

ICC References in HUD's Offsite Construction Research Roadmap

Every passage referencing the International Code Council, divided into ICC Codes, ICC Standards, ICC-ES, and ICC Services, compiled verbatim with page numbers.

Purpose

HUD's Offsite Construction for Housing: Research Roadmap is presented as a solution for lowering the cost of housing production. The purpose of my report is to document, using the Roadmap's own language, how its recommendations would extend the market position of the International Code Council (ICC) — an organization that already functions as a vertically integrated trade association: it develops codes and standards, and it owns the subsidiaries that separately sell training, third-party inspection, certification, accreditation, and evaluation reports (ICC-ES, ICC NTA). Taken together, these interlocking services tie jurisdictions nationwide into what amounts to a pay-to-play system, built on market power that is already consolidated and largely unchecked.

This raises a question the Roadmap itself does not answer: where does it leave competing standards-development bodies, independent third parties, and other organizations that offer evaluation reports? These organizations were not represented in shaping the Roadmap's recommendations — the report's own Appendix confirms that its stakeholder workshop was invitation-only (see p. 69, in the Appendix of this document).

I have also done extensive research on the organizations that received HUD funding tied to this report and found overlapping executives among them — a pattern that points to an even greater concern of consolidated power. I will be submitting that research as companion reports.

The HUD's Off-Site Construction Research Roadmap is not a path fostering consumer choice, and an open marketplace that encourages competition, it is a road map with roads directing every route to the International Code Council exclusively.

— Janet Thome, President, Tiny House Alliance USA

The passage above is my own statement of purpose for this document, not text from the HUD Research Roadmap itself.

Table of Contents

Primary source: Offsite Construction for Housing: Research Roadmap. U.S. Department of Housing and Urban Development, Office of Policy Development and Research, 2023.

About the Research Roadmap

Offsite construction of housing, which includes manufactured housing, modular homes, and prefabricated structural components, offers potential for production efficiencies, improved quality, and lower costs. Key knowledge gaps and research needs to be addressed to overcome the barriers and challenges of offsite construction and fulfill its potential. A literature review and industry consultation informed development of this research roadmap and recommended research priorities for the Department of Housing and Urban Development and broader public-private collaborations to advance offsite construction for housing. Research priorities are identified for six topical areas: Regulatory Framework; Standards and System Performance;

Capital, Finance, and Insurance; Project Delivery and Contracts; Labor and Workforce Training and Management; and Business Models and Economic Performance.

— *HUD Office of Policy Development and Research, publication abstract*

This report gathers every passage in HUD's Offsite Construction for Housing: Research Roadmap (2023) that references the International Code Council (ICC). Each passage below was pulled directly from and verified against the original HUD PDF, with page numbers as they appear in that document. As a work of the U.S. federal government, this report is in the public domain, so the passages are reproduced here in full, verbatim.

The passages are organized into four categories, since codes and standards are not the same thing — codes (IRC, IBC) are the model regulations that jurisdictions adopt into law, while standards (ICC/MBI 1200, 1205, 1210, G5-2019) are referenced technical documents incorporated by codes but not laws themselves:

- ICC Codes — the ICC's model building codes (IRC, IBC), other model codes, and its performance-code pathway.
- ICC Standards — the ICC/MBI 1200/1205/1210/G5-2019 offsite construction standards, developed with the Modular Building Institute and ANSI.
- ICC-ES — the ICC Evaluation Service, the report process code officials use to verify new and innovative building products.
- ICC Services — other ICC-provided processes named in the report, namely code/standards development (the consensus process), third-party inspection, remote virtual inspection, and ICC NTA plant certification.

A closing appendix lists the ICC-affiliated individuals named in the report and any direct quotes attributed to them — a fifth grouping, outside the four content categories above — and a summary table maps every page reference to its category.

This set of passages was originally identified and compiled by Tiny House Alliance USA, "HUD Funds Fast Track ICC/NIBS/MODX Monopoly."

HUD Funding Overview

This section traces the funding thread behind the Research Roadmap: the notice of funding opportunity (NOFO) that HUD issued to study offsite construction and land use reform, and the awards HUD ultimately made under it.

June 2023 — Research Grant Opportunity Announced (HUD No. 23-124)

On June 15, 2023, HUD released a NOFO to build the evidence base for accelerating adoption of innovative housing-supply practices and policies.

