

Value Added Housing Hubs

Catalyzing Dialogue and Action on Affordability,
Climate & the Economy

Discussion Paper

March 2023



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This discussion paper aims to catalyze dialogue and action on harnessing strategically located underutilized public land to build housing that supports affordability, climate action and offsite building manufacturing. Estimates in this paper are coarse and intended to be strengthened through deeper dialogue and analysis.

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Renewable Cities is accelerating the transition to renewable, restorative, resilient cities through critical analysis, policy innovation, strategic communication and meaningful engagement with public, private and social sectors. Renewable Cities is a special initiative of Simon Fraser University's Morris J Wosk Centre for Dialogue.



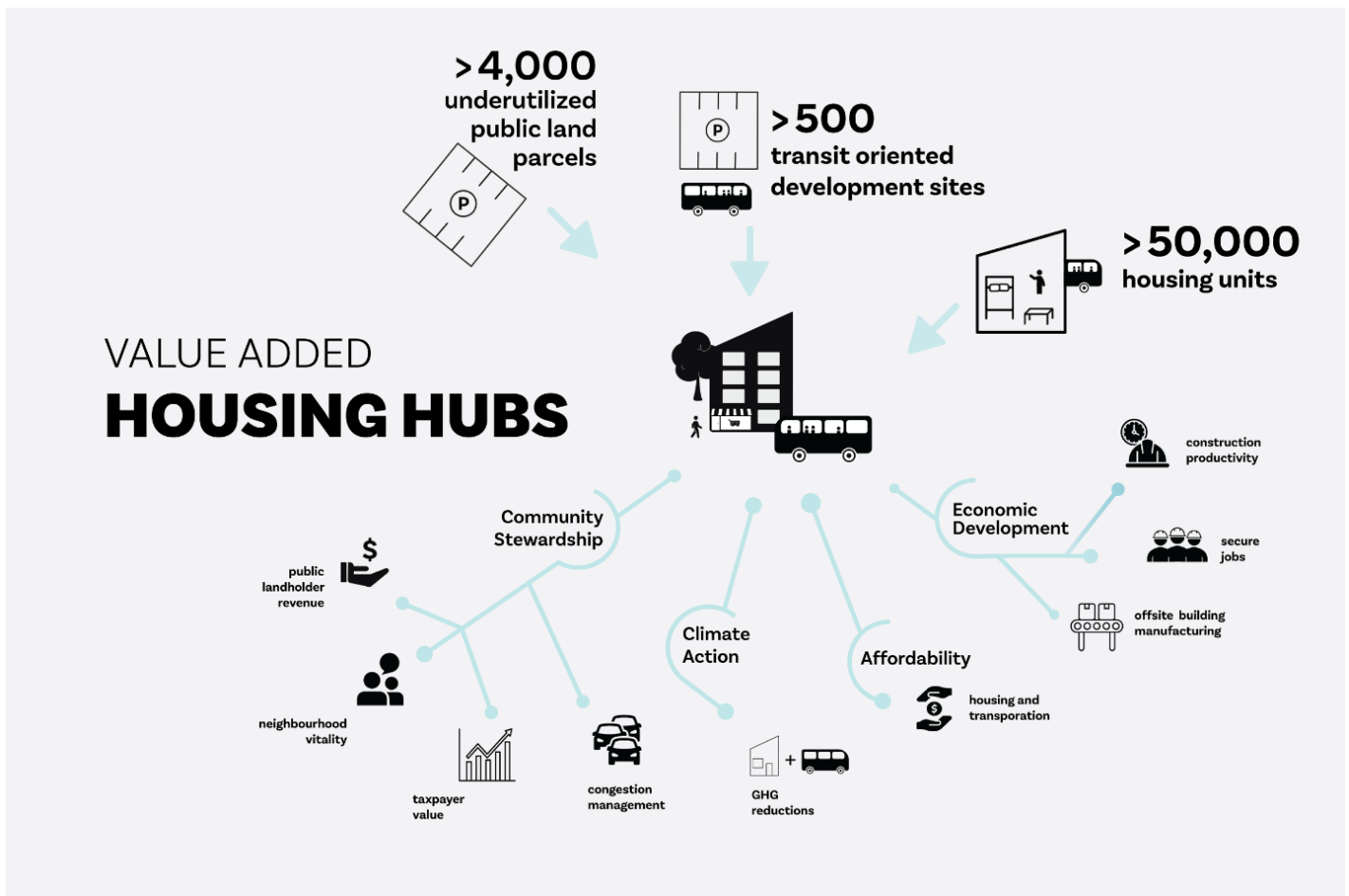
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Summary: Innovation to Market Transformation

