
Construction Skill Shortages Policy Brief

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2020

CONTENTS

Introduction.....	1
Executive Summary	1
Construction Labor Skill Shortages.....	2
Major Trends & Driving Forces	2
Cumulative Impact of New Market Challenges	6
Failure to Train: Adverse Effects on Project Delivery	7
Meeting the Challenge of the Skills Crisis.....	10
Mandating Training: Key Recommendations From Project Owners	10
Construction Institute Report: Positive Impact of Craft Training.....	12
Ensuring Craft Labor Supply Through Apprenticeship Training	13
Conclusion	15

I. INTRODUCTION

Construction is a highly skilled, highly labor-intensive industry that requires the systematic recruitment, training and deployment of multiple trades, and often hundreds of workers, for a single project. Craft labor also usually constitutes 25 to 30 percent of total project costs. For these reasons, craft labor supply can effectively make or break a project because it has a major impact on every key component of project delivery, including schedule, quality, safety and total project cost.

Yet the role of craft labor is often overlooked in the planning process, overshadowed by other factors such as delivery methods, design issues and selection procedures for contractors and A/E firms. While these issues are crucial, craft labor is equally important, and becoming an increasingly critical concern because the industry is facing unprecedented and potentially massive skill shortages—a skills gap of more than 1,000,000 workers in the nonresidential sector alone, according to a recent report supported by extensive industry research.

This paper summarizes the most comprehensive data on craft labor shortages to date. The skills crisis has been long in the making and is well documented. Fortunately, these same reports examine the root causes of the problem and offer new strategies for the industry to begin addressing its immense workforce development challenges.

II. EXECUTIVE SUMMARY

The challenges of ensuring that sufficient craft labor will be available for a given project is difficult under any circumstance. However, the industry currently faces unique challenges due to the following three trends:

- 1) *An expanding construction industry*—driven by an enormous backlog of work pent up from the Great Recession and fueled by major growth in several big industries, including energy, healthcare and technology;
- 2) *A steep decline in labor supply*—caused by the mass retirement of the industry’s most experienced and skilled workers and exacerbated by a decreasing number of young workers/new entrants in the field; and
- 3) *A general, steady drop off over the past several decades of effective skill training programs* throughout most of the industry.

The convergence of these factors, creating what some have called a *Perfect Storm* in the construction industry, represents growing risks for project owners that there will be insufficient manpower to staff future projects. For several decades, natural market forces have not fixed the problem; nor have government-supported training programs or voluntary contractor initiatives.

What’s more, new construction workers cannot be trained and deployed with the “flip of a switch” since it typically takes three to five years to properly train craft persons in the skilled trades. Simply hiring unemployed workers without the required knowledge, skills or training will not solve the problem. Increasing wages, which will drive up construction costs, may help in recruiting new workers but will not address the need for the type of large-scale, systematic training needed in the industry.

We cannot simply wait for a solution to the skill shortage. Without a timely response, project owners will continue to face a heightened risk of exposure in project planning and greater uncertainty when seeking

assurances from contractors on the availability and reliability of their craft labor resources. Moreover, project owners will pay more for craft labor as basic laws of supply and demand play out, and end up with a situation where they are paying more and still getting less—less in terms of quality, productivity, safety and other key delivery factors. Some experts predict that this will force owners to cancel or significantly delay major projects, no matter how critical.

These conditions, however, are also driving innovative solutions. Most importantly, the project owner community is no longer viewing the skills crisis as simply a “contractor” problem. Instead, they are taking steps to exercise more *direct owner control over craft labor supply to protect investments and minimize risk*.

This paper reviews the facts and data surrounding this issue and examines key recommendations by owner groups designed to address this challenge, namely—*to establish specifications in the bidding process, via prequalification or otherwise, that require contractors to participate in reliable, effective craft training as a condition of performing work*. Experts agree. *Project owners alone have the power to drive change needed in the industry*. By all accounts, it is very much in their interests to do so. As mounting evidence shows, new owner-driven strategies provide the most effective solution to craft labor shortages.

III. CONSTRUCTION LABOR SKILL SHORTAGES

A. MAJOR TRENDS & DRIVING FORCES

For years, numerous studies have documented a veritable skills crisis that has been developing in construction over the past few decades, spurred by changing demographics, an expanding industry and a general decline in the level of skill training provided in the industry. For example, a 1997 survey of the Business Roundtable found that 60% of its members reported skilled shortages on construction projects and conditions that caused serious turmoil for construction planning and project delivery.

A steady stream of subsequent reports shows that labor shortages have persisted and progressively worsened due to the lack of effective solutions.¹ Recently, top industry experts have identified industry-

¹ See, e.g., *Confronting the Skilled Construction Work Force Shortage*, Business Roundtable, Construction Cost Effectiveness Task Force (1997); Cihan Bilginsoy, *Apprenticeship Training in the U.S. Construction Industry*, University of Utah (Sept. 1998); *Key Workforce Challenges Facing the American Construction Industry: An Interim Assessment*, Center for Construction Industry Studies (Mar. 1999); *AGC Announces Model Language for “Training for the Trades” in RFPs*, AGC News & Bulletins (1999); *Workforce Conference Report*, Bloomberg BNA Construction Labor Report, 47 CLR 1079 (Nov. 21, 2001); *Craft Labor Shortage Provokes More Studies of Pay and Safety*, Engineering News Record (Aug. 20, 2001); *Confronting the Skilled Workforce Shortage (WP-401)*, Construction Users Roundtable (2004); *The Perfect Storm: Factors Come Together Creating a Storm in the Construction Workforce*, The Construction Executive (June 2004); *America’s Construction Industry: Identifying and Addressing Workforce Challenges*, ETA/Business Relations Group Report (Dec. 2004); *Craft Labor Supply Outlook: 2005-2015*, Construction Labor Research Council (2004); *A Workforce Needs Assessment of the Arizona Construction Trades Industry*, Arizona Department of Commerce (Feb. 2005); *The 2005-2006 U.S. Markets Construction Overview*, FMI Management Consulting (2005); *Workforce Development Committee*, The Voice, Construction Users Roundtable (Summer 2006); *Solving the Construction Industry Workforce Crisis – Ideas for Action*, McGraw Hill/ENR (2007); Paul Turenne, *In Demand: Emerging Solutions for the Workforce Crisis*, The Voice, Construction Users Roundtable (Spring 2007); *The Construction Chart Book*, CPWR—The Center for Construction Research and Training (2008); *Maryland’s Construction Industry Workforce Report*, Governor’s Workforce Investment Board (Sept. 2009); *Projected Demand for Craft Labor for the Southeast United States (2012-2017)*, Construction Labor Market Analyzer and Southeast Manpower Tripartite Alliance (2012); *Is Your Workforce Ready for the Rebound*, The Voice, Construction Users Roundtable (Summer 2013); Alexandra Walld, *Who is the Future Face of Our Industry?*, The Voice, Construction Users Roundtable (Fall 2014); Amy Saxton, *It’s Time for a Culture Change in the Construction Industry*, The Cornerstone, NCCER (May 22, 2015); *An Owner’s Toolbox: Improve Project Outcome With the Help of CURT*, The Voice, Construction Users Roundtable (Fall 2015); Patrick Clark, *Millennials: Builders Are*

