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Addressing the Workforce Skills Gap in Construction and CRE-related Trades

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About NAIOP

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The NAIOP Research Foundation was established in 2000 as a 501(c)(3) organization to support the work of individuals and organizations engaged in real estate development, investment and operations. The Foundation's core purpose is to provide information about how real properties, especially office, industrial and mixed-use properties, impact and benefit communities throughout North America. The initial funding for the Research Foundation was underwritten by NAIOP and its Founding Governors with an endowment established to support future research. For more information, visit naiop.org/research.

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Executive Summary

A shortage of construction and logistics workers has increased the cost of construction for developers and hampered the expansion and profitability of warehouse and distribution centers. The NAIOP Research Foundation commissioned this report to explore some of the contributing factors to the workforce shortage and how the construction and logistics industries can improve worker recruitment, training, productivity and retention. The author interviewed several national and regional workforce development program leaders to learn about their partnerships with industry to recruit and train the next generation of construction and logistics workers.

Recent economic growth has been a boon to developers, owners and investors across the commercial real estate industry, but has also made it more difficult for contractors and warehouse operators to recruit and retain qualified workers. While low unemployment has made recruitment and retention more challenging for employers in most industries, recent trends have contributed to more pronounced workforce shortages in construction and logistics than in other sectors. The construction industry has struggled to recover the workers it lost during the 2007-2009 recession. This can partly be explained by declining secondary school resources devoted to vocational education and relatively limited interest in construction trades among millennials. The logistics industry faces a similarly limited pipeline for new workers while demand for employees in warehouse and distribution centers is growing rapidly.

Worker shortages in both industries have been exacerbated by persistent low rates of productivity growth over several decades as these industries have been slow to adopt labor-saving technologies. That may be changing as firms turn to a range of new technologies to improve worker productivity and safety. Interviews with industry insiders reveal that a tight employment market is incentivizing a growing number of employers to invest in technologies ranging from augmented and virtual reality to 3-D printers and wearable technologies.

To provide insight into how employers can improve worker recruitment and training, the report explores existing construction and logistics workforce development resources and programs. Interviews with employers and educators and a review of the recent literature on the topic reveal substantial variety in construction and logistics workforce development programs. These include career and technical education programs at high schools and community colleges, employer-organized worker education programs, and apprenticeship programs that are organized by unions and industry associations.

Employers can often find willing partners and support for workforce development programs at educational institutions and in the federal, state and local government. For example, federal student aid and state grants can help defray the cost of career and technical education programs that are offered in partnership with a community college. Indeed, as this report's profile indicate strong partnerships with educational institutions and local community leaders are often the key to a program's success.

This report draws from interviews and secondary sources to explore five partnerships for workforce development in the construction and logistics industries. An analysis of these partnerships reveals several important findings that merit the attention of warehouse owners and operators as well as developers across the real estate industry:

- **Contractors will increasingly need to adopt new technologies to improve worker productivity.** Adoption of labor-saving technologies like 3-D printing and robotics can help substitute for scarce labor. Other technologies, like augmented and virtual reality and wearables, can improve the site design process and boost worker safety. In addition to mitigating the workforce shortage, a commitment to increasing worker productivity through technology adoption will help contractors grow their businesses more rapidly.
- **The most successful workforce development programs rely on multisector collaboration.** When employers, educational providers and community leaders work together to promote workforce development, they are able to leverage their unique capabilities and resources to maximize program outcomes. While employers can often develop effective in-house training programs, a partnership with an educational institution and local community leaders can allow for more effective and comprehensive training, unique insights into the local talent pool and better access to prospective workers.
- **It is important to align workforce development programs with local trends.** Worker training and recruitment programs should be designed to prepare prospective workers for jobs that are currently in demand in their local area. Program leaders should also tailor recruitment efforts to the local pool of prospective workers. For example, a new program in a rural area may need to demonstrate that prospective workers can find long-term employment there.
- **Demonstrating that a job can be part of a long-term career is important to recruitment and retention in the logistics and construction industries.** This is particularly true for recruiting and retaining workers in entry-level positions as these workers are less likely to be familiar with industry career tracks. When prospective or current employees are aware of future opportunities for development and advancement, they are less likely to treat a job as a short-term arrangement and are more likely to invest in their own skills.
- **The construction and logistics industries need to invest in training and recruiting high school students and recent graduates.** Declining public school investment in vocational education has contributed to lower awareness of careers in construction and logistics. This has exacerbated a shortage of entry-level workers. To reverse this trend, employers in construction and logistics will need to proactively reach out to high school students to expose them to opportunities in each industry and offer them relevant vocational training. Case profiles in this report reveal a range of approaches to engaging the next generation of construction and logistics workers.

- **Investing in ongoing training for current employees ensures that workers have the latest skills and improves worker recruitment and retention.** As construction and logistics technologies and processes continually evolve, it is important that workers receive training in the latest industry practices. Investing in ongoing training improves worker productivity and safety. It also has the added benefit of helping to recruit and retain workers. Workers are more likely to join and stay at a company that is committed to investing in their professional development.

Recent trends suggest that the construction and logistics industries cannot rely on the status quo to produce enough qualified workers to meet future demand. Similarly, current levels of technology adoption are unlikely to result in the worker productivity growth that these industries need to become more profitable. The interconnected strategies for improving workforce development and worker productivity that are identified in this report should be of interest to anyone who works in real estate development or the logistics industry.

Introduction

The NAIOP Research Foundation commissioned this study for real estate developers, contractors, warehouse and distribution facility operators, educators and others who have an interest in construction and logistics workforce development. In recent years, the construction industry has experienced a shortage of qualified workers that has slowed the progress and raised the cost of real estate and infrastructure development. The logistics industry has also faced similar challenges recruiting an adequate supply of skilled workers. These shortages have only grown more acute as overall unemployment has declined to record lows. Additionally, employers will face new hiring challenges as industry technologies advance.

This study explores the reasons for the construction workforce shortage and examines strategies to adapt to the shortage and improve worker recruitment, training, and retention. Many of these strategies also have applications in the logistics industry. Through interviews with employers and educators, the report examines innovative public-private partnerships that seek to develop the next generation of construction and logistics workers.

The report begins by evaluating demand trends in the construction industry since the Great Recession, the multiple factors contributing to the industry's labor shortage, and how construction firms have adapted to the shortage. This section includes an examination of how employers are adopting new technologies to increase worker productivity and provides an overview of workforce development programs offered by employers, unions, educational institutions and government agencies.

The author interviewed representatives of four exemplary regional and national programs that have contributed to worker training and recruitment in the construction and logistics industries in the United States. The individual case profiles explore aspects of these programs that would be instructive to NAIOP members and their communities seeking to develop or improve recruitment and retention programs for workers in construction or logistics. The profiles showcase a range of effective approaches to recruit and prepare high school students and young adults for careers in construction and logistics. They examine the origin and nature of the industry-educator partnerships, identify potential funding sources for training programs, explore program challenges, highlight key program features, and evaluate their outcomes for employers, workers and communities.

Adapting to the Skills Shortage in the Construction Trades

The construction industry shed 2.2 million jobs during the Great Recession. Many workers either retired or were laid off and found employment in other industries. It became clear after several years that these workers, now in new careers, were not coming back to the field. Construction employment totaled 7,464,000 in January 2019, the most since January 2008. However, the construction industry is still not attracting enough talent to meet demand. Tech-savvy millennials are less attracted to careers in construction than past generations. Baby boomers are entering retirement in growing numbers, challenging firms to meet their employment goals. To address the construction worker shortage, employers are increasingly turning to labor-saving technologies. Employers, educational institutions and government agencies are placing greater emphasis on apprenticeships and career and technical education (CTE).

