# Offsite Construction for Gentle Density: Barriers and Solutions

## Guidance Paper for Local and Provincial Government

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small housing

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This research culminated with a multi-stakeholder roundtable, as part of a series of expert sessions organized by Small Housing. These roundtables aim to tackle recurring and complex issues associated with the implementation of more expansive gentle density housing initiatives in British Columbia; all of which can be freely viewed on the Small Housing website. To accompany the offsite construction roundtable, SHBC also hosted roundtables focusing on affordability, infrastructure, land economics and energy efficiency

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The recommendations presented in this guidance paper do not necessarily reflect the views of the individual participants or the organizations they represent.

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**Interview and Focus Group participants were from the following organizations:**

- Aux Box Inc
- BC Builds
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- Champion Homes
- City of Burnaby
- City of Coquitlam
- City of Langley
- City of Mission
- City of New West
- City of North Vancouver
- City of Port Moody
- City of Richmond
- City of Surrey
- City of Vancouver
- District of Sechelt
- District of West Vancouver
- Freeport Industries
- Human Studio
- NRB Modular Solutions
- Northgate Industries
- Oliphia Associates
- ROC Modular
- Royal Bank of Canada
- Ryder Architecture
- Supermod
- UBC Properties Trust

**The Key Government and Industry Roundtable participants were from the following organizations:**

- BC Ministry of Housing
- BC Ministry of Jobs, Economic Development and Innovation
- Canadian Mortgage and Housing Corporation (CMHC)
- Canadian Homebuilders Association (CHBA) Modular Construction Council
- CHBA-BC
- Canadian Standards Association (CSA)
- Vancity Credit Union

# Contents

# Executive Summary

Gentle density homes, ranging from backyard infill through houseplexes and rowhouses, currently represent a small portion of new residential builds in BC. There is limited market involvement from offsite manufacturers. However, this market segment presents a substantial expansion opportunity within the current context of province-wide zoning reform to allow gentle density forms as-of-right, high consumer demand for smaller-format, lower-cost homes, and labour shortages in the construction sector.

It is of strategic interest to the Province of BC, and regional and local governments to hasten and solidify the establishment of the offsite construction sub-industry as a critical component in delivering gentle density housing supply. Well-considered industry-strengthening and market-enabling levers represent a significant opportunity for targeted government intervention to facilitate the industry's focused participation in resolving the province-wide housing crisis.

This guidance paper presents research findings from interviews, focus groups and a multi-stakeholder roundtable, including the participation of industry experts, building officials and key government representatives to unpack current barriers to adoption and explore approaches to accelerating the use of offsite construction to grow gentle density supply.

Background information includes current offsite construction industry dynamics, including how offsite manufacturing interacts with other players in the construction-development sector (including lenders) and with regulators (local government officials). Also outlined are several key barriers that currently hinder manufacturers from efficiently delivering new supply and deter new industry actors from entering this production space.

These insights have led to the identification of high-impact, high-viability solutions, as well as informed and actionable recommendations. This has quickly expanded the offsite construction sub-sectors' contributions to increase gentle density housing supply.  This guidance paper provides background information, identifies key barriers and offers recommendations in seven areas:

1. Government Initiatives
2. Industry Collaboration and Knowledge Building
3. Municipal Toolkits for Offsite-Ready Local Governments
4. Offsite-Ready Construction Financing
5. Pilot Studies for Modular Streamlining
6. Standard Design Catalog and Design Competition
7. Enterprise Zone Incentives

# Background

In the fall of 2023, the BC government introduced legislation to allow up to four homes on a standard single-detached residential lot, with additional homes permitted in areas well serviced by transit. As part of the Province's *Homes for People Plan*, this change supports a range of small-scale housing types and creates the conditions for delivering much-needed, modest-sized housing stock for our growing population.

Gentle density housing solutions refer to smaller-format home types that add housing diversity and choice to existing neighbourhoods. These range in form and configuration from backyard cottages and laneway homes to houseplexes and infill rowhouses. These housing typologies provide the opportunity for households of different sizes and income levels to live in a greater variety of neighbourhoods.