This discussion paper aims to catalyze policy and planning discourse amongst diverse stakeholders to accelerate action on three critical priorities: affordability, climate change and economic development. This unique synergy emerges out of strategically located, underutilized public land parcels to catalyze a major construction agenda with two purposes:

- Build 10s of 1000s of affordable housing units with other complementary uses that support neighbourhood vitality.
- Build a pipeline of hundreds of large construction projects that instils investor confidence in capitalizing high-tech, offsite building manufacturing, creating secure jobs in big cities, forest product towns and Indigenous communities while easing labour constraints.



This preliminary assessment has identified over 4,000 public land parcels across B.C., most of which have developable land. Coarse analysis conservatively estimates more than 500 project sites are strategically located and developable with potential for building 50,000 affordable housing units close to jobs, services and transit, cutting transportation costs, carbon and congestion.

With a concerted effort and strong policy alignment, this initiative could be scaled over a decade, delivering the equivalent of approximately 20% of projected new multi-family units, approximately 245,000 units under current construction rates. Under the right conditions, growth in offsite manufacturing in and outside this initiative, with its potential to accelerate construction, and provide secure jobs while easing labour constraints, most of these housing units could be in addition to, not simply a share of this projection.

While much deeper discussion is needed on all financial dimensions, this initiative is ballparked into \$10-\$20 billion territory. To understand the business case given ostensibly “free” public land, if units were rented at half current Metro Vancouver rates and below the B.C. average, it is not inconceivable that with a good financial model, rental revenue could theoretically amortize investment over typical mortgage horizons. To meet the needs of many households, it would be necessary to deliver a share of units at lower rates.

Affordability, forest products job security, Indigenous economic and social reconciliation, climate action, easing construction sector labour constraints—the Government of B.C. has identified all of these priorities is making some policy progress. Many local governments and private and social sector players are also driving innovation across these spaces—much of which is unparalleled across North America. The dial, however, is not being turned fast enough or far enough. *Value Added Housing Hubs* is an initiative where these priorities converge. Together, the dial could be turned from innovation to market transformation.



Illustration of a new Community Land Trust (CLT) housing co-operative, scheduled for completion by fall 2024.

Tracing a Perfect Policy Constellation

B.C.'s new premier, Honourable David Eby, and cabinet are moving expeditiously to intensify innovation and action on key priorities: affordability, climate action and a value-added economy.

Complementary policy priorities

- Housing supply and affordability are the Province's top priority with B.C.'s first-ever minister exclusively dedicated to housing, Honourable Ravi Kahlon. [New funding and policy directions aim to revitalize diverse efforts](#) from accelerated permitting, supportive and Indigenous housing and a BC Builds initiative focused on middle-income households supported by former Victoria Mayor Lisa Helps, special advisor to the Premier.
- Ministry of Jobs Economic Development and Innovation, formerly stewarded by Minister Ravi Kahlon, has developed [a Mass Timber Action Plan](#) which inherently advances a facet of offsite building manufacturing and all its benefits. The [StrongerBC Economic Action Plan](#) has identified the development of an Industrial and Manufacturing Action Plan with immense potential to deepen and broaden this effort.
- Ministry of Forests has articulated a commitment to [shift forestry from high volume to high value-added manufacturing](#), strengthening economic and social benefits in Indigenous and forest products communities and forest stewardship in the face of diminishing resilience and fibre quality and quantity.
- Ministry of Transportation and Infrastructure amended the [Transportation Act](#) to improve land utilization near transit amenities to increase housing affordability, supply and community vitality.
- The Ministry of Transportation and Infrastructure (MoTI) is also tasked under CleanBC to complete a [Clean Transportation Action Plan](#) with the Ministry of Energy, Mines and Low Carbon Innovation that will integrate land use in delivering greenhouse gas (GHG) reduction targets in transportation. Car-oriented, urban edge growth into forests and fields has been one of B.C.'s single largest GHG growth drivers. Transportation is the second largest household expenditure and the second largest driver of rising household costs, driven by surging per capita car ownership.
- [TransLink has launched a real estate development arm](#) to generate greater value from its land assets with housing identified as a top priority.