Current Workforce Availability

The Associated General Contractors of America (AGC), in conjunction with Autodesk, conducts a survey each summer to evaluate workforce availability. Survey respondents in 2018 were asked if their firms are having more difficulty than during 2017 in filling any of 20 specific hourly craft positions or 10 salaried positions. They indicated that the five most difficult non-salaried craft positions to fill are pipelayers, sheet metal workers, carpenters, concrete workers and pipefitters/welders. A majority of respondents said positions were harder to fill than a year ago for all but one of the craft personnel positions.

Growing demand for construction workers helps explain why 81 percent of firms reported in the 2018 survey that it will continue to be difficult to find hourly craft workers. Meanwhile, 59 percent of contractors in the Northeast are having a hard time filling salaried positions (up from 43 percent in 2017), as are 59 percent in the West (up from 41 percent), 57 percent in the Midwest (up from 38 percent) and 51 percent in the South (up from 38 percent). Two-thirds of firms report that it will continue to be hard, or get even harder, to find salaried field and office personnel, and 47 percent of firms say the local pipeline for skilled, well-trained craft personnel is poor.

Recruiting Strategies and Costs

The 2018 AGC/Autodesk survey also found that most construction firms are paying more to attract workers. Six in 10 report they have increased base pay rates for craft workers, while a quarter improved their employee benefits for craft workers and are providing incentives and bonuses to help recruit these workers. To attract salaried workers, 56 percent of firms report they have increased pay, while a third are providing bonuses and a quarter are providing improved employee benefits.

Construction firms are also adjusting operations to do more with fewer workers. Forty-six percent of firms have initiated or increased in-house training because of workforce shortages, while one-third have hired interns, 30 percent are paying more overtime and 26 percent have changed their hiring standards. Meanwhile, almost half of firms report getting involved with career-building programs at the high school and college levels. One-third use staffing firms to locate craft workers, and 28 percent are relying more heavily on sub- and specialty contractors.

As a result of these activities to reduce the labor shortage, almost half of firms in August 2018 report they have put higher prices on their bids. Forty-four percent report that already-underway projects have increased in cost due to labor shortages. Forty-six percent report it takes longer than originally scheduled to complete projects, and 27 percent are putting longer completion times into their bids because of workforce shortages.

Reasons for the Construction Labor Shortage

Several factors – economic, social, demographic and educational – have contributed to a significant shortage of skilled construction workers. First, recovery in construction activity has not been able to keep pace with the recovery in demand for construction following the 2007-2009 recession. This has resulted in a prolonged increase in demand for workers as companies grow and expand employment. The Tax Cuts and Jobs Act of 2017 has also freed up capital that construction companies were previously unwilling to spend. A U.S. Census report on construction spending revealed an increase in spending of 5 percent for the first 11 months of 2018 compared to the same period in 2017.

Second, the supply of skilled workers has not kept up with demand. Between 2006 and 2011, construction had the longest and steepest decline in employment of any sector, from a peak of 7.7 million people in April 2006 to a floor of 5.5 million in January 2011.¹ AGC member surveys and economic analyses conclude that the vast majority of the 2.2 million construction workers who exited the industry either retired, got jobs in other industries or dropped out of the workforce. Their loss was exacerbated by retirements, an atrophied construction workforce training pipeline and competition from other industries for prospective workers.

These trends have contributed to an increased reliance on immigrant workers in the construction industry. The ratio of construction workers who are immigrants is rising, according to an analysis of the most recent 2016 American Community Survey data by the National Association of Home Builders.² Immigrant workers comprise nearly 25 percent of the overall construction workforce and account for an average of 30 percent of the workers in the construction trades.³

Table 1
Age Distribution of the Construction Workforce

Industry	16 to 19	20 to 24	25 to 34	35 to 44	45 to 54	55 to 64	65 and over
Construction	1.7%	7.3%	22.5%	25.3%	21.4%	16.7%	5.0%
All Industries	3.3%	9.0%	22.7%	20.9%	20.8%	17.1%	6.2%

Source: U.S. Department of Labor Bureau of Labor Statistics

Although the median age of construction workers (42.5) is only slightly older than the median for all industries (42.2), an above-average proportion of the construction workforce is over 35. Attitudinal shifts over the past 30 years have resulted in far fewer shop classes and less exposure to construction as a potential career in primary and secondary schools. Instead of entering the industry directly from high school, workers tend to begin careers in construction at a relatively late age (the average age for entrants is about 28) after pursuing postsecondary education or employment in other industries. As a result, the construction industry faces a shortage of young workers to replace those who will retire in the coming years. The continued aging of the construction workforce has increased pressure on the industry to recruit and train workers in their late teens and early twenties.

The opioid crisis has had a disproportionate impact on the construction workforce, further exacerbating the worker shortage. Construction workers must not only be able to pass drug tests, but also operate in environments with hazards that can result in serious injury. In the process of recovering from these injuries, workers are often prescribed addictive opioids. The American Society of Safety Professionals has found that the injury rate for construction workers is 77 percent higher than the national average and that nearly 15 percent of construction workers deal with substance abuse. A study of opioid abuse in Massachusetts from 2011 to 2015 revealed that workers in construction and extraction industries accounted for 26 percent of opioid-related overdose deaths in the state.⁴

Construction firms face the added difficulty of having to compete with other industries for qualified workers. For example, short-term booms in the oil industry can pull workers from the construction industry to work in oil fields. Construction firms that seek to employ workers with strong technology skills must also compete with information technology firms for talent.

Technological Solutions and New Work Methods

Construction firms are increasingly turning to new technologies to increase worker productivity as one way to adapt to the worker shortage. The 2018 AGC/Autodesk survey found that 25 percent of firms are adopting methods to reduce on-site worktime. These include the use of lean construction techniques, virtual construction tools, augmented reality to train workers, off-site prefabrication and labor-saving equipment such as drones, robots and 3-D printers. The largest firms have been most likely to adopt these labor-saving approaches.

In addition to the technologies that Autodesk identified in the survey, the firm believes the following technologies will quickly become part of major construction projects:⁵

- **Wearable technologies** to alert workers of potential hazards and nearby accidents.
- **Machine learning** to analyze photos, videos and other visual data from job sites to look for safety violations and to inventory on-hand materials.
- **Predictive analytics** to identify and evaluate risk using design plans and historical data provided by subcontractors and materials suppliers.

These predictions align with analyst and industry practitioner forecasts. Kevin Major, a labor analytics consultant for CBRE, maintains that the combination of a shortage of workers and an abundance of venture capital is motivating construction companies to adopt 3-D printing and other labor-saving technologies.⁶

Ken Simonson, chief economist at the AGC, predicts that increased technology adoption will reduce the need for some low-skill workers such as assistants, allow other low-skill workers to perform the jobs that middle-skill workers currently perform and increase demand for workers with technology skills: “When you have GPS and laser-guided equipment instead of guys with transits and strings and pegs to show a bulldozer operator exactly where the edge is and what the camber should be on a slope, then you can do with fewer assistants.”⁷

Technology is also shaping the buildings that construction firms produce as demand grows for smart buildings that reduce energy usage and provide features to improve occupant safety and inter-building communications. However, smart building development remains a nascent field as developers and builders decide whether to develop smart solutions in-house or collaborate with third-party technology vendors. Several issues complicate these decisions, such as the reliability, accessibility, cost and safety of 5G or IoT technology.⁸



The construction industry has struggled to recruit young workers to replace those nearing retirement.
Photo Credit: Clem Onojeghuo on Unsplash

Renaissance in Construction Training

Although construction-related training is rarely a part of contemporary secondary education, state, local and federal government agencies, educational institutions and construction firms offer training in construction through apprenticeship programs, corporate training, and career and technical (CTE) programs. Recognizing how much the national labor shortage is constraining economic expansion and infrastructure development, plans to increase funding for technical training are emerging in the private and public sectors. In just the past few years, several national and state commissions have been set up to examine how to expand and pay for job training. Some of these commissions focus on manufacturing and construction. In 2018 the White House announced its new workforce commission, and several governors have used their 2019 state-of-the-state speeches to announce theirs. All indicate the intent to expand apprenticeships, CTE and work-based learning programs such as co-op education and industry internships.

