

Feeder Occupations and Next Steps for Broadband Initiatives

Prepared for America Achieves - February 2021



Emsi Burning Glass provides labor market data that helps to create better outcomes for communities. Our data, which cover more than 99% of the U.S. workforce, are compiled from a wide variety of government sources, job postings, and online profiles and résumés. A variety of our clients use Emsi Burning Glass to align programs with regional needs and demonstrate their institution’s economic impact on their region. Visit economicmodeling.com/ci-consulting to learn more or connect with us.

BACKGROUND and PURPOSE

As the country emerges from Covid-19 and its economic implications, a concerted effort is under way to reemploy the great number of American workers who have lost jobs and income amid the pandemic. Alongside of these disruptions of the past year, the US is also acknowledging historic and contemporary racial inequities that have implications across health, infrastructure, and employment.

As with any major disruption, it is not possible to simply “put the pieces back together”. Many of the most severely impacted industries are unlikely to recover immediately or predictably, and many of the interventions designed to stimulate the economy and increase employment may struggle to find enough workers who are ready to do the necessary work. Recovery cannot be allowed to simply reanimate historic inequities and the practices and systems that have entrenched them.

Publicly supported infrastructure investments can at once create the conditions for longer-term economic recovery and generate near-term opportunities to activate large numbers of unemployed, underemployed, and dislocated workers. We also recognize that stimulus and infrastructure spending is not only a tool for general recovery, but also to increase access to meaningful work for historically marginalized populations.

Among the massive elements of planning infrastructure projects is the need to identify and prepare the Americans who will work on those projects. In some measure, individuals dislocated earlier in 2020 can step back into their roles, already with the skills and credentials needed to do that work safely and effectively. The potential size of the infrastructure projects, however, calls for a larger workforce that cannot be supplied just by workers who had already been doing those roles. Rather, we will need a pipeline of additional workers who can quickly prepare to support these projects. Every worker that needs to be hired is also an opportunity to redress historic inequities and to create opportunities for a workforce that is more representative of the diversity of the country. This research aims to inform how the infrastructure investments can at once address the infrastructure, employment and equity challenges facing the country.

In partnership with the Brookings Institution and under the leadership of America Achieves, Burning Glass Technologies has leveraged its proprietary data and analytic capabilities to support human capital deployment to the infrastructure investments in a way that balances the need for rapid reemployment and the need to achieve equity goals. In planning these efforts, the analyses identifies:

- The ready workforce - those recently dislocated from occupations that will be important to the various infrastructure projects and that can be reactivated to work on those projects more or less immediately
- Workers who may need modest retraining - those workers who are in roles that call for similar skills that are required in the infrastructure workforce. Using Burning Glass’ proprietary skills data, we are able to identify a range of “feeder occupations” who will need less upskilling to become ready for the infrastructure jobs, and who are good candidates for upskilling and reskilling into the infrastructure jobs.

- Skills gaps - while substantial skills overlaps are identified, so too are the unique skills called for in the infrastructure occupations. These skills can be the focus of upskilling and reskilling efforts, and can prepare skills-adjacent workers for infrastructure roles most efficiently
- Demographics - some feeder occupations currently employ larger numbers of people of color and youth for whom the new opportunities stand to be especially meaningful. In using the new efforts to address equity priorities, these feeder roles can be especially important sources of talent, and for whom upskilling and reskilling can be especially impactful in creating more diverse and equitable infrastructure workforce
- Next Steps - recognizing that the infrastructure projects will have a defined lifecycle and associated employment opportunities will likely level off, some of the workers recruited into the new infrastructure roles will move forward in their careers to other occupations. Analysis of further skills similarities indicates where advancement from the infrastructure jobs into "Next Step" occupations may be feasible

This analysis focuses on the Broadband portion of the potential infrastructure initiative.

METHODOLOGY

Data

Burning Glass tracks demand by collecting job postings from more than 40,000 online job sites to develop a comprehensive, real-time portrait of labor market demand. Our software extracts topline information about each job such as title, employer, and industry, and then “reads” each job description to identify specific job titles, skills, and qualifications that employers are seeking.

We chose to define occupations using an internal BGT taxonomy, as opposed to O*NET / CPS codes. Based on analyses of real-time job titles and requirements for skills and education, Burning Glass Occupations (BGTOCCs) were adapted to reflect current employer demand more accurately— separating out distinct occupations that BLS codes as one occupation in some cases, and consolidating similar occupations that BLS splits out where real-time employer requirements did not vary significantly between job categories. Where possible, we use statistics for BGTOCCs. In some cases, like in defining the median salary and estimating employment numbers, we use a crosswalk that matched BGTOCCs back to O*NET / CPS codes. Additionally, we chose to look at BGTOCCs across the entire labor market, as opposed to constraining to a particular industry. This is because occupations are defined by industry-transferable skills and individuals in an occupation will be able to move more easily across industries as opposed to workers within an industry moving across occupations.

Initiative Level Reports:

Critical Occupations

For the proposed Broadband initiative, we present information centered around the critical occupations. Critical occupations are identified by Brookings and defined as those occupations that have the highest intensity of employment in each initiative relative to the rest of the economy. We hand select critical occupations and matched them to one or more BGT Occupations using a proportional crosswalk based on the job posting frequency. We report all metrics at the BGT Occupation level. The following tables show the mapping from O*NET / CPS Occupation to BGT Occupation.