wide shortages as one, if not *the* leading critical problem for both short and long-range construction project planning.² Three critical factors are driving the current skills crisis:

Factor #1—Fast Growing Demand:

Construction demand has risen quickly after years of decline. As population expands, the construction industry grows to accommodate increased demand. In addition to the need for greater housing stock and commercial building, this triggers the need for massive infrastructure re-building to replace and expand already seriously aging systems.³

- In 2018, U.S. construction spending surpassed \$1.3 trillion for the first time, outstripping even the pre-recession peak.⁴
- Top industry economists forecast the recovery in nonresidential construction through 2020. It is also estimated that spending on nonresidential construction will increase by approximately 4.4% in 2020.⁵ According to American Institute of Architects, “construction spending has been holding up reasonably well” despite “continued volatile conditions.”⁶
- FMI, an engineering and construction industry consulting firm, anticipates that capital improvements to airports nationwide, as well as a growing demand for new infrastructure and system maintenance, will lead to strong growth in transportation construction for the

Desperate to Hire You, Bloomberg BNA Construction Labor Report, 61 CLR 1062 (Dec. 17, 2015); Alexandra Walld, *Well-Played: CURT’s Playbook for Improving Construction Productivity*, The Voice, Construction Users Roundtable (Winter 2016); Emily Peiffer, *Construction Loses 15K Jobs as Labor Shortage Begins to ‘Undermine’ Industry’s Growth*, Construction Dive (June 3, 2016), <http://www.constructiondive.com/news/construction-loses-15k-jobs-as-labor-shortage-begins-to-undermine-industr/420319/>; Alexandra Walld, *Owners in Transition: Doing More with Less*, The Voice, Construction Users Roundtable (Fall 2016).

² See *2013 U.S. Markets Construction Overview*, FMI Corporation (2012); *2013 Dodge Construction Outlook*, McGraw-Hill Construction Research & Analytics Group (Oct. 2012); *Skilled Labor Shortage Risk Mitigation (WP-1101)*, Construction Users Roundtable (2015); Jerome R. Stockfisch, *Construction Projects Suffer from a Shortage of Skilled Trades*, Tampa Bay Times (Feb. 8, 2016), <http://www.tbo.com/news/business/construction-projects-suffer-from-a-shortage-of-skilled-trades-20160207/>; Alexia Elejalde-Ruiz, *Construction Contractors Warn of a Labor Shortage as Building Booms*, Chicago Tribune (May 31, 2016), <http://www.chicagotribune.com/business/ct-construction-labor-shortage-0531-biz-20160531-story.html>; Hallie Busta, *Labor Shortages Expected to Delay Hurricane Matthew Repairs, Renovations*, Construction Dive (Oct. 17, 2016), <http://www.constructiondive.com/news/labor-shortages-expected-to-delay-hurricane-matthew-repairs-renovations/428378/>.

³ See *Global Construction Market Set to Grow by Over 70% to \$15 Trillion by 2025*, Bloomberg, PR Newswire (July 17, 2013), <http://www.prnewswire.com/news-releases/global-construction-market-set-to-grow-by-over-70-to-15-trillion-by-2025-predicts-global-forecast-sponsored-by-textura-215806971.html> (citing *Global Construction 2025*, Global Construction Perspectives, Oxford Economics (July 2013)); Kate Davidson & Chris Hudson, *Apartment Demand Drives Home Construction*, The Wall Street Journal (July 17, 2015), <http://www.wsj.com/articles/u-s-housing-starts-rose-9-8-in-june-1437136432>; Press Release, *New Construction Starts in 2016 to Grow 6% to \$712 Billion According to Dodge Data & Analytics*, Dodge Data & Analytics (Oct. 20, 2015), <http://www.construction.com/about-us/press/New-Construction-Starts-in-2016-to-Grow-6-percent.asp>.

⁴ See *Total Construction Spending*, Federal Reserve Economic Research, Federal Reserve Bank of St. Louis, <https://fred.stlouisfed.org/series/TTLCONS>.

⁵ Press Release, *The view at midyear: continued growth in nonresidential construction through 2020*, American Institute of Architects (July 18, 2019) <http://www.aia.org/press/releases/AIAB108071>.

⁶ *Id.*

foreseeable future.⁷ Other major market sectors are also poised for substantial growth, including health care construction, education construction, conservation construction and public safety construction.⁸

- In its *2013 Report Card for America's Infrastructure*, the American Society of Civil Engineers estimates that the U.S. will need \$4.6 trillion in infrastructure investments alone by 2025.⁹ Meeting this investment need will require at least an additional \$206 billion in infrastructure investments per year.¹⁰

Collectively, these factors indicate unprecedented growth. One study predicts that growth of the U.S. construction market will outpace that of China through 2030. Specifically, through 2030, it is estimated that the U.S. construction market will increase 5 percent per year, on average, as the nation spends a cumulative \$30 trillion on construction.¹¹ Thus, over the next decade, the Bureau of Labor Statistics (BLS) estimates that the construction industry will add nearly 704,000 jobs, or almost 10 percent over 2018 levels.¹² This is well above the projected increase for all industries.¹³ As stressed below, the key question in this equation remains – where will these workers come from?