Private firms and industry organizations play an important role in construction workforce development. Larger construction companies have internal training programs and often partner with universities, community colleges or trade schools to upgrade the competencies of their personnel. Small businesses may utilize training and apprenticeship programs offered by labor unions to recruit and train skilled workers. AGC and the National Center for Construction Education and Research (NCCER) also maintain training and apprenticeship programs.



According to the United States Department of Labor, there were 166,629 active apprentices in the construction industry in Fiscal Year 2018, more than in any other industry.

Photo Credit: Getty Images

Educational institutions also offer workforce training related to construction through CTE programs. There are considerably more state and local resources than federal funds for CTE, with some states and localities prioritizing CTE more than others. There are several excellent publicly organized training programs for construction occupations throughout the U.S. For example, Georgia's Quick Start program has served as a model for 6-7 states in the Southeast region including Louisiana, Tennessee and North Carolina. Many community colleges offer

robust customized continuing-education programs that are developed in partnership with corporate clients. However, in states that impose significant administrative requirements on businesses that seek training grants, community colleges tend to prefer to reach a broader audience of companies with less customized training programs. In these states, companies often prefer in-house training over community college programs.

The Perkins Act is the principal federal sponsor for high school and community college CTE programs and is administered by the U.S. Department of Education. AGC has called for doubling Perkins appropriations, which total \$1.26B in FY2019.⁹ The federal government also provides support for training at private trade or vocational schools through direct assistance to students in the form of Pell Grants and federal student loans.

Apprenticeship programs remain a valuable tool for workforce development. These programs allow novices to learn a trade alongside experienced tradespersons while earning a salary. Apprentices are treated as regular employees with work assignments. In addition to learning job skills, they develop social skills and work attitudes that are necessary for success in any employment situation.

For more than 80 years, the Registered Apprenticeship system under the U.S. Department of Labor has enforced a set of standards that combine job-related technical instruction with structured on-the-job learning experiences. Apprenticeship programs range in length from one to six years depending on an occupation's skill requirements. These programs often require a partnership between an employer and an educational provider and may also involve the participation of a union or trade association. In 2016, the Department of Labor estimated there were 144,000 apprentices working in construction, making it the largest segment of apprentices and an essential part of the construction industry.

CBRE's Seth Martindale notes a renewed interest in apprenticeship programs that is mostly due to growing corporate awareness of the "tsunami" of retirements that are expected in the next few years.¹⁰ Employers also increasingly recognize that apprenticeships are an effective recruitment tool and improve worker retention. Apprentices tend to remain with the companies that hire them as they become eligible for promotions with generous pay raises while they gain skills and experience.

Labor Union Workforce Training Programs

Unions representing construction trades offer a variety of worker training programs. These primarily take the form of apprenticeships or similar programs. Among the more relevant apprenticeship programs for the construction industry are those operated by North America's Building Trades Unions (NABTU) and its affiliates. NABTU is a labor federation representing 14 North American building trade unions and is affiliated with the AFL-CIO. NABTU's affiliate unions and partnering contractors operate more than 1,900 training centers in North America and invest more than \$1.5 billion annually in apprentice and journey-level training in the U.S. As with other apprenticeship programs, those administered by NABTU-affiliate unions and partnering contractors allow apprentices to earn wages and college credit while receiving specialized job training.

NABTU's Apprenticeship Readiness Programs (ARPs) are particularly relevant to firms interested in recruiting and training recent high school graduates, veterans and others who may be interested in construction. These programs serve as a gateway to apprenticeship programs in an individual trade by offering participants the opportunity to acquire foundational education as they gain skills and exposure to the construction industry through work experience in the construction trades. NABTU advertises the program as an opportunity for participants to try out different crafts before focusing on a specific trade. ARPs are designed to increase the number of apprenticeship candidates and to increase the retention rates of apprenticeship programs. The ARPs also seek to contribute to diversity in the construction industry by recruiting and training veterans, people of color and women. State and local Building Trades Councils administer ARPs in partnership with training coordinators, contractors, government agencies, community groups, community colleges and high schools.

Employers can also partner with individual unions to recruit and train apprentices for specific construction trades. For example, the Laborers' International Union of North America (LIUNA), which represents construction workers, partners with contractors to train apprentices in a range of general construction skills, occupational health and safety and CPR, as well as training in concentration areas such as building construction, masonry, demolition and environmental remediation. LIUNA assists with marketing, recruitment, candidate screening and training for its apprenticeship programs.¹¹

Case Study: NCCER Hard Hat Heroes Credentialing Program

History of the Program

NCCER's roots extend back to the early 1990s, when more than a dozen of the largest contracting firms in the U.S. came together to standardize training and provide industry-recognized credentials. Over time, NCCER has expanded to become the construction industry's leading nonprofit organization for training, assessment and certification. NCCER develops curricula, management and safety training materials for more than 70 craft areas that have been used in all 50 states and in 20 countries. NCCER's curricula are utilized by a variety of registered apprenticeship programs across the U.S., and many employers also use NCCER curricula to offer non-registered training programs that are similar to apprenticeships. In addition to its training offerings, NCCER seeks to promote awareness of and recruitment into construction careers through its Construction Career Pathways initiative, which aligns pathways from entry-level jobs to senior technical and management positions so that current and prospective construction workers better understand the range of careers that are open to them.

As part of its strategy to address construction workforce shortages, NCCER determined that U.S. military veterans would be ideal candidates to fill many industry job vacancies. Veterans can represent a pipeline of talent for the construction industry, and the industry can help them easily find work in construction trades after their military careers.

The industry has long recognized that many former military personnel have skills and experiences that translate to civilian settings, but until recently, it was unclear how to effectively connect veterans to available construction jobs. One long-standing hurdle to recruiting veterans has been the absence of an effective way to determine how the skills veterans learned in the military would align with the construction industry's needs and requirements. Military occupational codes can differ from industry standards and, as recently as 10 years ago, there were no procedures in place to "translate" a candidate's military experience into private-sector qualifications. Without civilian credentials, veterans would have difficulty proving they had adequate training, making it more difficult for them to obtain construction-related employment.

Recognizing this gap, in 2012 NCCER began aligning Military Occupational Specialty (MOS) codes, an alphanumeric system representing training areas, with civilian construction credentials. At first, the military's skill areas seemed to match with industry craft areas such as welding, pipefitting and carpentry. However, those hiring in construction were still unsure of veterans' training. Without certification, veterans were often forced to start in entry-level positions regardless of how skilled they were.



Operation: Build America event in Houston in 2018. The day-long event focused on connecting industry and veterans by providing networking opportunities and expert speakers from the Department of Labor, U.S. Army, NCCER and NextOp. More than 20 companies were represented at the event and 20 out of 27 veterans that attended were hired.

Photo Credit: NCCER

To address this problem, NCCER convened an advisory council of industry leaders who had served in the military. The council brought together NCCER staff and service training experts at Ft. Leonard Wood, a U.S. Army base in Missouri, to compare the NCCER curriculum with military job training objectives. After three days of meetings, NCCER and the U.S. Army aligned their requirements so that former Army service members would not need to be retested when entering the civilian construction trades. Soon, other branches of the military, including the Marines, Navy and Air Force, met with NCCER, and the range of accepted credentials increased to cover more than 90 civilian-military skill alignments.