Properties that previously housed a single household could feasibly accommodate two to six households (or more, where lot size and/or height allowances are greater). The smaller formats and shared land costs of gentle density homes mean that prices can be more attainable than single detached housing. Gentle density emerges as a reasonable and scalable answer for many communities to expand housing supply in areas already serviced by infrastructure and amenities.

However, merely zoning for increased housing won't actually get it built—this was identified through research of similar upzoning efforts in other jurisdictions and consultation with industry and government actors in BC. Consideration of industry capacity and production dynamics is necessary to adequately craft supportive policies, regulations and programs that will bolster housing production, given market conditions.

The traditional residential construction industry (also referred to as "stick build" or "onsite") has been challenged with soaring costs, capacity constraints, increased materials costs and difficulty in attracting and retaining skilled tradespeople. Many BC regions, including the North, experience these challenges even more acutely. Although onsite construction is still the primary construction method for new homes in BC, offsite construction offers a viable, efficient alternative worthy of careful consideration and research.

Offsite construction involves the prefabrication of building parts, assemblies or components in dedicated remote fabrication facilities from the construction site.

British Columbia has used offsite construction methods for more than a century. At the turn of the 20th century, there was a proliferation of prefabricated institutional buildings, bringing standardized banks, schoolhouses and other structures into communities across the province. During this time and through to the post-war era, prefabricated single-detached homes also became available through catalog ordering. This greatly helped meet the high demand for fast, efficient and lower-cost construction. Manufactured homes have since comprised a smaller portion of the single-detached home supply. Offsite construction methods have also provided for many rural and remote housing, office and production facilities related to our resource extraction sectors. In recent years, offsite construction has been more commonly utilized in larger multi-family residential projects. The offsite construction sub-industry is presently diverse and fragmented. It is also ripe to respond to government initiatives focused on meeting the demand for gentle density homes.

The leading fabrication suppliers to British Columbia (within the province and in Alberta near the BC border) were surveyed to determine current operating capacity. In 2023, the annual operating capacity was just over 4.5m sqft of modular manufacturing space. As of September 2023, the average manufacturing plant was running at 62% of total capacity based on one single shift. Most manufacturers confirmed an appetite to ramp up to a second or third shift if the demand was sustainable enough to justify the expense.

With the high latent demand for new housing supply, and widespread labour supply shortages in the residential construction industry, it is critical that policymakers, regulators and related construction industry actors better understand methods for improving construction efficiencies—and this includes offsite construction.

The following sections outline the key barriers to adopting offsite construction methods, and present actionable solutions to shift these conditions.

## Four Common Types of Offsite Construction

### *Volumetric*

Entire buildings are built offsite in modules, transported to the site and assembled on the site-built foundation.

### *Panelized*

Building sections like walls, floors and roofs are built offsite, then transported to the site and assembled—the remaining construction scope shifts to the site. Examples include structural insulated (SIP) panels and mass timber projects.

### *Components and sub-assemblies*

Non-structural building components, such as bathroom pods and mechanical, electrical and plumbing (MEP) racks, are manufactured offsite and installed in the building. This is the simplest form of offsite construction.

### *Hybrid*

Combines two or more offsite construction types to reduce onsite work, for example, combining panels with modules to develop cost-effective open spaces between more complicated modules.

# Barriers to Adoption - Offsite Construction in Canada

Through extensive stakeholder interviews, we identified critical barriers impeding the scaling and speed of delivery of offsite construction for gentle density housing.

Here are the key obstacles to offsite construction adoption:

1. Consumer and regulator perception
2. Knowledge of design and standardization
3. Project financing
4. Procurement
5. Industry culture and connectivity
6. Regulatory frameworks
7. Cost
8. Schedule


## 1. Consumer and Regulator Perception

Perception of offsite construction, based on incomplete knowledge and negative stereotypes, impacts the sector's growth.

### Lack of familiarity

Offsite construction is not as well established as traditional site-built construction. Therefore, consumers are less likely to look to offsite manufacturers. Home builders and small developers are less likely to be familiar with prefabricated components.

### Lack of track record

Some forms of offsite construction represent newer approaches that are not well tested and have yet to prove the industry's claims regarding the benefits of quality and speed. The uptake over the last ten years has increased. However, the rate of uptake was slower than industry expectations.