The NOFO provides up to \$4 million to (1) assess the potential for off-site construction methods to increase housing supply, lower the cost of construction and/or reduce housing expenses for low- and moderate-income owners and renters; and (2) study how reforms to local zoning and other land-use regulations can increase the supply of quality, affordable housing and expand housing choices and opportunities for low- and moderate-income households. Proposals are due on August 1st.

"In recent decades, housing supply simply has not kept up with demand, which has driven up housing costs and limited affordable housing options for low- and moderate-income families.

However, the housing supply shortage has also inspired pro-housing policy reforms at the state and local levels and new attention to alternative construction methods,” said Solomon Greene, Principal Deputy Assistant Secretary for Policy Development and Research. “The goal of this research is to better understand which of these reforms and innovations are most effective at producing new affordable housing and what are the conditions for success.”

The announcement explicitly ties the NOFO to the Research Roadmap:

This NOFO builds upon the research needs that are identified in the Off-site Construction for Housing: Research Roadmap, which can help overcome the barriers and challenges of off-site construction.

Source: HUD press release 23-124, June 21, 2023.

February 2024 — Awards Announced (HUD No. 24-036)

On Feb. 23, 2024, HUD announced nearly \$4 million in awards across two NOFOs: the Offsite Construction and Land Use Reform NOFO (\$3 million to 10 institutions) and a separate Office to Residential Conversions NOFO (\$858,261.91 to one institution).

All 10 Offsite Construction and Land Use Reform NOFO awardees:

- **National Institute of Building Sciences** — \$499,878, to partner with six HUD regions to design pilot programs identifying regional barriers to offsite construction and to develop a pilot handbook.
- **University of California, Los Angeles** — \$458,340, to study the impact of accessory dwelling unit (ADU) legalization and production in California on rents, prices, and land values.
- **University of California, Irvine** — \$343,244, to study California's state-level ADU reforms in the context of affirmatively furthering fair housing (AFFH).
- **The Urban Institute** — \$263,874, to examine the interplay between local zoning reforms, housing costs, and segregation using its housing market forecast model.
- **Purdue University** — \$263,847, to study building codes as a land-use restriction and clarify how proposed revisions to the International Building Code and International Code Council would affect supply and affordability.
- **Louisiana State University** — \$263,650.42, to conduct a life-cycle cost analysis of disaster-resilient affordable housing, including elevated, wind-resilient manufactured homes.
- **Manufactured Housing Institute** — \$263,544.87, to examine local barriers to manufactured-home placement and propose regulatory reforms.
- **Washington State University** — \$226,756.05, to develop and demonstrate modular mass-timber hybrid construction (home institution of MOD X co-founder Ryan E. Smith).
- **ADL Ventures** — \$219,143, to study financing of industrialized offsite construction and ways to increase the industry's access to capital.
- **Lehigh University** — \$196,722.42, to catalog ADU-ordinance best practices, design guidelines, and financial incentives in small-to-medium-sized municipalities.

These 10 awards total \$2,998,999.76 — the source reports "a total of \$3 million."

Separately, under the Office to Residential Conversions NOFO:

- **M. Arthur Gensler Jr. & Associates, Inc.** — \$858,261.91, to analyze office-to-residential conversion activity in six cities, test financial feasibility, study policies and incentives, and build an online community guide.

Source: HUD press release 24-036, Feb. 23, 2024.

Part I — ICC Codes

This category covers the ICC's model building codes — the IRC, the IBC, other model codes, and the performance-code pathway. Codes are the regulations that Authorities Having Jurisdiction (AHJs) adopt into law; they are distinct from ICC's standards (Part II), which are referenced technical documents, not laws themselves.

Executive Summary Recommendation — HUD Code vs. ICC Codes

ROADMAP RECOMMENDATION TO HUD

HUD Code: Investigate the relative merits of the HUD Code versus the ICC codes for potential regulation of manufactured housing.

— *Research Roadmap*, p. vi

This recommendation is restated verbatim in the report's Appendix:

ROADMAP RECOMMENDATION TO HUD (RESTATED)

HUD Code: Investigate the relative merits of the HUD Code versus the ICC codes for potential regulation of manufactured housing.

— *Research Roadmap*, p. 68

Section 3.1, Regulatory Framework — Page 21

Section 3.1 opens with a pull-quote from Cindy Davis, President of the ICC Board of Directors. It calls for HUD to adopt both a single code (IRC and IBC) and a standard process (ICC/MBI) — so while it's placed here for its codes content, it also touches ICC/MBI standards (see Part II):

“With the ANSI industry consensus standard by ICC and MBI now available, it seems that HUD could streamline the manufactured home industry, remove unnecessary regulatory barriers, and increase consumer confidence by adopting these standards for all offsite construction. States could ease their workload with reliance on accredited third-party inspection and labeling organizations. Thus, you would have one simple set of construction rules (IRC and IBC) and a standard process (ICC/MBI) for offsite construction in all 50 states. This would create a level playing field and remove the patchwork of regulations that is holding the industry back from expanding.”