Making the Connections

In 2016, NCCER developed the Hard Hat Heroes (HHH) Credentialing Portal, a free-of-charge, web-based service that allows veterans and transitioning service members to enter their MOS codes online and instantly receive NCCER verification for construction-related military training that will carry over to private industry. Although companies have different classifications for their employment areas, employers can see that an applicant has NCCER credit in specific skills and he or she can be hired at the appropriate level, usually without additional training.

NCCER's online system also offers links to available positions with partner companies that are proactive in hiring former service members. Additionally, applicants can be referred to NextOp, a veterans' advocacy group based in Houston, for assistance with job placement, résumé development and adjusting to life after the military.

As of 2019, 600 veterans have been credentialed, and 92 percent of the applicants are successfully credited when they apply. (NCCER does not collect data on applicant demographics or the number of job placements.) Most applicants rank between E3 and E6 (roughly private to sergeant), and many receive credit for leadership experience in their military careers based on their rank when they completed their service.

If applicants do not have any construction-related skills, they may enroll in the NCCER Core Curriculum, part of which is available online, for free. In-person training can be completed at a local accredited training center.

Lessons Learned

Although HHH has received positive feedback from users, the program's biggest challenge has been getting the word out to prospective applicants. NCCER promotes the program to veterans' organizations and in military publications, but it hopes to attract additional applicants so that more candidates will have access to employment opportunities.

NCCER recognizes the connection between military and civilian skills and believes that veterans who once defended the U.S. should be encouraged to help build it.

Case Study: Johnson Controls Partnership with Lincoln Tech

History of the Partnership

In 2016, Johnson Controls merged with Tyco International to create Johnson Controls International plc, a global leader in building products and technology, integrated solutions and energy storage. Roughly 15,000 technicians in their North American field organization install, operate and maintain Johnson Controls systems in various markets. As a fast-growing global business, having highly capable technical workers is crucial to the company's success.



From left to right: Daniel Richins, Lincoln Tech Indianapolis Campus President; Rod Rushing, VP and President, Building Solutions, North America at Johnson Controls; and Scott Shaw, CEO at Lincoln Tech cut a ribbon to celebrate the workforce development partnership between Lincoln Tech and Johnson Controls on Tuesday, Aug. 14, 2018 in Indianapolis.

Photo Credit: Johnson Controls

The merger with Tyco presented Johnson Controls with significant challenges to adequately staff its technical workforce. In an average year, Johnson Controls experiences 10 to 15 percent turnover in its workforce, resulting in a need to replace 1,500 to 3,000 technicians. The company is also growing, requiring additional recruitment to support its expansion. Johnson Controls recognized that it could not solely rely on recruiting talent from other firms and would need to develop more self-sustaining recruitment strategies. The company already offered internships and co-op education apprenticeship programs, but it had limited access to recent high school graduates who would be interested in entry-level positions. To that end, Johnson Controls formed a partnership with Lincoln Tech to recruit and train recent high school graduates.

Lincoln Tech was started in Newark, New Jersey, just after World War II with the purpose of training veterans to perform skilled jobs in the civilian sector. In 2018, its 22 campuses in 14 states provided training services to more than 10,000 students from a variety of backgrounds in a number of skilled trade fields including automotive, welding, electrical and HVAC. Over the years, Lincoln Tech has worked with several employers to create company-specific training, such as advanced automotive training for Audi, BMW and Chrysler, and supermarket refrigeration unit installation and service training for Hussman. All employers who partner with Lincoln Tech offer students opportunities to interview at their firms.

Lincoln Tech develops the curricula, recruits students and performs training while Johnson Controls contributes to recruiting by working with Lincoln Tech's 90 high school admissions representatives. These representatives visit local markets around the country to educate students on available career paths and opportunities. Through this partnership, Johnson Controls is able to highlight opportunities for its employees while generating broader awareness of career opportunities in related technical occupations.

Since its beginning in 2018, the Johnson Controls-Lincoln Tech partnership has launched at Lincoln Tech's campuses in Indianapolis, Indiana; Melrose Park, Illinois; East Windsor, Connecticut; Shelton, Connecticut; New Britain, Connecticut; and Columbia, Maryland. This partnership will eventually expand to four other campuses and will deepen Johnson Controls involvement in the recruitment process for new high school graduates, which takes place throughout the year. To ensure that students receive the most up-to-date training, Johnson Controls will supply Lincoln Tech labs with its state-of-the-art equipment. Johnson Controls is hopeful that once students are exposed to their brand and recognize the company's commitment to their education, they will be more inclined to pursue a career at the firm.

Recruitment and Program Costs

Johnson Controls encourages local managers and employees to sponsor high schools and collaborate with Lincoln Tech to visit schools. These ambassadors communicate with students about how available training programs could lead to career opportunities, such as employment with Johnson Controls. The recruitment teams visit a variety of secondary schools, including comprehensive high schools, charter schools, and public and private career and technical schools.

Lincoln Tech training programs are primarily supported through tuition, which is approximately \$21 per hour of instruction. So a 1,000-hour program costs approximately \$21,000. As Lincoln Tech is an accredited institution, students are entitled to the same Title IV benefits as students attending other postsecondary institutions, including Pell Grants that do not need to be repaid. Students and their parents may also take out student loans and federal PLUS loans. Lincoln Tech also offers scholarships. While Johnson Controls does not offer scholarships at this time, it may consider doing so to attract students in the future.

Curriculum

Johnson Controls hires technicians in fire detection and life safety solutions, security systems, electrical and electronic systems, and heating and air conditioning controls systems. Technicians in these areas all address low-voltage systems, but each technical field requires different skill sets. Lincoln Tech offers courses in all of these fields, with two of their largest programs specializing in heating and air conditioning and electrical systems. As technology evolves, Lincoln Tech will develop additional curricula that will be customized to Johnson Controls' needs.

Lincoln Tech's 1,000-1,200-hour training programs in HVAC and electrical systems typically last about 10 months. Students usually attend classes for 25-30 hours per week. There is no spring or summer break, but students are given a week off at Christmas and additional time off for traditional holidays. This pacing helps students prepare for the schedules they are likely to experience once they obtain employment.

Student Career Outcomes

Johnson Controls will interview graduates of Lincoln Tech's HVAC and electrical programs. Most will qualify for entry-level roles as technicians in Johnson Controls' service business, where they will support equipment installation and maintenance. Johnson Controls has different certification levels for its technical workforce, so a new employee can opt to remain a technician and progress further in a technical capacity, or may instead pursue a management position as a frontline supervisor, technical supervisor or operations manager. Some of those who enter a management track may later be promoted into mid-level management.

Lessons Learned

Younger workers often lack soft skills associated with effective communication, working in groups and punctuality. Johnson Controls screens prospective employees for character and fit with company culture. In addition to having the right technical skills, entering employees must also have the right attitude and character to represent the company. The company's technical workers play an important customer-facing role.

Although soft skills and professionalism can be difficult to teach in short timeframes, Lincoln Tech integrates teamwork, interpersonal relations, negotiation and conflict resolution into its curricula. The programs also develop employment skills such as résumé writing, interviewing, time management and customer service. Lincoln Tech tracks attendance daily to instill in students the importance of punctuality and following a work schedule.

“This challenge that Johnson Controls has is kind of universal. The question I think for companies that will be successful in the long term is, who is really embracing these types of educational partnerships to ensure that they have the workforce that everyone needs? The more companies move quickly to tap into how they can develop these partnerships and attract more capable entry-level people, the better off they will be.”

– SCOTT SHAW, PRESIDENT AND CEO OF LINCOLN TECH



Graduates of Lincoln Tech's Heating, Ventilation and Air Conditioning (HVAC) and Electrical and Electronic Systems Technology (EEST) training programs throughout the country will have the opportunity to pursue careers with Johnson Controls.

