Driving Economic Mobility Through Training: An Exploration of Opportunities to Scale Pre-Apprenticeships

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Contents

Executive Summary

Today's workforce system does too little to unlock opportunity. We need talent; it's the force of productivity, of innovation, and of community wealth. Employers consistently report an inability to find the skilled workers needed to run their businesses. And yet, over 37 million workers are stuck in low-wage jobs without a clear path toward progression, and inequality reaches record highs as the wealth gap continues to widen across racial lines.

Against this backdrop of stagnation comes unprecedented investments by the federal government into this nation's infrastructure and green economy. The $1.98 trillion earmarked for infrastructure projects (including transportation modernization, renewable energy development, and semiconductor manufacturing) will increase demand for construction jobs – particularly union jobs. Over the next decade, even without fully accounting for the impact of this legislation, we expect over five million job openings to emerge across the top construction occupations. This growth comes on top of current challenges to find skilled workers (almost 500,000 construction jobs are currently unfilled) as well as an aging workforce. **Is our economy ready for this job growth? And will these roles be accessible to those who need them most?**

Today, many begin a construction career through an apprenticeship. Often lauded as "the other four-year degree," apprenticeships provide a chance for individuals to "earn and learn." In practice, however, they can be highly selective, requiring entrance exams and often only accepting those with pre-existing knowledge or connections.

For many, pre-apprenticeships offer a more equitable entry point. Shorter in duration (often 6-8 weeks) and with fewer entry requirements, pre-apprenticeships help level the playing field for those accessing training and career opportunities by providing career exploration, teaching professional skills, and helping prepare for entry assessments.

But funding for pre-apprenticeships, while expanding, is still limited and pales in comparison to funding for apprenticeships – in part driven by systemic market failures. Unlike apprenticeships, pre-apprenticeships lack federal oversight, which means there are no requirements to track outcomes or establish quality standards. This oversight gap makes it difficult for stakeholders to invest, as identifying quality programs and understanding their value is challenging. Additionally, employers and unions are not incentivized to support these programs because pre-apprentices are not yet union members, and no single employer benefits enough to cover program costs. Ultimately, this creates a self-perpetuating cycle that continues to hinder investment.

This limited funding, in turn, restricts the ability of pre-apprenticeship programs to provide critical assistance for program participants – such as wraparound supports (e.g., access to childcare, transportation, living expenses, coaching and mentor support). And while many pre-apprenticeship programs are free, most participants do not earn a salary – making living stipends even more critical, particularly for under-represented populations such as women and people of color.

Our team is focused on breaking this cycle, so more people can access these good paying jobs and careers than ever before. By leveraging our talent finance tools, we hope to design new and innovative financing models to expand access to and completion of quality apprenticeship programs. Through our

early conversations with industry stakeholders, we have identified several concepts that we are partnering with experts to test and refine:

- **Can student-friendly financing allow programs to serve more learners, especially those from under-represented backgrounds?** Today, too many people – particularly women and people of color – miss out on training opportunities due to lost wages or lack of transportation and childcare. These supports are expensive and often funded through philanthropy – limiting a program's ability to scale them. Funding for supportive services is also often purpose-restricted, which limits flexibility and agency for individuals to address the unique barriers they face. We see an opportunity to offer students flexible, zero percent living expense loans – to be repaid once they start earning above a minimum income threshold. We also believe it is important, and critical to learners' ultimate success, to ensure supports extend beyond a pre-apprenticeship program – as students often experience a gap before starting an apprenticeship, and lower wages during their early years of employment. Finally, depending on the initial seed capital, repayments can be recycled back to serve future students, thereby stretching the reach of every dollar.

- **Can outcomes-based funding models incentivize greater collective investment across different types of stakeholders?** Well-designed pre-apprenticeship programs have the potential to support and align with the goals of key stakeholders (e.g., employers, unions, government agencies). But disbursed benefits across stakeholders and long-time horizons to realize outcomes lead to hesitancy by stakeholders to financially support these programs. Can we change this? By designing financing structures oriented around paying for outcomes, we hope to more collectively align interests. For example, can we incentivize employers and unions to support these programs by having them pay into a pooled fund based on the hiring / retention of pre-apprentices? Could we unlock Department of Justice funding by demonstrating and paying for reduced recidivism rates through programs serving formerly incarcerated individuals; or Health and Human Service funding, by increasing the employment rates for current TANF/SNAP recipients? More intentionally aligning interests across these stakeholders and designing financing agreements to pay for success could ultimately help collectively fund pre-apprenticeships.

- **Can we monetize new tax incentives to help finance expansion of the apprentice pipeline?** The 2022 Inflation Reduction Act introduced a multiplier on the value of many clean energy tax incentives for projects that satisfy prevailing wage and apprenticeship requirements.[1] Clean energy projects working with unions are poised to benefit from these incentives but need to invest in developing the talent pipeline to unlock them at scale. We see an opportunity to offer low-interest financing to clean energy companies that commit to expanding pre-apprenticeships, thereby 'front-loading' these incentives in the form of a working capital loan. This capital infusion would accelerate the development of projects that drive labor demand and encourage companies to invest upfront in recruiting, training, and supporting apprentices.