— Cindy Davis, President, Board of Directors, International Code Council

— *Research Roadmap*, p. 21

Page 22 — IRC/IBC Adoption and ICC Definition

Residential Code (IRC) and (2) the International Building Code (IBC). Authorities Having Jurisdiction (AHJ), the local regulatory agency and authority, adopts the IRC and IBC in nearly all U.S. jurisdictions, as well as other ICC model codes (i.e., International Energy Conservation Code). These codes are deemed prescriptive, specifying approved materials and assemblies

rather than performance characteristics, and they have been developed to support a variety of site-built approaches.

— *Research Roadmap*, p. 22

A footnote on the same page defines the ICC directly:

The International Council of Codes (ICC) is a non-government for profit organization that produces model codes and standards for building safety. ICC uses a consensus process with industry stakeholders to develop and refine its model codes in 3-year cycles. In the United States, regulations for building construction are the responsibility of the Authority Having Jurisdiction (AHJ) at the state, county, or municipal level. Therefore, AHJs adopt the ICC model codes as their own but may apply certain additional regulations as well. The International Building Code (IBC) and the International Residential Code (IRC) are the most adopted construction model codes by AHJs nationally. Furthermore, the International Energy Conservation Code is also often adopted by AHJs for energy performance criteria.

— *Research Roadmap*, p. 22, footnote 4

Page 23 — Performance-Based Codes

Finally, ICC notes that although performance-based codes are legally acceptable, they are rarely used, and the council is actively trying to determine how to encourage their use in order to foster innovation and construction productivity (ICC, 2018).

— *Research Roadmap*, p. 23

Page 24 — AHJ Code Adoption Cycle

This passage on p. 24 is about codes specifically — the ICC/MBI standards discussed elsewhere on the same page are quoted in Part II.

Although there is an ICC code that is updated every 3 years, the local AHJ adopts a version of the code and then determines how often it will update. Further, the AHJ has the authority to interpret the code during permitting and inspection. Therefore, code officials at the local level have the legal authority to accept or reject the application of any new product or system innovation, and this engrained culture has challenged building product innovation in the United States for decades (Oster and Quigley, 1977).

— *Research Roadmap*, p. 24

Page 27 — International Regulatory Comparison and U.S. Codes

The U.S. building ICC codes, including the IRC and IBC, were established on a prescriptive model of construction including building type, construction type, occupancy type, and particular building materials assemblies that are preapproved to achieve these requirements.

— *Research Roadmap*, p. 27

Page 28 — Performance Code Pathway

Although the U.S. ICC has a performance-based code pathway, it is underutilized due to the time-consuming and cost-prohibitive process with which participants must engage to demonstrate compliance, subsequently resulting in most projects utilizing a prescriptive method by default. The offsite construction and performance-based code lessons from international countries need to be researched, evaluated, and tested in the U.S. offsite construction context.

Exhibit 14 compares prescriptive codes to performance codes. Additional information is related to the ICC Performance Code (ICC, 2018).

— *Research Roadmap*, p. 28

Page 75 — ICC Codes Reference-List Entry

ICC. 2018. “2018 ICC Performance Code for Buildings and Facilities (ICCPC).”

codes.iccsafe.org/content/ICCPC2018/preface

— *Research Roadmap*, p. 75

Part II — ICC Standards

This category covers the ICC/MBI 1200, 1205, 1210, and G5-2019 offsite construction standards, developed with the Modular Building Institute and ANSI — referenced technical documents distinct from the model codes (Part I) that incorporate them.

Page 2 — Terminology, Section 1

The subassemblies may serve different Building System functions, including structure, enclosure, finishes, mechanical/electrical/plumbing services (MEP), etc. The ICC/MBI Standard Toolkits provide more context and definitions of offsite construction industry accepted terminology (ICC, 2020).

— *Research Roadmap*, p. 2

Page 6 — Section 2.1, Key Concepts in Offsite Construction for Housing

This clarity of terminology has supported confidence in offsite construction in international contexts more broadly, from potential investors and lenders to end users. The International Code Council (ICC) has made an important step in standardizing terminology (ICC/MBI, 2021), but this is only the first step in a necessary process in which HUD could have a significant impact, especially as offsite construction relates to...

