

ISSUE BRIEF SERIES:

Making It Happen: Scaling Off-Site Construction

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About the Enterprise PD&R Team

PD&R provides thought leadership and data-backed recommendations to influence housing and community development policy, addressing both emerging policy issues and long-term needs. Read reports and policy briefs by the team (www.enterprisecommunity.org) and follow us on [X @E_HousingPolicy](https://twitter.com/E_HousingPolicy).



Executive Summary

This issue brief highlights recent updates on regulatory reforms that are designed to facilitate the use of off-site construction for multifamily housing development, as well as financing products that are tailored to fund off-site multifamily construction activities.

Our [previous research](#) demonstrated that off-site fabrication is a housing construction strategy with the potential to boost the time- and cost-effectiveness of multifamily housing development. However, this strategy is not without its challenges. Accomplishing both accelerated construction timelines and time-related cost savings while bringing off-site multifamily construction to scale requires regulatory reforms to streamline and accelerate the permitting, inspection and approval processes for off-site construction developments. It also requires sufficient access to financing products that are tailored for multifamily off-site construction, to allow for up-front material procurement, fabrication and coverage of overhead costs incurred by developers during the fabrication phase, which generally come before they can draw funds from traditional construction loans.

The International Code Council (ICC) and the Modular Building Institute (MBI) developed model standards that can be adopted by state and local jurisdictions nationwide to help U.S. jurisdictions create clear and streamlined plan review, inspection, and approval processes for off-site multifamily construction, with the goal of enabling the housing industry to realize the time and cost efficiencies offered by this construction method at scale.

Since 2021, the state of Utah and the commonwealth of Virginia have adopted these standards. Additionally, the Oakland City Council has revised the city's planning code to increase the height limit for modular multifamily developments, which typically have taller floor heights since each unit has a floor and a ceiling layer, creating thick layers of building materials between floors and taller floor heights compared to traditional on-site developments.

The upfront fabrication phase that occurs at an off-site factory, which can happen concurrently with site preparation and foundation work, is the longest construction phase in off-site construction projects, followed by a shorter on-site assembly phase. Due to this timing, fabricators typically require a large deposit up front, which could be 50% of the total construction cost or more, to purchase needed raw materials and cover labor and overhead costs. These financing needs do not align with traditional construction loans' fixed draw schedules, which are typically linked to achieving specific construction milestones at the development site.

On the financing side, several private entities recently launched lending products that are tailored to financing off-site multifamily housing. These products include revolving funds and lines of credit that are designed to either fully or partially cover upfront fabrication-related costs before developers can tap into funds from traditional construction loans, as well as construction loans with flexible draw schedules that are tailored to off-site construction.

Despite this progress, more work needs to be done to significantly boost the use of off-site fabrication for multifamily development nationwide. Since the regulatory efforts featured in this brief are recent and limited in scope, these changes have yet to translate into an increased supply of off-site multifamily development nationwide. Achieving this goal requires a larger number of jurisdictions nationwide to adopt similar reforms at a scale that would lead to a broader regulatory landscape that is supportive of off-site multifamily construction, enabling the housing industry to realize the time and cost efficiencies offered by this construction method at scale.

Additionally, more work needs to be done to address barriers to financing off-site multifamily developments. Public-private partnerships have been one strategy to expand developers' access to sufficient upfront capital before any funds can be withdrawn from traditional construction loans, as well as new construction loan products with flexible draw schedules that accommodate the needs of off-site fabrication.