Accomplishing this will take coordination and new kinds of partnerships. We will need to make real investments in our talent pipeline, in new and unprecedented ways; embrace accountability and take a

[1] As noted by the Inflation Reduction Act, "credit is increased by 5 times for projects meeting prevailing wage and registered apprenticeship requirements" (page 13)

stake in student success; and use data to make more informed decisions and maximize training dollars. **We invite you to join us as we embark on this journey.**

The Opportunity

The American workforce is facing a critical skills gap, as employers struggle to find skilled workers for essential roles. Left unchecked, this talent shortage could result in a $1.75 trillion loss for U.S. businesses by 2030.[2,3] And yet, 44% of U.S. workers (ages 18-64) hold low-wage jobs, with limited opportunities for advancement.[4] Unable to gain new skills, many workers continuously cycle between similar, if not worse, low-paying roles throughout their career, perpetuating a "low-wage carousel".[5,6] In fact, over the next decade, only 43% of people holding low-wage jobs are expected to move to higher paying roles – with their odds of doing so declining each year.[7]

And so economic mobility, long a hallmark of American society, continues its decades-long decline. The world is more interconnected than ever, but in practice millions are excluded from achieving their full potential, often based on their zip code. The U.S. has the worst income inequality among the Group of Seven (G7),[8,9] and it is even greater along racial lines, with a white-to-Black per capita wealth ratio of 6:1 that has only widened since the 1980s.[10]

Against this backdrop of stagnation came unprecedented investments by the federal government into this nation's infrastructure and green economy – including a $1.2 trillion Infrastructure Investment and Jobs Act[11], $500 billion Inflation Reduction Act[12], and $280 billion CHIPS and Science Act.[13]

But how will this funding impact workers? And can we channel these funds to those needing it the most? These are the central questions behind this exploration and the goals for our work.

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[2] "Future of Work – The Global Talent Crunch," Korn Ferry, 2018.
[3] "How States are Driving the Expansion of Apprenticeships: State Apprenticeship Policy Scan," Apprenticeships for America, 2024.
[4] "For 53 Million Americans with Low-Wage Jobs, The Road Out is Hard," Bloomberg, November 17, 2019.
[5] Marcela Escobari et al., "Realism about Reskilling – Upgrading the Career Prospects of America's Low-Wage Workers," The Brookings Institute, November 7, 2019.
[6] Christina Pazzanese, "Helping Trapped Low-Wage Workers, Employees Struggling to Fill Spots," Harvard Gazette, January 28, 2022.
[7] Marcela Escobari et al., "Moving Up: Promoting workers' Economic Mobility Using Network Analysis," The Brookings Institution Workforce of the Future Initiative, June 2021.
[8] The Group of Seven is an intergovernmental political and economic forum consisting of Canada, France, Germany, Italy, Japan, the United Kingdom and the United States; additionally, the European Union is a "non-enumerated member."
[9] "Income Inequality," Organization for Economic Cooperation and Development (OECD), 2023.
[10] Ellora Derenoncourt et al., "Wealth of Two Nations: The U.S. Racial Wealth Gap, 1860-2020," June 1, 2022.
[11] "The U.S. Bipartisan Infrastructure Law: Breaking It Down," McKinsey & Company, November 12, 2021.
[12] "The Inflation Reduction Act: Here's What's In It," McKinsey & Company, October 24, 2022.
[13] "The CHIPS and Science Act: Here's What's In It," McKinsey & Company, October 4, 2022.

Our Goal

We believe in the power of training to upskill workers and break this cycle of inequity. By offering opportunities for people to gain skills through accessible training programs, they can access good paying jobs and careers. These programs are also often less expensive than college, making them financially viable and accessible to more people.

Apprenticeships reign as the pre-eminent on-the-job training model, often lauded as "the other four-year degree," and provide the chance to "earn and learn".[14] From 2011 to 2021, the number of new registered apprentices increased by 85%, representing over 2.1M new apprentices.[15] As most registered apprenticeship programs (RAPs)[16] are in construction (36%), also known as the building trades, many were new construction apprentices.[17] These apprenticeships offer pathways to good paying, often union jobs, and a future career path.

In practice, however, apprenticeships can be highly selective:[18] many only accept those with pre-existing knowledge or industry aptitude; require advanced academic coursework with technical content, precluding those with lower levels of education from applying or succeeding; and have cumbersome application processes, benefiting those with connections. Furthermore, the apprentice pool often lacks broad representation. Between 2010 and 2019, women represented only 8.5% of apprentices (3.5% in construction) and non-white learners represented only 22.5% of apprentices (similar for construction).[19] This under-representation can further compound the challenge, by limiting networking opportunities and reinforcing hiring patterns shaped by familiarity and norms.[20]

Pre-apprenticeships represent a more equitable entry point by leveling the playing field for those accessing training and career opportunities. Shorter in duration (often 6-8 weeks) and with fewer entry requirements, pre-apprenticeships help participants prepare by exposing them to career options, teaching them professional skills, and helping them pass entry assessments (e.g., in math).