Many B.C. local governments are leading on these priorities from [Quesnel's Future of Forestry Think Tanks](#) to Metro's [Transit-Oriented Affordable Housing initiative](#).

Infrastructure Canada, CMHC and NRCan are helping drive innovation on all these priorities in a historic manner.

While stars are aligning and some synergistic connections are being drawn, current policy conditions cast shadows on each of these priorities. *Value Added Housing Hubs* is an effort that can help trace a perfect policy constellation, allowing multiple priorities to fully shine.

Offsite Manufacturing: A Building Business Case

With a steadily rising population and growing labour constraints due to an aging demographic, [B.C. and Canada cannot meet existing let alone future housing demand with traditional on-site construction](#).

[Offsite manufacturing can accelerate construction by as much as 50%](#) and under the right conditions and at scale cut costs by as much as 20%.

Despite B.C.'s surge in net zero construction, unparalleled across North America, scaling to the top of [B.C.'s Energy Step Code](#) by 2032 will only happen by shifting a significant share of new construction onto assembly lines where quality and cost can be effectively managed. Offsite construction with wood and other innovative materials is critical to reducing embodied building carbon.

While B.C. is a North American leader in mass timber and offsite manufacturing, it still accounts for not much more than 5% of all new building construction. [In Sweden, more than 80% of residential construction is done offsite](#), including diverse affordable housing efforts by social, public and private players and [innovative partnerships like Silviahemmet](#) led by IKEA, Skanska and a dementia-care foundation established by Queen Silvia. A cornerstone of Sweden's leadership is a shift to value-added manufacturing in forest products in low-rise wood frame and mid and high-rise, mass timber construction. B.C. has the mortar! *Value Added Housing Hubs* can help put in place a similar cornerstone in B.C.

Cracking the Demand-Supply Dilemma: A Chicken & Egg Game

In B.C. today, private and public sector contractors are reluctant to build mid-rise, mass timber buildings due to materials supply uncertainty. Many investors are hesitant to expand high-cost, high-tech mass timber assembly lines due to uncertain demand. At least a decade of steady supply is necessary for many forest products players and other secondary manufacturers to confidently invest in offsite construction plants.

It is not unusual for projects working their way through development approvals under the new 7-12 storey mass timber building code to switch to concrete or steel because of an inability to secure materials. While domestic mass timber manufacturing supply is growing, many B.C. mass timber buildings are importing materials from Europe.

To accommodate diverse communities and neighbourhoods, a *Value Added Housing Hub* initiative would need to include a portfolio of low-rise (≤ 6 storey) construction which can be simply wood frame but for all of its benefits must still be manufactured offsite. Indeed, Canada's first, multi-family passive certified construction was a two-storey building manufactured offsite and delivered in Bella Bella on budget and on time, seven months from contract award.

Ramping up the supply of high-performance, prefabricated low-rise manufacturing will be somewhat more straightforward but is challenged by similar chicken and egg dynamics, along with most of the same barriers, such as industry/regulator knowledge and traditional processes including existing permitting processes.

Working with a team of experts and engaging extensively with manufacturers, developers and local governments, Renewable Cities has just released [Building Capacity: Local Prefab Mass Timber Solutions](#), a guidebook to solve the most significant local barriers: zoning bylaws, design guidelines and permitting processes.

The *Value Added Housing Hub* initiative can be a powerful problem-solving accelerant on these barriers and more. It could be hammered home in an offsite manufacturing plank in B.C.'s emerging Industrial and Manufacturing Action Plan that considers industrial policy interventions in key markets (i.e., product, capital, labour) and technology.

Harnessing Public Land to Deliver Housing Supply and Manufacturing Demand

There are thousands of underutilized public land parcels across B.C. Most are surface parking lots at transit exchanges, depots and parking rides, hospitals, post-secondary and K-12 schools, ferry terminals and diverse municipal and provincial land assets. Some are single-storey facilities, e.g., rapid transit or commuter rail stations.

It is entirely possible to stack affordable housing atop many of these sites, from 2-3 storeys in small towns and mid and high-rise in large communities, while integrating existing uses from parking to transit or even library and recreation centre rebuilds and retrofits.

