



National Institute of
BUILDING SCIENCES™

2023

**Annual Report
to the President
of the United States**

Innovative Solutions for
the Built Environment

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Dear Mr. President:

On behalf of the National Institute of Building Sciences, it is an honor to provide you with this Annual Report to the President of the United States.

Fifty years ago, NIBS was established by the U.S. Congress in the Housing and Community Development Act of 1974, Public Law 93-383. At that time, Congress recognized the need for an organization to serve as an interface between government and the private sector – one to serve as a resource to those who plan, design, procure, construct, use, operate, maintain, renovate, and retire physical facilities.

This 2023 report highlights our work to improve the safety, performance, and resilience of the nation's buildings and communities; enable innovation and responsible use of technology across the building industry; and provide continuing education opportunities to ensure a competent and vibrant workforce.

Remaining true to the objectives in our enabling legislation, NIBS convenes building industry leaders to examine and build alignment on issues challenging our future.

We establish performance criteria, standards, and other technical provisions to maintain life, safety, health, resilience, and public welfare. We develop recommendations suitable for adoption by the jurisdictions and agencies that regulate buildings.

NIBS also offers a plethora of resources to the nation's built environment professionals and federal workers to maintain a solid base of knowledge to keep them informed on trends in emerging technologies and skills development.

Our work primarily is led by talented staff and the subject matter experts and volunteers who comprise our eight volunteer bodies – the Building Enclosure Technology and Environment Council, Building Seismic Safety Council, Consultative Council, Digital Technology Council, Facility Management and Operations Council, Off-Site Construction Council, Multi-Hazard Mitigation Council, and Whole Building Design Guide Workgroup.

These experts and stakeholders engage with private organizations, institutions, agencies and federal, state, and local government entities to bring attention to the development of methods that encourage representation from all sectors of the economy, ensuring national interests are represented and protected.

In 2023, we released several reports, including:

- The Moving Forward Report, which looks closely at the path toward decarbonization of the U.S. built environment, including recommendations for the Administration and policymakers. As a Better Climate Challenge ally of the U.S. Department of Energy, we are committed to reducing greenhouse gas emissions by at least 50 percent within 10 years across as much of the built environment as possible.
- The Collaborative Digital Delivery in the Age of Information Privacy and Cybersecurity report, which discusses the impacts of data and information security regulations on the advancement of project delivery and operations using building information management.
- The Social Equity in the Built Environment Workforce Survey, which was a partner-wide collection of critical data in spring 2023 for the purpose of informing future initiatives on social equity.
- The Resilience Incentivization Roadmap 2.0, which was developed with Fannie Mae to study public and private incentives that allow owners of buildings and other infrastructure to facilitate the upgrade of existing infrastructure and better design of new infrastructure.

2024 builds on many projects that already are underway, including the release of the National BIM Standard – United States – a much-needed data management standard that will revolutionize construction, creating a unified core industry standard by coordinating different building information management practices.

BIM plays a big part in the revitalization and retrofit of our existing building stock as this relates to improved performance, sustainability, health, and resilience. We believe that in order to address existing buildings, we must innovate.

Finally, NIBS has been working to assist the nation with community resilience and recovery after natural disasters, creating the Lifeline Infrastructure Hub to better understand and improve aging lifeline systems. These systems include water, wastewater, electricity, natural gas, liquid fuels, communications, and multi-modal transportation.

At the back of this annual report, Mr. President, you will find the 2024 Moving Forward Report by the Consultative Council. The report features our recommendations directly to you and your administration, regarding access to clean water and sanitation and the very real crunch that Americans are feeling with regard to housing affordability.

Thank you for the opportunity to share this work with you.



A handwritten signature in black ink that reads "Stephen Ayers".

Hon. Stephen T. Ayers, FAIA, NAC, CCM, LEED AP
Interim Chief Executive Officer
National Institute of Building Sciences



A handwritten signature in black ink that reads "Thomas H. Phoenix, SR.".

Thomas H. Phoenix, SR., PE, FASHRAE, LEED-AP
Chair
Mechanical Contractors, Inc., Greensboro, NC



About NIBS

NIBS is 50!

In 1974, the U.S. Congress established the National Institute of Building Sciences in the Housing and Community Development Act, Public Law 93-383.

Congress recognized the need for an organization to serve as an interface between government and the private sector – one that brings together local, state, and federal representatives, the professions, industry, and labor and consumer interests by supporting advances in building science and technology to improve the nation’s built environment.

NIBS leads conversations to ensure our buildings and communities are safe, resilient, and sustainable.



Vision

Improving lives through collaboration by integrating science into the built environment.



Mission

To serve the public interest by advancing building science and technology to improve the built environment.

NIBS represents an industry with more than 919,000 construction establishments and employers, as of the first quarter of 2023.* The industry employs more than 8.0 million and creates nearly \$2.1 trillion worth of structures every year.**



NIBS is a 501(c)(3) non-profit organization that conducts research, establishes performance criteria, standards and other technical provisions to maintain life safety, health and public welfare. NIBS’ work is supported through membership, contributions, events, and government and private sector contracts.

* <https://www.agc.org/learn/construction-data>

** <https://www.bls.gov/iag/tgs/iag23.htm>

Several important highlights of our work since 1974 are shown below.

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- August 22, 1974** • NIBS is created by the United States Congress in the Housing and Community Development Act, Public Law 93-383. We serve the public interest as a national source to make findings and advise the public and private sectors regarding the use of building science and technology and support federal agencies having responsibility for buildings or construction through technical research.
 - 1970s** • NIBS begins support of the Naval Facilities Engineering Systems Command (NAVFAC) and U.S. Department of Defense to update federal facility criteria.
 - 1977** • Congress passes the Earthquake Hazards Reduction Act to protect the lives of building occupants, during an earthquake and mitigate the impact of such disasters on the national economy. The law establishes the National Earthquake Hazards Reduction Program (NEHRP).
 - 1979** • NIBS analyzes mobile home standards for the U.S. Department of Housing and Urban Development.
• The Building Seismic Safety Council is created. Under a contract with the Federal Emergency Management Agency, BSSC develops and maintains the NEHRP Recommended Seismic Provisions for New Buildings and Other Structures. These provisions are used as the primary resource for the professional design standard ASCE/SEI 7 Minimum Design Loads for Buildings and Other Structures.
 - 1980** • NIBS develops rehabilitation guidelines for the U.S. Department of Housing and Urban Development.
• The Building Thermal Envelope Coordinating Council (future Building Enclosure Technology and Environment Council) is created.
• The U.S. Department of Veterans Affairs contracts with NIBS to review building start-up and operations procedures.
 - 1986** • The Construction Criteria Base (CCB) is launched. It is the building industry's first CD-ROM library of criteria, guidance, specifications, regulations, codes, and more. NIBS later developed programming to sell Industry Organization standards on the CCB and later converted over from ASCII-text documents to Adobe Acrobat PDF, as adopted by the Government Printing Office.
 - 1989** • NIBS conducts review of federal court design criteria. By 1991, the first five editions of the U.S. Courts Design Guide are completed.
 - 1996** • NIBS creates the Facility Maintenance & Operations Committee, which eventually becomes the Facility Management and Operations Council.
 - 1997** • The NIBS Board of Directors establishes the Multi-Hazard Mitigation Council. MMC comes to inform thousands of mitigation decisions that lead to effective public policy.
• The United States National CAD Standard effort begins, based on an MOU between NIBS, Construction Specifications Institute, American Institute of Architects, Sheet Metal and Air Conditioning Contractors' National Association, United States Army Corps of Engineers, U.S. Coast Guard, and General Services Administration.

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- 1998** • ProjNet™ is developed by the U.S. Army Corps of Engineers Engineer Research and Development Center Construction Engineering Research Laboratory (ERDC-CERL) as a suite of integrated web-based design review, bid, and build applications. NIBS assists with the identification and resolution of design issues for this worldwide customer base of federal and non-federal users (commercial, state, and academic institutions).
 - 2000-2005** • The Multi-Hazard Mitigation Council is commissioned by FEMA to conduct a Congressionally-mandated independent study of mitigation. The Natural Hazard Mitigation Saves study found that for every dollar spent on mitigation, society saves \$4.
 - 2001** • NIBS assumes management of the Whole Building Design Guide – a massive resource to thousands of building professionals on design recommendations, operations and maintenance project management, federal facility criteria, and continuing education. NIBS adds Resources Pages and expanded Federal Mandates to reference the CCB.
 - 2004** • The national Building Enclosure Councils are created through an MOU between NIBS and the American Institute of Architects.
 - 2005** • NIBS studies the 9/11 collapse of the World Trade Center and offers provisions for local building codes.
• NIBS begins conducting post-occupancy evaluations for the General Services Administration.
 - 2006** • The Construction Operations Building Information Exchange (COBie) is created.
 - 2007** • NIBS buildingSMART alliance® releases the United States National Building Information Modeling Standard™ V1 – Part 1.
 - 2008** • BETEC co-sponsors the new Building Enclosure Science and Technology (BEST) conference series.
 - 2009** • NIBS hosts the Security, Energy, Environmental Sustainability Summit for the U.S. Department of Homeland Security.
 - 2012** • NIBS and AIA collaborate on a new research portal, the Building Research Information Knowledgebase (BRIK).
 - 2013** • The first Building Innovation conference takes place.
• The Whole Building Design Guide breaks the 7 million mark in documents downloaded monthly.
 - 2014** • NIBS and the U.S. Department of Education’s National Center for Education Statistics release the report, Condition of America’s Public School Facilities.
• The U.S. House of Representatives approves the Thermal Insulation Efficiency Improvement Act based on a Consultative Council recommendation.
 - 2015** • NIBS develops U.S. Bridge Lifecycle Process Map and IFC-based Design to Construction Exchange Specification for the Federal Highway Administration to provide an open standard for bridge modeling in the U.S.
 - 2016** • NIBS works with the U.S. Department of Energy and Green Sports Alliance to identify opportunities to influence energy and water use in stadiums and arenas. The report, Taking the Field: Advancing Energy and Water Efficiency in Sports Venues, is released in 2017.

About NIBS

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- 2017** NIBS publishes the National BIM Guide for Owners.
 - 2020** The buildingSMART alliance® becomes the Building Information Management Council.
 - 2022** The U.S. National BIM Program implementation and launch plan becomes available. Program goals: Next generation standards, support owner adoption, improve project delivery, build communities, and create a legal framework.
 - 2023**
 - Building Innovation: The Podcast is launched.
 - NIBS forms the Lifeline Infrastructure Hub, a public-private partnership to assist the nation with community resilience and recovery after disasters.
 - IBS launches the National BIM Standard-United States® V4. This includes Project BIM requirements, BIM execution planning, BIM use definition and COBie Version 3.0.
 - 2024**
 - United States National CAD Standard® V7 is approved by the NCS Project Committee and slated for release in 2024.
 - The Whole Building Design Guide is a federal facility criteria library and collection of more than 5,000 federal criteria, manuals, specifications, standards, and more. It receives 2 million annual visitors, 6.4 million page views, and 1.4 million document views.
 - The Building Information Management Council becomes the Digital Technology Council.



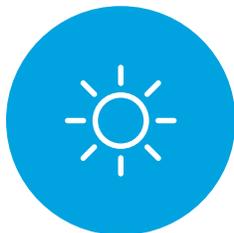
National Institute of
BUILDING SCIENCES™
50TH ANNIVERSARY

Strategic Plan

The National Institute of Building Sciences improves communities by accelerating collaboration between public and private stakeholders and advancing transformational technologies across the built environment.

The NIBS Board of Directors worked hard to develop a three-year strategic plan to guide the organization under these cultural values: collaboration, innovation, inclusion, and accountability.

Objective: The strategic plan includes four goal themes, each with specific strategies.



Climate Adaptation, Mitigation and Resiliency

We've all heard the terms: climate action, climate justice, climate crisis. We're in a climate emergency. NIBS' goal of climate adaptation, mitigation, and resilience requires the advancement of climate solutions and their adoption in the built environment. Building alliances with public and private sector organizations to develop and deploy innovative solutions is critical. NIBS also must drive collaboration, resulting in the development of policies, codes, and standards and share knowledge to advance resilient and sustainable communities.



Transformational Building Sciences and Technologies

NIBS aims to promote convergent research and transformational technologies. Strategies to this goal involve nurturing and promoting creativity and innovation to advance technology. NIBS also aims to remove barriers to accelerate technology acceptance and adoption and advance innovative technology awareness and implementation.



Industry Development and Diversification

NIBS encourages collaboration across the public and private sectors to increase diversity, equity, and inclusion within the workforce and communities. Strategies to this goal include expanding the industry's understanding of how building science, the built environment, and social equity are related and championing diverse, equitable, and inclusive communities. It's also important to advance initiatives to enhance the recruitment and development of the building industry workforce.



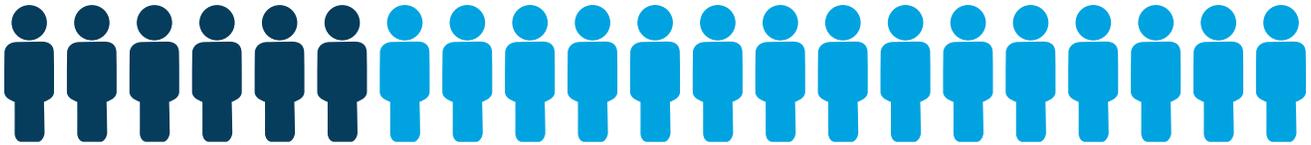
Visibility and Recognition

NIBS is a trusted authority and resource in the built environment. The organization aims to amplify its congressionally-authorized purpose as the nationally recognized authoritative voice. Strategies include increasing NIBS' brand visibility and stakeholder engagement among government and the private sector as well as attracting new stakeholders and business partners.

Board of Directors

The National Institute of Building Sciences Board of Directors has up to 21 members. The President of the United States, with the advice and consent of the U.S. Senate, appoints six members to represent the public interest. The remaining 15 members are elected from the nation’s building community and include both public interest representatives and industry voices. A majority of board members is required by the authorizing legislation to be in the public interest category.

In 2023, we welcomed five new members to the board: Bruce Risley, RA, CCM, Senior Vice President, ARCADIS; Michael Leondi, Vice President, Design and Construction, NJ/PA Region, Rockefeller Group; John (JC) Hudgison, CBO, Assoc. AIA, Construction Services Center Manager and Chief Building Official, City of Tampa, Florida; Mónica Serrano, Resilience Program Manager, Turner Construction Company; and Justin L. Boone, Principal and Unit Manager, Wiss, Janney, Elstner Associates, Inc.



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NC A&T State University, Mechanical Contractors Inc.,
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Rockefeller Group, Sparta, NJ

Justin L. Boone, AIA, CDT, LEED AP
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Monika Serrano
Turner Construction Company, Belle Mead, NJ

Anne Ellis, P.E., HON.M.ACI, F.ASCE, NAC
Past Chair, Ex Officio
Anne Ellis, LLC, Potomac, MD

John (JC) Hudgison, CBO, Assoc. AIA
City of Tampa, Tampa, FL



Industry Solutions

- Climate Adaptation, Mitigation, and Resiliency
- Transformational Building Sciences and Technologies
- Industry Development and Diversification

Climate Adaptation, Mitigation, and Resiliency

The Maui Fires: A Horrific Storm of Tragedy

In 2023, a story that dominated the news was the devastating Maui fires that killed more than 100 people and destroyed thousands of structures.

The fires were fueled by the strong winds of Hurricane Dora and drought conditions in West Maui, decimating nearly three-quarters of all buildings in the Lahaina community.

“With limited evacuation routes and power outages impacting water resources, the fire overwhelmed first responders in a horrific storm of tragedy,” wrote Anne Cope, PhD, P.E., chief engineer with the Insurance Institute for Business & Home Safety (IBHS), and Jiqui Yuan, P.E., PMP, chief resilience officer and head of engineering with the National Institute of Building Sciences, in How ‘Miracle’ Homes Survived the Maui Fires in The Messenger.

