SSMUH and TOA Scenarios in British Columbia*

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Table of contents

List of Figures

List of Tables

Glossary

ACC Amenity Cost Charges (ACCs) are a new development finance tool that allow local governments to collect funds for amenities like community centres, recreation centres, daycares, and libraries from new development that results in increased population of residents or workers.

CAC Community Amenity Contributions, voluntary contributions made by developers in the process of rezoning a specific property that don't fall under DCCs. These could be done in form of density bonusing, preset fixed rate contributions, inclusionary zoning, or contributions that are negotiated case by case. These have recently been phased out and replaced by ACCs.

DCC/DCL Development Cost Charges (or Development Cost Levies in the City of Vancouver) are fees on new development that can be imposed by municipalities to cover the marginal cost of infrastructure (water, sewer, drainage, parks, and roads) required to service new development.

Demand Elasticity This is the measure of the sensitivity of demand for housing to changes in the price of housing or other other factors like population. The classic demand elasticity is the percentage change in either the number of housing units or "housing services," the quantity and quality of benefits received by occupants from housing, resulting from a percentage change in a determinant of demand such as income, prices, or population. In this report we use the "inverse" demand elasticity, which measures the sensitivity of the price of housing to these determinants, particularly the ratio of the stock of housing to population, income, and user costs (the latter includes interest rates). With an inverse demand function, the effect on prices operates through a change in the quantity demanded. An inverse housing demand elasticity of the ratio of the stock of housing to population of -3.0 would mean that if this ratio falls 10 percent because of an increase in population relative to the stock of housing, prices will rise 30 percent, keeping all other factors unchanged. An inverse demand elasticity of user cost of -0.3 means that if user costs increase by 50 percent, for example from an increase in interest rates, then house prices would fall 15 percent. Elasticities are inelastic (<1), unitary (=1), or elastic (>1), where all

are in absolute values.

Duplex A building containing two dwelling units on a single lot. We use the term broadly, but the term is sometimes used more narrowly to denote a particular configuration of units (up-down, as distinguished from "semi-detached" side-by-side in the Census), or a particular division of property ownership (as opposed to secondary suites, which include single properties split into multiple dwellings but confined to rental).

Dwelling Dwellings are self-contained residential units with their own entrances, washrooms, and kitchens, including a range of sizes, layouts and number bedrooms (including zero bedrooms for studio dwellings).

Dwelling stock The total number of dwellings of a certain type and location at any given point in time.

Fourplex/4-plex A building or set of buildings containing four dwelling units on a single lot. In our scenarios, we assume these units can be stratified and owned separately and can be built out to 1 FSR.

Four Storey A building four storeys tall. In our scenarios we assume this takes the form of a 2 FSR apartment building that can be stratified, with contained units owned separately.

Floor Space Ratio (FSR) A common planning metric linking the amount of floor space permitted within a building to a fixed ratio of the lot size. The metric is frequently used within municipal zoning bylaws as a strong limit on what can be built, and sometimes also goes under the name FAR (Floor Area Ratio) or FSI (Floor Space Index) within planning. Zoning can also limit FSR through specification of maximum lot coverage and maximum height rules, which are also frequently used to limit development. We use FSR to specify reform scenarios and estimate what could be built under each scenario.

Missing Middle Missing middle refers to multi-family housing typologies encompassing typologies between duplexes to low-rise apartments. For the purposes of this report we take low-rise to top out at six storeys.

Multiplex Multiplex housing involves multiple dwellings distributed on a single lot in a variety of possible forms differentiated by number of units. Usually these include entries to the outside and similar forms to

townhouse or stacked townhouse configurations, distinguishing multiplex from apartment buildings, though we do not detail these distinctions.

Net Dwellings Net dwellings is a measure of the total addition of dwellings to dwelling stock, incorporating both additions (e.g. new builds) and subtractions (e.g. demolitions).

Non-market Housing Non-market housing refers to housing that cannot be allocated by market mechanisms. Typically non-market housing has received capital or operational subsidies to offer rents affordable to people who can't find housing on the market that's affordable to them.

Official Community Plan (OCP) Official Community Plans (OCPs) are long-range plans identifying intended future land uses for municipalities. Future land uses may require intensive negotiation and rezoning to achieve, but provide developers with an indication of how their own plans are likely to intersect with municipal permissions. OCPs are mandated for most municipalities by provincial legislation, and have recently been tied to requirements for meeting housing needs. The City of Vancouver is not governed by an OCP, but has major planning project documents that operate like OCPs for parts of the city.

Primary Rental Market The primary rental market refers to purpose-built rental buildings, where all units in a building are owned by the same entity and rented out.

Secondary Suite A secondary suite is an attached accessory dwelling unit on a single family property that can be rented out.

Secondary Rental Market The secondary rental market refers to rented dwelling units that are not part of the primary rental market or non-market housing.

Single-detached house A single-detached house is a single ownership property with a house an no other attached or detached accessory dwelling units. We model these as properties with Actual Use Code *000* when using BC Assessment data, as *non-stratified single-detached* units when using Statistics Canada data, and as *singles* when using CMHC data

Single family property Single family property refers to a single ownership

property with a house that may have an attached or detached accessory dwelling unit. We model these with Actual Use Codes *000* and *032* when using BC Assessment data, as *non-stratified single-detached* or "duplex" units when when using Statistics Canada, data and as *singles* when using CMHC data.

Sixplex/6-plex A building or set of buildings containing six dwelling units on a single lot. In our scenarios, we assume these units can be stratified and owned separately and can be built out to 1 FSR.

Six Storey A building with six storeys, starting from ground level.

Strata Strata is used synonymous with *condominium*, a legal structure that allows dwelling units in a building or set of buildings to be owned separately while land and common elements are held jointly.

Supply Elasticity This is the sensitivity of housing supply to the price of housing or other factors such as construction costs and interest rates. Supply may be the total stock of housing or new construction, where the latter is the change in the stock excluding demolitions and depreciation. As starts are typically less than 5 percent of the stock, the elasticity value differs considerably by the supply measure under analysis. As well, the stock changes over multiple periods in response to a change (a 10 percent increase construction levels in perpetuity affects the stock over many years) so that short and long run elasticity measures will differ. As with demand, an inverse supply elasticity measures the change in house prices from a change in the stock (total supply) of housing. An inverse housing supply elasticity of -1.75 indicates that a 10 percent increase in the stock of housing would lower house prices by 17.5 percent, keeping all other factors unchanged. Elasticities are inelastic (<1), unitary (=1), or elastic (>1), where all are in absolute values.

Tenure Tenure refers to whether a private dwelling unit is owned or rented.

Transit Oriented Area (TOA) These are the areas that municipalities are required to designate around prescribed SkyTrain stations, West Coast Express stations, and bus exchanges by bylaw. Within these areas, municipalities are required to allow prescribed minimum levels of residential density (floor area ratio and building height).

Transit Oriented Development (TOD) This is a form of planned and intensive development undertaken around major transit infrastructure, generally intended to provide extra density for housing where residents will be most readily able to access transit investments for their travel.

Triplex A building or set of buildings containing three dwelling units on a single lot. In our scenarios, we assume these units can be stratified and owned separately and can be built out to 1 FSR.

Units of measurement We use official Metric units of measurement (e.g. square meters) in some settings, especially within tables and figures. But we also draw upon older Imperial units of measurement (e.g. square feet) in the text insofar as these reflect the history of relevant bylaws and land surveys and are still most common in many discussion of housing, real estate, and development.

Upzoning The process of changing the zoning to allow for higher density use.

Value capture In the context of this report, value capture refers to the process of government recovering some of the value generated by upzoning via CACs.

The Wedge In this report the *wedge* refers to the difference of what we estimate a square foot of living space would sell for, and what we estimate it costs to build this, including land cost, design, financing, marketing, and developer profit.

Zoning Rules that specify what can be built on properties in a specified area and how these properties can be used. Typically these rules regulate use (e.g. residential, commercial, industrial, etc.), maximum density and site coverage, as well as minimum front, rear, and side setbacks, as well as what ancillary structure are allowed and related requirements like minimum number of off-street parking spaces and other restrictions. Zoning can allow buildings and uses *outright* or through various levels of discretionary processes. In BC, zoning can also require rental tenure for part/all of a building.

1 Executive summary

We model two land use reforms for British Columbia, the Small Scale Multi Unit Housing (SSMUH) initiative, enabling 4-plex housing on all residential lots in urban areas across the province and 6-plexes in the frequent transit network, and the Transit Oriented Area (TOA) initiative, with higher density stepping up to as high as 20 storeys in parts of designated transit-oriented areas.[1] The model reflects density scenarios consistent with ministerial statements and placed within the context of recent reforms enacted in other jurisdictions, particularly New Zealand and Washington State. We also compare examples of existing zoning and reform efforts across a selection of municipalities within British Columbia.

Table 1 summarizes the estimated effects of the SSMUH and TOA initiatives as applied across British Columbia across multiple scenarios. Net new planned units are counted when they enter the approval pipeline[2], completions count units at time of completions. Both subtract out units lost to demolition in the redevelopment process.

Table 1: Estimated net new units across modelled scenarios.

	5 years		10 years	
Measure	Low	High	Low	High
Net new planned	83,000	111,000	298,000	437,000
Net new completions	44,000	54,000	216,000	293,000

This refines and expands upon earlier preliminary modelling that estimated around 130,000 net new dwellings due to the SSMUH legislation and another 100,000 due to the TOA legislation over a ten year timespan. Predictions for TOA developments are more volatile than for SSMUH developments, but

[1] Multiplex scenarios are based on standard lot sizes, smaller lots may only allow fewer units. For example, under the baseline 4-plex scenario we limit development to three units for lots smaller than 280m^2. Scenarios in designated TOA areas depend on location, type of service, and distance from stops.

[2] A development is considered to have entered the approvals pipeline when the first planning approval is submitted. Depending on the approval requirements that could be the time a rezoning application, a development permit application or a building permit application is submitted, whichever comes first.

after 10 years we predict they comprise between 14%-27% of net new planned units and 8% to 20% of net new completions.

This would mostly be above and beyond what would occur in the absence of the proposed reform.[3] This compares to a recent CMHC estimate that 610,000 additional housing units would be required, in excess of the current "business-as-usual" development patterns, to return British Columbia to its affordability levels from the early 2000s. The additional 44,000 to 54,000 net growth in dwellings over 5 years estimated by our model would result in 6% to 12% lower prices and rents than what they would have been without the provincial legislation. Expected price effects over a 10 year timeframe are larger, but vary substantially depending on demand growth scenarios. These estimates are consistent with the results observed so far from the large-scale upzoning of Auckland, New Zealand, the earliest example of recent reforms most similar to the reforms in British Columbia.[4]

An important result of the proposed reform is to enhance the ability of the development industry to deliver new units in response to increasing demand for housing; that is, to increase the elasticity of housing supply. As the CMHC has demonstrated, the housing supply elasticity has been low in BC markets. With low supply elasticity, a given expansion in demand results in fewer new units and greater housing price escalation.[5] The proposed reform dramatically expands the locations for more housing development and densification, which we find increases housing supply elasticity. Nevertheless, municipalities and the province may wish to add considerably more development capacity to central areas to encourage further improvement in supply elasticity, enabling greater future development as needed to deal with demand pressures.

The primary effect of the SSMUH and TOA legislation on renters is to reduce rents of existing rental homes through supply effects. We expect supply

[3]There remains some uncertainty concerning how much TOA development would otherwise ultimately be enabled by Official Community Plans, despite not being enabled by current zoning. However, most of our modelled development occurs in low-density residential use, which is largely excluded from redevelopment to higher use in existing zoning and community plans.

[4]Auckland also had a higher density transit oriented component, although less ambitious than the TOA legislation introduced in British Columbia.

[5]By *supply elasticity* we mean the supply elasticity to price, so the rate at which the housing stock increases in response to an increase in price.

effects on prices to vary by unit type and region. The model projects declines in the price of multiplex and apartment housing due to increased supply effects, all else being equal. The estimated impact on the price of single family properties remains uncertain, with demand to redevelop to fourplexes, as well as the resulting reduction in the supply of existing single family properties pushing up prices, and perceived or real disamenity effects, as well as overall supply effects from the new higher density construction, working in the opposite direction.

In addition to estimating overall effects, we model how the SSMUH and TOA legislation would alter the geography of development and prices within urban areas of British Columbia. We show that in most cases, new higher density housing would be built closer to city centres, with potential benefits in reducing commuting, congestion, and associated carbon emissions. Additionally, the higher densities near transit are expected to increase transit use.

We include a section that assesses value capture by government. The analysis highlights the trade-off between incentivizing redevelopment and capturing the increase in land value from rezoning for government revenue. An additional section discusses the effects of the reforms on different socio-economic groups. Since the SSMUH initiative's up-zoning of single family properties will not directly affect the stock of older, lower cost rental buildings, the added supply will likely have positive effects for more marginal renters. Our analysis shows that the provincial reform would increase both the stock of owner-occupied housing as well as the secondary rental stock in British Columbia. The new forms of housing produced would likely directly house many lower-income households, in addition to indirectly opening up other rental housing through vacancy chains. In addition, enabling denser forms of by-right development will increase development opportunities for non-profit housing providers.

The TOA densification policy is also likely to produce new housing serving all of these groups, but redevelopment within TOA areas potentially entails a greater risk of displacing existing tenants who would otherwise remain relatively secure. While much existing purpose-built rental stock is contained within designated TOA areas, the majority of this is already covered under existing municipal OCPs that allow similar or higher densities. Existing municipal policies and development priorities often protect tenancies and rental stock, which alleviate displacement threats for existing tenants, so

that the marginal effect of the TOA reforms on these renters is likely to be small. We expect the main contribution of the TOA policy to come from the redevelopment of current low-density uses included in the TOAs that in many cases are excluded from higher density in existing municipal OCPs, as well as redevelopment of current non-residential uses that may already be included in municipal OCPs. Because of this, reasonable protections for existing tenancies or rental stock would be unlikely to slow the pace of redevelopment overall, though patterns may vary by metropolitan area.

2 Overview

2.1 Background

Housing affordability is a major problem for people in British Columbia that has worsened over time. While affordability challenges are most acutely felt by renters, this report focuses mostly on ownership prices due to the lack of good data on rents. Holding factors like interest rates fixed, home price movements serve as a proxy for changes in rents as people make decisions on renting vs buying where we expect rent movements to follow the same trends as price effects. We return to considering effects on rents within the Socioeconomic Impact section (Section 8) of the report.

Overall, real home price indices for British Columbia metropolitan areas (CMA) and Census Agglomerations (CA) have been increasing over time. (see Figure 1) Periods of relative stability alternate with rapid price rises, especially over the 2003-2008 period and from 2015 to the present.

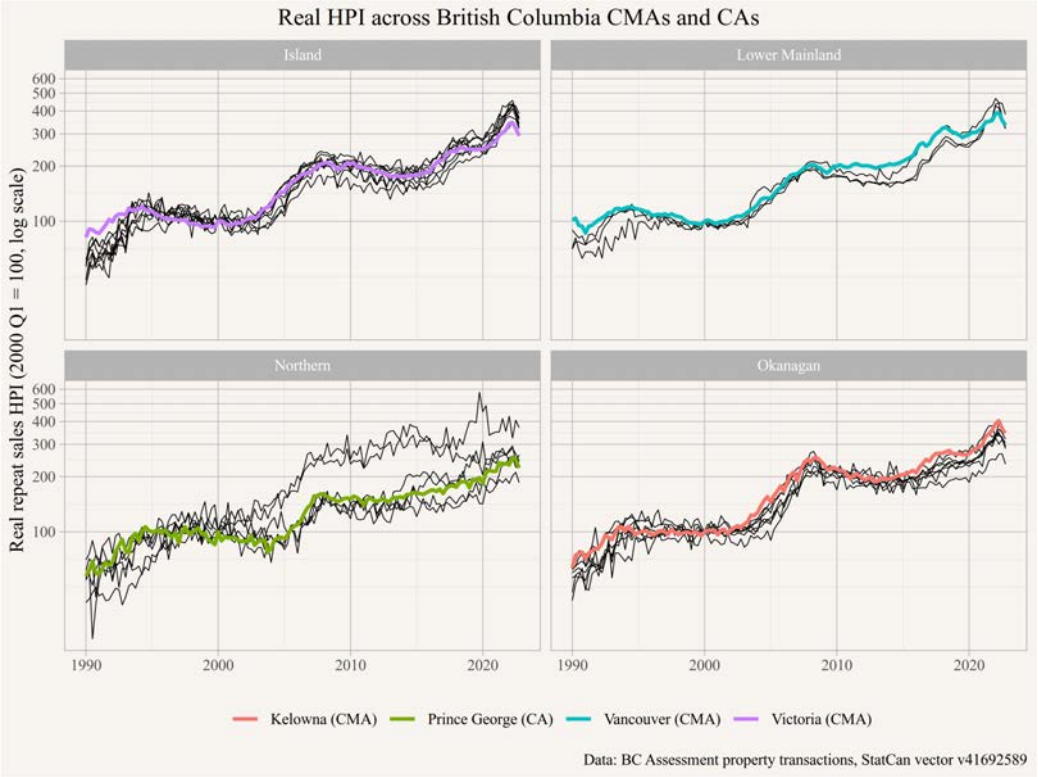


Figure 1: Repeat sales HPI for British Columbia CMAs and CAs

These series are house price growth net of inflation, as measured using the British Columbia CPI excluding the shelter component. In the short run prices are most responsive to changes in demand, due to shocks in interest rates, incomes, or population pressures. In the long run the unconstrained market response to increased demand is increased supply, which dampens price inflation. However, if planning regulations constrain the market supply response, prices can remain elevated for a long time, resulting in price levels above and beyond what it costs to build more housing.

Supply elasticity measures the responsiveness of supply to increases in price. Past modelling has indicated that Metro Vancouver, Victoria, and Kelowna have very low supply elasticities (CMHC 2018a; Paixão 2021), suggesting regulations interfere with the ability to build housing in response to demand shocks. Recently the CMHC has estimated that British Columbia requires 610,000 housing units above and beyond the usual rate of housing construc-

tion by 2030 to bring housing affordability back to levels seen in the early 2000s, with even more housing units required to bring affordability in line with other provinces (CMHC 2022, 2023). Studies of current suppressed household formation are in line with these estimates of housing shortage (von Bergmann and Lauster 2022b, 2022a).

The cause of housing shortages appears to be largely regulatory. Estimates by CMHC researchers for how high prices have risen above the cost to build in Metro Vancouver suggest that prices in the City of Vancouver in 2018 were almost 90% beyond what is expected based the cost to build (CMHC 2018b). Estimates of the regulatory burden of low density zoning in the City of Vancouver and other Metro Vancouver municipalities shows that low density zoning is binding and carries a high cost (von Bergmann and Lauster 2021b; Gensey 2019). Zoning for single-family detached houses has been especially binding and widespread across the province (Lauster 2016).

In 2019 the province of British Columbia published a report on the Development Approvals Process Review (Ministry of Muncipal Affairs and Housing 2019), highlighting the need to reform the development approvals process. This was followed by a joint federal and provincial expert panel report on housing supply and affordability (Canada-British Columbia Expert Panel 2021). Reforms modelled below build upon research findings and recommendations from these reports.

2.2 Reform scenarios

This project investigates the likely impact of the SSMUH and TOA policies raising density and allowing at least four independent dwelling units on each lot. Moreover, within the frequent transit network we consider further density increases as described in Table 2. In particular, we highlight the minimum Floor Space Ratio (FSR) to be allowed within each zone. This ties the amount of floor space enabled for each lot to its overall lot size, and is a key parameter in most zoning codes. Here we use it to understand how much floor space would be allowed to be constructed and sold on lots under upzoned scenarios, to be divided up into varying numbers of dwelling units.

Table 2: Model upzoning scenarios

Model Reform	Application	Units	Min. Storeys	Min. FSR limit	Min. Lot Size (m^2)	Min. FloorArea (m^2)	Min. Avg. Unit Size (m^2)
4-Plex SSMUH	BC Urban Areas	4	3	1.5	280	420	105
6-plex SSMUH	Frequent transit catch-ments	6	3	1.5	280	420	70
Lowrise TOA	BC Bus Exchange (400m)	varying	4-10	2-3			
Midrise TOA	Metro Vancou-ver Bus Exchange (400m)	varying	8-12	3-4			
Highrise TOA	BC Skytrain (800m)	varying	8-20	3-5			

Not all redevelopments would result in the floor space enabled by our model reform, and we expect wide variation in design and fitting to lots (more on lot sizes below). But setting floor space ratios is useful both to ensure municipalities meet the requirements of reform without inserting other rules to undermine what could be built, and to effectively model likely outcomes, as we attempt below.

2.2.1 Small Scale Multi-Unit Housing (SSMUH)

To model the SSMUH reform, we need to make the meaning of "four units per lot" precise. Looking at prevailing lot sizes (see Section 2.3.1 for details) we interpret this as allowing four independent units. On lots approximating a standard 50 foot by 122 foot lot this gives 6,100 square feet of lot area. An average FSR up to 1.5 has been provided by provincial directive, and yields a per unit size of 2,287 square feet, on average for a 4-plex (see Table 2 for metric conversion). Some units on a particular lot may be larger, some may be smaller than the 2,287 square foot average. These FSRs are in line with comparable reforms and usefully consider the underlying logic of allowing enough room per unit to make 4-plexes attractive substitutes for single family

homes for families willing to trade the latter for a more central location or a lower price. In some cases developers may opt to build smaller than the maximum allowed density if there are buyers wishing to trade reduced unit sizes for construction cost savings.

With frequent transit catchments the SSMHU initiative enables 6 dwelling units per lot at the same FSR (1.5). On a 50 foot by 122 foot lot this gives average unit sizes up to 1,525 square feet. On smaller 33 foot by 122 foot lots (common in the City of Vancouver), average unit sizes would be just over 1,000 square feet. We estimated the frequent transit network using GTFS feeds with an inclusion criterion for transit stops of average 15 minutes headways and 400m radius, expanding to 600m for rapid bus.[6] Skytrain stops and some high-frequency bus exchanges are covered by the TOA legislation that overrides the SSMUH densities. Reference maps of the frequent transit network and the associated density scenarios can be found in Appendix C. The only areas with frequent bus service as defined in the SSMUH legislation are in Metro Vancouver, Metro Victoria, and Whistler. The Whistler frequent transit stop is already covered by the TOA legislation. In the modelling we expanded the definition slightly to also capture routes in Kelowna and Nanaimo that come close to reaching 15 minute headways.

We recognize that the frequent transit network will change over time as bus capacity is added, new bus and rapid bus connections are opened up. For the purpose of this report we only model the current frequent transit network to data availability reasons, but forward-looking housing planning would preferably take into consideration anticipated expansions in the frequent transit network as e.g. described in the Transportation 2050 Regional Strategy (TransLink 2022). This approach would expand the areas where higher density scenarios are considered, and simplify and streamline their geographic boundaries after taking other planning objectives into consideration.