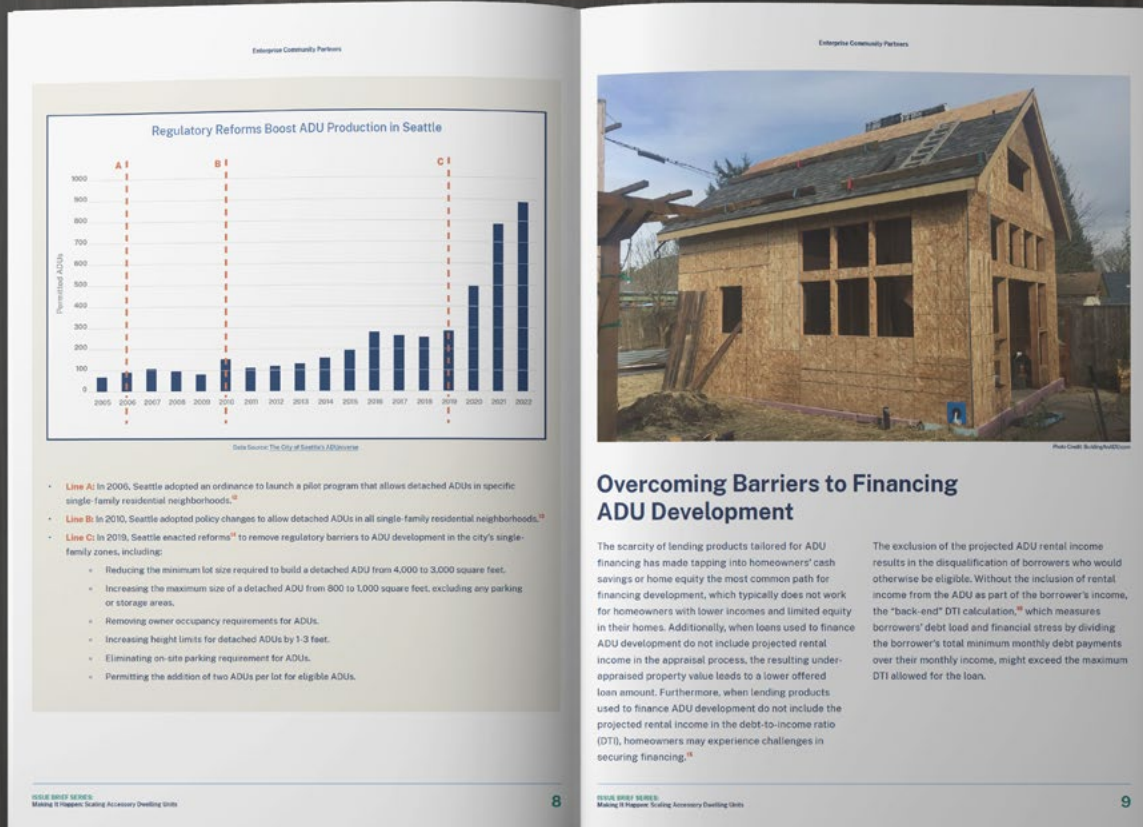


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Overcoming Barriers to Financing ADU Development

The scarcity of lending products tailored for ADU financing has made tapping into homeowners' cash savings or home equity the most common path for financing development, which typically does not work for homeowners with lower incomes and limited equity in their homes. Additionally, when loans used to finance ADU development do not include projected rental income in the appraisal process, the resulting under-appraised property value leads to a lower offered loan amount. Furthermore, when lending products used to finance ADU development do not include the projected rental income in the debt-to-income ratio (DTI), homeowners may experience challenges in securing financing.¹⁶

The exclusion of the projected ADU rental income results in the disqualification of borrowers who would otherwise be eligible. Without the inclusion of rental income from the ADU as part of the borrower's income, the "back-end" DTI calculation,¹⁹ which measures borrowers' debt load and financial stress by dividing the borrower's total minimum monthly debt payments over their monthly income, might exceed the maximum DTI allowed for the loan.

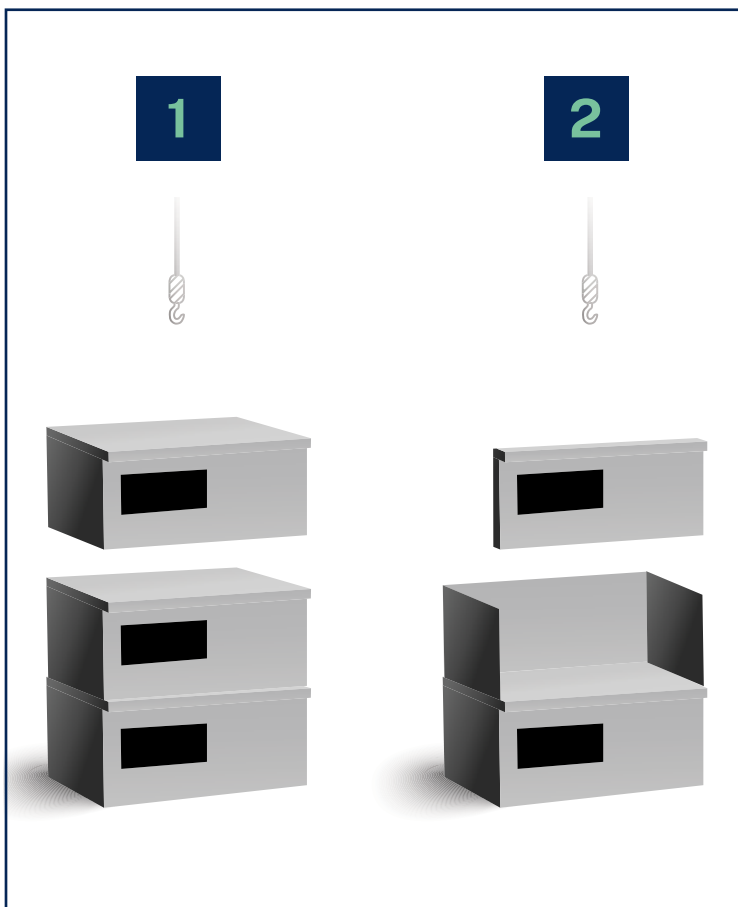
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Background