So, how did some buildings survive in fire-ravaged neighborhoods?

One photo of a lone, red-roofed home that survived among the wreckage went viral. Additionally, a neighborhood built in 2019-2020 also suffered only minor damage, as identified in a study from IBHS with early insights on the fire. Located immediately south of the Kahoma stream channel, no single-family structures were lost in this neighborhood, and only four multi-family units were ignited (likely by embers). Fire spreading from house to house across this neighborhood was avoided.

Cope and Yuan wrote: “The structures in these success stories all had “Class A” noncombustible roofs and “defensible space,” a buffer area surrounding the building with reduced connective fire fuels. The homeowner of the single, red-roofed structure cut down the foliage surrounding the home (for termite control), while the less-damaged neighborhood’s houses have noncombustible wall covers, less dense constructive fuels between structures and high-wind off-ridge attic vents. These components played a critical role in protecting those homes. The metal roofs protected the houses from fire debris floating in the air, while cutting and reducing foliage created defensible spaces and reduced fire fuel.”

The keys: Preparation and mitigation



Photo Credit: Patrick T. Fallon/AFP via Getty Images

NIBS' Natural Hazard Mitigation Needs Assessment

NIBS kicked off a major natural hazard resiliency initiative with the Federal Emergency Management Agency (FEMA) called Natural Hazard Mitigation Needs Assessment in 2022. FEMA awarded this project to NIBS to support the development of a methodology to estimate the nation's unmet natural hazard mitigation needs and determine the respective roles the private sector, public sector, and federal government should play in addressing those mitigation needs.

The project is divided into two phases – phase I conducting the methodology and phase II – performing analysis and implementation of the phase I findings.

In September 2023, the project technical team, consisting of engineers, geographers, economists, scholars, and practitioners, successfully completed phase I and developed a methodology by natural hazard peril, geographic location, stakeholder (payor) group, and beneficiary group.

Natural Hazard Mitigation Needs Assessment Project Goals

The methodologies allow one to answer the following questions:

1. How much could the country reasonably invest to improve the natural hazard resilience of buildings, utilities, and transportation infrastructure, including consideration of future weather? The methodology addresses remediating existing construction, code changes to improve new construction, and processes, such as early warning systems.
2. How much of the resilience investment gap falls to FEMA or other government agencies, and how much to the private sector?
3. How can the nation ensure that the benefits of resilience programs reach communities that are overburdened by natural hazards, pollution, and historic underinvestment? This applies the question raised in 2022 by the White House Justice40 Initiative to the nation's resilience investment gap, using the White House's language to refer to the general concept of equity in disaster resilience.

In addition to allocating the country's resilience investment gap these three ways, NIBS aims to geographically estimate costs, so that the states or communities with the greatest resilience needs are identified.

Assessment Study Project Peer Recruitment and Review

The needs assessment study presents heavily peer-reviewed methods, due to the complexity of the questions the study seeks to answer.

NIBS retained a panel of scholars, practitioners, and other experts to review the methods within their areas of expertise. Additionally, FEMA recruited another panel of government subject-matter experts from various federal agencies, such as the U.S. Army Corps of Engineers, Cybersecurity and Infrastructure Security Agency, U.S. Department of Energy, U.S. Department Housing and Urban Development, White House Council for Environmental Quality, National Oceanic and Atmospheric Administration, U.S. Department of Agriculture, National Institute of Standards and Technology, and representatives from all FEMA regions to review the overall framework of the study and provide feedback and recommendations.

Finally, NIBS and FEMA jointly recruited a third group of volunteer experts and advocates who attended a workshop



near the end of the methodology development to critique and advise the project team and to inform their own constituencies about the work.

What's Next: Data to be Available for Other Uses

During phase II of the project, the team will develop data used to calculate and map the foregoing results, but that also will have many other mapping and analysis uses beyond the immediate needs of the current project.

The project team will provide an electronic data supplement containing these results, with fields for geographic location (e.g., census tract), degree of disadvantage, asset class (e.g., existing buildings), peril (e.g., earthquake), mitigation measure (e.g., bolt and brace foundations of small older wood frame buildings), occupancy class (e.g., single-family dwellings), quantity required (e.g., number of buildings), unit cost (e.g., cost per building), total cost (including hard and soft costs), FEMA share (%), other government share (%), and private-sector share (%).

NIBS and Fannie Mae Release Disaster Mitigation Roadmap

In September, the NIBS Multi-Hazard Mitigation Council (MMC) Committee on Finance, Insurance and Real Estate (CFIRE) and Fannie Mae successfully completed a project called the Resilience Incentivization Roadmap 2.0.

“Climate resilience will be key to sustainable homeownership as the impacts of climate change increase,” said Tim Judge, Head of Modeling & Chief Climate Officer with Fannie Mae, in a story by [StreetInsider.com](https://www.streetinsider.com). “The Roadmap provides tangible recommendations that the collective stakeholders can take to promote resilient investment that U.S. housing certainly needs.”

Roadmap 2.0 advances the 2020 “A Roadmap to Incentivization” paper, which calls for public and private incentives that allow owners of buildings and other infrastructure to facilitate the upgrade of existing infrastructure and better design of new infrastructure. Roadmap 2.0 advances this research by creating a set of mutually reinforcing contracts, grants, and other mechanisms for co-beneficiaries to help pay for resilience.

The study is a product of collaboration across business and academic disciplines and incorporating input from a range of stakeholder groups. It focuses mainly on residential buildings subject to flood and leaves language and procedures flexible to deal with other perils, occupancies, and locales.

Roadmap 2.0 Key Findings

Based on extensive research and input from organizations representing a cross-section of stakeholder groups, the report presents several findings:

1. Mitigation saves, but it doesn't do so in proportion to individual stakeholder investments.
2. Co-beneficiaries can share the cost of such investments – but they face similar challenges to those of the property owner.
3. Public-private coordination is essential.

Based on these conclusions, the project team formulated a roadmap aimed at establishing and executing initiatives to bolster disaster resilience. This comprehensive plan encompasses the conceptualization of a certification program tailored to enhance flood resilience, along with the contemplation of three prospective pilot studies.

The primary purpose of the Roadmap 2.0 is to offer a structured framework that fosters alignment of the motivations and interests of various stakeholders involved. While it serves as an illustrative model for enhancing pluvial urban flood resilience, it's noteworthy that numerous principles outlined in the report can be adapted to address challenges related to riverine and coastal flooding, as well as other non-flood-related perils.

Taken together, the report recommendations form the basis for a pilot program (or series of pilot projects) to create value for all stakeholders while generating useful information toward future resilience incentive efforts.



Introducing Functional Recovery to the 2026 NEHRP Provisions

The Building Seismic Safety Council (BSSC) Provisions Update Committee is in its third year of preparing the 2026 National Earthquake Hazards Reduction Program Recommended Seismic Provisions for New Buildings and Other Structures (NEHRP Provisions).

The effort consists of more than 200 national experts who are organized into 20 committees.

On August 4, the BSSC Functional Recovery Planning Committee [published a report](#) detailing the recommended scope, organization, and deliverables for developing functional recovery code provisions within the 2026 NEHRP Provisions.

To implement the recommendations from the Functional Recovery Planning Committee report, BSSC and the 2026 NEHRP Provisions Update Committee formed the Functional Recovery Task Committee with support of five topic subcommittees, including (1) key terms and concepts, (2) functional recovery categories and performance metrics, (3) recovery time targets for occupancies/services, (4) prescriptive design provisions, and (5) applicable hazard levels.

It is expected that a standalone functional recovery design provisions chapter will be developed and included in the 2026 NEHRP Recommended Seismic Provisions for New Buildings and Other Structures.

These provisions are aiming for adoption by ASCE/SEI 7-28 and IBC 2030.

Spring Resilience Workshop Hosted by the BSSC and MMC

In March, the Building Seismic Safety Council and Multi-Hazard Mitigation Council convened a workshop centered on federal agencies' needs in the areas of seismic resilience and readiness.

Breakout sessions included the evaluation and retrofit of existing federal buildings and the functional recovery of new and existing buildings to decrease downtime after a seismic event. Attendees included representatives from the White House Council on Environmental Quality, U.S. Department of Agriculture, U.S. Department of Defense, U.S. Army Corps of Engineers, United States Air Force, Federal Emergency Management Agency, U.S. Department of Veterans Affairs, U.S. Fish and Wildlife Service, Naval Facilities Engineering Systems Command, National Security Council, U.S. Department of Energy, General Services Administration, Office of the Director of National Intelligence, U.S. Environmental Protection Agency, U.S. Department of Housing and Urban Development, U.S. Department of State, National Oceanic and Atmospheric Administration, and National Institute of Standards and Technology.

The workshop discussions centered around three themes:

- Ongoing resilience efforts agencies have undertaken and leveraging potential synergies with other hazard mitigation projects
- Critical seismic resilience gaps identified by these agencies that lack momentum for making significant progress
- Short- and long-term resilience-focused policy and practice research needs

To expand on the findings from the 2023 workshop, NIBS plans to host a follow-up workshop in 2024 and report agency progress with addressing seismic risk across their facility portfolio.

Call to Action: NIBS Calls for Congressional Leadership on Natural Disaster Resilience

For the past two decades, development of codes and standards to advance design and construction practices of lifeline infrastructure has been woefully overlooked, making communities across the nation susceptible to devastating consequences from natural hazards. It is imperative for policymakers and regulatory agencies at multiple government levels, infrastructure owners and operators, researchers, and practitioners to collaborate, recognize interdependencies, and prioritize enhancements and associated investment in lifeline infrastructure.

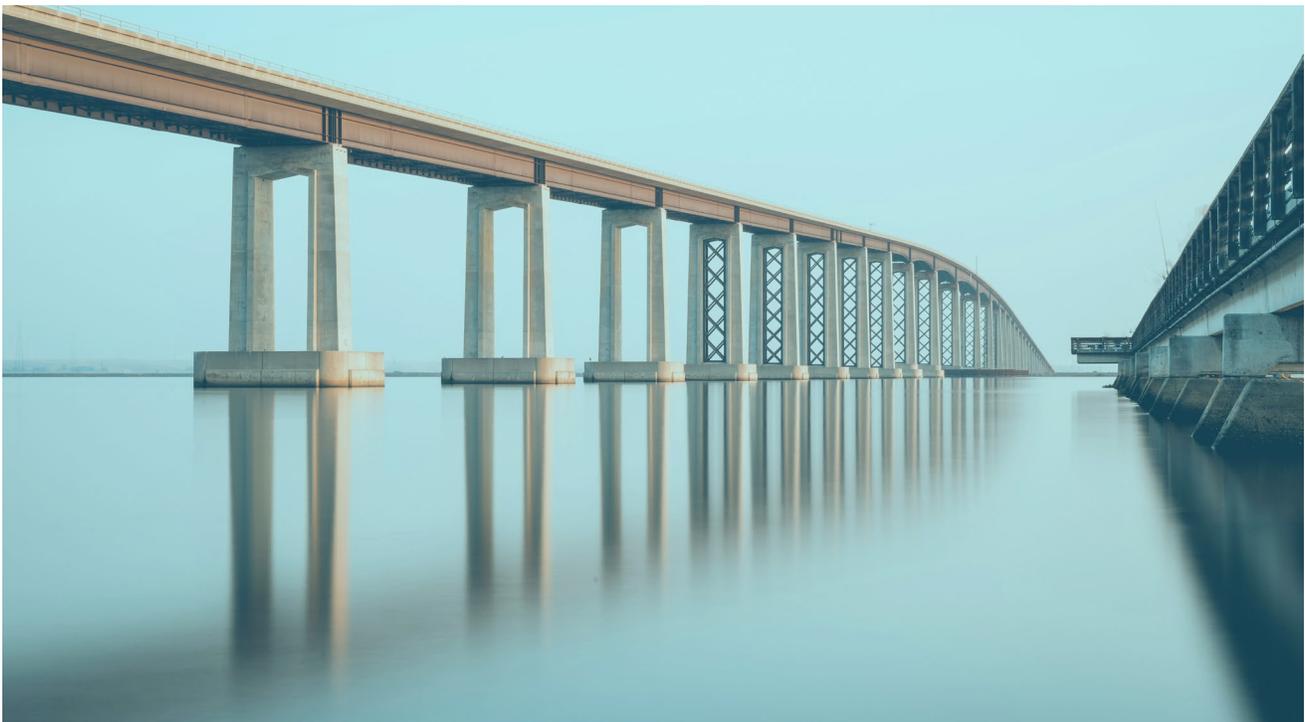
This issue is becoming even more critical, considering the increasing frequency and severity of natural disasters. Community resilience necessitates a unified vision for the future and a platform of diverse perspectives offering opportunities for comprehensive, synergistic, and sustainable solutions.

Urgency especially is required given the historic infrastructure investments made possible by the 2022 Inflation Reduction Act. If a collaborative approach is not defined, data-informed design requirements will not be set forth for lifeline infrastructure, and the promised investments under the act will fail to fulfill their true potential benefit to the American public.

NIBS' Strategic Focus on Lifeline Infrastructure

To help shape and influence future policy and practices with respect to enhancement of lifeline infrastructure resilience and reliability, NIBS leadership has been working with the BSSC and MMC to establish a national lifeline resilience organization since 2022.

On September 1, 2023, the 100-year anniversary of the devastating 1923 Great Kanto Japan earthquake, NIBS officially launched the Lifeline Infrastructure Hub to help the nation with community resilience and recovery after disasters.





The objectives of the NIBS Lifeline Hub include:

- Serve in a coordinating role to forge and engage public-private partnerships across lifeline sectors for natural hazards, including hurricanes, earthquakes, tsunamis, floods, wildfires, and future extreme weather events
- Understand the fundamentals of lifeline infrastructure systems, plus identify gaps and cost-effective ways to mend gaps in lifeline resilience
- Prioritize investments and improvements in the technology and policy realms that are most needed to enable lifeline infrastructure in all communities to improve disaster resilience and modernization

2023 NIBS Lifeline Activities and Initiatives

To prepare for resilience improvement among the public and private sectors, NIBS launched several initiatives in 2023 to ensure lifeline infrastructure is prioritized within community resilience investments.

Each initiative fills a necessary gap by ensuring the nation is better prepared to meet communities' expectation for recovery after natural disasters, as identified in the NIBS strategic plan.

These initiatives include:

- **Introduction of the Lifeline Infrastructure Hub to members of the Building Seismic Safety Council.** On November 9, 2023, NIBS officially introduced the Lifeline Infrastructure Hub to members of the BSSC at its first council meeting of fiscal year 2024. The Hub is a platform that fosters collaboration among lifeline infrastructure industry experts, stakeholders, and policymakers. Objectives for the new initiative include serving as a convener to establish private and public partnerships, building a fundamental understanding of current lifeline infrastructure vulnerabilities and potential cascading failures due to their dependencies, and prioritizing investments and policies for resilience improvement and modernization of lifeline infrastructure.

To inform the direction of the Lifeline Infrastructure Hub, the BSSC and MMC have joined efforts to form a Lifeline Advisory Panel. Comprehensive details for this initiative, can be found on the Lifeline Infrastructure Hub's website.

Call to Congress: Through consensus procedures, Congress must enable partnerships to develop lifeline performance targets consistent with the services needed by their customers/users after natural disasters. Unlike the model building code community, which has advanced building safety for the past 40 years, lifeline model codes have been neglected for the past 20 years. NIBS calls for congressional leadership to reinstate the development of lifeline infrastructure guidelines and standards for the safety of the American people and economical vitality.