But many pre-apprenticeship programs face funding challenges – limiting their capacity to serve participants, offer wages or stipends, and provide needed wraparound supports like childcare or transportation assistance. And so, pre-apprenticeships face the same problems as many other training programs: money, time, and the complications of poverty.

However, we have a unique opportunity to change this by leveraging the federal government's historic investment to spur more than just job growth. If we align incentives correctly, we can help bring key stakeholders to the table and support investments in early training opportunities, leading to more equitable access to jobs and career pathways.

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[14] "The Building Trades' Multi-Craft Core Curriculum," North America's Building Trades Unions.
[15] "FY 2021 Data and Statistics," U.S. Department of Labor.
[16] "What is a Registered Apprenticeship Program?" Apprenticeship USA.
[17] "FY 2021 Data and Statistics," U.S. Department of Labor.
[18] Nelson Schwartz, "A New Look at Apprenticeships as a Path to the Middle Class," The New York Times, July 13, 2015.
[19] "Equity Snapshot: Apprentices in America," White House Initiative on Advancing Educational Equity, Excellence, and Economic Opportunity for Hispanics.
[20] Tricia Kagerer, "Unconscious Bias Can Sabotage Diversity Initiatives," International Risk Management Institute, November 22, 2019.

Doing this will take coordination and new kinds of partnerships – across employers, unions, training institutions, funders, and government. We will need to make real investments in our talent pipeline, in new and unprecedented ways; embrace accountability and take a stake in student success; and use data to make more informed decisions and maximize training dollars. **By working together, we hope to develop new and innovative funding structures to help scale pre-apprenticeship programs, allowing them to reach more people than ever before.**

Labor Market Analysis

Assessing the Demand

To better understand the opportunity at hand, we began by first examining the impact of recent federal funding, as well as the related industries and jobs poised for growth.

Three federal bills between 2021 and 2022 support improvements in our nation's infrastructure. The Infrastructure Investment and Jobs Act, for example, invests $550B in new spending on infrastructure projects over the next five years. Key elements include $110B to modernize roads, bridges, and other major projects; $80B for enhancements to public transit, ports/waterways, and airports; $66B for railway improvements; and $65B for broadband access infrastructure.[21] The Inflation Reduction Act provides $270B in tax credits for renewable energy construction projects, including solar, wind, hydrogen and electric vehicle infrastructure.[22,23] Finally, the CHIPS and Science Act invests in building and improving semiconductor manufacturing facilities, including through a $24B tax credit.[24,25]

These infrastructure projects will dramatically increase the demand for construction jobs, as estimates peg the annual increase at 467,000 jobs.[26] Considering the construction industry currently employs 8.2M people, this represents a significant proportion of the workforce.[27] And given a current deficit of almost 500,000 construction jobs is paired with an aging workforce (41% of construction workers expect to retire by 2031), there is a clear need for more skilled talent in construction.[28,29]

Evaluating Wages and Benefits

With respect to salary, average annual earnings for the top 10 construction occupations range from approximately $49,000 to $85,000.[30] Across almost all states, this meets the living wage for a single adult with no dependents, and for a family of four (assuming two working parents).[31,32]

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[21] "Bipartisan Infrastructure Investment and Jobs Act Summary," Ben Cardin U.S. Senator for Maryland, September 2022.
[22] Jennifer French, "The Impact of the Inflation Reduction Act on the Construction Industry," PB Mares, February 6, 2024.
[23] "Inflation Reduction Act and CHIPS Act Likely to Build More Momentum for U.S. Infrastructure," GlobalX, June 1, 2023.
[24] Jennifer French, "The CHIPS Act and Its Impact on the Construction Industry," PB Mares, August 9, 2022.
[25] "Fact Sheet: CHIPS and Science Act Will Lower Costs, Create Jobs, Strengthen Supply Chains, and Counter China," The White House, August 9, 2022.
[26] Robert Pollin et al., "Employment Impacts of New U.S. Clean Energy, Manufacturing, and Infrastructure Laws," Political Economy Research Institute (PERI), September 2023.
[27] "Industries at a Glance: Construction," U.S. Bureau of Labor Statistics, 2023.
[28] Liz Sheffield, "Construction Grows, But Baby Boomers Retiring Leaves Gap," ADP.
[29] "2024 Construction Workforce Shortage Tops Half a Million," Associated Builders and Contractors, January 31, 2024.
[30] Average annual earnings use 2024 wage data and are across all occupation tenures / geographies. See Table 1 in the Appendix for detailed information.
[31] "Living Wage Calculator," Massachusetts Institute of Technology.
[32] See Table 2 in the Appendix for a detailed breakdown of livable wages by state.

Furthermore, given most of the new jobs in question will be subject to federal rules requiring prevailing wages, much of the federal funding will flow through unions [33,34,35] – and union wages in construction are typically 34-54% higher than their non-union counterparts. [36,37] In addition, unions typically offer better healthcare and retirement benefits, safer working conditions, and increased job protection. For these reasons, we chose to prioritize union career pathways.