The SSMUH legislation only applies to areas zoned for single-detached or du-

[6]The 600m radius around rapid bus stops is larger than the provincial 400m radius and was chosen out of convenience based on earlier version of this modelling work. We expect the effect of using a larger catchment to only make a small difference to overall estimates. Municipalities are encouraged to take a broad approach to the frequent transit network when implementing the provincial regulation that scales with frequency and quality of service instead of sticking to provincially mandated minimums.

plex housing. We lack a comprehensive zoning fabric covering the province, so for modelling purposes we apply the SSMUH only to current single family (with or without suite or laneway house) and duplex use. Within each region we follow the provincial SSMUH framework to consider current single family or duplex use as eligible for SSMUH, importantly excluding areas outside of regional growth boundaries where they exist and where we had data available. We also exclude lots larger than 2 acres as a proxy for rural areas.[7] We model the SSMUH option on each site based on the individual lot sizes and the corresponding SSMUH guidelines. We do not consider lot splits or subdivisions, which is another avenue for increasing density on single family lots or to split large lots into several SSMUH lots.

The legislation also applies in both Victoria and Vancouver, but both cities have already passed zoning bylaw amendments to allow for multi-unit housing in what were previously single-family or duplex zones. The province expects these two municipalities will consider the provincial policy manual and site standards and whether or not they need to make further amendments to ensure a consistent development landscape across regions and the province. We discuss the differences in multiplex zoning in Vancouver and Victoria compared to the SSMUH initiative, and the impact if these cities were to update their zoning to conform to provincial SSMUH expectations in more detail in section Section 6.7.

We assume permit times for SSMUH housing are not longer than a few months until developers receive a building permit, facilitated by efforts of municipalities to streamline permitting and the provincial initiative of creating pre-approved design templates.

In estimating effects of SSMUH, we do not model the impact of the legislation allowing secondary suites or other accessory dwelling units throughout the province, the focus is on areas where the 3/4/6 unit requirements apply. That said, we expect that this broad allowance of secondary suites province-wide will lead to additional new housing on top of the housing growth estimates in this report. When suites are integrated into existing housing (e.g. via renovation) they can quickly expand the dwelling stock, but they also add stock when new housing gets built with secondary suites. To the extent suites in new housing compete with stratified multiplex units rather than being

[7] The SSMUH legislation only applies to lots at most 1 acre in size, the impact of this discrepancy on the modelling is minimal.

added on top of these units, they will generally reduce the effective supply of housing insofar as secondary suites are used flexibly by the owner and frequently re-absorbed into the main unit, or used for other purposes than stable lang-term rental housing. The inherent flexibility of suites, and their historically informal status, make them difficult to model or study closely. Overall, we believe suites are likely to provide more choices for property owners and more housing for tenants, with limited impact on the viability of multiplex options.

2.2.2 Transit Oriented Areas (TOAs)

Within the province's designated Transit Oriented Areas (TOAs) densities step up depending on location and transit service as shown in Table 3.

Table 3: TOA density scenarios

TOA Type	Transit Hub Type	Prescribed Distance	Min. Allowable Density (FAR)	Min. Allowable Height (Storeys)	Type of Building
Type 1 (Metro Vancouver)	1A) Rapid Transit	200m or less	5.0	20	Concrete Tower
		200m - 400m	4.0	12	Concrete Midrise
		400m - 800m	3.0	8	Wood Lowrise
	1B) Bus Exchanges	200m - 400m	4.0	12	Concrete Midrise
		400m - 800m	3.0	8	Wood Lowrise
Type 2	Bus Exchange	200m - 400m	3.5	10	Concrete Midrise
		400m - 800m	2.5	6	Wood Lowrise
Type 3		200m - 400m	2.5	6	Wood Lowrise
		400m - 800m	1.5	4	Wood Lowrise/Townhouse

Because of the difference in construction costs between frame and construction, we model the 3 FSR versions as 6 storey wood frame construction with 50% lot coverage. In reality, we expect there will be instances, especially in more desired locations, where builders opt for the higher per square foot 8 storey concrete or mass timber form instead of the lower height frame construction. However, we limit the modelling to the lower height wood frame form.

The list of designated TOA areas includes some future Skytrain stations for

which funding and planning has been secured (i.e. Broadway and Surrey-Langley SkyTrain extensions), and these are included in the modelling. Further changes that might impact TOA designations in the future based on e.g the Translink Transportation 2050 Regional Strategy (TransLink 2022) are not considered in this report. Maps of the designated TOA areas can be found in Appendix ~Section D.

The TOA initiative applies to lots zoned for residential or mixed use. In absence of the availability of coded province-wide zoning data we model this as enabling redevelopment of any current use that includes a residential component. For Metro Vancouver, where most of the TOA areas are, we refine this by utilizing the data from the Metro Vancouver Zoning Project to identify the residential and mixed use zoning of the TOA areas.

We assume TOA projects receive a building permit within 12 to 18 months of entering the approvals pipeline, that is when they start applying for planning approval. We recognize that these are ambitious timelines given current planning practices that will require work by municipalities to implement. This is facilitated by the ACC legislation that introduces predictability into the process and removes the need for negotiated amenity contributions, as well as the requirement that municipalities have up-to-date community plans and the removal of the public hearing process for OCP-compliant developments.

Across scenarios the modelling exhibited trade-off effects between SSMHU and TOA developments. The combination of assumptions on future land value growth, initial land lift, ACCs imposed by municipalities, development of construction costs and future demand growth scenarios yields a variety of proportional breakdown between these development types. We view this flexibility of markets to respond to conditions as a positive feature of bringing in both types of legislation, and the SSMUH and TOA initiatives strengthening each other.

2.2.3 Comparable reforms and scenarios

We situate our scenarios within comparable reforms and zoning codes, located abroad and within British Columbia. Comparables initially provided modelling scenarios for us to draw upon before provincial legislation details were unveiled. Comparables continue to provide a basis for linking building typologies (4-plex and 6-plex townhouses, and apartments) to floor space

ratios, minimum lot sizes, expected building heights, and potential dwelling unit sizes that might be realistically achieved. International comparables also place proposed British Columbia reforms in dialogue with recent reform efforts elsewhere. Comparables drawn from existing code in British Columbia highlight municipal ingenuity and provide homegrown models for provincial level reforms.

Internationally, we use the upzoning from the Auckland Unitary Plan (AUP) in New Zealand, coming into effect in 2016, as a comparable reform. The AUP has been the most studied and promising large-scale rezoning from recent years (Greenaway-McGrevy and Jones 2023; Cooper, Greenaway-McGrevy, and Jones 2022; Greenaway-McGrevy and Phillips 2022a; PWC and Partners 2022). New Zealand's National Policy Statement on Urban Development, first issued in 2020, built upon and expanded successful Auckland reforms, making similar reforms mandatory for other "Tier 1" large urban areas (New Zealand Ministry for the Environment 2022). A 2022 update sped up these reforms by replacing the minimum residential zone in "Tier 1" large urban areas with the MRDS zone, enabling 3-plexes on nearly all lots (New Zealand Ministry for the Environment 2021a, 2021b). In this sense, New Zealand also provides an example of how to ensure reforms are implemented rapidly within municipalities.

Looking immediately to the south, we draw upon comparable reforms from Washington State. Here two recent (2023) reform bills provide models; SB 1110, aimed at enabling Missing Middle housing, which passed, and SB 5466, aimed at enabling greater Transit-Oriented Density, which gained widespread support before stalling in the State House (State of Washington, House of Representatives 2023; Housing Development Consortium 2023). We also draw upon code from Oregon, slightly further to the south, where HB 2001, enabling quadplexes on all residential lots in large cities (25,000+ population), was passed in 2019 (State of Oregon 2019). This resulted in a statewide model code released in 2022, to be applied where municipalities failed to pass their own enabling versions (State of Oregon 2022). Finally, we highlight another southern neighbour in Montana's missing middle initiative, SB 323, which recently passed, enabling duplexes in all cities, after amendments reduced the initial plan to require the legalization of 4-plexes.

Elsewhere in Canada, Edmonton recently undertook a comprehensive citywide zoning reform, allowing up to 8 units at 1.35 FSR (45% lot coverage,

10.5m height limit) on most lots in the City. (City of Edmonton 2023) Several other cities have implemented broad multiplex zoning, partially in response to the federal Housing Accelerator Fund.

While we were unable to complete a full assessment of zoning codes across British Columbia for this project, we highlight comparable recent codes and reforms from Kelowna, Kimberley, City of Langley, Vancouver, and Victoria. Victoria passed the most recent and ambitious "Missing Middle" reform of its zoning bylaw in 2023, establishing new housing multiplex options across most lots in the City (City of Victoria 2023). Kelowna has a longer standing program to encourage 4-plex infill through its RU7 zoning and fast-tracking program, since refashioned and expanded into its MF1 zone (City of Kelowna 2020, 2022). Further in the interior, a Kimberley initiative in 2022 responded to local housing shortage by upzoning its R2 code to include up to 6-plex, stepping up allowed FSR by number of units (City of Kimberley 2022a, 2022b). Within Metro Vancouver, Coquitlam opened up 4-plex options within its RT-1 zone in 2019 in an effort to expand its Housing Choice program (Mckenna 2019; City of Coquitlam 2019). Vancouver zoning for townhouse development accomplishes much the same goal, and we draw upon the RM-8 code for comparison (City of Vancouver 2022c). Finally, the City of Langley offers a 6-plex model in its recent RM-1 code (City of Langley 2017). These comparable examples help inform our models and analysis of the province's framework for 4-plex and 6-plex townhouses, as per below. We return to reforms from Auckland, Kelowna, Coquitlam, and Vancouver in a later section detailing what can be learned so far from the development patterns they set in motion.

Table 4: Comparable 4- and 6-plex

Jurisdiction	Reform / Zone	Years	Units	FSR	Min. Lot Size (m)	Min. Floor Space (m^2)	Min. Avg. Unit Size
Auckland	MHU	2016-22	3	1.35	300	405	135
Auckland	MHS	2016-22	3	0.8	400	320	107
New Zealand - Tier 1	MDRS	2022-	3	1.5			
Washington	SB 1110	2023-	4 to 6				
Oregon	HB 2001 Model	2022-	4	1.4	279	390	97
Montana	SB 323	2023-	2				
Edmonton, AB	RS	2024-	8	1.35	75/dw		100
Victoria, BC	Missing Middle	2023-	6 to 12	1 - 1.1	500	550	92
Kelowna, BC	RU7	2017-20	4	0.8	600	480	120
Kelowna, BC	MF1	2020-	4	0.8	400	320	80
Kimberley, BC	R2	2022-	6	2	275	550	92
Coquitlam, BC	RT-1	2019-	4	0.75	740	555	139
Vancouver, BC	RM-8	varies	mixed	1.2	445	534	
Langley City, BC	RM-1	varies	6	1	700	700	117
BC 4-Plex	SSMUH		4	1.5	280	420	105
BC 6-Plex	SSMUH		6	1.5	280	420	70

Overall, reforms enabling 4-plex and 6-plex across former single-family lots are spreading rapidly, with both Washington and Oregon moving ahead of British Columbia. Number of units, where specified, range from 2-12, but mostly include 3-6 units. FSRs for this number of units vary from 0.75 to 2, with cumulative reforms, as in New Zealand, tending to raise the overall FSR permitted over time as well as expanding geographic coverage. Similarly cumulative reforms, as in Kelowna, have tended to lower the minimum lot size for multiplexes over time while expanding geographic coverage.

Minimum lot sizes, in conjunction with max FSRs, can be used to estimate minimum floor space allowed at max FSR, and while implementation can

vary, these can be roughly divided by number of units to illustrate average unit size across plexes on minimum sized lots. Across BC, lot size varies widely, and holding FSRs constant on very large lots can produce unrealistically large units for 4-plex and 6-plex scenarios. For modelling purposes, we cap overall floor space at 1200 square meters for 4-plexes and 1800 square meters for 6-plexes. This maps well onto many jurisdictions where maximum floor space is capped, or FSR is stepped to decline with lot size (as in Oregon). Overall our model 4-plex and 6-plex scenarios compare well with other reforms and existing enabling zones, with FSRs of 1.5. Both 4-plexes and 6-plexes would produce relatively large (family-sized) dwelling units on average when combining standard lot size with permitted FSRs.

Turning to larger scale transit-enabled densification, there are fewer examples of widespread reforms. For comparable scenarios introducing stepped up apartments (at least 4-6 storeys) as standard near transit, we first return to New Zealand. Auckland's Terrace Housing and Apartment (THA) zone, introduced under the AUP in 2016, enabled up to 5-storey apartment buildings from 2016 onward, geared toward encouraging a more urban density in transit friendly areas (Greenaway-McGrevy and Jones 2023). Under the National Policy Statement on Urban Development, this was further upzoned to allow a minimum 6-storey density across all Tier 1 cities for areas a) within the metropolitan centre or b) within a walkable catchment area (roughly 800m) of rapid transit, metropolitan centres, or city centres, with details about implementation to be worked out by municipalities (New Zealand Ministry for the Environment 2022, 2020). In addition, the NPS-UD banned municipalities from setting minimum parking requirements for dwellings.

The State of Washington put forward a similar bill in 2023, intending to upzone areas around rapid transit, but enabling flexibility in how greater density was to be achieved. Rather than specifying a minimum number of storeys to be enabled, Washington SB 5446 instead specified minimum average FSRs to be achieved within zoning containing walking catchments from Rapid Transit (0.25 miles) and Fixed Rail (0.5 miles) (Housing Development Consortium 2023). The bill, which also removed parking requirements within these areas, passed the Washington Senate with bi-partisan support before stalling out in the House. Of note, Washington's SB 5446 was designed similarly to California's SB-50, which also attempted to enable transit-oriented density (at 2.5 and 3.25 FSR) before its ultimate defeat in 2020 (State of California 2020).

Table 5: Comparable Transit Oriented

Jurisdiction	Reform/Zone	Years	Apartment Form	Max Height (m)	FSR	Min. Lot Size (m^2)	Min. Floor Area (m^2)
Auckland	THA	2016-22	5 Storey	16	2.5	1200	2000
New Zealand - Tier 1	NPS-UD	2022-	6 Storey				
Washington	SB 5446 Rapid Transit	2023	Flexible		2.5		
Washington	SB 5446 Fixed Rail	2023	Flexible		3		
Kelowna, BC	MF3	2022-	4 Storey	18	1.85	1400	2590
Kelowna, BC	MF3 (transit)	2022-	6 Storey	22	2.35	1400	3290
Victoria, BC	URMD	2017-	6 Storey	18.5	2	1840	3680
Vancouver, BC	C-2	varies	6 Storey		2.5-3.5		
Vancouver, BC	Broadway Plan KKSA	2022-	6 Storey		2.4-2.7	1122	3029
Langley City, BC	RM3	varies	6 Storey		2	1850	3700
BC TOA Type 3	TOA Bus Exchange		4-6 Storey		1.5-2.5		
BC TOA Type 2	TOA Medium-Sized Muni Bus Exchange		6-10 Storey		2.5-3.5		
BC TOA Type 1B	TOA Metro Vancouver Bus Exchanges		8-12 Storey		3-4		
BC TOA Type 1A	TOA Skytrain		8-20 Storey		3-5		

Within British Columbia, a number of municipalities have implemented zones for six storey construction, though achieving these heights is often conditional upon planning approval rather than allowed outright. Kelowna offers guidelines for both 4-storey and 6-storey buildings within its MF3 zone, applying

differing density standards to each, with the 6-storey enabled primarily on transit corridors. Victoria also created a zone for Urban Medium Density up to six storeys, though it has not been widely applied. Within Vancouver, C-2 Commercial zoning enables dwellings as a conditional use up to six storeys in height along corridors also served by transit. Vancouver's Broadway Plan also envisions several neighbourhoods within walkable catchments of the SkyTrain at heights of six storeys, and here we draw upon proposed standards for the Kitsilano South - Area A (KKSA) area. (City of Vancouver 2022a) City of Langley's RM-3 code similarly enables 6-storey developments and is provided here for comparison.

2.2.4 Visualizations of FSR variation

The actual forms taken by our scenarios can vary widely. In particular, a given Floor Space Ratio can be reached for a given lot by various combinations of lot coverage (what percent of the lot can be covered with a built structure) and heights (how tall can a structure be). The maximum achievable built area is also affected by setbacks and other factors. Much as with reforms in New Zealand and Washington, we do not specify the exact form any of these should take here, but we assume that municipalities must enable the zoned amount of floor space suitable to the lot under our FSR standard. In Figure 2, Figure 3, and Figure 4 we provide visualizations of what potential built forms enabled by reform scenarios could look like based on the work of Bryn Davidson.[8] We detail some necessary accompany legislation that municipalities and the province should enable in Section 9.

A basic 4-plex at 1 FSR on a 50 foot wide lot may look something like Figure 2, yielding four large family-sized units at around 1500 square feet each with at-grade parking, some private outdoor space and rooftop patios.

[8]Bryn Davidson, LaneFab Design/Build https://www.lanefab.com/plexes

Figure 2: BC 4-Plex infill example at 1.0 FSR on a 50 ft lot

A model 6-plex, at 1.5 FSR, could look something like Figure 3 on a 50' lot. Other variations could alter heights, lot coverage, setbacks, architectural style, and related details to result in different forms of equivalent FSR.

Figure 3: BC 6-Plex infill example at 1.5 FSR on a 50 ft lot

Visualizations of BC 4-Storey Model in Figure 4 enable four storeys in height under 2 FSR. As infill developments in neighbourhoods in Vancouver, where 33' lots are common, these would reach only slightly above the heights of surrounding detached houses. Scenarios near rapid rail that allow 3 FSR apartments may look similar in form, except resulting in six storeys instead of 4.

Figure 4: 2 FSR infill example on 33' and 66' lots

2.3 Geographic coverage

The regions targeted for the modelling in this report consist of all Census Metropolitan Areas (CMAs) and Census Agglomerations (CAs) in British Columbia, excluding First Nation reserves, treaty lands, and Island Trust areas, covering 90% of the population of British Columbia. Price modelling for some of the smaller regions, namely Ladysmith, Williams Lake, Quesnel, Terrace, and Dawson Creek, proved challenging because of the low range in housing types and property transactions available. Correspondingly, results for these regions weren't robust enough to include in this analysis. (See Figure 5)

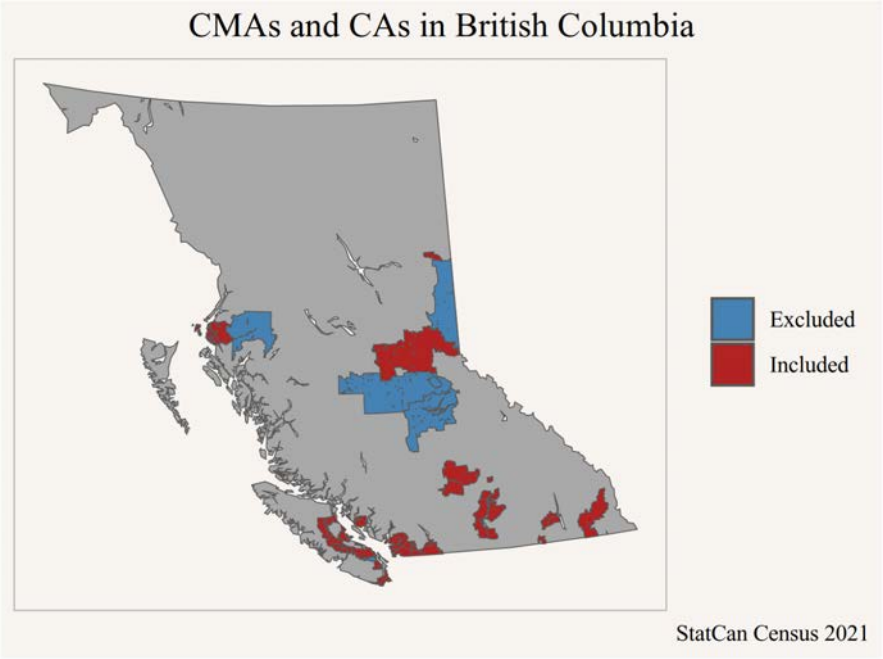


Figure 5: Geographic coverage of the regions considered.

The included regions cover a broad range of areas across the province, from the populous metro areas of Vancouver, Victoria, and Kelowna, to the lower population metro areas of Abbotsford - Mission, Nanaimo, Kamloops, and Chilliwack, and the Census agglomerations: Prince George, Vernon, Courtenay, Duncan, Penticton, Campbell River, Parksville, Fort St. John, Cranbrook, Port Alberni, Squamish, Salmon Arm, Nelson, Powell River, Trail, and Prince Rupert. For a detailed breakdown of jurisdictions covered by CMA/CA refer to Table 7 in Appendix E. The regions included in the modelling cover all of the TOA areas and make up the majority of the municipalities covered by the SSMUH legislation. Covering all municipalities, especially those outside of CMAs or CAs, proved difficult for modelling prices and development impacts because of the lack of existing multiplexes to inform modelling and guarantee robust enough results. This does not mean that we do not expect multiplexes getting built in these smaller communities, and these would add to the numbers presented in this report.

2.3.1 Lot size variation across the province

When investigating the impact of allowing four independent housing units per lot it is essential to fix the base unit, the size of the underlying lot. To this end we take a survey of lot frontages and size across different regions throughout the province. Within Metro Vancouver (see Figure 6), lots were initially marked off under the 66' chain system, with variation in standard frontages ranging from 33' (most common in the City of Vancouver and nearby Burnaby) to 50' (New Westminster and North Vancouver) and 66' (Surrey and City of Langley). Lot depths were generally set at two chains, with a portion set aside for a laneway, resulting in a depth of 122' standard in the City of Vancouver. But overall dimensions vary widely, and many lots occupy non-standard sites. Switching to metric, a standard lot in the City of Vancouver comes in around 374 square meters, standard sizes elsewhere tend to be larger. Both fall well within the SSMUH minimum lot sizes. We will mostly discuss lot frontages and sizes in terms of imperial units (feet and square feet) below, reflecting origins and common market usage.

