as the critical supports for participants, such as income support and other wraparound services |
| 5. Working with Employers, Build and Scale Evidence-Based Programs and Practices with Measurable Job Outcomes to Train New and Existing Broadband Worker | • Helping Eligible Entities build their trained workforce by working with state coordinating offices to expand job training opportunities at community colleges and other training providers, for both new and incumbent employees.<br><br>• Offsetting program costs—such as tuition, support for earn and learn opportunities, wraparound services, and career counseling, as well as helping to study emerging best practices and programs to understand and improve outcomes. |
| 6. Recruit And Grow a Skilled, Diverse Broadband Workforce | • Working directly with community partners, colleges and other training providers to guide how to classify, advertise and market broadband training classes across disciplines. |

## FEDERAL GOVERNMENT

| Report Section | Opportunity for Engagement |
|---|---|
| 3. Collect, Analyze, and Use Current and Needed Broadband Workforce Data | • Leveraging existing BLS data to develop data tools and reports focused on the broadband workforce. (The Department of Commerce, led by the National Telecommunications and Information Agency (NTIA), and the Department of Labor's Bureau of Labor Statistics (BLS))<br><br>• Helping to ensure all states and territories have relevant, timely and actionable analysis on broadband workforce needs by establishing and funding technical assistance to support broadband workforce data analysis. (Department of Commerce and other federal agencies and/or philanthropy) |
| 4. Identify Additional Funding Sources to Support Broadband Workforce Development | • Providing technical assistance to Eligible Entities detailing all possible federal funding streams that may be used to bolster broadband workforce development—from data to training, to recruitment, retention, and more. (Department of Commerce and other federal agencies, including the Department of Labor and Department of Education) |
| 5. Working with Employers, Build and Scale Evidence-Based Programs and Practices with Measurable Job Outcomes to Train New and Existing Broadband Worker | • Creating a resource hub for effective and promising workforce development approaches and curricula for critical broadband occupations. (Department of Commerce and other federal agencies and/or philanthropy)<br><br>• Providing technical assistance, including providing tool kits and exemplars, and support to spur the development of intermediaries where they do not yet exist—or strengthen them where they do. |
| 6. Recruit And Grow a Skilled, Diverse Broadband Workforce | • Helping to map and disseminate these career pathways, connecting them to additional opportunities for training and advancement (Department of Labor or NTIA at Department of Commerce)<br><br>• Making information for marketing purposes clearer (Department of Education, Department of Labor, and other federal agencies). |

## INTERMEDIARIES

| Report Section | Opportunity for Engagement |
|---|---|
| 1. Appoint a Broadband Workforce Director and Staff and Develop a Broadband Workforce Strategic Plan | • Working closely with state broadband offices and broadband workforce directors to carry out some or all of the actions laid out in the report below, including analyzing workforce needs and the corresponding skills/credentials, finding and scaling workforce development programs aligned with employer needs, working with communities to recruit a diverse workforce and provide career navigation and wraparound support for workers, convening and working with employers, training workforce staff on broadband issues, and convening community partners to accomplish these tasks. |
| 2. Convene Employers and Other Key Stakeholders to Advance Meaningful Collaboration and Mutual Commitments | • Playing a critical role in helping to bring groups together and/or leading this work. |
| 5. Working with Employers, Build and Scale Evidence-Based Programs and Practices with Measurable Job Outcomes to Train New and Existing Broadband Worker | • Playing a critical role in identifying workforce development needs, liaising with and coordinating multiple stakeholders, developing and securing agreement on a common strategy, coordinating the different components needed to deepen the talent pool, and supporting development and implementation of training programs and support services. |