Photo Credit: Johnson Controls

Lincoln Tech benefits from the partnership by becoming a larger and more financially stable institution through revenues and state-of-the-art equipment provided to its training centers. As an educator of skilled technicians in several occupations across multiple states, Lincoln Tech hopes to expand its impact by forming more relationships with employers like Johnson Controls. These partnerships help convince prospective students that they can find jobs at the end of their studies. Communities also benefit from the growth of major training institutions like Lincoln Tech that provide more career options for residents through high-quality career and technical education.

In the current economic environment, finding good faculty members has been one of the greatest challenges that partnerships between employers and educational institutions have faced, as qualified individuals can choose among many opportunities. Recruiting enough students to meet industry demand has also been a challenge, as these programs must compete for students with bachelor's degree programs. Nonetheless, partnerships between firms and educational institutions tend to be very effective in increasing awareness of career opportunities among students and their parents.

Case Study: Logistics Park Kansas City

History and Rationale of Logistics Park and its Learning and Career Center

Logistics Park Kansas City (LPKC) is a 1,700-acre master-planned distribution and warehouse development in Edgerton, Kansas, 35 miles southwest of downtown Kansas City. Anchored by BNSF Railway's newest state-of-the-art rail, truck and barge intermodal facility and developed by NorthPoint Development, LPKC is strategically and centrally located in the Midwest, positioned for the efficient shipment of goods for import and export, serving all points throughout the U.S.¹²

The Learning and Career Center (LCC) at Logistics Park Kansas City is a collaborative effort between private industry, educational institutions, and community and workforce partners to develop a highly trained workforce for the logistics and supply chain industry in and around LPKC. Northpoint Development has been proactive in finding employer tenants for LPKC and then connecting its human resources departments to local governments and educational institutions.



Logistics Park Kansas City is anchored by a BNSF intermodal facility.

Photo Credit: Logistics Park Kansas City

In the mid-2000s, Northpoint Development began working with BNSF Railway's intermodal facility in Edgerton, Kansas, to design a warehouse and distribution center to increase efficiency, safety, environmental protection and profitability. It began construction in 2010 and commenced operations in 2013. As of 2018, LPKC encompassed approximately 13 million square feet of warehouse and distribution centers, manufacturing space and cold storage. Locating these facilities together allows for intermodal service and lowers transportation costs, which represent the largest contributor to occupancy costs for a warehouse or distribution center.

In addition to lowering costs for tenants, the LPKC project has created thousands of jobs and expanded the tax base for the local community. Although LPKC is located adjacent the Kansas City metropolitan area, which is home to 2.2 million people, rapid growth in demand for workers led LPKC and its partners to implement programs to provide tenants with a steady supply of trained workers. To date, LPKC has created more than 4,000 jobs and is on pace to create more than 1,000 jobs per year.

Recognizing that record-low unemployment is a significant headwind to economic expansion, LPKC has partnered with the local community and educational institutions to expand training for jobs that are currently in demand. LPKC has targeted developing the local talent pipeline among those living in the rural areas in and around Edgerton and southwest Johnson County. Although most prospective entry-level employees for the business park's new warehouse and distribution centers have little formal education beyond high school, LPKC's leadership recognized that many are from farm families and possess a strong work ethic and basic mechanical skills. Many learned transferrable skills in vocational student organizations such as 4-H and Future Farmers of America, which encourage practical farm, home and community projects and train youth to develop and realize personal goals.

Funding and Operations of the Learning and Career Center

The primary partners of LCC are the City of Edgerton, Elevate Edgerton, the Southwest Johnson County Economic Development Corporation, Johnson County Community College and the Kansas Workforce Partnership. Elevate Edgerton is the City of Edgerton's economic development corporation, which hosts a monthly roundtable with the human resources managers of all the companies located at Logistics Park Kansas City. The roundtable discusses future building and other economic development projects and how those plans will affect training needs for the local workforce.

Northpoint and LPKC built the LCC facility and provide it to Johnson County Community College to hold classes there on a rent-free basis. The Kansas Workforce Partnership uses federal and state funding to provide the LCC with reception, maintenance and logistics staff. In addition, LPKC provides an office in the LCC for the Kansas Department of Transportation that provides Commercial Driver License (CDL) training for those who wish to get their truck driver's license at the LCC.

“There were 1,300 high school students that otherwise would have gone into the military, left Kansas to work in the oil fields of the Permian Basin or remained unemployed or under-employed in Kansas with low-wage jobs. The challenge was to figure out how to retain them and make them the fuel that grows the state’s economy through gainful, family-wage employment that looks like the American dream.”

– PATRICK ROBINSON, VICE PRESIDENT OF DEVELOPMENT, NORTHPOINT DEVELOPMENT

LPKC's various partners complement each other's revenues and expenditures. While the Kansas Workforce Partnership receives ample federal funds for training, it lacks an advertising budget. Other partners have established programs to recruit students and dropouts by reaching out to high school counselors who pass along information about nearby opportunities in the logistics field. With this recruiting help, the Workforce Partnership can achieve training and job placement outcomes that are mandated by the federal government.

LPKC and its partners have made a concerted effort to ensure that tuition costs are not a barrier to prospective students. Most employers provide new employees onsite occupational training while paying them a living wage. Johnson Community College initially charged \$99 for their courses, but they are now available for as little as \$25. The Kansas Workforce Partnership often offsets tuition for those participants it places in a college course or program. Northpoint Development has also set up a scholarship program specifically targeted to Edgerton residents. Employers also cover the cost of an internship program that Northpoint Development recently started by paying participants a stipend or hourly wage.

Partners facilitate transportation to LPKC, allowing employers to reach a broader pool of prospective workers. Public authorities have recently started a bus route to the park that picks up riders from more populated areas in the region, including Kansas City, Wyandotte County and Overland Park in Northern Johnson County.

LPKC partners work with local high schools as part of an initiative to recruit workers who otherwise might leave the area. The City of Edgerton and Elevate Edgerton, in partnership with economic development corporations such as the Kansas City Area Development Council, hosted a supply chain summit for local high school guidance counselors. The summit's goal was to engage counselors in reaching out to the approximately 1,300 students each year in surrounding communities who do not pursue post-secondary education and demonstrate that there are many career pathways within the logistics field.

Programs and Enrollment

LCC enrolls roughly 500-600 students per year. In coordination with LPKC employers, the LCC has developed various certificate programs, including forklift certification and a logistics certificate. The LCC also offers onsite associate's degree programs where students can earn a formal two-year degree and then more advanced degrees in partnership with other institutions. These programs can last 13 weeks, two years, four years or more.

Although LPKC employers do not hire many truck drivers, truck driver training classes are the most popular LCC offering. Soft skills courses at the LCC are also popular. Students develop many of these skills by participating in role-playing exercises where they practice face-to-face communication and conflict resolution. The LCC also offers GED completion programs, basic skills classes and classes related to emerging technologies. These include a course on drone training, an aviation course that is customized around students' commercial or recreational interests and has applications in a variety of industries.

All these training programs are designed for individual success. The goal is not to weed out the less able or the least motivated, but to allow employees to acquire the competence and mindset to work effectively. Class sizes are small enough that instructors can take a personal interest in each student ensuring that everybody is getting the skills they need and that they are able to succeed in their careers.

Partnership Benefits

The LPKC is an example of a public-private partnership where each partner collaborates to produce the ongoing innovation needed to remain competitive and anticipate future challenges. Logistics Park is differentiating itself through its ability to train workers from mostly rural backgrounds into a capable workforce that is a source of competitive advantage for Edgerton and the Kansas City region. Proof of LPKC's success can be found in its creation of 4,000 new jobs with an average salary of roughly \$40,000. This economic expansion has contributed to homebuilding, increased consumer activity and expanded the regional tax base. LPKC's project has also attracted additional development beyond the park from employers such as Amazon, Walmart and Kubota.