In 2019, the Enterprise Policy Development and Research (PD&R) team launched a research series with the purpose of examining different methods of overcoming the regulatory and financing barriers to scaling affordable housing design, construction and production strategies. Between 2019 and 2022, Enterprise issued several research papers and briefs, exploring policy solutions to boost a range of housing innovations, including off-site construction, accessory dwelling unit (ADU) development, and low-density multifamily housing.

In 2023, the Enterprise Policy Development and Research (PD&R) team launched an issue brief series titled, "Making it Happen." The series explores recent successes in scaling affordable housing innovations and highlights newly launched initiatives that are designed to overcome regulatory and financing barriers to these innovations.¹ Second in the "Making it Happen" series, this brief will lay out recent progress in bringing off-site construction to scale since releasing Enterprise's 2019 white paper, "[Overcoming Barriers to Bringing Off-Site Construction to Scale](#)".²



What is off-site construction?

Off-site construction is the production of modules or construction components at an off-site location to be assembled on-site. Under off-site multifamily construction, there are two key techniques:

1. **Modular multifamily housing** is developed by fabricating modules – typically an individual housing unit – at a factory or fabrication facility, delivering the modules, and then assembling them on-site, often stacking them vertically (see the left side graphic)
2. **Prefabricated multifamily housing** is developed by fabricating construction components (panels) at a factory and connecting these components on site to complete the assembly process (see the right side graphic).

Although modular construction and prefabrication differ in the share of costs and activities that take place off-versus on-site, they share common challenges with respect to their overall regulatory and financial barriers and benefit from common solutions.

Our research highlights off-site fabrication as a housing construction strategy with the potential to boost the time- and cost-effectiveness of multifamily housing development. This is, however, on the proviso that these developments are not subject to adverse financing or regulatory barriers relative to traditional on-site construction or challenges related to production, delivery, or assembly, all of which would lead to significant delays and cost increases.

Since we released our paper in 2019, several jurisdictions have enacted regulatory reforms that are designed to facilitate the use of off-site construction for multifamily housing development, largely by modernizing and streamlining permitting and inspection processes for this construction method. Additionally, several private entities have launched new financing products that are tailored for off-site multifamily construction. As of the writing of this brief, however, these efforts have yet to translate into a significant increase in the use of off-site construction for developing multifamily housing.



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Overcoming Regulatory Barriers to Off-Site Construction

Regulations governing off-site multifamily construction are inconsistent across the U.S. Nearly 40 states and the District of Columbia have off-site multifamily construction regulations at the state level.³ When a state does not regulate this type of construction, the responsibility is shifted to the local government – typically a local entity that has jurisdiction over building regulations. The lack of universal regulations governing off-site multifamily construction nationwide, during both the plan review and inspection processes, has cost and time implications.

Plan Review

During the plan review process, a designated government entity or third party is charged with ensuring that submitted construction documents, including architectural, structural, mechanical, and electrical plans, for a proposed development comply with the jurisdiction’s building codes ahead of issuing a building permit. The lack of consistent and clear regulations governing the plan review process typically has cost and time implications for off-site multifamily construction, especially since the project’s off-site modules or elements may be fabricated in a different jurisdiction, which may have different regulations governing off-site construction, and then transported to the jurisdiction where the site assembly will take place.

To assist jurisdictions with streamlining and expediting the plan review process for off-site construction, the International Code Council (ICC) and the Modular

Building Institute (MBI) issued [ICC/MBI 1200 Standard for Off-Site Construction: Planning, Design, Fabrication and Assembly](#), which can be adopted by jurisdictions nationwide to provide requirements for designers, manufacturers, transporters, and assemblers of off-site construction projects. The ICC/MBI 1200 Standard is intended to ensure that modules or components are produced under a quality control process, and that they demonstrate compliance with building code requirements while providing a clear structure of the required roles and responsibilities of different stakeholders and necessary documentation at each step. These requirements are designed to create a streamlined and expedited plan review process for off-site multifamily construction, which would help the housing industry tap into the cost- and time-effectiveness of this construction technique.