## PHILANTHROPY

| Report Section | Opportunity for Engagement |
|---|---|
| 3. Collect, Analyze, and Use Current and Needed Broadband Workforce Data | • Helping to ensure all states and territories have relevant, timely and actionable analysis on broadband workforce needs by establishing and funding technical assistance to support broadband workforce data analysis. |
| 4. Identify Additional Funding Sources to Support Broadband Workforce Development | • Playing a role in collecting and disseminating information on other funding opportunities available from the government.<br><br>• Helping to give financial support to evidence-based workforce development for the broadband workforce, as well as the critical supports for participants, such as income support and other wraparound services. |
| 5. Working with Employers, Build and Scale Evidence-Based Programs and Practices with Measurable Job Outcomes to Train New and Existing Broadband Worker | • Supporting public private partnerships to help relocate trained workers to areas where the local workforce is undersized and potential pool of applicants limited.<br><br>• Helping offset program costs—such as tuition, support for earn and learn opportunities, wraparound services, and career counseling, as well as helping to study emerging best practices and programs to understand and improve outcomes.<br><br>• Creating a resource hub for effective and promising workforce development approaches and curricula for critical broadband occupations.<br><br>• Providing technical assistance, including providing tool kits and exemplars, and support to spur the development of intermediaries where they do not yet exist—or strengthen them where they do. |

## D. Key Federal Programs Supporting Workforce Development

| Lead Agency | Program | Requirements / Eligibility | Potential Uses for Funding | Examples |
|---|---|---|---|---|
| Department of Education | Pell Grant Program (short-term Pell) | Federal Pell Grants usually are awarded only to undergraduate students who display exceptional financial need and have not earned a bachelor's, graduate, or professional degree.<br><br>Workforce Pell Grants (proposed in Congress), also known as short-term Pell Grants, would allow federal financial aid dollars to be used to pay for short-term training or credential programs – programs that have been proven to help workers quickly gain the skills necessary to compete for in-demand jobs and earn higher wages. | **Undergraduate students may use Pell Grant funds to pursue a certificate or degree in a broadband-related program at a Title IV participating institution.** | While some institutions offer specific broadband certificates (see Northwoods Technical College above), many others offer degrees and certificates in areas related to "communication systems installation and repair." |

| Lead Agency | Program | Requirements / Eligibility | Potential Uses for Funding | Examples |
|---|---|---|---|---|
| Department of Education | Work-Study programs | The FWS Program provides funds for part-time employment to help needy students finance the costs of postsecondary education. Students can receive FWS funds at approximately 3,400 participating postsecondary institutions. Hourly wages must not be less than the federal minimum wage.<br><br>A participating institution applies each year for FWS funding by submitting a Fiscal Operations Report and Application to Participate (FISAP) to the U.S. Department of Education.<br><br>Students may be employed by: the institution itself; a federal, state, or local public agency; a private non-profit organization; or a private for-profit organization. | **Institutions can support students pursuing a degree or credential in a broadband-related field by offering funding through FWS programs.** | – |

| Lead Agency | Program | Requirements / Eligibility | Potential Uses for Funding | Examples |
|---|---|---|---|---|
| Department of Education | Career and Technical Education | Each year under Perkins V, Congress appropriates roughly $1.2 billion in State formula grants and over $30 million in competitive discretionary grants specified in the law for the improvement of career and technical education (CTE) programs across the nation. | **Federal CTE funding can be directed toward institutions and programs with a focus on information technology to develop necessary broadband workforce skills and access training opportunities.** | Indiana's CTE Program—"Next Level Programs of Study" has an Information Tech area of study<br><br>New York's P-TECH schools "offer an innovative six-year high school program to prepare students for college and careers competitive in science, technology, engineering, and mathematics (STEM) industries." |

| Lead Agency | Program | Requirements / Eligibility | Potential Uses for Funding | Examples |
|---|---|---|---|---|
| Department of Labor | WIOA Formula Grants | The Workforce Innovation and Opportunity Act (WIOA) of 2014 enacted a comprehensive youth employment program for serving eligible youth, ages 14-24, who face barriers to education, training, and employment.<br><br>Funds for youth services are allocated to states and local areas based on a formula. The WIOA Youth Program focuses primarily on out-of-school youth, requiring local areas to expend a minimum of 75% of WIOA youth funds on them. The program includes 14 program elements that are required to be made available to youth participants. WIOA prioritizes work experience through a 20% minimum expenditure rate for the work experience program element. | **WIOA Formula Grants can support employment opportunities, pre-apprenticeship programs and on-the-job training programs, and could be utilized by telecommunications and broadband industry companies to increase opportunities for eligible youth to be exposed to careers in the broadband industry.** | CareerOneStop lists opportunities for training, apprenticeship and certification programs. |