Broadband Critical Occupations

BGT Occupation	O*NET / CPS Occupation
Satellite / Broadband Technician	Telecommunications Equipment Installers and Repairers, Except Line Installers
Radio Technician	Radio, Cellular and Tower Equipment Installers and Repairers
Utility Line Locator / Technician	Electrical Power-Line Installers and Repairers
Maintenance Helper / Assistant	Helpers--Installation Maintenance and Repair Workers
Electronics Engineer	Electronics Engineers, Except Computer
RF Engineer	Electronics Engineers, Except Computer
Cable Technician / Installer	Telecommunications Line Installers and Repairers

We calculate the following statistics:

Estimated hiring need metric is the number of jobs created per amount of money invested. The amount of investment varies across the four initiatives with Broadband and Oil and Gas based on 80 billion dollars and 24 billion dollars, respectively. Data on this metric was provided by Brookings. We used a crosswalk that matched BGT OCCs back to O*NET / CPS codes.

Median 2019 salary numbers are from Occupational Employment Statistics (OES). OES reports estimates of employment and wages for approximately 800 occupations based on a semiannual survey that they conduct. Data from self-employed persons are not collected or included in OES estimates. All OES data in this report is at the national level.

Five-year **occupation projections** are produced from a machine learning model combined with an econometric time series method. The model incorporates 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 (BLS) and internet trend data, which indicate how many people have been searching for occupational information.

We report **current demographic information** for each critical occupation. We include the percent of workers in the critical occupation that are White, Hispanic, Black, and Male. Data on

this metric is provided by Brookings. We used a crosswalk that matched BGT OCCs back to O*NET / CPS codes.

We provide the **most requested minimum education level** and the associated percent of postings requesting that level of education by looking at postings for the occupation between January 1st, 2020 through December 31st, 2020.

We provide the **percent of postings requesting 0 to 2 years of experience** by looking at postings for the occupation between January 1st, 2020 through December 31st, 2020.

We provide the **top certifications** by looking at postings for the occupation between January 1st, 2020 through December 31st, 2020. Common certification requirements are good targets for training programs curriculum ensuring that workers are properly prepared for employment. We exclude listing certifications that do not meet sample size requirements.

We report the **necessary and defining skills** for each occupation. An occupation's necessary skills are specialized skills that are required for that job and are relevant across other similar jobs. An employee needs these skills as building blocks to perform the more complex defining skills. An occupation's defining skills represent the day-to-day tasks and responsibilities of the job. An employee needs these skills to qualify and perform successfully in this occupation. These skills are crucial for education and training programs and providers to cover.

Ready workforce metric is the number of dislocated or unemployed workers from the critical occupation. Data on this metric was provided by Brookings. We used a crosswalk that matched BGT OCCs back to O*NET / CPS codes.

Feeder Occupations

For each critical occupation, we identify three or four of feeder occupations. Feeder occupations are previous step occupations that are skills-adjacent to the critical occupations. Workers within the feeder occupations can be upskilled or reskilled to meet projected demand. To pick feeder occupations, we consider similarity scores, salary differentials, unemployment statistics, demographics information, and automation risk.

In this analysis, we use an index of similarity or similarity scores. The similarity scores for occupation pairs have a numeric value between 0 and 1. They can be seen as a proxy measure for the feasibility of transitioning between the two jobs. Job pairs that have a similarity score of 1 can be said to have a perfect fit (and are in fact the same occupation), while job pairs with a similarity score of 0 have the most imperfect fit with no overlapping skills. We look for feeder occupations where making the transition to the critical occupation is advantageous providing the worker with a higher wage or lower risk of automation. Additionally, relevant demographic information including age distribution, race/ethnic information and unemployment estimates are also considered.

We calculate statistics at the individual feeder level or across the group of feeders for the critical occupation. The following statistics are included in this section:

We report the **percent of feeder roles meeting education requirements of target occupation**. This metric is calculated using each occupation's most requested minimum education level seen from job postings between January 1st, 2020 through December 31st, 2020.

We provide the **percent of feeder roles with higher automation risk than the target occupation**. The automation risk score for an occupation is a numeric value between 0 and 1. Occupations that have an automation score closer to 1 are at a high risk of being automated in the future, while occupations that have a score closer to 0 are at low risk of being automated in the future. Data on the automation risk is based on the 2013 study "The Future of Employment: How Susceptible are Jobs to Computerization?" by Oxford researchers, Carl Benedikt Frey and Michael A. Osborne.

The **available workforce metric** is the number of dislocated or unemployed workers from the feeder occupation. Data on this metric was provided by Brookings. We used a crosswalk that matched BGTOCCs back to O*NET / CPS codes.

We report the **salary difference** between the feeder occupation and the critical occupation. Salary differences are calculated using 2019 median wage estimates from OES.

The **youth metric** is the percent of current workers that are 16 to 24 years old and are currently employed in the critical occupation. Data on this metric was provided by Brookings. We used a crosswalk that matched BGTOCCs back to O*NET / CPS codes.

The **non-white metric** is the percent of current workers that either Black, Multiracial/Other, or Hispanic and are currently employed in the critical occupation. Data on this metric was provided by Brookings. We used a crosswalk that matched BGTOCCs back to O*NET / CPS codes.

Skill gaps and **skill overlaps** are provided for each feeder occupation and critical occupation pair. Skill gaps represent the skills that need to be gain for workers in the feeder occupation to successfully transition into employment in the critical occupation. Skill overlaps are the common skills that both the feeder occupation and the critical occupation require to perform successfully.

Destination Occupations

For each critical occupation, we identify three or four of destination occupations. Destination occupations are next step occupations that workers in the critical occupation can aim to advance based on skills-adjacency. In addition to skill-adjacency, we look at salary differentials, education requirements and automation risk when selecting destination occupations.

We calculate the following statistics for each destination occupation:

We report the **salary difference** between the critical occupation and destination occupation. Salary differences are calculated using 2019 median wage estimates from OES.

We provide the **change in requested education level** between the critical occupation and destination occupation. This metric is calculated using each occupation's most requested minimum education level seen from job postings between January 1st, 2020 through December 31st, 2020.

