



Infrastructure Workforce Resource Mapping

Introduction

Workforce development is a key issue for Governors as they continue to invest in improving the country's aging infrastructure and allocate the billions of dollars provided through the bipartisan Infrastructure Investment and Jobs Act (IIJA) and other state and federal legislation. To support this work, the National Governors Association (NGA) regularly convenes state and territory officials, federal representatives and corporate partners to share and implement best practices. NGA has also developed [a suite of resources](#) to provide information and tools for Governors and their staff.

Governors and other state and territory leaders across the country agree on the urgent need to develop a qualified workforce to design, build and maintain infrastructure investments. Several states and territories have reported workforce shortages that threaten to slow progress on major infrastructure projects and have highlighted the need to plan for a skilled infrastructure workforce to meet current and future demand.

To support these efforts, NGA has developed an ***Infrastructure Workforce Resource Mapping Tool***. The Mapping Tool presents several prospective pathways into critical infrastructure careers and identifies funding opportunities that can be tapped to support training for individuals to enter those careers. This tool is by no means exhaustive, and NGA will make additions based on feedback from states, territories and federal partners. The Mapping Tool lists several infrastructure-related careers and outlines scenarios based on an individual's current employment status, the type of education partner or training provider required, possible federal funding sources, and relevant state/territory agencies that administer those funding sources or serve as key partners in program development and delivery. Additional context for the Mapping Tool, including descriptions for the programs and funding sources listed, can be found beneath the tool.

Infrastructure Workforce Mapping Tool

Career or Occupation	Individual's Employment Status	Sector	Education Partner/ Training Provider	Funding Sources	Administering State Agencies
DOT Engineer	College Student	State Government	State University	504(e) funds; SLTTFRI funds; Title IV funds; SLFRF funds	Transportation
Project Manager	College Student	State Government	State University	504(e) funds; SLTTFRI funds; Title IV funds; SLFRF funds	Transportation
Project Manager	College Student	State Government	Private Sector	WIOA Title I funds; Perkins V funds; SLFRF funds	Workforce/Labor; Education
Fiber Technician	Not Working or Underemployed job seeker	Broadband	Private Sector	WIOA Title I funds; BEAD funds; Perkins V funds; YouthBuild funds; SLFRF funds	Workforce/Labor; Broadband/Economic Development; Education
Fiber Technician	Not Working or Underemployed job seeker	Broadband	Community College	Title IV funds; WIOA Title I funds; BEAD funds; Perkins V Funds; Apprenticeship Building America funds; SLFRF funds	Workforce/Labor; Broadband/Economic Development; Education
Broadband Construction	College Student	Broadband	Community College	Title IV funds; WIOA Title I funds; BEAD funds; Perkins V funds; Good Jobs Challenge funds; Apprenticeship Building America funds; SLFRF funds	Workforce/Labor; Broadband/Economic Development; Education

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Career or Occupation	Individual's Employment Status	Sector	Education Partner/ Training Provider	Funding Sources	Administering State Agencies
EV Electrician/ Installer	State Licensed or Certified Electrician	Electric Vehicle	Community College	504(e) funds; SLTTFRI funds; Title IV funds; WIOA Title I funds; Perkins V funds; Advancing Equity Through Workforce Partnerships funds; Apprenticeship Building America funds; NEVI program; Federal Highway Administration's On-the-Job Training Program funding, Federal Transit Administration's Bus and Bus Facilities and Low or No Emission Grants Programs (serving incumbent workers); Federal Transit Administration's Passenger Ferry Program;	Workforce/Labor; Education; Transportation
EV Electrician/ Installer	State Licensed or Certified Electrician	Electric Vehicle	Private Sector	504(e) funds; SLTTFRI funds; WIOA Title I funds; Perkins V funds; YouthBuild funds; Good Jobs Challenge funds; Advancing Equity Through Workforce Partnerships funds; Apprenticeship Building America funds; NEVI program	Workforce/Labor; Education; Transportation