Factor #2—Fast Shrinking Supply:

The construction labor pool is aging and supply is generally shrinking. This trend is caused by shifting demographics—namely the aging of the baby boom generation, which is leading to massive retirement of the most skilled and experienced workers in the construction industry. The Great Recession only made the situation worse driving many workers out of the industry.

- From 2007 to 2013, the U.S. construction industry lost more than 2 million workers, shrinking nearly 20 percent.¹⁴ According to the Census Bureau, of the construction workers who faced long-term non-employment spells between 2006 and 2009, approximately 60 percent “have left the labor market or moved into other industries.”¹⁵

⁷ 2019 FMI Overview, FMI Management Consulting (2019) at 21, https://www.fminet.com/wp-content/uploads/2019/01/2019_Overview.pdf.

⁸ See *id.* at 17-25.

⁹ 2017 Infrastructure Report Card, *Economic Impact*, American Society of Civil Engineers (2017), <http://www.infrastructurereportcard.org/the-impact/economic-impact/>.

¹⁰ *Id.*

¹¹ See *Global Construction 2030 – Executive Summary*, Global Construction Perspectives, Oxford Economics (Nov. 2015) at 11, full report available at http://www.globalconstruction2025.com/worldwide/products#report_products.

¹² *Construction and Extraction Occupations*, Bureau of Labor Statistics, U.S. Dep't of Labor (Sept. 4, 2019), <https://www.bls.gov/ooh/construction-and-extraction/home.htm>.

¹³ *Id.*

¹⁴ Kermit Baker, *Construction Spending Projected for Moderate Growth*, AIA Architect (Jan. 29, 2016), <http://www.aia.org/practicing/AIAB107986> (citing statistics from the U.S. Census Bureau's American Community Survey).

¹⁵ Hubert Janicki & Erika McEntarfer, *Where Did All the Construction Workers Go?*, Research Matters, U.S. Census Bureau (Oct. 16, 2015), <http://researchmatters.blogs.census.gov/2015/10/16/where-did-all-the-construction-workers-go/>.

- Construction unemployment has fallen to pre-recession levels (monthly unemployment rates in construction fell to as low as 3.2% in 2019¹⁶), while employment levels are at their highest since 2008.¹⁷ Given the improved unemployment rate in the industry, one top industry economist believes “it’s unlikely that many more construction workers from the boom years will be returning to the industry.”¹⁸
- Associated General Contractors (AGC) found that 78% of respondents are having a hard time filling craft positions.¹⁹ Further, 68% of respondents expected that it would become harder or remain as difficult to find qualified construction workers over the next twelve months.²⁰ A report by Wells Fargo securities found the 47% of contractors said the ability to hire qualified workers was their utmost cost concern, and 35% listed it as their most significant risk factor.²¹
- The Construction Industry Institute (CII) estimated that as of 2003—over half of the construction labor pool was already 45 or older and nearly 20% were between age 55 and 65; generally, median age of the construction workforce rapidly increased in the early 2000s, while retirement age remained constant.²²
- Recent projections estimate 20% of workers in the construction industry will retire over the next decade, “representing attrition of about 900,000 skilled workers.”²³

The reality is that the skills crisis has been decades in the making and has not and will not be corrected by natural market forces. As explained below, the negative impact has been further exacerbated by a general decline in training across a large part of the industry.

Factor #3: Decline in Training & Productivity:

Over the past several decades there has been a steady, consistent decline in skill training throughout most of the construction industry that seriously compounds the industry's other significant challenges. Evidence of this factor has been mounting:

¹⁶ Kim Slowy, *Construction unemployment returns to 2009 low*, ConstructionDive (Oct. 7, 2019), <https://www.constructiondive.com/news/construction-unemployment-returns-to-2009-low/564537/>.

¹⁷ Press Release, *Construction Employment Reaches 10-Year High as Industry Adds 19,000 Jobs in July and 303,000 for the Year; Industry Unemployment Sets Record Low*, AGC (Aug. 3, 2018), <https://www.agc.org/news/2018/08/03/construction-employment-reaches-10-year-high-industry-adds-19000-jobs-july-and>.

¹⁸ Kermit Baker, *Construction Spending Projected for Moderate Growth*, AIA Architect (Jan. 29, 2016), <http://www.aia.org/practicing/AIAB107986>.

¹⁹See *2019 Construction Outlook Survey Results National Results*, AGC of America (2019) at 3, https://www.agc.org/sites/default/files/Files/Communications/2019_Outlook_Survey_National.pdf.

²⁰ *Id.*

²¹ Kim Slowey, *Wells Fargo: Nonresidential construction industry growth continues*, ConstructionDive (Mar. 8, 2019), <https://www.constructiondive.com/news/wells-fargo-nonresidential-construction-industry-growth-continues/549514/>.

²² *The Shortage of Skilled Craftworkers in the U.S.*, Construction Industry Institute (Sept. 2003) at 10.

²³ Alexandra Walld, *Well-Played: CURT’s Playbook for Improving Construction Productivity*, The Voice, The Construction Users Roundtable (Winter 2016) at 41.

- A critical study from the National Institute of Standards and Technology (NIST) found a steep and steady decline in craft training throughout most of the construction industry.²⁴ A primary reason for this is the general lack of training provided in the open shop sector.²⁵
- The NIST study also reveals that productivity in construction ranks among the lowest, and possibly the lowest, of all non-farm industries. Specifically, examining construction skill shortages, NIST found that over the past 40 years, labor productivity in construction has actually trended *downward* at an average annual rate of *-0.6%*.²⁶
- Not surprisingly, the study finds that falling productivity is attributed in substantial part to a decline in skill training. Less training means as older workers increasingly leave the industry, their younger, less-experienced counterparts are being neither recruited nor trained in sufficient numbers to maintain supply and productivity levels.²⁷
- Market surveys support this study. According to a survey conducted by AGC, half of the respondents found that the pipeline for preparing new construction craft workers is below average or poor.²⁸

B. CUMULATIVE IMPACT OF NEW MARKET CHALLENGES

While the economy is showing signs of gradual growth and recovery, skill shortages threaten to limit broader growth and continue to limit the industry's ability to fully revive itself. For example, BLS reports that the construction industry had 404,000 job openings unfilled in April 2019, the most since the Great Recession.²⁹

²⁴ See Allison L. Huang, et al., *Metrics and Tools for Measuring Construction Productivity: Technical and Empirical Considerations*, U.S. Department of Commerce, National Institute of Standards and Technology, Office of Applied Economics (Sept. 2009) [hereinafter NIST report] at 23, http://www.nist.gov/customcf/get_pdf.cfm?pub_id=903603.