— *Research Roadmap*, p. 6

Page 24 — The ICC/MBI Standards

Several standards for offsite construction are being developed by ICC in partnership with the Modular Building Institute and ANSI. These standards include the ICC/MBI 1200 Standard for Offsite Construction: Planning, Design, Fabrication and Assembly; ICC G5-2019 Guideline for the Safe Use of ISO Intermodal Shipping Containers Repurposed as Buildings and Building Components; ICC/MBI Standard 1205: Standard for Offsite Construction: Inspection and Regulatory Compliance; and ICC/MBI Standard 1210: Standard for Mechanical, Electrical, Plumbing Systems, Energy Efficiency and Water Conservation in Offsite Construction. Additionally, the Specialized Carriers and Rigging Association (SC&RA) is developing the UPT 2021: Uniform Permit Transport 2021 to harmonize all 50 states for oversized and overweight transport. However, due to the recent publication of these documents, it is unclear if the standards are being adopted and how effective they are at improving offsite construction project delivery outcomes.

— *Research Roadmap*, p. 24

The four ICC/MBI standards named in this passage:

- **ICC/MBI 1200** — Standard for Offsite Construction: Planning, Design, Fabrication and Assembly
- **ICC G5-2019** — Guideline for the Safe Use of ISO Intermodal Shipping Containers Repurposed as Buildings and Building Components
- **ICC/MBI Standard 1205** — Standard for Offsite Construction: Inspection and Regulatory Compliance
- **ICC/MBI Standard 1210** — Standard for Mechanical, Electrical, Plumbing Systems, Energy Efficiency and Water Conservation in Offsite Construction

— *Research Roadmap*, p. 24

Page 27 — International Standards Comparison

In addition, Australia has quickly become an international leader in high-rise 3D volumetric construction and has developed a unique offsite construction country standard to accommodate this market growth called the “Handbook for the Design of Modular Structures” (MCCB, 2017) that, like the ICC/MBI standards, outlines project delivery processes and harmonizes residential offsite project delivery with the Australian Building Codes.

— *Research Roadmap*, p. 27

Page 30 — Effectiveness of Recent ICC Offsite Construction Standards

Review the effectiveness of the recent ICC offsite construction standards on overall project value for the offsite construction industry.

The ICC recently developed several standards for offsite construction, including ICC/MBI 1200, ICC/MBI Standard 1205, ICC/MBI Standard 1210, and ICC G5-2019. The standards are intended to be a guide for stakeholders and AHJs in the project delivery, mechanical/electrical/plumbing (MEP) services, use of shipping containers in construction, and regulatory review and inspection process for offsite construction. However, due to the relatively recent publication of these documents, and some not issued or officially released at the time of the writing of this report, it is unclear if the standards are being adopted, and it is unclear how effective they are at improving offsite construction project delivery outcomes. Although this is a positive step showing initial signs of success (i.e., ICC/MBI 1205 was adopted in Salt Lake City AHJ), these standards need to be reviewed and continuously improved (ICC, 2022).

— *Research Roadmap*, p. 30

Related Research Questions immediately following this passage:

- To what extent are the ICC/MBI Offsite Construction Standards being implemented nationally?
- How are the ICC/MBI Offsite Construction Standards being disseminated and adopted/implemented by AHJs?
- How effective are the new standards in improving project delivery performance and uptake of offsite construction?
- How can the concerns of AHJs that are considering the standards be shared publicly and discussed?
- What are ways that the lessons learned from AHJs that are adopting the standards be collected and shared across the United States for continuous improvement?

— *Research Roadmap*, p. 30

Page 32 — ICC/MBI Standards Harmonization

Standards for products often include considerable testing to demonstrate technical compliance with codes. For example, the ICC/ Modular Building Institute 1200, 1205, and 1210 are standards for offsite construction that are written to be in support of and harmonized with the ICC family of codes and standards, including IRC and IBC.

— *Research Roadmap*, p. 32

Page 33 — Common Terminology

Although there are several sources for U.S. offsite construction for housing terminology, including the NIBS Glossary (NIBS, 2015), ICC Offsite Construction Toolkits (ICC, 2020), and Offsite Architecture (Smith and Quale, 2017), there is no universally accepted common language concerning offsite construction.