Identifying Priority Occupations

While most union construction occupations represent promising career pathways, some are particularly attractive due to their expected job growth[38], accessibility through apprenticeships, and near or above average annual earnings (compared to other top construction jobs).[39] Three occupations stand out against these dimensions and have the highest concentration of construction apprentices: *Electricians (31%), Plumbers (17%), and Carpenters (14%).*[40] While most pre-apprenticeship programs prepare participants for these occupations, we will prioritize those with stronger relationships to electrical / plumber / carpenter unions, given the promise of these occupations.

Exploring the Regional Impact

Understandably, expected growth of construction jobs varies across states. Factors contributing to state variation include state size / population; access to existing natural resources, which supports clean energy jobs; and regional policy differences, such as the strength of labor unions and ability to comply with federal Project Labor Agreements needed for most large-scale construction projects.[41]

Overall, nine states account for almost half (49%) of the expected job growth for carpenters, electricians, and plumbers: *California, Texas, Florida, New York, Washington, Pennsylvania, Michigan, Ohio, and Illinois.*[42] Combined with recent legislation in several of these states, which will further stimulate construction, we expect this growth to multiply.[43,44]

As we continue with this work, we hope to explore opportunities to scale pre-apprenticeships in these states for these occupations of interest (i.e., carpenters, electricians, plumbers), while remaining open to other possibilities. We recognize the complexity of labor markets, and the impact strong labor unions, unique partnerships, and exceptional program leaders have for realities on the ground.

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[33] "Fact Sheet: The Bipartisan Infrastructure Investments and Jobs Act Creates Good-Paying Jobs and Supports Workers," The White House, August 3, 2021.
[34] "Fact Sheet: How the Inflation Reduction Act's Tax Incentives Are Ensuring All Americans Benefit from the Growth of the Clean Energy Economy," U.S. Department of the Treasury, October 20, 2023.
[35] "Creating Helpful Incentives to Produce Semiconductors (CHIPS) Act – Guidance and Resources," Associated Builders and Contractors, 2024.
[36] "Labor Force Statistics from the Current Population Survey," U.S. Bureau of Labor Statistics.
[37] Analysis is based on the average of median weekly earnings data across 2013-2023. For the purposes of this analysis, wages from workers who were members of unions as well as those who were represented by unions were included as "union wages."
[38] Expected job growth is based on extrapolation of historical data from Lightcast, which sources data from the U.S. Bureau of Labor Statistics. See Appendix for further information.
[39] See Table 1 in the Appendix for a breakdown of data across top construction occupations.
[40] Daniel Kuehn et al., "Apprenticeship as a Tool to Improve Diversity in Construction," Urban Institute, March 2024.
[41] "Fact Sheet: Biden-Harris Administration Announces Action to Support Economic and Efficient Construction Projects While Creating Good-Paying and Union Jobs," The White House, December 18, 2023.
[42] Table 3 in the Appendix breaks down expected job growth for Carpenters, Electricians, and Plumbers by state.
[43] Francisco Uranga, "With $1.4 B Investment, Texas Hopes to Sprint to the Front of the Microchip Manufacturing Race," Texas Tribune, June 12, 2023.
[44] "Seizing the Semiconductor Opportunity," New California Coalition, 2022.

On-The-Ground Learnings

To complement this analysis, we spoke with experts and leaders across the country familiar with training people for these programs – including pre-apprenticeship and apprenticeship program leaders, union leaders in building trades, and workforce boards. Through these conversations, several key themes emerged:

Funding for pre-apprenticeships, while expanding, is still limited.
Funding for pre-apprenticeship programs has increased in recent years, including through a $98M investment by the Department of Labor (DOL) in these training programs.[45] And while apprenticeship funding is higher at $300M annually (albeit used to support longer programs), both figures pale in comparison to funding for more traditional higher education pathways: for every dollar of taxpayer support an apprentice receives, a college student receives $50.[46]

So why is funding for pre-apprenticeships so limited? First, and perhaps most importantly, many pre-apprenticeship programs lack reliable outcomes tracking. In talking with program leaders, while some noted they collect student outcomes data one year out, most said they lacked capacity for more robust data tracking.

Additionally, while some states have made attempts to do so, pre-apprenticeships are not regulated by the DOL like their apprenticeship counterparts.[47,48] This further reinforces the lack of robustly tracked pre-apprenticeship data. In contrast, the DOL requires data tracking for registered apprenticeships, so key metrics like participant demographics and completion rates exist for all registered apprenticeship programs. No national standard also means program quality for pre-apprenticeships varies dramatically nationwide – a fact abundantly clear from simply examining overall program duration, which can range from a few weeks to a few months.[49] Ultimately, this lack of evidence for pre-apprenticeships and inherent program variability likely holds funders back from making needed investments.

Finally, key stakeholders like employers and unions must overcome additional hurdles before taking this leap. For employers, no single entity benefits enough to cover program costs, at least not without more intentional collaboration: since pre-apprenticeship programs prepare graduates for a variety of employment opportunities, benefits are currently disbursed across many stakeholders. For unions, while many fund apprenticeship programs (typically as a percentage of union dues), they lack direct incentives to fund pre-apprenticeships. As several union leaders shared with us, given members pay dues, there is a sentiment that only members should benefit: notably, apprentices are union members, but pre-apprentices are not – at least not yet. Any attempts to adjust dues and related allocations must also happen through contract negotiations, as they are written into collective bargaining agreements with employers. This makes change difficult, and opportunities to do so infrequent. And so, pre-apprenticeships fall victim to another market failure: while the collective benefit is high in the long-term, short-term costs and coordination challenges prevent real change from happening.

