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Chairman Williams, members of the Committee — thank you for the opportunity to testify.

I’m an architect, researcher, and co-founder of MOD X Advisory — a firm that has directly supported HUD’s offsite construction research since 2022 and advises industry and government on topics related to accelerating industrialized housing delivery in the United States. With Ryan E. Smith and Tyler Schmetterer, I co-authored a report for HUD, published this March, that examines why the United States has persistently struggled to industrialize housing delivery while our peer economies have not. As someone who has spent decades working on this topic, I wish I could say our conclusions were new. They were not. What we found, repeatedly, was that much of what has worked abroad was first proposed in the United States, debated, tested, but never fully implemented. Our contribution was modest: we updated those ideas for a new time and context. My central recommendation is concrete: this Committee should support the National Institute of Building Sciences — NIBS — in initiating development of a housing system certification framework, initiatable without new appropriations or new authority. Our report recommends three actions to achieve this: standardize federal terminology and award criteria; direct NIBS to develop the certification framework Congress already authorized; and use that framework as the bridge toward performance-based code reform.[1]

The Unfinished Breakthrough

The industrialization of housing delivery is the integration of design, production, supply chains, quality control, and continuous improvement into a coordinated system — organizational as much as technological innovation. Most other complex American industries operate within regulatory frameworks that support this kind of integration. Housing does not. In 1968, HUD documented exactly that, and concluded that the federal role is to create the enabling conditions within which states, localities, firms, and teams can innovate. Half a century ago, Congress listened — across administrations of both parties. The research findings were affirmed; an implementing institution was established. What was left undone was the operationalization of what Congress had already authorized. What was that institution, and that framework?

The 1968 Housing Act authorized HUD to pilot a national housing system certification program.[2] That pilot, Operation Breakthrough, validated the institutional architecture, the performance-based system certification approach, even where commercial scale was not achieved.[3] The gap was not in the demonstrated framework. It was in sustained

implementation. The 1974 Housing and Community Development Act produced two performance-based regulatory reform actions in response. The first was the HUD Code, which replaced the mobile home industry's self-regulated standard with a federal performance-based one — one of the earliest national performance-based housing standards of its kind.[4] The second was the establishment of the National Institute of Building Sciences, mandated to continue the work Operation Breakthrough had started: developing a performance-based fast track for scaling innovative housing systems.[5]

Our focus on housing system certification should be clear given its massive transformative potential. Our research pointed to it as the most promising path forward for three concrete reasons: it was proven at a pilot level in the United States through Operation Breakthrough; it has been operating successfully for more than fifty years in Japan; and it is essentially the same framework that already governs every other consequential American manufactured product. This framework isn't speculative. It is already validated, internationally and in our own economy.

The current proposals for reforming the HUD Code have exciting potential. But the already-approved framework for housing system certification deserves even more focus. The 1974 Act explicitly mandated NIBS to continue the housing system certification work that Operation Breakthrough had piloted. That mandate has never been exercised, but it has also never been rescinded. If Congress is looking for powerful housing legislation already on the books, the NIBS mandate is one of the most powerful unused levers available. That is the implementation pathway now before us.

In 1968, preparing the legislative foundation for Operation Breakthrough, HUD found that "large-scale application of industrialized building systems is not limited by technological, design or cost factors, but only by institutional constraints." [6] That same year, Congress tasked HUD with evaluating "the effect which local housing codes and zoning regulations have, or would have if applicable, on the cost per dwelling unit." [6] It did. Six years later, with Operation Breakthrough completed and its findings in hand, the 1974 Act stated the conclusion plainly: "the lack of uniform housing and building regulatory provisions increases the costs of construction and thereby reduces the amount of housing and other community facilities which can be provided." [7] The problem had been identified and measured, a solution demonstrated, and an institution established to support reform. What was never completed was the implementation. [8]

What Is Housing System Certification?

Before explaining what certifying a housing system means, it is worth being precise about what a housing system is — because the term is doing real work here.

A housing system is essentially a product definition — the design logic, the structural and material systems, the offsite manufacturing and onsite assembly process, the supply chain, the quality controls, and the performance characteristics of a defined, repeatable housing offering — treated as a unified whole rather than a collection of discrete decisions made project by project. A housing system may involve significant factory production, but it can also be primarily site-built. What defines it as a system is the integration — design for manufacturing and assembly,

coordinated supply chains, serial production, continuous improvement — rather than where production physically occurs. A factory helps. The organizational method matters more.