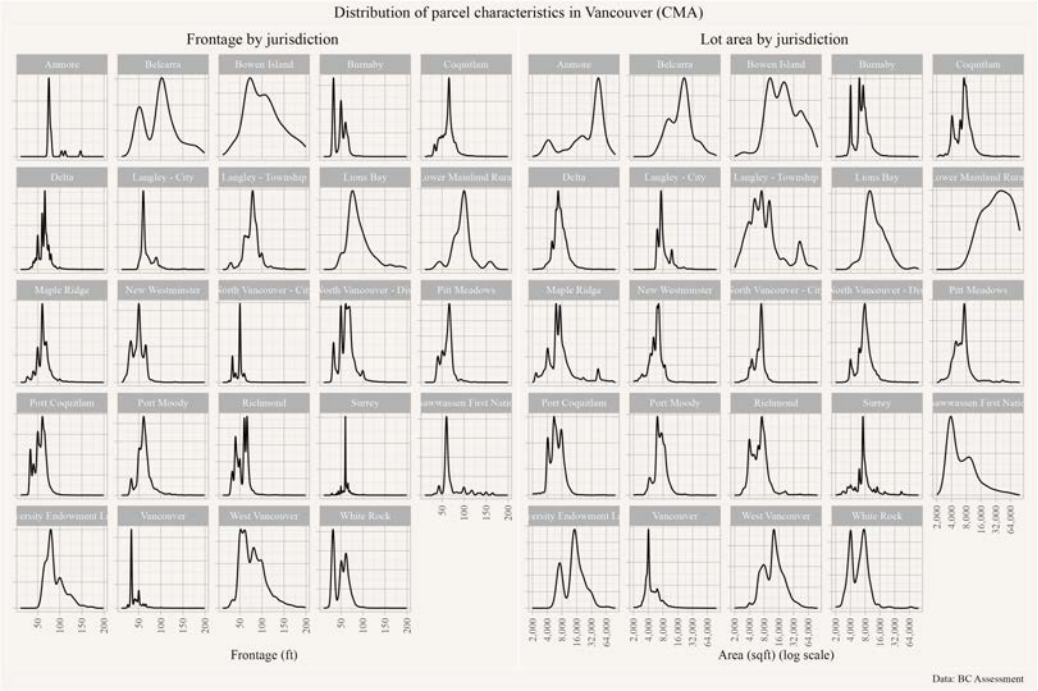


Figure 6: Lot characteristics in Metro Vancouver municipalities

Lot sizes across the Capital Region also vary widely. (See Figure 7) Frontages of 50' dominate Victoria, Esquimalt, Oak Bay, and Saanich, and most lots across the region are similarly wide, but Sooke looks like an outlier, and remains more similar to Vancouver with 33' frontages. While Sooke's lots are narrow, many are quite deep, though Victoria's depth looks similarly standard to Vancouver's 122'. The shapes and lot sizes of other municipalities in the region vary widely. Both 4-plex and 6-plex models would result in generously sized dwelling units across most of the region.

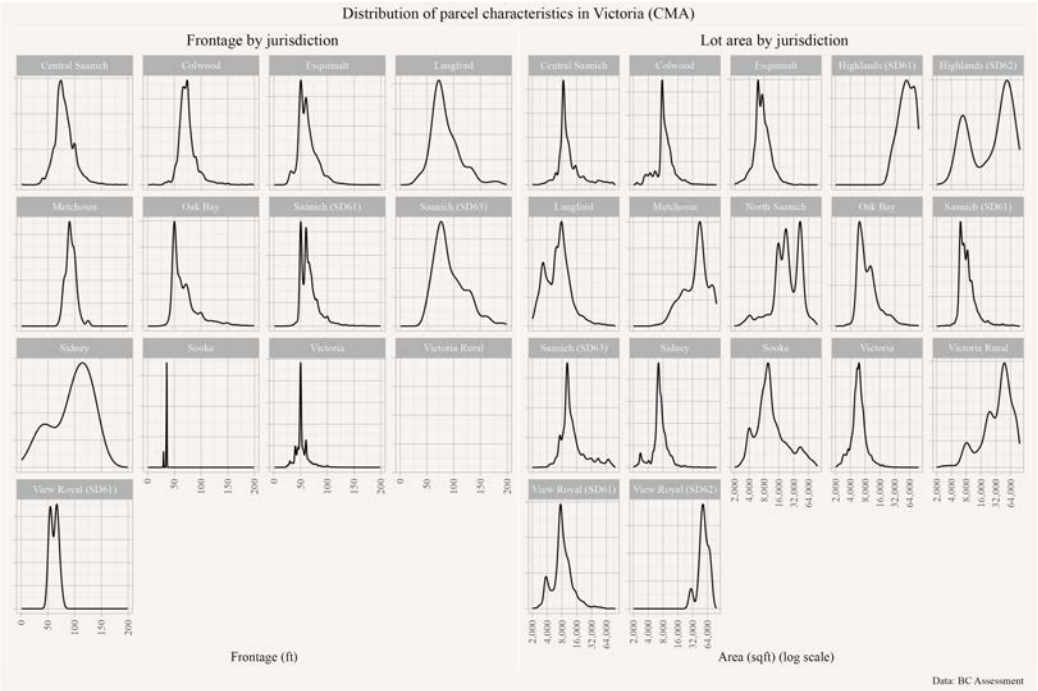


Figure 7: Lot characteristics in Metro Victoria municipalities

Returning to the Lower Mainland, Municipalities within the Fraser Valley tend to have markedly larger lot sizes than the Metro Vancouver region, reflecting their more rural character. 4-plexes would be spacious across most of the region. (See Figure 8).

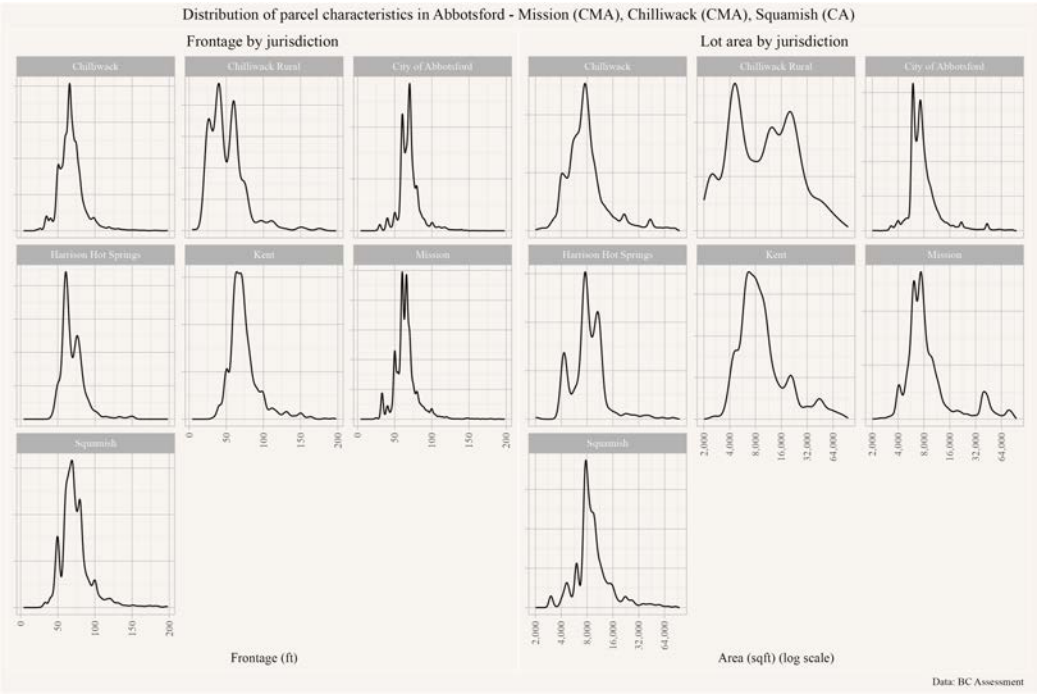


Figure 8: Lot size characteristics in the Lower Mainland outside of Metro Vancouver

Kelowna, along with most of the other Interior regions of British Columbia, also tends to see lot frontages of 50' or greater. This results in larger lot sizes overall than are common in Metro Vancouver outside of outlying suburbs like Surrey. Lots of 8,000 square feet and above are common, which under our model 4-plex, could result in generous 4-plexes where dwelling units averaged 2,000 square feet in size. (See Figure 9)

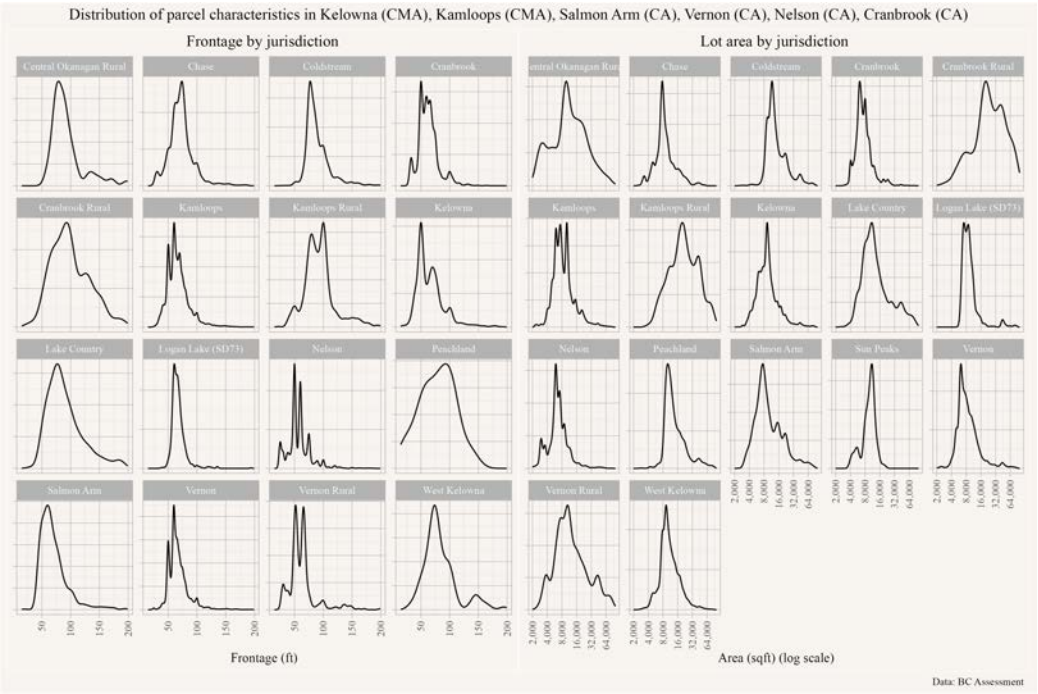


Figure 9: Lot size characteristics in the interior.

Island urban areas outside of the Capital Region also tend to cluster around 8,000 square feet or larger in size, offering spacious possibilities for 4-plex development. (See Figure 10)

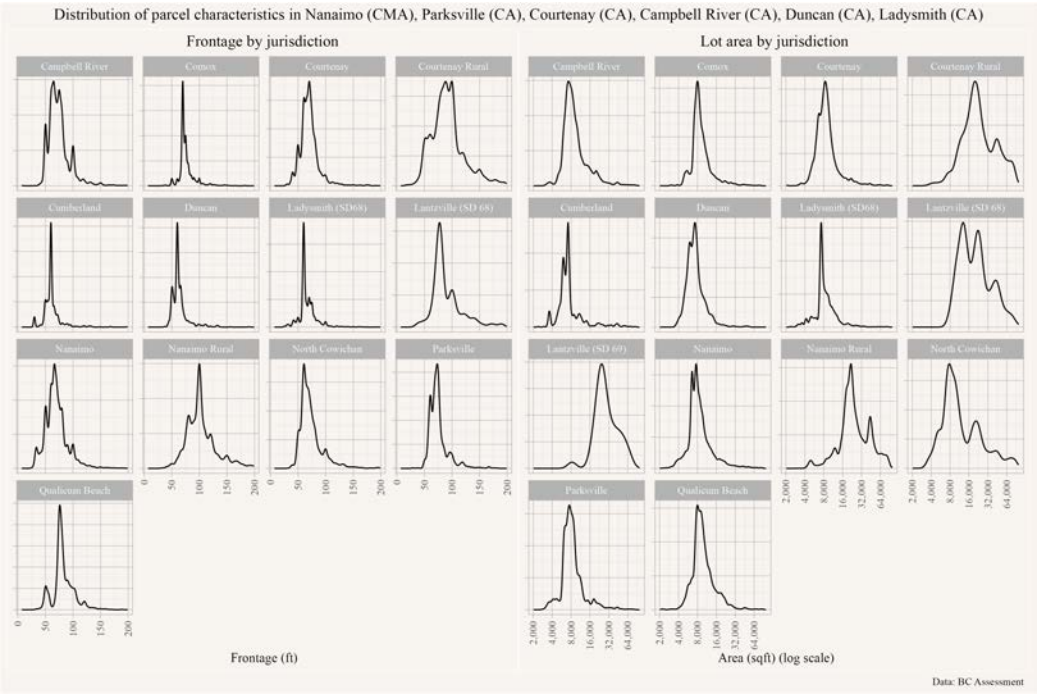


Figure 10: Lot size characteristics in Vancouver Island outside of Victoria

2.4 Comparing Provincial TOA Minimum Allowable Densities to Official Community Plans

Municipalities govern development largely through a combination of zoning powers (including parking requirements) and official plans. Outside of the City of Vancouver, Official Community Plans (OCPs) are meant to signal to developers not just what is currently allowed (as contained within zoning regulations), but also where municipalities are likely to consider rezoning to otherwise enable new land uses, including greater density. In this sense, plans are usually more ambitious than either outright or conditional zoning, but also less certain. They have typically required developers to proceed through complicated and lengthy negotiation and rezoning processes to achieve densities close to those designated in the OCPs. Within the City of Vancouver, a series of major planning projects operate in the same fashion for different parts of the City, while others are covered under various other policies extending beyond zoning (e.g. the Secure Rental Program).

Portions of provincial Transit Oriented Areas (TOA) are often covered by municipal plans for enabling greater density in the future associated with Transit-Oriented Development (TOD), and on top of existing zoning. Correspondingly, it is useful to compare provincially mandated TOA minimum allowable densities to both existing zoning and to Official Community Plan and related planning programs. Sometimes Official Community Plans match or exceed provincial TOA minimums, and other times TOA minimums are far higher. Some development enabled by provincial TOA minimums would likely also take place without provincial intervention under municipal OCPs, but approval and development timelines might take longer, and other developments would not happen at all. As such, we can't fully quantify the amount of development enabled by TOA above and beyond business-as-usual (including adherence to OCPs) without some uncertainty. OCPs also encode a variety of municipal priorities, including, for instance, preservation of historic areas and preservation or expansion of secured rental housing stock. We provide examples of TOA to OCP comparisons below for illustrative purposes.

2.4.1 Vancouver

Within the City of Vancouver, major planning projects cover TOD within the Broadway Corridor, TOD along the Cambie Corridor, and the Joyce-Collingwood Precinct. We explore how these relate to new provincial TOA minimum allowable densities below.

2.4.1.1 Broadway Corridor Plan

The Broadway Corridor Plan (BCP) is the most recent TOD plan within the City of Vancouver. Figure 11 compares the applicability of the Broadway Pan to the provincial TOAs.

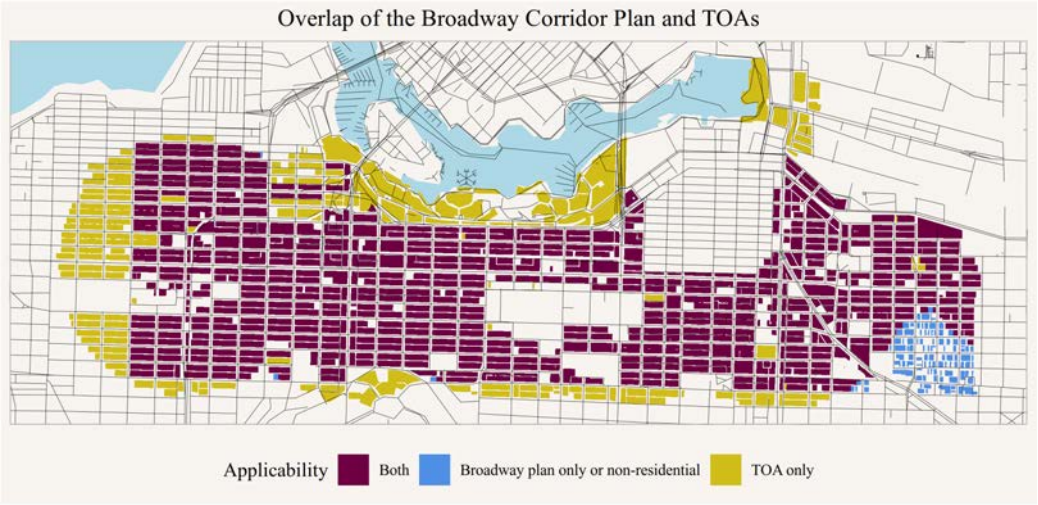


Figure 11: Overlap of the Broadway Corridor Plan and TOAs

There is a pocket in the south-east that is covered by the Broadway Plan but is not in any of the TOAs, while on the fringes, especially on the west side, TOAs expand beyond the reach of the Broadway Plan. Some areas that have been excluded from the Broadway Plan have special zoning, like False Creek South. Figure 12 demonstrates that where the Broadway Corridor Plan applies the prescribed densities are generally higher than the provincial TOA minimums.

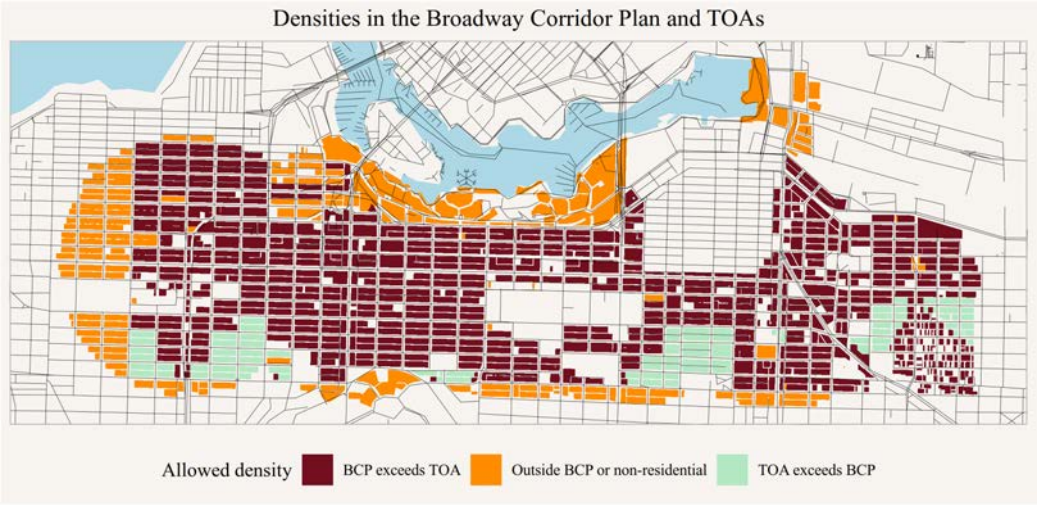


Figure 12: Densities in the Broadway Corridor Plan and TOAs

Figure 13 shows the location of purpose-built rental buildings in the area, most of the purpose-built rental buildings in the area are within the Broadway Corridor Plan, the TOA legislation adds some rental in the north-western part. The TOA legislation also adds some low-density residential use in the south-western part of the area.

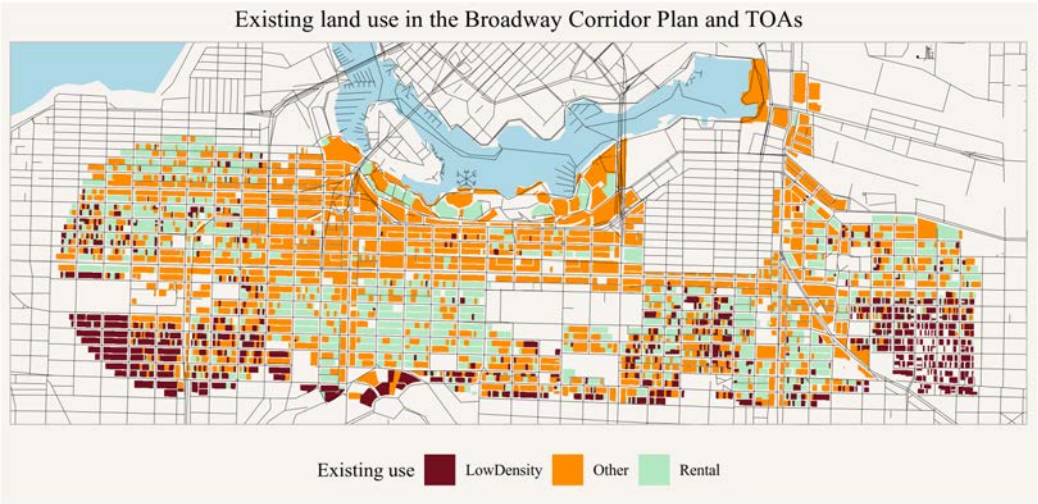


Figure 13: Existing land use in Broadway Corridor Plan and TOAs

We turn to a more detailed comparison around the Arbutus Station. The provincial TOA extends to additional land to the west of the Arbutus Station not covered under the current BCP. With some exceptions, the highest FSRs achievable within the Broadway Plan largely match or exceed minimum TOA densities where applied to parts of the Arbutus Station catchment. However, the highest ranges often apply with limits (e.g. only for secured rental housing and/or limited to two towers per block). It remains unclear exactly how provincial TOA minimums will affect these kind of municipal limits. Moreover, densities achievable within the Kitsilano South area of the BCP are currently below the provincial TOA minimum. Here provincial TOA minimums should boost the likelihood of redevelopment by enabling more housing to be built over existing municipal planning.

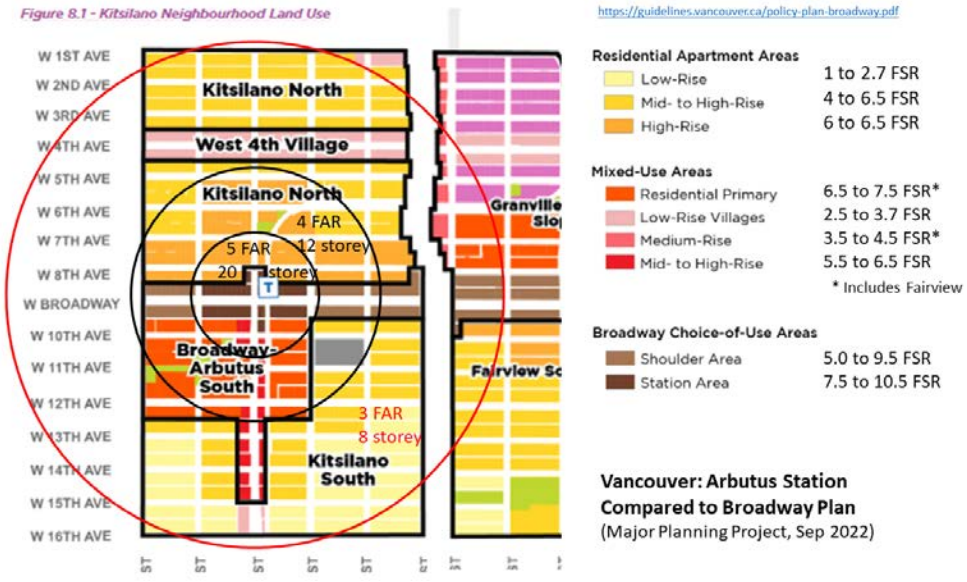


Figure 14: Arbutus Station TOA Densities to Broadway Plan Comparison

2.4.1.2 Cambie Corridor Plan

The Cambie Corridor Plan (CCP) and Joyce-Collingwood Precinct Plan (JCP) are older TOD plans for the City of Vancouver. The CCP has proceeded in three stages, extending from 2010 up to the present. Provincial TOA minimums surrounding the King Edward SkyTrain Station far exceed the density and heights associated with the CCP in nearly every regard. Nev-

ertheless, the Cambie Corridor has been built out relatively rapidly. While recently completed projects are unlikely to redevelop, the King Edward TOA area could see dramatically more new development under provincial minimums than is currently planned under the CCP.