- **BSSC/MMC Joint Policy Task Group Educates Congress on Disaster Risk Reduction Programs.** In September 2023, BSSC and MMC leadership formed a policy task group to support the reauthorization of the National Earthquake Hazards Reduction Program (NEHRP). The task group developed educational materials to explain how insufficiently funding infrastructure initiatives threaten life safety and community disaster preparedness. Going forward, educational materials can be used to aid the Office of Management and Budget's mission of addressing its building assets' seismic deficiencies. The goal of the task group in 2024 will be to transition efforts to other resiliency programs, such as the National Wind Impact Reduction Program (NWIRP) and Tsunami Warning, Education, and Research Act (TWEREA).

Call to Congress: Contrary to common belief, earthquake hazards are a national problem. In April 2023, the USGS published the Hazus Estimated Annualized Earthquake Losses for the United States Report, which declared half of the population lives in a high seismic zone and estimated the U.S.'s building asset exposure to earthquake hazards at \$107.8 trillion.

According to the 2019 NIBS Natural Hazard Mitigation Saves Report, since its creation 30 years ago, NEHRP has been responsible for developing enhanced earthquake design requirements, which saved \$7 billion per year of new construction while only adding \$600 million annually in construction cost (for a benefit-cost ratio of 12:1). NEHRP agencies (NIST, FEMA, USGS, and NSF) collaborate to inform the source material for the nation's model building codes by contributing state-of-the-art research and regularly updated earthquake ground motion and hazard maps. Therefore, urgent action is needed to reauthorize NEHRP to continue on the path for safe, earthquake resilient buildings.

However, the current legislation neglects to include directed funding for lifeline infrastructure performance goals. Confirming this gap, the NEHRP Advisory Committee on Earthquake Hazards (ACEHR) recommended to restore its commitment to lifeline infrastructure and "re-energize the American Lifelines Alliance."



Transformational Building Sciences and Technologies

Benefits of Building Technology: Efficiency, Productivity, Savings, and Profitability

For decades, NIBS has been on the forefront of innovation, transformative building technology, and standards.

NIBS began its support of a national computer-aided design (CAD) standard, for example, in 1997.

The United States National CAD Standard® (NCS) effort began with a memorandum of understanding between NIBS, the Construction Specifications Institute, American Institute of Architects, Sheet Metal and Air Conditioning Contractors' National Association, United States Army Corps of Engineers, U.S. Coast Guard, and General Services Administration.

Today, NCS coordinates the efforts of the building design and construction industry by classifying electronic building design data consistently, allowing streamlined communication among owners and design and construction project teams. It is the only comprehensive standard for facility planning, design, construction, and operation drawings. It incorporates several industry publications – the AIA's CAD Layer Guidelines, Construction Specifications Institute's Uniform Drawing System (Modules 1-8), and NIBS' BIM Implementation & Plotting Guidelines.

United States National CAD Standard® – Version 7 Progress

In 2023, the Building Information Management (BIM) Council's NCS Steering Committee completed its review and reorganization of the seventh version of the standard. The changes and global updates submitted for approval of the NCS Project Committee in late 2023 were approved by a majority of the committee members.

To help make the United States National CAD Standard® (NCS) a unified standard and make presentation of the materials easier to read and understand, the NCS Steering Committee edited and, in some cases, performed editorial rewrites on parts of the document.

Major updates included:

- Clearer presentation of normative (required for NCS compliance) portions of the NCS and other portions, including highlighting and formatting of normative requirements.
- Minor changes to language in those sections to clarify normative requirements for NCS compliance and differentiate from optional recommended practices.
- Removal of references to constituent documents (i.e., Uniform Drawing System, AIA CAD Layer Guidelines, etc.) in favor of consistent references to NCS throughout.
- Updates and rewrites to most sections that discussed technology to bring current and remove outdated practice and references (i.e., eight-character file names with three-character extensions).
- Deprecated sections containing references to manual drafting.
- Simplified sentence structure by removing passive voice, breaking up run-on sentences, and inserting imperative or declarative voice, where appropriate.
- Edits to words and grammar to correct longstanding issues.

2024 will focus on the release of the online NCS standard currently scheduled for delivery in 2024.



Digital Transformation to Revolutionize the Building Industry

According to a Yahoo! Finance story entitled [Emerging BIM Standards Promise to Bolster AEC Efficiency](#), architecture, engineering and construction (AEC) firms would be “wise to adopt standardized approaches to building information modeling (BIM) now that it is becoming an expected—or even government-mandated—part of their projects, advised BIM specialists from HFA Architecture + Engineering.”

The story continued: “Researchers at the National Institute of Building Sciences already are developing such standards in a bid to spur greater BIM adoption in the United States, noted Jesus Reyna, a Senior BIM Application Specialist at HFA, in a webinar.

“They have done this independently,” he explained, “but now they have a new standard coming out in collaboration with professional organizations like ASHRAE, AIA, BIM Forum, and the International Organization for Standardization or ISO.”

This is just one more way in which AEC firms can maximize the efficiency of their projects and operations, the story explained.

Launching the National BIM Standard – United States™ Version 4

At Building Innovation 2023, NBIMS leads launched the latest version of the National BIM Standard – United States™.

“This isn’t just a new progression,” said John Messner, Chair of the National BIM Standard - US™ Planning Committee (PLC) and Architectural Engineering Professor with Penn State University, during a BI2023 session in September. “This is a new direction for the National BIM Standard. The challenge was how to develop clear, industry-focused standards and guidelines for facilities, including buildings and infrastructure. There was lots of debate on language.”

NBIMS v4 is very different than our previous versions of NBIMS, Messner said.

In 2023, the NBIMS-US™ PLC completed work on the next edition of the standard with workgroups creating modules for Project BIM Requirements, BIM Execution Planning, BIM Uses, and Construction to Operations information exchange (COBie), a digital format for project information handover. Website enhancements for the updated standard have continued into early 2024.

Partnerships to Support the Advancement of Standards

Continuing the longstanding partnership with ASHRAE, work was completed on the joint ANSI/ASHRAE/NIBS Standard 224 – 2023 Standard for the Application of Building Information Modeling. The standard provides minimum requirements for facility owners for the application of building information modeling (BIM) to the planning, design, construction, and operation of facilities, including buildings and infrastructure. It is based on the National BIM Guide for Owners and is closely integrated with the National BIM Standard, U.S. modules.

In June, NIBS partnered with buildingSMART USA (bSUSA) and buildingSMART International (bSI) in separate memorandums of understanding to support the use of open standards and help improve efficiency in the construction industry.

NIBS and bSUSA signed a three-year agreement to collaborate in the promotion and support of standards, interoperable solutions, and digital work practices to overcome inefficiencies across the U.S. built environment. The goal: To advise and educate groups on the benefits of adopting open data and national standards.

These groups include national infrastructure organizations, industry experts, state and local port and transportation owners/operators; corporate and government building owners; industry stakeholders, including architects, engineers, contractors, owners, and operators; academia and researchers; and solutions providers and public officials.

With bSI, NIBS aims to support the digital transformation of the U.S. and global construction industry.

Highlights of the agreement include NIBS' support of the adoption of IFC and other open data standards in NBIM-US™. NIBS also will assist in promoting U.S. government, industry, and academia representation to support bSI and participate in projects to ensure U.S. industry requirements are being voiced and addressed.

Formation of a New Digital Twin Integration Subcommittee

Digital twin technology has received a great deal of attention in recent years.

According to McKinsey & Company, a digital twin is a “digital representation of a physical object, person, or process, contextualized in a digital version of its environment. Digital twins can help an organization simulate real situations and their outcomes, ultimately allowing it to make better decisions.”

In 2023, the BIM Council launched a new Digital Twin Integration Subcommittee (DTI-S).

The DTI-S was formed to identify the relationship between BIM and digital twins for the built environment. The subcommittee worked throughout 2023 to develop a position paper that's scheduled for release in 2024.

U.S. National BIM Program: Expanding on Needed Standards

The U.S. National BIM Program expands on standards and the change needed in practices to support their adoption and use to transform the building industry.

The National BIM Program Steering Committee supports the NBP's implementation and adoption by building and infrastructure asset owners and brings together many related initiatives and stakeholder groups working on standardized data formats and processes in the U.S. It is comprised of representatives of public and private asset owners, design and construction organizations, and academia.

In 2023, the steering committee began execution of the NBP Implementation Plan and formed three of six workstreams.

The Owner Leadership, Standards and Guidelines, and Stakeholder Engagement workstreams began to identify necessary work to drive digital transformation in the industry. The work includes engaging stakeholders with meaningful value proposition statements on technology adoption, research on the current level of adoption, and bridging gaps between national and international standards and efforts. The formation of three remaining workstreams are planned

U.S. National Building Information Management Program

Learn about our program and be part of the community advancing technology in the built environment.

Take the next steps:

-  Read the program summary
-  Read the implementation plan
-  Sign the pledge

National Institute of BUILDING SCIENCES usbimprogram.nibs.org

for 2024: Project Delivery, Education and Training, and Legal and Insurance.

U.S. Strategic Plan for Off-site Construction

NIBS, with MOD X, continued to work on a competitive solicitation by the U.S. Department of Housing and Urban Development to develop an Offsite Strategic Plan for fostering growth and advancement in the U.S. industrialized construction (IC) sector.

The overall objective of this study is to assess the past, present, and potential future roles of Federal agencies in facilitating and accelerating growth in the domestic IC sector to respond to the dual challenges of housing affordability and climate change.

The 18-24 month project consists of three phases:

- **Phase 1:** Study the Federal Government’s direct and indirect roles in U.S. IC by identifying and evaluating the costs of past and present domestic IC initiatives and programs, especially HUD’s Operation Breakthrough, and assessing their impacts on housing delivery at various scales.
- **Phase 2:** Perform comparative studies of international IC programs and initiatives in Sweden, Japan, and the United Kingdom to identify and analyze key public, private, and non-governmental actions that have moved the IC industries forward in each country.
- **Phase 3:** Facilitate three workshops to analyze and compare domestic and international lessons learned and develop an Offsite Strategic Plan of actionable and sustainable strategies and tactics for HUD, other Federal agencies, local governments, universities, businesses, and other stakeholders to foster growth and advancement in of the U.S. IC housing sector.

In February 2023, HUD, in partnership with NIBS and MOD X, released the Offsite Construction for Housing: Research Roadmap, a strategic report that presents the key knowledge gaps and research needs to overcome the barriers and challenges to offsite construction.

What’s in The Offsite Construction for Housing: Research Roadmap

The Research Roadmap was developed by a Project Technical Committee chaired by MOD X and composed of national and international stakeholders and cross-sector experts.

It covers six topical areas in need of coordinated research efforts, with sub-topics and specific research questions listed to help answer the knowledge gaps:

- Research Topic 1: Regulatory and Policy Framework.
- Research Topic 2: Standards and System Performance.
- Research Topic 3: Capital, Finance, and Insurance.
- Research Topic 4: Project Delivery and Contracts.
- Research Topic 5: Labor and Workforce Training and Management.
- Research Topic 6: Business Models and Economic Performance.



Strategies to help GSA Minimize Carbon Expenditures

Many of the projects NIBS worked on for the General Services Administration in 2023 centered on developing and using tools and strategies to help GSA minimize carbon expenditures in its new and existing buildings.

For example, the Net Zero Study project investigated the technical feasibility, lifecycle costs, and regional considerations required to fully electrify GSA's federally-owned building portfolio and make recommendations for selecting and prioritizing investments to minimize operational greenhouse gas (GHG) emissions and reach net-zero energy throughout the portfolio. Another prominent project had NIBS and consultant AECOM developing a tool to enable early design calculations of carbon expenditure throughout the total cost of ownership of a project.

In addition to carbon-centered projects, NIBS worked with industry experts to update GSA's existing fire protection specifications to incorporate state-of-the-art technologies and methodologies.

Evaluating Federal Buildings for GSA

The General Services Administration POE Program for 2023 conducted post-occupancy evaluations (POEs) on six GSA-owned buildings to enable GSA to improve design, construction, and operations for the Federal building stock, existing and future.

Using a multidisciplinary team of subject matter experts, the POE team evaluates in-use buildings and their surrounding sites in terms of structural, mechanical, architectural, interior, and lighting and energy performance, including the use of innovative practices and technologies.

In these evaluations, the team collects firsthand data through direct observations and on-site interviews to determine how an existing GSA facility actually is functioning.

In 2023, the team, per GSA's request, concentrated on land ports of entry, including facilities in Warroad, Minnesota; Calexico and San Ysidro, California, and Derby Line, Vermont. The team rounded out the year with evaluations of Federal office buildings in Houston and Woodlawn, Maryland.

Improving Design Criteria for FBI Facilities

As part of the GSA Cost Studies Projects, NIBS worked on a number of projects used by the General Services Administration to help the agency, its regional divisions, tenants in Federal buildings, and its myriad A/E contractors understand and manage the costs of designing and operating Federal Buildings across their lifecycle by updating and improving the data and tools available to the agency.

In 2023, the cost-study projects centered on updating the National Cost Management Tool (NCMT) used for planning, estimating, tracking and reconciliation; and developing project benchmarking tools and improving design criteria for FBI facilities.

Strategic Prioritization of Capital Investments for Military Healthcare Facilities

In 2023, NIBS completed its multi-year project to assist the U.S. Department of Defense (DoD) Defense Health Agency (DHA) with the planning, administration, and implementation of DHA's strategic process for prioritizing capital investment requirements across military healthcare facilities, an initiative known as the Capital Investment Decision Model (CIDM).

The CIDM process combines real property data sets with expert evaluation of the contributions made by medical

facilities towards DoD’s operational and strategic priorities and uses a facilitated scoring process to inform planning for future construction and renovation projects throughout the Military Health System.

NIBS supported execution of the eighth and final prioritization event and provided guidance and recommendations to DHA for the upcoming CIDM endeavors.

Migrating to the Government Cloud

This past year, the U.S. Department of Veterans Affairs’ cloud cybersecurity team and NIBS’ subcontractor, OM Group, worked on the continued migration of ProjNet.org™ to the Microsoft Azure Government (MAG) cloud as a FedRAMP moderate certified application.

The ongoing FedRAMP certification is anticipated to be completed in late winter-early spring 2024.

In September 2023, the NIBS Board of Directors approved the modernization of ProjNet as a 2024 NIBS strategic initiative. The overall 14-month effort will be focused on developing the ProjNet applications on a modern platform.

The redesign of ProjNet in a cloud-native environment will increase application efficiencies, improve system reliability and availability, and enhance the ProjNet’s security posture. The modernized ProjNet will be delivered to end-users as a single release.

Functional improvements, such as application evolution and RESTful API integration options, will be performed in the modern ProjNet application.