No housing system certification framework currently exists in the United States. Congress authorized NIBS to develop one in 1974, but that work was never carried out. NIBS, with industry participation, is now beginning that development work. What follows is what such a framework would do once developed and implemented.

The target market is not speculative. MOD X Advisory is currently working with partners in Washington State on the first statewide initiative specifically designed to apply housing system certification to starter homes — the attainable housing that working families at moderate income levels need most and that the current project-by-project regulatory burden makes hardest to deliver at scale.

Today, nearly every residential project is treated as a unique event. The design is reviewed against the prescriptive building code project by project. The construction is inspected project by project. The financing is underwritten project by project. The insurance is priced project by project. Every approval is relitigated every time, even when the underlying system is the same one a company has used a hundred times before.

Housing system certification would work differently. Under such a framework, a company's integrated delivery system — the design logic, the offsite manufacturing and onsite assembly process, the quality controls, the performance characteristics — would be reviewed once, against performance criteria, by an independent expert body. Once the system was certified, individual projects using the system would inherit that approval. As in aerospace, a configuration space would be created, allowing for variations within the preapproved framework. Permitting would be streamlined. Lenders and insurers could rely on the certification as a basis for underwriting. Code officials would retain their authority but exercise it against a known and tested baseline. This is not a proposal to preempt local code officials — it is a proposal to give them a tested performance baseline against which to exercise their authority.

The savings would come from not redoing the same approvals on every project. The quality gains would come from concentrating expert review at the system level rather than diffusing it across thousands of individual project reviews. This is what most other manufactured products in the American economy already do — automobiles, aircraft, medical devices, consumer electronics, agricultural equipment. Housing remains an outlier among major American sectors that produce complex, safety-critical products, even though Congress identified the solution in 1968, demonstrated it between 1969 and 1973, and authorized its implementation in 1974.[9]

Certification is also inherently evolutionary — and that is perhaps its most important feature. A certified system would not be a frozen specification but a living baseline that the responsible company refines as evidence accumulates. More than a century ago, American industrial management pioneers described exactly this kind of continuous, evidence-based evolution of standards — driven by the firms doing the actual work, refined through use — as the ideal toward which industrial regulation should evolve. Japan adopted a similar framework in 1973, based in part on a close dialogue with the Operation Breakthrough team.[10] Housing system

certification is the framework that would finally make that vision operational in American housing. The design principle: think sector wide, experiment at the company and team level.

The 1974 authority granted to NIBS to develop and implement this framework has never been exercised. Congress passed the law. The framework was sound. The implementing institution was established. What ran out was political continuity, not policy validity.[11] The authority is still on the books today.

The Evidence

Other countries built what we authorized but did not implement. Today, more than twenty-eight percent of Japanese housing units pass through their housing system certification program.[12] Certified buildings are significantly more resistant to natural disasters — certified housing is nearly three times less likely to suffer severe earthquake damage,[13] two-thirds achieves net-zero energy performance,[14] and sixty-four percent meets barrier-free accessibility standards for an aging population.[15] Insurance discounts of between ten and fifty percent are tied to certification,[16] and mortgage rate reductions are also commonly available.[17]

In the U.S., the strongest endorsement of housing system certification in our research has come not from the largest players but from small, vertically integrated companies and integrated project teams working in long-term relationships — firms already committed to industrialized housing delivery, absorbing the project-by-project approval burden on every job, unable to amortize their system-level investments across a pipeline the current regulatory environment makes unpredictable. Fading West Development, the Colorado-based factory-built modular homebuilder testifying alongside me today, is exactly this kind of firm — building starter homes, operating across multiple jurisdictions, and navigating a different permitting, inspection, and financing landscape in every one of them. Certification is not a policy preference for firms like Fading West. It is the reform that would make their business model viable at scale. And it benefits factory, site, and hybrid delivery equally — because what it certifies is the integrated system, not the venue.

What struck us was a different and in some ways more significant endorsement. JPI is one of the largest multifamily developers in the United States — and also happens to be owned by Sumitomo Forestry, a Japanese company deeply involved in housing system certification there. MOD X Advisory currently advises JPI, which gives us direct access to the operational data cited in this section. The degree to which JPI's leadership has internalized the logic of housing system certification, and the sophistication with which they articulate what it would do for their operations, is not what you would expect from a company with no direct investment in factory production.

JPI invests at least six percent of its annual return in research and development.[18] By any measure, that commitment is an order of magnitude higher than the American construction industry average. This level of private investment is precisely what housing system certification would encourage sector wide — and it requires no federal funding. The framework would simply remove the institutional barrier that makes the investment irrational for most firms operating in

the current regulatory environment. Certification is the institutional reform that would unlock private capital that is otherwise sitting on the sidelines waiting for regulatory clarity.