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[45] "DOL Announces $98M to Support Pre-Apprenticeship Programs," Leading Age, November 17, 2023.
[46] Michael Horn et al., "LISTEN – Beyond 'College or Bust': Apprenticeship as a Path to Opportunity," The74, January 9, 2024.
[47] "Explore Pre-Apprenticeship," Apprenticeship USA.
[48] Vanessa Bennett, "Modern Apprenticeships Need Modern Preparation: Five Reasons States Should Recognize Pre-Apprenticeship Programs," Jobs for the Future, November 12, 2021.
[49] "What is Pre-Apprenticeship?" Apprenticeship USA.

Limited funding, in turn, restricts a program's ability to provide wraparound services – which are essential to ensuring participants, particularly those from historically under-represented populations, can access and complete pre-apprenticeships.

Perhaps unsurprisingly, program leaders emphasized the need to provide supports to ensure success for under-represented groups – such as women and people of color – as they often face challenges with program participation and completion. Most people come to an apprenticeship after trying another career first (the average construction apprentice is 29 years old). Timing wise, this often aligns with increasing financial and personal responsibilities – including raising a family, paying a mortgage, and covering childcare. [50] Thus challenges commonly encountered include, but are not limited to: [51,52,53]

- *Childcare*: While reliable and affordable childcare is challenging for most working families, exceptionally early on-site hours in construction (e.g., arriving by 6am) require extended day coverage and support before school – services not typically provided by childcare facilities.

- *Transportation*: Simply getting to job sites presents a challenge for many workers – particularly those without a car or access / money for reliable transportation. Even in urban areas, accessing public transportation during off-peak hours can be difficult.

- *Time-off / schedule*: The building trades regularly have periods of unemployment (given seasonality in work and fluctuating and/or unpredictable economic conditions) paired with an inflexible schedule. This often means that taking time off work, for sick days or personal reasons, forgoes wages – and sometimes a job.

- *Harassment*: Unfortunately, we heard that harassment and discrimination toward women and people of color still occurs on far too many job sites. This can create a culture that is not welcoming or supportive for these groups, making working in construction even more challenging.

The lack of women and minorities also means many job sites are not set up well to accommodate these groups (e.g., no female restrooms). Additionally, it can lead to a practice known as "checkerboarding": to meet federal diversity mandates, employers move women and people of color from site to site and/or lay them off, once minimum hourly requirements are met.[54,55,56] Consequently, unlike their peers (typically white males), these workers may never complete a job – thereby further limiting their growth and career.

To help combat some of these challenges, some programs provide living stipends, which help offset the costs of transportation and care. Others have setup (or partnered with) childcare facilities offering

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[50] "Apprenticeship Programs Can't Do it Alone," National Center for Construction Education and Research, November 17, 2022.
[51] Chair Charlotte Burrows, "Building for the Future: Advancing Equal Employment Opportunity In the Construction Industry," U.S. Equal Employment Opportunity Commission, May 2023.
[52] Gauri Rege, et al., "Improving Apprenticeship Completion Rates," American Institutes for Research, October 2023.
[53] Caroline Preston, "The Jobs Where Sexual Harassment and Discrimination Never Stopped," The Hechinger Report, January 31, 2021.
[54] "Appendix P: Participation Goals for Minorities and Females," U.S. Department of Labor | Office of Federal Contract Compliance Programs.
[55] "3C00 Executive Order Goals," U.S. Department of Labor | Office of Federal Contract Compliance Programs.
[56] Caroline Preston, "The Jobs Where Sexual Harassment and Discrimination Never Stopped," The Hechinger Report, January 31, 2021.

extended hours specifically for parents working non-standard schedules.[57] However, the transient nature of construction jobs makes permanent and more systemic solutions here challenging. Many program leaders also shared that access to mentors and coaching support are critical to ensure program completion – especially for women and people of color, given harassment and often difficult working conditions. But these supports are expensive and can ultimately limit a program's ability to effectively scale.

Even after surmounting these obstacles, placing graduates into an apprenticeship program remains challenging.
While specific timelines vary by union and trade, many unions only open applications for apprenticeships a few times per year, and some only annually.[58] For those seeking employment, navigating this job market can be complex: an Executive Director of a Workforce Development Board shared, *"Even after 10+ years in this workforce development role, I still don't understand the process!"* Moreover, many graduates cannot hold out between program completion and apprenticeship openings without taking another job — making it harder to ultimately return to the trade career path.[59]

And finally, even after being placed, many apprentices never finish the program.
For all the reasons above, successfully completing these training programs remains an elusive goal for many. Nationally, apprenticeship completion rates are abysmally low: less than 35% of people who start an apprenticeship complete it, and for certain sub-groups, such as black apprentices, these rates are even lower (24%).[60] And while the finish line often offers a well-paying, stable job, most building trade apprentices start at half a skilled worker's salary (i.e., journeyman's salary). Not surprisingly, many cannot last through the full apprenticeship: four years for most building trades, and five years for certified trades, such as electricians.