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Career or Occupation	Individual's Employment Status	Sector	Education Partner/ Training Provider	Funding Sources	Administering State Agencies
EV Electrician/ Installer	Not Working or Underemployed job seeker	Electric Vehicle	Community College	504(e) funds; SLTTFRI funds; Title IV funds; WIOA Title I funds; Perkins V funds; YouthBuild funds; Good Jobs Challenge funds; Advancing Equity Through Workforce Partnerships funds; Apprenticeship Building America funds; NEVI program; Federal Highway Administration's On-the-Job Training Program funding; Federal Transit Administration's Bus and Bus Facilities and Low or No Emission Grants Programs (serving incumbent workers); Federal Transit Administration's Passenger Ferry Program;	Workforce/Labor; Education; Transportation
EV Electrician/ Installer	College Student	Electric Vehicle	Community College	504(e) funds; SLTTFRI funds; Title IV funds; WIOA Title I funds; Perkins V funds; Good Jobs Challenge funds; Advancing Equity Through Workforce Partnerships funds; Apprenticeship Building America funds; NEVI program; Federal Highway Administration's On-the-Job Training Program funding; Federal Transit Administration's Passenger Ferry Program;	Workforce/Labor; Education; Transportation

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Career or Occupation	Individual's Employment Status	Sector	Education Partner/ Training Provider	Funding Sources	Administering State Agencies
Construction/ Trades	High School Student	Transportation	Private Sector	504(e) funds; SLTTFRI funds; WIOA Title I funds; Perkins V funds; YouthBuild funds; Good Jobs Challenge funds; Apprenticeship Building America funds; SLFRF funds;	Transportation; Workforce/Labor; Education
Construction/ Trades	College Student	Transportation	Private Sector	504(e) funds; SLTTFRI funds; WIOA Title I funds; Perkins V funds; YouthBuild funds; Good Jobs Challenge funds; Apprenticeship Building America funds; SLFRF funds;	Transportation; Workforce/Labor; Education

Understanding the Mapping Tool

Career types

The first column of the Mapping Tool presents several career paths by industry that are expected to be in high-demand as Governors implement the IIJA and other infrastructure-related state and federal programs. Given the significant new investments being channeled in these areas and the expected demand for new positions to support implementation, the Mapping Tool presents career paths for broadband, transportation, and electric and alternative vehicle infrastructure asset classes. While this list is not exhaustive, careers highlighted include engineers, project managers, fiber technicians, construction/trades, and electric and alternative fuel vehicle infrastructure installers/electricians.

**Note:* The IIJA and other legislation such as the Inflation Reduction Act also allocate significant new funding for upgrades to the electricity grid, renewable energy, water and wastewater, environmental resilience and cybersecurity. NGA has not, however, included careers for these asset classes in the Workforce Tool at this stage.

Source of workers

The second column of the Mapping Tool sets out groups in the labor market that could be potentially tapped for the future infrastructure workforce. This includes individuals who are not working, high school students, college students and those already in related career paths.

For the cohort of individuals who are currently not working or underemployed, it is generally well understood that the U.S. labor market remains extremely tight. In September 2022, the U.S. unemployment rate stood near a record low at 3.5% and the number of job openings advertised remains substantially higher than the total number of individuals looking for a job.ⁱ Despite this, there are some pools of potential infrastructure employees that states and territories may want to consider targeting. These include:

- Those who have left the labor force during the pandemic and have yet to return. This group varies from state to stateⁱⁱ but can include early retirees, women who have exited the labor force and those suffering from long covid or other health issues.
- Transportation workers who are actively looking for work, but have so far been unable to secure a role (note: the transportation sector unemployment rate is higher than the national average).ⁱⁱⁱ
- Those who are currently working in part-time roles but would prefer full-time positions across the economy (around 3.8 million nationwide), as well as individuals in roles that are susceptible to changes in the business cycle, such as certain warehousing jobs.^{iv}

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Another scenario set out in the Mapping Tool is the prospect of tapping into those who are working in the trades but outside of the infrastructure sector. For example, individuals currently working as electricians could attain skills through training offered by private providers or community colleges to become electric or alternative fuel vehicle infrastructure electricians or installers.

Finally, the Mapping Tool highlights the pool of high school and college students who may be interested in pursuing a range of transportation, broadband and electric vehicle infrastructure careers. This includes high school students who may be interested in pursuing apprenticeship or pre-apprenticeship programs for in-demand trade or construction careers, or college students who may want to pursue a role as a project manager or attain an engineering degree to work in state transportation departments or the private sector.

Funding Opportunities

For each of the scenarios presented, the Mapping Tool lists prospective federal funding sources that states and territories can use to support infrastructure workforce development. Details on these funding sources can be found below.

504(e) Funding (Fast Act)

State DOTs may allocate [certain FAST Act program dollars](#) (now IIJA programs) towards workforce development and educational activities. The programs eligible are the National Highway Performance Program, the Surface Transportation Block Grant Program, the Highway Safety Improvement Program and the Congestion Mitigation and Air Quality Improvement Program.