²⁵ *Id.* at 23 The study notes that *prior to* the last several decades, training had been provided comprehensively throughout the industry, most typically through joint labor-management training programs administered by contractors and building trade unions under collective bargaining agreements and that in the union sector this continues. *Id.* It further notes that, “[w]hile open shop training programs exist, they tend to be rare.” *Id.* at 23
Data from the past forty years has shown that “[w]ith the decline of union membership and collective bargaining agreements, training programs and the number of apprentices also have declined.” *Id.*

Currently, the non-union sector appears to invest substantially less than the union sector, even though the former accounts for over 80 percent of the industry. One report, for example, showed the open shop Associated Builders and Contractors invested approximately \$28 million in apprenticeship programs, while the union sector invested \$750 million in such programs. *The Perfect Storm: Skilled Worker Shortage Looms for Construction Sector*, The Electrical Worker, International Brotherhood of Electrical Workers, <http://www.ibew.org/articles/13ElectricalWorker/EW1307/IBEW%20EW%20V07%20N07.pdf>.

²⁶ NIST report, at 39.

²⁷ *Id.* at 23.

²⁸ *2015 Worker Shortage Survey Analysis*, AGC of America (2015) at 2, https://www.agc.org/sites/default/files/Files/Communications/2015_Worker_Shortage_Survey_Analysis.pdf.

²⁹ Press Release, *Unfilled Construction Jobs at Post-Recession High*, Nat'l Association of Home Builders (June 13, 2019), <http://nahbnow.com/2019/06/unfilled-construction-jobs-at-post-recession-high/>.

What's more, the Construction Labor Market Analyzer (CLMA)³⁰ forecasts a nationwide labor shortage of as many as 1.1 million nonresidential construction workers by 2020.³¹ CLMA's prediction is not based on vague estimates, but thorough research and analysis of key market factors, including planned project data and demand for skill crafts. CLMA analyses have warned of a shortage of as much as two million workers since at least 2012.³² Other reports provide similar forecasts. For example, one 2012 analysis estimated the industry would need to recruit and train 275,000 workers per year for at least the next 10 years to fill the growing skills gap.³³

C. FAILURE TO TRAIN: ADVERSE EFFECTS ON PROJECT DELIVERY

Industry experts agree: failing to address the skills crisis can produce multiple negative effects. As a top trade association stresses, “[p]otential project delays or cancellations, loss of business, wage and benefit escalations and negative future impact on attracting new facilities or expansions are just a few of the potential negative consequences.”³⁴ Such effects will also include lower productivity, cost overruns, schedule delays, increased safety incidents and outright project failures.³⁵

The NIST study referenced above also provided similar reports, finding that skill shortages produce higher costs for project owners and greater schedule delays.³⁶ The NIST study further cautions that the challenge posed by a shortage of skilled workers is only projected to grow worse in future years.³⁷ In addition, a lack of skilled manpower has other crippling repercussions for construction, including: poor quality workmanship, increased re-work, higher life-cycle costs, lower overall value, excessive claims, change orders, increased litigation and related financial and administrative burdens and headaches for project owners forced to deal with major performance problems.

Similarly, CURT observes: “[a]s the workforce shortage expands within the construction industry, project costs and schedules will continue to be impacted.”³⁸ Given current market conditions, it is clear that project owners are being exposed to increasing levels of risk in construction project delivery. The

³⁰ CLMA is an analysis tool developed in alliance with the Workforce Development Committee of the Construction Users Roundtable (CURT). See *What You Need to Know to Get Started*, Construction Labor Market Analyzer, <http://www.myclma.com/clma-tools-services/faqs/> (last visited Oct. 26, 2016).

³¹ Daniel Groves, *Impact of Project Demand on Wages, Per Diem and Craft Availability*, Construction Labor Market Analyzer (Feb. 17, 2016) at 15, <http://www.houbtr.com/2005/documents/CLMAPresentation2016Feb17.pdf> (presentation to the Houston Business Roundtable).

³² See *Projected Demand for Craft Labor for the Southeast United States (2012-2017)*, Construction Labor Market Analyzer and Southeast Manpower Tripartite Alliance (2012), summary available at <http://www.myclma.com/wp-content/uploads/2015/02/Foresight-Report-SEMTA-Handout-2012Oct18.pdf>.

³³ See *Bad for Business: Skilled Labor Shortages in Alabama's Construction Industry*, The Associated Schools of Construction (2012).

³⁴ Ryan Wilder, NCCER, *The Importance of Owner Support for Workforce Development*, The Voice, Construction Users Roundtable (Summer 2013) at 26.

³⁵ *Id.* at 26-27.

³⁶ See NIST report, at 24.

³⁷ *Id.*

³⁸ *An Owner's Toolbox: Improve Project Outcome with the Help of CURT*, The Voice, The Construction Users Roundtable (Fall 2015).

adverse effects of skill shortages can be seen in national surveys as well as case examples from several cities and private sector construction programs around the country. For example:

- A recent AGC survey made an alarming finding that the “lack of skilled workers may impact safety,” with 47% of respondents stating “that inexperienced skilled labor and worker shortages are a major challenge to the safety and health of workers and “[a]nother 37[%] cit[ing] worker shortages as a minor challenge.”³⁹
- In the Gulf Coast states of Texas, Louisiana and Mississippi, the number of construction fatalities has been on a steady rise – from 90 in 2012 to 127 (projected) in 2015.⁴⁰ A major engineering and construction firm head in the region observed that the uptick in fatalities along the Gulf Coast can be attributed to training difficulties in industrial construction, and stressed that project owners “need to get training programs included in contracts.”⁴¹
- The completion of a \$200 million DuPont ethanol plant in Iowa was delayed by a shortage of qualified construction workers.⁴²
- In Las Vegas, at least half of the construction firms are having trouble finding qualified craft workers.⁴³ As one economist noted: “[w]hen Las Vegas was at the height of its construction boom, contractors were hiring less-qualified workers with the idea that they could be watched, trained and supervised by more experienced workers.”⁴⁴ Experience has shown this approach does not work.
- A residential contractor in Denver’s particularly tight housing market noted that he could construct at least 10% more homes this year if he had enough workers, but he remains short-staffed due to the skilled worker shortage.⁴⁵
- Although the demand for commercial construction projects in Dallas is booming, contractors are fighting over the limited supply of workers to complete three major mixed-use projects slated to go up in a “\$5 billion mile” in a northern suburb. One contractor noted that he had two pending six-figure lawsuits because “there’s not enough labor out there” to complete his projects.⁴⁶

³⁹*The Challenges Facing a Growing Industry: The 2016 Construction Hiring and Business Outlook*, AGC of America and Sage (2016) at 6, https://www.agc.org/sites/default/files/Files/Communications/2016_Construction_Hiring_and_Business_Outlook_Report.pdf.