Figure 15: King Edward Station TOA Densities to Cambie Corridor Plan Comparison

2.4.1.3 Joyce-Collingwood Precinct Plan

The Joyce-Collingwood Precinct Plan (JCP) is more recent than the CCP, but also more modest in geographic coverage and specifically tailored to parcels around Joyce-Collingwood Station. Towers are marked as extending from mixed use podiums within the centre, where FSRs meet provincial minimums for at least some parcels. Others are left untouched by planning, or planned for densities below provincial TOA minimums. Some of the parcels excluded from planning are left out to protect existing rental buildings, while others are simply low-density residential lots. These are in many cases covered by other policies, including attempts at zoning for multiplex, that are also at lower densities than allowed by provincial TOA.

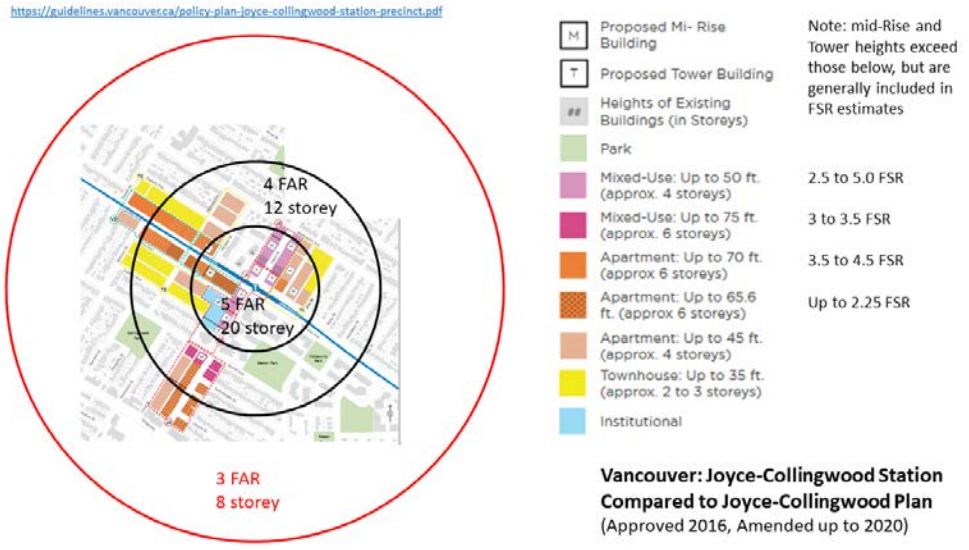


Figure 16: Joyce-Collingwood Station TOA Densities to Joyce-Collingwood Precinct Plan Comparison

2.4.1.4 Secured Rental Policy Comparison in Dunbar

Sometimes transit-oriented development is not covered by a specific area plan, but other policies nevertheless set out potential redevelopment guidelines and options. Within the City of Vancouver these are often tied to specific kinds of housing, especially non-market, below-market, and secured rental (i.e. purpose-built and protected against transformation into condominium). The area around the Dunbar & 41st Bus Exchange is covered by the province's TOA minimum allowable density for bus exchanges, overlapping with Vancouver's Secured Rental Policy (SRP) coverage applied to most arterials. The SRP enables rezoning for RR zones supporting rental housing at greater density than would otherwise be allowed by existing zoning. Vancouver's SRP also allows higher densities for commercial (C-2) zoning if developed to support rental rather than condo. Densities enabled by the SRP are lower than those meant to be achievable under provincial TOA minimums. Nevertheless, the program has seen relatively rapid uptake by developers, with applications to the City for at least 34 projects near arterials since its inception in December of 2021 (Duo 2023), suggesting more generous provincial TOA minimums will be successful in spurring further

development.

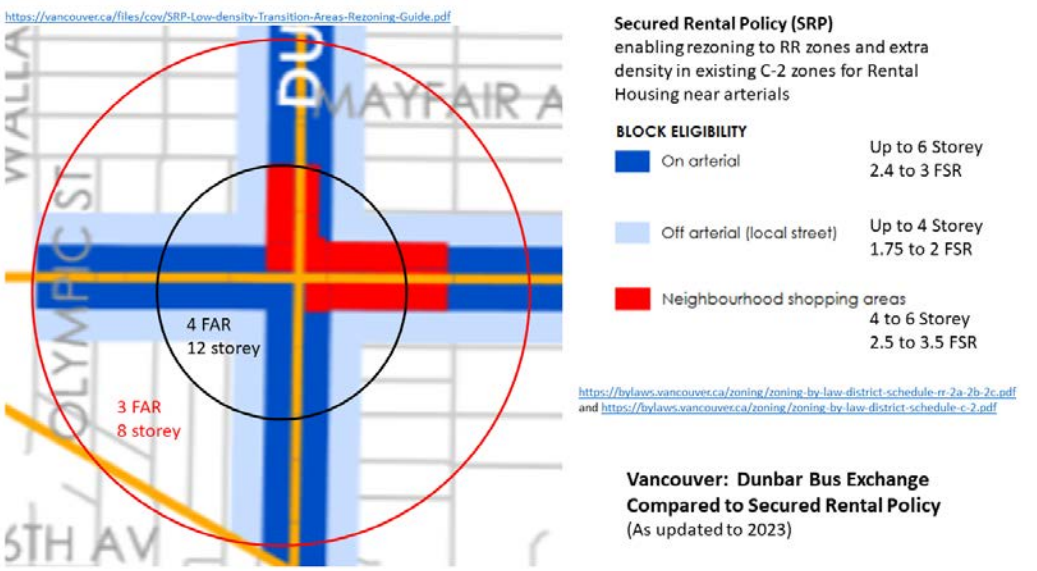


Figure 17: Dunbar Bus Exchange TOA Densities to Secured Rental Policy Comparison

2.4.2 Burnaby

Next to Vancouver, the City of Burnaby has the most SkyTrain stations in Metro Vancouver, containing key portions of both the Expo Line and the Millennium Line. Burnaby also has a relatively long history of Transit-Oriented Development, and town centre plans within Burnaby's OCP cover a large portion of provincial TOA catchments.

2.4.2.1 Metrotown

Metrotown is currently the densest and most developed of these town centres. Figure 18 shows that the Metrotown Plan (MP) is compactly assembled around the station and provincial TOAs expand on the area.

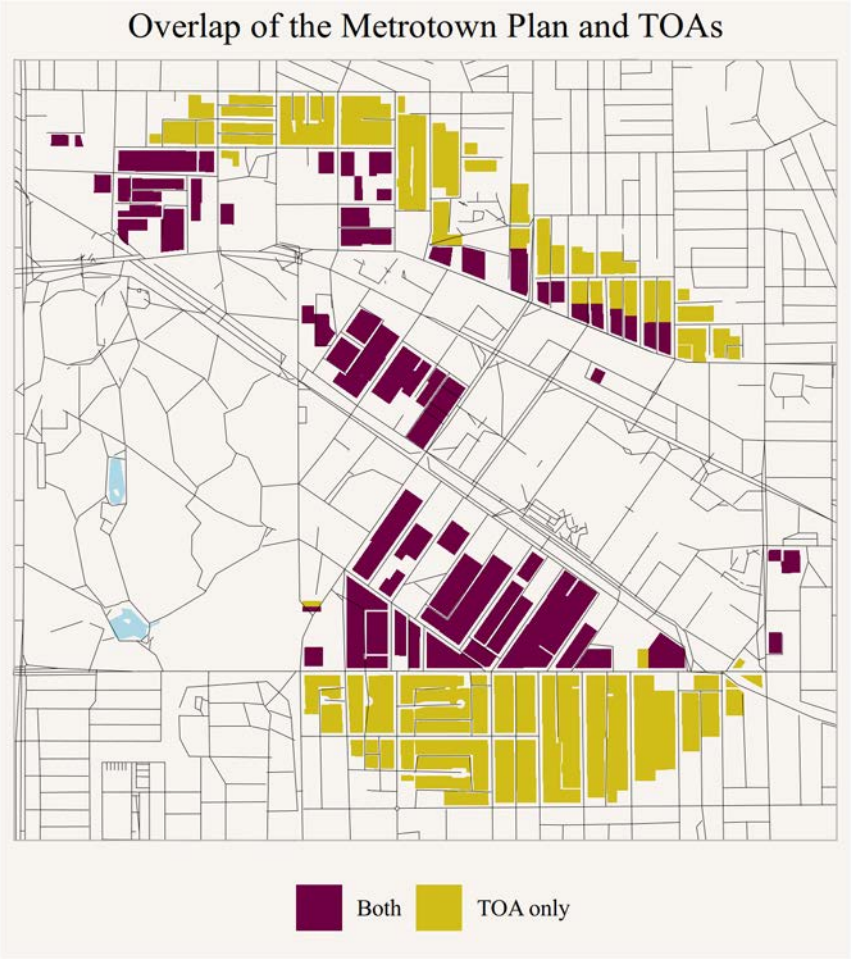


Figure 18: Overlap of the Metrotown Plan and TOAs

The densities allowed within the Metrotown plan mostly exceed those enabled by the TOA minimums, but the TOAs bring in large areas on the fringes as shown in Figure 19.

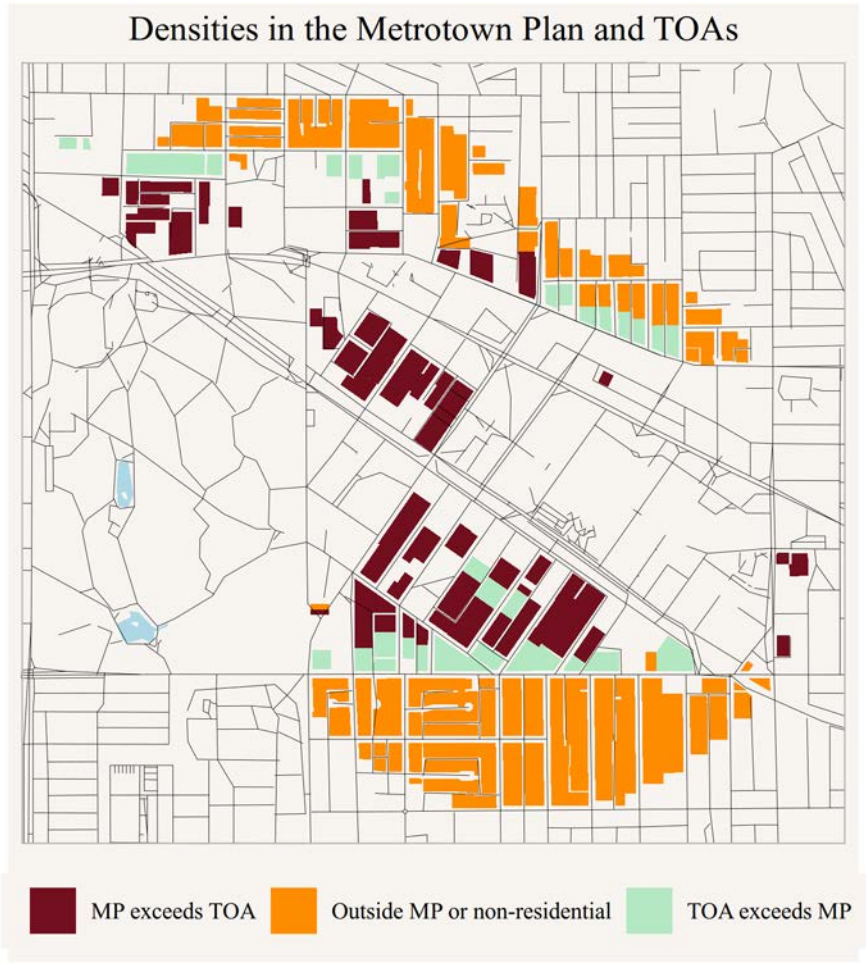


Figure 19: Densities in the Metrotown Plan and TOAs

Figure 20 shows that the areas brought into play by TOAs are almost exclusively current low-density residential use (e.g. R5, limited to single or two family dwellings).

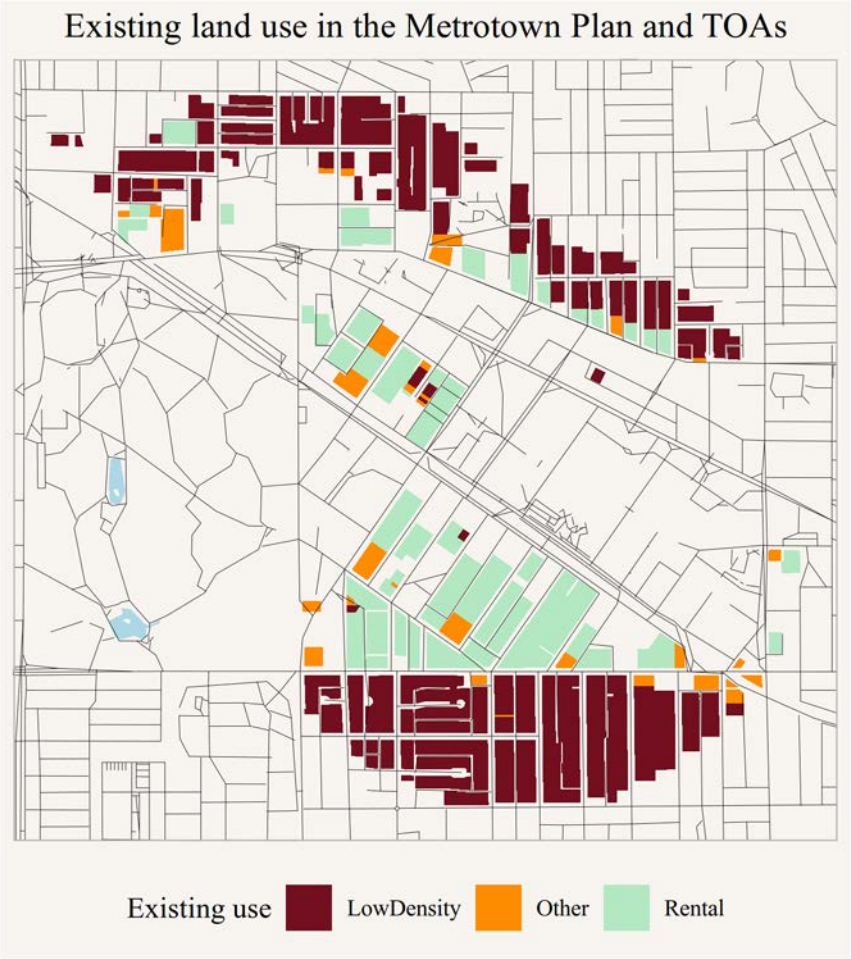


Figure 20: Existing land use in Metrotown Plan and TOAs

Looking in more detail within the OCP planning area for Metrotown, it generally matches or exceeds the TOA minimums imposed by the province, with the exception of the Medium Density Residential (RM3s) portions. These are set to a base FAR of 0.9, but density bonuses can be obtained up to 1.5 for underground parking and amenity contributions. In cases where below-market rental apartments replace existing rental apartments or comprise at least 20% of units created, parcels in RM3s portions can also be rezoned to achieve up to 2.05 FAR as part of Burnaby's efforts to protect and expand secured rental housing within TOA catchments. This remains well below 3 FAR, as specified by provincial minimums covering RM3s portions of the

catchment.

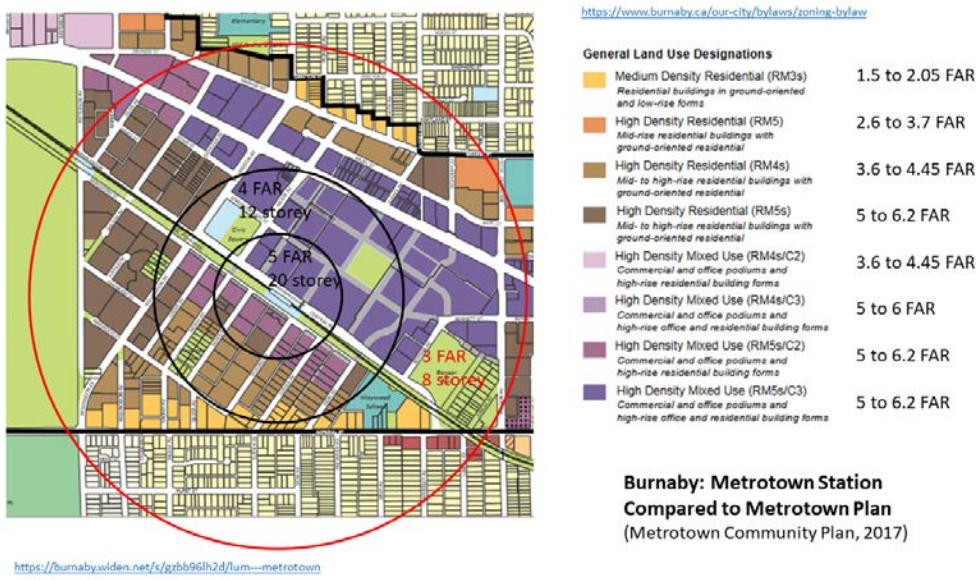


Figure 21: Metrotown Station TOA Densities to Official Community Plan Comparison

2.4.3 New Westminster

New Westminster contains multiple stations along the Expo Line of the SkyTrain. The 22nd St. Station is the least developed of these, located between Metrotown and downtown New Westminster. Plans to density the 22nd St. Station were updated in 2019, as shown below. With the exception of a small portion of the catchment envisioned for mixed-use high rise up to 5.2 FAR, the densities are well below those imposed by provincial TOA minimums. The scope of the planning area is also limited, leaving most surrounding low-density zoning within the Connaught Heights neighbourhood untouched. Notably, after the municipality declared a climate crisis in the same year, the planning process was revisited. Currently the City of New Westminster is in the process of working through a new "bold vision" for the station, likely envisioning greater density, and with a dual focus on Climate Change and Reconciliation with First Nations. Here and elsewhere, provincial TOA minimum allowable densities can be incorporated within and help reshape ongoing TOD planning processes.

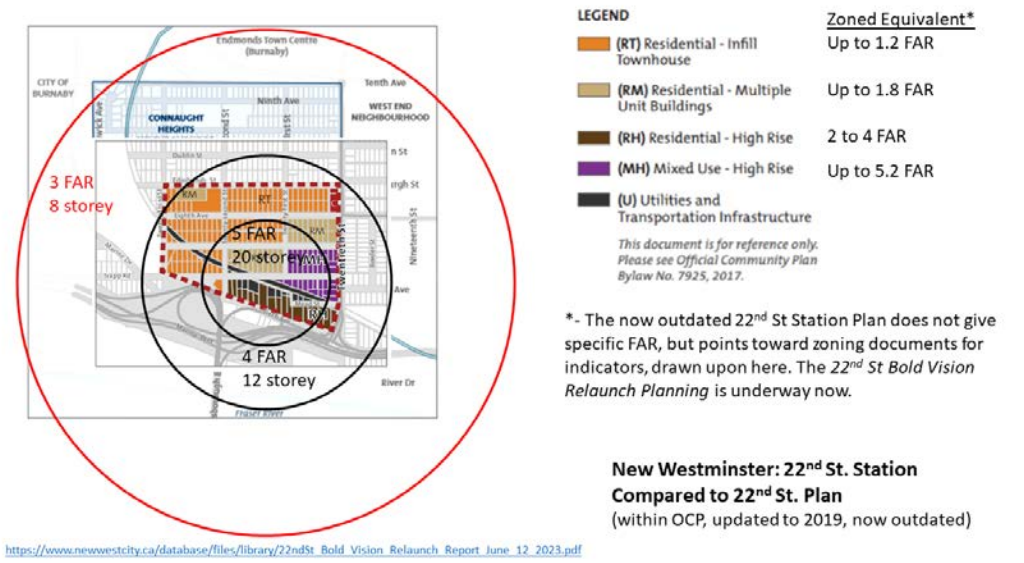


Figure 22: 22nd St Station TOA Densities to Official Community Plan Comparison

2.4.4 Surrey

Surrey currently contains four Expo line stations, with plans underway for up to seven more as the line continues to Langley. The Gateway Station offers insight into TOD-oriented planning within Surrey around TOA catchments. In many cases, as with High Rise Residential and Mixed-Use (Type I) areas, current OCP densities reach or exceed provincially mandated TOA minimums. At 3.5 FAR, Mid to High Rise Residential and Mixed-Use areas approach the TOA minimum of 4 FAR within 400m of the Gateway Station, and exceed the TOA minimum beyond that boundary. Other planning areas tend to fall below TOA minimums. In addition, the TOA catchment extends beyond the OCP planning area into surrounding low-density neighbourhoods to the West of the Gateway Station.

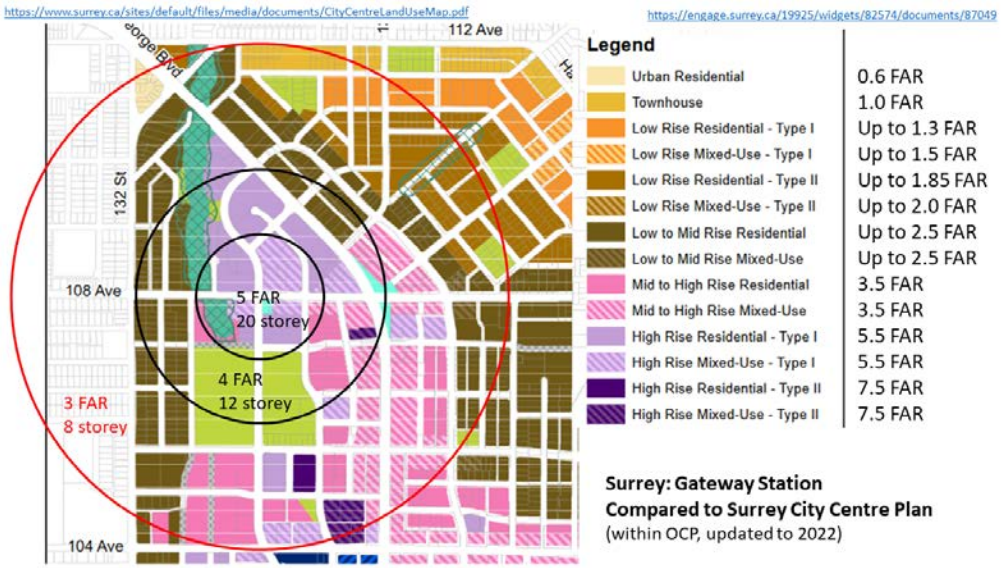


Figure 23: Gateway Station TOA Densities to Official Community Plan Comparison

2.4.5 City of Langley

Though it does not yet have a SkyTrain stop, the City of Langley is already engaged in TOD planning processes for its downtown area. Densities planned for within the City of Langley's OCP tend to range widely. Upper ranges often extend up to or exceed those mandated by the province's TOA minimums. Of note, these higher ranges of FAR are offered under the City's Density Bonusing policies associated with amenity contributions.