### Specialist knowledge required

The additional logistics required, installation, design, and transportation elements sometimes require specialized knowledge to facilitate efficiency at the construction site.

### Lack of quality examples

Modular construction in BC is well established for site offices on construction sites, mobile homes and workforce accommodation. However, more instances of successful, higher-quality project examples are required to change the current perception for both consumers and regulators.


## 2. Knowledge of Design and Standardization

Offsite construction excels when adopting a Design for Manufacturing & Assembly (DfMA) approach. Standardization is one of the tools from the DfMA strategy that may be effective in improving project outcomes. Standardization can occur at the full building design scale or an incremental scale, for example, with repeat floorplans or bathroom modules in a multi-family project. Standardization yields different efficiency benefits for different types of prefabrication (e.g., volumetric modular, wall panels, components).

### Standardization

Suppliers are working to standardize their offerings to maximize manufacturing efficiency. However, consumers' are leaning towards the customization enjoyed in traditional construction approaches.

### Lack of Design for Manufacture and Assembly (DfMA) expertise

In addition to the challenges faced by traditional construction projects, offsite construction must also consider floor plan optimization, manufacturing limitations, transportation considerations, component assembly and navigation once onsite. CSA (Canadian Standard Association) is a tool that can be deployed on projects, but requires a comprehensive understanding of how the standard works concerning the DfMA strategy.

### Massing change impacts

Different offsite typologies present significant design implications. For example, modular construction increases the wall and floor thickness compared to site construction. The additional thickness in these locations can impact the building massing and height.

### Design for transport

Design teams should include input from the manufacturers early in the design process to understand the impact of fabrication transportation weight and size limitations.

Factors driving customization that limit standardization potential include:

- Irregularly shaped building lots
- Variable slopes and geotechnical considerations (impacting foundation systems and building design)
- Craning and delivery obstacles (overhead lines, trees)
- Regional variability in structural requirements (seismic tolerances and snow loading, impact on structural connection details and beam sizes)
- Design guidelines or other design requirements of local regulations
- Designer interest in promoting custom projects (more creative interest, fewer constraints)
- Consumer demand for specific design accommodations

With varied outcomes for different manufacturing types, it is challenging for offsite construction to provide for customization efficiently. When certain offsite fabricators choose to pursue custom projects, the additional rigor required by the design team adds substantial time and cost to the front end of the projects, with as much as a 20% increase in delivery costs. Fabricators must also consider what impact customization has on their manufacturing line, as efficiency in production can be lost when diverting from standardized builds.

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## 3. Project Financing

### Financing structure obstructive

Construction financing is required to support a building or other infrastructure project from inception to completion. With offsite construction, the building is not attached to real property. Additionally, offsite projects are considered unsecured or channel projects, which results in only 50% of the banks' available funding capacity. This reduces project funding desirability due to an increase in risk and a reduction in lending capacity. Financial institutions are less inclined to fund the construction phase until the building is delivered to the site. In most cases, offsite manufacturers charge up to 90% of the building cost before transportation from the factory. Little, if any, typical construction financing can be applied to this payment (known as the "consumer deposit gap").

### Manufacturers deposits inflated

Manufacturers' deposits vary depending on the provider and project type. The higher the deposit, the higher the risk the lender accepts—unless the consumer bridges the lending gap until the building is attached to real property, where conventional funding approaches apply. Conventional construction requires lower deposit amounts than offsite construction. Offsite construction deposits are inflated to correct the financing gap.

### Upfront manufacturer costs

Offsite construction requires significant upfront costs to procure components needed before production starts.

### Timelines and cost risk

Long lead items (material inputs with long ordering and delivery timelines) and project deposits can total 35% of the total cost. This shifts the financing costs of the build and financing risk to the manufacturer until the remaining costs can be recovered at 100% of fabrication completion.

### Payment timing gap

Most fabricators request payment before transport, which creates an additional gap in construction financing as the owner has not received the products at the construction site.

### High facility startup costs

Setting up and operating a fabrication facility is expensive, especially close to where density is at its highest due to increased land costs. In addition to the land acquisition, the facility equipment is costly. As such, most fabricators scale up over time to reduce the upfront burden. This may create fabricators with limited capacity for growth due to the current facility setup and hinder expansion due to the financial investment required for growth.