⁴⁰ Ben DuBose, *ECF '16: Energy Contractors Need Newcomers to Ease Labor Shortage*, Hydrocarbon Processing (Mar. 1, 2016), <http://www.hydrocarbonprocessing.com/Article/3533820/Conference-news/ECF-16-Energy-contractors-need-newcomers-to-ease-labor-shortage.html>.

⁴¹ *Id.*

⁴² Gavin Aronsen, *Labor Shortage Delays DuPont Plant Completion*, Ames Tribune (Jan. 9, 2015), <http://amestrib.com/news/labor-shortage-delays-dupont-plant-completion>.

⁴³ Matt Finn, *Las Vegas Construction Industry Can't Seem to Hit a Lucky Streak*, FoxNews.com (Nov. 15, 2014), <http://www.foxnews.com/us/2014/11/15/las-vegas-construction-industry-cant-seem-to-hit-lucky-streak> (citing an AGC survey).

⁴⁴ *Id.*

⁴⁵ What's Holding Back the Housing Market? Not Enough Construction Workers, Fortune (Sept. 6, 2016), <http://fortune.com/2016/09/06/housing-construction-worker-shortage/>.

⁴⁶ *Id.*

- A \$100 million senior living community in Arizona was canceled in 2018 despite being 95% preleased, in part because of uncertainty over having enough workers for the duration of the project.⁴⁷
- Exxon Mobile’s plan to build the world’s largest ethylene plant in Texas had to be altered due to a shortage of welders in the Gulf Coast, delaying construction by a year.⁴⁸
- Despite the booming D.C. housing market, project delays caused by the shortage of skilled labor caused on contractor to suffer a \$4 million dollar loss in 2018. ⁴⁹
- While the construction market in Austin, Texas is booming, a consultant on projects in the area called it the “toughest (hiring) market I have seen in 35 years.” As a result, projects in the city are taking 20 to 25% longer than average, and local experts say that, it’s going to cost more (to complete projects), and the quality is going to be worse.”⁵⁰
- In Maryland, the lack of skilled trades in the Mid-Atlantic has caused \$64 million in cost overruns for two large projects at the University of Maryland, College Park.⁵¹
- According to a major insurance provider, fewer workers means a greater risk of injury, with new workers unfamiliar with safety protocols, unskilled workers attempt to perform skilled tasks, the pace of work increases to match unrealistic deadlines, and supervisors step in to lend a hand, leaving the larger task unsupervised.⁵²
- The Nuclear Regulatory Commission extended the deadline for a South Carolina fuel fabrication facility by 10 years.⁵³ *A shortage of qualified construction workers was among the top five*

⁴⁷ Gabriela Rico, *Labor Shortage, steel-cost uncertainties halt work on highly anticipated Oro Valley senior community*, Arizona Daily Star (June 9, 2018), https://tucson.com/business/labor-shortage-steel-cost-worries-halt-anticipated-oro-valley-senior/article_9c48ee4f-7a90-5c89-90e2-aedd902738ec.html.

⁴⁸ Chirs Ramirez, *Labor shortage causes Exxon to shift construction plans*, Corpus Christi Caller-Times (Aug. 9, 2017), <https://www.caller.com/story/news/2017/08/09/labor-shortage-causes-exxon-shift-construction-plans/525241001/>.

⁴⁹ Daniel Moore, *Shortage of construction workers spurs Limbach Holdings to scale back ambitions in Washington*, Pittsburgh Post-Gazette (Apr. 17, 2019), <https://www.post-gazette.com/business/career-workplace/2019/04/17/Construction-worker-shortage-spurs-Limbach-Holdings-to-scale-back-ambitions-in-Washington/stories/201904160127>.

⁵⁰ Bob Sechler, *Booming Austin construction sector hurting for workers*, Austin American-Statesman (June 26, 2019), <https://www.statesman.com/news/20190626/booming-austin-construction-sector-hurting-for-workers>.

⁵¹ Teresa Johnson, *Some Construction Projects More Costly Due to Labor Shortage*, CBS (Dec. 13, 2019), <https://baltimore.cbslocal.com/2019/12/13/some-construction-projects-more-costly-due-to-labor-shortage/>.

⁵² Rose Hoyle, *Dealing with the Construction Workforce Shortage*, IRMI (Feb. 2019), <https://www.irmi.com/articles/expert-commentary/dealing-with-the-construction-workforce-shortage>.

⁵³ In the Matter of CB&I AREVA MOX Services, LLC, 79 Fed. Reg. 69886 (Nov. 24, 2014), <https://www.gpo.gov/fdsys/pkg/FR-2014-11-24/pdf/2014-27796.pdf>.

reasons cited for delaying the project.⁵⁴ The facility's purpose: disposing of 34 tons of surplus weapons-usable plutonium by converting it to fuel for nuclear reactors.⁵⁵

The labor market conditions underscoring the skills crisis in construction have been brewing for decades and will deteriorate further unless corrective action is taken. Years of underinvestment in skills training has led to a serious, steady decline in productivity and construction quality, and these trends will only increase as the mass retirement of baby boomers continues and industry demand expands. The evidence is already showing that the collective impact of these trends impedes project planning and undercuts project delivery.

Market forces alone will not fix this problem and history likewise shows that government-sponsored training programs are not the answer. They simply cannot deliver the skills the market needs in a safe and timely manner nor effectively connect skilled workers with job opening.