JPI has invested in industrialized delivery at every level of their organization, and the results are measurable. On large multifamily projects, they have compressed timelines from twenty-six months to eighteen — a thirty percent reduction, achieved through technology-enabled rigorous organization across design, procurement, scheduling, and onsite assembly.[19] Every month of that compression eliminates financing costs, carrying costs, and risk premiums that currently flow to the end user. Interior finishes illustrate the framework with particular clarity: JPI cut completion time from one hundred eighty days to one hundred twenty days through industrialized organization alone, then from one hundred twenty days to seventy days by using qualified third-party inspectors rather than waiting on local jurisdictional inspection cycles. The first step is industrialization itself. The second step is what third-party inspection can deliver even within the current regulatory environment. Housing system certification would generalize the second step across all sub-tasks and all projects, with qualified inspectors working to a certified process specification.

To preserve their project-wide gains under current conditions, JPI works with third-party inspectors that run alongside their construction schedule rather than gating it. This process remains an analog approach with many of the archaic challenges of normal AHJ inspection. Under housing system certification, with qualified inspectors working to a systems- and technology-enabled certified process specification rather than to default jurisdictional standards, JPI estimates — based on their own operational data — they could make another significant step toward the technical limit of fifty-eight percent project-wide time savings, substantially higher than their current thirty percent.[20] JPI also believes certification would help local code authorities do their job with more certainty in less time, by giving them a tested baseline against which to apply their continuing oversight authority. AHJs would retain authority; the framework would give them better tools to exercise it.

Housing system certification would serve firms as different as JPI — which is site-built — and Fading West Development, the Colorado-based factory-built modular homebuilder that testified before the House Financial Services Committee last summer, with the same instrument. Both firms are already participating alongside other industry partners in the NIBS Steering and Technical Committee that is currently doing the development work — different industrialization strategies converging on the same institutional reform, and doing so actively. And both represent something the small innovators who first endorsed this framework already understood: the regulatory barrier is not a barrier to any particular method of construction. It is a barrier to the organizational commitment that industrialization requires.

The implementation challenges are real — inspector certification, AHJ capacity, liability allocation — and NIBS's development work would address each of them. That is exactly what the framework development process is designed to produce.

Three Recommended Actions

The HUD report we co-authored proposes a path toward a clear long-term goal: a performance-based regulatory framework for housing, harmonized across jurisdictions where harmonization serves shared public purposes, and rationally accommodating local difference where local conditions actually require it.

The path has three sequenced actions.

First, immediately: conduct an agency-wide review of federal award criteria across all programs that affect housing delivery — a preliminary version of which we delivered to HUD.[21] Like every country we studied, the United States first needs to clarify and standardize the terminology used to describe industrialized housing delivery before coordinated criteria can do their work. Consider what a small innovative builder faces today: terminology for industrialized housing delivery is inconsistent across federal agencies; financing and underwriting criteria treat factory-built and site-built systems differently depending on the program; and resilience and performance standards vary by agency and sometimes conflict. A large national builder has the compliance capacity to navigate this fragmentation. A small firm building starter homes does not. Consistent language and criteria across HUD, the Federal Housing Finance Agency, USDA Rural Development, the Department of Veterans Affairs, FEMA, and others would generate the demand aggregation that early-adopter manufacturers and small builders need — without new federal spending, without new authority, and without picking winners among construction methods.

Second, as the early adopters establish themselves: direct NIBS to initiate development of a housing system certification framework under the authority Congress granted in 1974[22] — a framework that would allow lenders, insurers, and code officials to rely on a single performance-based approval rather than the project-by-project review that drives much of the current cost burden on small builders. This can be initiated through committee report language. It does not require new appropriations or new authority. It requires direction to exercise authority that has been on the books for fifty-two years. NIBS already exists. Industry partners are already engaged. What's needed is congressional support for this work to proceed.

Third, as a certification framework matures: support performance-based building code reform, building on the precedent of the HUD Code and the existing work of the International Code Council. Performance-based regulation, where it has been adopted, has consistently produced four results: increased competitiveness, faster innovation, lower costs, and improved quality. This is not a theoretical claim. It is the empirical record of Japan, the United Kingdom, and the entire European Union,[23] and it is also the operational reality of every other consequential sector of the American economy that produces complex manufactured products. These sectors are regulated against what the product must achieve, not against how it must be built. Housing is the outlier. The 1976 HUD Code is the only sector of American housing that operates on this principle, and it has delivered nine million units of affordable manufactured homes at roughly half the cost of comparable site-built housing on a per-square-foot basis.[24]

These three actions follow the same organizing principle: federal action creates the enabling conditions; innovation happens at the local, company, and team level.