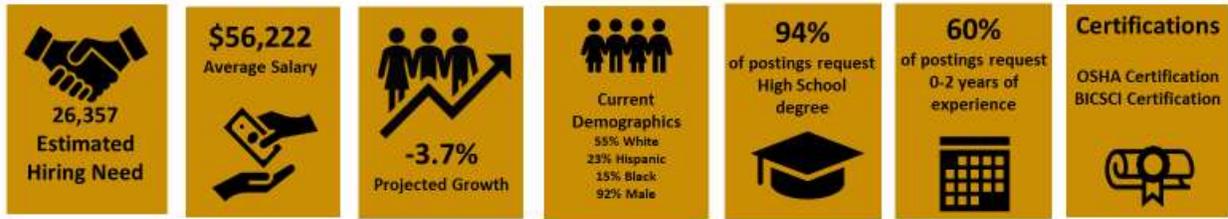
We report the **change in automation risk score** from the critical occupation to the destination occupation. A positive number for this metric indicates that the destination occupation is at higher risk of automation than the critical occupation.

We approximate the **labor market demand** by looking at postings for the occupation between January 1st, 2020 through December 31st, 2020.

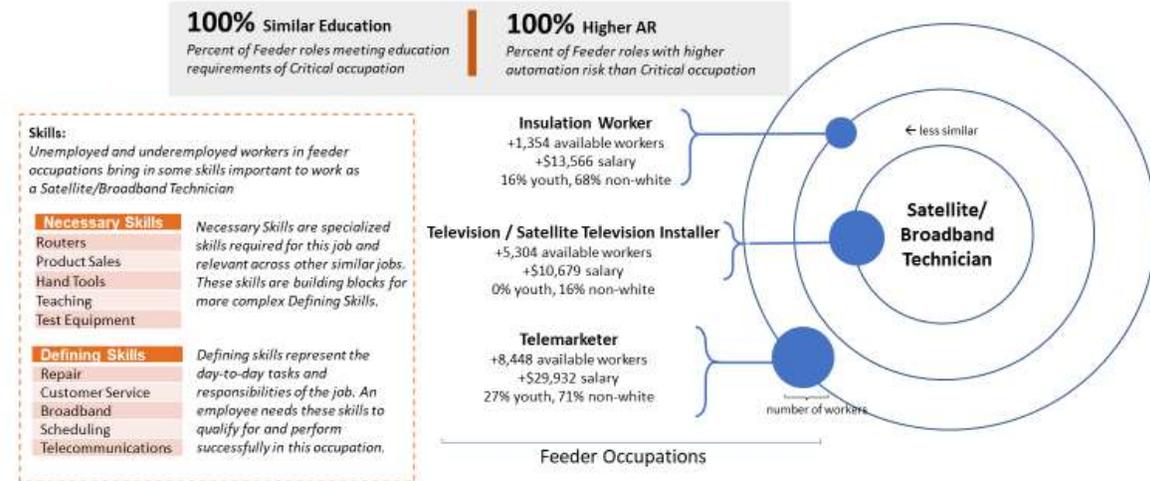
BROADBAND EXPANSION: OCCUPATION AND JOB IMPLICATIONS

Initiative: **Broadband**

Critical Occupation Profile: **Broadband/Satellite Technician**

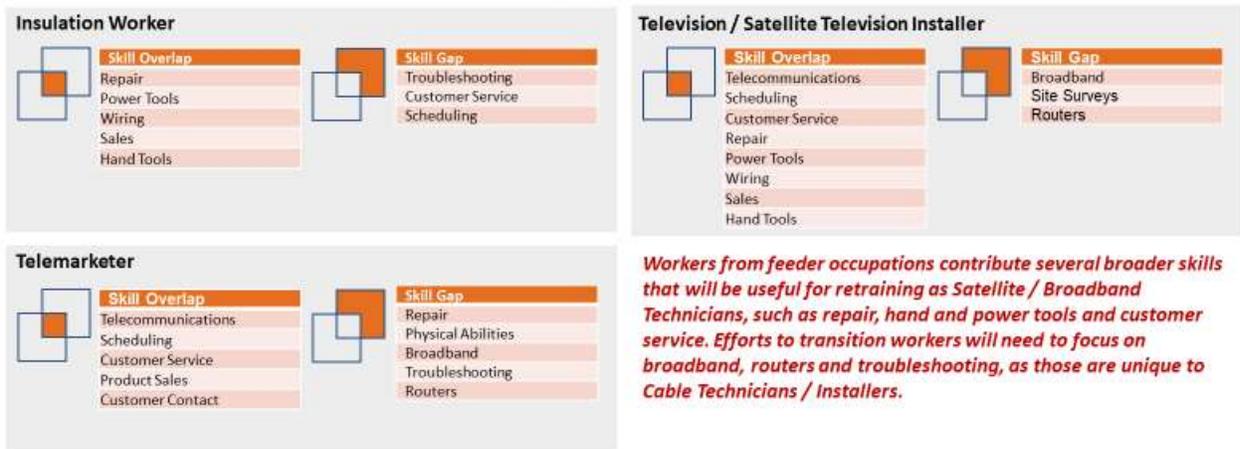


Back to Work Opportunity:



Skill Gaps and Overlaps

Feeder Occupations:



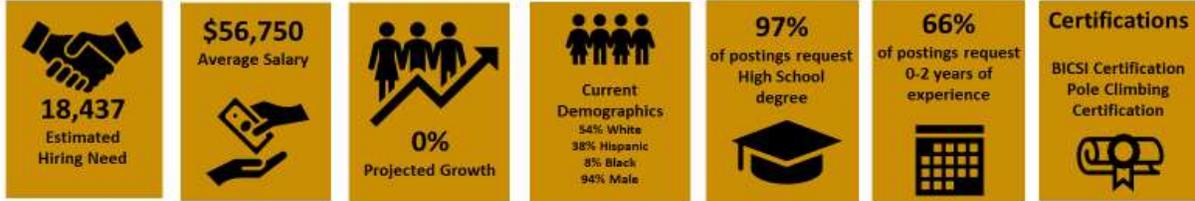
Next Step Occupations

Critical Occupation	Next-Step Occupations	Wage Increase	Change in Educ. Req.	Change in Automation Risk*	12 Month Demand
	Electrical Substation / Relay Repairer	+\$26,558	HS -> HS	-1%	1,130
	Network / Systems Support Specialist	+\$7,238	HS -> Assoc./BA	+26%	21,342
	Electrician	-\$42	HS -> HS	-24%	57,756
	Avionics Technician	+\$7,475	HS -> HS	+30%	5,921

* A positive number in red indicates that the Next-Step Occupation is at higher risk of automation than the Critical occupation

Initiative: **Broadband**

Critical Occupation Profile: Cable Technician / Installer



Back to Work Opportunity:

Projected Demand:
18,437 roles to fill

Ready Workforce:
4,070 dislocated
Cable Technician / Installer

Potentially Available Workforce:
99,427 skills-similar dislocated workers

100% Similar Education

Percent of Feeder roles meeting education requirements of Critical occupation

100% Higher AR

Percent of Feeder roles with higher automation risk than Critical occupation

Skills:

Unemployed and underemployed workers in feeder occupations bring in some skills important to work as a Cable Technician / Installer

Necessary Skills

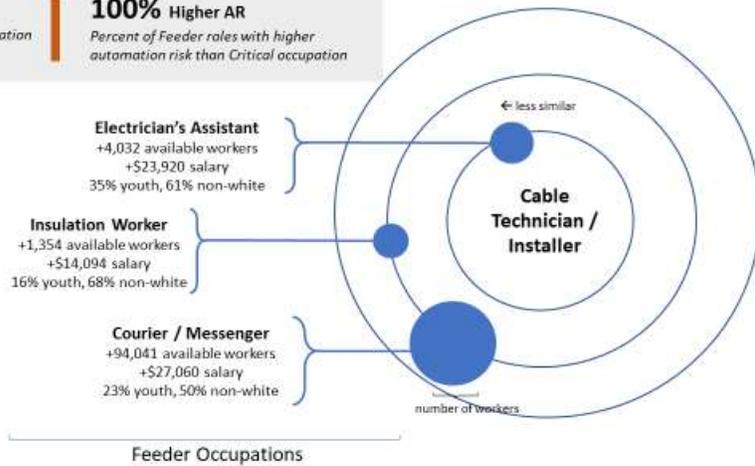
Hand Tools
Customer Service
Test Equipment
Lifting Ability
Occupational Health and Safety

Necessary Skills are specialized skills required for this job and relevant across other similar jobs. These skills are building blocks for more complex Defining Skills.

Defining Skills

Repair
Telecommunications
Fiber Optics
Cabling
CAT5 Cable

Defining skills represent the day-to-day tasks and responsibilities of the job. An employee needs these skills to qualify for and perform successfully in this occupation.



Skill Gaps and Overlaps

Feeder Occupations:

Electrician's Assistant



Skill Overlap

Occupational Health and Safety
Repair
Power Tools
Wiring
Hand Tools



Skill Gap

Telecommunications
Fiber Optics
Cabling
Troubleshooting
CAT5 Cable

Insulation Worker



Skill Overlap

Occupational Health and Safety
Lifting Ability
Repair
Power Tools
Wiring
Hand Tools



Skill Gap

Troubleshooting
Fiber Optics
Communication Skills
Test Equipment

Courier / Messenger



Skill Overlap

Customer Contact
Customer Service
Occupational Health and Safety
Lifting Ability



Skill Gap

Telecommunications
Troubleshooting
Repair
Hand Tools
Power Tools

Workers from feeder occupations contribute several broader skills that will be useful for retraining as Cable Technicians / Installers, such as repair, hand and power tools and customer service. Efforts to transition workers will need to focus on telecommunications, fiber optics and cabling, as those are unique to Cable Technicians / Installers.

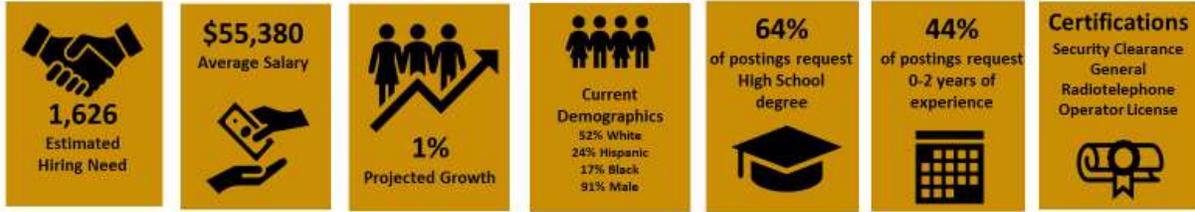
Next Step Occupations

Critical Occupation	Next-Step Occupations	Wage Increase	Change in Educ. Req.	Change in Automation Risk*	12 Month Demand
	Network / Systems Support Specialist	+\$6,710	HS -> Assoc./BA	+16%	21,342
	Electrician	-\$570	HS -> HS	-34%	57,756
	Avionics Technician	+\$6,947	HS -> HS	+20%	5,921
	Crane Operator	-\$60	HS -> HS	+31%	9,163

* A positive number in red indicates that the Next-Step Occupation is at higher risk of automation than the Critical occupation

Initiative: **Broadband**

Critical Occupation Profile: **Radio Technician**



Back to Work Opportunity:

Projected Demand:
1,626 roles to fill

Ready Workforce:
1,021 dislocated
Radio Technicians

Potentially Available Workforce:
7,501 skills-similar dislocated workers

100% Similar Education

Percent of Feeder roles meeting education requirements of Critical occupation

100% Higher AR

Percent of Feeder roles with higher automation risk than Critical occupation

Skills:

Unemployed and underemployed workers in feeder occupations bring in some skills important to work as a Radio Technician

Necessary Skills

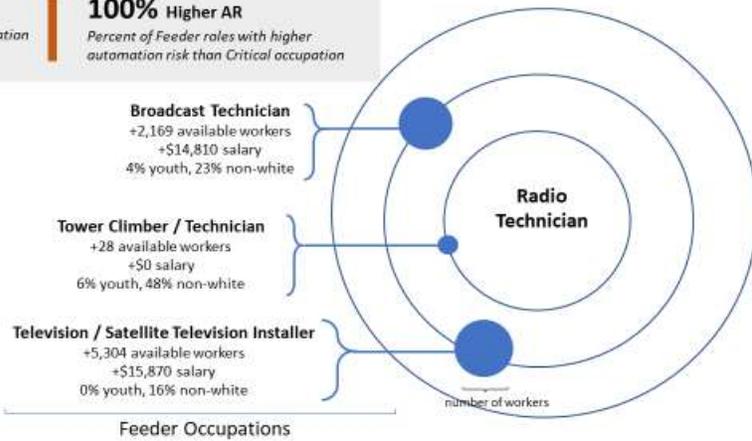
- Schematic Designs
- Electronics Industry Knowledge
- Two-Way Radio Operation
- Calibration
- Technical Support

Necessary Skills are specialized skills required for this job and relevant across other similar jobs. These skills are building blocks for more complex Defining Skills.

Defining Skills

- Repair
- Test Equipment
- Oscilloscopes
- Telecommunications
- Cabling

Defining skills represent the day-to-day tasks and responsibilities of the job. An employee needs these skills to qualify for and perform successfully in this occupation.



Skill Gaps and Overlaps

Feeder Occupations:

Broadcast Technician



- Skill Overlap**
- Repair
 - Customer Service



- Skill Gap**
- Troubleshooting
 - Test Equipment
 - Oscilloscopes
 - Level Antennas

Tower Climber / Technician



- Skill Overlap**
- Telecommunications
 - Repair
 - Soldering
 - Two-Way Radio Operation
 - Wiring
 - Public Health and Safety
 - Hand Tools



- Skill Gap**
- Test Equipment
 - Troubleshooting
 - Repair
 - Oscilloscopes

Television / Satellite Television Installer



- Skill Overlap**
- Cabling
 - Telecommunications
 - Customer Service
 - Repair
 - Wiring
 - Hand Tools



- Skill Gap**
- Troubleshooting
 - Test Equipment
 - Oscilloscopes

Workers from feeder occupations contribute several broader skills that will be useful for retraining as Radio Technicians, such as repair, wiring, telecommunications and customer service. Efforts to transition workers will need to focus on oscilloscopes and test equipment, as those are unique to Radio Technicians.

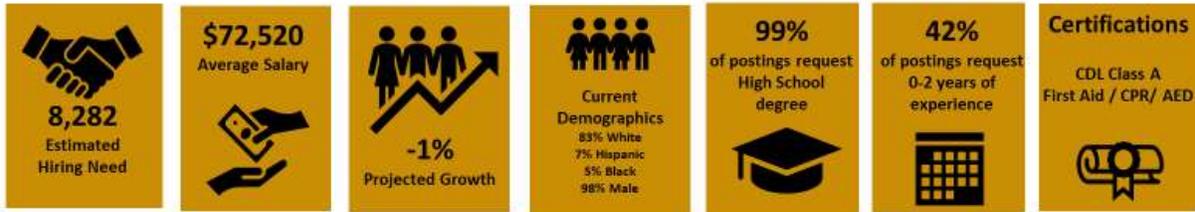
Next Step Occupations

Critical Occupation	Next-Step Occupations	Wage Increase	Change in Educ. Req.	Change in Automation Risk*	12 Month Demand
 Radio Technician	Electrical Substation / Relay Repairer	+\$27,400	HS -> HS	-55%	1,130
	Network / Systems Support Specialist	+\$8,080	HS -> Assoc./BA	-28%	21,342
	Electrical and Electronics Technician	+\$8,080	HS -> HS	-11%	58,815
	Sound Engineering Technician	-\$640	HS -> BA	-80%	1,948

* A positive number in red indicates that the Next-Step Occupation is at higher risk of automation than the Critical occupation

Initiative: **Broadband**

Critical Occupation Profile: **Utility Line Locator / Technician**



Back to Work Opportunity:

Projected Demand:
8,282 roles to fill

Ready Workforce:
5,222 dislocated
Utility Line Locator / Technician

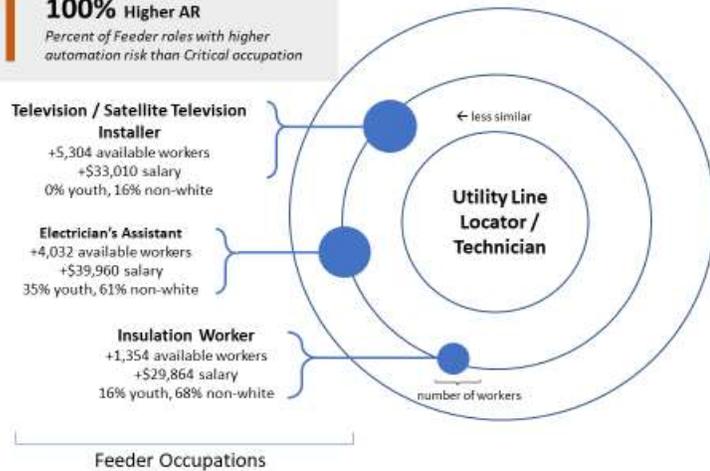
Potentially Available Workforce:
10,690 skills-similar dislocated workers