IV. MEETING THE CHALLENGE OF THE SKILLS CRISIS

A. MANDATING TRAINING: RECOMMENDATIONS FROM PROJECT OWNERS

Leading experts agree: proactive measures by the project owner community, including both public and private sector owners, as shown below, are vital to address this crisis. Now more than ever, owners need to protect their short-term interests in securing successful project performance and promote their long-term interests in promoting effective workforce development.

Recognizing the urgency of the skills crisis, the Construction Users Roundtable ("CURT"), the nation's leading trade association for project owners, has repeatedly issued strong recommendations to those responsible for capital facilities construction to take ownership of this problem and drive the changes needed in the industry. The primary solution CURT recommends is for project owners to pre-qualify contractors on skill training and mandate such requirements as a condition of doing business.

CURT has made this recommendation repeatedly for over a decade, increasingly stressing the need for action in light of the growing nature of the problem. In 2015, CURT's Director of Operations squarely addressed the issue: "owners need to require contractors to recruit, hire and train skilled workers. Similar to how owners prequalify on safety, they should do so on workforce development as well."⁵⁶ CURT, the National Center for Construction Education and Research (NCCER), and other industry groups reiterated this recommendation in 2018, emphasizing that "[o]wners should only do business with contractors who invest in training and maintain the skills of their workforce."⁵⁷

⁵⁴ *Id.*

⁵⁵ See *More Time to Build Nuclear Plant*, World Nuclear News (Nov. 17, 2014), <http://www.world-nuclear-news.org/ENF-More-time-to-build-US-MOX-plant-1711144.html>.

⁵⁶ Daniel Groves, *Three Solutions to Improving Project Outcomes Rather Than Just Paying Higher Craft Wages*, Construction Citizen (Nov. 4, 2015), <http://www.constructioncitizen.com/blog/three-solutions-improving-project-outcomes-rather-just-paying-higher-craft-wages/1511041> (emphasis added); see also *Construction Labor: Contractors' Workforce Development Assessment (WP-413)*, Construction Users Roundtable (July 2013) at 3 ("As a condition of employment, owners should require contractors to invest in training and maintain the skills of their workforce.").

⁵⁷ *Restoring the Dignity of Work: Transforming the U.S. Workforce Development System Into a World Leader (RT-335)*, NCCER (July 2018). https://www.nccer.org/docs/default-source/pdfs/cii-rt335-longver-final_web.pdf?sfvrsn=80e91f4f_14.

In its white paper on skill shortages, CURT further explains that: “[t]he most effective and long-lasting changes in the industry are changes that are supported and encouraged by the owner community.”⁵⁸ To this end, CURT specifically urges owner companies to:

- Recognize the necessity of investing in training; and establish expectations in the areas of workforce training and development, workforce recruitment, and worker retention;
- Only do business with contractors who invest in training and maintain the skills of their workforce; and
- Make contractor commitment to craft training a factor in the qualification process.⁵⁹

In several other publications, CURT has repeated and reinforced the critical need of project owners to require skill training because of its direct and substantial impact on project delivery both in the short and long term.⁶⁰ The importance of pre-qualifying contractors based on their commitment to workforce development was emphasized by CURT as recently as January 2019, when the organization repeated its “strong recommendation [that] owners should prequalify and select those only those contractors actively training the workforce of the future.”⁶¹

Explaining the rationale for its recommendations, a 2015 report notes at the outset that CURT’s mission is to “promote cost effectiveness for owners doing business in the United States by providing aggressive leadership on issues that will significantly improve project engineering, maintenance and construction processes, thereby creating value for the owners.”⁶² Project owners, CURT explains, depend on skill training to protect their own interests in securing successful projects and, therefore, should take a proactive role to ensure contractors provide skill training to craft workers.⁶³

In 2015, CURT released a white paper that “organizes and outlines CURT’s current thinking on the best ways owners can mitigate labor shortages, keep projects staffed and deliver projects on time in this new economic reality.”⁶⁴ Again, CURT specifically recommends that project owners:

- Require “contractors to have effective programs for including younger workers in their projects, including apprenticeship . . .” to attract and recruit the best workers;⁶⁵ and Prequalify

⁵⁸ *Confronting the Skilled Workforce Shortage (WP-401)*, Construction Users Roundtable (2004) at 9.

⁵⁹ *Id.*

⁶⁰ See e.g., *Skilled Labor Shortage Risk Mitigation (WP-1101)*, Construction Users Roundtable (2015); *Construction Labor: Craft Employee Training Evaluation Tool (T-404)*, Construction Users Roundtable (2006); *Construction Labor: Managing the Construction Workforce (UP-403)*, Construction Users Roundtable (2005).

⁶¹ *The Owners’ Blueprint for Skilled Labor Risk Management*, Construction Users Roundtable (Jan. 25, 2019), <https://www.curt.org/wp-content/uploads/2019/01/LRM-Press-Voice-Teaser-2019Q1.pdf>.

⁶² *Skilled Labor Shortage Risk Mitigation (WP-1101)*, Construction Users Roundtable (2015).

⁶³ *Construction Labor: Managing the Construction Workforce (UP-403)*, Construction Users Roundtable (2005) at 9; see also Paul Turenne, *In Demand: Emerging Solutions for the Workforce Crisis*, The Voice, Construction Users Roundtable (Spring 2007) at 15.

⁶⁴ *Skilled Labor Shortage Risk Mitigation (WP-1101)*, Construction Users Roundtable (2015) at 2.