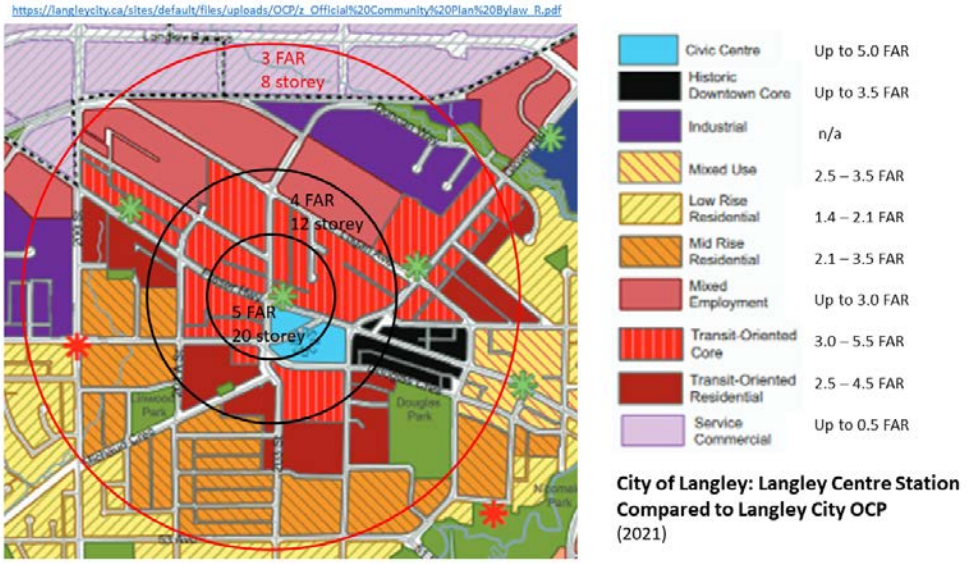


Figure 24: Langley Station TOA Densities to Official Community Plan Comparison

2.4.6 Port Moody

Port Moody currently includes two stops of the Millennium Line. Transit-oriented planning for the Moody Centre Station was included within the 2014 OCP, as shown. Heights enabling tower forms were mostly limited to a rectangular strip extending out from the station, with maximum tower heights exceeding provincial minimums near the station, but stepping down sharply thereafter to a maximum of six storeys near the edges. Towers are also envisioned for a comprehensive redevelopment of the lumber mill currently occupying the Oceanfront District (E). Beyond these areas, heights for Moody Centre planning area parcels are limited to 3-6 storeys, falling below provincial TOA minimums. Densities in terms of floor area are not readily available within the OCP. Several low-density residential areas, including some protected by historical designation, currently fall outside of the Moody Centre planning area, but within the provincial TOA minimums. Of note, attempts have been made to revise the 2014 OCP for greater transit-oriented density, and a new planning process for the area is currently underway, much as with the 22nd Station in New Westminster.

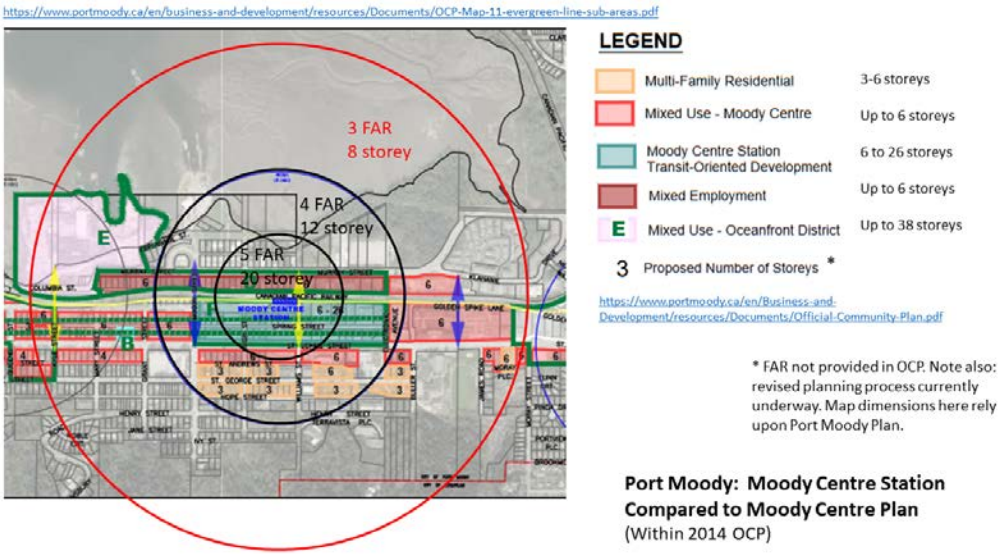


Figure 25: Moody Centre Station TOA Densities to Official Community Plan Comparison

2.4.7 Kelowna

Outside of Metro Vancouver, minimum TOA densities drop slightly from those within the Metro area and apply only within 400m of bus exchanges. Bus exchanges are often covered under urban centre or related transit-oriented planning within OCPs. Within the City of Kelowna, the Okanagan College Bus Exchange provides an example for comparing TOA minimums to OCPs, as per below. The exchange is within the South Pandosy Urban Centre (UC) Plan, which includes potential heights from four to six storeys within the provincial TOA area, either below or just reaching provincial minimums. Low density residential areas to the south fall outside of the South Pandosy Plan, but still within provincial TOA minimums. The UC 5 zone links the plan to achievable FARs, which all fall below the provincial TOA minimums.

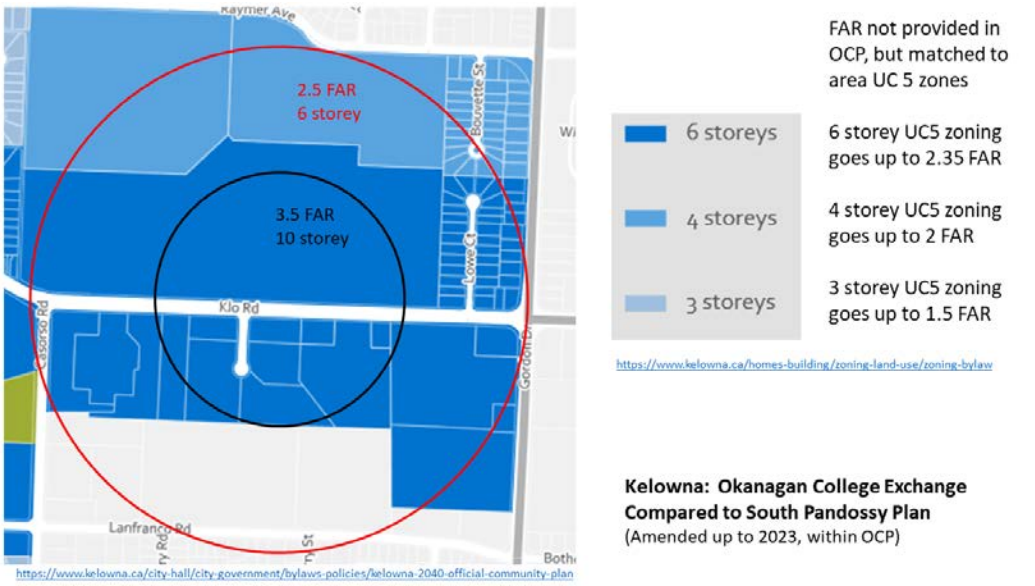


Figure 26: Okanagan College Bus Exchange TOA Densities to Official Community Plan Comparison

2.4.8 Nanaimo

Nanaimo's Country Club Bus Exchange is also covered by existing Urban Centre planning. The range of Urban Centre, Mixed Use, and Residential Corridor allowable heights in storeys extend past or up to provincial TOA minimums. Only Neighbourhood storeys fail to reach minimums within the TOA radius of the station. Densities are expressed in units/hectare rather than FARs, making it difficult to compare the two metrics.

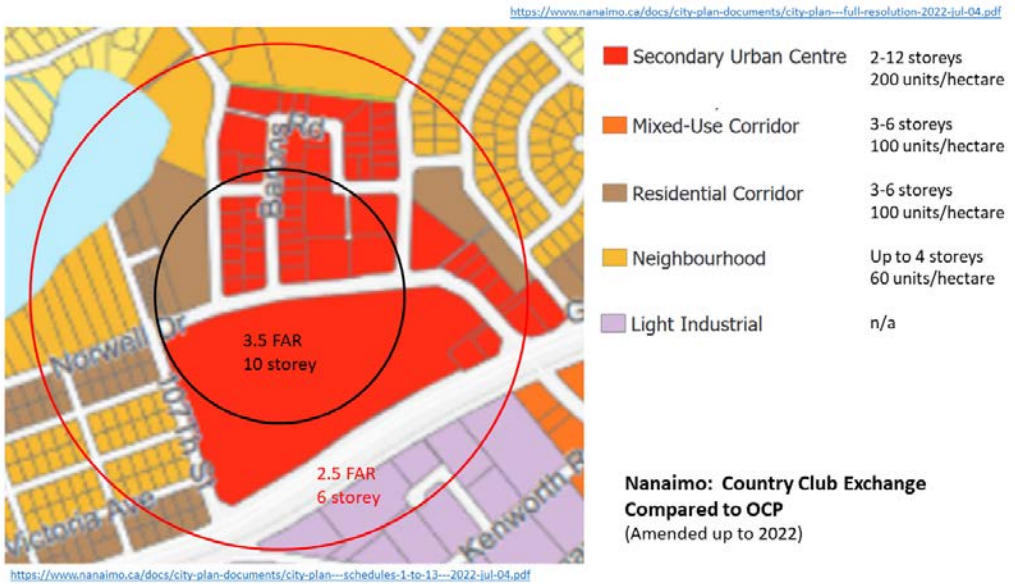


Figure 27: Country Club Bus Exchange TOA Densities to Official Community Plan Comparison

3 Price model

To understand redevelopment potential under hypothetical density scenarios we need to estimate the price at which housing built under the scenarios above would sell for. On the surface this is not dissimilar from what Automated Valuation Models (AVMs), or models used for tax assessment purposes, do. However, AVMs focus on estimating the price existing housing would fetch if they were for sale. Our task is different in that we are trying to estimate the price of hypothetical housing that may not currently exist in a particular geography of interest. This makes our approach more challenging as it aims to extrapolate from the existing data.

Relative to AVMs, we place a higher emphasis on generalizability over accuracy at the individual property level. This suits our approach in that it is less important if predictions at the individual property level are correct so long as, on average within a given area, predictions are accurate enough that the aggregate effects of upzoning can be understood. The purpose is not to inform development decisions on the individual property level but rather un-

derstand development patterns at the broader neighbourhood and regional levels.

To infer prices multiplexes would sell for on a particular lot we use past sales data to model the relationship between location and dwelling characteristics like type, size, and age, as outlined in Figure 28. To do this we employ historical sales data and fit the following hierarchical model which reflects our understanding of market price setting.

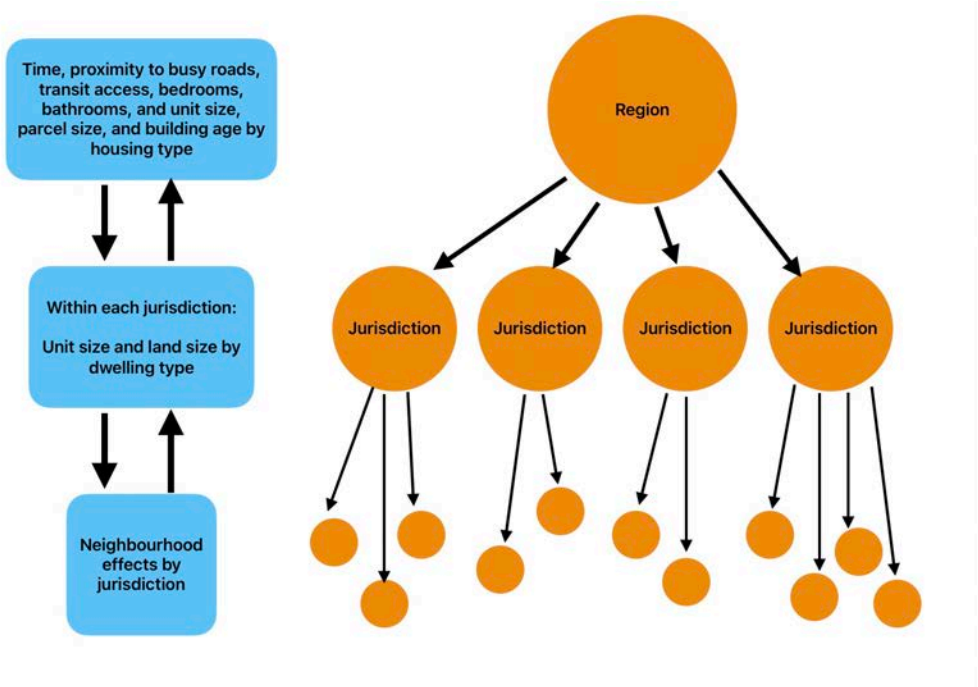


Figure 28: Multi-level model for prices

At the first level, this multi-level approach fits: date, proximity to roads, access to jobs within 30 and 45 minutes of walking or transit as estimated using employment by place of work data from the 2021 Census and Google Transit Feeds, proximity to employment, health care, and parks as estimated by Statistics Canada's proximity index database, bedrooms and bathrooms, and (effective) building age, floor area, and land area per dwelling unit interacted with dwelling type. At the second level, the model then adds random effects of floor area and land area per unit, interacted with dwelling type, by

jurisdiction, which accounts for jurisdiction level differences in preferences as well as in regulation and observed built form. The second level jurisdiction based random effects may introduce boundary artifacts in the data between two jurisdictions, but these sub-area level artifacts get balanced by more robust average estimates at the jurisdiction level.

Finally, at the third level the model adds neighbourhood level random intercepts to account for geographic variation in prices. We weight observations by year, assigning a weight of 1 to all sales in 2020 or after, stepping down to a weight of 0.5 in 2010. Overall, we only consider sales in 2010 or after when fitting the model.

This is made precise with the following model specification:

$$
\begin{aligned}
\log(price) \sim & YearQuarter + Bedrooms + Baths + \\
& road\_type + jobs\_30 + jobs\_45 + \\
& prox\_idx\_emp + prox\_idx\_health + prox\_idx\_parks + \\
& \log(land\_area\_u) * DwellingType + \\
& \log(BuildingAge) * DwellingType + \\
& \log(FloorArea) * DwellingType + \\
& (\log(FloorArea) * DwellingType + \\
& \log(land\_area\_u) * DwellingType | Juridiction) + \\
& (1 | Juridiction : Neighbourhood)
\end{aligned}
$$

We believe this approach is well-suited to estimate hypothetical prices for multiplexes and low to mid-rise condominium apartments insofar as it gains power by observing transactions over multiple years and estimates prices surfaces by borrowing from observations of single family property sales in areas where there are no or few multiplexes or apartment condominiums. Results are calibrated in each jurisdiction to overall relationships of prices between those types after accounting for level 1 region-wide estimates.

To reduce bias we blend this with a linear model that replaces the random effects by neighbourhood fixed effects.

$$\begin{aligned}\log(price) \sim & YearQuarter + Bedrooms + Baths + \\ & road\_type + jobs\_30 + jobs\_45 + \\ & prox\_idx\_emp + prox\_idx\_health + prox\_idx\_parks + \\ & \log(land\_area\_u) * DwellingType + \\ & \log(BuildingAge) * DwellingType + \\ & \log(FloorArea) * DwellingType + \\ & Neighbourhood\end{aligned}$$

There remain a few limitations to our model that may cause problems with our goal of estimating prices of multiplexes and apartment condominium units in areas where right now few of these exist.

- The model assumes (log) price trends have been uniform across dwelling types and geographies. This is broadly true, although at times some property types have appreciated at a faster rate than others. Similarly, prices have appreciated faster in some regions than in others. We believe that these effects are small enough that they can be mitigated by using weights as discussed above. This keeps the model concise and avoids over-fitting. An alternative approach might be to allow interactions by dwelling type and Jurisdiction in the second level random effects.
- The model assumes the effect on log floor space and log land per dwelling unit are uniform across jurisdictions and time. In British Columbia individual cities tend to be rather small geographically and constant preference distributions across jurisdictions may be a reasonable approximation.

We discuss additional limitations with respect to measurements below as well as within the Section 10.

3.1 Variable definitions

The model uses the following variables:

- **price** is the sale price of the dwelling unit

- **YearQuarter** is the year and quarter of the closing date. Using contract date would be preferable here, but our data source originates in title transfer data which does not have information on the contract date.
- **road_type** flags if the property is located on a highway, an arterial, a collector, or a local road. To inform this we use the *motorway*, *trunk*, *primary* and *secondary* tags in Open Street Map data.
- **jobs_30** and **jobs_45** lists the (log of) the number of jobs reachable within 30 and 45 minutes of walking or transit, respectively. Job locations are derived from the 2021 Census table 98-10-0504 enumerating the population with usual place of work at the census tract of work. Travel limes are estimated using current Google Transit Feed Specification data and estimated morning weekday commute times, averaged over several start times 5 minutes apart using the `r5r` package (Pereira et al. 2021), taking dissemination blocks linked to property parcels as place of origin. This variable was only used for Metro Vancouver due to low information value to the model in other regions.
- **prox_idx_emp**, **prox_idx_health**, and **prox_idx_parks** are proximity indices from the Statistics Canada Proximity Measures Database (Statistics Canada 2023). They measure the proximity to employment, health care, and parks, respectively. Values are linked to each property based on the Statistics Canada Dissemination Block they lie in. NA values were imputed to zero.
- **Bedrooms** and **Baths** note the number of bedrooms and bathrooms in the dwelling unit, respectively. They have been adjusted by counting studios as 0.8 bedrooms and taking the square root. The choice of square root is borrowed from Statistics Canada methods to adjust income based on family or household size and has been successfully used in earlier work where we have shown that this is a useful transformation to make homes with a different number of bedrooms comparable. (Stewart and von Bergmann 2020)
- **BuildingAge** denotes the *effective age* of the building, which is an adjusted building age that reflects upgrades to the structure and finishings. This is taken from the current assessment roll and might incorrectly date some properties at the state of sale in the past.

- **DwellingType** is the type of dwelling, which we code into several categories as Single Family (including single family homes with secondary suites and/or laneway houses, actual use codes 000 and 032), Duplex, Multiplexes including triplexes, fourplexes, town and row houses (actual use codes 039, 047, and 049), and apartment condominium units (actual use code 030). For apartment condominium units we further distinguish wood frame lowrise up to 6 floors, concrete or mass timber lowrise, concrete or mass timber midrise up to 12 floors, concrete highrise 12 through 25 floors, and tall highrise with more that 25 floors. These choices were informed by the proposed SSMUH and TOA legislation. Not all regions have all types of dwellings, the actual number of categories used in the model varies by region.
- **FloorArea** is the total finished floor area in the dwelling unit.
- **land_area_u** is the land area of the parcel the building is on divided by the number of dwelling units on the property.
- **Jurisdiction** labels the jurisdiction as coded by BC Assessment, which roughly corresponds to municipalities.
- **Neighbourhood** labels the neighbourhood of the property, as coded by BC Assessment. This corresponds to smaller geographic areas within each jurisdiction.

3.2 Assumptions and inputs

Our model is chiefly informed by property transaction data as well as data on the residential property stock and property characteristics supplied for this project by BC Assessment.

3.3 Multiplex price distribution

Fitting the model to each region allows us to estimate the prices multiplex units would sell for if built in different parts of each region. Price per square foot of living space is a simple way to convey the distribution. To illustrate price surfaces we provide an example of results based on a 1,500 square foot 3 bedroom unit as shown in Figure 29 for Vancouver, which offers a good overview of the range of prices multiplexes are expected to sell for.

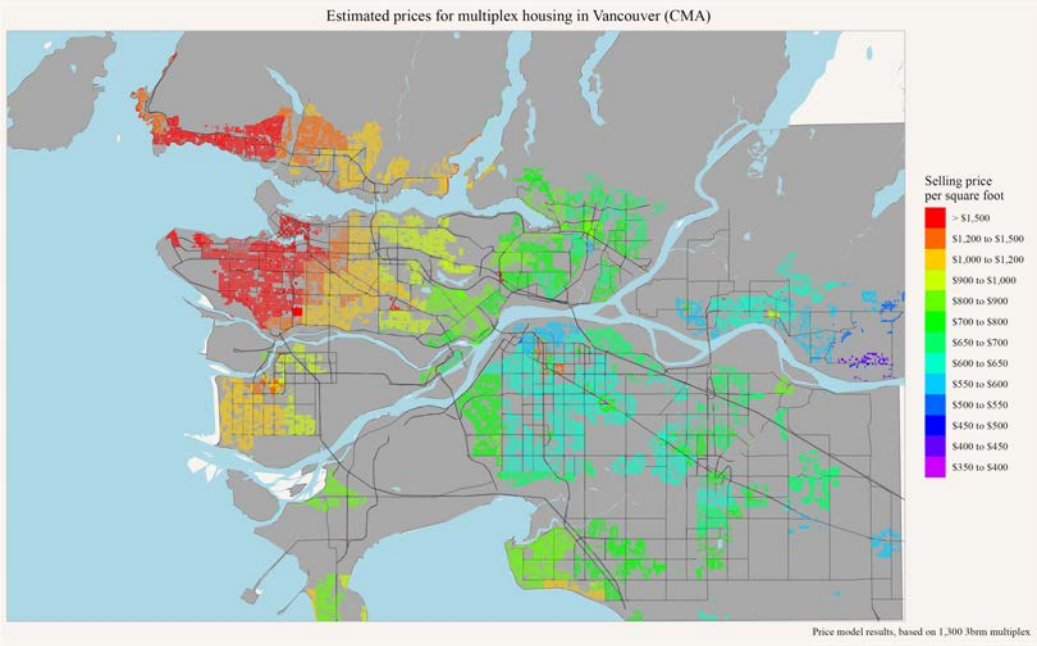


Figure 29: Vancouver new multiplex selling price per square foot

Corresponding images of the price surface for select other regions can be found in Appendix F.