Path Forward

Given this series of barriers, it is perhaps no wonder that so many construction jobs remain unfilled, and the demographics of most apprentices and tradespeople are white males.[61] We thus return to our original questions: **Where do we go from here? How do we change this?**

Fortunately, we've had the opportunity to speak with many leaders working tirelessly to break this cycle, and have seen firsthand the impact intentional, well-designed programs can have on the lives of learners. Through this work, we have also begun to identify promising ideas to further explore:

Can we design student-friendly financing to expand program access, and help scale wrap-around supports?
At the end of the day, many learners simply need additional supports to succeed, such as childcare, transportation, or general living expenses. But these supports are expensive and typically financed

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[57] Example: Building Pathways (a construction pre-apprenticeship program) partners with a Boston-based pilot, Care That Works, who connects working families with early-morning childcare.
[58] "Application Deadlines Coming Up for Construction Apprenticeship Programs," Construction Careers Foundation, 2024.
[59] "Pre-Apprenticeship," NECA-IBEW Electrical Training Center.
[60] Gauri Rege, et al., "Improving Apprenticeship Completion Rates," American Institutes for Research, October 2023.
[61] Daniel Groves, "The Future of Diversity and Apprenticeships in Construction," Chief Learning Officer, December 2, 2021.

through philanthropy and grants, which represent a finite resource and limit a program's ability to serve participants – and ultimately scale.

Are there ways to creatively finance some of these costs, so we can reach more learners? For example, in Colorado, our team designed and launched zero-interest loans for learners enrolled in a construction pre-apprenticeship program, The Master's Apprentice, that targets under-represented groups (e.g., those formerly incarcerated). These loans cover living expenses in hopes of improving program completion, and only need to be repaid when and if students get a job.[62] Moreover, once repaid, these funds are recycled and redistributed among future learners – multiplying the impact of the initial seed funding.

Offering student-friendly financing, such as these living stipend loans or emergency lines of credit, allows programs to reach and serve more participants – particularly those from historically under-represented populations. Depending on the upfront funding, we can also recycle capital by re-distributing repayments to support more learners – thereby stretching the impact of every dollar.

We also know these supports are critical beyond just a pre-apprenticeship program – or students run the risk of dropping out before ever entering high-paying jobs. By taking a holistic approach, we can provide this financing at multiple times throughout a learner's journey: during a pre-apprenticeship program to improve persistence; during the gap between graduating from a pre-apprenticeship program and enrolling in an apprenticeship, to provide support during this transition; and into the early years of an apprenticeship, when wages are lower. Financing across the training lifecycle helps address drop-out risk at multiple points and creates loan portfolio diversity, which can mitigate repayment risk.

We hope to explore opportunities to offer financing like this – potentially in combination with other innovative funding structures, like an outcomes-based repayment model (*described more below*).

Can outcomes-based funding models incentivize greater collective investment across different types of stakeholders?

We believe there is an opportunity to creatively engage more and different stakeholders – including unions, employers, and non-Department of Labor (DOL) government agencies – to financially support pre-apprenticeship programs by focusing on common goals.

This model, known as Pay for Success, ties payments to outcomes instead of specific programs or activities. The model can help address some of the core challenges inherent in the pre-apprenticeship landscape, such as benefits being disbursed across multiple stakeholders, by asking stakeholders to only pay for realized outcomes that directly benefit them.

There are already established provisions within federal workforce funding streams to enable this shift towards paying for performance. These include the reauthorization of the Workforce Innovation and Opportunity Act in 2014 to include pay for performance models as an eligible use of formula funding, and the FY24 DOL Appropriations Bill authorizing the exploration of "*pay-for-success initiatives to*

[62] "Colorado Pay It Forward Fund," Social Finance.

increase and expand registered apprenticeship programs." [63,64,65] Local-level government efforts have also employed similar approaches.[66,67]

Extending this approach to pre-apprenticeship programs will take intentional effort and collaboration – but also has the potential to unlock new and different funding. For this to work, we'll need to design funding agreements around these different types of stakeholders. More specifically:

- *For employers and unions*, could we incentivize their financial support by having them pay into a pooled fund based on hiring and/or retention of pre-apprentices? Doing so directly links outcomes these stakeholders care about with program success. In turn, programs can use these funds to expand operations, offer stronger and more comprehensive wraparound supports, or repay living stipends / emergency loans.

- *For non-DOL government agencies*, is there opportunity to demonstrate outcomes tied to Agency policy goals? For example, could pre-apprenticeship programs for formerly incarcerated individuals demonstrate lower rates of recidivism, thereby unlocking Department of Justice Funds? Could targeting people who are unemployed and receive TANF / SNAP funding allow us to demonstrate higher rates of employment post training – thereby unlocking Department of Health and Human Services funding? If so, we have the potential to strategically align public systems and invest in pre-apprenticeship programs delivering results.

And finally, can we monetize new tax incentives to help finance expansion of the apprenticeship pipeline?