| Lead Agency | Program | Requirements / Eligibility | Potential Uses for Funding | Examples |
|---|---|---|---|---|
| Department of Labor | Apprenticeship Grants | Apprenticeship: Closing the Skills Gap: Using H-1B training funds, grant awards range from $500,000 to $6 million to each organization partnering with businesses ready to train apprentices. The grantees include institutions of higher education, state systems of higher education, non-profit trade organizations, industry or employer associations, labor unions, and labor-management organizations. The grant program will support the training of more than 92,000 individuals in new or expanded apprenticeship programs, and increase access to apprenticeship opportunities for all Americans, particularly veterans, military spouses, service members reentering the civilian workforce, and groups underrepresented in current apprenticeship programs. | **Apprenticeship grant funds can be used to help telecommunications companies develop and expand apprenticeship opportunities through the Telecommunications Industry Registered Apprenticeship Program (TIRAP).** | Velex, a tower construction and technical services company, has a successful tower climbing technician Registered Apprenticeship program through TIRAP: "With a thorough understanding of available career paths, Velex has developed clear and applicable training standards that ultimately carry over to on-the-job training." |

| Lead Agency | Program | Requirements / Eligibility | Potential Uses for Funding | Examples |
|---|---|---|---|---|
| Department of Labor | Strengthening Community College Grants | The second round of the Strengthening Community Colleges Training Grants Program (referred to as Strengthening Community Colleges or SCC2) builds the capacity of community colleges to address identified equity gaps and meet the skill development needs of employers in in-demand industries and career pathways leading to quality jobs. In January 2021, the Department of Labor awarded $40 million in grants to 11 community colleges, including seven consortium grants and four single institution grants in 10 states. Industry sectors represented among grants include Advanced Manufacturing, Health care, Information Technology (including Cybersecurity), and others. | **Eligible institutions could use SCC2 grant funds to increase broadband-related training, credentialing and degree programs.** | Broward College used grant funding to develop a process for micro-credentialing, including industry-recognized credentials for: Engineering Technology Support Specialist; Computer Programming Specialist; IT Apprenticeship; AWS Certified Cloud Practitioner. |
| Department of Labor | YouthBuild | YouthBuild is a community-based pre-apprenticeship program that provides job training and educational opportunities for at-risk youth ages 16-24 who have previously dropped out of high school. Youth learn vocational skills in construction, as well as in other in-demand industries that include health care, information technology, and hospitality. | **YouthBuild grants could go toward workforce development centers or ISPs to provide pre-apprenticeship and training programs for at-risk youth.** | In 2021, YouthBuild awarded funds to 68 organizations, including to the Citrus Levy Marion Regional Workforce Development Board Inc., the Georgia Building Trades Academy, the Detroit Employment Solutions Corp., among others. |

| Lead Agency | Program | Requirements / Eligibility | Potential Uses for Funding | Examples |
|---|---|---|---|---|
| Department of Labor | Wagner-Peyser Employment Service | The American Job Center network, part of the One-Stop system, provides universal access to an integrated array of labor exchange services so that workers, job seekers, and employers can find the services they need. The Wagner-Peyser Employment Service focuses on providing a variety of services including job search assistance, help getting a job referral, and placement assistance for job seekers. Additionally, re-employment services are available for unemployment insurance claimants, as well as recruitment services to employers with job openings. Services are delivered in one of three modes including self-service, facilitated self-help services and staff assisted service delivery approaches. | **The Wagner-Peyser Employment Service could work with ISPs and other workforce development centers to assist individuals in their job search by connecting them with broadband industry career opportunities.** | – |
| Department of Veteran Affairs | G.I. Bill Benefits | VA offers job training in On-the-Job (OJT) or Apprenticeship programs, while paying GI Bill benefits on a sliding scale depending on length of training in addition to a salary from the employer. | **Telecommunications companies can participate in VA's OJT & Apprenticeship programs to provide veterans with opportunities for training and experience in broadband careers.** | In the past, VA has partnered with Local Union Joint Apprenticeship & Training Commissions, including linemen and electricians. |