100% Similar Education
Percent of Feeder roles meeting education requirements of Critical occupation

100% Higher AR
Percent of Feeder roles with higher automation risk than Critical occupation

Skills:
Unemployed and underemployed workers in feeder occupations bring in some skills important to work as an Utility Line Locator / Technician

Necessary Skills	<i>Necessary Skills are specialized skills required for this job and relevant across other similar jobs. These skills are building blocks for more complex Defining Skills.</i>
Occupational Health and Safety	
New Construction	
Switchgear	
Hand Tools	
Detection and Measurement Equipment	
Defining Skills	<i>Defining skills represent the day-to-day tasks and responsibilities of the job. An employee needs these skills to qualify for and perform successfully in this occupation.</i>
Telecommunications	
Repair	
Claims Knowledge	
Transformers	



Skill Gaps and Overlaps

Feeder Occupations:

<p>Broadcast Technician</p> <table border="1"> <tr> <th>Skill Overlap</th> <th>Skill Gap</th> </tr> <tr> <td>Repair Customer Service</td> <td>Troubleshooting Test Equipment Oscilloscopes Level Antennas</td> </tr> </table>	Skill Overlap	Skill Gap	Repair Customer Service	Troubleshooting Test Equipment Oscilloscopes Level Antennas	<p>Electrician's Assistant</p> <table border="1"> <tr> <th>Skill Overlap</th> <th>Skill Gap</th> </tr> <tr> <td>Hand Tools Repair Transformers Occupational Health and Safety</td> <td>Telecommunications Switchgear Tower Climbing New Construction</td> </tr> </table>	Skill Overlap	Skill Gap	Hand Tools Repair Transformers Occupational Health and Safety	Telecommunications Switchgear Tower Climbing New Construction
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<p>Television / Satellite Television Installer</p> <table border="1"> <tr> <th>Skill Overlap</th> <th>Skill Gap</th> </tr> <tr> <td>Cabling Telecommunications Customer Service Repair Wiring Hand Tools</td> <td>Troubleshooting Test Equipment Oscilloscopes</td> </tr> </table>	Skill Overlap	Skill Gap	Cabling Telecommunications Customer Service Repair Wiring Hand Tools	Troubleshooting Test Equipment Oscilloscopes	<p><i>Workers from feeder occupations contribute several broader skills that will be useful for retraining as Utility Line Locators / Technicians, such as repair, telecommunications and customer service. Efforts to transition workers will need to focus on oscilloscopes, test equipment, switchgear, and detection and measurement equipment, as those are unique to Utility Line Locators / Technicians.</i></p>				
Skill Overlap	Skill Gap								
Cabling Telecommunications Customer Service Repair Wiring Hand Tools	Troubleshooting Test Equipment Oscilloscopes								

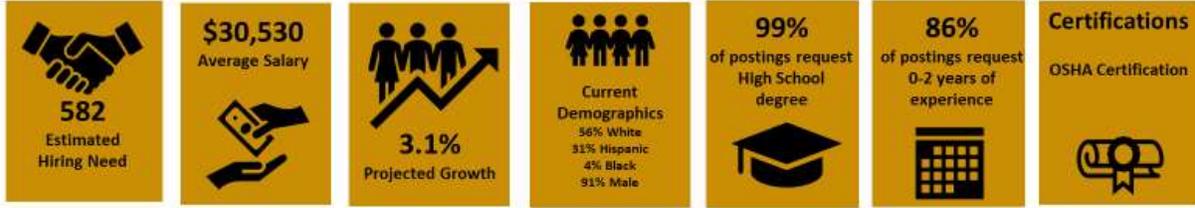
Next Step Occupations

Critical Occupation	Next-Step Occupations	Wage Increase	Change in Educ. Req.	Change in Automation Risk*	12 Month Demand
	Electrical Substation / Relay Repairer	+\$10,260	HS -> HS	+28%	1,130
	Geographer / GIS Specialist	+\$10,935	HS -> BA	+21%	17,716
	MRI / CT Technician / Technologist	+\$890	HS -> Assoc.	+13%	28,594
	Ultrasound Technologist / Sonographer	+\$1,431	HS -> Assoc.	+25%	30,313

* A positive number in red indicates that the Next-Step Occupation is at higher risk of automation than the Critical occupation

Initiative: **Broadband**

Critical Occupation Profile: **Maintenance Helper / Assistant**



Back to Work Opportunity:

Projected Demand:
582 roles to fill

Ready Workforce:
362 dislocated
Maintenance Helper / Assistant

Potentially Available Workforce:
992,359 skills-similar dislocated workers

100% Similar Education
Percent of Feeder roles meeting education requirements of Critical occupation

66% Higher AR
Percent of Feeder roles with higher automation risk than Critical occupation

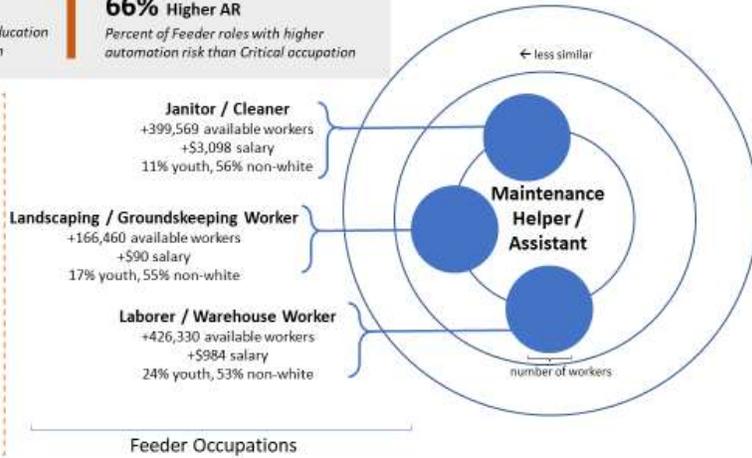
Skills:
Unemployed and underemployed workers in feeder occupations bring in some skills important to work as a Maintenance Helper / Assistant