4 Construction cost model

The modelling approach to determine if redevelopment is profitable is the standard land residual approach used by developers to price land, by appraisers to estimate land values, and within urban economics to model the geographic variation in land prices and the allocation of different land uses to locations. The basic premise is that in the absence of constraints on development, land will be developed to the use that yields the highest land price. The latter is the residual after construction costs and expected developer profit are subtracted from the market price for the new development constructed on the site. The ripeness of a site for redevelopment is the wedge or spread between this residual calculation and the value of the land in its current use. If the price of the finished unit minus all construction and financing costs and expected profits exceeds the value in its current use, then redevelopment

is sufficiently profitable to justify redevelopment.[9] In this section we explain the methodology for estimating the construction costs and expected profits.

Our approach is to create a generalizable treatment that allows us to let input parameters vary by geography following clear guidelines. Land value in the current use is the acquisition cost of the property, equal to its current assessed value. If lots must be assembled to achieve the minimum practical development size, each additional lot includes a 25 percent assembly premium.[10] The land cost also includes the property transfer tax. Construction costs include both hard and soft components, adding contingencies and the estimated costs of municipal and regional development cost charges. Financing cost assumptions include a land loan for the land acquisition and then a construction loan to cover construction costs, interest reserves, and the part of the land loan not taken out with equity. Developer profit is a percentage of total costs: land, construction, and financing.

Hard costs are taken from Butterfield Property Advisors (BPA), and matched to geography and product type.[11] When BPA reports a specific cost for a given jurisdiction we use that number, which is the case for most jurisdictions in the Vancouver CMA. For the Victoria CMA we use Victoria hard cost numbers. For the rest of Vancouver Island, Powell River, and Prince Rupert we use the Nanaimo costs. For the interior from Kamloops east and south we use the Kelowna costs, and for Williams Lake north the Northern British Columbia costs.

Costs are matched to built-form as follows. The 4-plex 1.50 FSR up-zone (three to four units per lot) uses townhouse cost per square foot with at-grade parking.[12] The 6-plex 1.50 FSR up-zone varies construction costs with the built form. If the lot size exceeds 680 m^2, then six units on the site using townhouse cost per square foot with at-grade parking. For lots 540 – 680 m^2, again six units per lot, but using frame apartment construction cost with at-grade parking. For lots 375 – 540 m^2, four units per lot and

[9]The land value per buildable square foot is the land value per square foot as estimated for the existing use divided by the FSR for the new use.

[10]The premium reflects discussion with developers on how much they typically pay.

[11]Butterfield Property Advisors (BPA) http://www.bpadvisors.ca/tools/tool/cicalculator, retrieved 2020-03-22.

[12]Four units per site for lots in excess of 280m^2, three per site for lots 200-280 m^2, and two for lots under 280 m^2. Redeveloped units have a maximum size of 3,000 sf.

frame apartment construction cost with at-grade parking.[13] For the higher densities near transit, we use frame apartment construction cost, and for the 3.00 FSR scenario it is assumed that developers will opt for below grade concrete structured parking, consequently requiring a minimum lot size of 690 m^2. This is in some cases more conservative than what our reform scenarios allow.

Our expectation is that a reform would encourage developer creativity, for example some developers may opt to build to 3.00-5.00 SFR near skytrain stations on small sites without underground parking, but overall developers may respond in a more conservative fashion, setting our expectations for what, on average, would be developed in response to reform. Especially developers of rental housing may take advantage of the parking reform and provide only little on-site parking. Our development and construction type assumptions are visualized in Figure 30. For the 4 FSR scenario midrise we are assuming concrete or mass timber construction with underground parking and minimum lot sizes of 12,000sf, stepping up to a minimum of 18,000sf for the 5 FSR scenario to ensure adequate tower separation.[14]

[13] Average unit sizes are a function of lot size and the FSR, but do not exceed 2,200 sf nor fall below 800 sf.

[14] Average unit sizes are assumed to be in line with what is observed recent condominium developments in each jurisdiction.

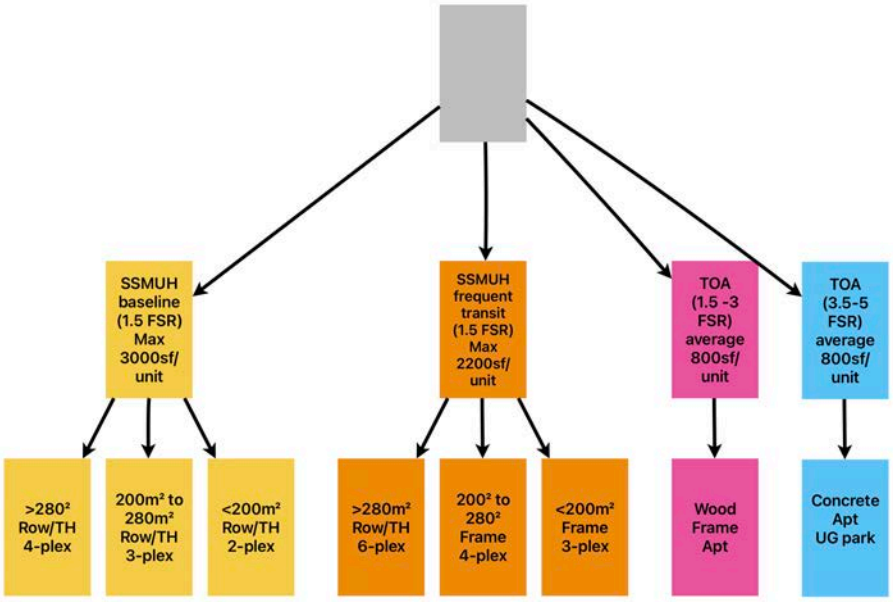


Figure 30: Modelled development forms based on density scenarios.

For each built form type and location, BPA reports costs for low, medium, and high quality construction. We assume that in jurisdictions in the CMAs (Abbotsford-Mission, Chilliwack, Kamloops, Kelowna, Nanaimo, Vancouver, and Victoria) 25 percent of properties would redevelop at lower quality, 50 percent medium quality, and 25 percent at higher quality. For the lower priced, smaller areas (the Census agglomerations), we assume that 40 percent of properties would redevelop at lower quality, 50 percent medium quality, and 10 percent at higher quality. Quality levels are matched to the distribution of current property values, so in the CMAs, the 25th percentile of properties by value would redevelop at the lower quality construction. The 25th-75th percentile at the medium quality, and above the 75th percentile at the higher quality construction.[15]

Soft costs and contingencies are calculated as percentages. Soft costs as a percentage of the hard costs and contingencies as a percentage of both hard and soft costs. Within the real estate industry there is considerable variation

[15]Percentiles are calculated for each jurisdiction.

in contingencies, where developers and appraisers who use lower contingency percentages, then just offset these with higher profit rates. For townhouse hard costs, soft costs are 26 percent of hard costs for the Lower Mainland and Fraser Valley and 20 percent for all other locations.[16] For frame construction the percentages are 29 and 22 percent. Contingencies are priced at 10 percent of hard and soft costs in The Lower Mainland and the Fraser Valley. They are 10 percent of hard and 5 percent of soft in the Victoria CMA and the Northern Census agglomerations.[17] For the remainder of the province they are 5 percent of both.

Development cost charges and levies (DCCs) are estimated for townhouse and frame apartments by jurisdiction. We assume that the four and six unit per lot forms will be charged townhouse DCC rates and medium density or general apartment rates for the 2.00 FSR and higher uses. Where possible we collect municipal and regional DCC levies and use those. However, for many locations, especially smaller communities, we had to apply the rates charged by neighbouring or other jurisdictions in the region.[18]

We are assuming construction times in line with what we observed in the recent past, but shorter approval times than has been the norm due to higher certainty and clarity due to provincial SSMUH and TOA legislation as well as legislation fast-tracking projects that are in line with community plans. Moreover, renewed municipal focus on issues of long approval times, paired with provincial initiatives looking at pre-approved designs give us confidence that shorter approval times of at most a few months for multiplexes and approval times between 1 to 1.5 years we are using for higher density projects are achievable, albeit ambitious given current processes.

Our baseline financing assumptions are that a developer would purchase the land with a land loan and then finance construction with a construction loan. We use the same underwriting terms for all locations. Land loans have a 50 percent loan to value ratio and are priced with a 1 percent fee and at 200 basis point spread over the prime rate. Construction loans are at 75 percent loan to cost with a 1 percent fee and at 100 basis point spread over prime. The

[16] Abbotsford-Mission, Chilliwack, and Vancouver CMAs

[17] Dawson Creek, Fort St John, Prince George, Quesnel, Terrace, and Williams Lake

[18] This should not be a major source of error as in general these are areas with lower DCCs; a small variation in costs that themselves are a small fraction of total construction costs will not result in meaningful changes in the model results.

land loan is paid off at the start of construction with the construction loan or equity. The land loan is held for one year and the construction period for the four and six unit per lot forms (1.50 FSR) is also one year. For the higher density frame construction forms (2.00 through 5.00 FSR) the construction period is assumed to be two years.

Expected developer profit is calculated as a percentage of total costs. The cost basis is land, construction, and financing. The expected profit rate varies by location, though this in part reflects regional norms on allocating between contingencies and profit, where a lower contingency implies a 'riskier" project and thus a higher profit rate. For all built forms, the four and six unit per lot options and the higher FSR four and six floor frame construction, the profit rate on costs for the Abbotsford-Mission, Chilliwack, Vancouver, and Victoria CMAs is 15 percent. For all other areas on Vancouver Island, the coast, and the southern interior (Kamloops and south) it is 18 percent. For the northern interior (Williams Lake and north) it is 22 percent.

Net revenue is a function of estimated values for new construction, marketing costs, and building efficiency. The estimated market values per square foot for new construction are as described above. Since gross buildable area can exceed the net salable area, because of hallways, stairwells, elevator and utility cores, amenity space, etc., we adjust this by the expected building efficiency. For the four and six unit per lot forms we assume 100 percent efficiency, similar to what is realized with townhouses. For the four and six floor frame apartment construction (2.00 and 3.00 FSR) we assume 85 percent efficiency. For the four and six plex we assume there is no marketing, only agent commissions at 2.5 percent. For the frame construction we assume marketing costs at 5 percent of gross revenues.

4.1 Impacts of upzoning on construction costs

Upzoning should result in lower construction costs for the higher density small-lot uses presented here, increasing the number of locations where it is profitable to redevelop single family lots. In general, permanent increases in construction volume of particular construction types leads to lower real unit costs through greater comfort with type-specific construction processes, more efficient supply chains, and more knowledgeable developers, design professionals, and skilled trades. These are the long run changes that offset or dampen the short run increases in costs that can occur when demand in-

creases quickly before the construction industry adjusts its productive capacity to the new volumes. It is not unreasonable to believe that as the construction of four and sixplex on structures on single family lots becomes commonplace, the inflation adjusted construction costs can come down.

The greatest benefits in lower costs will come from specific steps taken by local governments, of their own initiative or following provincial guidance, to streamline and lower the costs associated with the permitting process. Examples of steps that would lower development costs include:

- Uniformity, simplicity, and clarity in zoning codes and similarity in these across jurisdictions.
- Pre-approved plans and designs that can be fast-tracked through the development and building permit processes.
- Simultaneous approval of development and building permits.
- Outright zoning instead of conditional zoning.

These types of reforms and changes in the permitting process by local governments should lower the costs of development and reduce minimum expected profit thresholds from reduced expenditures, shorter development time, and greater certainly. More explicitly, we would expect the following patterns:

- Reduction in financing costs from shorter development timelines.
- Lower minimum profit hurdles from increased certainty.
- Project internal rates of return improve because of faster development timelines (return of and on equity happens sooner), allowing for lower profit targets.
- Lower soft costs as a result of lower expenditures on architects, engineers, and other consultants.
- Lower soft cost contingency costs from increases in certainty.

These suggest that a broad implementation of SSMUH in accordance with missing middle upzoning along with explicit actions by local government to reduce regulatory costs and time would generate more favourable conditions for new supply over time than is reflected in current development models.

5 Model results

Folding the cost model into the price model, and using current assessed values as a rough guide for transaction prices in the event an owner decides to sell, we can paint a picture of which properties will generate value above the cost to acquire the land, tear down the existing structure, build a multiplex, market and sell it, finance the package and make an expected profit. The geographic distribution for Metro Vancouver is shown in Figure 31. Corresponding images for select other regions can be found in Appendix F.

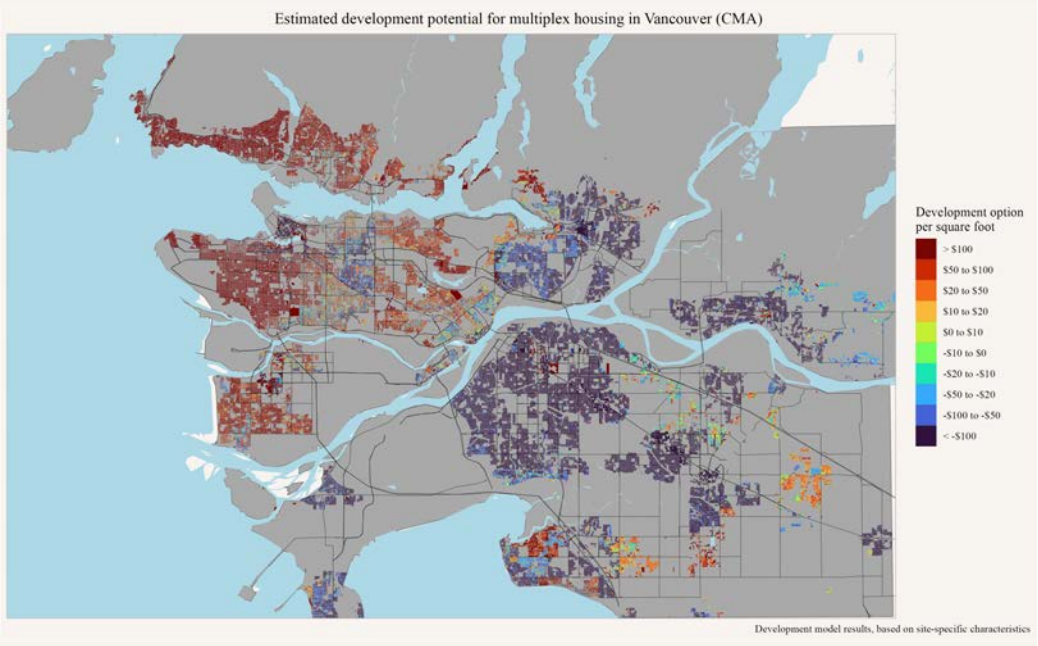


Figure 31: Metro Vancouver development option geographic distribution

On properties showing a zero development option a developer would make their expected profit. Properties showing a negative development option could still get redeveloped due to individual property characteristics, heterogeneous preferences, or less fancy construction. The spread between low and high construction hard cost scenarios per square foot we are using ranges from $35 to $136, with median value $44, across the jurisdictions of interest, which has a large impact on construction cost but also impacts end user prices in monotone but less predictable ways. Individual decisions by builders who

have better information on conditions on the ground will differ from model expectations and move the viability of products.

The model in this report identifies the lots most ripe for redevelopment under the specified density scenarios, where the gains for converting from the existing single family properties are highest, as the size of the wedge. Consistent with the basic model in urban economics, these are areas where land values for single family lots are highest. In Metro Vancouver, the City of Vancouver (especially its west side), the North Shore, Richmond and Burnaby stand out. These results correspond well with expectations that high amenity areas closest in to the metropolitan centre would receive the greatest attention for higher density redevelopment if it were enabled. But we provide a brief discussion of how these results compare with alternative patterns that might have been expected below.

A finding that there is a negative wedge does not necessarily mean that current zoning is at, or even close to, highest and best use. Especially on lots in high demand areas, redevelopment at a higher density than contemplated under this report may be a viable and attractive option.

Of note, our expected pattern of multiplex and apartment redevelopment differs from historic patterns of the uptake of basement suite units, new duplexes, and laneway housing within the City of Vancouver. We believe this can be best explained by the difference between the stratification option, provided by the reform proposal here, relative to the rental only options most available for infill densification in the past.

Specifically, within Vancouver, uptake of rental suite and laneway options has been higher on the lower value east side of the city than the higher value west side, shown in our projections as more likely to redevelop into multiplex. Between 2010 and 2017, 41 percent of redeveloped single family properties on the east side included a laneway in-fill unit, compared to 14 percent on the west side (Davidoff, Pavlov, and Somerville 2022). Similar patterns exist for basement suite (duplexes) (von Bergmann 2023), but we cannot infer from these patterns that redevelopment of single family lots into multiplexes and medium density wood-frame building would also happen faster in more moderate income areas.

The differences between old rental and new, denser stratification infill options explain the divergent expectations. With basement suites and laneways, the

owner of the principal unit sacrifices privacy and their own consumption benefits from their property in favour of a rental income stream or private accommodation for a family member. If the marginal utility of additional rental income falls as base income and wealth rises, at least relative to the marginal utility of privacy and housing consumption, then higher income areas would have lower pick-up of rental units on the site of their primary residence. In contrast, here we examine the replacement of the single owner property with separate stratified units, often at much higher densities near transit, where the purchaser pays a price that already reflects the multi-unit aspect of the development.

It is also possible that depending on the distribution of demand for the type of units that would result from the modelled upzoning, more redevelopment would occur in lower price areas. These would still be areas where redevelopment of single family lots is profitable, but where the wedge is smaller. This could occur because the geographic distribution of prices reflects how prices must vary over space to keep the marginal buyer at a given location from choosing a different location, which is not identical to the number of potential buyers. Consider a smaller number of higher-income households with strong preferences for a certain location and a larger number of lower income households. The higher income households' strong willingness (and ability) to pay drives up prices at their preferred location, but construction is higher at the lower price area because of the larger number of households who can afford that area. Given distributions of income and wealth, it is possible that there is a greater pool of buyers, and more market liquidity, at smaller wedge locations, so that more units are supplied at those locations. For developers, the larger pool of potential buyers could lower the uncertainty they face.

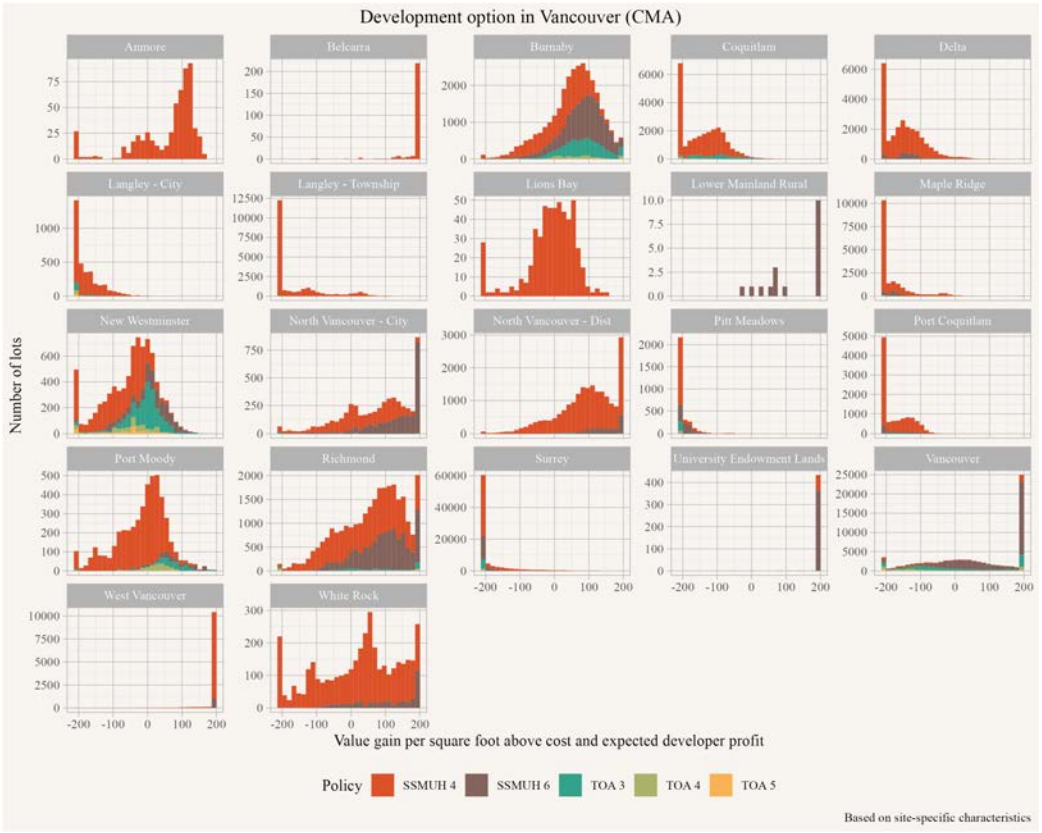


Figure 32: Development option by jurisdiction

With the above caveats in mind, Figure 32 summarizes how many properties in each jurisdiction within Metro Vancouver are estimated to be profitable for redevelopment into multiplexes and related infill options opened up by our modelled reform. Corresponding images for select other regions can be found in Appendix F.

6 Redevelopment modelling over time

We base the likelihood of redevelopment for each lot upon the wedge between the value of possible new use and the value of existing use. Crucially, to be attractive to developers this wedge has to be large enough to cover the costs of purchasing and redeveloping the lot, as per our pro formas above. For existing

owners wishing to redevelop their properties, the wedge only has to cover the costs of redeveloping the lot. This represents two different possible estimates of the wedge. Nevertheless, we expect developers will drive teardown and redevelopment patterns, so we concentrate on the effects of wedges including purchasing cost for the lot. We attempt to estimate this for all single-family and non-stratified duplex (suited) residential properties within major urban areas (defined as Census CAs and CMAs) across the province.

6.1 Comparable examples

We draw upon a variety of examples from recent reforms to inform our modelling, check against our results, and contextualize our expectations. Below we devote a lengthy section to what we've learned from Auckland, New Zealand following their recent metropolis-wide upzoning reform similar in scale to that proposed for BC. Afterwards we look to a variety of municipal reforms within BC, carried out at a much smaller neighbourhood scale, but still informative for what we might expect from province-wide reform.

