

# Optimizing Off-Site Construction for Housing in Lethbridge: Exploring Innovative and Affordable Housing Solutions

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Class Name: Independent Study



## Introduction

- In 2021, 10.1% of households in Canada, 9.9% in Alberta, and 9.0% in Lethbridge were in core housing need. This means they spent more than 30% of their income on housing due to **housing affordability challenges** (CMHC, 2025; Statistics Canada, 2022; Wiedemann, 1990).
- Off-site construction (OSC) refers to building processes that occur away from the final building site.

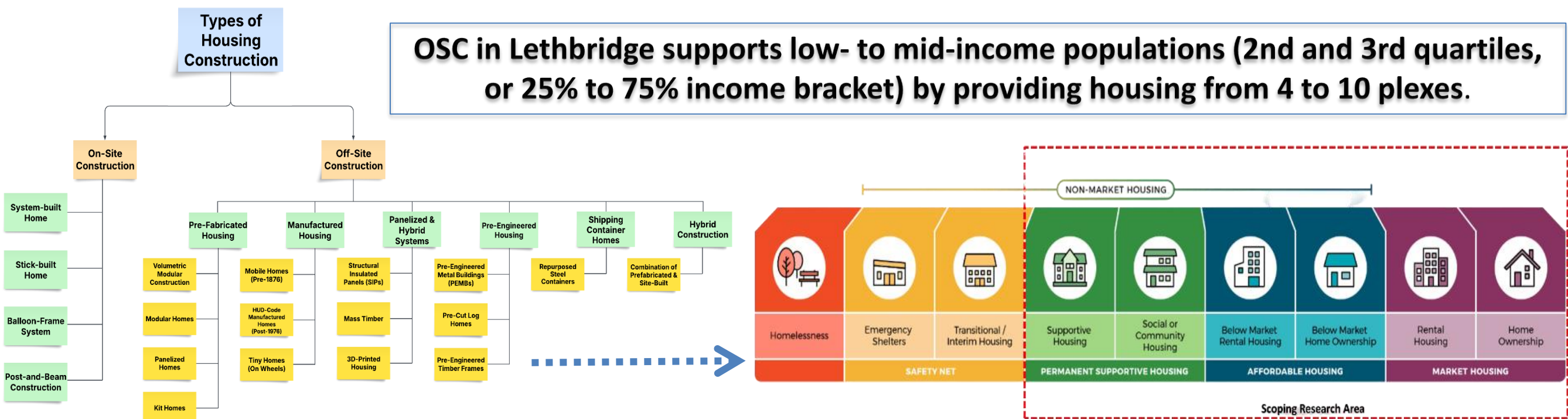
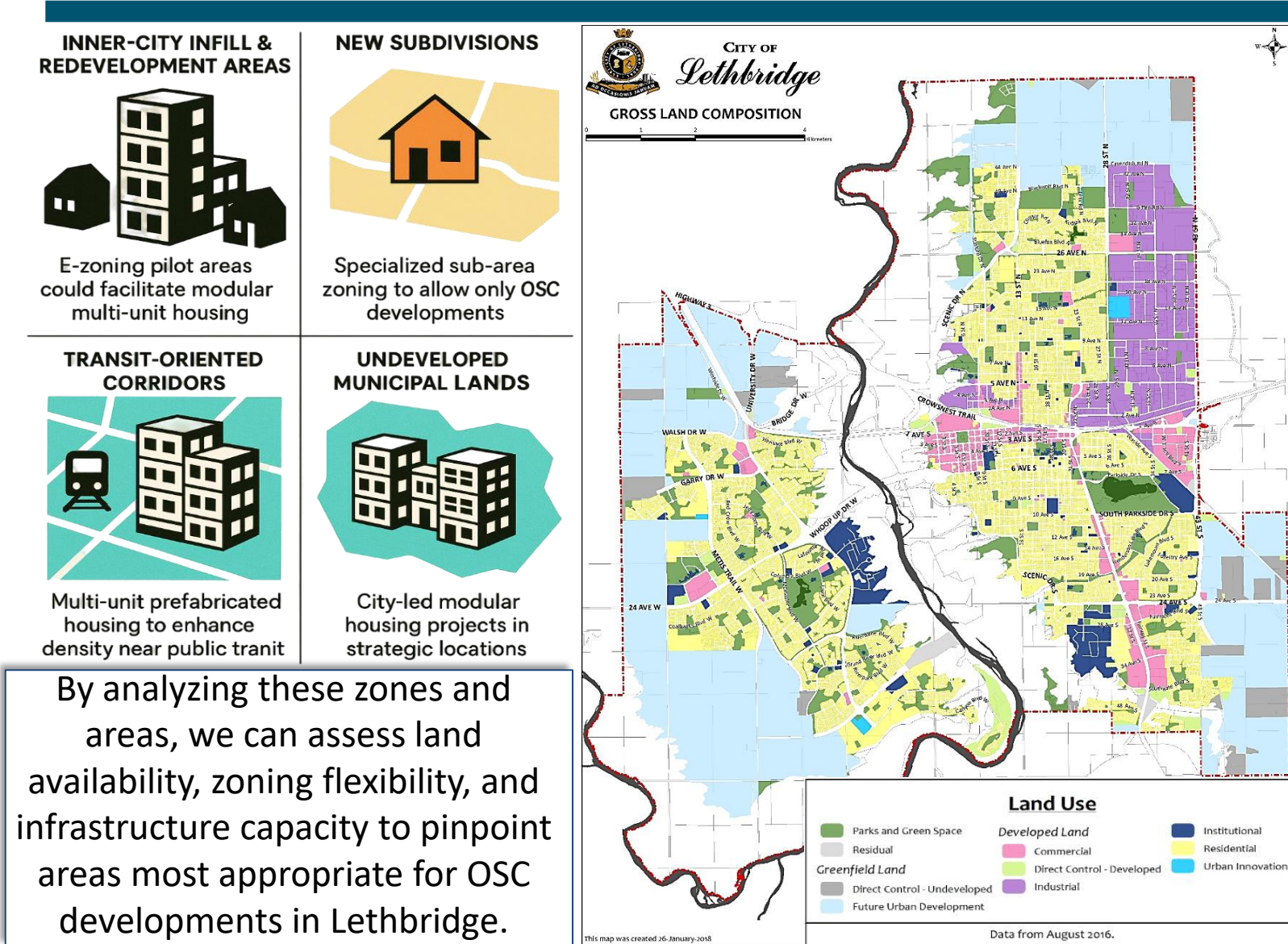
## Objectives