They also compound through network effects. Standard award criteria would give early-adopter manufacturers and builders a viable demand pipeline. Housing system certification, once developed, would give lenders, insurers, and code officials a basis for relying on certified systems across multiple projects. Performance-based code reform would create the long-term regulatory environment in which the framework becomes self-sustaining. The path begins modestly — a few manufacturers, a few jurisdictions — and grows exponentially as each successful certification makes the framework more valuable to the next potential adopter. None of these actions requires new federal authority. All of them use authorities Congress has already granted.

In closing: Congress addressed this institutional problem twice, in 1968 and again in 1974, across administrations of both parties. The opportunity before this Committee is not to start something new. It is to finally enable the implementation of what was authorized fifty-two years ago. Congress passed the law. The authority has not been used. We are not asking for new authority — we are asking for support to exercise what is already on the books.

What this Committee can enable is straightforward. Innovative American firms get the regulatory environment they need to invest in industrialized housing delivery without the institutional barriers that currently strand their capital. Local code authorities get a tested baseline that helps them exercise their authority with more certainty in less time. And American families — the people this Committee exists to serve — get housing that costs less, performs better, and reaches them faster, because the institutional gap that drives so much of the current cost is finally closed.

Fifty-eight years ago, HUD wrote that "large-scale application of industrialized building systems is not limited by technological, design or cost factors, but only by institutional constraints." [6] That assessment was accurate then. It is accurate now. We have the opportunity to finally act on it.

Thank you. I welcome the Committee's questions.

ENDNOTES

[1] The primary sources for this testimony are: Smith, R.E., Rupnik, I., and Schmetterer, T. (2026). *HUD's Past, Present, and Future Role in Accelerating U.S. Offsite Construction for Housing: A Comparative Study and Action Plan*. Washington, DC: U.S. Department of Housing and Urban Development, Office of Policy Development and Research [hereafter "HUD Action Plan"]; and Smith, R.E., Rupnik, I., Schmetterer, T., and Barry, K. (2023). *Offsite Construction for Housing: Research Roadmap*. Washington, DC: U.S. Department of Housing and Urban Development, Office of Policy Development and Research [hereafter "Research Roadmap"]. Available at <https://www.huduser.gov/portal/publications/Offsite-Construction-for-Housing-Research-Roadmap.html>. The Research Roadmap's industry consensus process identified regulatory framework as the highest-priority research topic across six areas, directly informing the three-action sequence recommended in this testimony. Research Roadmap, pp. i–ii.

[2] Public Law 90-448-AUG. 1, 1968: Housing and Urban Development Act of 1968, Section 108 (New Technologies in the Development of Housing for Lower-Income Households). See HUD Action Plan, pp. 28–29. Congress tasked HUD to "encourage large-scale experimentation in the use of such technologies," "provide a basis for comparison of such technologies with existing housing technologies," and evaluate "the effect which local housing codes and zoning regulations have, or would have if applicable, on the cost per dwelling unit." Public Law 90-448, p. 495. Congress funded construction of 5,000 units over five years for the pilot program.

[3] U.S. Government Accountability Office (1976). *Operation Breakthrough: Lessons Learned About Demonstrating New Technology*. PSAD-76-173: B-114860. Washington, DC: GAO. See also HUD Action Plan, pp. 29–32. The GAO report documented HUD's findings on which systems demonstrated the most potential and which regulatory reforms were most effective. The HUD Action Plan notes that Operation Breakthrough "produced the evidence that the framework worked" in terms of validating the performance-based certification approach, even as commercial scaling was interrupted by the 1973 federal housing subsidy moratorium. HUD Action Plan, pp. 31–32.

[4] Public Law 93-383; 88 Stat. 633 (1974), Title VI (Manufactured Home Construction and Safety Standards). The HUD Action Plan describes Congress's use of the Interstate Commerce Clause to create "the first preemptive U.S. national building code and the first performance-based national code in the world." HUD Action Plan, p. 33.