6.1.1 Auckland Unitary Plan upzone 2016-2020

Auckland's reforms from 2016 under the Auckland Unitary Plan (AUP) offer likely the most studied large-scale upzoning effort, in part because large-scale upzoning efforts until recently have been so scarce (Cooper, Greenaway-McGrevy, and Jones 2022; Freemark 2023; Greenaway-McGrevy and Jones 2023; PWC and Partners 2022). Auckland is New Zealand's largest metro area, at roughly 1.5 million residents, or approximately a million residents less than Metro Vancouver. Prior to the upzoning, Auckland was estimated to contain 530,300 dwellings. Greenaway-McGrevey & Phillips (2022) conducted a careful examination of building permit ("consent") trends in the area covered by the AUP prior to and after its implementation to estimate that the upzoning resulted in an additional 26,903 permits being processed over what would have been expected without the upzoning. In effect, across a 5-year time period, upzoning enabled a boost to permits equivalent to about 5% of pre-existing housing stock (Greenaway-McGrevy and Phillips 2022b). An equivalent boost across the urban areas of British Columbia covered by the proposed upzoning reform would result in an additional 94,009 dwellings permitted by 5 years, above and beyond current projections. This naive extrapolation from Auckland's reform comes in just a little below the

lower bound of our model forecast's expected range of an additional 112,000 to 143,000 new dwellings entering the approvals pipeline 5 years after implementation of the proposed British Columbia upzoning reform. (Note these figures differ from net dwelling gains insofar as they fail to account for demolitions, but do count projects at the time they enter the approvals process not the time they receive a building permit as reported in the New Zealand comparison.)

Drawing upon the Auckland example, and the AUP specifically, to estimate the boost in development and housing stock we'd likely see from a similar upzoning in British Columbia remains complicated. The upzoning proposed for BC begins at 4-plex, where Auckland's largely involved triplex. Auckland was a smaller and lower density city at the start of reforms than Vancouver, but significantly larger than most of British Columbia's other urban areas. The AUP upzones also differed from those modelled here insofar as they involved both upzoning existing parcels of Auckland for greater infill development (as per scenarios drawn upon above) as well as expanding the urban footprint of Auckland to allow for greater greenfield development. In the context of British Columbia, the latter form of upzoning for greenfield development would be roughly equivalent to releasing land from the Agricultural Land Reserve (ALR) to support development near major urban centres. We do not model greenfield upzoning or development in our analysis. In terms of housing stock, Greenaway-McGrevey & Phillips (2022) estimate that 95%-99% of permitted housing gets constructed, suggesting a significant boost to housing stock overall, but it remains difficult to fully interpret the size of the boost insofar as Auckland lacks reliable demolition data for housing torn down through infill development. Net of demolitions we forecast the upzoning reform modelled for British Columbia would lead to 83,000 to 111,000 additional dwellings entering the approvals pipeline. Accounting for approval and construction delays, which pushes especially the higher density TOA projects two to three years out, this would translate to 44,000 to 54,000 additional dwellings completed over 5 years. Finally, the recent nature of the AUP reform, and its preemption by the even more ambitious National Policy Statement on Urban Development, precludes longer term analysis of its total boost to the housing stock able to match up our 10 year forecasts.

Some of these complications can be addressed by focusing on the results at a more granular level, illustrating the continuation of the upward trend and pulling out development for attached dwellings in particular. As the adapted

Figure 33 demonstrates, the development trend within upzoned areas post-reform has been dramatically upward and distinct from both pre-reform and non-upzoned areas within the AUP, and attached developments account for most of the new dwellings permitted. A separate analysis reveals that most development occurs within upzoned infill areas, rather than greenfield areas opened up by the AUP (Greenaway-McGrevy and Jones 2023).

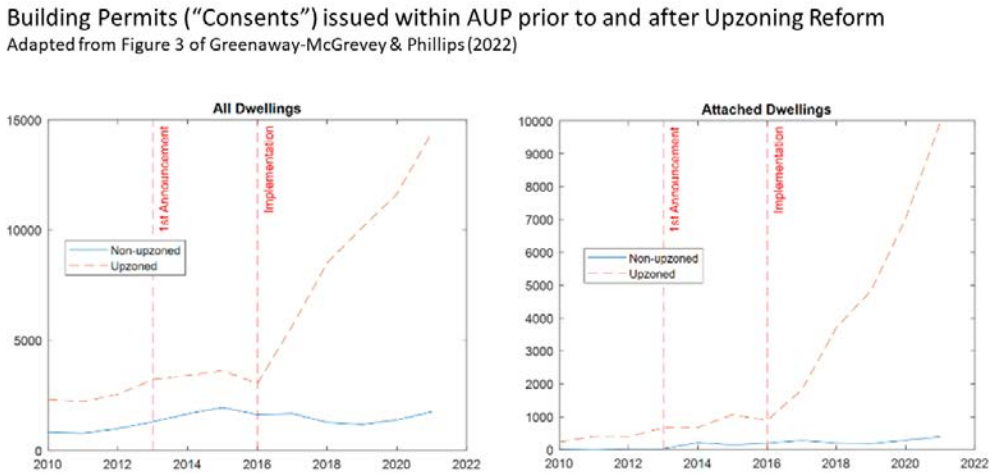


Figure 33: Effect of upzoning in Auckland on building permits.

Within parts of British Columbia, like Metro Vancouver, where fewer greenfield development opportunities exist, the upzoning of residential lots could be expected to result in mostly infill development. In other parts of British Columbia reforms enabling more new multiplex options could result in both infill and greenfield development, similar to Auckland. While greenfield developments tend to add housing without demolitions, addition of housing stock through urban infill works largely through demolition of existing sites and their replacement with a larger number of new dwellings. Multiplexes generally offer a multiplier effect, replacing single-detached with triplex in the case of the AUP's MHU and MHS zones, for a 3:1 effect. Reforms modelled for British Columbia would generally enable a larger multiplier effect under 4-plex (4:1) and 6-plex (6:1) zoning, counterbalanced by the prevalence of

secondary suites within detached dwellings that might also face demolition. While exact comparisons remain imprecise, results from Auckland suggest that upzoning reforms would likely result in a strong development response in British Columbia, with newly enabled attached housing options adding significantly to housing stock, if not quite enough to make up for CMHC estimated housing shortfalls (CMHC 2022, 2023). Auckland's experience maps well onto the results our model forecasts for proposed upzoning reforms in British Columbia.

Research on Auckland has also looked at the impacts of large-scale upzoning reform on land values (per square metre of land) and land values as an input to housing costs (per square foot buildable) (Cooper, Greenaway-McGrevy, and Jones 2022). As demonstrated by Figure 34, taken from p. 11 of (Cooper, Greenaway-McGrevy, and Jones 2022), the prices of parcels of land across different post-reform zoning categories broadly tended to move together, both in the run-up to reform and after reform implementation. Prices were already rising fastest for parcels where the highest density was ultimately allowed, under THA zoning (most similar to our 4- and 6-storey density transit-oriented scenarios), prior to announcement and implementation of reform. Prices in higher density zones saw a further slight increase to trend just before implementation, and then levelled off. Land prices for MHU and MHS zoning (most similar to our 4-plex scenario), look nearly identical to land prices for SH zoning, where only single-family detached housing was allowed, up through the implementation of reform. After reform, all land prices generally stabilized, with land prices within SH zones priced only slightly below prices in MHU and MHS triplex enabled zones.

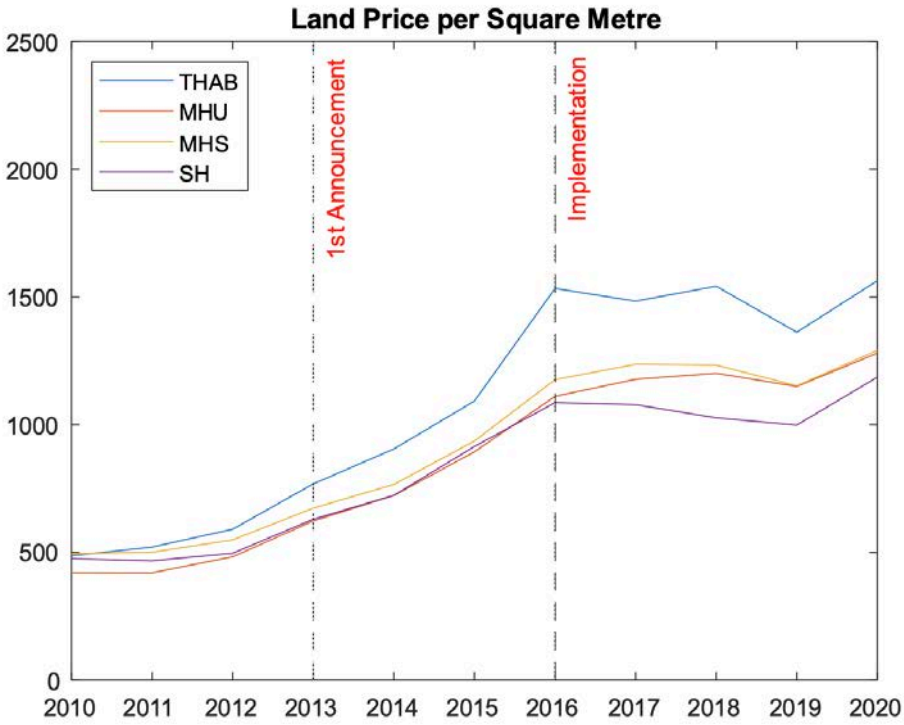


Figure 34: AUP impact on land prices per square meter of land, extract from Figure 3 in (Cooper, Greenaway-McGrevy, and Jones 2022)

While the price of land (per square meter of lot) stabilized, the price of land as an input to the construction of residential floor space dropped dramatically in those zones where greater density was allowed. In particular, the FAR (or Floor Area Ratio, equivalent to FSR) was effectively lifted to 1.35 in MHU and 2.5 within THA zoning (THAB in figure), while MHS remained at 0.8, compared to 0.7 for SH. Higher FARs led directly to much lower land costs per square meter of floor space created. As a result, land costs also dropped on a per dwelling unit basis as FAR (FSR) rose. The highest priced land, within the THA zone, cost the least per square meter of residential floor space that could be constructed upon it.

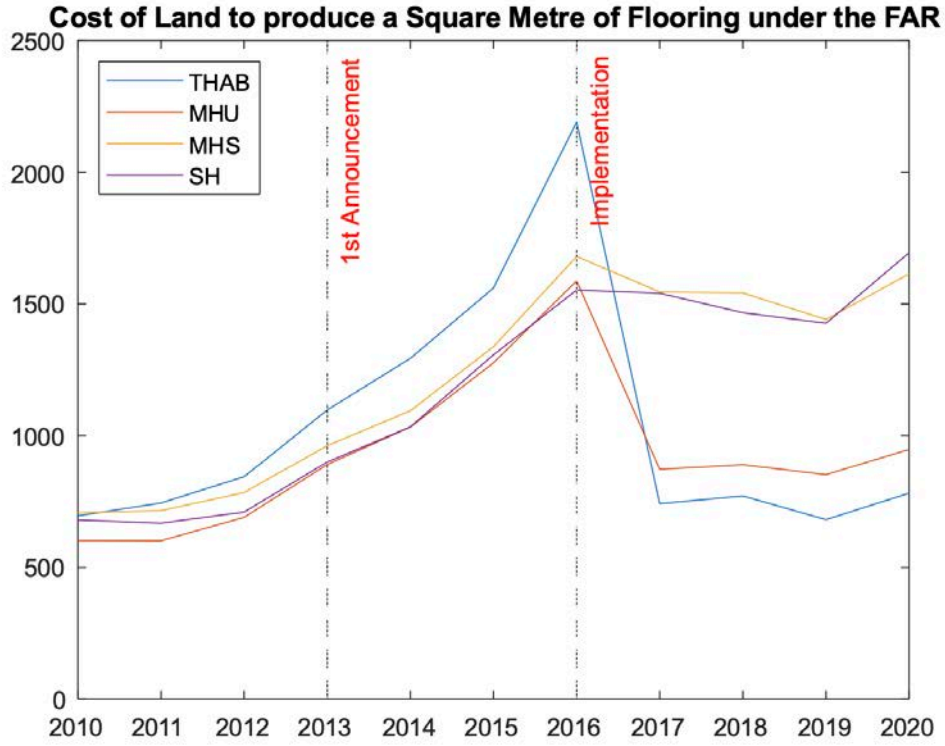


Figure 35: AUP impact on land value per square meter of buildable floor space, extract from Figure 3 in (Cooper, Greenaway-McGrevy, and Jones 2022)

We return to what can be learned from Auckland's experiences again in a later section discussing expected reform effects on rents (see Figure 55 for more). Overall, while the Auckland Unitary Plan reform offers the best example of large scale upzoning similar to the proposal here, smaller scale reforms can also be useful to examine, especially within BC.

6.1.2 Kelowna RU7 fourplex upzone and fast-tracking 2017-2020

In 2017, Kelowna upzoned central parts of the City for pre-approved and fast-tracked infill housing, enabling 4-plexes at 0.8 FSR under a new RU7 zone, where previously only single-family and duplexes had been allowed (under

the former RU6 zone). Reports indicate that of the ~800 lots rezoned within the RU7 area, approximately 99 lots had been granted Building Permits for 4-plex developments within five years (Seymour 2022), with most of these fast-tracked by the end of 2019 (City of Kelowna 2020) (see Figure 36). RU7 zoning was renewed and effectively further expanded under the MF1 zone in Kelowna's updated 2020 Zoning Bylaw. There reports are supported by BC Assessment data, which allows us map the portion of Kelowna rezoned under the initial RU7 reform below, highlighting lots developed since 2017 by type of redevelopment.

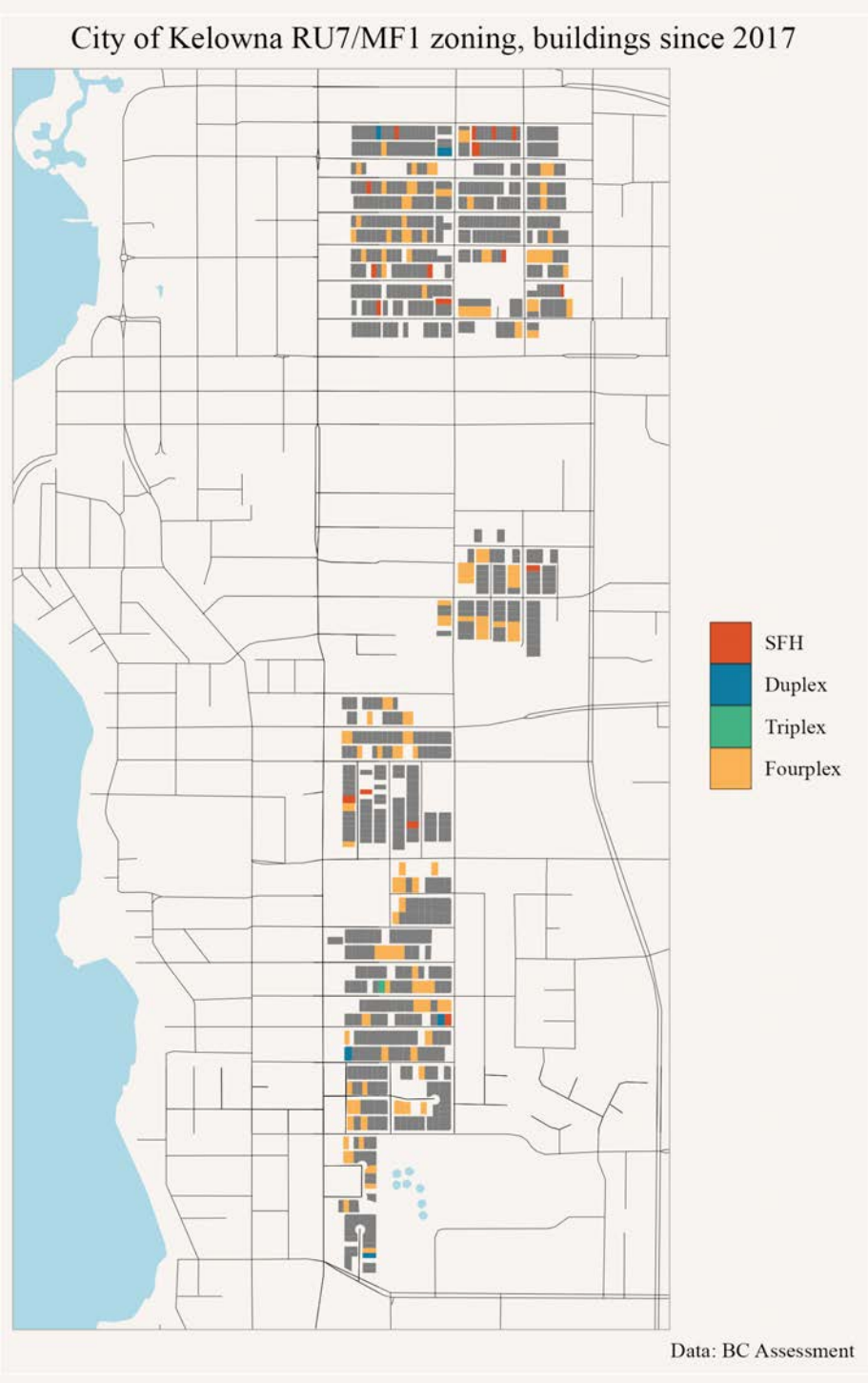


Figure 36: RU7 Upzoned Portions of Kelowna

Once enabled by the RU7 zone following Kelowna's 2017 reform and the introduction of its permit fast-tracking program, 4-plexes became far and away the most common new developments within a zone formerly dominated by duplex and single-family homes. We summarize development patterns before and after the reform by number and type of units constructed. Not only did the introduction of the RU7 zone dramatically boost construction within the area, but nearly all new construction led to replacement of single or duplex housing with 4-plex developments, either doubling or quadrupling the number of units per lot for a dramatic net gain in dwellings in the neighbourhood(s) affected. (See Figure 37)

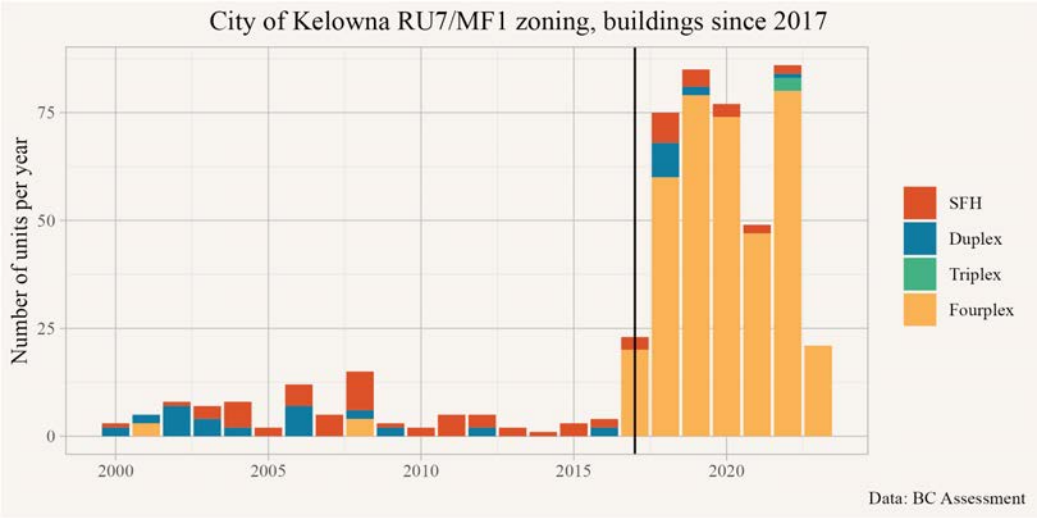


Figure 37: Development within RU7 & MF1 zone by year

Kelowna's experience suggests that uptake of newly enabled attached housing options can be very rapid in places with high pent-up demand. But we expect the effects of highly localized reforms may be distinct from widespread reforms, potentially just channelling development pressure across the region into particular locations rather than increasing development overall. In this, the results of Kelowna's 4-plex reform should be paired with Auckland's AUP to get a sense of what might be expected from how different sized reforms can unlock new housing development at different levels. Of note, the speed of uptake of Kelowna's reforms also reflect the fast-tracking of pre-approved 4-plex designs through the permitting process (City of Kelowna 2020; Seymour

2022).

To understand the impact of the localized upzoning on land prices we compare how prices of single family properties in the upzoned area evolved relative to nearby single family properties outside of the RU7/MF1 zoning in Figure 38. To this end we use a repeat sales price index that follows individual properties through time, but breaking links when properties get redeveloped. This provides us with a quasi-experimental comparison where we can compare 4-plex upzoned (treatment) with stable (control) properties nearby to gauge the effect of upzoning on prices.

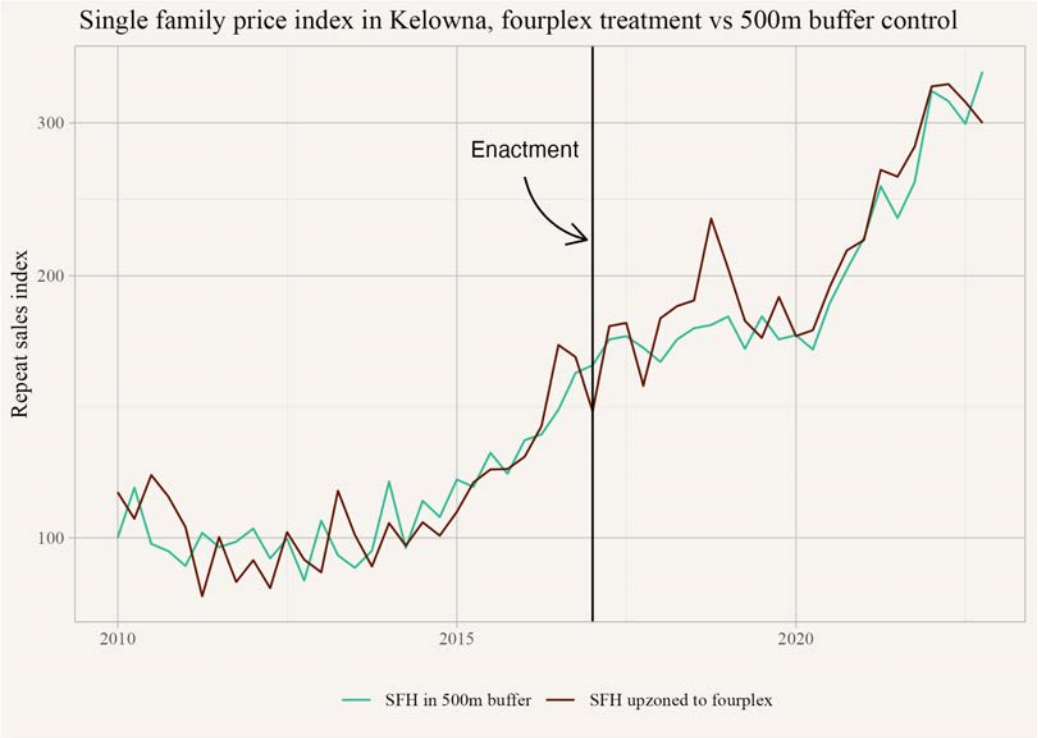


Figure 38: Kelowna upzoning price index comparison

This shows that trends in both upzoned and nearby *control* properties were quite similar overall, showing strong increases starting 2015 for properties in both areas. To better quantify the effects we look at the ratio of the two time series and and look at levels and trends in the pre-2015 period, the 2015 to pre-2017 period during which the fourplex proposal was in the

public discussion, and the post-2017 period starting in January 2017 when the fourplex upzoning was implemented. The result is shown in Figure 39.