Lessons Learned

In partnership with the local community, LPKC successfully developed recruitment and training programs that have allowed its tenants to build a substantial and qualified workforce. LPKC's leadership recognized that tenants needed to compete not only with other employers in the Kansas City region, but also with other warehouse and distribution centers such as Dallas, Memphis, Chicago, Columbus and Indianapolis, which are also grappling with low unemployment. In this context, developing an industry-ready workforce requires local innovation that builds on community strengths.

A key factor in the success of LPKC's workforce development strategy is that its training programs all but guarantee a career-track job for anyone who completes them. Employers and the Johnson County Community College instructors at the LCC work to ensure that trainees get the guidance and financial and academic support they need to earn relevant qualifications and obtain a job.

The workforce at LPKC has proven to be highly competent and reliable thanks to excellent training in various logistics professions by Johnson County Community College. LCC and the college have been sufficiently nimble and flexible to quickly mount training programs to meet the specific skill needs of the individual employers at Logistics Park.

The extraordinary collaboration among the human resources directors of LPKC companies has also been a huge factor in ensuring a sufficiently large and effective LPKC workforce. This inter-firm working group does whatever it takes to develop the public-private partnerships needed to recruit, train and retain the LPKC workforce. Northpoint Development is now sharing these best practices for partnership development and problem-solving with new business parks it is developing throughout the country.

Case Study: Youth Outreach and Training Programs in Effingham, Illinois

History of Program

Established in 1986 in rural Effingham, Illinois, Agracel, Inc. has developed more than 17 million square feet of industrial space in 20 states, mostly in small towns. Depending on customer preferences and its own corporate needs, Agracel develops, leases, manages or sells industrial facilities and properties. It specializes in attracting manufacturers to rural areas by providing development, location and construction services. Agracel also partners with local economic development authorities to assist manufacturers with setting up operations in a community. While it has not developed massive distribution centers, Agracel's manufacturing plants typically range from 50,000 to 300,000 square feet in size.¹⁴

“We’re not bringing up a young workforce that wants to get into the construction trades. The message is, ‘Hey, you’ve got to go to college. You’ve got to go to college.’ Kids who might have gravitated towards the construction trades are being channeled into college.”

– JACK SCHULTZ, CEO, AGRACEL

Agracel's key challenge has been a shortage of manufacturing workers for the plants it constructs and leases. This is particularly true in the rural regions in which Agracel operates, as young people in these areas continue a long-term trend of moving to cities for employment and recreational opportunities. Although Agracel has found enough construction workers for its own projects, other rural construction enterprises are experiencing labor shortages.

Agracel realized that a robust skilled labor supply was essential for rural communities and its own business to prosper. Agracel has been instrumental in the development of partnerships between local firms and communities to launch and staff programs that recruit and train young workers. Agracel was among the companies that spearheaded the Creating Entrepreneurial Opportunities (CEO) program and the Construction Trades Education Curriculum (CTEC) in Effingham County. These two programs are designed to attract young people to opportunities in the construction trades and other rural businesses.

Creating Entrepreneurial Opportunities Program

More than a decade ago, six Effingham County high schools partnered with the local business community to develop and implement the CEO program. It introduces juniors and seniors to the business community through guest speakers, tours of local businesses and by guiding students in the development of their own enterprises. The program is fully funded by partnering employers, with each employer providing the program up to \$1,000 a year. Due to its popularity, Effingham County has expanded the program from one to two CEO classes, or from 20 to 40 students per year. CEO has spread to more than 50 small towns around the Midwest with the purpose of keeping educated youth in their communities by helping them obtain good jobs in fields that are currently in demand.

Students attend CEO for the entire school year, with classes that meet daily before school starts, from 7:15 a.m. to 9 a.m. Volunteers from the local business community provide the CEO curriculum. In addition to classroom presentations and discussions about local businesses, students make 40-50 site visits during the course of the year to learn about entrepreneurship and basic business operations. These visits greatly expand students' awareness of the kinds of available occupations and business opportunities and help them form a considerable network of contacts they can draw upon when they graduate.

Another important feature of CEO is that students must start their own business while in the program. Each student must develop a business plan in which they estimate revenues and expenses such as staffing costs, supplies, utilities and insurance. They then develop an "elevator pitch" and make a formal presentation of their plan to peers and business representatives, who provide feedback and occasionally furnish additional support for the proposed business. Some students continue to execute their business plan at the end of the program.

The CEO program has been particularly effective in encouraging students to seek local opportunities and to remain in their communities. One year, CEO's organizers surveyed student participants to find out how many expected to remain in the local area after they completed high school. At the start of the year, only 10-30 percent expected to remain in the area or return after going to college, but by the time the school year ended, 80 percent expected to remain or return.

Construction Trades Education Curriculum

CEO served as a model for the Construction Trades Education Curriculum (CTEC), which focuses exclusively on preparing students for careers in construction. CTEC was established in 2014 by a public/private partnership of county board members, construction professionals, and local high school and community college officials. The program enrolls 20 students from six Effingham County high schools each year and equips them with the skills and work experience they need to secure a job in the construction trades upon graduating.

Each year, students are chosen for the program through a blind selection process. The application consists of a personal narrative statement and three references, including from the student's high school guidance counselor and a teacher. Students complete applications during their junior year to enter the program in their senior year. CTEC seeks to recruit students who are interested in training that will have practical applications and result in employment after high school.

The roughly 300-hour program lasts nine months and meets daily before school starts from 7:15 a.m. to 9 a.m. Instructors and guest speakers are recruited from the construction industry. They organize construction site visits and other innovative activities to provide students insight into the construction industry and the building trades. These experiences give students a better understanding of the construction industry and help them establish valuable connections in the local business community.

Students receive professional training in blueprint reading, vocational math, carpentry, plumbing, masonry, residential wiring and more. The program supplements locally developed course modules with the NCCER Core Curriculum. Upon completion of the course, students can register for a NCCER certification that is valid anywhere in the United States. Occasionally, employer representatives are so impressed with CTEC students that they quickly hire them once they graduate from high school.

CTEC graduates are highly employable and can earn roughly \$13 to \$18 per hour once they graduate from high school. Some contractors also provide these workers with health insurance and other benefits. Upon graduation, about 65 percent of program participants obtain jobs with local contractors in fields such as plumbing, carpentry, electrical and HVAC or are pursuing college degrees in construction-related fields (construction management, civil engineering, architecture, etc.). Some participants opt to start their own subcontracting businesses.

Those who participate in CTEC and subsequently attend college tend to go into construction-related fields such as logistics, engineering technology, business administration, architecture or computer-assisted drafting and design. The first CTEC graduates who subsequently went on to a four-year college plan to graduate and return to the Effingham area in spring 2019.

Lessons Learned

Since the program's formation in 2014, there has not been sufficient time to track program outcomes such as average annual weeks of employment in the industry, wage and occupational changes, turnover rates, employer satisfaction with CTEC graduates or the graduates' satisfaction with their jobs. However, anecdotal evidence suggests that both the CTEC and CEO programs have profound impacts on program participants. These programs have given students who are willing to develop entry-level skills a direct pathway into good-paying jobs. However, to significantly reduce the remaining labor shortage in the local area, programs like CTEC would have to train a larger volume of students, employers would have to hire more CTEC graduates and support their continual improvement with additional training, and nearby rural counties would have to replicate the program.

Perhaps the greatest lesson learned from the CEO and CTEC programs is that rural communities can more effectively stem rural-to-urban migration by systematically introducing young students to their region's businesses and equipping them with the skills they need to earn a living after high school or pursue postsecondary education.