— *Research Roadmap*, p. 33

Page 47 — MBI and ICC Standards Development

A key step in this process has been the collaborative work of the MBI and ICC on a set of American National Standards Institute standards for offsite construction, with one, ICC/MBI 1200, focused on the design, fabrication, construction, and assembly of IRC and IBC offsite construction projects. This is not a contract; rather, it provides a process guide for project stakeholders.

— *Research Roadmap*, p. 47

Page 49 — Project Delivery and Contract Standards

To overcome the challenges associated with traditional AIA and AGC contracts, the ICC, in a consensus process, has developed a guide for project delivery (ICC/MBI, 1200). Although this guide does not fundamentally change contracts, the tools are intended to provide project stakeholders with a process to attain success in project delivery.

— *Research Roadmap*, p. 49

Related Research Question:

- What are the project-delivery benefits and challenges of using ICC/MBI 1200 through pilot testing?

— *Research Roadmap*, p. 49–50

Page 50 — Additional Related Research Questions

- How can this standard be improved, or additional guides and standards be developed, to foster project-delivery success in offsite construction?
- How do different housing types and subassemblies affect the use and success of ICC/MBI 1200 and AGC ConsensusDocs 753?

— *Research Roadmap*, p. 50

Pages 75–76 — ICC Standards Reference-List Entries

ICC (2022). Off-site Construction Toolkits.

www.iccsafe.org/advocacy/safety-toolkits/offsite-construction/

— *Research Roadmap*, p. 76

ICC/MBI. 2021. “ICC/MBI 1200-2021 Standard for Off-Site Construction: Planning, Design Fabrication and Assembly.” International Code Council.
shop.iccsafe.org/standards/icc-mbi-1200-2021-standard-for-off-site-construction-planning-design-fabrication-and-assembly.html

— *Research Roadmap*, p. 76

Part III — ICC-ES

This category covers the ICC Evaluation Service (ICC-ES) — the report process code officials use to verify that new or innovative building products and subassemblies comply with code requirements.

What an ICC-ES Evaluation Report Contains

According to ICC Evaluation Service's own description of its reports, code officials rely on these reports as their preferred way to confirm that a new or innovative building product meets code requirements. Each report explains which code provisions or acceptance criteria were used to judge the product, how it should be installed, and how to identify it in the field.

ICC-ES organizes each report into eleven standard components:

- A CSI MasterFormat division number, which places the product within the Construction Specifications Institute's standard classification system.
- The report holder — the company or organization that applied for the report.
- The specific product or products the report covers.
- The scope of the report — which code or codes were used to evaluate the product.
- A summary of which properties were tested, such as fire or wind resistance, and whether the product is approved for structural use.
- The permitted uses, tying the evaluated product to specific code provisions.
- A general description of the product's physical characteristics (dimensions, materials, features, etc.).
- Installation guidance, so inspectors can confirm the product was installed in compliance with code or acceptance criteria.
- The conditions of use — a statement that the product complies with, or is a suitable alternative under, the applicable code, along with any conditions attached to the report.
- The evidence submitted to support the evaluation, such as test reports, calculations, and installation instructions.
- Identification information — manufacturer name, product code, report number, and other details used to confirm the product matches the report.

Source: ICC Evaluation Service, "What's in an ICC-ES Evaluation Report," <https://icc-es.org/>

Executive Summary Recommendation — New Products (ICC-ES)

ROADMAP RECOMMENDATION TO HUD

New Products: Research the obstacles of the current ICC-Evaluation Service (ES) process to develop mechanisms to foster new product development in offsite construction for the housing sector.

— *Research Roadmap*, p. vi

Page 32–33 — Narrative Naming the ICC Evaluation Service (ES) Process

A discussion involving the current testing process of materials and assemblies, as related to ICC compliance, was closely linked to the PTC and workshop participant discussions involving the permitting and inspection process of offsite construction and the impact of performance-based codes. The current ICC Evaluation Service (ES) process and associated cost and time were noted as significant hindrances to fostering innovation, standardization, and competitiveness within the housing industry. The current process was also described as a deterrent to developing a functional research and development (R&D) culture that has been the hallmark of other successful manufacturing industries.

— *Research Roadmap*, p. 32–33

Page 34 — Research Subtopic Header and the Full ICC-ES Narrative

The research subtopic header:

Determine the extent to which material testing and ICC compliance are inhibitors for innovation in the offsite construction industry.