| Lead Agency | Program | Requirements / Eligibility | Potential Uses for Funding | Examples |
|---|---|---|---|---|
| Department of Veteran Affairs | Rapid Reemployment Assistance Program | The Veteran Rapid Retraining Assistance Program (VRRAP) offers education and training for high-demand jobs to veterans who are unemployed because of the COVID-19 pandemic. Note: individuals can't receive VRRAP benefits at the same time as they are receiving unemployment benefits (including CARES Act benefits). | **VRRAP covers education and training programs approved under the GI Bill and Veteran Employment Through Technology Education Courses (VET TEC) that lead to high-demand jobs. VRRAP could be used toward career training opportunities relevant to the broadband industry.** | VRRAP includes the following occupations among its list of "high-demand occupations":<br><br>• Telecommunications equipment installers and repairers, except line installers<br><br>• Computer, automated teller, and office Radio, cellular, and tower equipment installers and repairers<br><br>• Electrical power-line installers and repairers<br><br>• Telecommunications line installers and repairers |

| Lead Agency | Program | Requirements / Eligibility | Potential Uses for Funding | Examples |
|---|---|---|---|---|
| Department of Defense | SkillBridge Program | The DOD SkillBridge program is an opportunity for Service members to gain valuable civilian work experience through specific industry training, apprenticeships, or internships during the last 180 days of service. SkillBridge connects Service members with industry partners in real-world, civilian job experiences. | **ISPs could partner with DOD and Skillbridge to increase training and apprenticeship opportunities for Service Members, in addition to introducing Service Members to broadband industry career pathways.** | The following are examples of existing Authorized Skillbridge Organizations: <br><br> • Glenwood Telecommunications <br><br> • Northwest Lineman Colleges and Centers—Electrical Lineworker Program and the Telecommunications Lineworker Program <br><br> • RJE Telecom <br><br> • TDS Telecommunications <br><br> • TeleCommunication Systems, Inc.—Comtech MCT Cyber SkillBridge Transition Program |
| HUD | Jobs Plus | The purpose of the Jobs Plus Initiative program is to develop locally-based, job-driven approaches to increase earnings and advance employment outcomes through work readiness, employer linkages, job placement, educational advancement technology skills, and financial literacy for residents of public housing. | **ISPs and community colleges can partner with HUD on the Jobs Plus Initiative to provide relevant broadband industry training opportunities and job placements.** | Among the FY2020–2021 Jobs Plus award grantees are workforce development boards, community and technical colleges and career centers, all of which work with individuals to provide resources and access to in-demand jobs. |

| Lead Agency | Program | Requirements / Eligibility | Potential Uses for Funding | Examples |
|---|---|---|---|---|
| USDA | SNAP Employment and Training (E&T) | The SNAP E&T program helps SNAP participants gain skills and find work that moves them forward to self-sufficiency. Through SNAP E&T, SNAP participants have access to training and support services to help them enter or move up in the workforce. These programs also help reduce barriers to work by providing support services—such as transportation and childcare—as participants prepare for and obtain employment. Each state is required to operate a SNAP E&T program and receives federal funding annually to operate and administer the program. | **ISPs could leverage the SNAP E&T program as well as the SNAP to Skills program to increase awareness of broadband career opportunities as well as increase access to relevant training programs.** | The SNAP To Skills (S2S) program connects participants with training opportunities, as well as programs that offer certificates and credentials. In the past, S2S has partnered with community and technical colleges to give participants access to short-term training programs, like a mechanics program with an HVAC certification. |

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### F. Stakeholders Consulted

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- Center on Rural Innovation
- Chamber of Commerce Foundation
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- Comcast
- Communications Workers of America
- Emsi Burning Glass
- EnerTribe
- Fiber Broadband Association
- Flume Internet
- Hudson Valley Wireless
- Land of Sky Regional Council (North Carolina)
- The Marconi Society & Arizona State University
- Markle Foundation
- Microsoft
- Mission Wisconsin
- National Governors Association
- NCTA—The Rural Broadband Association
- Northwood Technical College
- The Pew Charitable Trusts
- Schmidt Futures
- State of Louisiana—Office of Broadband Development and Connectivity
- State of Mississippi—Broadband Expansion and Accessibility of Mississippi (BEAM) Office

- State of Missouri—Office of Workforce Development
- State of Ohio—Governor's Office of Workforce Transformation
- State of Vermont—Vermont Community Broadband Board
- State of Wisconsin—Governor's Task Force on Broadband Access
- Wireless Infrastructure Association
- Wisconsin Paper Council
- Wisconsin State Telecommunications Association
- Wisconsin Technical College System