- Explore types of OSC and their suitability for Lethbridge.
- Evaluate economic, regulatory, and social barriers to OSC adoption.
- Identify innovations to optimize design/construction processes.
- Propose policy/design recommendations for integrating OSC into Lethbridge’s housing continuum.

## Methods

- Systematic Review & Content Analysis** of OSC projects in Canada and globally.
- Case Studies** evaluating the economic feasibility, sustainability, and regulatory considerations of OSC in urban centers.

## Urban Geography: OSC Spatial Suitability Analysis & Zoning Considerations In Lethbridge



| Zoning Barriers for Modular Housing in Lethbridge |   |   |
|---|---|---|
| Issue   | Impact on Modular Housing   | Relevant Laws / Notes   |
| Restrictive Zoning                                | Limits modular units in low-density areas; no as-of-right permissions | Lethbridge Land Use Bylaw (LUB) 5700 (Res. Zones); Alberta Municipal Government Act (MGA) – Section 640 |
| No Sunset Provisions                              | No time-limited zoning to pilot modular builds                        | MGA 640(Sec.4) – Allows temporary land use bylaws   |
| Limited Secondary Unit Flexibility                | Prevents modular suites/triplexes in single-unit zones                | LUB 5700 (Sec. 9); MGA 640 (Sec.2)  |
| Slow Rezoning for Social Housing                  | Delays modular projects with supportive services                      | Affordable Housing Strategy (AHS)-2019; Municipal Housing Strategy                                      |
| Outdated Definitions                              | Modular homes misclassified as manufactured, causing permit confusion | LUB 5700 Definitions; CSA A277; Alberta Building Code   |
| Lack of Innovation Zones                          | No overlays or flexible areas to test modular housing                 | MGA 633 (Area Structure Plans)  |
| Community Resistance (NIMBYism)                   | Public pushback delays or blocks modular approvals                    | Municipal Development Plan (MDP)-Public Engagement Policies; MGA 636 (Hearing Process)                  |

| Addressing the challenges of modular housing in Lethbridge |   |
|--|---|
| 1. Restrictive Zoning Regulations                          | The current Land Use Bylaw 6300 in Lethbridge imposes limitations on the development of modular housing in certain zones, potentially hindering the expansion of affordable housing options.  |
| 2. Delays in Social Housing Approvals                      | In February 2024, Lethbridge City Council postponed amendments to social use zoning in the Land Use Bylaw until 2026, delaying potential modular housing projects aimed at addressing social housing needs.   |
| 3. Community Resistance (NIMBYism)                         | There have been instances where community opposition has impacted housing projects. For example, in May 2024, Opportunity Lethbridge’s plans for densification in an existing neighborhood were delayed due to a variety of public concerns (E.g. parking, park space, urban canopy health, etc.) |
| 4. Outdated Bylaw Definitions                              | The Land Use Bylaw 6300 may not adequately differentiate between modular and other forms of housing, leading to potential misclassification and regulatory challenges for developers.   |