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## 4. Procurement

### Construction procurement processes

These are typically geared towards traditional site-build projects that follow a linear design, bid and construction process. Consumers must determine when to make payment milestones and risk tolerance in offsite construction deliveries.  Different offsite techniques require variations in lead time, usually with more complex assemblies needing a longer lead time.

### Notice to proceed timing

Onsite construction usually starts once the building permit is granted. Offsite fabrication, in contrast, must be planned before the building permit to allow for long lead ordering and scheduling of the fabrication space.


## 5. Industry Culture and Connectivity

### Lack of familiarity and resistance to change

New construction methods face resistance, particularly with older, more established companies that are more comfortable with familiar, traditional ways of working with existing relationships. A change in the delivery method can threaten these established relationships, creating resistance. The network of trades in small communities may have the most significant pushback to innovation as it may threaten future work.

### Lack of industry collaboration

Offsite construction is a fragmented industry comprising different manufacturer types and scales and diverse focuses on residential, commercial, and institutional construction. However, many of the challenges and barriers to adoption are experienced across these types. Advocacy bodies exist for subsets like Modular Building Institute (MBI) and Manufactured Home Builders Association (MHBA). However, a more holistic industry body that includes the entire offsite construction industry is needed.


## 6. Regulatory Frameworks

Various regulatory frameworks provide direction and guidance on essential aspects of the development process, including land use, building design and construction standards. These standards are intended to promote safe and sustainable development per community principles.

### Jurisdiction requirement differences

Local governments have varied requirements related to building codes, step codes, zoning, bylaws and application requirements. Variations in jurisdictions' requirements can affect design and restrict the use of a standard design on a provincial scale. Variations in application requirements, for example, in the submission of site plan drawings for laneway homes in Vancouver, can add cost and timeline to a project and reduce project replicability between jurisdictions.

### Zoning requirements yielding inefficiencies and infeasibility

Within some municipalities, the zoning bylaws may impede the use of certain types of offsite construction. For example, the City of Vancouver requires a 50% reduction on the upper floor space for laneway homes. This is inefficient for factory-produced systems that prefer repeatability in facades for the upper and lower floors. Additional costs are incurred, for example, when plumbing drops are not stacked between the levels. While reductions on the upper floor may look appealing, they drive inefficiency and increase costs.

Zoning requirements may also prove inflexible on the placement of additional structures, for example, requiring infill homes to be located at the rear of the lot. This may limit development options on differently sized lots, with opportunities lost for side-by-side placement. Additionally, rear lot placement can imply additional complications (or infeasibility) for the delivery/craning of prefabricated structures due to site constraints like trees and utility locations (e.g., overhead wires).

Some local governments also have bylaws that have been added to over time (as opposed to amended and restructured), creating a layered framework that can sometimes present internal conceptual conflict. This can be confusing for builders and manufacturers to navigate and entail certain risks if resolving gray areas depends on staff discretion.

Setback requirements are based on a garage, not a home. This process presents further challenges for modular, where stacking is an issue. Repeatable floor plates between the first and second floors are more optimal than the zoning allows.

### Constrictive design guidelines

Some jurisdictions have their own set (or sets) of design guidelines intended to maintain (or foster) a particular form and character of a neighborhood or community. These may add design requirements that limit the ability to utilize standardized designs.

### Local government opposition

Some municipalities oppose prefabricated homes and won't allow the construction type in their jurisdiction. Where there is an acceptance, the approval process to acceptance can be convoluted, causing the homeowner or developer to lose interest in the application.

### Lack of local government CSA understanding

Some building inspectors don't understand how to work with CSA A277 or Z240MH, resulting in lengthy education time on the fabricator's side that is usually not financially recuperated. This presents less of a challenge in municipalities already accustomed to manufactured homes. Alignment between municipal departments and management may lead to conflicting messages to developers.

* Canadian Standards Association, CSA A277, serves as a national standard outlining the design and construction requirements for manufactured homes across Canada. The standard encompasses aspects like structural design, fire protection, electrical systems, and plumbing, with the overarching goal of ensuring a consistent standard of quality, safety, and durability. Conversely, CSA Z240MH is tailored to manufactured homes in British Columbia, building upon the A277 requirements but introducing additional provisions specific to the province. For instance, CSA Z240MH mandates the inclusion of fire suppression systems and resilience to the unique weather conditions and seismic activity in the region.