— *Research Roadmap*, p. 34

The report's most detailed ICC-ES passage:

The ICC-ES (2022) provides reports that are the most preferred resource used by code officials to verify that new and innovative building products comply with code requirements. The ICC-ES provides information about what code requirements or acceptance criteria were used to evaluate the product, how the product should be installed to meet the requirements, how to identify the product, etc. ICC-ES reports also require evidence through testing from an ICC-certified standards laboratory (i.e., ANSI, ASTM, UL, etc.) and how the product complies or is a suitable alternative to the requirements of the applicable code. Obtaining an ICC-ES Report is a process that is both time-consuming and expensive, and participants report that it does not foster innovation or competitiveness for small businesses and inventors, and it further reinforces prescriptive specifications. The ICC-ES process has encountered difficulty accommodating larger subassemblies (i.e., 2D enclosed panels or 3D volumetric modular) in offsite construction that integrate various material products for performance outcomes. The extent to which the current ICC-ES process is an obstacle to offsite construction and small business innovation needs to be researched. Additional information related to ICC-ES reports is available at the following website: <https://icc-es.org/>

— *Research Roadmap*, p. 34

Related Research Questions following this narrative:

- What are the scope, time, and cost impacts on new product development for offsite construction using the ICC-ES process?
- How are these impacts a barrier to innovation and new market entrants and start-ups? How can these barriers be overcome?

- What is a pathway for offsite manufacturers of subassemblies that aggregate existing laboratory-certified products to develop ICC-ES reports?

— *Research Roadmap*, p. 34–35

Page 35 — Remaining Research Questions and Technical Testing

- What is a potential alternative to ICC-ES for offsite manufacturers to demonstrate compliance and improve speed to market for new products and subassemblies?
- What is intellectual property, and what is generalizable knowledge in offsite construction products and processes?

— *Research Roadmap*, p. 35

Technical testing is needed at certified laboratories to establish ICC-ES reports to verify compliance with prescriptive or performance-based codes.

— *Research Roadmap*, p. 35

Page 40 — Fire and Sound Attenuation Testing

Fire and sound attenuation performance characterization of established offsite construction subassemblies with ICC-ES Reports (2D enclosed panels and 3D volumetric modules) and final installed performance assessment.

— *Research Roadmap*, p. 40

Page 68 — Appendix Recommendation (restated)

ROADMAP RECOMMENDATION TO HUD (RESTATED)

New Products: Research the obstacles of the current ICC-ES process to innovation and develop mechanisms to foster and expedite new product development in the offsite construction-for-housing sector.

— *Research Roadmap*, p. 68

Page 76 — ICC-ES Reference-List Entry

ICC-ES. 2022. “ICC Evaluation Service.” [icc-es.org/](https://www.icc-es.org/)

— *Research Roadmap*, p. 76

Part IV — ICC Services

This category covers ICC-provided processes named in the report: the code/standards development process itself (the consensus process by which ICC produces its codes and standards), third-party field inspection, remote virtual inspection, and ICC NTA — the ICC-affiliated inspection and certification body for modular and manufactured housing.

Code & Standards Development

Developing and maintaining codes and standards is itself an ICC service, distinct from the codes (Part I) and standards documents (Part II) it produces. The passages below describe that consensus development process; the same passages are also quoted in Part I or Part II in the context of the specific code or standard they introduce.

The International Council of Codes (ICC) is a non-government for profit organization that produces model codes and standards for building safety. ICC uses a consensus process with industry stakeholders to develop and refine its model codes in 3-year cycles.

— *Research Roadmap*, p. 22, footnote 4 — also in *Part I, ICC Codes*

Several standards for offsite construction are being developed by ICC in partnership with the Modular Building Institute and ANSI.

— *Research Roadmap*, p. 24 — also in *Part II, ICC Standards*

A key step in this process has been the collaborative work of the MBI and ICC on a set of American National Standards Institute standards for offsite construction, with one, ICC/MBI 1200, focused on the design, fabrication, construction, and assembly of IRC and IBC offsite construction projects.

— *Research Roadmap*, p. 47 — also in *Part II, ICC Standards*

To overcome the challenges associated with traditional AIA and AGC contracts, the ICC, in a consensus process, has developed a guide for project delivery (ICC/MBI, 1200).

— *Research Roadmap*, p. 49 — also in *Part II, ICC Standards*

Page 25 — Third-Party Inspection

Additional information related to the ICC third-party inspection process for offsite construction is provided by the ICC FAQs on Offsite Construction document (ICC, 2020).