Coarse Site Identification and Project Screening

There are over 4,000 public land parcels in communities across B.C. A large share has some developable land or is largely underutilized. Total project potential based on complimentary analysis in other jurisdictions and coarse screening in several sample geographies of developable and strategically located sites provide a conservative, medium estimate of approximately 650 and a low estimate of approximately 350 projects. A high estimate wasn't made given the uncertainty of total sites and the need for more comprehensive, granular locational analysis.

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 libraries (~250), municipal halls (~160), fire halls (~400), rec centres (~200) as well as public golf courses, diverse provincial facilities (court houses to crown corporation and core government facilities), dedicated parking lots.

Project Screening Criteria

- Developability
- Locational criteria to manage carbon, congestion and transportation cost
 - proximate to major employment hubs
 - proximate to services
 - proximate to good transit

Housing Unit Potential

An estimate of housing potential on these sites was informed by a range of average unit numbers for low and medium project estimates. There would be a wide range of units per project based on site, neighbourhood and community characteristics. A sample of projects would range from 2-4 storey with approximately 30 units, 6 storey with approximately 60 units, 12 storey with approximately 140 units, right up to 18 storey of approximately 200 units. Three intensities of average unit numbers per project generated a range of potential housing units from low average units (50) in low total projects (350) of approximately 20,000 to high average units (100) in medium total projects of approximately 65,000 units. A high projection was not generated.

Total Project Assumptions	Housing Unit Estimates		
	High	Medium	Low
Medium: 650	~65,000	~50,000	~30,000
Low: 350	~35,000	~30,000	~20,000
Avg Units/Project Assumption	~100	~80	~50

These initial project and unit estimates are coarse and conservative. A more precise range requires more detailed analysis and planning, including more granular site and neighbourhood study, project economics, business model development and stakeholder engagement. For early discussion purposes, 600 projects and 50,000 housing units is a defensible coarse working number.

Good Homes, Great Neighbourhoods

While housing is the top priority, many sites could and should accommodate complementary uses including restaurants, cafés, offices, clinics, pharmacies, daycares, pocket parks and playgrounds. Other services and amenities should be based on unique neighbourhood and community needs driven by municipal-level engagement. Sites should be vibrant social and economic hubs, fostering diverse objectives such as transit and active transportation growth, congestion management, local economic development, neighbourhood revitalization and community safety.

While residential buildings that accommodate diverse socio-economic and demographic backgrounds are well established to strengthen social cohesion, some locations, as described in the chart below, could address unique housing priorities.

Locational examples	Housing preference examples
Hospital precincts	Seniors, workforce
Historic Indigenous sites	Indigenous
Post-secondary precincts	Students
Urban industrial and employment lands	Workforce
K-12 school sites	Workforce, notably teachers and staff

Underutilized Public Land: Foundations for Affordable Housing and Economic Development



Bus Exchanges

Phibbs Exchange, North Vancouver



Park & Rides

Carvolth Exchange Park & Ride, Langley



Rapid Transit Stations

Scott Road Station, Surrey



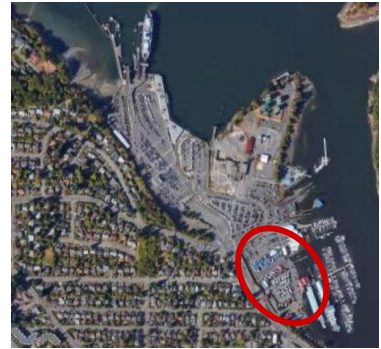
Transit Depots

Port Coquitlam Transit Centre



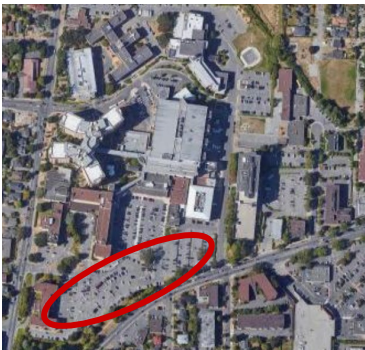
Train Stations

Coquitlam Central Station



Ferry Terminals

Departure Bay Terminal, Nanaimo



Hospitals

Royal Jubilee Hospital, Victoria



Recreation Facilities

Prospera Place, Kelowna



Fire Halls

Dawson Creek Fire Hall



Elementary Schools

Beairsto Elementary School, Vernon



Secondary Schools

Caledonia Secondary School, Terrace



Post-Secondary Schools

Simon Fraser University, Burnaby

Precedents for Housing & Community Development on Underutilized Public Land

In small towns and big cities, diverse jurisdictions taking action on affordability and climate change have begun to seize underutilized public land in strategic locations. These initiatives are happening in pockets across North America with some exceptional homegrown innovation on B.C.'s own shores.