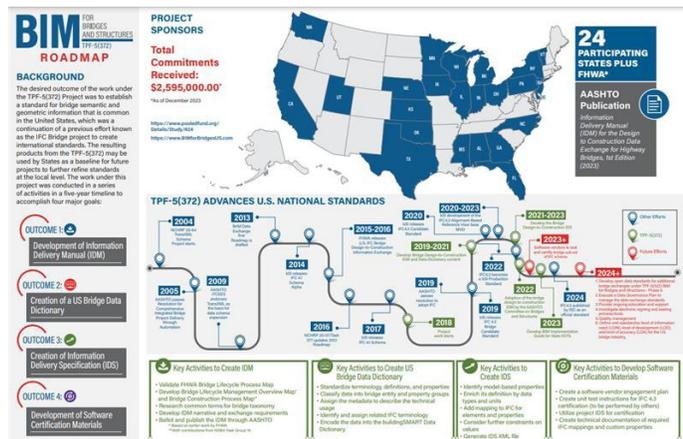
Better Building Information Management for Bridges and Infrastructure

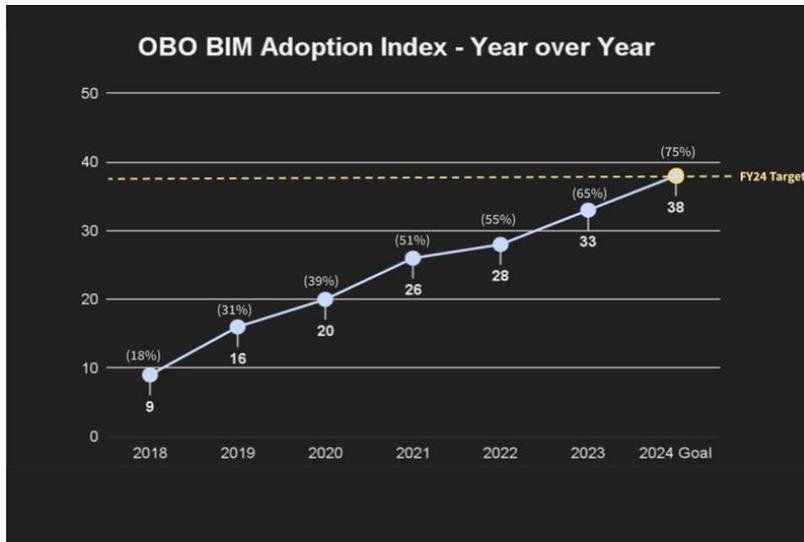
NIBS continued its support of bridge modeling standardization as part of the AASHTO BIM for Bridges pooled fund project TPF-5(372) in 2023. In the final year of Phase 1, work to implement the buildingSMART/ISO Industry Foundation Class standard-based Design to Construction exchange moved to implementation in leading bridge modeling software systems to support adoption by state departments of transportation.

NIBS will continue to provide support and guidance to implement and expand the use of standards in a Phase 2 effort beginning in 2024 to continue supporting adoption and to expand into other phases of the bridge lifecycle. In 2024, NIBS looks forward to continuing to advance shared BIM practices in the building and transportation sector by working with the Federal Highway Administration in the ongoing development of a National BIM Transportation Library to augment the Pooled Fund efforts to advance bridge modeling.

Advancing Building Information Management for Department of State Facilities Worldwide

The Department of State, Bureau of Overseas Buildings Operations (OBO) continued working with NIBS to mature its use of building information modeling and management (BIM) to support facility planning, design, construction, and operations at U.S. diplomatic facilities around the globe.





With support from the NIBS BIM team working with OBO cost, design and construction teams, BIM standards are now embedded into the capital projects process from programming to turnover.

NIBS and OBO collaborated on developing OBO’s BIM Roadmap, which, beginning in 2017, outlines major milestones for OBO to achieve its goals in better leveraging BIM. This partnership has continued to grow enabling OBO to make sustained progress in BIM implementation maturity across the facility lifecycle.

Support for OBO’s ongoing adoption of new enterprise level systems for project delivery and asset management helped ensure that BIM is incorporated into these implementations and that the models and data produced during projects are accessible to stakeholders throughout the life cycle of a facility. The BIM program’s focus on acquiring and using building data and processes has contributed to a bureau-wide process improvement effort focused on integrating process, data, technology, and change into the organization’s operations.

NIBS will continue to support implementation of BIM uses and business processes for planning, design, construction, and operations at OBO following the OBO strategic BIM Use Roadmap in 2024.



Industry Development and Diversification

A Closer Look at Housing Affordability

The NIBS Consultative Council in November held a full-day public hearing, bringing together veteran building industry experts to discuss housing affordability.

Speakers came from academia, organized labor, think tanks, and research consultancies. The event consisted of three parts:

- State of Housing Affordability
- Examining Solutions – Innovation and Best Practices
- Examining Solutions – Means and Methods

Affordable housing generally is defined as housing where the occupant pays no more than 30% of gross income for housing costs, including utilities. According to Pew Research Center, a rising share of Americans say the availability of affordable housing is a major problem in their local community.

In October 2021, about half of Americans (49%) said this was a major problem where they live, up 10 percentage points from early 2018. In the same 2021 survey, 70% of Americans said young adults today have a harder time buying a home than their parents' generation did.



Housing Affordability is an Everywhere Problem

While there's ample motivation to fix housing affordability, it's taken the country decades to get here. The road forward isn't easy to navigate.

"This is no longer an issue of the poor," said Chris Herbert, PhD, Managing Director with the Joint Center for Housing Studies of Harvard University, during the hearing at the National Press Club in Washington. "Affordability has gotten worse for working families. This has changed the conversation around rental affordability, and people are spending excessive amounts for rental housing."

Those in the labor force – fully employed individuals are the most affected by the cost of housing. What's more – middle- and lower-income households are severely impacted by the cost of rental housing.

The ones most likely to stretch? First-time homebuyers.

The results of the public hearing are detailed in the 2024 Moving Forward Report.

Built Environment Workforce Report: 63% Say It's Important to Increase Diversity

In 2023, NIBS partnered with Avenue M Group and nearly 30 agencies to take the pulse on industry diversity, equity, and inclusion.

The 2023 Built Environment Workforce Survey is extensive and includes a breakdown of the definition of diversity. More than seven in 10 respondents included race (75%), ethnicity (74%), gender (73%), and age (71%) in their definition of diversity within the context of the built environment.

Nearly two-thirds (63%) of respondents said it's important to increase diversity of the built environment. And overall, younger respondents—aged 39 or younger (68%) and aged 40 to 49 (66%) — as well as women (79%) were more likely to indicate the importance with regard to increasing diversity.



2023 Social Equity in the Built Environment Workforce Survey



More than seven in 10 respondents defined diversity as race (75%), ethnicity (74%), gender (73%), and age (71%).

 National Institute of BUILDING SCIENCES™ nibs.org/about/diversity-inclusion

2023 Social Equity in the Built Environment Workforce Survey

The workforce:

- The majority of respondents are full-time employees (73%), and about half (51%) have been in the built environment for more than 20 years.
- More than two-thirds (68%) of respondents were men, and about three in 10 (31%) were women.

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Workforce Survey Highlights

More than two-thirds (68%) of respondents to the 2023 Built Environment Workforce Survey were men and about three in 10 (31%) were women.

Other highlights include:

- More than four in five (82%) identified as White and/or a person of European descent. Seven percent of respondents identified as Hispanic and/or Latina/Latino/Latinx; 4% identified as Black, African American, and/or a person of African descent; 4% identified as East Asian; and 3% identified as Native American, Alaska Native, First Nations, Métis, and/or Inuit.
- Sixty-seven percent of respondents work in private industry or business.
- The majority said they are employed full-time (73%), and about half (51%) have been in the built environment for more than 20 years.
- With regard to discrimination, almost one-third (32%) indicated they have experienced discrimination or prejudice based on age.
- Around two-thirds (67%) of women indicated they have experienced discrimination or prejudice in the built environment based on gender.

Participants and Partners in the Workforce Survey

An initiative of the NIBS Consultative Council, the first Built Environment Social Equity Survey was released in May 2021.

In 2023, participating organizations included The American Association of Blacks in Energy; The American Institute of Architects; American Institute of Steel Construction; American Society of Civil Engineers; American Society of Landscape Architects; ASHRAE; Association of Equipment Management Professionals; ASTM International; BOMA International; Building Talent Foundation; Construction Management Association of America; Construction

Specifications Institute; Design-Build Institute of America; Green Building Initiative, Inc.; International Code Council; International Institute of Building Enclosure Consultants; Midwest Energy Efficiency Alliance; National Apartment Association; The National Association of Hispanic Real Estate Professionals; National Building Museum; New Buildings Institute; Northwest Energy Efficiency Council; Phius (Passive House Institute US); Ready Mixed Concrete Research & Education Foundation; Royal Institution of Chartered Surveyors; and the U.S. Green Building Council.

Supporting Federal Energy Management Training

NIBS continued its important work in support of the U.S. Department of Energy's Federal Energy Management Program (FEMP).

FEMP serves as the primary Federal support program for the Federal agency energy and facilities managers. The NIBS team supports the FEMP Training Program in multiple ways, including managing and hosting the learning management system for the FEMP Training Program.

In 2023, the NIBS team supported FEMP's successful Application for Reaccreditation to the International Association for Continuing Education and Training (IACET). The FEMP Training Program has been accredited by IACET since 2013, with NIBS successfully managing the program's accreditation including two applications for reaccreditation. In 2023, NIBS supported a second successful 14-month reaccreditation effort, with FEMP receiving high marks from IACET reviewers for the quality and rigor of its training program.

Highlighting Workforce Collaboration

2023 marked the fifth year of NIBS' work with the University Research Institute (URI) on a study of collaborative analytics for the U.S. Army Corps of Engineers.

Highlighting the importance of collaboration within the workforce, the study employs monthly surveys to measure and predict the performance of various team members on the Fort Leonard Wood Hospital construction project in Kansas City, and immediately alerts Corps project managers when a conflict occurs or is about to occur. Due to the success of the project, which centers on the Fort Leonard Wood hospital construction project, the Corps signed up NIBS and URI to take an additional nine months with the project.

Industry Engagement

The background features a dark blue field on the left. On the right, there are two overlapping geometric shapes: a light blue triangle pointing downwards and a green triangle pointing upwards. The text 'Industry Engagement' is positioned in the upper left area, overlapping the dark blue background.

Association Collaboration

The National Institute of Building Sciences brings together a variety of interests from across the building industry. Our mission is to serve the public interest by advancing building science and technology to improve the built environment. Each organization and association represent a vital piece and specific constituency of the greater building sciences map.

American National Standards Institute/American Society of Heating, Refrigerating and Air-Conditioning Engineers/NIBS Standard 224-2023 -

Building on the National BIM Guide for Owners, NIBS and ASHRAE completed the transition from a guide document to develop an ANSI-approved standard for owners to foster digitalization of information about buildings and civil engineering works, including building information modelling (BIM). The standard was published on Oct. 11, 2023.

Building Enclosure Technology and Environment Council -

BETEC members virtually networked to continue work on rebuilding sections of the Whole Building Envelope Guide (part of the Whole Building Design Guide), including teaming up with the Air Barriers Association of America, International Masonry Institute, and Glass Association of North America.

buildingSMART International/buildingSMART International U.S. Chapter -

NIBS and buildingSMART International and buildingSMART USA developed and released an MOU aimed at working together on the development and adoption of BIM and related technology standards in the U.S.

Design Build Institute of America (DBIA) -

NIBS continued discussions with DBIA on involvement in the U.S. National BIM Program and a possible MOU.



NIBS Events: In-Person and Webinar Events Abound in 2023

It was an active year with NIBS in-person and webinar events. These include:

Social Equity in the Built Environment Roundtable, Hybrid Workshop. On January 18, NIBS hosted 30 built environment executives at NIBS headquarters in Washington, DC, to discuss and define social equity in the built environment. The roundtable was an initiative of the Consultative Council. Moderators Glenn and Dan Tecker, of Tecker International, carried participants through some exercises to develop an envisioned future of the built environment. These exercises involved breaking out into four different groups to discuss the following: The year is 2033, and we have achieved a socially equitable built environment. Breakout groups had to answer the following questions: What does it look like? For whom is it different? What will be the benefit to them? With the answers to these questions, participants were able to extract a set of long-term goals and high-level commitments.

MMC and BSSC Resilience Workshop with Federal Agencies and Partners, Hybrid Workshop. In March, the Multi-Hazard Mitigation Council and Building Seismic Safety Council convened a workshop that focused on federal agencies' needs around seismic resilience and readiness. Breakout sessions included the evaluation and retrofit of existing federal buildings and the functional recovery of new and existing buildings to decrease downtime after a seismic event.

Women Executives in Building Symposium, In-Person Conference. On May 24, NIBS hosted female leaders from all sectors of the built environment for a one-day Women Executives in Building Symposium. Highlights included: Natasha Daley, editor with the National Geographic, speaking about building a personal brand through social media; Daley spoke about having clear objectives about why you are on social media, choosing the correct platforms, and being authentic, and a fireside chat featuring several industry veterans and NIBS board members, including Anne Ellis, Evelyn Fujimoto, Sandra Benson, and Kimberly Jones. The group addressed “Being the Only Woman in the Room” and covered many issues, including mentorship, navigating obstacles, how to drive change, and the importance of being a strong problem solver. Symposium sponsors included Delta Controls, 84 Lumber, Compass Datacenters, Daikin U.S., and Green Building Initiative.

Social Equity & Workforce Development Workshop, Hybrid Workshop. NIBS held a workshop for building industry executives to discuss social equity and workforce goals on May 25. The workshop included three breakouts that focused on the development of three primary development goals: increasing access for individuals from low socio-economic backgrounds and communities to have greater opportunities in the built environment through employer-led internships, apprenticeships, and mentoring; creating a built workforce that is highly skilled, sustainable,

and match the demographics of our population; and embedding diversity, equity, inclusion, accessibility, belonging (DEIAB) and opportunity into all aspects of built environment operations, including full parity in workforce salaries, benefits, and work/life balance.

EV Revolution, GM RE100 Goal and General Motors Perspective, Webinar. On April 25, NIBS partnered with General Motors for a webinar entitled EV Revolution: GM RE100 Goal and the General Motors Perspective. The webinar focused on GM’s commitment to electric vehicles (EV) while working to



reducing the company's carbon footprint. GM's key efforts in electrification include a 4-pillar strategy to achieve the RE100 goal – a future with zero crashes, zero emissions, and zero congestion for EVs, and various technologies and services GM is launching. These efforts are in line with recent actions by Congress that include the Inflation Reduction Act, and the Infrastructure, Investment and Jobs Act.

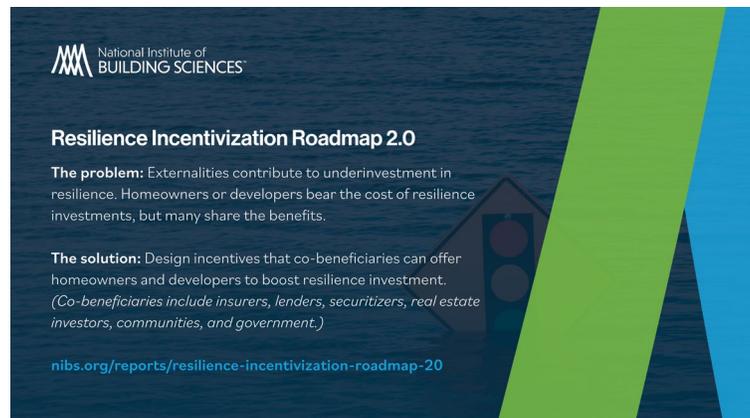
Total Cost of Ownership – Maintenance of Essential Data, Webinar.

The total cost of ownership (TCO) is an accepted approach to gather all costs associated with ownership of a facility over its lifecycle. Inputs to TCO are drawn from several sources and require transparency and collaboration. On June 1, NIBS hosted this webinar, which covered how TCO creates awareness of costs and commitments. The webinar was sponsored by the Facility Management and Operations Council.

2023 Existing Buildings Webinar Series. According to the 2022 Global Status Report for Buildings and Construction released at COP27, the building sector accounted for over 34% of energy demand and around 37% of energy and process-related CO2 emissions in 2021. With this, the report from the Global Alliance for Buildings + Construction (GlobalABC) states the gap between the climate performance of the building sector and the 2050 decarbonization pathway is widening. Building retrofits could be key to producing enormous environmental impacts compared with adoption of a sole focus on new green design and construction practices. In 2023, NIBS hosted three webinars that covered the hows and whys of retrofitting: Green Building Retrofits (July 12), Retrofitting for Resilience (October 24), and Building Technology and Retrofits (December 6).