Federal and local governments have long used tax incentives as a lever for addressing market gaps in areas such as affordable housing and clean energy development – however, these financial benefits are only realized after the fact, meaning companies still lack the upfront resources or are too afraid to take big risks to unlock these incentives.

The Inflation Reduction Act (IRA) introduced enhanced tax benefits for clean energy projects that meet specific requirements related to wages and apprenticeships. Specifically, the IRA offers a 5x multiplier on the value of tax incentives for clean energy projects that adhere to prevailing wage and apprenticeship requirements. Tax benefits may be claimed or sold to generate revenue for financing future clean energy projects. These provisions are intended to ensure that federal investments in clean energy projects yield jobs offering competitive compensation, and support apprenticeship training and development. Union clean energy projects are well-positioned to qualify for these tax benefits but may not be able to scale fast enough, due to a lack of upfront financing and limited supply of qualified labor.

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[63] "Building a Better Workforce: How States Can Use the Workforce Innovation & Opportunity Act to Turbocharge Workforce Development," Social Finance and Jobs for the Future, November 2021.
[64] Daniel Kuehn, et al., "How Pay for Success Can Support Workforce Development and Integrated Career Pathway Models," Urban Institute, November 20, 2017.
[65] "Resolution: Providing for the Concurrence by the House in the Senate Amendment to H.R. 2882, With an Amendment," U.S. House of Representatives.
[66] Liz Cohen, "Under Pilot Program in Texas & Florida, Tutoring Fees Depend on Student Progress," The74, February 12, 2024.
[67] "Collaboration among Federal Agencies Would Be Helpful as Governments Explore New Financing Mechanisms," U.S. Government Accountability Office, September 2015.

We are interested in exploring how to accelerate the realization of these tax incentives under the IRA by providing low-cost financing to clean energy companies committed to expanding pre-apprenticeship training opportunities, inclusive of wraparound supports. Financing can be structured so that repayment is tied to the realization of the tax incentives: once the company claims or sells the incentives, they repay the financing, thus aligning cash flows with the future benefit.

By working creatively together with training providers, employers, unions, and other key stakeholders, we hope to explore these and other opportunities as we work toward scaling pre-apprenticeship programs and wraparound supports.

Join Us!

Interested in exploring these or ideas further with us? Want to support this work?

Contact Nadine Abraham, nabraham@socialfinance.org, to learn more →

Appendix

Overview of Data Sources

Data Source *(including hyperlink)*	**Description**
Lightcast	Lightcast gathers and integrates economic, labor market, demographic, education, profile, and job posting data from dozens of government and private-sector sources, creating a comprehensive and current dataset that includes both published data and detailed estimates with full United States coverage. Examples of these data sources include the Bureau of Labor Statistics (BLS) Quarterly Census of Employment and Wages, the BLS Occupational Employment Statistics (OES) dataset, state level department of labor datasets, and more. Lightcast also uses their own proprietary models to make projections for future looking data.
Registered Apprenticeship Partners Information System Database (RAPIDS)	RAPIDS is the data collection point for all DOL Registered Apprenticeship Programs across the United States.
U.S. Census Bureau	A principal agency of the U.S. Federal Statistical System responsible for producing data about the American people and economy.
MIT Living Wage Calculator	Estimates a local wage rate that a full-time worker requires to cover the costs of their family's basic needs where they live.

Labor Market Analyses

Table 1: Data on Top 10 Construction Occupations in the U.S.

Occupation	Estimated Job Openings (2024-34)[1]	% of Active Apprenticeships that are Union Affiliated (2019-24)[2]	Avg. Annual Earnings (2024)[3]	Median Annual Earnings (2024)[4]	25th Percentile Earnings (2024)[5]	75th Percentile Earnings (2024)[6]
Construction Laborers	1,402,253	93.93%	$49,181	$43,263	$33,442	$56,222
Carpenters	954,189	93.73%	$59,725	$53,020	$39,506	$69,756
Electricians	864,118	48.79%	$67,644	$60,646	$46,476	$80,006
Plumbers, Pipefitters, and Steamfitters	501,211	62.78%	$67,408	$60,172	$45,546	$79,769
Operating Engineers	469,832	92.12%	$62,470	$55,940	$45,794	$73,159
HVAC Mechanics / Installers	452,066	34.22%	$59,929	$56,607	$44,930	$71,243
Painters, Construction and Maintenance	331,661	88.06%	$52,847	$44,178	$34,819	$58,795
Roofers	149,573	86.91%	$55,544	$48,926	$40,507	$62,196
Sheet Metal Workers	130,229	85.12%	$64,023	$58,103	$44,839	$78,208
Electrical Power Line Installers / Repairers	114,572	47.65%	$85,833	$85,269	$62,795	$104,194

[1.] Sourced from Lightcast in July 2024. The estimated total number of people who are entering the occupation for the first time (i.e., "replacement jobs") in addition to the number of jobs created during the period (i.e., "net-new jobs")

[2.] Sourced from RAPIDS in July 2024. The percent of active registered apprenticeships that are affiliated with a union.

[3.] Sourced from Lightcast in July 2024 (pulled from BLS Quarterly Census of Employment and Wages). Average annual salary of every person who's employed in the occupation as of Q1 2024. Does not filter based on tenure or geography.