Montpelier Transit Centre



Photographer: Ryan Bent Photography

[Montpelier Transit Centre](#)

Location: Montpelier, Vermont

Population: 8,000 (city)

30 units of net zero, affordable and market housing were built in three storeys atop a full bus terminal podium in the heart of the city's downtown, close to jobs, services and parks and fully integrated into its bike and pedestrian networks. The site was most recently a parking lot and prior to that a scrap yard.

Potrero Yard Modernization Project



Rendering source: San Francisco Municipal Transportation Agency

[Potrero Yard Modernization Project](#)

Location: San Francisco

Population: 900,000 (city)

575 affordable rental units for low- and moderate-income are stacked on top of an expanded, three-storey bus depot which will accommodate overhead electric charging for its fleet, a transit administration office and retail activity. Potrero is car-free and has ample bike parking. It is close to jobs, services, and parks and will be integrated into pedestrian and bike networks.

Casa del Maestro



[Casa del Maestro](#)

Location: Santa Clara Unified School District, Silicon Valley

Population: 15,000 students and 1,600 teachers and staff

To retain teachers, the school district built Casa del Maestro (House of the Teacher). Broad community and workforce support led to a second phase. As of 2021, there were 83 school district-owned sites in California at various stages of development for education workforce housing. Four are completed and occupied at an average of 64 units per project in diverse 2 to 5-

storey buildings. To help other districts retain staff, an analysis of development potential was undertaken to accommodate housing that wouldn't interfere with school activities including recreation, bus and traffic circulation and building access. [UCLA City Lab](#) found 80% of sites had a median of 5.9 acres (2.4 ha) of developable land and created a handbook for developing education workforce housing.

Dundas & Ossington Mass Timber Non-Market Housing



[Dundas & Ossington Mass Timber Non-Market Housing](#)

Location: Toronto

Population: 2,800,000 (city)

100 affordable housing units are planned for a mid-rise, zero carbon, mass timber building atop slab on grade to expedite construction. The site is close to jobs and services in a walkable neighbourhood proximate to diverse transit options. The site was a city-owned

surface parking lot. Funded in part by CMHC's Rapid Housing Initiative, Toronto aims to use this project as a model which can be replicated on other city-owned land.

Firehall #5



[Fire Hall #5](#)

Location: Vancouver

Population: 630,000 (city)

31 social housing units operated by the YWCA in a four-storey light wood frame are situated atop two storeys of fire and rescue services, including a board room, kitchen, dormitory and fitness in Fire Hall #5 re-build at LEED Gold standards.

Photo source: BOP Architects

náca?mat ct Strathcona Public Library



[náca?mat ct Strathcona Public Library](#)

Location: Vancouver

Population: 630,000 (city)

21 safe, affordable housing units for low-income single mothers and their children is operated by the YWCA in four storeys atop the City of Vancouver náca?mat ct Strathcona Public Library first floor. Built to LEED Gold Standards

Photo source: Canadian Architect

The Exchange



[The Exchange](#)

Location: University of British Columbia

Population: 15,000 permanent residents and 12,000 students

UBC built 10 storeys of student housing atop a TransLink bus exchange.

275 diverse units, from micro suites to large studios and townhouses, are integrated into multiple buildings of five to fourteen storeys atop a bus exchange podium which has enhanced passenger experience and bus

operation. This UBC project involved close collaboration with TransLink to meet the demand of over a thousand buses a day including one of North America's highest volume routes: #99.

Build Out Scenarios

Build out scenarios provide a sense of viability and diverse planning requirements including stimulus potential, governance and business/financial model requirements. Two simple scenarios are sketched out below, delivering 50,000 units through 600 projects, assuming an average of 83 units per project.

One scenario has a 15-year horizon with an annual growth rate of 37%. At current rates of apartment construction (24,500 units/year based on [CMHC/Statistics Canada 5 year trend](#)), 367,500 units would be built in 15 years. 50,000 *Housing Hub* units is equivalent to almost 15% of this total.