Inspections

The majority of state and local governments have an official process for inspecting the fabricated modules or components either at the factory and/or after on-site assembly completion. The inspection of the modules and components at the factory is conducted to ensure that the manufacturer has followed the jurisdiction's requirements governing off-site construction and approved construction drawings prior to the on-site assembly process. The on-site inspection process is conducted prior to issuing a certificate of occupancy, which proves that the property is safe to inhabit and meets all codes and requirements. Some jurisdictions allow third-party entities to complete these inspections to ensure that any capacity issues at government entities overseeing off-site construction do not lead to time and cost delays related to the inspection and approval processes.

To provide jurisdictions with standards that can streamline and expedite the inspection processes for off-site construction, the ICC and MBI also issued

ICC/MBI 1205 Standard for Off-Site Construction: Inspection and Regulatory Compliance. The ICC/MBI 1205 Standard provides a framework for permitting off-site construction, completing at-factory inspections, conducting final on-site inspections, and allowing for third-party plan review and inspections while describing the roles and responsibilities of different stakeholders at each step. Specifically, the ICC/MBI 1205 Standard allows local entities governing off-site construction to conduct remote virtual inspections in addition to in-person inspections and requires each local entity to maintain a list of approved third-party inspection agencies while directing each manufacturer to contract with one or more inspection agencies for evaluation, monitoring, and inspection services. The ICC/MBI 1205 Standard is designed to allow for expedited inspection and approval timelines, enabling developers to realize the time and cost efficiencies offered by off-site multifamily construction.



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Module, an Enterprise-Wells Fargo Housing Affordability Breakthrough Challenge winner

Since 2021, several jurisdictions have either adopted or explored enacting these ICC/MBI Standards, which are periodically updated to reflect any changes in off-site construction practices and technology, in order to ease regulatory barriers to off-site multifamily construction.

- In March 2021, the Salt Lake City Council voted to adopt ICC/MBI 1200 and 1205 Standards for Off-Site Construction.⁴ At that time, the state of Utah lacked any statewide codes and regulations governing off-site construction. Additionally, Salt Lake City did not allow for third-party inspections and prohibited the city's building officials from leaving the jurisdiction to conduct such inspections, effectively creating a major roadblock to off-site construction development citywide.
- In January 2024, the commonwealth of Virginia updated the state-level Virginia Uniform Statewide Building Code and the Virginia Industrialized Building Safety Regulations to incorporate ICC/MBI 1200 and 1205 Standards for Off-Site Construction, becoming the first state to adopt these standards.⁵
- In March 2024, Utah Governor Spencer Cox signed into law SB 168, a measure that adopts ICC/MBI 1200 and 1205 Standards for Off-Site Construction statewide, making Utah the second state to adopt these standards.⁶ This state-level effort was an outgrowth of the prior Salt Lake City legislation.

Bulk Regulations

In addition to these regulatory efforts, in 2021, the Oakland City Council passed the Construction Innovation and Expanded Housing Options Act. This measure revised the city's planning code to increase the height limit for volumetric modular buildings. In modular construction, each unit includes a separate ceiling and floor. During the site-assembly process, the modules are stacked on top of each other in a way that the ceiling of one module is stacked against the floor of another, creating thicker layers of building material in between floors. Therefore, modular construction developments typically have slightly larger heights compared to traditional on-site construction with the same number of floors.

The city of Oakland adopted this change to overcome unnecessary barriers faced by proposed modular developments slightly exceeding height limitations, which previously required developers and architects to lower the proposed number of floors and, accordingly, the number of housing units, to adhere to height limitations.⁷ The unintended consequences of some height restrictions would be to reduce the unit counts in modular development, further restricting this construction technique's potential to expand the supply of housing in a cost-and time-effective manner.



Beacon Landing

Overcoming Barriers to Financing Off-Site Multifamily Construction

One of the key differences between financing off-site and traditional on-site construction projects is the draw schedule, which outlines the amount of project funds that will be made available by lenders at certain intervals throughout the construction phase. In traditional on-site construction, these installments, which may vary in amount from one period to another based on the work schedule and costs for that period, are released upon the completion of specific construction milestones – typically over a consistent schedule with equal periods, such as at the end of each month. However, this arrangement does not work for off-site construction, due to when the majority of construction activities take place and the expedited construction timeline.