— *Research Roadmap*, p. 25

Page 26 — Remote Virtual Inspection (ICC NTA)

Although this is just beginning to be used and seemingly would be of great benefit to offsite construction, there are reported technical challenges with remote inspection due to camera set-up, WIFI connections, training, and production-line access (ICC NTA, 2020).

— *Research Roadmap*, p. 26

Pages 75–76 — ICC Services Reference-List Entries

ICC. 2020. “FAQs on Off-site Construction. International Code Council.” www.iccsafe.org/wp-content/uploads/20-19332_GR_Offsite_Construction_FAQs_FLR_FINAL_1_HIRES.pdf Accessed 3/14/22.

— *Research Roadmap*, p. 76

ICC NTA. 2020. “Visual Cues: Inside NTA’s First All-Virtual Modular Plant,” Building Safety Journal. International Code Council. www.iccsafe.org/building-safety-journal/bsj-dives/visual-cues-inside-icc-ntas-first-all-virtual-modular-plant-inspection/

— *Research Roadmap*, p. 76

Appendix — ICC-Affiliated Individuals Named in the Report

Two named individuals are identified in the report by their ICC affiliation: Cindy Davis (State of Virginia; President, ICC Board of Directors), named three times (Acknowledgements, p. i; PTC roster, p. 16; workshop attendees, p. 69), and Ryan Colker (ICC), named once (workshop attendees, p. 70). They fall outside the Codes / Standards / ICC-ES / Services breakdown above but are included here for completeness.

Direct Quotes from ICC-Affiliated Individuals

Of the two, only Cindy Davis is directly quoted in the report. Her quote opens Section 3.1 and is reproduced in full below (it also appears in Part I, ICC Codes, since it's placed there for its codes content, though it also touches ICC/MBI standards):

“With the ANSI industry consensus standard by ICC and MBI now available, it seems that HUD could streamline the manufactured home industry, remove unnecessary regulatory barriers, and increase consumer confidence by adopting these standards for all offsite construction. States could ease their workload with reliance on accredited third-party inspection and labeling organizations. Thus, you would have one simple set of construction rules (IRC and IBC) and a standard process (ICC/MBI) for offsite construction in all 50 states. This would create a level playing field and remove the patchwork of regulations that is holding the industry back from expanding.”

— Cindy Davis, President, Board of Directors, International Code Council

— *Research Roadmap*, p. 21

Ryan Colker is listed only as a workshop attendee (p. 70); no quoted statement is attributed to him anywhere in the report. No other pull-quote in the document is attributed to an ICC-affiliated individual — the report's other named pull-quotes (Lisa Podesto of Lendlease, Rebeca Lorenz of Assembly OSM, Cheryn Metzger of PNNL, Laurie Robert of a modular building specialist firm, Helena Lidelow of Lindbäcks Bygg, and Carol Galante of UC Berkeley) are all attributed to individuals from outside ICC.

Page i — Acknowledgements

The Acknowledgements section, thanking the Practice and Technical Committee (PTC), also identifies Cindy Davis by her ICC role:

Cindy Davis, State of Virginia, and ICC President

— *Research Roadmap*, p. i

Page 16 — Exhibit 10, Practice and Technical Committee (PTC) Roster

Cindy Davis — State of Virginia; ICC President, Board of Directors — Regulatory

— *Research Roadmap*, p. 16

Pages 69–70 — Stakeholder Workshop Attendees

Cindy Davis — State of Virginia; ICC President Board of Directors — Regulatory

— *Research Roadmap*, p. 69

Ryan Colker — ICC — Regulatory

— *Research Roadmap*, p. 70

Page 69 — The Workshop Itself Was Invite-Only and Virtual

Both Cindy Davis and Ryan Colker attended the stakeholder workshop described in Appendix A. The report specifies that this workshop was invite-only and held virtually via Zoom:

In December 2021, the National Institute of Building Sciences and MOD X hosted an invite-only, half-day virtual workshop in support of the HUD Industrialized Construction Research Roadmap. The purpose of the workshop was to gather a diverse group of leading experts from across the offsite construction industry to review and validate the proposed research questions and to provide additional areas of recommendation that could be included in the final research roadmap to be published by HUD.

— *Research Roadmap*, p. 69

NIBS, MOD X, and PTC Members nominated approximately 70 candidates to invite to the workshop... Over 40 industry experts, representing a diversity of disciplines within the industrialized construction industry, joined HUD, NIBS, MOD X, and the PTC to discuss the proposed research topics... The workshop was conducted via Zoom.