[4.] Sourced from Lightcast in July 2024 (pulled from BLS Quarterly Census of Employment and Wages). Average median salary of every person who's employed in the occupation as of Q1 2024. Does not filter based on tenure or geography.

[5.] Sourced from Lightcast in July 2024 (pulled from BLS Quarterly Census of Employment and Wages). The 25th Percentile of those employed making a certain salary. For example, if the 25th percentile is $25,000, then 25% of those employed in the occupation make $25,000 and lower.

[6.] Sourced from Lightcast in July 2024 (pulled from BLS Quarterly Census of Employment and Wages). The 75th Percentile of those employed making a certain salary. For example, if the 75th percentile is $70,000, then 75% of those employed in the occupation make $70,000 and lower. Or conversely, 25% of those employed in the occupation make above $70,000.

Table 2: Livable Wages in States with Highest Expected Job Growth for Carpenters, Electricians, and Plumbers

State	Livable Wage (assuming 2 working adults + 2 kids)[1]		Livable Wage (assuming 1 working adult + 0 kids)[1]	
	Hourly Wage	*Annual Salary (assuming 2,080 hours per year)*	*Hourly Wage*	*Annual Salary (assuming 2,080 hours per year)*
CA	$ 33.26	$ 69,181	$ 27.32	$ 56,826
TX	$ 24.20	$ 50,336	$ 20.92	$ 43,514
FL	$ 25.13	$ 52,270	$ 22.43	$ 46,654
NY	$ 33.53	$ 69,742	$ 26.86	$ 55,869
WA	$ 30.94	$ 64,355	$ 25.60	$ 53,248
PA	$ 27.70	$ 57,616	$ 21.95	$ 45,656
MI	$ 25.78	$ 53,622	$ 20.28	$ 42,182
OH	$ 25.16	$ 52,333	$ 19.40	$ 40,352
IL	$ 27.88	$ 57,990	$ 22.86	$ 47,549

[1.] Sourced from MIT Living Wage Calculator

Table 3: Job Openings for Carpenters, Electricians, and Plumbers per Capita by State

State	Estimated Job Openings (2024-34)[1]	State Population (as of 7/1/23)[2]	Job Openings Per Capita
California	273,613	38,965,193	0.007021974
Texas	222,123	30,503,301	0.007281928
Florida	151,987	22,610,726	0.006721894
New York	133,706	19,571,216	0.006831757
Washington	73,545	7,812,880	0.009413352
Pennsylvania	71,968	12,961,683	0.00555237
Michigan	67,522	10,037,261	0.006727182
Ohio	67,084	11,785,935	0.005691879
Illinois	66,476	12,549,689	0.005297032
North Carolina	65,441	10,835,491	0.006039474
Massachusetts	65,087	7,001,399	0.009296346
Arizona	60,320	7,431,344	0.008116961
Virginia	58,629	8,715,698	0.006726784
Georgia	57,903	11,029,227	0.005249986
Tennessee	52,369	7,126,489	0.007348501
Colorado	51,284	5,877,610	0.00872534
Indiana	46,857	6,862,199	0.006828256
New Jersey	46,102	9,290,841	0.004962071
Utah	42,730	3,417,734	0.012502425
Missouri	41,984	6,196,156	0.00677585
Minnesota	41,172	5,737,915	0.007175357
Wisconsin	40,055	5,910,955	0.006776381
Maryland	36,954	6,180,253	0.005979411
Oregon	35,865	4,233,358	0.00847204
Nevada	33,055	3,194,176	0.010348649
Louisiana	30,325	4,573,749	0.006630122
Alabama	29,208	5,108,468	0.005717663
Kentucky	28,795	4,526,154	0.00636197
Iowa	26,232	3,207,004	0.008179443
South Carolina	26,006	5,373,555	0.004839635
Oklahoma	24,051	4,053,824	0.005932848
Idaho	23,636	1,964,726	0.0120301
Connecticut	22,328	3,617,176	0.006172798
Arkansas	20,981	3,067,732	0.006839291
Nebraska	19,346	1,978,379	0.009778926
Kansas	18,877	2,940,546	0.006419547
New Mexico	15,421	2,114,371	0.007293204
Mississippi	14,733	2,939,690	0.005011702
Maine	13,787	1,395,722	0.009878194
Hawaii	13,409	1,435,138	0.009343512
Montana	12,199	1,132,812	0.010768741
New Hampshire	11,881	1,402,054	0.008474209
South Dakota	9,867	919,318	0.010733269
Rhode Island	8,860	1,095,962	0.008083797
West Virginia	8,575	1,770,071	0.004844158
North Dakota	8,061	783,926	0.01028243
Wyoming	7,318	584,057	0.012529611
Vermont	6,191	647,464	0.009561945
Delaware	5,690	1,031,890	0.00551381
Alaska	5,673	733,406	0.007735046
District of Columbia	4,239	678,972	0.006242613

[1.] Sourced from Lightcast. The estimated total number of people who are entering the occupation for the first time (i.e., "replacement jobs") in addition to the number of jobs created during the period (i.e., "net-new jobs")

[2.] Sourced from U.S. Census Bureau