⁶⁵ *Id.* at 12.

contractors and subcontractors based on an evaluation of “their company commitment and involvement in workforce development.”⁶⁶

Reports and studies from various other top industry groups also support these recommendations and similar proactive strategies by project owners to address the construction skills crisis.⁶⁷ By pre-qualifying contractors based on their participation in workforce development, project owners “have the capacity to make a real difference” in addressing the construction industry skills shortage.⁶⁸ In turn, owners stand to benefit from lower project costs and shorter project durations.⁶⁹

B. CONSTRUCTION INSTITUTE REPORT: POSITIVE IMPACT OF CRAFT TRAINING

While it is clear that the failure to train can result in serious negative consequences for project owners, project owners and the industry at large both reap significant benefits from skill training, provided it is done right. Research in the construction industry demonstrates that investments in craft training make significant positive returns, both for individual workers and for the industry as a whole. As explained by the 2007 industry report, *Construction Industry Craft Training in the United States and Canada*:

A preponderance of evidence demonstrates that training pays off, as indicated not only in the analysis from this study but others as well. The research team analyzed benefits from craft training from three perspectives: employer, project, and craft worker. Craft training can benefit both the individual worker and the employer.⁷⁰

In reviewing this report, Sandra Olson, president of the Construction Industry Training Council, explained that the study showed that “a 1 percent investment in training netted benefits on both capital and maintenance projects, ranging from an 11 percent hike in productivity to a 27 percent decrease in injury rates.”⁷¹ The report also highlights the potential benefits of reducing turnover, absenteeism, injuries and rework, and “estimated improvements in all categories.”⁷² Similarly, a 2017 guide to registered apprenticeships from the Urban Institute reports that employers in these programs can generally expect to “fill vacancies that otherwise couldn’t be filled,” attract a more diverse workforce, reduce the amount of time it takes for new employees to become productive, decrease error and accident rates, and ensure that

⁶⁶ *Id.* at 28.

⁶⁷ See e.g., *Confronting the Skilled Construction Work Force Shortage*, Business Roundtable, Construction Cost Effectiveness Task Force (1997); *AGC Announces Model Language for “Training for the Trades” in RFPs*, AGC News & Bulletins (1999); *Workforce Conference Report*, Bloomberg BNA Construction Labor Report, 47 CLR 1079 (Nov. 21, 2001); *Craft Labor Shortage Provokes More Studies of Pay and Safety*, Engineering News Record (Aug. 20, 2011); *Craft Labor Supply Outlook: 2005-2015*, Construction Labor Research Council (2004); *The 2005-2006 U.S. Markets Construction Overview*, FMI Management Consulting (2005); *Solving the Construction Industry Workforce Crisis – Ideas for Action*, McGraw Hill/ENR (2007); Don Whyte, NCCER, *Measuring Contractor Commitment*, The Voice, Construction Users Roundtable (Fall 2014).

⁶⁸ *Construction Productivity in an Imbalanced Labor Market*, Construction Labor Market Analyzer (May 2016), at 41.

⁶⁹ *Id.* at 31 (finding that labor staffing difficulty is correlated with higher project costs and longer project durations).

⁷⁰ *Construction Industry Craft Training in the United States and Canada*, Construction Industry Institute (Aug. 2007) at 12, <http://ps.businesssocialinc.com/media/uploads/abceastflorida/craftstudy.pdf>.

⁷¹ *Id.*

⁷² Sandra Olsen, *Construction Training is Good for Your Bottom Line*, Seattle Daily Journal of Commerce (Mar. 27, 2008) at 12-13 (emphasis added), <http://www.djc.com/news/co/11198999.html>.

knowledge and experienced is transferred from aging workers to the new generation.⁷³ A failure to invest in craft training, on the other hand, will lead to costs associated with “poor safety, late deliverables and delayed projects.”⁷⁴

The benefits to employers of participating in a registered apprenticeship program are further reinforced by a 2017 study commissioned by the Michigan Building and Construction Trades Council. This study found that although completing an apprenticeship program “significantly raises a worker’s wage,” such programs also produce significant benefits for employers.⁷⁵ A survey of contractors participating in these programs showed that over 93% felt that apprenticeship programs were “important” to meeting their need for skilled labor, while over 79% reported that the costs of participating in these programs was either “not an issue” or only a “minor issue.”⁷⁶ The study concluded that contractors “viewed apprenticeship programs as an important tool for helping them meet their demand for skilled workers, and for recruitment and retention.”⁷⁷

Craft training is also an obvious way to attract the younger generation and help rebuild a solid pipeline of productive, skilled workers.⁷⁸ Thus, in addition to improving the quality of work and overall project success, training programs within the trades provide an economically sound and commonsense way to bring new workers into the industry.

C. ENSURING CRAFT LABOR SUPPLY THROUGH APPRENTICESHIP TRAINING

Promoting the use of formal apprenticeship training programs in the construction industry provides one of the most viable means to addressing the skills gap. This is because, as many experts agree, apprenticeship training offers the most reliable, time-tested and effective options for educating the next generation of skilled construction workers.⁷⁹ As recognized by the President’s Task Force on Apprenticeship Expansion, “[a]pprenticeship is a proven model that provides paid, relevant work experiences and opportunities to develop skills that employers value.”⁸⁰

⁷³ Diane Auer Jones & Robert Lerman, *Starting a Registered Apprenticeship Program: A Guide for Employers or Sponsors*, Urban Institute (June 2017), https://innovativeapprenticeship.org/wp-content/uploads/2017/06/Employer-Guide_June-2017.pdf.

⁷⁴ Daniel Groves, *Industry Papers Support the Quest for Better Productivity*, The Voice, Construction Users Roundtable (Summer 2016), at 25-27.

⁷⁵ *Benefits of Michigan Apprenticeship Programs*, Public Sector Consultants, Inc. (Apr. 2017) at 1, <http://publicsectorconsultants.com/wp-content/uploads/2017/05/Benefits-of-Apprenticeships-FINAL-April-2017.pdf>.

⁷⁶ *Id.* at 14-16.

⁷⁷ *Id.*

⁷⁸ See *2013 Dodge Construction Outlook*, McGraw-Hill Construction Research & Analytics Group (Oct. 2012) at 47-48.

⁷⁹ The NIST study referenced above likewise explains that skill training in construction yields substantial benefits, noting that it increases productivity and reduces turnover, absenteeism, and rework. NIST report, at 25-26. In addition, craft training increases individual skills, knowledge, income, and job satisfaction – variables that help to counteract industry-wide recruitment problems that have been linked to a poor industry image and perceived limitations in career development opportunities. *Id.* at 26.

⁷⁹ Industry research indicates that contractors agree that on-the-job training and apprenticeship programs were thought to be the most important and valuable means for combating these problems.

⁸⁰ TASK FORCE ON APPRENTICESHIP EXPANSION, FINAL REPORT TO THE PRESIDENT OF THE UNITED STATES 14 (2018).