Necessary Skills: *Necessary Skills are specialized skills required for this job and relevant across other similar jobs. These skills are building blocks for more complex Defining Skills.*

- Preventative Maintenance
- Customer Service
- Scheduling
- OSHA

Defining Skills: *Defining skills represent the day-to-day tasks and responsibilities of the job. An employee needs these skills to qualify for and perform successfully in this occupation.*

- Repair
- Plumbing
- Painting
- Carpentry
- Cleaning



Skill Gaps and Overlaps

Feeder Occupations:

Occupation	Skill Overlap	Skill Gap
Janitor / Cleaner	Machinery, Painting, Customer Service, Scheduling, Cleaning, Repair, Occupational Health and Safety	Plumbing, Carpentry, Preventative Maintenance, HVAC
Landscaping / Groundskeeping Worker	Machinery, Painting, Power tools, Customer Service, Hand Tools, Cleaning, Repair	Plumbing, Carpentry, Preventative Maintenance, HVAC
Laborer / Warehouse Worker	Scheduling, Customer Service, Cleaning	Repair, Plumbing, Painting, Carpentry, Preventative Maintenance, HVAC

Workers from feeder occupations contribute several broader skills that will be useful for retraining as Maintenance Helpers / Assistants, such as repair, machinery and cleaning. Efforts to transition workers will need to focus on predictive and preventative maintenance, as that is unique to Maintenance Helpers / Assistants.

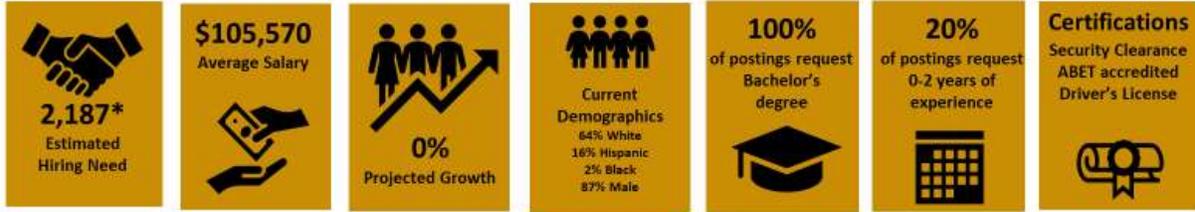
Next Step Occupations

Critical Occupation	Next-Step Occupations	Wage Increase	Change in Educ. Req.	Change in Automation Risk*	12 Month Demand
 Maintenance Helper / Assistant	Building and General Maintenance Technician	+\$12,941	HS -> HS	-30%	353,169
	Repair / Service Technician	+\$9,089	HS -> HS	-15%	133,917
	Locksmith	+\$11,410	HS -> HS	-2%	2,332
	Industrial Mechanic	+\$23,060	HS -> HS	-12%	34,252

* A positive number in red indicates that the Next-Step Occupation is at higher risk of automation than the Critical occupation

Initiative: **Broadband**

Critical Occupation Profile: **Electronics Engineer**



Back to Work Opportunity:

Projected Demand:
2,187 roles to fill

Ready Workforce:
1,537 dislocated
Electronics Engineers

Potentially Available Workforce:
12,962 skills-similar dislocated workers

66% Similar Education

Percent of Feeder roles meeting education requirements of Critical occupation

100% Higher AR

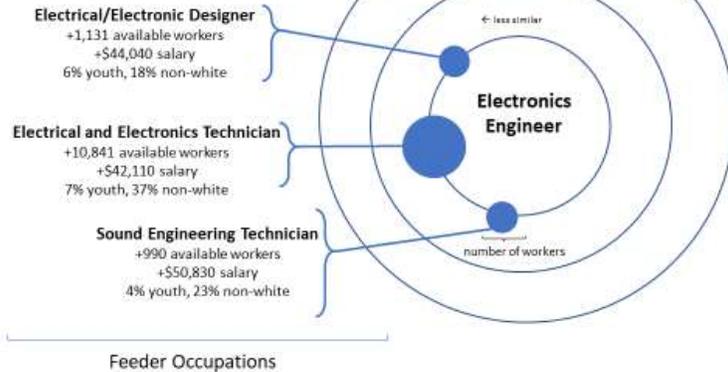
Percent of Feeder roles with higher automation risk than Critical occupation

Skills:
Unemployed and underemployed workers in feeder occupations bring in some skills important to work as an Electronics Engineer

Necessary Skills	Defining Skills
Simulation	Electronic Engineering
MATLAB	Electronics Design
Systems Engineering	Circuit Design
Physics	VHSIC hardware description language
Test Equipment	Digital Signal Processing

Necessary Skills are specialized skills required for this job and relevant across other similar jobs. These skills are building blocks for more complex Defining Skills.

Defining skills represent the day-to-day tasks and responsibilities of the job. An employee needs these skills to qualify for and perform successfully in this occupation.