These allowable uses include:

- tuition and direct educational expenses, excluding salaries, in connection with the education and training of employees of State and local transportation agencies;
- employee professional development;
- student internships;
- pre-apprenticeships, apprenticeships, and career opportunities for on-the-job training;
- university, college, community college, or vocational school support;
- education activities, including outreach, to develop interest and promote participation in surface transportation careers;
- activities associated with workforce training and employment services, such as targeted outreach and partnerships with industry, economic development organizations, workforce development boards, and labor organizations;
- certain activities carried out by the National Highway Institute under subsection (a); and
- (l) local technical assistance programs under the Local Technical Assistance Program under subsection (b).

State, Local, Tribal, and Territorial Fiscal Recovery, Infrastructure, and Disaster Relief Flexibility Act Funds (SLTTFRI funds)

Enacted in December 2022, the State, Local, Tribal, and Territorial Fiscal Recovery, Infrastructure, and Disaster Relief Flexibility Act allows states and territories to put American Rescue Plan Act funds originally appropriated for COVID-19 relief towards workforce development in surface transportation. States and territories may use these dollars for the same workforce development activities allowed under 504(e) funds for the National Highway Performance Program, the Surface Transportation Block Grant Program, the Highway Safety Improvement Program and the Congestion Mitigation and Air Quality Improvement Program.

Workforce Innovation and Opportunity Act (WIOA) Title I Funding

WIOA's Title I offers states [multiple options to invest](#) in workforce development activities that can support IJJA implementation.

These include:

1) Required Activities Under WIOA's Title I Programs (Youth; Adult; Dislocated Worker): Local workforce development boards are required to use formula grant dollars from the three programs in Title I of WIOA on certain services, including providing career services; training services; establishing relationships with employers; and establishing industry or sector partnerships.

- WIOA's Youth Program: WIOA's Youth Program is designed to support both "in-school youth" and "out-of-school youth". In-school youth receiving support under this program must be ages 14-21 and have a low-income. Out-of-school youth receiving support under this program must be between the ages of 16-24 years old and not be enrolled in school.
- WIOA's Adult Program: Workers receiving support under this program must be 18 years of age or older.
- WIOA's Dislocated Program: Funding is allocated to states based on the same formula as the Adult Program. Workers receiving support under this program must be 18 years of age or older; have been laid off; and be unlikely to return to their industry.

2) Governors Reserve Funds: Governors have discretion over 15 percent of the state's formula grants for the Youth, Adult, and Dislocated Worker programs. Allocations for Governors Reserve Funds are made in conjunction with states' WIOA planning. States are required to submit WIOA plans to the U.S. Department of Labor every four years and submit any modifications every two years. Notably, Governors may call for modifications to the state's WIOA plan at any time.

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3) Individual Training Accounts: Depending on the policy set by the relevant Local Workforce Development Board (which are governed under WIOA Title I and for which the Governor provides oversight), individuals seeking a role in the infrastructure workforce may be eligible for aid to cover classroom instructions costs.

The Career and Technical Education for the 21st Century Act (Perkins V)

[The Career and Technical Education for the 21st Century Act](#), commonly referred to as "Perkins V" is the primary federal statute that governs career and technical education at the secondary and postsecondary level, and can be used to support IIJA implementation. Opportunities include:

1) Reserve Funds: States may reserve up to 15 percent of its formula grant for developing programs in high-demand occupations and fostering innovation.

2) State Leadership Funds: States are required to spend activities that may support IIJA implementation, including supporting special populations as they pursue a program in a high-skill, high-wage, in-demand occupations. States may also use Leadership Funds to develop sector partnerships with the aim of developing programs to meet business needs.

Select Infrastructure Investment and Jobs Act Programs with Workforce Eligibility

- ❖ Federal Highway Administration's [On-The-Job Training Program](#): Competitive program which provides \$50 million over 5 years to states to help develop capacity of the Nation's current and future highway construction industry workforce.
- ❖ Federal Transit Administration's [Bus and Bus Facilities Program](#) and [Low or No Emission Grant Program](#): Recipients of funds are permitted to use up to 0.5% of their requested grant award for serving recumbent workers workforce development activities eligible under the Federal Public transportation law (49 U.S.C. 5314(b)) including on-the-job training, labor management partnership training, and registered apprenticeships, and an additional 0.5 percent for costs associated with training at the National Transit Institute. For applicants proposing projects related to zero-emission vehicles for either program, 5 percent of the requested Federal award must be used for workforce development to retrain the existing workforce and develop the workforce of the future, including registered apprenticeships and other joint labor-management training programs, as outlined in the applicant's Zero-Emission Transition Plan.
- ❖ Joint Office of Energy and Transportation's [National Electric Vehicle Infrastructure Program](#): This formula program allocates \$5 billion to states, D.C. and Puerto Rico to deploy EV infrastructure along highways and alternative fuel corridors. Workforce development activities for NEVI projects are eligible so long as they are directly related to the charging on an electric vehicle.