Another scenario has a 10-year horizon with an annual growth rate of 62%. At current rates of apartment construction, 245,000 units would be built in 10 years. 50,000 *Housing Hub* units would be 20% of this total.

Current growth trends are inadequate to meet the current backlog and projected future demand for housing.

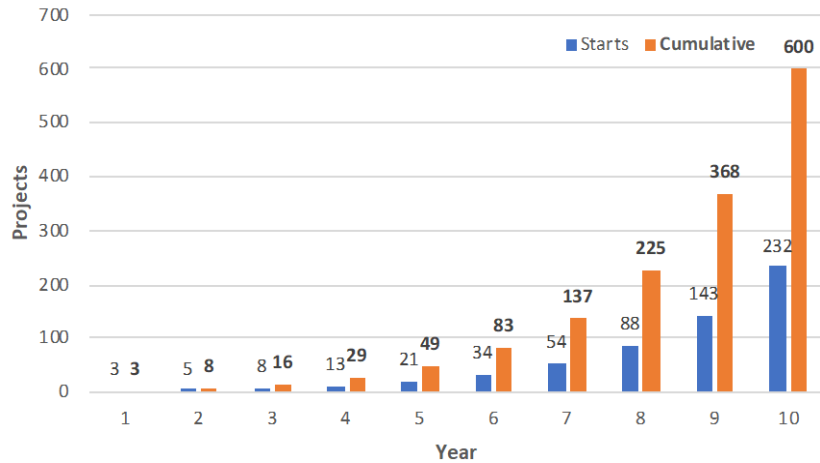
With a concerted effort and strong policy alignment, and given precedents in other jurisdictions and a solid foundation of innovation in B.C., the ten-year scenario appears entirely defensible.

Under the right conditions, growth in offsite manufacturing as a part of and beyond the *Housing Hub* initiative with its potential to accelerate speed, manage cost and quality and ease labour constraints, it is plausible that a large share of these units—if not all—would be additional not simply a share of the 245,000. If fully additional, in year 5 this would be simply an additional 7% to annual apartment completions (1,700 units). In year 10, the 19,300 units would be an 80% increase in annual apartment completions.

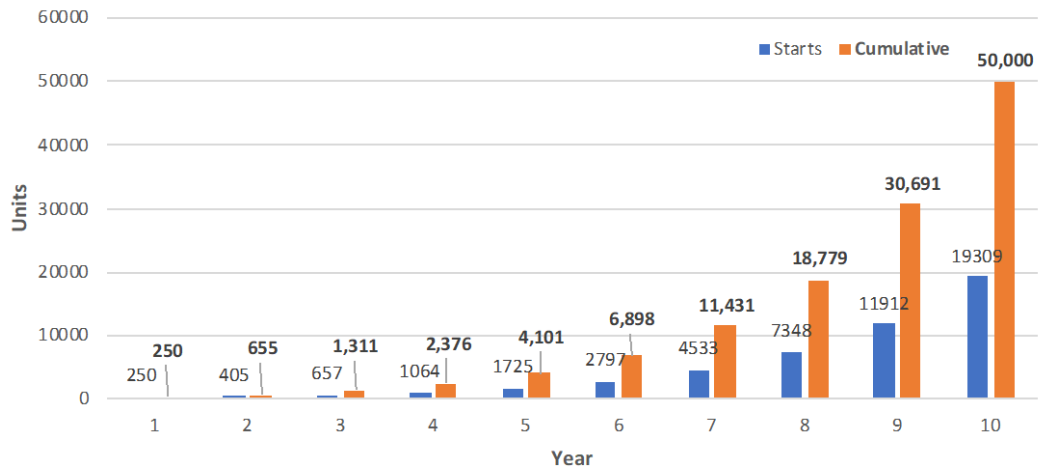
With strong policy and governance and concerted efforts across diverse private sector players, this initiative could augment construction speed and help manage costs in real estate development on private land. In fact, it would be critical to ensure enough pipeline capacity for private real estate development on private land. Over the long-term, will be the lifeblood of an offsite building manufacturing sector.