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## 7. Costs

### Scale required for cost benefits

Offsite construction requires scale to work. Mobile homes have been historically successful due to reduced building limitations and the ability to supply based on scale.

### Transportation distance impact

Transportation costs are unique to offsite construction and can add significant additional project costs. This can be reduced when the building site is closer to the fabrication location, which requires increased fabrication options across the province.


## 8. Schedule

### Variable permitting timelines

In conventional construction, a delay of a couple of weeks is not a big deal. However, it can bump a fabrication schedule into a much later fabrication slot, costing the project months of delay. Permitting may be particularly challenging if the code official or the Authority Having Jurisdiction (AHJ) is unfamiliar with offsite construction.

### Last-minute design changes

If offsite construction variances are required after the building has moved into fabrication due to the regulatory process, long lead items may delay the fabrication online date.

### Tighter timeline tolerances

With a compressed timeline and work happening concurrently in different locations, schedule delays are more acutely felt.

# Potential Solutions

This section presents several potential solutions to address the barriers to adoption explored in the previous section.

The solutions presented in this section include:

1. Government Initiatives
2. Industry Collaboration and Knowledge Building
3. Municipal Offsite-Ready Toolkit
4. Offsite-Ready Construction Financing
5. Pilot Studies for Modular Streamlining
6. Standard Design Catalog and Design Competition
7. Enterprise Zone Incentives

The initial solution concepts emerged through the research and were discussed with various participants. While some of the solutions rely heavily on a primary actor or driver, others require the collaboration of several. Actions may include advocacy and use of leadership voice, policy direction, funding, research, development, coordination and convening.

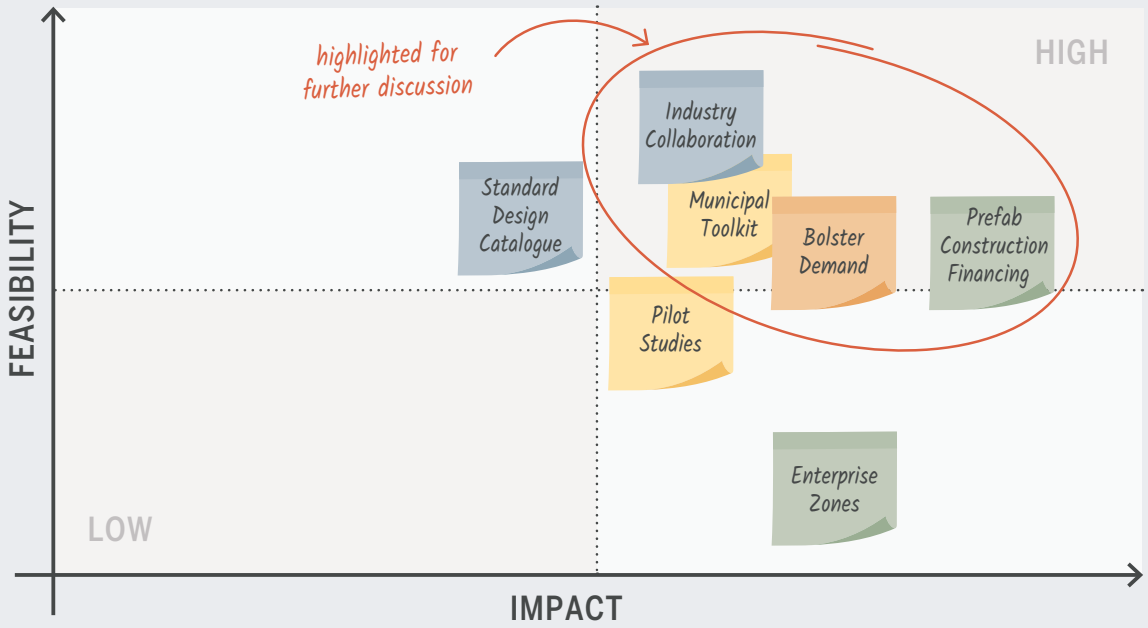
For greater uptake in offsite construction to support the scaling of gentle density housing supply, the provincial government might take a holistic approach to remove as many barriers as possible.