In a report titled *The Benefits and Challenges of Registered Apprenticeship*, the Urban Institute reviews the utility of registered apprenticeship programs based on how capable such programs are in conducting effective skills training.⁸¹ This report and an underlying survey were commissioned by the Employment and Training Administration of the U.S. Department of Labor. Key findings are as follows:

- “The most frequently cited benefit of apprenticeship programs, identified as very important by over 80 percent of sponsors, was that it helped meet their demand for skilled workers. The second most frequently cited benefit “ 72% of sponsors) was apprenticeship’s role in reliably showing which workers have acquired the necessary skills.”⁸²
- “Other benefits, cited by 68 percent of sponsors as very important, were: raising productivity, strengthening worker morale and pride, and improving worker safety.”⁸³ A majority also cited the “role of registered apprenticeship in worker recruitment and retention and in meeting licensing requirements.”⁸⁴
- “Ninety-seven percent of sponsors of registered programs said they would recommend the program to others, with 86 percent stating they would ‘strongly’ recommend it and 11 percent indicating they would recommend it with reservations, due primarily to problems with accessing related instruction.”⁸⁵
- Significantly, the great majority of apprenticeship programs are not sponsored or assisted by government but are funded, designed and administered by private parties, usually employers or joint employer-labor programs

In addition, the President’s Export Council’s Subcommittee on Workforce Readiness found that “[a]pprenticeship training programs, especially those offered in the construction industry . . . provide viable career paths for those seeking employment in the skilled building trades.”⁸⁶ As the subcommittee highlighted, the key characteristics of the construction industry apprenticeships that make them so successful are: (1) apprentices are learning industry-specific skill sets while receiving livable wages; (2) the program is completely self-funded; (3) the program is demand-driven; and (4) apprentices are provided practical employment training.⁸⁷

⁸¹ Robert Lerman, et al., *The Benefits and Challenges of Registered Apprenticeship: The Sponsors’ Perspective*, The Urban Institute (2009), <http://www.urban.org/sites/default/files/alfresco/publication-pdfs/411907-The-Benefits-and-Challenges-of-Registered-Apprenticeship-The-Sponsors-Perspective.PDF>.

⁸² *Id.* at ii (emphasis added).

⁸³ *Id.* (emphasis added)

⁸⁴ *Id.*

⁸⁵ *Id.* (emphasis added). Sponsors also reported generally high completion rates. Specifically, the report found that “[f]orty-four percent of sponsors said that the completion rate for their program was between 90 to 100 percent and 21 percent indicated it was between 70 and 89 percent, thus making a total of 65 percent of sponsors who reported completion rates at or above 70 percent.” *Id.* at iii.

⁸⁶ The President’s Export Council, *Compilation of the Council’s Recommendations during the First Term of the Obama Administration, 2010-2012* (2012) at 32, http://trade.gov/pec/docs/PEC_Term_Report_2010-2012_12062012.pdf.

⁸⁷ *See id.*

A 2012 study commissioned by the Department of Labor further highlights the benefits of registered apprenticeship for participating workers and the public.⁸⁸ The report compared participants in registered apprenticeship to non-participants and found that participants earned significantly more and had less dependence on government assistance.⁸⁹ In a 2015 report prepared for the National Academy of Sciences, Robert Lerman noted several studies examining the benefits of apprenticeship programs, including the Department of Labor-commissioned study, concluding that apprenticeship programs benefit both employers and participants financially.⁹⁰ These benefits are further reinforced by a 2018 study of registered apprenticeship programs in Illinois, which found that such programs “deliver good middle-class careers” and “should be expanded...[t]o address [the] shortage of skilled workers” in craft positions.⁹¹

In a June 2015 National Academy of Sciences symposium on the supply chain for middle-skill jobs, several speakers urged for an increase in the use of apprenticeships to bolster workforce development.⁹² The speakers overwhelmingly agreed that the U.S. will continue to struggle in the global labor market if workers do not get adequate training, like that offered by apprenticeships.⁹³ According to Professor Carolyn Heinrich, the U.S. spends less than 0.5 percent of gross domestic product on workforce development, while western European countries are spending nearly seven times as much.⁹⁴ Scott Cheney of the U.S. Senate Committee on Health, Education Labor and Pensions stated that “the U.S. is shamefully behind where we need to be” on employer-based training.⁹⁵

V. CONCLUSION

The evidence is clear: growing project demand, shrinking labor supply and a general decline in training add up to huge challenges that the construction industry must address in real time. Considering current pressures placed on the industry by the skills crisis and the proven benefits of craft training, especially via registered apprenticeship programs, there is a compelling rationale behind qualifying contractors based on their participation in such programs. As studies continue to show a widening gap between the demand and supply of skilled craft workers, the industry must make changes to implement effective policies that respond to these problems, and the research has demonstrated that increasing commitments to craft training is one of the most effective solutions.

⁸⁸ See Debbie Reed, et al., *An Effectiveness Assessment and Cost-Benefit Analysis of Registered Apprenticeship in 10 States*, Submitted by Mathematic Policy Research to the U.S. Department of Labor Employment and Training Administration (2012), http://wdr.doleta.gov/research/FullText_Documents/ETAOP_2012_10.pdf.

⁸⁹ See *id.* at xiv-xv, xix.

⁹⁰ See Robert Lerman, *Are Employers Providing Enough Training? Theory, Evidence and Policy Implications*, Urban Institute, American University and IZA Prepared for National Academy of Sciences Symposium on the Supply Chain for Middle-Skill Jobs: Education, Training, and Certification Pathways (2015) at 18, http://sites.nationalacademies.org/cs/groups/pgasite/documents/webpage/pga_168146.pdf.

⁹¹ Frank Manzo IV & Robert Bruno, *The Apprenticeship Alternative: Enrollment, Completion Rates, and Earnings in Registered Apprenticeship Programs in Illinois*, Illinois Economic Policy Institute (2020), at i, 16-17, <https://illinoisepi.files.wordpress.com/2020/01/ilepi-pmcr-the-apprenticeship-alternative-final.pdf>.

⁹² See Gayle Cinquegrani, *Academy Speakers Want More Apprenticeships, Data*, Bloomberg BNA Construction Labor Report, 61 CLR 460 (July 9, 2015).

⁹³ See *id.*

⁹⁴ *Id.*

⁹⁵ *Id.*