10 Year Build Out Scenario

10 Year 600 Project Scenario



10 Year 50,000 Housing Unit Scenario



Yr	Projects/Year	Housing Units/Year
1	3	250
5	21	1,725
10	232	19,309

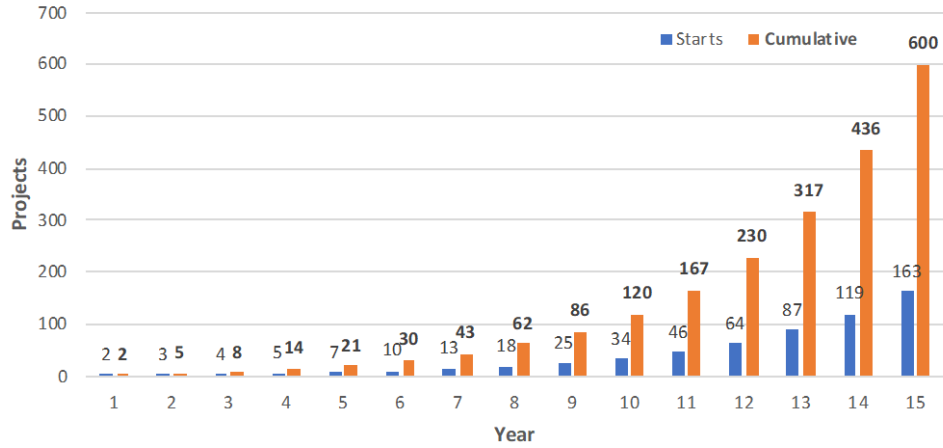
Annual growth rate: 62%

Current 10 year apartment completion projection: 245,000

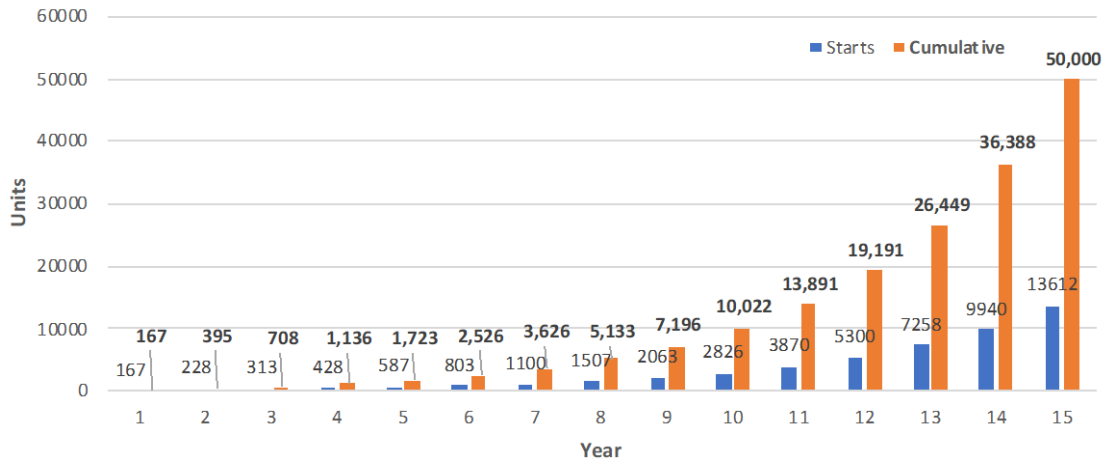
Housing Hub units: 50,000 (20%)

15 Year Build Out Scenario

15 Year 600 Project Scenario



15 Year Housing Unit Scenario



Yr	Projects/Year	Housing Units/Year
1	2	167
5	7	587
10	34	2,826
15	163	13,612

Annual growth rate: 37%

Current 15 year apartment completion projection: 367,500

Housing Hub units: 50,000 (14%)

Housing Hub Economics: Throwing Some Ballpark Numbers

Analysis of a huge number of variables—many of which are geographically and temporally dynamic, some of which are unique, others requiring significant multi-stakeholder deliberations—would be necessary to understand *Value Added Housing Hub* costs and revenues.

These ballpark estimates are a conversation starter for beginning to understand the magnitude of stimulus potential and public and private financing, as well as complementary financial policy tools. Ideally, they warm up some stronger projections from players with better ballpoint pens.

Housing Hub Economics

Two estimates use low to medium costs and low and medium gross floor area assumptions to provide a range of total costs. These estimates exclude land as it is ostensibly “free.”