[5] Public Law 93-383; 88 Stat. 633; 42 U.S.C. 5301 et seq., Section 809 (National Institute of Building Sciences). The 1974 Act granted NIBS "functions and responsibilities in four general areas, relating to building regulations," including: development of nationally recognized performance criteria and standards; evaluation and prequalification of building technology; investigative research; and data assembly and dissemination. HUD Action Plan, pp. 35–36. Congress also mandated the creation of an Advanced Building Technology Council and Advanced Building Technology Program — a direct continuation of the New Technologies Program that funded Operation Breakthrough. HUD Action Plan, p. 35.

[6] Patman, P.F., Howenstine, E.J., Szczepanski, C.Z., and Warner, J.R. (1968). *Industrialized Building: A Comparative Analysis of European Experience*. Washington, DC: U.S. Department of Housing and Urban Development, Division of International Affairs, p. 121. Cited in HUD Action Plan, p. 67. The 1968 tasking language directing HUD to evaluate the effect of local codes on per-unit cost is from Public Law 90-448, p. 495, cited in HUD Action Plan, p. 29. The closing use of this quote in the testimony is cited to the same source.

[7] Public Law 93-383; 88 Stat. 633 (1974), p. 97. Full passage: "the lack of uniform housing and building regulatory provisions increases the costs of construction and thereby reduces the amount of housing and other community facilities which can be provided." Cited in HUD Action Plan, p. 35. The 1974 Act also found that "the lack of an authoritative national source to make findings and to advise both the public and private sectors of the economy with respect to the use of building science and technology... is an obstacle to efforts by and imposes severe burdens upon all those who procure, design, construct, use, operate, maintain, and retire physical facilities." Ibid.

[8] HUD Action Plan, p. 36: "This authority remains to this day but is not being currently exercised. The need for a national institution is more acute than ever to streamline regulations to achieve the rapid supply of affordable

housing through offsite construction." The NIBS mandate has neither been exercised nor rescinded since its authorization in 1974.

[9] HUD Action Plan, pp. 9–12 (Section 1.2: Effective Government Action for Accelerating Offsite Construction for Housing); Research Roadmap, Research Topic 1: Regulatory Framework. The Research Roadmap's consensus process identified regulatory framework as the single highest-priority research need, reflecting industry-wide recognition that current prescriptive regulatory frameworks assume design-bid-build delivery and present structural barriers to industrialized housing delivery. Research Roadmap, p. i.

[10] HUD Action Plan, pp. 41–42. A HUD-led delegation visited Japan in December 1970, and Japan's Ministry of International Trade and Industry organized a reciprocal "Uchida Delegation" to Operation Breakthrough sites in October 1971. The Uchida Delegation was "presented with a comprehensive overview of the U.S. housing system certification that HUD and NBS were developing." HUD Action Plan, p. 41. Japan's Certification Program for the Performance of Prefabricated Houses was established in 1973, directly following this exchange. HUD Action Plan, p. 42. See also: U.S. Department of Housing and Urban Development (1972). "The Uchida Mission." *HUD Challenge* 3 (3): 16–18.

[11] HUD Action Plan, pp. 31–33. The Nixon Administration placed a moratorium on all federal housing subsidies in early 1973, eliminating the demand pipeline before the housing system certification framework could demonstrate commercial viability. Most firms that had invested in Operation Breakthrough capacity went bankrupt by the end of the decade. HUD Action Plan, p. 32. The Advanced Building Technology Council and Program were never constituted, leaving the NIBS mandate unexercised.

[12] Building Center Japan (BCJ) (2023). *Overview of the Business of Type Approval/Certification of Specific Type Products Manufacturers*. Technical Appraisal Department, Building Center of Japan. Japan Housing Finance Agency (JHF) (2023). *Overview of Japan Housing Finance Agency*. International Affairs Group. Both cited in HUD Action Plan, p. 44. Specific figure: "In 2021, the housing system certification program, which had been in place since 2000, was utilized by 28.2 percent of housing units, approximately 50 percent detached and 50 percent multi-unit." HUD Action Plan, p. 44.

[13] HUD Action Plan, p. 44: "Housing system-certified housing is nearly three times less likely to experience 'severe damage' during earthquakes." Source: Sekisui House and Sekisui Heim (2023), as cited in HUD Action Plan, p. 38 (footnote 67).

[14] HUD Action Plan, p. 45: "Sixty-seven percent of housing system-certified housing is Net Zero Energy Buildings (ZEB), with many of the leading 'prefab house' companies producing 90 percent or more ZEB units. Japan plans to reach 100 percent ZEB for new construction by 2030."