Case Study: Educator Externships in the Oregon Construction Industry

History of the Program

In 2016, the Oregon chapter of the Associated General Contractors (AGC) and Willamette Education Service District's (WESD) Willamette Promise formed a partnership to inform educators about opportunities for their students in the construction industry. The partnership aimed to build relationships and support educators with information and hands-on experience in the construction industry. The program is centered on a two-week summer "Educator Externship" (EE) and related activities during the school year. The program's ultimate goal is to help educators teach their students about construction skills and career opportunities within the field. The initiative has expanded rapidly since 2016, with more educational and business sponsors supporting externships.



Educator Externship program participants.

Photo Credit: The Willamette Promise Educator Externships Program

Program leaders consulted with their agency directors and boards on the program's development, as well as with several business leaders from AGC Oregon's Construction Workforce Coalition. Companies that provided leadership for the first Education Externship included P&C Construction, Lease Crutcher Lewis, Northwest College of Construction, Mr. Rooter, and Watts Heating and Cooling.

Key Features of the Educator Externship program

The externship takes place over two weeks during the summer. Teachers participate in an intensive series of structured visits to construction sites. These include general contractor, specialty contractor, back office, and roadway construction sites. Educators also shadow individual construction professionals in a range of different roles.

Five days of the program consist of “core construction days.” These provide participating teachers an introduction to the construction industry in an experiential setting. On the first day, educators learn about apprenticeships and safety training. The second day focuses on project management, estimating and time management. The third day focuses on back-office functions, including accounting, information technology, marketing and business operations. The fourth day includes a tour of highway roadwork that is coupled with a visit to a community college. On the fifth day, participants visit Oregon universities, such as Oregon State University or Oregon Institute of Technology, to learn about their construction-related programs.

Three days of the program consist of “local shadow-and-explore” days. Participants are divided into smaller groups of two or three educators to visit nearby companies. Shadowing sessions last from four to eight hours per day. Smaller groups allow for more interaction and inquiry as teachers speak with construction professionals and observe their work. For example, teachers can ride along with a mechanical contractor who services heating and cooling units to see how a service technician interacts with clients, how they make repairs, and how they handle estimates and billing. These on-site visits also allow educators to learn more about construction and manufacturing strategies that are unique to individual regions. For example, educators in Southern Oregon learn about timber and lumber.

Local shadow-and-explore visits are particularly helpful to externship educators whose school has a career pathway or technical training program in construction. An externship participant can inform a school’s students and faculty about the best opportunities for workers to find high-paying construction-related positions.

Industry participants agree to host educators for half a day to a day and a half. Their availability depends on work schedules, current jobs and how many educators are participating in the local program. For example, there are only a few AGC members in Oregon’s North Coast, so each of them took all of the educators for full-day visits that explored each aspect of their business. Then each company took individual educators for a half day of shadowing.

Program participants receive a syllabus with assignments and worksheets that help them get the most from each site visit. These materials also provide educators guidance on how best to inform students of opportunities that are available in various construction careers. When educators return from the externship, they are able to use real-world examples of how construction workers apply the skills and knowledge that students are learning in their regular classes.

As part of their externship, educators are able to earn four master’s level credits. In most districts, these credits can help them obtain pay increases. As part of their externship and an accompanying graduate course, participants tour several apprenticeship training programs, complete informational interviews with key individuals in the industry, maintain a reflective journal of their experiences and develop at least one lesson plan that they can share with other educators. When requested, industry partners can provide educators advice on how well one of their lesson plans integrates theory and practice.

Program Size, Scope and Funding

Education Externship partners in industry, education and the nonprofit sector make cash and in-kind contributions to the program on a voluntary basis. The AGC's Oregon Columbia Chapter was the EE program's biggest financial sponsor in 2018. AGC provided funds for 20 educators to participate in the program and one full-time employee to support it. In 2017, financial sponsors included the Willamette Education Service District, South Metro-Salem STEM Partnership, Linn Benton Community College, GEAR UP Oregon, Albany Chamber Pipeline and Southern Oregon Education Service District (ESD). The program raised almost \$100,000 in 2017.

Some sponsors make multiyear commitments. Others contribute year by year. Individual sponsors, many of which are ESDs, have tapped several different funding streams to contribute to the EE program. These include federal STEM (Science Technology Engineering Math) matching grant funds, Perkins CTE funds, funds from GEAR UP Oregon (a career and college readiness program), and funds from AGC, the Ford Family Foundation and a few chambers of commerce. In addition to financial contributions, industry partners volunteer employee time to help plan and lead educator site visits and to further support those who complete the externship program.

“Industry validates the teaching and training that is going on in the schools, and that’s been a big game changer. The input that AGC has had in the classroom and on teaching methods has been phenomenal.”

– CHERIE CLARK, MANAGER, WILLAMETTE PROMISE CAREER AND COLLEGE,
WILLAMETTE EDUCATION SERVICE DISTRICT

The program's cost per participant is \$1,450, which includes a \$1,000 stipend. Besides graduate course tuition, other expenses covered by program tuition include evaluation, publicity and clerical support. No costs are passed on to participants or their school districts. However, a few districts have opted to pay graduate course tuition directly to universities that bestow graduate or professional development credit. This allows the Willamette Education Service District to redirect funds earmarked for graduate tuition to enroll more educators into the program. Educators incur some out-of-pocket travel expenses, but these are offset by the \$1,000 stipend they are paid upon program completion.

Since its inception in 2016, the EE program has experienced remarkable growth. In 2018, educators from nine of Oregon’s ESDs participated. These ESDs serve most of the state’s 198 school districts and a majority of the state’s student population.¹⁵ The program’s growth is described in the table below:¹⁶

Table 2 Growth of the Educator Externship Program, 2016-2018			
Partners	2016	2017	2018
Educators	10	27	68
Industry partners	11	63	83
School districts	6	16	32

Participants share their positive experiences with colleagues, leading to rapid growth in those areas where the EE program has been offered. The program must currently place many applicants on a waitlist, though no applicant has been denied admission.

Program Outcomes

Each year the WESD Center for Education, Innovation, Evaluation and Research surveys the satisfaction of EE program participants and tracks the number of program partners. Educator satisfaction is uniformly positive, and almost all (97 percent) would recommend the program to others. Since the program is only in its third year, it is too soon to evaluate economic outcomes or benefits to participating construction firms.

However, anecdotal observations are generally positive. School districts are making better and more frequent connections with apprenticeship programs. Industry partners take great pride in how much their employees “own” their company as they speak with teachers and lead them through tours or projects. Industry partners are also very satisfied in seeing how much teachers are learning from these interactions.

Oregon’s success with the teacher externship program is generating interest in other states. Conversations have already begun with Washington, Tennessee and Texas. More are likely as the program is presented at various conferences and meetings by the externship coordinators and Oregon AGC.



Educator Externship program participants visit the offices of Baldwin General Contracting.
Photo Credit: The Willamette Promise Educator Externships Program

Lessons Learned

Program partners have learned that continued interaction between educators and industry representatives is critical to support the extensive coordination required to make the program work logistically and benefit both sectors professionally. In only three years, Oregon’s two-week summer Educator Externship program has proven to be a cost-effective and popular way to increase high school student awareness of construction careers. It is also helping teachers include real-world examples from the construction industry in their lesson plans. Educators who complete the externship program report seeing more student interest in construction-related careers. More than 600 high school students in the Willamette region attended National Apprenticeship Week site visits in the fall of 2018.

“Our average age of apprentices right now is 28. I think a lot of those kids are just bouncing around trying to figure out what to do, and eventually that door opens and they get into construction. With the externship program, they are able to open that door at age 17 and 18 instead of 27.”

