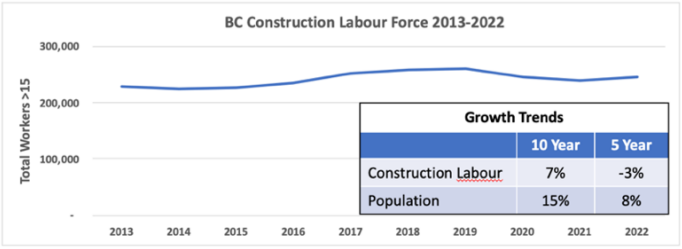
# B.C. Affordable, Net Zero, Offsite Wood Housing Industrial Development
# UBCM Resolution Background Brief

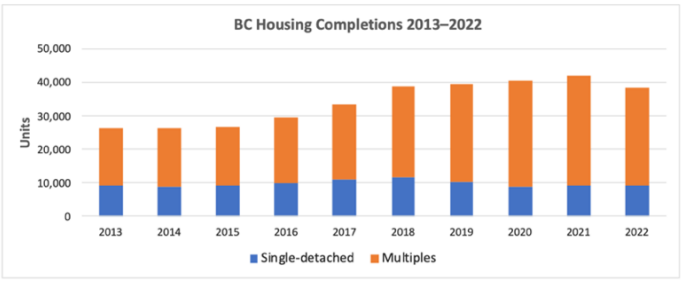
## Strategy Needed to Address BC's Biggest Housing Supply Constraint

The single biggest constraint on increasing new housing supply is construction labour force shortfalls. This dynamic is also increasing construction costs.

While B.C.'s population has grown 8% in the last five years, the construction labour force shrunk 3% (Statistics Canada, 2023). This shortfall will worsen with 38,000 projected retirees over the next decade and insufficient replacements, leaving a 19,000 worker shortfall (Build Force, 2023).

The B.C. Government has yet to address this fundamental constraint. Without a robust strategy, B.C. will never meet its housing supply and affordability targets.




*Alex Boston with Statistics Canada data, 2023*

## Offsite Wood Construction: Delivering Supply, Affordability, Climate Action & Economic Development

The central strategy for addressing labour force constraints is transforming the traditional approach to construction to drive productivity step changes. This requires shifting construction into high tech offsite construction manufacturing plants. Offsite construction can achieve the productivity gains essential to meeting supply targets. Offsite wood frame and mass timber offsite construction can also deliver B.C.-wide affordability, climate action and economic benefits (Blackbox Offsite Solutions, 2021; Building Intellect, 2015; McKinsey, 2019; WPI Economics, 2017).

**Affordability and supply**

- Accelerate construction schedules up to 50% and cutting costs up to 20%*

**Climate action and waste**

- Deliver net zero new buildings, top of B.C.'s Energy Step Code (only way to scale province/industry-wide!)
- Reduce embodied carbon in apartment construction with engineered wood over concrete
- Cut construction waste to landfills by 50 to 90%*

**Economic and community development**

- Improve labour productivity up to 50% *
- Reduce workplace injury and mortality rates in one of B.C.'s most dangerous sectors
- Reduce construction disruptions to businesses, residents and traffic by halving construction schedules
- Generate secure, value-added jobs in forest-based towns and Indigenous communities
- Grow a new industrial sector in B.C. with immense domestic and international market potential

**Gains depend on effective policy support and industry engagement.*

Industrial countries with similar demographic conditions to B.C.—a rapidly rising ratio of seniors to workers, notably in construction—and similar building performance objectives (seismic, energy, carbon) are solving these problems with robust offsite construction policy, e.g. Japan, Germany, Austria and across Scandinavia.

## B.C.'s Offsite and Mass Timber Construction Industry: North American Innovators

B.C. is home to an offsite wood frame and mass timber manufacturing industry that is much more mature than most North American jurisdictions. This leadership has been driven by entrepreneurial construction, manufacturing and forest products players, talented engineers, architects and tradespeople, and local and provincial policy innovation on climate, energy and construction. While some of this innovation is in our big cities, most is based in small towns manufacturing homes for fast growing urban areas (see Appendix A).

Still, however, less than 15% of single family and only a couple percent of multi-family units in B.C. are offsite built (Canadian Home Builders Association, 2021; NRCan, 2021). In Sweden, more than 80% of single family units are built offsite, more than half of multi-family units include advanced offsite constructed components and a rapidly rising share of multi-family is built mostly offsite, rising from clost to zero in 2000 to above 10% today (Nordregio, 2023).