Resilience Incentivization Roadmap 2.0, Webinar. On October 18, NIBS hosted a webinar on the Resilience Incentivization Roadmap 2.0, a report by NIBS and Fannie Mae released in September 2023. Roadmap 2.0 is the continuation of a 2020 study that called for public and private incentives allowing owners of buildings and other infrastructure to facilitate the upgrade of existing infrastructure and better design of new infrastructure. Led by the NIBS Multi-Hazard Mitigation Council's Committee on Finance, Insurance, and Real Estate (CFIRE), Roadmap 2.0 maintains the goal of having stronger and safer buildings and resilient communities by catalyzing collaboration across the building science, finance, insurance, and real estate industries; increasing mitigation investment; and developing coordinated resilience guidelines and tools for community implementation.

Consultative Council Housing Affordability Hearing, Hybrid Hearing. [See page 30 for details.](#)



Building Innovation 2023

Sessions: Digital Transformation, Workforce, and Resilience

The NIBS annual meeting – Building Innovation – saw hundreds of built environment professionals descend on the Washington Hilton in DC in September.

Educational sessions covered four tracks: building performance and sustainability, resilience, technology, and workforce.

Session highlights included:

- GIS-based Digital Twin Capabilities to Decarbonize the Built Environment
- The Intersection of AI and Building Sciences: A New Era of Intelligent Infrastructure
- A Retiring Facilities Management Workforce: Technology Strategies for Attracting and Onboarding a New Generation
- Deep Green, Market Rate, Net Zero: How ASHRAE’s New Global HQ Renovation Achieved All Three
- Designing for Our Future - Climate Forward Design
- BIM & Digital Twins: A Formal Position on Successful Integration for the AECO Industry

The Future of the Built Environment Workforce

A panel that discussed the future of the workforce kicked off the conference. Panelists included Nancy Novak, with Compass Datacenters; Peter Templeton, with the U.S. Green Building Council (USGBC); and Cheryl Lyman, with the Ohio Facilities Construction Commission (OFCC). Dr. Kimberly Jones, with Howard University and a member of the NIBS Board of Directors, served as moderator.



USGBC's Templeton said he reads about a workforce study nearly every day.

"I'm always trying to evaluate things in the context of these conversations," he said, mentioning the most valuable feedback comes from his team, who say retention comes down to engagement, pay and compensation, and work-life balance.

When it comes to promotions, Novak said Compass Datacenters has a unique way of handling things.

"We focus on the ability to be collaborative, have humility, and ask good questions," Novak said. "It's not necessarily about ticking off certain boxes. It's about using your community."

The New U.S. National BIM Standard V4

The National BIM Standard - United States Version 4 was softly launched during Building Innovation.

A session highlighting the standard was led by John Messner, Chair, National BIM Standard - US Planning Committee and Architectural Engineering Professor with Penn State University; Ralph Kreider, Associate Director, Berkeley Research Group; and TJ Meehan, with Cadd Microsystems

Session attendees learned why having a U.S. standard for building information modeling (BIM) is important and how it aligns with other international BIM standard efforts, such as ISO 19650 and the Industry Foundation Classes.

NBIMS v4 is very different than previous versions of NBIMS, Messner said.

"This isn't just a new progression," he said. "This is a new direction for the National BIM Standard. The challenge was how to develop clear, industry-focused standards and guidelines for facilities including buildings and infrastructure. There was lots of debate on language."



Advancements in Flood Resilience

Building Innovation attendees learned in the session, Advancements in Flood Resilience, that flooding is getting worse, despite our best efforts.

The nation's annual flood losses roughly are doubling per decade and now cost \$20 billion-plus a year.

In fact, John Ingargiola, with the Federal Emergency Management Agency, quoted a Zillow study that found 80 percent of homebuyers consider climate risks when buying a new home.

And while the nation's flood data also evolves, so must our building codes and standards, many of which haven't been updated in several years.

This becomes a land use issue.

"We're not having the conversations that we need to," said Chad Berginnis, CFM, Association of State Floodplain Managers.

Oregon State University Professor Dan Cox said he's seen some interesting case examples and successes. He talked about a grocery store that appeared to have a plain storefront but looked like an elevated parking garage in back.

"So, there are solutions out there," Cox said. "These are doable things for new construction or retrofit. I'm encouraged by some of the options out there."

NIBS Launches the Building Innovation Webinar Series

As part of NIBS' mission to continue education from the Building Innovation Conference, NIBS launched a webinar series to reach even more professionals on new technology, trends, groundbreaking tools, best practices, and workforce solutions.

This was our way of extending Building Innovation beyond the in-person meeting.

Webinar recordings allow built environment professionals to virtually access and learn from subject matter experts on a variety of topics.

In 2023, we hosted four webinars. They include:

- The Intersect of Resilience, Low-Embodied Carbon, and LCCA in Materials Selection (October 3, 2023)
- Accelerating Digital Transformation with the U.S. National BIM Program (November 9, 2023)
- Cyber-Impact Modeling (November 28, 2023)
- Innovations and Operations: Developments in Sustainable Precast Concrete (December 12, 2023)

Listen Up: NIBS Unveils the Building Innovation Podcast

NIBS joined the broadcast world with the launch of Building Innovation: The Podcast in summer 2023.

The podcast features Johnny Fortune, Executive Director of the National BIM Program, as host.

It educates the building industry on the latest challenges and emerging solutions, offers unique experiences and learnings from experts in the built environment, shares new insights from NIBS members, and continues growth of the built environment community.

Our guests and episodes included:

- Dr. John Messner, Chair of the National BIM Standard – United States (NBIMS). Messner dove into BIM, NBIMS V4, and challenges and opportunities facing the industry.
- Adam Matthews, Head of Global Digital Transformation at Connected Places Catapult, shared a global perspective on how digital technology standards for the built environment are being developed and implemented around the world.
- Kimon Onuma, President of Onuma Inc., discussed a range of emerging technologies such as artificial intelligence and digital twins and explored their impact on the built environment.
- Innovation catalyst Salla Eckhardt discussed how digital transformation is socially equalizing the construction industry and explored trends such as AI, smart cities, the metaverse, and data governance.

The podcast is available on various platforms, including Apple Podcasts, Spotify, YouTube, and more.



BUILDING INNOVATION THE PODCAST

NIBS Recognizes 2023 Built Environment Award and Scholarship Winners

On September 7, 2023, the National Institute of Building Sciences recognized building industry leaders and scholarship recipients, during a ceremony at Building Innovation.

NIBS serves the public interest by advancing building science and technology to improve the nation's built environment. Award winners are a direct reflection of this mission.

The 2023 award recipients were:

- NIBS Distinguished Service – **Dudley McFarquhar**, PhD, PE, VP & Partner, Stone Building Solutions and President, McFarquhar Group Inc.
- Exceptional Woman in Building – **Salla Eckhardt**
- Future Leaders – **Zahra Ghorbani**, BIM Manager, Office of Physical Plant, Department of Architectural Engineering, Penn State University
- NIBS Innovator – **Wildfire Prepared Home-Insurance Institute for Business & Home Safety**
- NIBS DEI Leadership – **Logan Herring**, Chief Executive Officer, The WRK Group
- Beyond Green™ High-Performance Building and Community Award – **Holabird Academy + Graceland Park O'Donnell Heights Elementary Middle School Zero Energy Schools for Baltimore City**
- Mortimer M. Marshall Lifetime Achievement – **David Bonneville**, Senior Principal, Degenkolb Engineers, Retired





NIBS also named two recipients of the Betty and Mort Marshall Memorial Scholarship, which was established to promote diversity in the building sciences and benefit students pursuing a career in architecture and engineering at a historically Black college or university.

The scholarship was started in 2020, in memory of the Marshalls. Mort was the first NIBS member.

The 2023 scholarship recipients were **Evan Cage**, an architecture student at Morgan State University, and **Onye Andrus**, an aerospace science engineering student at Tuskegee University. Each student received \$5,000 toward their tuition.

NIBS Councils

BETEC

The **Building Enclosure Technology and Environment Council (BETEC)** fosters a better understanding of how building components interact with each other and with the environment in order to optimize energy use and minimize carbon expended.

In 2023, BETEC members continued efforts to bring more building science education into school curricula and created a building sciences education workshop to be presented at the Building Enclosure Science and Technology (BEST6) conference in spring 2024.

BETEC is happy to report that one of its founding members, Dudley McFarquhar, PhD, PE, VP & Partner, Stone Building Solutions and President, McFarquhar Group Inc., received the NIBS 2023 Distinguished Service Award. This award is presented to an individual or organization member who has made a substantial contribution in support of the mission, goals, and objectives of NIBS.

Chair: Stephen Shanks, Chief Operating Officer, CTI Consultants Inc.

Vice Chair: Dudley McFarquhar, PhD, PE, Owner, McFarquhar Group Inc.

Members-at-Large: Theresa Weston, President, The Holt Weston Consultancy, LLC;

AIA Liaisons: Will Babbington, Principal, Facade Design Director, Studio NYL; Lane Beougher, FAIA, FCSI, LEED AP BD+C, Program Manager, Ohio Facilities Construction Commission

NIBS Staff: Stephanie Stubbs, Vice President, Technical Solutions

As of October 2023:

Chair: Dudley McFarquhar, PhD, PE, Owner, McFarquhar Group Inc.

Vice Chair: Keith A. Simon, FAIA, Senior Architectural Consultant/Principal, Terracon

Board Liaison: Justin Boone, AIA, Wiss, Janney, Elstner Associates, Inc.

AIA Liaison: William Babbington, AIA, Principal, Studio NYL

BECs

The **Building Enclosure Councils (BECs)**, created in 2004 as a joint venture between The American Institute of Architects and NIBS under the aegis of BETEC, has grown from seven to 34 local chapters that carry out BETEC's mission and support some 4,000 members.

This year saw a return of in-person meetings and conferences for a growing number of BEC chapters as virtual meetings continued their popularity. As an example, NIBS staff members took part in a live panel discussion on BETEC, and the BECs have been working in tandem throughout 2023 to restore the Building Enclosure Science and Technology (BEST) Conference series. BEST6 took place March 18-20, 2024, in Austin.

BEC National Chair: John Burningham, Principal, UNVCYL

BEC National Vice Chair: Amrish Patel, Senior Project Manager, SG&H

NIBS Staff: Stephanie Stubbs, Vice President, Technical Solutions

NBP Steering Committee

National BIM Program Steering Committee – The U.S. National BIM Program (NBP) expands on needed standards, supporting their implementation and adoption by building and infrastructure asset owners and bringing together the many related initiatives and stakeholder groups working on digital transformation in the U.S.

The NBP Steering Committee, which is comprised of representatives of the public and private asset owners, design and construction organizations, and academia, began execution of the NBP Implementation Plan and began the formation of workstreams.

The Owner Leadership, Standards and Guidelines, and Stakeholder Engagement workstreams were formed and began to identify necessary work to drive digital transformation in the industry. The work includes engaging stakeholders with meaningful value proposition statements on technology adoption, research on the current level of adoption, and bridging gaps between national and international standards and efforts. Three remaining workstreams are planned for 2023: Project Delivery, Education and Training, and Legal and Insurance.

NBP Steering Committee:

Andy Blackmore, U.S. Department of State, Bureau of Overseas Buildings Operations

Salla Eckhardt, Chair, SEE Bright

Paul Audsley, NBBJ

Luciana Burdi, Massachusetts Port Authority

Jason Fairchild, U.S. Army Corps of Engineers

Charles G. Hardy, U.S. General Services Administration, Public Building Service

Michael Kennerly, Iowa Department of Transportation

Hannu Lindberg, DPR Construction

Jagannath Mallela, WSP

Russ Manning, International Code Council

Katherine Petros, Office of Infrastructure Research and Development, Federal Highway Administration

Ivan Panushev, Stealth Mode Startup Company

Will Sharp, HDR

Grace Wang, Google

Workstream Leads:

Stakeholder Engagement: Alex Belkofer, McCarthy Building Companies, Inc.

Standards and Guidance: John Messner, Penn State

Owner Leadership: Grace Wang, Google

NIBS Staff:

Roger J. Grant, FbSI, Vice President, Building Technology; Johnny Fortune, PhD, Executive Director, National BIM Program

BSSC

The **Building Seismic Safety Council (BSSC)** manages complex technical, regulatory, social and economic issues involved in developing and promulgating building earthquake risk mitigation provisions that form the source material for the nation's model building codes.

The council convenes the top seismic experts from across the United States as well as relevant public and private interests to resolve issues related to the seismic safety of the built environment through authoritative guidance and

assistance backed by a broad consensus. It enhances public safety by providing a national forum that fosters improved seismic planning, design, construction and regulation in the building community.

BSSC was established in 1979, as one of the important initiatives under the National Earthquake Hazards Reduction Program (NEHRP).

Chair: Kent Yu, PhD, SE, Principal, SEFT Consulting Group

Vice Chair: Joann Browning, PhD, P.E., Dean, College of Engineering, University of Texas, San Antonio

Secretary: Iris Tien, PhD, Williams Family Associate Professor, Georgia Tech

Members-at-Large: Roberto Leon, P.E., PhD, Professor, Via Department of Civil and Environmental Engineering, Virginia Tech; Bill Earl, S.E., P.E., National Structural Engineering Program Manager, GSA

Past Chair: Charles J. Carter, SE, PE, PhD, President, American Institute of Steel Construction

Board Liaison: Sez Ratamturktur Russcher, PhD, Associate Vice President, Charleston Innovation Centers (Clemson University Restoration Institute Campus)

NIBS Staff: Jiqui (JQ) Yuan, PhD, P.E., PMP, Chief Resilience Officer and Head of Engineering, Executive Director, Multi-Hazard Mitigation and Building Seismic Safety Councils; Sara Barrett, P.E., Project Manager, Engineering

Consultative Council

The **Consultative Council** assembles high-level building community representatives to make recommendations directly to the executive and legislative branches of government to improve our nation's buildings and infrastructure.

Each year, the Consultative Council publishes the Moving Forward Report to investigate key issues, offering solutions to overcoming these challenges. The 2024 Moving Forward Report will consist of two detailed interim reports (Clean Water and Sanitation, and Housing Affordability) which have been aggregated and included at the end of this annual report.

Chair: Brian Pallasch, CEO & Executive Vice President, IIBEC

Vice Chair: Thomas Smith, Executive Director, American Society of Civil Engineers

Board Liaison: Daniel Nichols, Asst. Vice President - Fire, ADA, and Code Compliance, MTA Metro-North Railroad

NIBS Staff: Kyle Barry, PMP, Director, Technical Solutions; Jennifer Hitzke, Director, Governance & Special Programs

BIM Council

The **BIM Council** builds on the work and foundation of building information management and modeling and reflects the rapid expansion of digital technology in the built environment.

BIMC membership is comprised of individuals and organizations representing government agencies, academia, and the private architect, engineer, and construction firms.

In 2023, as the Building Information Management Council (BIMC), the council continued to support the national computer-aided design (CAD) and building information modeling (BIM) standards – the United States National CAD Standard® (NCS) and National BIM Standard–United States® V4 (NBIMS-US™).

The BIMC's NCS Steering Committee completed its review and reorganization of the seventh version of the standard. The changes and global updates submitted for approval of the NCS Project Committee in late 2023 were approved by a majority of the committee members.

To help make the NCS a unified standard and make presentation of the materials easier to read and understand, the

NCS Steering Committee edited and, in some cases, performed editorial rewrites on parts of the document.

The NBIMS-US™ Planning Committee (PLC) completed work on the update of the next edition of the standard with workgroups creating modules for Project BIM Requirements, BIM Execution Planning, BIM Uses, and Construction to Operations information exchange (COBie), a digital format for project information handover.

The updated standard was soft launched in 2023 with website enhancements continuing into 2024. The BIMC also launched a new Digital Twin Integration Subcommittee (DTI-S). The DTI-S was formed to identify the relationship between BIM and digital twins for the built environment. The subcommittee worked throughout 2023 to develop a position paper, that is scheduled to be released in 2024. The BIMC recently was renamed the Digital Technology Council.

Chair: Rachel Riopel, AIA, Digital Practice Leader, HDR Inc.