The upfront fabrication phase that occurs at an off-site factory, which can happen concurrently with site preparation and foundation work, is the longest construction phase in off-site construction projects, followed by a shorter on-site assembly phase. Due to these factors, fabricators typically require a large deposit upfront, which could be 50% of the total

construction cost or more, to purchase needed raw materials and cover labor and overhead costs. Some lenders may be hesitant to release large amounts of debt up front before they are able to track any tangible construction progress on the project's site.

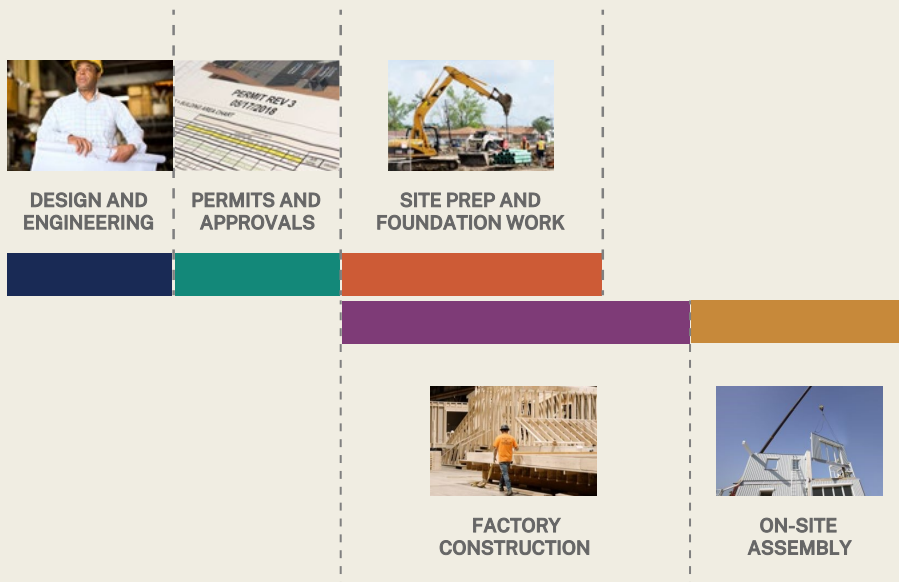
This challenge necessitates identifying alternatives to traditional construction lending with fixed draw schedules. This may include early-stage capital that would be paid back by a traditional construction loan later on, which is then ultimately paid off by a permanent loan. Another alternative would be an innovative construction loan with a flexible funds draw schedule that offers early access to capital needed to cover fabrication costs, which is eventually paid off by a permanent loan.

To overcome this challenge, several private entities have launched lending products that are tailored to financing off-site multifamily housing. These products function in one of two ways: 1) covering early costs that allow development to get to the point at which a traditional construction loan can be obtained, or 2) providing a full replacement for a traditional construction loan.

Typical Site-Built Construction Timeline



Off-Site Construction Timeline



Early-Stage Capital Products

Several private entities have launched financing products that are designed to either fully or partially cover upfront fabrication-related costs before developers can tap into funds from traditional construction loans. These products usually function as a source of early-stage capital that can be paid back once the construction loan funds are accessed later in the development timeline. Examples include:

Revolving Loan Fund

A revolving fund, which typically pools public and private sector dollars, is an evergreen or long-term source of capital that can continuously offer loans to eligible recipients as it is replenished by loan repayments. Offering eligible developers of off-site multifamily housing access to capital provided by a revolving loan fund enables them to address the challenge of covering upfront costs associated with this construction technique, including the purchase of raw materials and fabrication costs, until the construction loan funds are available.

To address challenges associated with financing the upfront costs of off-site multifamily construction, financial institutions and community development organizations can offer developers access to dedicated revolving funds that are designed to expand financing options for this type of construction and at a larger scale compared to traditional lending products that need to be evaluated for use with off-site construction on a case-by-case basis.