— *Research Roadmap*, p. 69

Summary Table of ICC References, by Category

Category	Page	Content
ICC Codes	vi	"HUD Code" recommendation comparing HUD Code to ICC codes.
ICC Codes	68	"HUD Code" recommendation restated in the Appendix.
ICC Codes	21	Cindy Davis (ICC) pull-quote calling for one code (IRC/IBC) and a standard process (ICC/MBI).
ICC Codes	22	IRC/IBC adoption by AHJs; footnote defining the ICC.
ICC Codes	23	ICC's position on the underuse of performance-based codes (ICC, 2018).
ICC Codes	24	AHJ code-update cycle (3-year cycle).
ICC Codes	27	U.S. ICC codes (IRC/IBC) as prescriptive model.
ICC Codes	28	Underutilized ICC performance-based code pathway (ICC, 2018).
ICC Codes	75	Reference: ICC (2018) Performance Code.
ICC Standards	2	ICC/MBI Standard Toolkits cited as source of offsite construction terminology.
ICC Standards	6	ICC credited with standardizing offsite construction terminology (ICC/MBI, 2021).
ICC Standards	24	ICC/MBI 1200, G5-2019, 1205, and 1210 standards described.
ICC Standards	27	International standards comparison (Australia's MCCB handbook, likened to ICC/MBI standards).
ICC Standards	30	Effectiveness of recent ICC offsite construction standards (ICC, 2022) and related research questions.
ICC Standards	32	ICC/MBI 1200/1205/1210 harmonization with IRC/IBC.
ICC Standards	33	ICC Offsite Construction Toolkits cited among terminology sources.
ICC Standards	47	MBI and ICC collaboration on ANSI standards (ICC/MBI 1200) for project delivery.
ICC Standards	49–50	ICC/MBI 1200 project-delivery guide and related research questions.
ICC Standards	76	References: ICC (2022) Toolkits, ICC/MBI (2021).
ICC-ES	vi	"New Products" recommendation naming the ICC-Evaluation Service (ES) process.

ICC-ES	32–33	Narrative naming the "ICC Evaluation Service (ES)" process as a hindrance to innovation.
ICC-ES	34	Research subtopic header and the full ICC-ES subtopic narrative — the report's most detailed ICC-ES discussion.
ICC-ES	34–35	Four related research questions on ICC-ES's impact on small businesses and new entrants.
ICC-ES	35	Technical testing needed at certified labs to establish ICC-ES reports.
ICC-ES	40	Fire/sound testing of subassemblies with ICC-ES Reports.
ICC-ES	68	"New Products" recommendation restated in the Appendix.
ICC-ES	76	Reference: ICC-ES (2022).
ICC Services	22, footnote 4	ICC's consensus development process for model codes, 3-year cycles (cross-ref: also ICC Codes).
ICC Services	24	Standards being developed by ICC in partnership with MBI and ANSI (cross-ref: also ICC Standards).
ICC Services	25	ICC third-party inspection process and ICC FAQs on Offsite Construction (ICC, 2020).
ICC Services	26	Remote virtual inspection challenges (ICC NTA, 2020).
ICC Services	47	MBI/ICC collaborative development of ANSI standards (cross-ref: also ICC Standards).
ICC Services	49	ICC's consensus-process development of the ICC/MBI 1200 project-delivery guide (cross-ref: also ICC Standards).
ICC Services	76	References: ICC (2020) FAQs, ICC NTA (2020).
Personnel (Appendix)	21	Direct quote: Cindy Davis (ICC President) on codes and ICC/MBI standards adoption.
Personnel (Appendix)	i	Acknowledgements: Cindy Davis identified as ICC President among PTC members.
Personnel (Appendix)	16	Cindy Davis listed as ICC President, Board of Directors (PTC roster).
Personnel (Appendix)	69–70	Cindy Davis (ICC President) and Ryan Colker (ICC) listed as workshop attendees.
Personnel (Appendix)	69	Context: the workshop both attended was invite-only and held virtually via Zoom (Dec. 2021).

Sources

- HUD Funds Fast Track ICC/NIBS/MODX Monopoly (Tiny House Alliance USA)
- Offsite Construction for Housing: Research Roadmap. U.S. Department of Housing and Urban Development, Office of Policy Development and Research, 2023.
- What Is An ICC-ES Evaluation Report? — ICC Evaluation Service, <https://icc-es.org/>
- HUD press release 24-036, Feb. 23, 2024 — HUD Archives: News Releases
- HUD press release 23-124, June 21, 2023 — HUD Archives: News Releases