To deliver on affordability, climate and economic development, B.C. must move from innovation to market transformation. This is necessary, in fact, for some innovators to not only thrive but survive. Entrenched barriers are increasing costs, overwhelming benefits. This transition requires an offsite construction industrial policy framework.

### Innovation to Market Transformation: Industrial Policy Framework with a Market Demand Corner Post

Regardless of benefit, novel products and approaches confront barriers. Offsite construction has many including builder knowledge and familiarity, work force capacity, and policy—local, provincial and federal—that inadvertently favours on site construction. An offsite industrial policy framework is necessary to hurdle these barriers. To understand the problems and advance solutions, effective and efficient collaboration is essential: local, provincial and federal governments, manufacturers, builders, developers, contractors, co-op and non profit housing organizations, Indigenous housing and foresty players, labour, academia, forestry companies, investors…

The single biggest barrier to scaling offsite construction is inadequate demand from building project developers, both private and public sector. Market demand must form a policy corner post. A strategic opportunity for methodically building demand and growing capacity while at the same time making a transformative impact on affordability is harnessing the immense untapped potential on strategically located and underutilized public lands.

There are over 4,000 public land parcels in B.C. communities (see table below and Appendix B). Most are *not* strategically located for housing. Many do not have underutilized land. However, many do. Medium intensity potential for multi-family/mixed used projects is approximately 15% based on preliminary screening across several representative geographies of A) developable land and B) location, specifically proximity to jobs, services and transit to manage transportation cost (public and household), congestion and carbon. Fifteen percent is approximately 650 projects. If an average of 80 housing units were built per project (a range of low rise with ~30 units to mid and high rise up to ~180), this could generate 50,000 housing units on land the public already owns. A growing number of public land holders across North America are seizing on underutilized land to deliver affordability (see Appendix C).

If a large share of these projects are built offsite, a substantial, predictable project pipeline is created, enabling investment into offsite construction plant expansion. Interested municipalities and public land holders from health boards to school boards to post-secondary could voluntarily step forward to support projects, dealing an ACE card for British Columbians, delivering on *Affordability, Climate* and *Economic* development. While rental revenue at affordable rates can amortize investment in whole or part, the province needs a sophisticated business model as part of its policy framework, aggregating provincial, federal and private sector capital to support individual projects.

Interested municipalities could grow the project pipeline, delivering more housing supply and affordability by pre-zoning land and pre-approving a suite of attractive offsite manufactured designs for builders and developers, expediting permitting. Housing types can include coach houses, RS multiplex, and/or low rise and mid-rise mass timber. Smaller municipalities could collaborate to aggregate the volumes that help deliver bigger cost reductions.

**Preliminary Public Land Holding Coarse Screening**

| Site Types | Total | Project Estimates | | | |
|---|---|---|---|---|---|
| | | Medium | | Low | |
| Transit Sites: exchanges, stations, depots, park and rides | 200 | 60 | 30% | 30 | 15% |
| Ferry Terminals | 50 | 10 | 20% | 5 | 10% |
| Hospitals | 110 | 33 | 30% | 17 | 15% |
| Public Post Secondary: campuses | 60 | 24 | 40% | 12 | 20% |
| Public K-12: school sites only | 1500 | 225 | 15% | 113 | 8% |
| Miscellaneous Public* | >2000 | ~300 | ~15% | ~150 | ~7.5% |
| Total | **>4000** | ~650 | **~15%** | ~350 | **~7.5%** |

**Includes provincial facilities (court houses, crown corps, core government facilities) as well as municipal: llibraries: ~250, city halls:~160, fire halls:~400, rec centres: ~200, golf courses, diverse dedicated parking lots.*

*Prepared by Alex Boston Alex@BostonConsulting.co*

*Alex Boston has served scores of B.C. local governments as well as provincial and federal governments, utilities, real estate developers, transit authorities, social service organizations and research institutes. This analysis was supported in part by Forest Innovation Investment and Real Estate Foundation of B.C. while Alex was Renewable Cities ED and MJ Wosk Centre for Dialogue Fellow at SFU*

