National Institute of BUILDING SCIENCES™

MOVING FORWARD

FINDINGS AND RECOMMENDATIONS FROM THE CONSULTATIVE COUNCIL

2019

Innovative Solutions for the Built Environment

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Moving Forward

INTRODUCTION

The National Institute of Building Sciences (NIBS) serves as the unbiased forum for discussing issues and identifying opportunities within the building community. The NIBS Consultative Council assembles high-level building community representatives to make collective recommendations directly to policymakers to improve our nation's buildings and infrastructure.

Each year, the Consultative Council publishes the Moving Forward Report to investigate key challenges, offering solutions to overcoming these challenges. The 2019 Moving Forward Report will examine three critical areas identified by building industry leaders and the Consultative Council:

- Developing, investing in, and maintaining a skilled 21st-century workforce
- Advancing an understanding of the importance of resilience in adapting to climate change and promoting disaster mitigation
- Adapting and driving the use of new technologies and their impact on the built environment

The State of the Industry

In 2019, the National Institute of Building Sciences conducted a survey of CEOs of the organizations that make up the Consultative Council. The survey asked two simple questions, with a goal of identifying what building leaders saw as the industry's immediate critical challenges:

1. What are the top three issues that keep you or your members up at night?
2. What are the three main policy priorities for your organization for 2020-2022?

After compiling responses, the three most critical issues identified by those leaders can be summarized as such: workforce, technology and resilience.

Nearly 80 percent of building industry leaders identified recruiting and maintaining a robust building workforce as the No. 1 issue facing the industry. Fifty percent of respondents identified adapting to changing technology as an important challenge moving forward. Finally, 40 percent of respondents indicated that investment in resilience and responding to climate change will be critical to the building industry's future.

Additional areas identified by building industry leaders include:

- Infrastructure investment
- Effectively advancing energy codes to support state/city climate goals
- Affordable housing and equitable transportation

Policy priorities for building industry leaders for 2020-2022 include the following:

- Workforce development
- Resilience and climate change adaptation
- Using technology in facility management
- Infrastructure investment

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WORKFORCE

State of the Building Workforce

The critical issue of promoting and maintaining a viable building and trades workforce has been a continued focus of the Consultative Council. It is no secret that the U.S. is reaching a crisis point, in terms of ensuring that a "full pipeline" of skilled workers is available to meet the needs of a rapidly advancing building industry. The statistics, even during the longest period of sustained economic growth in U.S. history, are stark:

- A survey by AGC and Autodesk found that nearly 80 percent of contractors reported difficulties in finding qualified craft workers for available jobs, while also wanting to expand current hiring.[1]
- According to the same survey, 45 percent described the "adequacy of the local pipeline supplying craft personnel" as "Poor."[1]
- According to the U.S. Bureau of Labor Statistics (BLS), approximately 240,000 job openings were available in construction, as of December 2019.[2]
- Workers under the age of 25 in construction decreased over the last decade, representing only 9 percent of the workforce in 2018, while the percent of workers over the age of 55 increased by five percentage points between 2011-2018, to 22 percent of all workers.[3]

Changing Perceptions Among Young People

Today's parents, guidance counselors, and society-at-large place a great deal of pressure on young people to enroll in a four-year college and obtain a bachelor's degree. Evidence of this preference is borne out of public policy: Federal and state education systems provide significant funding to four-year colleges and universities, while community colleges, vocational, and technical schools and programs receive insufficient support from public programs. Policymakers should work to even the playing field for the trades, enabling students to pursue a productive and fulfilling career.

Changing perceptions among young people themselves is also critical: According to a 2017 survey of high school students completed by the National Association of Home Builders, only 3 percent indicated an interest in pursuing a career in the construction trades. The industry needs to make an investment in promoting the potential fulfilling careers available in construction and the trades.[4] Some of this work has already started – groups like We Are Generation T and many sectors of the trades are highlighting the potential of a career in the trades.[5] They connect people looking to work with opportunities, but more is needed. The industry should continue to invest in recruiting young people to the workforce and train and re-train its existing workforce.

Improving Access for Women and Minority Groups

The industry and government need to make a concerted effort to recruit women and minorities into the workforce, including breaking down perceived barriers to entry and enabling opportunities for advancement especially, for this traditionally white, male-dominated industry.[6,7]

Take the example of women in construction: According to the Department of Labor (DOL) Bureau of Labor Statistics (BLS), women make up only 10 percent of construction managers, 5.7 percent of construction and building inspectors, 3.5 percent of construction laborers, and 3.5 percent of first-line supervisors of construction trade and extraction workers.[7] Though these numbers have increased year-over-year for nearly 25 years, additional support is needed from the industry and policymakers to accelerate the rate of change through outreach to women. We must develop training programs specifically designed for women entering the trades and showcase leadership opportunities and broad attempts to change the industry's attitudes toward women in the trades and building workforce.

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Empowering the Current Workforce

While attracting new workers into the construction trades should be a focus for industry, it is also critically important that the current workforce is ready to meet the needs of the 21st century buildings industry. The deployment of new and advanced technologies into the building space is occurring at a faster pace than ever before. Policymakers and the built environment need to ensure that the current workforce is not left behind by these technological shifts. The importance of this effort goes beyond simple employment numbers: all potential gains from these new technologies depend on the skills and competency of the individuals installing or utilizing them.[8] Investing in training and skills for the current workforce, through credentialing programs or other means, is required for new technologies to be implemented correctly and safely, and to have a continued and sustained impact.