The solutions listed will produce the greatest results if implemented in concert through a focused effort to stimulate the offsite construction sub-industry. Without a robust and coordinated effort that mobilizes stakeholders to "pull in the same direction," the inertia of the current construction culture and systems will be too great to overcome.

The Key Government and Industry Roundtable participants were invited to assess these potential solutions regarding their feasibility and the level of potential impact to focus conversation on the highest-value solutions. Those discussed in further detail are also shown with considerations for a plan of action, including key parties and next steps.

These topics are briefly outlined in the following section.

**Opportunity Assessment:** Prioritization of Solutions




## 1. Government Initiatives

With a reliable pipeline of work, manufacturers are more likely to invest in training more people and scaling up fabrication facilities to meet the demand. To stimulate the sector and boost demand signals, a thorough approach is imperative. It will be essential to engage closely with existing construction industry actors and associations to ensure that sufficient supports are in place to assist in their transition towards increased use of offsite production.

### Presumption in favor of offsite construction

Directing government-funded projects to consider offsite construction as the first line in affordable housing, defense, social care, justice and transportation will allow the industry to reach a larger scale with more sustained demand.

### Mandating offsite construction

Dedicating 25% of government-funded affordable housing projects to be delivered through offsite construction with a pre-manufactured value exceeding 50% of the total project will provide the industry with ongoing, increased work.

### Pipeline of work commitment

Committing to a ten-year plan with assigned spending for prefabricated housing, allowing private sector investment to build future capacity in the supply chain. Further consideration is specifically needed to design a program that would incentivize private sector small-scale home builders to use prefabricators (e.g., spending may be geared towards a grant or rebate program, similar to CleanBC program for new construction). Additional incentives, such as PST relief on prefabricated material and labour, can reduce costs and help drive industry towards increasing use of prefabrication.

Most fabricators seek a pipeline of existing work and a long-range outlook of demand to support future investment. The interventions outlined above can move the needle for industry to confidently build production and human resource capacity, and should demonstrate immediate impact to low costs, faster delivery, and support the longer-term gentle density vision.

### Next steps

I. Identify project sponsors within the BC Provincial Government.

II. Engage key stakeholders to form a working group able to develop the programs and policies required to bolster demand.

### Potential interested parties

- Ministry of Housing
- Minister of Jobs, Economic Development and Innovation
- Ministry of Finance
- BC Housing

### Key stakeholders

- Canadian Home Builders Association
- Mass Timber key fabricators
- Modular Building Institute
- Manufactured Housing Association of BC
- Building Officials Association of BC
- Architects Institute of BC
- Building Designers Association of BC
- BC Institute of Technology (BCIT)


## 2. Industry Collaboration and Knowledge Building

The offsite construction industry is fragmented with some sub-sectors having an industry body like the Modular Building Institute and others, such as mass timber, without one. A united effort is required to increase understanding and support more consistent direction and market uptake.

### Industry conference

Sponsor or host an industry conference to improve awareness of the wider industry and improve perceptions of the construction sector. This conference could also facilitate a series of industry-focused workshops and education sessions.

### Industry body representing all offsite construction

As part of the conference outcome, a new provincial body could be formed to represent a diverse cross-section of the industry, regulators, architects, engineers and fabricators to enhance knowledge further and promote best practices. Current bodies are more sub-industry-focused rather than holistically, as previously suggested.

### CSA capacity building workshops

Facilitate regional workshops with CSA to bring all industry stakeholders, including offsite construction (modular, panels, pods) and associated suppliers, architects, engineers and building and government officials together. These would seek to improve education and develop actionable changes to the existing standards. When well understood and effectively integrated into local processes, CSA standards should be able to be employed towards faster project approval and building completion, with improved stakeholder confidence. Workshop topics may include:

- Explanation of the CSA standards (A277, Z240 MH & 250)
- How the standards apply to the regulatory process
- Roles and responsibilities
- Site obligations that fall outside of the CSA standards
- Chain of custody for modifications
- CSA process for inspections
- CSA monitoring and assurances

### Specialized architect training on CSA

Creating a CSA course for architects as part of continuous education credits would encourage continuous learning on improving compliance. AIBC would need to be engaged to approve the course and ongoing learning credits.