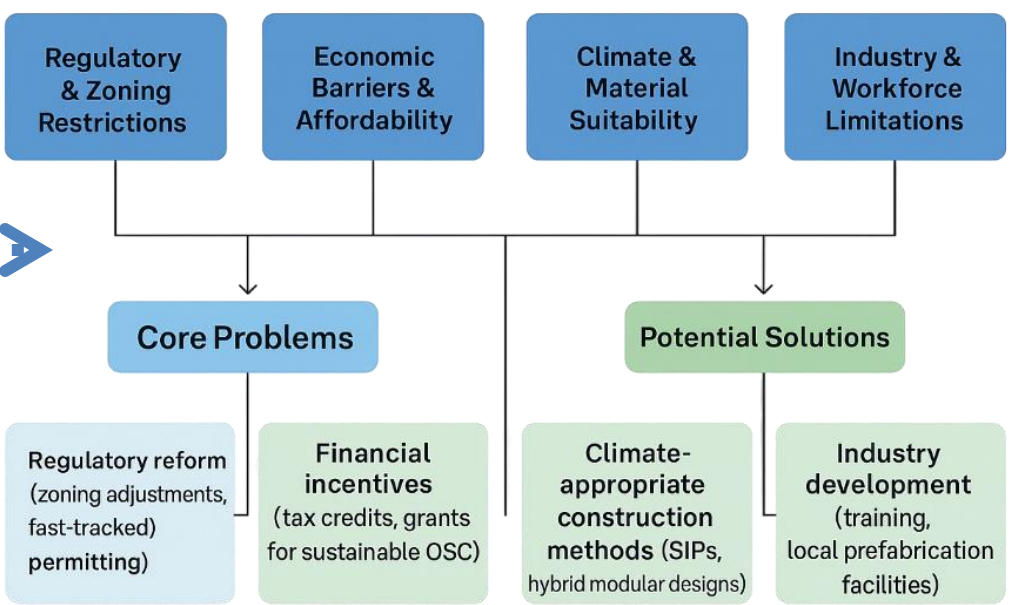
## Findings: Best OSC Options for Lethbridge

- Appropriate OSC Housing Types for Lethbridge**
  - Best suited:** Prefabricated modular homes, Structural Insulated Panels (SIPs), and panelized construction (cost-effective, climate-adaptable, and align with existing zoning regulations).
  - Challenging:** 1. 3D-printed concrete homes and shipping container housing (high local adaptation costs, limited regulatory clarity) 2. Wood-framed modular homes may face durability concerns in Lethbridge’s high-wind and variable climate conditions 3. Limiting local expertise in OSC and a lack of local manufacturing facilities for modular components increases transportation costs. 4. OSC may not be appropriate for permanent supportive housing which has been identified as a high priority local need. 5. Larger multi-unit OSC designs may face challenges related to zoning restrictions and higher upfront costs compared to traditional construction methods.
- Regulatory Frameworks and Limitations**
  - Lethbridge’s Land Use Bylaw 6300 mandates compliance with CSA A277 certification for modular construction, which adds complexity but ensures safety standards.
  - Current zoning regulations limit the adoption of larger-scale OSC developments in certain areas. Policy adjustments, such as streamlined CSA certification and flexible zoning fast-tracked permitting processes, could ease adoption.
- Alignment with National Housing Initiatives**
  - Mark Carney’s housing platform proposes \$25 billion in financing for prefabricated home builders, which could catalyze OSC adoption in Lethbridge by reducing costs and increasing scalability.
  - Public-private partnerships and incentive programs (e.g., tax credits for sustainable OSC projects) would support affordability.
  - Local efforts could align with federal initiatives like Build Canada Homes to leverage funding and expertise for affordable housing projects.

## Conclusion

- Off-site construction**, particularly modular housing, is gaining traction in Lethbridge as a viable solution to address housing needs efficiently.
- Local manufacturers like **Triple M Housing** have been at the forefront, producing high-quality, energy-efficient modular homes for over three decades.
- Their construction methods emphasize **reduced material waste and enhanced energy efficiency**, offering customizable designs that adhere to stringent building standards.

## A Roadmap for OSC in Lethbridge



- Canada Mortgage and Housing Corporation (2025) Core housing need and gender.
- City of Lethbridge (2016) Efficient Land Use Strategy and City of Lethbridge (2020) Land Use Bylaw 6300.
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- Wiedemann SJ (1990) Modular prefabrication versus conventional construction as a cost-effective alternative for the construction of single family detached housing in the Montreal area.



## References