Vice Chair: Alex Belkofer, CM-BIM, VDC Director, McCarthy Building Companies, Inc.

Secretary: Zahra Ghorbani, BIM Manager, Penn State

Member-at-Large: Shawn Foster, Director, Business Development & Customer Success, Allegion

Past Chair: Van Woods, BIM Program Manager, Seattle District, U.S. Army Corps of Engineers

Board Liaisons: Russell Manning, PhD, LEED AP, CEFP, CRL, International Code Council; Nancy Novak, Chief Innovation Officer, Compass Datacenters

NIBS Staff: Roger J. Grant, FbSI, Vice President, Building Technology; Dominique Fernandez, Program Director; Johnny Fortune, PhD, Executive Director, National BIM Program

FMOC

The **Facility Management & Operations Council (FMOC)** is focused on the use of technology for existing buildings and aims to be an authoritative resource for integrated life-cycle maintenance and operations information.

In 2023, council workshops and virtual webinars were executed to bolster a few key areas that the council believed are underrepresented or underdeveloped in industry. The focus areas selected for fortification included TCO (Design for Maintainability) and Asset Sustainment: Capex Prioritization and Resiliency.

Several focus areas have been elevated for multi-council collaboration and development, including Cybersecurity, AI in Buildings, and Lean Data Standards & Product Data Requirements.

In 2024, the FMOC intends to publish several whitepapers and tools to address training opportunities for Facilities Management Career Development, Gaps in the Labor Pool and Defining Where Education is Needed, Artificial Intelligence for Facilities Management, and Total Cost of Ownership.

Chair: Keith Bryan, Director, Federal Advisory – Sustainability, Environmental, & Climate, KPMG LLP

Board Liaison: Michael Leondi, Rockefeller Group, Vice President, Design & Construction, NJ/PA Development

NIBS Staff: Jay Kline, Director, Project Management, BIM Program Manager

MMC

The **Multi-Hazard Mitigation Council (MMC)** brings together a body of experts in a multitude of related fields that address the challenges associated with identifying and implementing effective mitigation and community resilience practices.

The work of the MMC has informed thousands—perhaps tens of thousands—of mitigation decisions that led to effective public policy on many levels. Its goal is simple: promoting disaster resilience, while becoming a focal point of credible information and whole-building strategies that strengthen individual buildings, businesses, communities and the nation.

Chair: Dr. Anne Cope, Chief Engineer, IBHS

Vice Chair: Russ Strickland, Secretary, Maryland Department of Emergency Department

Secretary: Natalie F. Enclade, PhD, Executive Director, BuildStrong America

Member-at-Large: Alice Yates, Director of Government Affairs, ASHRAE

Past Chair: Sara Yerkes, International Code Council (retired)

Board Liaison: Lori Peek, PhD, Director, Natural Hazards Center and Professor, Department of Sociology, University of Colorado Boulder; Yvonne Castillo, Esq., Senior Vice President, Risk Management, Victor US

NIBS Staff: Jiqui (JQ) Yuan, PhD, P.E., PMP, Chief Resilience Officer and Head of Engineering, Executive Director, Multi-Hazard Mitigation and Building Seismic Safety Councils; Mira Papinova, Senior Project Manager

CFIRE

Multi-Hazard Mitigation Council - Committee on Finance, Insurance, and Real Estate (CFIRE) examines the intersection of finance, insurance, investment and design, construction, and ownership to encourage the development and assist in the affordability of high-performance buildings.

Banks, insurance companies, appraisers and real estate firms all play a significant role in how buildings are procured, designed, and constructed. How these segments evaluate the risk associated with particular projects, technologies and practices can have an enormous impact on whether an idea gets the funding and insurance needed to move forward to fruition. However, banks, insurance companies, appraisers and real estate firms often lack the necessary data to support building industry efforts to go beyond “business as usual.”

CFIRE works to address these challenges by promoting a cooperative process and open dialogue among the different parties to support the achievement of cost-effective high-performance buildings.

Chair: Daniel Kaniewski, PhD, Managing Director, Public Sector, Marsh McLennan

CFIRE Steering Committee

Timothy Judge, SVP, Chief Climate Officer, Fannie Mae

Michael Newman, Senior Director, Law and Public Policy, IBHS

Bill Garber, Director, Government and External Relations, Appraisal Institute

Cassandra Skidanov, Affordable Lending Manager, Housing Insights and Solutions, Freddie Mac

Natalie Enclade, Executive Director, BuildStrong Coalition

Jamie Woodwell, Vice President, Research & Economics, Mortgage Bankers Association

Board Liaison: Lori Peek, PhD, Director, Natural Hazards Center and Professor, Department of Sociology, University of Colorado Boulder

NIBS Staff: Jiqui (JQ) Yuan, PhD, P.E., PMP, Chief Resilience Officer and Head of Engineering, Executive Director, Multi-Hazard Mitigation and Building Seismic Safety Councils

OSCC

In 2013, the National Institute of Building Sciences established the **Off-Site Construction Council (OSCC)** to serve as a research, education and outreach center for relevant and current information on off-site design and construction for commercial, institutional, and multifamily facilities.

Chair: Ryan Colker, Vice President of Innovation, ICC

Vice Chair: Marc Bielas, Founder and CEO, Quilt Group

Member-at-Large: Ryan Smith, Founding Member, MOD X

Board Liaisons: JC Hudgison, Chief Building Official/Construction Services Manager, Development & Growth Mgmt;

NIBS Staff: Kyle Barry, PMP, Director, Technical Solutions

Whole Building Design Guide

The Whole Building Design Guide (WBDG) was envisioned over 25 years ago and continues to evolve as the only online portal (wbdg.org) providing built environment practitioners access to relevant building-related guidance, up-to-date federal criteria, new technology information, and workforce development training from a 'whole building' perspective.

For over two decades, the National Institute of Building Sciences has offered this valuable resource to the building community through funding and advisory support from the U.S. Department of Defense (represented by the NAVFAC Engineering Innovation and Criteria Office, U.S. Army Corps of Engineers and Air Force Civil Engineer Center), U.S. Department of Veterans Affairs, U.S. Department of Energy, General Services Administration, U.S. Department of State Bureau of Overseas Buildings Operations (OBO), and U.S. Department of Homeland Security.

The WBDG is unique as it represents a collaborative effort among not only government agency subject matter experts but also those from private sector companies, non-profit organizations, and educational institutions all contributing their knowledge and experience to better serve the building community.

Chair: Don Myers, Dir., Facilities Standards Service, U.S. Department of Veterans Affairs

NIBS Staff: Bob Payn, Chief Information Officer & FSO



Climate Resiliency & Transformational Technologies:

970 WBDG authored pages, federal facility criteria, training events, and other resources provide information supporting these pillars



Industry Development:

9,285 trainees in 307 training events, totaling 35,670 training hours



Visibility & Recognition:

1.6 million visitors, including staff from 630 unique Government and Military agencies engaged with 6 million views of WBDG content

Moving the Industry Forward

Moving Forward Report

Introduction

Since it was created by the U.S. Congress in 1974, the National Institute of Building Sciences has served as an unbiased national forum for solving common issues and identifying opportunities within the building community. To bolster this mission, the NIBS Consultative Council convenes high-level building community leaders to make collective recommendations directly to policymakers to improve our nation's buildings and infrastructure. Members of the Council include organizations representing consumers, architects, engineers, government officials, contractors, researchers, and housing officials. One of the Council's annual goals is to develop a *Moving Forward Report*, defining solutions to key challenges faced within the built environment. This report is shared broadly, including with the President of the United States.

For its 2024 *Moving Forward Report*, the Council chose to address the critical challenges of 1) Access to Clean Water and Sanitation and 2) Housing Affordability. In each issue area, the Council evaluated the state of the industry, identified key issues, and made recommendations to industry actors and policymakers to help guide potential solutions. NIBS and the Consultative Council intend to revisit each topic periodically to track progress and discuss potential new challenges and solutions.

This report, submitted as part of the NIBS Annual Report to the President of the United States, offers a top-line summary of thought-provoking recommendations to tackle two of the most pressing problems confronting the building industry today: access to clean water and sanitation, and housing affordability. These recommendations are the work of the National Institute of Building Science (NIBS) Consultative Council.

Clean Water, Sanitation, and the Built Environment

Concerns

As part of its 2024 *Moving Forward Report*, the Consultative Council explored “Water and Sanitation Access and the Built Environment,” focusing on key considerations to inform decisions on planning for, mitigating, and potentially solving water access issues from the perspective of the built environment, specifically for residential and commercial buildings. A link to the full report may be found here: <https://www.nibs.org/reports/clean-water-sanitation-and-built-environment>.

The Council concluded that water use in buildings and households indeed is an underexamined and underappreciated aspect of the water crisis this country currently faces. While it is undoubtable that the U.S. has one of the most robust water systems in the world, more than 2.2 million people nationwide today live without access to running water or sanitation services.ⁱ The U.S. Center for Disease Control and Prevention (CDC) estimates that millions of Americans get sick from a waterborne illness each year.ⁱⁱ Water issues disproportionately fall on poor and marginalized communities and have grown in recent years as funding for water access, quality, and sanitation has lagged. While recent Federal actions to upgrade water infrastructure are a big step forward, more work is needed to better understand water access and sanitation issues.

The Council also found that water equity and environmental justice loom large in all aspects of water quality, access, and scarcity, particularly for impoverished communities, rural communities, and communities of color. “Overall,

rigorous enforcement of federal and state standards coupled with adequate testing is the key to curbing water inequality,” according to Save the Water,TM a 501(c)(3) non-profit organization dedicated to conducting research and raising public awareness about water contamination and its health impacts. “This is especially true for local water authorities in areas where Federal and state oversight is lacking.”

Additionally, water is getting increasingly expensive. The New York Times recently noted that average water and sewer bills have increased by approximately 50% over the last decade, with additional increases forecasted.ⁱⁱⁱ These rate increases, are likely to fall disproportionately on poor and disadvantaged communities.

Recommendations

In response to these concerns, the Council’s recommendations center on:

1. **Data: Improve and increase data collection efforts regarding water access, quality, and use in households and buildings.**
 - The Federal government must coordinate and consolidate how data on water access, use, and quality in buildings is measured. Current Federal data-gathering efforts regarding water are irregular and uncoordinated, with primary efforts at measuring water access and quality in buildings mainly driven by the EPA’s surveys of drinking water systems.
 - A more comprehensive effort to understand water systems and water use in buildings is needed, with input from multiple Federal agencies, and must be provided on a consistent and regular basis. The White House should convene a multi-agency working group to develop and implement a coordinated water data strategy, including funding needs. Congress should appropriate funding to support this strategy.
2. **Efficiency: Increase market share for WaterSense (a voluntary labeling program sponsored by the US EPA) and other efficiency programs, expand use of alternate water sources, and bring increased focus to water efficiency as it relates to energy efficiency.**
 - Expand the WaterSense program, with a focus on improving water efficiency for those with the least access to water-efficient products.
 - Ensure that when promoting “efficiency,” water is given equal imperative as is energy. Water needs to be better integrated into, or given increased focus by, Federal efficiency efforts, with emphasis on how it relates to energy efficiency.
 - Expand the use of alternate water sources in Federal buildings, including rainwater, stormwater, and greywater. In addition, seek better understanding the interplay of energy efficiency, carbon reduction strategies, water efficiency, and current plumbing codes and standards.
3. **Funding: Continue to increase funding for centralized and decentralized water and sanitation infrastructure, especially for projects in underserved communities, and support strong water treatment standards.**
 - In addition to recent legislation providing additional funding for water infrastructure, including the Infrastructure Investment and Jobs Act, the Federal government must continue to increase its share of funding to water infrastructure projects.
 - Additionally, funding should be provided to ensure and increase equity and affordability among the most vulnerable. Many existing funding mechanisms are currently focused on the capital costs for installing the

water and wastewater systems; there also needs to be consideration for the long-term sustainability of systems that are installed. Many of the systems will serve low-income residents who are unable to afford the ongoing operation and maintenance expenses.

- Congress and the Administration should prioritize the following programs and initiatives through funding commensurate with their impacts:
 - WaterSense
 - Drinking Water State Revolving Fund (including potential reduction in match requirements for disadvantaged jurisdictions and a focus on long-term operations and maintenance of systems)
 - NIST Plumbing Research Lab
4. **Research: Support implementation of the newly authorized NIST Plumbing Research Program and increase the role of EPA, DOE, and other relevant Federal and industry stakeholders in collecting data on water usage, improving efficiency in system design, and identifying safe alternate water sources for use in the built environment.**
 - Actualize the research outlined in the report through the effective implementation of the recently authorized NIST Plumbing Research Act. This includes supporting NIST in developing an appropriate roadmap with goals and funding to see the research through.
 - Strengthen NIST’s coordination with DOE, EPA, and other Federal agencies, as well as state and local actors, and private industry in carrying out this research agenda. Congress and the Administration should prioritize research as identified in the roadmap through appropriations and budgets.
 5. **National Strategy: Develop a national strategy for providing sustainable water and sanitation services to rural and disadvantaged communities, particularly focused on those that rely on decentralized systems.**
 - EPA should lead (with Congressional approval as needed and with the engagement of other relevant agencies) development of a national strategy for sustainable water and sanitation services in rural and disadvantaged communities. This should be linked to EPA’s existing decentralized wastewater initiative.
 6. **Updated Regulations: Update testing, standards, and codes—and enforce their implementation**
 - Increased rates of waterborne illness, like Legionnaires’ Disease, over the last decade indicate a need to reevaluate Federal water treatment standards in the Safe Drinking Water Act and adjust as needed.
 - Frequent water line breaks and disruptions can compromise the water entering all types of buildings and necessitate the testing of water further downstream in the distribution system than water providers have typically done.
 - The Federal government should support communities in the regular update to plumbing codes and related standards and support their effective implementation, providing technical assistance and grant funding (similar to funding provided for energy code adoption and implementation through IJJA and BIL).
 7. **Workforce: Increase funding for workforce programs for the water sector, to ensure a pipeline of future workers.**
 - Federal and state and local governments should collaborate to invest in the water workforce, which includes plumbers and other individuals who work to ensure water access and quality both within the larger systems as well as within the building itself.

- Include investment in attracting new skilled workers into the water sector.
- Include continuing education and training for the current workforce to ensure that today's workers are up-to-date on the latest technologies and practices. For example, EPA should expand the Water Industry Workforce Initiative to increase the scope and breadth of the program and continue to attract top talent into the building water workforce.

Housing Affordability

Concerns

For the second part of the 2024 Moving Forward Report, the Consultative Council examined the fundamental problem of affordability of rental and for-sale housing in the U.S. The study kicked off on November 6, 2023, when NIBS and the Council hosted a full-day hearing focused on housing affordability at the National Press Club in Washington, DC. The hearing assembled leading experts from trade associations, think tanks, academia, and practitioners to discuss the state of housing affordability and potential solutions to address the affordability and availability of housing. A link to the hearing may be found here: <https://www.nibs.org/events/housing-affordability-hearing>.

The U.S. Department of Housing and Urban Development's (HUD) standard measure of affordability for renters and homeowners is to spend 30% or less of their gross income on housing costs. In recent years, the combination of a housing shortage, inflation, and higher interest rates increased the cost of both rental and purchase housing faster than wage growth, leading to higher percentages of consumers paying more than 30% and even 50% or more of their income for housing. While steep housing costs impact lower income households more significantly than higher income households, the issue is pervasive throughout all income levels in every community.

The housing affordability crisis has steadily worsened over decades of divergence between housing costs and incomes. Between 1960 and 2021, real incomes grew by 15% among renters, while rents increased by 70% during that same period. The combination of rising housing costs and income losses during the COVID-19 pandemic, which hit lower income households hardest, generated the most significant decline in rental affordability in years. Homeownership, too, has become increasingly difficult for the average U.S. wage earner over the past two years, according to ATTOM's report. The increase in home prices and residential mortgage rates combined have pushed the average percentage of wages needed to buy a typical home up to 35%, a level considered unaffordable.