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- ❖ [Federal Motor Carrier Safety Administration's Commercial Motor Vehicle Operators Grant Program](#): Awards grants to education institutions that provide commercial truck and bus driving training.
- ❖ Federal Motor Carrier Safety Administration's [Commercial Motor Vehicle Enforcement Training and Support Grants Program](#): New competitive grants program to train non-federal government employees who conduct commercial motor vehicle enforcement activities and to develop related training materials.
- ❖ [Federal Railway Administration's Consolidated Rail Infrastructure and Safety Improvement Program](#): Competitive IJJA program whereby workforce development and training activities are eligible uses (applications due December 1, 2022).
- ❖ [Federal Transit Administration's Passenger Ferry Program](#): Recipients are permitted to use up to 0.5 percent of their grant award to pay for not more than 80 percent of the cost for workforce development activities eligible under Federal public transportation law (49 U.S.C 5314(b)) and an additional 0.5 percent for costs associated with training at the National Transit Institute.
- ❖ [Federal Transit Administration's Public Transportation Technical Assistance and Workforce Development Program](#): Provides funding to support workforce development and transition, including in relation to zero-emission fleet conversion and other technical assistance to support transit providers.
- ❖ [USDOT's University Transportation Centers](#): Provides funding to advance transportation research and technology, and develops transportation professionals.
- ❖ [Broadband Equity, Access, and Deployment \(BEAD\)](#): The overarching goal of the BEAD program, which is being administered by the U.S. Department of Commerce, is to build the infrastructure necessary to ensure that all Americans can access the internet. States may spend these program dollars on developing relevant workforce training programs.

Note: the NGA's [IJJA Tracker](#) includes a column with highlights which programs in the Infrastructure Investment and Jobs Act can potentially be used to fund workforce development programs.

Additional Funding Sources that can support Infrastructure Workforce Training

- ❖ Title IV Funding ([Federal Student Aid](#)): Students who meet income eligibility criteria and are enrolled in an institution of higher education that has been certified by the U.S. Department of Education may be eligible for a Pell Grant up the amount of \$6,895 per academic year as well as federal student loans.

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- ❖ YouthBuild: The [YouthBuild program](#), which is authorized by WIOA, is a competitive grant program that serves approximately 5,000 "opportunity youth" who are between 16-24 years old and do not have a high school diploma. YouthBuild grants may be awarded to workforce development boards, local education agencies, and institutions of higher education for a range of activities including education and skills training in construction trades.
- ❖ Good Jobs Challenge: The Economic Development Administration [awarded grants in August 2022 to entities in 32 states and territories](#) to develop workforce partnerships led by industry, including construction and transportation.
- ❖ Advancing Equity Through Workforce Partnerships: State entities are among the eligible recipients for [this grant program](#) that will be administered by the U.S. Department of Energy. The program will focus on the development of workforce programs for solar energy technologies, while supporting an inclusive workforce with opportunities for career advancement for traditionally underserved communities and underrepresented populations.
- ❖ Apprenticeship Building America: The U.S. Department of Labor's [Apprenticeship Building America program](#) provided awards to parties including state entities to expand, diversify, and modernize apprenticeship programs in fast-growing industries and occupations.
- ❖ State and Local Fiscal Recovery Funds (SLFRF): States may allocate [these flexible dollars authorized by American Rescue Plan Act](#) for workforce development in the public sector, for transit authorities, broadband, and other new infrastructure projects including roads.

State and Territory Best Practice Examples of Infrastructure Workforce Development

Louisiana Broadband Workforce Initiative

Louisiana's ConnectLA Office of Broadband Development and Connectivity worked closely to connect Bossier Parish Community College in Louisiana with the Fiber Broadband Association (FBA) to establish the FBA's Optical Telecom Installer Certification Path (OpTIC Path) program at the college. The OpTIC Path program, which started enrolling students in the Fall of 2022, will train students as skilled fiber optic technicians through 144 hours of classroom instruction and hands-on skills training. This program has been designed to develop the technical workforce needed to support the significant increase in fiber network builds as a result of the BEAD and other federal and state funding opportunities. "The OpTIC Path program is one of the most comprehensive workforce training programs, taking individuals with no experience to be field-ready in a short amount of time", said Veneeth Iyengar, Louisiana State Executive Director for Broadband Development and Connectivity at ConnectLA. Further information can be found [here](#).