### Next steps

I. Identify a party interested in spearheading a new industry body

II. Apply to the Ministry of Education's SLMP (Sector-Labour-Market Partnerships) fund to finance the creation of a new industry body

III. Identify a local conference on a related topic that can be used to initiate the industry body launch (for example, BUILDEX)

### Potential interested parties

- AIBC
- CSA
- Canadian Home Builders Association
- Mass Timber key fabricators
- Modular Building Institute
- Manufactured Housing Association of BC


## 3. Municipal Offsite-Ready Toolkit

Create a good practices guide or toolkit to support local governments in updating their processes, procedures and incentive structure to enable offsite construction. The toolkit could be further refined through pilot studies (proposed in solution #5).

### Confidence in Building Permit approval

Because offsite construction has long lead times to consider, the timing to order materials is an essential factor in the overall production timeline. If materials can be ordered before the Building Permit is issued, it can save up to six months in the construction schedule (depending on the municipal approvals schedule and building mass). Confidence could be further enhanced by considering pre-approved design, repeatable projects in the same jurisdiction, informal comments prior to formal responses, approval timeline certainty, and early input from the Fire Chief regarding fire stopping.

### Pre-approved standardized plans

Create plans that are reviewed and approved by the Authority Having Jurisdiction (AHJ) for certain building projects. This may improve building permitting times by reducing the time it takes to review a set of custom-building plans and meet the local requirements.

### Zoning reform and streamlined approvals

The Province's *Homes for People* legislation is set to allow for 3-4, or up to 6, units on single-detached lots, as of right. Local governments will soon update their zoning bylaws to comply. They should be encouraged to remedy any requirements that lead to inefficiencies for offsite construction (as enumerated in the Barriers section). It is suggested that local governments further streamline approvals, removing any excess requirements (including design panel reviews) and going straight to building permits.

### Trusted supplier stream

Local jurisdictions could create a trusted supplier approvals stream. Once a manufacturer has successfully built within the locality or has proceeded through a specified training program, a jurisdiction may offer them faster approval times.

### Incentives

Offer lower permitting fees for prefabricated homes, to reflect the reduction in building inspector workload, as fewer site inspections should be needed.

### Next steps

I. Find funding to support the development of the toolkit

II. Work with CSA to develop training program and resource support for local governments

III. Run a campaign to find an individual or organization interested in championing the development of local government readiness

IV. Identify party interested in spearheading a new industry body

### Potential interested parties

- Planners; PIBC Councils
- Building officials: BOA
- CSA

## 4. Offsite-Ready Construction Financing

As demonstrated in the Barriers section, the structure of conventional construction financing does not match the offsite construction context, as the consumer/project owner is saddled with an outsized upfront deposit.

Lenders and manufacturers could develop a trusted supplier relationship, and create a construction loan product that recognizes construction progress in the factory and provides construction draws accordingly.

Mechanisms like barcode tracking and documentation of in-factory construction-in-progress could support lender assurance.

To further support lender assurance, it may be helpful to secure additional guarantors (such as a government entity).

### Next steps

I. Assess the outcomes of current initiatives (Vancity, RBC and Desjardins) and develop future iterations that enhance the financial options to the industry

II. Develop a financial industry working group to develop a framework for the security of an offsite project component

### Potential interested parties

- Vancity
- Appraisal institute of BC
- BMO
- RBC
- CHBA
- Desjardins


## 5. Pilot Studies for Modular Streamlining

Conduct a series of pilot studies with local governments, industry and stakeholders to develop designs, that document the end-to-end process and provide regulatory and industry streamlining opportunities. The toolkit listed above could provide the initial basis for the program, which would see the implementation of each of those components with a cohort of local governments to test new modular designs and streamline the permit approval process. Lessons learned would be incorporated into the toolkit to develop best practices in an iterative format. The pilot study also allows early municipal adopters to test systems before a mass provincial rollout. Successful designs may also contribute towards the production of solution #6.

Further detail on a pilot study design is included in Appendix A.