PROMOTING RESILIENT COMMUNITIES

Disaster and Climate Resilience

The Resilience Building Coalition's 2014 Statement on Resilience defines resilience as "the ability to prepare and plan for, absorb, recover from, and more successfully adapt to adverse events."[9] Across the country, investing in resilience is a near no-brainer. The NIBS Multi-Hazard Mitigation Council examined the most significant savings associated with various mitigation measures.

- Since 1995, public investment by FEMA, EDA, and HUD will ultimately save the country $160 billion, at a cost of $27 billion, or $6 saved per $1 invested
- Building codes sets minimum requirements to protect life safety: adopting the latest building code requirements is affordable and saves $11 per $1 invested
- Stricter requirements with above-code design can cost-effectively boost life safety and speed functional recovery with a benefit cost ratio of $4 to $1
- Our country could efficiently invest, save $4 per $1 cost, to upgrade residences
- Upgrading lifelines protect the whole economy, saving up to $31 per $1 invested[10]

Policymakers and the building industry must insist on capitalizing on this good deal, not only through these important mitigation programs but also through aligning the interests and incentives of the building and finance industries. This includes smarter investment in the construction and maintenance of buildings and infrastructure that will help mitigate the impacts of disasters and climate change and adoption of codes, standards, and guidance tools that enable local communities to prepare for and predict potential disasters. Planning and preparation will enable the industry to provide safe and secure spaces for Americans to live and work. Full vulnerability assessments are needed on buildings to ensure property owners and residents understand the risks associated with resilience and are able to make necessary precautions. When disasters do occur, the industry must be able to quickly and effectively respond. This involves consistent coordination with government officials, at all levels, to assess damages and organize recovery efforts as communities rebuild. Special attention should be given to the lifelines and utilities that connect our communities, such as power distribution and water distribution, transportation and communication systems, which are essential to community resilience, with additional investment in protecting vulnerable populations who are at particularly high risk of adverse impact.

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Technology

The rapid pace of technological change will continue to have an impact on the building industry. From changes to the way buildings are designed, constructed, commissioned, maintained and operated, the building industry must continue to evolve to realize the potential of new technologies, as well as prepare for its effects.

Cybersecurity

Today, cybersecurity is an everyday threat. Its potential to adversely affect building and construction is no different from any other industry.[11] Many buildings and campuses are becoming increasingly reliant on connected advanced tools and systems that are used throughout the building lifecycle. Additionally, the amount of data shared among stakeholders responsible for a building throughout its lifecycle is increasing exponentially. We share information not only about particular buildings, but also sensitive personally-identifiable information on employees, vendors and other stakeholders, as well as regular business operations, such as invoicing and correspondence.

Critically important is guidance and training for individuals: A 2019 study by Symantec found that the construction industry ranked third (of 11) in percentage of individuals targeted with malicious email (26.6 percent), as well as seventh in malicious email rate (one of every 382 emails).[12] Additionally, protection of entry points for building controls and operations must increase. The building industry and policymakers should continue to prioritize and invest in cybersecurity, mitigating the risk of cyberattacks and readying companies and individuals up and down the supply chain (and throughout the building lifecycle) for this imminent threat.

Building Information Modeling

The use of building information modeling (BIM) continues to increase in both frequency and type of use. The benefits of using BIM are now seen not only in the design and construction phase, but throughout the building lifecycle. As stated on the NIBS Whole Building Design Guide, a primary goal of a BIM model is to access all pertinent graphic and non-graphic information about a facility as an integrated resource, thereby eliminating re-gathering or reformatting facility information. Eliminating this need has the potential to greatly reduce waste in the construction industry, which is significantly higher than other sectors. The building sector should come together to work collaboratively to identify common metrics and support the interoperability of data. In 2020, NIBS will update the National BIM Standard. The NBIMS-US™ provides consensus-based standards through referencing existing standards, documenting information exchanges and delivering best business practices for the entire built environment.

RECOMMENDATIONS

To address the issues facing the 2019 building industry, the Consultative Council makes the following recommendations:

- The Administration, Department of Labor, and the U.S. Department of Education should extend their efforts to advance apprenticeships and workforce development to include careers within the buildings and construction workforce, with additional programs focused on promoting women and minority groups in the trades.
- The DoED, DOE, DOL, EPA and other relevant federal agencies should work with the private sector to create a public service announcement campaign highlighting the importance of the building industry to the economy, the many exciting opportunities available in the industry and potential educational pathways to entering the industry.
- Federal entities, including the Small Business Administration, the U.S. Department of Housing and Urban Development (HUD), the U.S. Department of Agriculture, the U.S. Department of Veterans Affairs and Fannie Mae and Freddie Mac, along with private sector stakeholders, should encourage the development of products and services that facilitate holistic consideration of resilience strategies at the community level.
- Congress, with input from the private sector, should identify and enact policies, including incentive programs, that encourage increased investment in natural and man-made hazard mitigation for existing buildings and other infrastructure. This includes ensuring FEMA mitigation grants and tools receive the funding necessary to effectively capture the significant benefits pre-disaster mitigation provides.
- Congress, working with FEMA and other federal agencies, should enact incentives for state and local jurisdictions to adopt current building codes in order to make communities more resilient in the face of hazards and to reduce the cost of federal disaster cleanup and recovery.
- The Department of Commerce, Department of Homeland Security, and NIST should continue to work with the building industry to deploy existing federal and private-sector tools to assure the cybersecurity of building control systems. This includes training to recognize and address vulnerabilities.

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Endnotes

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