Maryland "Jobs That Build" Initiative

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Maryland Governor Larry Hogan [announced](#) on October 14, 2022, a new \$15 million "[Jobs That Build](#)" initiative to eliminate real-world barriers to careers in infrastructure in the context of unprecedented federal and state infrastructure investments. With the support of federal funds from the U.S. Department of Treasury, the Maryland Department of Labor will provide grants to eligible employers of up to \$10,000 per employee to enhance recruitment efforts, facilitate training and support employee retention. Specifically, the \$10,000 grant can be used for Employee Support Programs aimed at alleviating employee barriers, such as transportation, housing, child and dependent care. The funding can also be used for Payroll Incentives, including signing bonuses, retention bonuses and to compensate employees for time spent in training or professional development programs. Employers are given maximum flexibility for designing the program based on how to best serve their employees.

Maryland Department of Transportation Skilled Trade Partnering Event

In September 2022, the Maryland Department of Transportation (MDOT) [hosted](#) a Skills Trade Partnering event to support growth of the next generation of MDOT employees. The event brought together organizations involved in workforce development, including community colleges, trade schools and high school vocational programs, to connect and share ideas on how to partner to place students into MDOT positions. At the event, MDOT Secretary James F. Ports Jr said that "we're ready to do our part to build a productive skilled trades workforce by working with all of you to bridge the skilled trades gap" and said to participants "let's work together to help you grow your business, increase enrollment and get more young adults interested in skilled trades."

MDOT has a number of existing apprenticeship and internship programs, including the [MDOT Fellows Program](#) at the University of Maryland Baltimore County and the [Morgan State University Graduate School Internship Program](#). In addition, [MDOT State Highway Administration](#) operates a student internship program in fields from engineering and construction to data analysis and environmental science, and each MDOT Maryland Aviation Administration hosts a paid [Summer Youth Initiative](#) internship.

Massachusetts SPEED Act for Military Families

On October 25, 2022 the Baker-Polito Administration joined military family members and legislators for a ceremonial [signing](#) of the Military Spouse Licensure Portability, Education and Enrollment of Depends (SPEED) Act. The Act streamlines the process for occupational licensure and school enrollment for military families transferring to Massachusetts, so families can continue their careers and education in the state. This includes occupational licensure for infrastructure-related roles. The Act also created a new Medal of Fidelity to honor veterans who lost their lives due to service-related injuries or illnesses. At the ceremony, Governor Charlie Baker said that "the SPEED Act makes Massachusetts a more welcoming place for military families transferring here by streamlining the occupational licensing process so that military spouses can continue their

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professional careers and by making it easier for those families to access educational opportunities in the Commonwealth.”

South Carolina Electric Vehicle Workforce Consortium

In April 2022 Trident Technical College with Greenville Technical College, Spartanburg Community College and Clemson University established the Revolutionizing Electric Vehicle Education collaborative (Collaborative Research: REVVED). This program, funded by \$2.83 million from the National Science Foundation, has the goal of creating the next generation of innovation and talent for the electric vehicle workforce. Specifically, the consortium will conduct evidence-based research studies to investigate integration of virtual and augmented reality systems to support electric vehicle manufacturing and education. The digital learning tools will be based on industry needs and will be made available at www.EducateWorkforce.com. Further information can be found [here](#).

ⁱ [Bureau of Labor Statistics, *The Employment Situation, September 2022*](#) and [Bureau of Labor Statistics, *Job Openings and Labor Turnover Survey, August 2022*](#).

ⁱⁱ See [Federal Reserve of Richmond, *Lagging Labor Force Participation in Maryland and Virginia, September 23, 2022*](#)

ⁱⁱⁱ The unemployment rate in the transportation sector is slightly higher than the national average at 4.3%, about 1.1% higher than pre-pandemic, suggesting there remains a potential pool of transportation workers who are actively looking for work. Bureau of Transportation Statistics, *Employment in Transportation*, September 2022

^{iv} See Bloomberg, Odd Lots Podcast, *Joelle Gamble Explains the Confusing State of the US Labor Market*, August 29, 2022