## Appendix A: BC Offsite Mass Timber and Wood Frame Manufacturers

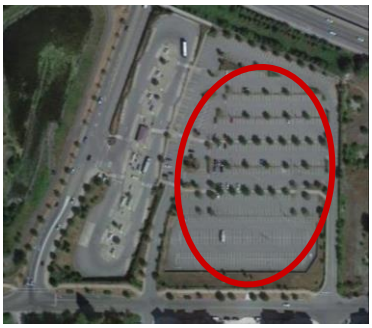
| | | | |
|---|---|---|---|
| Adaptive Homes | Columbia Shushwap | Kalesnikoff | Central Kootenay |
| BC Passive House | Squamish-Lillooet | Kinsol Timber Systems | Cowichan Valley |
| Brisco Manufacturing | East Kootenay | Nexus Modular Solutions | Cowichan Valley |
| Collective Carpentry | East Kootenay | NRB Modular Solutions | Thompson-Nicola |
| Factor Building Panels | Squamish-Lillooet | Seagate Mass Timber | Metro Vancouver |
| FraserWood | Squamish-Lillooet | Winton Homes–Sinclar FP | Fraser–Fort George |
| Intelligent City | Metro Vancouver | Spearhead | Central Kootenay |
| Tag Panels | Squamish-Lillooet | StructureCraft | Fraser Valley |
| Paradigm Panels | Thompson-Nicola | Structurlam | Okanagan-Similkameen |
| Kandola | Cariboo | | |

Companies operating in B.C. prefabricating advanced components, wood frame or mass timber buildings for both single and multi-family developments. Please contact the author with omissions/corrections.

## Appendix B: Underutilized Land—Foundations for Housing and Economic Development

Bus Exchanges

Phibbs Exchange, North Vancouver



Park & Rides

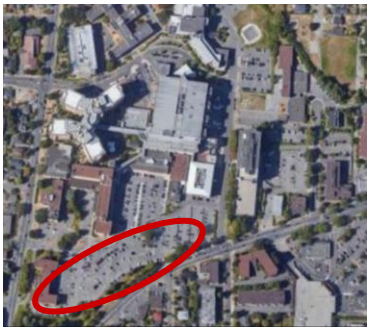
Carvolth Exch. Park & Ride, Langley

Rapid Transit Stations

Scott Road Station, Surrey

Transit Depots

Port Coquitlam Transit Centre



Hospitals

Royal Jubilee Hospital, Victoria

Ferry Terminals

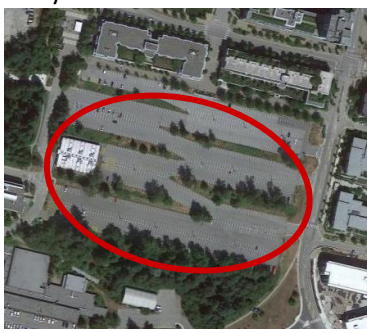
Departure Bay Terminal, Nanaimo

Municipal Facilities

Prospera Place, Kelowna

K-12 Schools

Caledonia Secondary, Terrace



Post-Secondary Schools

Simon Fraser University, Burnaby

## Appendix C: Precedents for Housing & Community Development on Public Land

### Montpelier Transit Centre

**Location:** Montpelier
**Population:** 8,000

Thirty units of net zero, affordable and market housing in three storeys atop a bus exchange podium close to jobs, services and parks and integrated into the bike network. The site was most recently a parking lot and prior to that a scrap yard. *Image: Ryan Bent Photography*

### Potrero Yard Modernization Project

**Location:** San Francisco
**Population:** 900,000

Built on a surface bus depot, Portero has 575 affordable rental units are stacked atop a three-storey bus depot equipped with electric charging, a transit administration office and retail. Once a surface bus depot, Portrero is close to jobs, services and parks, car-free with ample bike parking. *Image: SF Municipal Transportation Agency*

### Casa del Maestro

**Location:** Santa Clara Unified School District, Silicon Valley
**Population:** 15,000 students and 1,600 teachers and staff

The district built "House of the Teacher" in the 1990s to retain teachers. Today, more than 80 school sites in California are at various stages of workforce housing development. UCLA City Lab found 80% of schools had a median of 2.4 ha of developable land that didn't interfere with recreation, building access and traffic. *Image: UC Berkeley*

### Fire Hall #5

**Location:** Vancouver
**Population:** 630,000

Thirty one social housing units operated by the YWCA in a four-storey light wood frame are built atop two storeys of fire and rescue services, including a board room, kitchen, dormitory and gym. The Fire Hall re-build met LEED Gold standards. *Image: BOP Architects*

### The Exchange

**Location:** UBC
**Population:** 15,000 permanent residents and 12,000 students

275 units from micro suites to large studios and townhouses are integrated into multiple buildings of five to fourteen storeys atop TransLink's busiest bus exchange. The exchange's experience to pedestrians, riders and bus operators was enhanced. *Image: Dialog*