For example, in 2022, with philanthropic support from the Conrad N. Hilton Foundation, California Community Foundation, and CommonSpirit Health, LISC launched the Modular Housing Fund, which is a \$5.83 million pilot that provides a replicable model designed to demonstrate that offering bridge financing to developers of off-site multifamily housing in the late stages of predevelopment is feasible and necessary for achieving time- and cost-effectiveness, as well as the scalability of this construction technique.⁸

Upon its launch, the Modular Housing Fund provided low-cost bridge financing to a collaborative of three housing development organizations – Abode Communities, LA Family Housing, and Mercy Housing – that were awarded \$40 million in city of Los Angeles Proposition HHH Housing Challenge Funds to deliver nearly 400 permanent supportive homes over five developments.⁹ Additionally, Abode Communities received a commitment from JPMorgan Chase to repay the Modular Housing Fund upon the closing of their construction loans for two off-site multifamily developments: Beacon Landing and Western Landing.



Modular construction of Beacon Landing



Completed construction of Beacon Landing

Line of credit

A line of credit is a flexible, short-term financing tool that allows developers to draw funds as needed to cover a variety of early-stage development activities, such as site preparation activities, soft costs related to engineering and design services, purchase of materials, cost of labor, and other costs associated with the project. To support off-site multifamily construction, some lenders, including KeyBank, offer developers access to a line of credit option that is designed to help developers finance upfront costs incurred by pre-development and fabrication activities under off-site multifamily developments.

Offering eligible developers of off-site multifamily housing a line of credit enables them to address the challenge of covering upfront costs associated with this construction technique. Lenders typically charge developers interest only on the amount of funds withdrawn. Developers can repay the full amount of funds withdrawn from the line of credit when they access initial funds from the project's construction loan. Such lines of credit options could be secured by collateral that guarantees the repayment of the withdrawn funds, such as a Uniform Commercial Code (UCC) filing, which is a document that establishes the lender's legal right to assets that borrowers use to secure a loan, a share or the full amount of developer fees, and cash or saving accounts.



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Innovative Off-Site Construction Loans

To support off-site multifamily construction, several private lenders have either explored or launched construction lending products that are tailored to off-site multifamily financing needs. These innovative construction loans are designed to provide developers of off-site multifamily developments with flexible funds draw schedules that offer early access to debt financing to cover the upfront costs.

For example, US Modular Capital is a private lender that is exclusively focused on financing off-site construction. While each loan is tailored to the financing needs of each proposed development, US Modular Capital is largely focused on providing early access to the debt capital needed to finance costs related to the fabrication of modules, which typically kick in after the project's equity funds are dispensed.

Additionally, this lender aims to facilitate and streamline the process of accessing financing for offsite construction by providing one source of debt capital and offering developers consulting services intended to increase cost- and time-effectiveness. This debt capital is typically paid off and replaced by a take-out permanent loan at a specific milestone, such as the completion of on-site assembly or the issuance of the housing development's certificate of occupancy. Therefore, a partnership or collaboration between private lenders and banks or financial institutions that can provide access to such take-out loans is necessary to support financing for off-site multifamily construction.



Beacon Landing



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Looking Ahead

Bringing off-site multifamily construction to scale and accomplishing both accelerated construction timelines and time-related cost savings requires innovative regulatory reforms that streamline and accelerate the permitting, inspection, and approval processes. Progress has been made with several jurisdictions recently adopting standards that are intended to provide clear and streamlined processes for permitting, inspecting, and approving multifamily construction developments. Since these regulatory efforts are recent and limited in scope, they have yet to translate into an increased supply of off-site multifamily development nationwide. The adoption of similar reforms by other jurisdictions could lead to widespread state-level standards, enabling the housing industry to realize the time and cost efficiencies offered by this construction method at scale.

While several private entities have either explored or launched efforts to boost innovative lending products that are tailored to off-site multifamily construction, more work needs to be done to address barriers to financing this construction method. Federal, state, and local governments can partner with private entities to provide developers with sufficient access to the capital needed to cover activities at the early stages of projects, such as the purchase of raw materials and the fabrication of modules or components before any funds can be withdrawn from construction loans.

Expanding the number of innovative lending products that are tailored to off-site multifamily construction and easing regulatory barriers are both needed to significantly boost the use of off-site fabrication for multifamily development nationwide.

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About Enterprise Community Partners

Enterprise is a national nonprofit that exists to make a good home possible for the millions of families without one. We support community development organizations on the ground, aggregate and invest capital for impact, advance housing policy at every level of government, and build and manage communities ourselves. Since 1982, we have invested \$72 billion and created 1 million homes across all 50 states, the District of Columbia, Puerto Rico and the U.S. Virgin Islands – all to make home and community places of pride, power and belonging. Join us at [enterprisecommunity.org](https://www.enterprisecommunity.org).