The extreme shortage of housing to rent and to purchase is a prime driver of affordability issues. Estimates of the housing shortage vary from 1.5 million to as high as 5 million housing units. While housing construction varies according to household formations and demand, since 2014 the degree of underbuilding compared to demand has been stark, at nearly half of the number of units built in previous decades, according to the National Association of Home Builders (NAHB).

Multiple factors contribute to the lack of construction, including:

- Financing: The limited availability of financing and its high cost have slowed the availability of land for developers, along with overly restrictive zoning regulations. Construction loans currently carry mortgage rates of 12% to 13%, which is one reason there is less than a one-year supply of buildable lots.
- Labor shortages, which have been exacerbated by a decline in immigration and limited investment in encouraging young people to enter trade professions, slow construction, and increase costs.
- Regulatory constraints from local, state, and federal jurisdictions that limit or slow construction and add to costs.

- Materials costs have exponentially increased in recent years, partly due to tariffs, regulations, and supply chain disruption, along with increased demand for remodeling and new construction.
- Land issues, such as the time it can take to prepare land for development. For instance, NAHB estimates that it can take as long as five years to prepare land for development in areas with a lengthy zoning approval process, including a community review.

Households with extremely low income, defined as less than 30% of area median income, and with very low income, defined as less than 50% of area median income, are impacted the most by the lack of supply of affordable housing. The U.S. has consistently underfunded programs that provide housing vouchers and subsidies for these households. In addition, the supply of affordable housing is limited, even for those who qualify for special programs. Many people in low-income households wait years for subsidized housing to become available. Seniors in low-income households are particularly at risk, typically needing assistance at home with limited resources to pay for housing and care, according to a JCHS report.

Recommendations

In response to these concerns, the Council's recommendations center on:

1. **Regulations: NIBS supports a non-biased, scientifically rigorous study of the costs and benefits of codes and standards adoption on housing affordability, from both a first-cost and lifecycle cost perspective.**
 - A full and comprehensive, unbiased study of the impact of buildings codes and other regulations on housing affordability is needed.
 - Jurisdictions should examine regulations or requirements that may be impeding alternative or innovative forms of construction, such as permitting and inspection as it currently relates to offsite methods, for possible streamlining or updating.
 - The Administration should consider updating the statutory definition of manufactured housing to provide manufactured homebuilders with more design flexibility and consumers with more options beyond local site-built for single-family homes.
2. **Zoning and Land Use: Revise zoning codes to allow accessory dwelling units (ADUs), increase density, and allow multifamily buildings in neighborhoods previously restricted to single-family homes.**
 - Congress should increase funding for the Pathways to Removing Obstacles to Housing program (PRO), which incentivizes housing-forward actions to further develop, evaluate, and implement housing policy plans.
3. **Make financial investments on the supply side and the demand side.**

On the supply side:

- Federal agencies should encourage lenders to ease lending requirements and fund reduced mortgage rates for builders, particularly for land development and construction loans.
- Federal, state, and local jurisdictions should develop incentives to encourage the construction of two-to-four family buildings that allow homeowners to offset their mortgage with rental income and contribute to the availability of rental housing.
- Federal, state, and local governments should introduce incentives such as tax abatements and low-cost financing to offset the cost of converting underutilized office buildings for residential use, which could in turn

contribute to the revitalization of downtown communities.

- The Federal government should reduce or eliminate tariffs that contribute to the cost of building materials, which are up 41.46% over the past five years.
- The Federal government should increase funding for state housing finance agencies so they can invest more money in homeownership programs, such as down payment assistance, low interest loans, and tax credits.
- State and local jurisdictions should consider taxing investment properties at a higher rate to stop predatory investors that compete against first-time buyers and impact affordability.

On the demand side:

- Increase the availability of homeownership programs that help low-and-moderate income households buy homes.
 - Address the impact of rising insurance premiums and property taxes with exemptions and subsidies for seniors and low-income households.
 - State and local jurisdictions should address the impact of rising insurance premiums and property taxes, particularly on seniors and low-income households with exemptions or subsidies.
 - The Consultative Council asks Congress to increase the number of credits they make available to each state this year through the Low-Income Housing Tax Credits (LIHTC) program.
 - The Council also encourages members of Congress to pass the bipartisan Neighborhood Homes Investment Act (NHIA), establishing a Federal tax credit targeted at the new construction or substantial rehabilitation of affordable, owner-occupied housing located in distressed urban, suburban, and rural neighborhoods.
4. **New Construction: Invest in alternative methods of construction, including industrialized off-site production, along with new materials and methods such as 3D printing or insulated concrete form construction, to speed construction time and lower costs**
- Localities should ensure housing-related regulations are updated to support their effective use.
 - Encourage design and production of smaller homes, small multifamily units for homeowners to share with tenants, and the conversion of obsolete commercial spaces for residential use.
 - Government agencies, building scientists, academic researchers, and private companies should collaborate on how to expand development of factories for modular homes in multiple locations to reduce the expense and negative environmental impact of transporting housing components long-distance.
 - Support the adoption of standards that promote greater consistency in how off-site construction is regulated.
 - Congress can foster new construction and the rehabilitation of affordable rental housing by continuing to fund the HOME Investment Partnerships Program (HOME). This program provides homeownership opportunities not seen before its inception in 2021.
5. **Workforce: Develop model programs and provide incentives to increase recruitment, training, and retention in construction and related fields to address the long-term shortage of labor.**
- Government agencies, nonprofit organizations, academic institutions, and builders should provide outreach

and incentives to encourage more people from diverse backgrounds to enter construction trades, particularly women, who currently represent just 11% of construction workers.

- These same entities also should create more programs to train, recruit, and retain employees for construction and related industry jobs to address the ongoing shortage of skilled labor in numerous housing markets.
- The Administration should utilize funds provided by the Workforce Innovation and Opportunity Act (WIOA) and seek increased funding from Congress to assuage the workforce shortage in the built environment.



ⁱ“Close the Water Access Gap.” DIGDEEP. www.digdeep.org/close-the-water-gap.

ⁱⁱU.S. Center for Disease Control and Prevention. “Waterborne Disease in the United States.” Updated January 4, 2023. <https://www.cdc.gov/healthywater/surveillance/burden/index.html>

ⁱⁱⁱCarrns, Ann. “Water Bills Are Rising. Here’s What to Do About It.” The New York Times. July 14, 2023. <https://www.nytimes.com/2023/07/14/your-money/water-bills-tips.html>

^{iv}“Home Affordability Gets Even Tougher Across U.S. During Third Quarter As Home Prices And Mortgage Rates Rise Further.” ATTOM. September 2023. <https://www.attomdata.com/news/market-trends/home-sales-prices/attom-q3-2023-u-s-home-affordability-report/>

Financials

| Assets | <u>2023</u> | <u>2022</u> |
|--|----------------------|----------------------|
| Current Assets | | |
| Cash and cash equivalents | \$ 5,601,306 | \$ 11,369,179 |
| Certificates of deposit | 50,003 | 50,003 |
| Accounts receivable | 6,132,690 | 2,895,833 |
| Contract assets | 2,367,065 | 2,278,031 |
| Prepaid expenses and deposits | 306,176 | 154,830 |
| Total current assets | <u>14,457,240</u> | <u>16,747,876</u> |
| Investments | <u>4,326,831</u> | <u>1,093,498</u> |
| Right-of-Use Asset , operating | <u>468,799</u> | <u>--</u> |
| Property and Equipment | | |
| Furniture and equipment | 630,117 | 548,274 |
| Leasehold improvements | 751,864 | 751,864 |
| Software | 199,150 | 192,150 |
| Total | <u>1,581,131</u> | <u>1,492,288</u> |
| Less accumulated depreciation and amortization | <u>(1,180,202)</u> | <u>(1,026,768)</u> |
| Total property and equipment, net | <u>400,929</u> | <u>465,520</u> |
| Total assets | <u>\$ 19,653,799</u> | <u>\$ 18,306,894</u> |
| Liabilities and Net Assets | | |
| Current Liabilities | | |
| Accounts payable and accrued expenses | \$ 3,005,835 | \$ 2,290,102 |
| Lease liabilities, operating, current portion | 550,434 | -- |
| Deferred rent, current portion | -- | 91,165 |
| Contract liabilities | 1,256,556 | 1,519,953 |
| Total current liabilities | <u>4,812,825</u> | <u>3,901,220</u> |
| Lease Liabilities , operating, net of current portion | <u>340,197</u> | <u>--</u> |
| Deferred Rent , net of current portion | <u>--</u> | <u>577,706</u> |
| Total liabilities | <u>5,153,022</u> | <u>4,478,926</u> |
| Net Assets , without donor restrictions | | |
| Undesignated | 10,123,943 | 12,684,467 |
| Designated, reserves | 4,376,834 | 1,143,501 |
| Total net assets | <u>14,500,777</u> | <u>13,827,968</u> |
| Total liabilities and net assets | <u>\$ 19,653,799</u> | <u>\$ 18,306,894</u> |

| | <u>2023</u> | <u>2022</u> |
|---------------------------------------|----------------------|----------------------|
| Revenue | | |
| Contracts and awards | \$ 21,102,486 | \$ 17,800,880 |
| Other publication sales | 24,291 | 32,588 |
| Member and other contributions | 147,400 | 165,245 |
| Investment gain (loss) | 264,374 | (236,592) |
| Meeting and other | 459,827 | 260,469 |
| Total revenue | <u>21,998,378</u> | <u>18,022,590</u> |
| Expenses | | |
| Program Services: | | |
| Contracts and awards | 19,378,804 | 15,270,398 |
| Events and publications | 584,124 | 530,644 |
| Other | 277,196 | 135,512 |
| Total program services | <u>20,240,124</u> | <u>15,936,554</u> |
| Supporting Services: | | |
| General and administrative expenses | 589,920 | 94,135 |
| Membership | 495,525 | 446,598 |
| Total supporting services | <u>1,085,445</u> | <u>540,733</u> |
| Total expenses | <u>21,325,569</u> | <u>16,477,287</u> |
| Change in net assets | <u>672,809</u> | <u>1,545,303</u> |
| Net Assets , beginning of year | <u>13,827,968</u> | <u>12,282,665</u> |
| Net Assets , end of year | <u>\$ 14,500,777</u> | <u>\$ 13,827,968</u> |

Member Spotlight

Membership Overview

The National Institute of Building Sciences serves the public interest by advancing science and technology to improve the built environment.

Our members are building industry professionals – representatives of academia, non-profit associations, local, state and federal government, and the public and private sectors. Members develop and implement technical and procedural improvements through collaboration on our councils, events, and programs.

In 2023, NIBS focused on maintaining connection with current members as well as attracting new ones.

We offer three different individual membership packages (public interest, industry, and student) and two organizational member packages.



Organization Members

Membership provides access, at an individual or organizational level, to weigh in on member projects that shape our future. Organizational members often have multiple individuals, representing a variety of job roles, participating in NIBS councils.

Unlimited Member Organizations

Unlimited Organizational Membership is for organizations seeking unlimited access for their employees to participate in NIBS communities.

American Institute of Architects
Autodesk, Inc.
Bentley Systems
FM Global
Gilbane Building Co.
National Institutes of Health
NAVFAC

NBBJ
Ohio Facilities Construction Commission
Toric Labs, Inc.
U.S. Department of State
U.S. Department of Veterans Affairs
U.S. General Services Administration

Member Organizations

84 Lumber
AABC Commissioning Group (ACG)
Airwavz Solutions, Inc.
American Institute of Steel Construction
American Iron & Steel Institute
American Wood Council
APA - The Engineered Wood Association
Architect of the Capitol
Armstrong World Industries
ASHRAE
Association for Facility Engineering
AWG Contracting + The Moses West Foundation
BOMA International
BSI Group America, Inc.
Charles Pankow Foundation
Coda
Compass Datacenters
Component Assembly Systems
Concrete Masonry Association of California and Nevada
Connex
Construction Specifications Institute
Daikin U.S.
Dell Technologies
Delta Controls, Inc.
Design-Build Institute of America

DOE: Better Climate Challenge
ESRI
Fishbeck
General Motors Company
Green Building Initiative
IIBEC
Insurance Institute for Business & Home Safety
International Association of Plumbing and Mechanical Officials
International Code Council, Inc.
McCarthy Building Companies, Inc.
McDonough Bolyard Peck, Inc.
MOD X
Modular Building Institute
National Association of Home Builders
National Fire Protection Association
National Ready Mixed Concrete Association
National Building Museum
New Horizons Foundation
NCSEA
NOAA
Onuma, Inc.
The Pew Charitable Trusts
Precast/Prestressed Concrete Institute
Procore Technologies, Inc.

Professional Roof Consultants, Inc.
Protogetic
RICS
Salas O' Brien
Simpson Gumpertz & Heger
STG Design
Structural Engineers Association of California
U.S. Army Corps of Engineers
U.S. Green Building Council
U.S. Navy
U.S. Resiliency Council



Member Spotlight :
David Bonneville
Senior Principal, Degenkolb Engineers, Retired
Past Chair, Building Seismic Safety Council Board of Directors



My professional background is in structural engineering. I spent my career with Degenkolb Engineers in the San Francisco office. This is a structural engineering firm that has always had a focus on seismic analysis and design of buildings, as well as seismic rehabilitation of buildings. This blended well with my seismic code development work with the Building Seismic Safety Council (BSSC).

Much of my own focus and passion has been on seismic consulting related to the seismic evaluation and upgrade design of existing buildings – making buildings safer and more resilient. I’ve consulted for corporations and government agencies with large and often critical building inventories.

I initially got involved in volunteer professional activities as a young engineer in San Francisco primarily for continuing education. I wanted to see what other young engineers in other firms were working on. It was a way to supplement what I was learning through my own projects and collaborations within the firm.

I have been supporting the BSSC for a couple of decades. BSSC is one of oldest NIBS councils. It was created in 1979, after Congress passed the National Earthquake Hazard Reduction Act in 1977. The council’s primary purpose is to develop national seismic design provisions through the National Earthquake Hazards Reduction Program, which is funded by FEMA.

I’ve served as a member of the BSSC Board, and then as Board Chair. However, my greatest effort with BSSC was as the Chair of its Provisions Update Committee (PUC). The PUC is responsible for developing the NEHRP Recommended Seismic Provisions. The Provisions are updated on about a five-year cycle. This effort involves a committee of about 25 seismic experts, supported by a group of subcommittees totaling more than 100 people. The effort is funded by FEMA and supported by USGS and NIST.

These Provisions form the basis for the seismic requirements in the ASCE 7 Building standard, which are the regulations used by state building codes across the country.

While the expense for this effort is FEMA-funded, most of the work is done by volunteers, like myself. It’s a labor of love by many experts.

In the type of work undertaken in the BSSC, you can either work as a specialist – a subject matter expert – or you could follow the path I took. I never considered myself to be a specialist. My success came from learning how to work with subject matter experts and, when necessary, to rein them in.

Communication was critical – knowing enough about each technical specialty to manage it within the context of an overall goal. I think that advice can apply within volunteer professional activities, like seismic standards in my case or within your firm or organization. Even in very technical areas, there’s a place for both specialists and for the individuals who can lead them and get them to do their best work toward achieving the greater goal.

Member Spotlight :
Whitney Doll
Executive Vice President, Customer Engagement
International Code Council



What's unique about the built environment is how impactful it is.

I have a background in working for nonprofit organizations. Years ago, when I was searching for my next career step, I specifically looked for organizations that had a mission that inspired me. I was thrilled to join the International Code Council because of the breadth and depth of its mission and vision.

The built environment affects every human on this planet. Unless there's a major disaster, people assume that their building is safe.