Total Cost 50,000 Housing Units	Assumptions				
	Cost per unit	Square Foot Cost			Avg Gross Floor Area
		Hard	Soft	Total	
\$10,000,000,000	\$200,000	\$175	\$75	\$250	800
\$17,500,000,000	\$350,000	\$250	\$100	\$350	1,000

Cost Amortization Reference

While no assumptions are made about actual rental rates and home mortgage amortization comparisons are artificial, some reference values are used to understand the contribution rental revenue could play in amortizing the expenditure. These reference rental rates are [half the current Metro Vancouver rate](#) and [below the current provincial average](#). This revenue would theoretically permit amortization over typical mortgage horizons.

Floor Area	Bed room	Unit Cost	Monthly Rent Reference	Amortization Reference
750	1	\$ 200,000	\$1,250	25 years
900	2	\$ 300,000	\$2,200	25 years

Interest rate assumption: 5.25% (current Bank of Canada)

Broader Financial Innovation & Incubation

A \$10 billion public procurement program is one facet of a broader suite of tax policies, incentives, incubation labs, and public, private and social sector impact investment programs that can support this low carbon, industrial transition and affordable housing agenda.

Given the critical revenue needs for some public landholders with extensive assets and relatively modest workforce housing requirements, e.g., transit authorities and BC Ferries, it would be prudent to consider a financial model that generates revenue in the short term to consolidate buy-in.

Conclusion: Collaboration, Innovation, Market Transformation

Advancing an initiative like *Value Added Housing Hubs* requires conversation, collaboration and social innovation horizontally across multiple provincial government ministries, vertically through local to federal governments and broader engagement with diverse private, public and social sectors.

While all of North America has to make an offsite construction shift if it is to meet pressing imperatives, few jurisdictions have the preconditions to lead the transition. B.C. does! The Province has repeatedly been involved in transformative governance and policy innovations from the Energy Step Code to the Great Bear Rainforest Agreement. On construction sites and factory floors, through cut blocks and housing project doors, in band offices and city halls—many public, private and social sector players are leading some of the continent's most transformative innovations.

R Cities has begun conversations with diverse sectors to explore how our excellence across so many sectors can take *Value Added Housing Hubs* from inspiration to implementation:

- Construction and real estate development
- Trade and economic development
- Housing affordability
- Forest products, offsite and mass timber manufacturing
- Indigenous players in housing and industry
- Labour
- Local government and transit authorities
- Post-secondary institutions
- Multiple B.C. Government ministries

Despite all our leadership, the dial is not being turned fast or far enough on our most important priorities: affordability, forest products job security, Indigenous economic and social reconciliation, climate action, labour force transition...

Major efforts are needed to drive beyond innovation to comprehensive market transformation. *Value-Added Housing Hubs* is such an effort. To date, the initiative has been met with eye-raising intrigue to palpable excitement. Broader and deeper dialogue and action planning are necessary.

Playing an ACE Card: Affordability, Climate & the Economy

Value Added Housing Hubs is an ACE card that can enable B.C. to decisively advance an elegant solution to three complex, intractable problems:

Affordable Housing and Transportation: leverage underutilized, strategically located public land parcels to build a significant supply of affordable housing in locations with low transportation spending, the second largest and second fast-growing household expenditure.

Climate Action: meet steadily rising construction standards for low operational and low-embodied carbon buildings strategically located to support active travel, transit and shorter driving trips, cutting B.C.'s largest and fastest growing GHG sector: road transportation.

Economic Transition: support one of B.C.'s largest sectors—building construction—towards high-tech manufacturing to strengthen competitiveness and adjust to growing labour shortfalls and create value added jobs to support small and big towns and Indigenous communities, adjusting to lower fibre quantity and quality.

This play's bonus: the public doesn't need a lot of chips. The greatest cost barrier for affordable housing is land value. *Value Added Housing Hubs* is immensely cost-effective given the sheer number of under-utilized public land parcels. Fiscal constraints are one of the factors constraining demand and supply of offsite, value added, building manufacturing. ROI is ok. Quality and cost controls from offsite building manufacturing can further cut cost, accelerate production and increase building performance. Smart land use is the single most cost-effective climate action strategy wedge—a negative cost—increasing returns for transit authorities, transportation departments and households.

Once the table is set, ambitious players can take early action. As *Value Added Housing Hub* benefits become increasingly clear, others will join.