– STEVE MALANY, PRESIDENT, P&C CONSTRUCTION

While a boom in the construction industry has supplied the EE program with many active projects that educators can learn from, it has also reduced the amount of time industry partners have for community outreach. Nonetheless, strong relationships with the educational community have led many employers to find a way to accommodate the program for its relatively short duration each year. Many of the industry professionals who volunteer to participate in the program are either related to an educator or were inspired by an educator and want to give back to the community.

It is still too soon to assess the extent to which the program is helping to alleviate a shortage of skilled construction workers in Oregon. However, the program is highly regarded by partners in industry and education, as demonstrated by growth in the number of program participants, partners and funding sources. Externship participants are highly satisfied with the two-week program and believe it has made them better teachers who are able to engage students by creatively incorporating construction knowledge and techniques into their lessons.

Conclusion

The construction industry faces favorable conditions for growth. A sharp decline in construction during the Great Recession contributed to supply shortages in housing, commercial real estate and public infrastructure. Capital markets are favorable as banks have healthy balance sheets and venture capital firms have substantial funds available to invest. The Tax Cuts and Jobs Act of 2017 has increased the amount of after-tax profits that construction firms can re-invest in new ventures, better equipment, labor-saving technologies and employee training. The law has also incentivized investment in commercial real estate development within Opportunity Zones, further boosting demand for construction. Finally, the construction industry has developed widely-accepted standards and training curricula that will contribute to workforce development, high standards of quality and worker safety.

Alongside these favorable conditions, a shortage of skilled workers remains a significant impediment to growth in the construction industry. Relatively few of the 2.2 million workers who left the industry during the Great Recession have returned. Although the industry's workforce has been growing more than three times faster than the overall workforce, construction is still not attracting enough talent to meet demand. Four of five firms surveyed in 2018 expect that it will remain difficult or get harder in 2019 to find and hire qualified workers. Firms are all too aware that there is no easy solution to the shortage of skilled workers. Many craft, professional and managerial positions require years of progressive work experience.

Fortunately, the construction industry can turn to several exemplary partnerships as models for future training programs and best practices. The relatively new programs identified in this report are all striving to meet an urgent need for more well-trained construction professionals. Their experiences reveal several broader lessons for employers, community leaders and educators who are interested in construction workforce development:

- **Workforce training programs are most successful when they are closely aligned with regional economic trends and with jobs and skills that are currently in demand.**
Most of the exemplary training programs examined in this report were designed with the needs of their local or regional economies in mind, and they all train workers for growing occupations. Moreover, demonstrating that participants can enter well-paying jobs that have a defined career pathway with opportunities for promotion has been key to the success of several programs. Students need to be confident that a considerable investment of time and effort to learn new skills and habits will be compensated with tangible benefits and a rewarding career. For these reasons, the best time to launch or revise a training program is during a labor shortage, when trainees know they can pursue multiple employment opportunities upon completing their training. Labor shortages often also help spur employers to partner with educators and local communities to develop relevant training programs.

- **Multisector collaboration is essential to reduce construction labor shortages.** Whether a job training program or an effort to persuade teens and young adults to consider a career in construction or logistics, collaboration between businesses, educators, and public officials is essential. Each of these partners brings unique perspectives, capabilities and resources to an initiative. Businesses can fund a training program, incentivize program participation by advertising employment opportunities during or after a program, and supply training programs with current equipment and industry expertise. In addition to developing and administering a training curriculum, educators can help recruit program participants from local schools. Community leaders can help to secure public funds, support recruitment and provide additional logistical support. Together, each partner can ensure that a program has sufficient resources, will address skills that are currently in demand and is properly tailored to the needs of the local community.
- **Construction and logistics firms need to reach out to high schools to address the labor shortage.** Over the past few decades, trade-oriented education has become increasingly rare in high schools, contributing to a decline in the number of young adults entering the construction workforce. Proactive employers are recognizing the importance of working with high schools to expose students to careers in construction and logistics. This outreach is particularly welcome in rural communities that can place local graduates in rewarding careers and thereby mitigate outmigration to urban areas.
- **Providing employees with ongoing training ensures that they have the latest skills and is also important to both recruitment and worker retention.** Unsurprisingly, all interviewees for this project cited the increasing importance of ensuring that workers have up-to-date skills. In an economy characterized by technological change and increasing competition, employers need workers who can adapt quickly and care about their company's success. The programs profiled in this report invest in training the adaptive and collaborative workforce that employers will need to be successful.

Collaborative partnerships between industry, local governments and educational institutions are essential to ensuring an adequate supply of skilled workers and helping a region remain economically competitive. With continued demand for construction and logistics services and a coming wave of skilled worker retirements, the industry cannot ignore its talent pipeline. Fortunately, employers can highlight the favorable employment conditions that new workers face. These include new technologies that enhance worker safety, favorable wages, clear career pathways with promotion potential and opportunities to receive training without taking on substantial student loans. The partnerships described in this report have developed creative ways to expose prospective workers to these advantages and to support their training. They can serve as useful models for employers, educators and leaders to develop programs that will attract young people to the industry.

Appendix

Interview Participants

Frosti Adams, Workforce and Professional Development Manager, Education Outreach, Oregon Chapter, Associated General Contractors (AGC)

Dan Belcher, Director of Workforce Development, National Center for Construction Education and Research (NCCER)

Rachel Burris, Communications Manager, National Center for Construction Education and Research (NCCER)

Cherie Clark, Manager, Career and College, Willamette Education Service District (WESD)

Robert Kirk, Build Your Future Manager, National Center for Construction Education and Research (NCCER)

Kevin Major, Senior Manager of Client Strategy Consulting, CBRE

Steve Malany, President, P&C Construction and Board Member, Oregon Chapter, Associated General Contractors (AGC)

Seth Martindale, Senior Managing Director, CBRE

Patrick Robinson, Vice President of Development, Northpoint Development

Rod Rushing, Vice President and President of Building Solutions North America, Johnson Controls International plc

Bob Schultz, Treasurer, Midland Institute and Board Member, Creating Entrepreneurial Opportunities (CEO) and Construction Trades Education Curriculum (CTEC)

Jack Schultz, CEO, Agracel Inc.

Scott Shaw, President and CEO, Lincoln Tech

Ken Simonson, Chief Economist, Associated General Contractors (AGC)

Mike Stark, Vice President of Knowledge Programs and Building Markets, Associated General Contractors (AGC)

Jennifer Wilkerson, Marketing Director, National Center for Construction Education and Research (NCCER)

Endnotes

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- ³ [Kim Slowey, “Percentage of immigrant construction workers on the rise,” Construction Dive, January 26, 2018.](#)
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- ⁵ [Adam Higgins, “5 Major Construction Technology Innovations to Watch in 2019,” Connect & Construct Autodesk BIM 360, February 15, 2019.](#)
- ⁶ Interview with Kevin Major, Senior Client Strategy Consulting Manager, CBRE. July 20, 2018.
- ⁷ Interview with Ken Simonson, Chief Economist, Association of General Contractors, June 19, 2018.
- ⁸ [Carl Weinschenk, “Smart Buildings and the IoT are Complex and Challenging,” Energy Manager Today, February 2, 2017.](#)
- ⁹ [“FY 2019 Funding for Selected Department of Education & Related Programs,” Committee for Education Funding, September 14, 2018.](#)
- ¹⁰ Interview with Seth Martindale, Senior Managing Director, CBRE, August 6, 2018.
- ¹¹ [“Owners and Contractors,” LIUNA Training & Education Fund.](#)
- ¹² [Logistics Park Kansas City.](#)
- ¹³ [Learning & Career Center at LPKC.](#)
- ¹⁴ [“Property Portfolio,” Agracel, Inc.](#)
- ¹⁵ The remaining 10 ESDs mostly serve rural, less populated communities with smaller schools.
- ¹⁶ The 68 educator externs in 2018 included 39 high school teachers, 14 middle school teachers, 14 counselors and one principal.

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