By implementing a well-structured pilot program, offsite manufacturers can test new designs, validate compliance with regulations and streamline the permit approval process. This approach promotes collaboration between industry professionals and regulatory authorities, improving efficiency, reducing timelines and increasing confidence in offsite construction.


## 6. Standard Design Catalog and Design Competition

A standard design catalog could be produced, with consideration for DfMA. Local governments could be encouraged to adopt these as pre-approved designs, with expedited permitting and other incentives. Designs may be collected/produced through a design competition, including design submissions that offsite manufacturers already have in production. This could help raise awareness within the architecture, engineering and construction (AEC) sector, inviting suppliers to provide innovative design solutions. The submission and review process could include an assessment of any known regulatory barriers, to help inform local governments. Design catalogs and competitions also commonly serve as public and industry-awareness-raising tactics and can accelerate the acceptance curve.


## 7. Enterprise Zone Incentives

Enterprise zones, also known as economic development zones or empowerment zones, are specific geographic areas designated by governments to promote economic growth, investment and job creation. These zones typically offer a range of incentives and benefits to businesses that establish operations within them. Incentives may include tax breaks, reduced regulations, streamlined permitting processes and access to infrastructure.

Successful international examples include enterprise zones initiated by the local, regional/provincial or federal government levels. In this case, it is proposed that an enterprise zone or zones be established in localities or regions where housing supply is of most concern, and where economic development and stimulation of the construction sector is most needed.

# Appendix

## Pilot Study for Modular Streamlining

A pilot program to test new modular designs and streamline the permit approval process in modular construction could be structured as follows:

### 1. ENGAGE LOCAL GOVERNMENT AUTHORITIES

Engage with a selection of planning departments and building authorities. Collaborate closely with these stakeholders to understand their requirements, codes and regulations and begin to explore opportunities for streamlining the permit approval process specifically for modular construction.

### 2. DESIGN SELECTION

Identify a pool of innovative modular designs from different manufacturers. These designs should showcase offsite construction building technologies and sound designs for gentle density home types, and should represent a variety of typologies: accessory dwelling, duplex and multiplex.

### 3. PROJECT SELECTION

Ensure projects vary in size, complexity and geographic locations to capture a range of factors that could impact the permit approval process.

### 4. PRE-APPLICATION MEETINGS

Organize meetings with the regulatory authorities and project teams. During these meetings, present the selected modular designs and discuss the unique features, construction methods and potential challenges or concerns. Seek early feedback from the authorities to address any compliance issues or modifications required.

### 5. STREAMLINED PERMIT PROCESS

Work with the regulatory authorities to develop a streamlined permit process tailored for modular construction. This may involve creating specific checklists, guidelines or standardized templates for modular projects. Simplify documentation requirements, eliminate redundant steps, and establish clear timelines for review and approval.

### 6. TESTING AND EVALUATION

Execute the pilot projects using the selected modular designs. Monitor and evaluate the entire permit approval process, including the time taken for reviews, any modifications required and the overall efficiency of the streamlined process. Collect feedback from project teams, regulatory authorities and other involved stakeholders.

### 7. ITERATIVE IMPROVEMENTS

Based on the findings and feedback from the pilot program, make iterative improvements to the streamlined permit process. Address any challenges, bottlenecks or ambiguities identified during the pilot projects. Continuously engage with regulatory authorities to refine and optimize the process further.

### 8. KNOWLEDGE SHARING AND TRAINING

Document the lessons learned, best practices, and success stories from the pilot program. Conduct workshops, seminars or training sessions to disseminate this knowledge among industry professionals, regulatory authorities and other relevant stakeholders. Foster collaboration and information exchange to encourage wider adoption of streamlined processes.

### 9. MONITORING AND SCALING

Monitor the adoption and impact of the streamlined permit process beyond the pilot program. Track key metrics such as permit approval time, cost savings and project outcomes. Use this data to demonstrate the benefits of the streamlined process and advocate for more comprehensive implementation.

By implementing a well-structured pilot program, offsite manufacturers can test new designs, validate compliance with regulations and streamline the permit approval process. This approach promotes collaboration between industry professionals and regulatory authorities, improving efficiency, reducing timelines and increasing confidence in offsite construction.