Skill Gaps and Overlaps

Feeder Occupations:

Occupation	Skill Overlap	Skill Gap
Electrical / Electronic Designer	Simulation, Project Management, Circuit Design	Electronic Engineering, Troubleshooting, Systems Engineering, MATLAB
Electrical and Electronics Technician	Repair, Electronics Industry Knowledge, Oscilloscopes, Test Equipment	Electronic Engineering, Simulation, MATLAB, Systems Engineering, Circuit Design
Sound Engineering Technician	Repair, C++, Electronics Industry Knowledge	Simulation, Electronics Design and Engineering, Circuit Design, Physics

Workers from feeder occupations contribute several broader skills that will be useful for retraining as Electronics Engineers, such as repair, electronics industry knowledge and project management. Efforts to transition workers will need to focus on electronic and systems engineering, MATLAB and circuit design, as those are unique to Electronics Engineers.

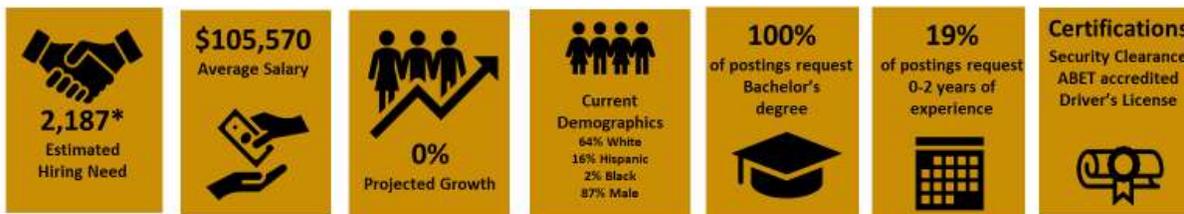
Next Step Occupations

Critical Occupation	Next-Step Occupations	Wage Increase	Change in Educ. Req.	Change in Automation Risk*	12 Month Demand
 Electronics Engineer	Software Developer / Engineer	+\$1,940	BA -> BA	+2%	899,451
	Hardware Engineer	+\$11,650	BA -> BA	+20%	10,247
	Engineering Manager	+\$39,239	BA -> BA	-1%	69,967

* A positive number in red indicates that the Next-Step Occupation is at higher risk of automation than the Critical occupation

Initiative: **Broadband**

Critical Occupation Profile: **RF Engineer**



Back to Work Opportunity:

Projected Demand:
2,187 roles to fill

Ready Workforce:
1,537 dislocated
RF Engineers

Potentially Available Workforce:
12,092 skills-similar dislocated workers

66% Similar Education

Percent of Feeder roles meeting education requirements of Critical occupation

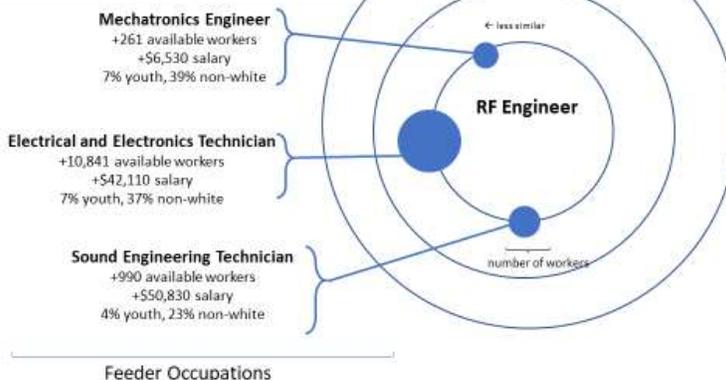
100% Higher AR

Percent of Feeder roles with higher automation risk than Critical occupation

Skills:

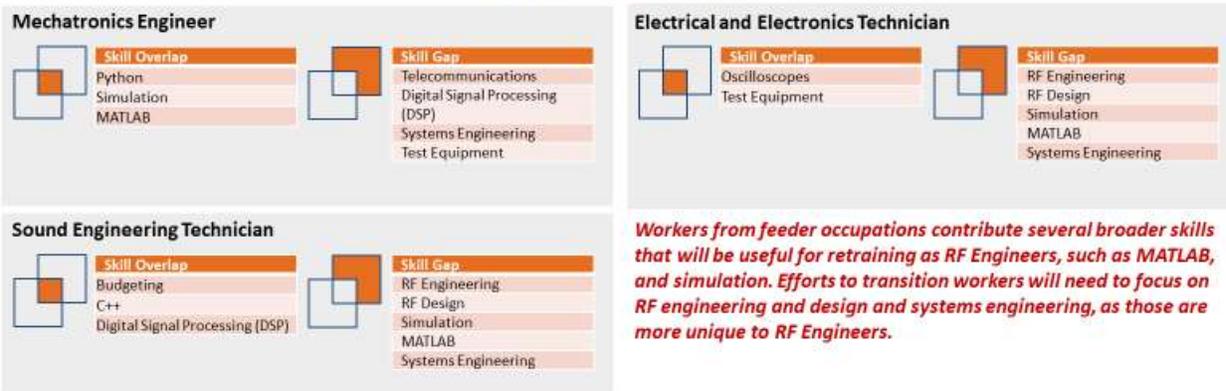
Unemployed and underemployed workers in feeder occupations bring in some skills important to work as an RF Engineer

Necessary Skills	Defining Skills
MATLAB	RF Engineering
Test Equipment	RF Design
Systems Engineering	Simulation
Budgeting	Digital Signal Processing
Telecommunications	Oscilloscopes



Skill Gaps and Overlaps

Feeder Occupations:



Next Step Occupations

Critical Occupation	Next-Step Occupations	Wage Increase	Change in Educ. Req.	Change in Automation Risk*	12 Month Demand
 RF Engineer	Software Developer / Engineer	+\$1,940	BA -> BA	+2%	899,451
	Hardware Engineer	+\$11,650	BA -> BA	+20%	10,247
	Data Scientist	+\$17,270	BA -> BA	-1%	35,063
	Business Intelligence Architect /Developer	+\$1,940	BA -> BA	+2%	59,809

* A positive number in red indicates that the Next-Step Occupation is at higher risk of automation than the Critical occupation