[15] HUD Action Plan, pp. 44–45: "Sixty-four percent of housing system-certified housing is barrier-free, a key metric for Japan's aging population."

[16] HUD Action Plan, p. 44: "10- to 50-percent discount on earthquake insurance is determined based on performance criteria met during the housing system certification process." Source: JHF (2023). Earthquake insurance discounts are assessed across performance criteria including seismic resistance, energy efficiency, barrier-free design, and structural durability.

[17] JHF Flat 35S Program provides mortgage rate reductions for certified housing meeting one or more of the following criteria: highly energy-efficient housing, superior seismic resistance, superior barrier-free housing, and superior durability and flexibility of the housing structure. HUD Action Plan, p. 44. See also JHF (2023).

[18] Information provided directly by JPI to MOD X Advisory in the course of an ongoing advisory engagement. JPI defines this figure as a percentage of annual return on investment. The American construction industry comparison ("fraction of one percent of revenue on R&D") is drawn from industry data documented in the HUD

Action Plan's discussion of the construction sector's historically low R&D investment. See HUD Action Plan, pp. 8–9; Research Roadmap, Research Topic 6: Business Models and Economic Performance.

[19] Information provided directly by JPI to MOD X Advisory in the course of an ongoing advisory engagement, 2025. The timeline compression from twenty-six months to eighteen months reflects JPI's large multifamily project data as reported to the research team. The interior finishes compression (180 → 120 → 70 days) reflects the same dataset, illustrating the two-step gains from industrialized organization and qualified third-party inspection respectively.

[20] JPI estimate based on the company's operational data and analysis of their current construction process, provided to MOD X Advisory in the course of an ongoing advisory engagement. This figure represents JPI's projection of the technical limit achievable through housing system certification, substantially higher than their current thirty percent schedule reduction. The estimate has not been independently verified and is presented as company analysis.

[21] HUD Action Plan, pp. 13–16 (Section 2.1: Immediate Timescale Strategy: Standard Award Criteria). A preliminary agency-wide review of federal award criteria was delivered to HUD by the research team in connection with the Action Plan project. The HUD Action Plan recommends that "HUD lead the development of standard award criteria through the review and coordination of all current federal programs that currently affect offsite construction." HUD Action Plan, p. 14. See also Research Roadmap, Strategy A (demand aggregation via coordinated federal criteria).

[22] Public Law 93-383; 88 Stat. 633; 42 U.S.C. 5301 et seq., Section 809. The 1974 mandate grants NIBS authority to develop and maintain "nationally recognized performance criteria, standards, and other technical provisions for maintenance of life, safety, health, and public welfare suitable for adoption by building regulations jurisdictions," including evaluation and prequalification of building technology. HUD Action Plan, pp. 35–36. The HUD Action Plan concludes: "Congress granted HUD and NIBS the authority and responsibility for developing, disseminating, facilitating, and maintaining a building systems standards and certification program based on performance criteria... This authority remains to this day but is not being currently exercised." HUD Action Plan, p. 36. See also HUD Action Plan, pp. 16–19 (Section 2.2: Intermediate Timescale Strategy: Housing System Certification).

[23] HUD Action Plan, Part B, pp. 37–68 (country case studies for Japan, Sweden, and the United Kingdom). For the European Union specifically: European Commission (n.d.a). "Harmonised Standards." The Eurocode — a set of ten performance-based European standards regulating building construction — was mandated across all EU member states in 2010, completing a regulatory reform process the European Community began in 1975. Construction Products Regulation (CPR) providing a common performance-based product registration system was mandated in 2011. HUD Action Plan, pp. 49–51. See also HUD Action Plan, p. 21 (footnote 40): "In 2010, all members of the EU adopted performance-based building codes and building product standards, completing a regulatory reform project that the European Community first defined around the same time the HUD Code was launched. Today, the United States and Canada are the only G7 countries that have not adopted this form of regulatory environment."

[24] U.S. Census Bureau data; HUD Action Plan, p. 33: "more than 9 million housing units have been produced and delivered with this method since 1976, providing housing that would likely only be available with government-led acceleration." The cost comparison — roughly half the cost of comparable site-built housing on a per-square-foot basis — reflects the HUD Action Plan's characterization of manufactured housing's cost advantage and is consistent with HUD's Manufactured Housing Program documentation. The "per-square-foot basis" qualifier acknowledges that manufactured homes are on average smaller than comparable site-built homes and that direct cost comparisons should control for unit size. See HUD Action Plan, pp. 33, 65; Research Roadmap, Research Topic 3: Capital, Finance, and Insurance.