The Code Council is celebrating its 30th anniversary in 2024. We're a nonprofit membership association with a wide range of services. Over the past decade, we have experienced significant growth and expanded the services we offer to the building safety industry. Currently, we have 11 offices across the globe.

The Code Council has had a long history with NIBS. We value our relationship and know that NIBS has a really important role in the industry – bringing people together and ensuring we have safer, more sustainable buildings.

It requires so many people to make this happen – architects, engineers, code officials, homebuilders, and thought leaders in the technical space. It's complicated, and there are a lot of players.

The Code Council is a convener. We bring people together to discuss the latest in building science and technology and to develop codes and standards. Studies like Mitigation Saves are so important to helping the federal government, our stakeholders, and the public understand codes and standards.

In May, I attended NIBS' Women Executives in Building Symposium, and I was impressed with the event. I met so many outstanding women in the industry, and we had very frank conversations.

Being in that space, where you get together with those who are succeeding in the building industry, is very exciting. There are unique aspects to being a female in this industry, and I enjoy being able to talk about our experiences in a safe space.

For those trying to enter the industry, I encourage you to be thoughtful and open to hearing others' opinions. You have to take time to understand many different perspectives. We are all passionate, and we all have a viewpoint to share. The vast majority of people come here from a place of caring, and working together is how we'll succeed at making the world a safer place.

Thank you, NIBS, for being an independent thought leader in the building industry, and congratulations to the organization on 50 years of excellence! I personally am thrilled to join you in your celebration.

Member Spotlight :
Russell Strickland
Secretary, Maryland Department of Emergency
Management
President, National Emergency Management
Agency
Vice Chair, Multi-Hazard Mitigation Council



Whether it's law enforcement or emergency management, I've always had an infatuation with emergency services.

What really helped me solidify that position was the Boy Scouts – the whole concept of preparedness. The Boy Scouts motto is “be prepared,” and do a good deed every day.

That really sunk in.

When I was 16, I moved into the volunteer fire department. Later, I became involved with the Maryland Fire and Rescue Institute, which is part of the University of Maryland at College Park.

I remember working on the Essential of Firefighting training manual, published through Oklahoma State University Fire Protection Publications, that we use to train firefighters. They bring in people from all over the country to validate this material, and I chaired the committee to see the publication of two editions of this book. Through all of those committee meetings we pushed for safety, fire prevention and especially sprinklers. Today, I'm really rather proud to say Maryland is one of three or four states that require residential sprinklers in all new construction.

It was during this time with the Maryland Fire and Rescue Institute that I became interested in the work of our state emergency management agency. I have always been public safety and public service-focused.

Bryan Koon, who is a past president of the National Emergency Management Association, called me one day about a position open with the Multi-Hazard Mitigation Council. It was 2020, when I served as Secretary of the MMC.

NIBS creates an environment of effectiveness, efficiency, and safety – this is right up emergency management's alley. We're conveners. We bring people together to talk about the problem, identify the resources, and solve the problem.

The products that NIBS puts out are science-based, data-driven, and factual. That's the kind of information we need to convince the public of the direction we need to go. The full utilization of codes and standards nationwide is tough because we're 50 states and 3,500 counties. How to figure out how to effectively and efficiently keep these people safe – that's a lifetime challenge.

I see NIBS as the leader in focusing on bringing together the people in the building industry with people like me. We believe safety is a cornerstone to preparedness.

Member Spotlight Organization: ASHRAE

ASHRAE's partnership with NIBS has been instrumental in advancing building resiliency efforts to safeguard communities against both natural and human-induced disasters. Through our collaboration with the NIBS Coalition on Resiliency, ASHRAE has played a vital role in promoting the importance of investing in resilient building practices.

One of our key contributions has been through the Consultative Council, where we have worked to amplify ASHRAE's resources for the broader buildings community.

Additionally, our staff leadership has actively participated in the NIBS Multi-Hazard Mitigation Council, enabling us to engage with government stakeholders and advocate for resilient building policies.

Recently, ASHRAE provided expertise from our technical committee on Seismic, Wind, and Flood Resistant Design to inform the development of the National Earthquake Hazards Reduction Program (NEHRP) Recommended Seismic Provisions. By ensuring that HVACR considerations are integrated into these provisions, we are helping to enhance the resilience of buildings and infrastructure against seismic events.

ASHRAE and NIBS also have a long history of working together to advance Building Information Management and Modeling (BIM) practices and standards. ASHRAE member participation in NIBS BIM Council led to the development and release in 2023 of the ANSI/ASHRAE/NIBS Joint Standard 224 - 2023 Standard for the Application of Building Information Modeling aimed at helping project teams use technology effectively.

ASHRAE is proud to collaborate with NIBS in our commitment to develop innovative solutions and resources that will enhance the structural integrity and functionality of buildings globally.



*Jeff Littleton, Executive Vice
President and Secretary, ASHRAE*

Member Spotlight Organization: Green Building Initiative

The Green Building Initiative (GBI) is an inclusive, international organization united to achieve sustainable, healthy, and resilient buildings for all. GBI has been a member of NIBS for nearly 10 years, supporting the organization's mission through active participation in its CEO-led Consultative Council, where GBI President & CEO Vicki Worden is a past chair of the council.

GBI is a convener and an accredited standards developer through the American National Standards Institute (ANSI). GBI and NIBS share many overlapping priorities and work collaboratively in the execution of objectives that ensure building science and data are at the forefront of our efforts to advance and improve the nation's built environment. Toward this end, GBI offers education, credentialing, and a suite of tools in support of third-party assessment and certification. Nearly 650 million square feet of commercial space has been certified by GBI to date. From the most complex of buildings to the most common, GBI's programs are aimed at improving the global built environment's impact on climate and society.

- GBI's Green Globes® whole building certification emphasizes rigor over rigidity and is considered a three-in-one certification supporting third-party assessment and recognition of achievements in sustainability, health & wellness, and resilience.
- Green Globes Journey to Net Zero™ certification empowers building and portfolio owners to evaluate progress in reducing site EUI and CO₂e and provides expert support with a progress report that can be used to support reporting and compliance requirements.
- Guiding Principles Compliance, in conjunction with Green Globes, has been used to support implementation and assessment of sustainability objectives for the U.S. Department of Defense, U.S. Department of Veterans Affairs, and others, accounting for over 21 million square feet.

Used by some of the largest real estate developers in the world, GBI's assessment and certification programs are renowned for world-class client support through dedicated project managers and expert third-party assessors that empower project teams with access and education throughout GBI's streamlined evaluation processes.

GBI also issues professional credentials, including Green Globes Emerging Professional (GGEP), Green Globes Professional (GGP), and Guiding Principles Compliance Professional (GPCP), and offers a variety of resources, including free technical reference manuals, interactive tools, and trainings.

To learn more about opportunities to become involved with GBI, contact info@thegbi.org or visit the GBI website at www.thegbi.org.



NASA's Marshall Space Flight Center Building 4221, Three Green Globes, 2020 Green Globes Project of the Year

Member Spotlight Organization: IIBEC

The International Institute of Building Enclosure Consultants (IIBEC)—an association of professionals who specialize in roofing, waterproofing, and exterior wall design and specification—has been proud to partner with NIBS in strengthening the built environment. We have a member expert for every type of roof, exterior wall, or waterproofing issue in the world today. From sprayed polyurethane foam to cedar shakes, from parking garages to air barriers, IIBEC is advancing the profession of building enclosure consulting.



IIBEC's relationship with NIBS includes a shared commitment to diversity among those working to improve the built environment. We joined with more than two dozen organizations representing the built environment for the 2021 NIBS Built Environment Social Equity Survey, and since then, we have established an IIBEC Diversity and Inclusion Committee that is working to ensure that we are a welcoming organization to all building enclosure professionals. The committee's efforts have focused on educating IIBEC members, creating a resource page on iibec.org, and updating the IIBEC Code of Ethics in partnership with our Ethics Committee.

IIBEC also is proud to be one of the 24 members of the NIBS Consultative Council. IIBEC Executive Vice President and CEO Brian Pallasch, CAE, longtime managing director of government relations and infrastructure initiatives with the American Society of Civil Engineers, now chairs NIBS' Consultative Council, which is tasked with making recommendations to executive and legislative branches of government to improve the national buildings and infrastructure. The council also publishes the Moving Forward Report, which in 2022 looked closely at the relationship between the climate emergency and the built environment, charting a path toward decarbonization of U.S. buildings.

IIBEC has sponsored NIBS events, including last year's Building Innovation Conference in Washington, DC, where we showcased IIBEC's importance in the building industry to conference attendees, speakers, and other exhibitors. We were able to highlight many of our benefits to Building Innovation attendees, including:

- IIBEC's educational programs, which explain the practical application of roofing, exterior wall, and waterproofing technologies, as well as building enclosure commissioning
- IIBEC Interface, a monthly technical journal
- Ongoing chapter and branch events that provide interactive forums for information exchange and networking

Perhaps most important are our IIBEC credentials, which represent the pinnacle of building enclosure consulting. The Registered Roof Consultant (RRC[®]), Registered Waterproofing Consultant (RWC[®]), Registered Exterior Wall Consultant (REWC[®]), Registered Roof Observer (RRO[®]), Registered Exterior Wall Observer (REWO[®]), and Certified Building Enclosure Commissioning Provider (CBECxP[®]) programs distinguish professionals with proven standards of education, experience, and ethics. Individuals with all three consultant designations (RRC[®], RWC[®], and REWC[®]) may apply to be a Registered Building Enclosure Consultant (RBEC[®]).

We look forward to continuing our partnership with NIBS as we advance the profession of building enclosure consulting.

Member Thank You

The National Institute of Building Sciences serves the built environment to ensure the safety of buildings in the U.S. We do this by performing research, publishing timely reports, and sponsoring expert-led events to discuss challenges in the built environment.

We work to help improve and reimagine a future built environment that continues to innovate and thrive.

We could not do this work without you – our subject matter experts, volunteers, members, and dedicated partners.

Thank you.

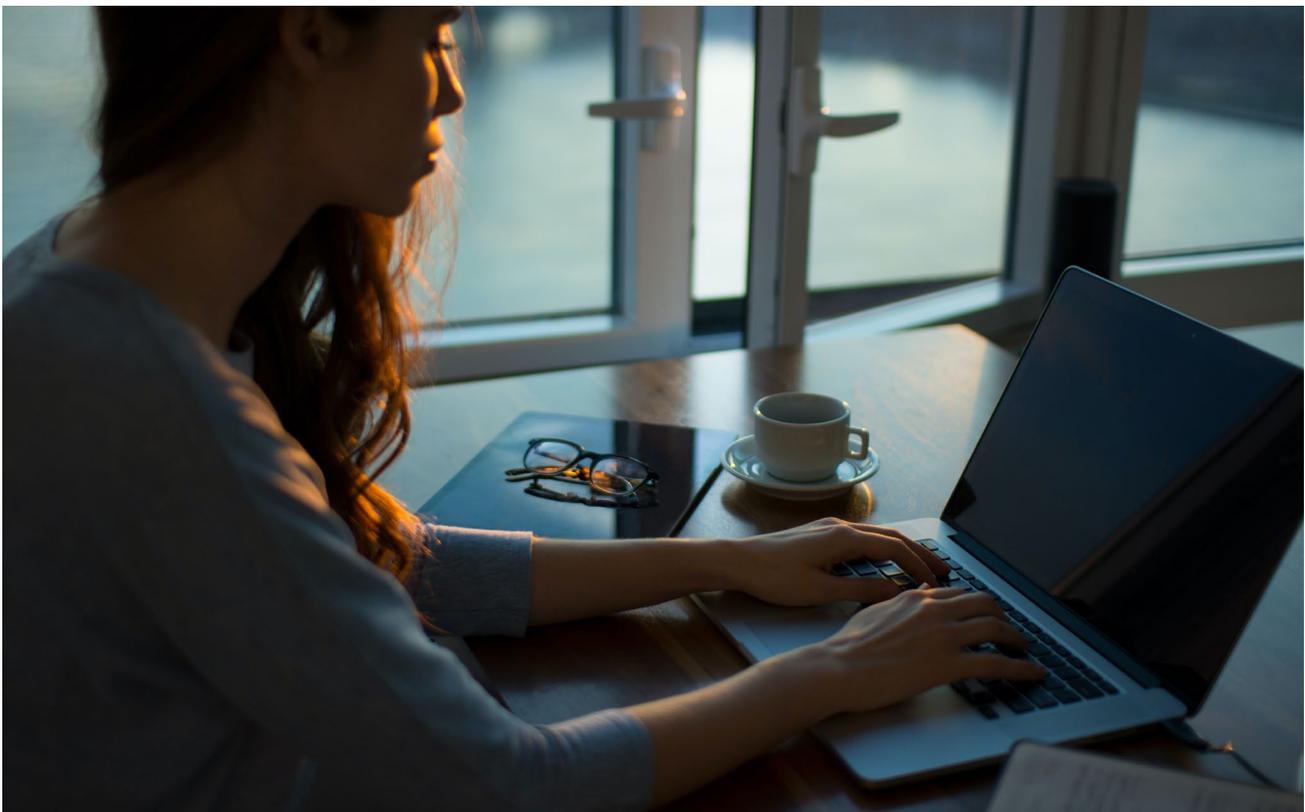
You make our important work possible. Your partnership affects and improves the building profession and our communities.

NIBS was established by Congress to serve the built environment, but we receive no congressional funding.

We ask that you please consider donating to NIBS. Your generous donation will help to continue to elevate the built environment through educational webinars and workshops, and vital research that impacts the buildings industry and our communities.

Your donation may be tax-deductible. Please check with your tax advisor.

On behalf of the NIBS team, thank you for your support!



NIBS Staff

Hon. Stephen T. Ayers, FAIA, NAC, CCM, LEED AP
Interim President & CEO

Rebecca Liko
Chief Financial Officer

Bob Payn
Chief Information Officer & FSO

Roark Redwood
Senior Vice President, Technical and Government
Solutions

Kristen Petersen
Senior Vice President, Marketing and Communications

Roger J. Grant, , FbSI
Vice President, Building Technology

Stephanie Stubbs, Assoc. AIA, PMP
Vice President, Technical Solutions

Jiqui “JQ” Yuan, PhD, PE, PMP
Chief Resilience Officer and Head of Engineering

Sarah Swango
Vice President, Corporate and Foundation Relations

Vlad Mitrofanov
Executive Director, Finance

Johnny Fortune
Executive Director, National BIM Program

Dominique Fernandez
Project Director

Jennifer Hitzke
Director, Governance and Special Programs

Kyle Barry, PMP
Director, Technical Solutions

James (Jay) Kline, PE, LC
Director, Project Management

Nina Ancharski
Director, Professional Development and Credentialing

Christine Cube
Associate Director, PR and Social Media

Ana Valentin
Senior Graphic Designer



NIBS Staff

Zoe Maymon
BIM Data Analyst

Omar Martinez
BIM Manager

Pratik Solanki
BIM and Project Cost Manager

Stephanie Sneary
BIM Manager

Adham Naiem
Senior Project Manager, Engineering

Mira Papinova
Senior Project Manager, Engineering

Sara Barrett
Project Manager, Engineering

Julie Heyneman, M.S.
Project Manager, Technical Solutions

Kelly Lloyd
Web Content and Criteria Manager

Ben Nolan
Web Manager

Rachel Gonzalez
Senior Marketing Manager

D. Leland Rogers
Contracts Manager

Ed Smith
Office Manager

Jennifer Dewitt
Partnership Manager

Zoe Bourne
BIM Coordinator

Brittany Kitchens
Web Project & Distance Learning Coordinator

Tony Massaro
Graphic Designer

Keran Basiram
Financial Analyst

Sarah Diesing
Accounting Director

Graham Billings
Project Manager, BIM







1090 Vermont Avenue, NW, Suite 700
Washington, DC 20005
Phone: 202-289-7800
www.nibs.org