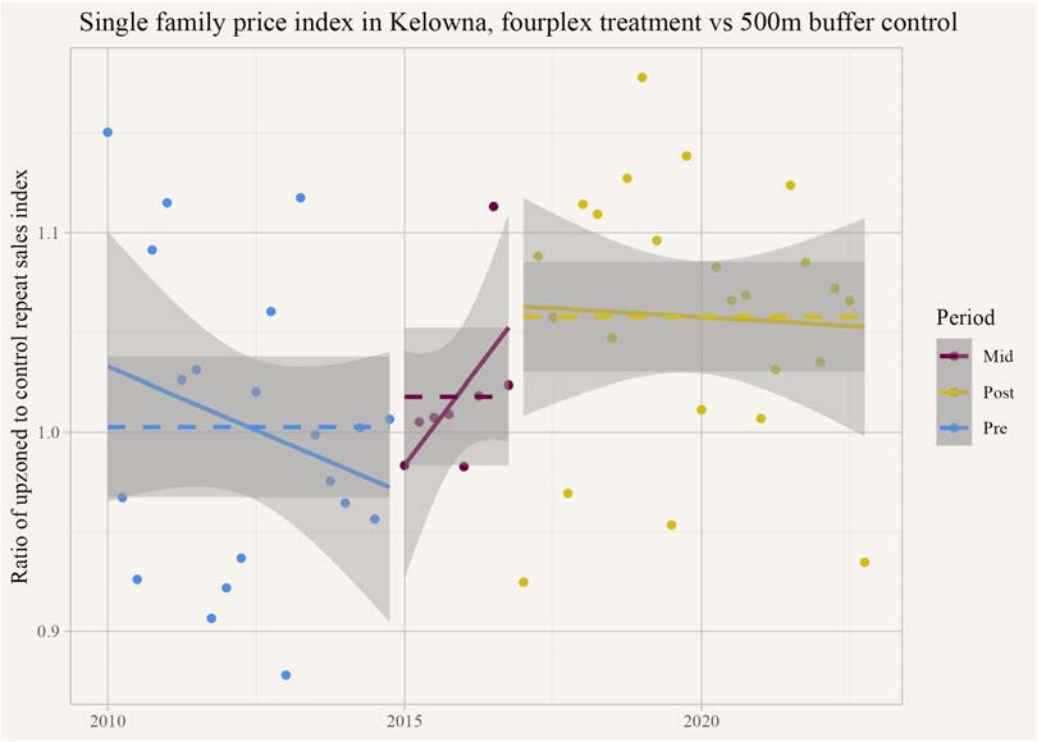


Figure 39: Kelowna upzoning price effects

While we can't detect a statistically significant effect, our results are consistent with a small price increase of 5% to 10% for the upzoned properties, mostly occurring at or right before the implementation of the upzoning. This is consistent with data from New Zealand as discussed in section Section 6.1.1 and Figure 34. We expect price impacts on land (existing single family properties) to be lower the larger the geographic scope of the upzoning reform, but higher FSRs associated with SSMUH reform could have a countervailing effect.

6.1.3 Coquitlam 2019 RT-1 fourplex upzone

The City of Coquitlam conditionally opened up parts of its RT-1 zone for 4-plexes in 2019 under a revamped Housing Choices program (City of Co-

quitlam 2019). The coverage was constrained to the *Neighbourhood Attached Residential* planning area within RT-1, limited to 0.75 FSR, and only applicable to parcels at least 740m² in size and 20m frontage. Since the inception of the program, only one 4-plex has been built or neared completion on eligible lots. By contrast, five duplexes and four single family homes were constructed or neared completion on eligible 4-plex lots since 2020. However, there are several more fourplex proposals at various stages in the approvals process.

Differences with Kelowna's program may be instructive. While Kelowna allowed 4-plexes outright, with pre-approved designs and fast-tracked permitting, Coquitlam layered a development permit process before the building permit process. Figure 40 gives an overview over the number of projects in various stages of the development permit approvals process in Coquitlam. In total, 15 fourplex projects having received a development permit and another 30 remain in various stages of the process. Unfortunately we did not find data on how many fourplexes proceeding beyond the development permit stage have received a building permit.

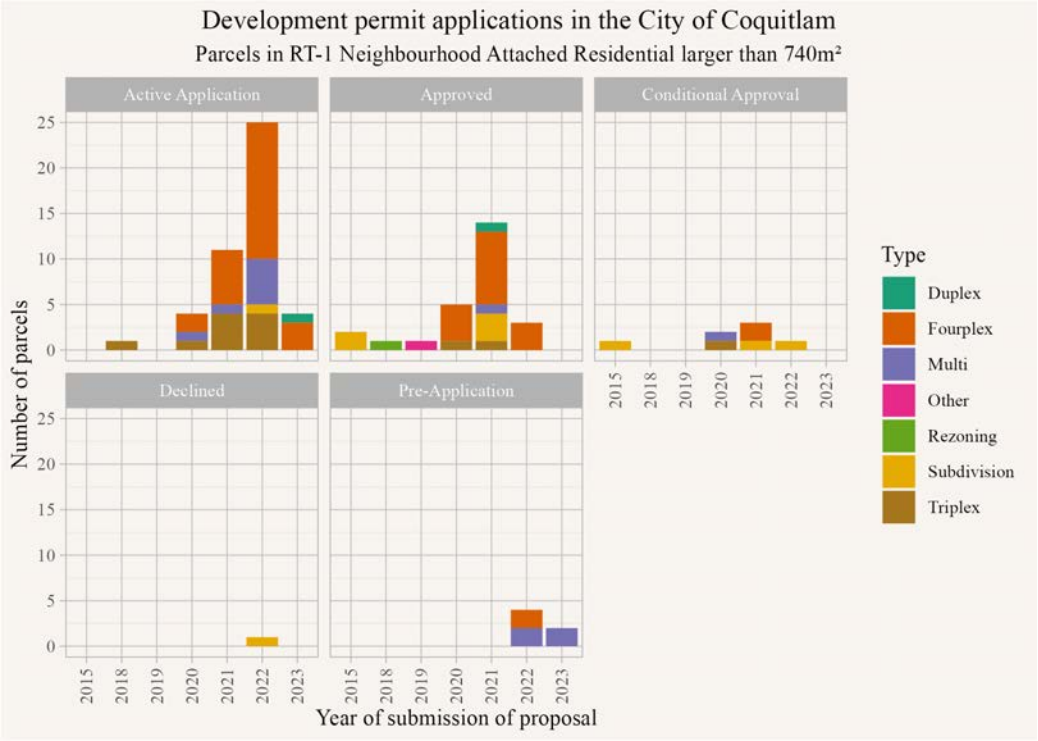


Figure 40: Development permit process in Coquitlam RT-1 fourplex areas

Overall we note that layering a development permit process before the building permit stage seems to have resulted in a significant lengthening of timelines in Coquitlam. The long timelines, in conjunction with the youth of Coquitlam's reform, suggest it remains too early to fully assess results. In particular, both Auckland and Kelowna reforms were well underway by 2019, giving them a head start on Coquitlam and enabling them to develop a track record prior to the uncertainties attached to the pandemic.

6.1.4 Vancouver Cambie Corridor and RM-8 Upzones

The City of Vancouver provides a recent example of higher density transit-related planning and development within BC. Following the opening of the Canada Line Skytrain extension in 2009, the City of Vancouver released information concerning opportunities for density in the Cambie Avenue corridor, covering over 1,100 single-family lots. Broad planning objectives were announced in 2010 (Phase 1), and in 2011 (Phase 2), the process of rezoning for

significantly greater densities was laid out, mostly on Cambie Avenue, King Edward Avenue, and 41st Avenue (City of Vancouver 2018). Development was not allowed outright, but rather through developer-initiated rezoning processes under the guidance of the Cambie Corridor Plan (City of Vancouver 2021). Density was enabled by plan up to six storeys on these arterial roads via rezoning processes under fixed Community Amenity Contributions (CAC). In 2018, the precise location of Phase 3 was also announced, enabling developers to apply for upzoning to 1.2 FSR townhouse forms under RM-8 in off-arterial areas (see Figure 41, taken from a Vancouver City Planning Department web resource).[19] The City also directly upzoned 167 RS & RT lots (single-family & duplex) to RM-8 (sub-schedule A and AN) zoning, conditionally allowing townhouse and related forms of development. The City of Vancouver is currently considering expanding the coverage of RM-8 upzoning to an additional 220 RS and RT lots, with staff noting that it would save 10-12 months of processing time for new townhouse developments relative to a developer-initiated rezoning, though as townhouses remain conditional, applications would still need to proceed through a development permit process (City of Vancouver 2023). These development options were not enabled on standard sized lots but generally required assembly to ~100' or more frontage.

Though rezoning applications and development permits have added considerable time and expense to development processes along the Cambie Corridor, development corresponding to our 4-storey and 6-storey transit oriented model scenarios has gradually filled in former single-family lots where it has been enabled, primarily along corridors. Similarly, townhouse developments have filled in RM-8 lots, after a combination of rezonings initiated by developers and rezonings initiated by the City (City of Vancouver 2023).

We draw upon the sale of lots along the Cambie Corridor to gather a better sense of price lift. Figure 42 depicts results from a modified "difference-in-differences" regression that calculates the evolving premium to a single family property's inclusion in the mapped areas eligible for Phase 2 and Phase 3. Prior to completion of the Canada line, single family homes eligible for Phase 2 traded at a discount to homes with similar lot sizes outside of Phase 2 or 3 (that baseline effect is not depicted in Figure 42, and homes in Phase 3 sold for similar prices to homes outside of either Phase 2 or 3 eligibility. The esti-

[19] Cambie Corridor Plan' at https://vancouver.ca/home-property-development/cambie-corridor-plan.aspx

mated differential price changes by year come from a regression of log single family home prices on log lot size and log frontage with indicator variables for inclusion in the different phases, for calendar year of transactions, and their interaction. Comparison single family property transactions are those east of Oak, on or west of Ontario, and south of 16th Avenue that are in neither Phase 2 nor Phase 3. The interactions between year dummies and phase inclusion dummies are presented along with statistical confidence intervals.[20] we find that homes in Phase 2, which was defined earlier and offers greater density, see an earlier and much larger increase in home price than inclusion in Phase 3. By 2019, when both phases are fully announced, Phase 3 single family properties see a roughly 10.5% increase relative to their initial baseline. The premium to Phase 2 inclusion rises with time (along with home prices and hence redevelopment profitability), and is roughly 50% by 2015 and somewhere between 80% and 150% greater by 2018.[21]

[20]In many instances of historical transactions, structure characteristics are unavailable do not have lagged structure data for many historical transactions

[21]Regressions specified in levels rather than logs provide a worse fit to the data, with very large dollar values attached to Phase 3 (over $900,000 by 2018, around a mean and median transaction value of $3 and $2.3 million respectively, and a seemingly implausibly large $8.5 million premium to Phase 2. Our estimates of the Phase 3 premium may be biased downward by the need to approximate included addresses.

Figure 41: Map of Cambie Corridor phasing, from Vancouver City Planning

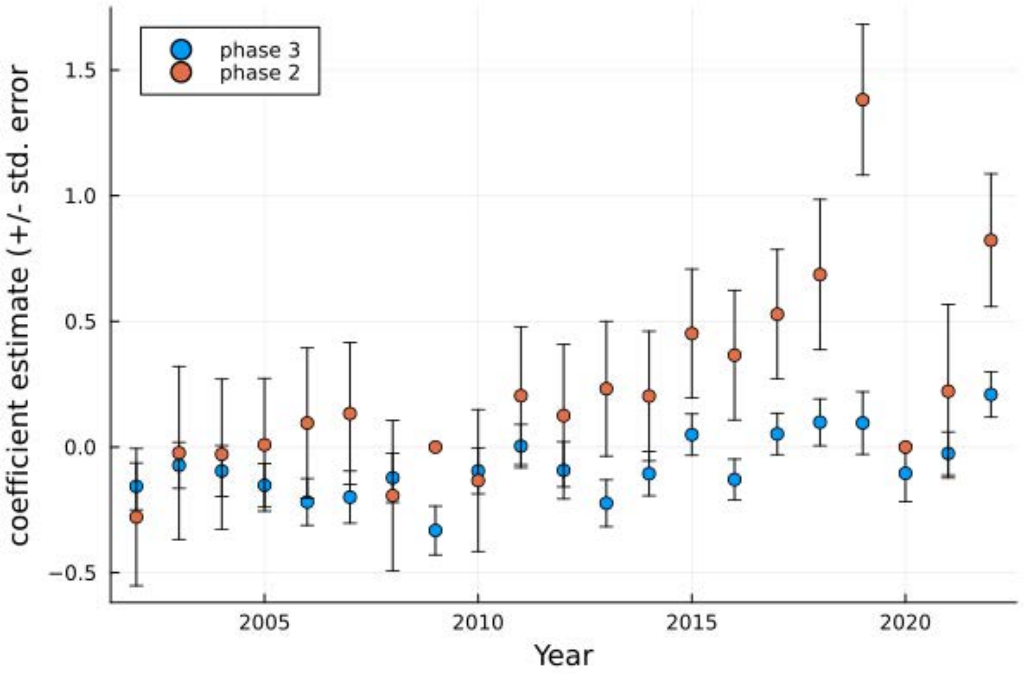


Figure 42: Estimated difference in cumulative price growth since 2001, single family properties located in Phase 2 or Phase 3 of the Cambie Corridor Rezoning. Estimates come from regression of log price on log lot size, log frontage, and indicator variables for year, inclusion in Phase 2 or Phase 3 maps and interactions between year and inclusion indicators. Points indicate coefficients on those interactions, with bar widths indicating confidence intervals

6.1.5 Takeaways

We can draw together lessons concerning the likelihood and speed of a development response for the upzoning reform modelled for BC, and the expected increase in land prices, based on the results from comparable reforms as detailed above. Auckland suggests that a broad zoning reform is likely to see significant developer uptake, resulting in an increase of new dwelling units matching or exceeding 5% of existing dwelling stock over five years' time from implementation. More local upzoning reforms within BC have also seen significant developer uptake. Kelowna had perhaps the most rapid response, with approximately 1 in 8 upzoned lots redeveloping into 4-plex within the

first five years of the program. Kelowna's success was likely tied to its fast-tracking of permitting for pre-approved 4-plex designs. The Cambie Corridor has also seen widespread uptake of new development options. Here the timelines to redevelopment have been significantly longer than in Kelowna, drawn out by rezoning and development permitting processes, as well as the need to assemble lots, but developers have also seen greater incentives than in Kelowna, in terms of both the greater floor space permitted and higher prices they could ultimately command per square foot. To date, Coquitlam has seen the least redevelopment associated with its introduction of new housing choices in former single-family and duplex areas. The lack of uptake may relate to the less ambitious nature of Coquitlam's reform relative to Kelowna's, including in particular the Coquitlam RT-1 zone's relatively low FSR, high minimum lot size, and significantly lengthier and more uncertain approval processes for 4-plex redevelopment.

We can also extract patterns of price lift for land associated with various reforms. Price lift tended to be relatively minor for widespread reform, as in the case of Auckland, and also for more localized reforms, as in Kelowna and the RM-8 areas of the Cambie Corridor. Nevertheless, there was some gradation of land lift in price by density permitted, so that zones permitting more residential floor space per lot rose higher in price in both Auckland and the Cambie Corridor. Studies of the upzoning effect in Minneapolis identified a price impact on single family homes between 3% and 5%. (Kuhlmann 2021; Donaldson 2022) Of note, the lots within higher density zones were also the most scarce after these reforms. Overall, price lifts per square foot of land were relatively minor, and as a result within higher density zones the cost of land as an input to residential floor space dropped dramatically following upzoning. This pattern is most clearly illustrated with respect to results from Auckland (Figure 34) but applies across all upzonings studied.

6.2 Elasticities

The base model only estimates prices at today's market conditions. If broad policy reform like the scenarios we model have a strong supply response, as for example observed in New Zealand when similar reforms were introduced, then this may affect prices and rents, as well as the price of land and construction costs. While estimating this in a robust way is challenging, we can try and determine a credible range of estimates of the change in market conditions

informed by econometric modelling of the demand curve, as well considering results for similar estimates from the literature, and observing what happened after similar policy initiatives in other regions, chiefly in New Zealand.

The econometric modelling we undertake follows closely the approach employed by CMHC in the Canadian context (CMHC 2022, 2023), building on work by DiPasquale-Wheaton and Geoffrey Meen. (DiPasquale and Wheaton 1992; Meen 2011)

Econometric models require rich input data to give useful results, we estimate this model for Metro Vancouver.

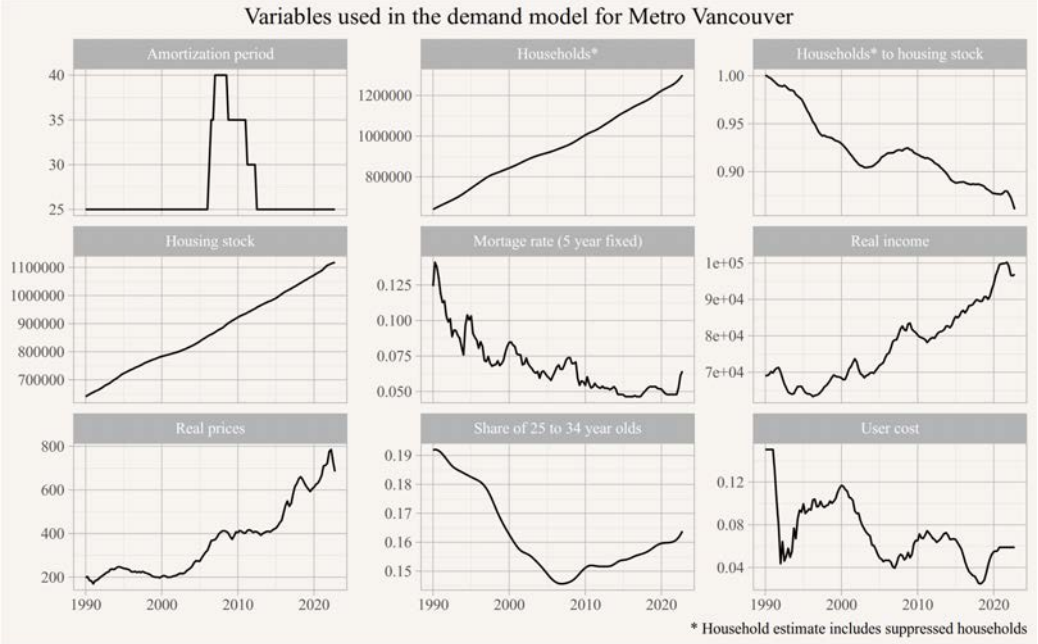


Figure 43: Variables used in the demand model for Metro Vancouver.

These variables are conventional inputs into such models, with the exception of our choice of household variable. Households are highly collinear with dwellings in supply constrained markets, households can't form if there aren't dwellings to house them. This provides a challenge to modelling, to overcome this we use a modified household estimate that includes an estimate of suppressed households, that is households that would likely have formed if there were ample dwellings available. This choice and the corre-

sponding estimates are based on prior work. (von Bergmann and Lauster 2022b, 2022a)

Based on these variables we fit a model of the form

$$\log(\textit{Real prices}) \sim \log(\textit{Households to housing stock}) + \log(\textit{Real income}) \\ \log(\textit{User cost}) + \textit{Amortization period}$$

with the `Share of 25 to 34 year olds` as deterministic control, with the results shown in Figure 44 and Table 6.

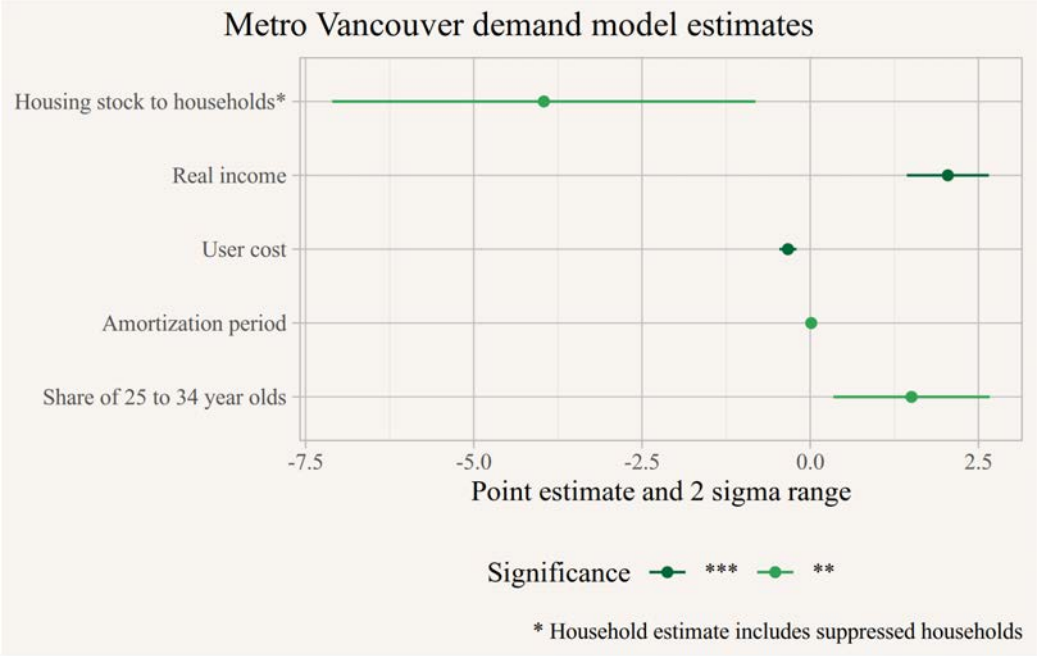


Figure 44: Demand model results for Metro Vancouver

Table 6: Demand model for Metro Vancouver

Variable	Estimate
Constant	-16.09 ***
	(3.8)
Housing stock to households	-3.96 **
	(1.57)
Real income	2.05 ***
	(0.3)
User cost	-0.33 ***
	(0.06)
Amortization period	0.02 **
	(0.01)
Share of 25 to 34 year olds	1.51 **
	(0.58)

Note:
Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

This shows the impact on prices the model predicts for changes in our input variables. The relationship we are most interested in is how the change in housing stock to households impacts prices. The confidence interval on the estimate is quite large, reflecting uncertainty, but the point estimate indicates that a 1% percent increase in the ratio of number of housing units to households results in a decrease in prices by about 4%.

This is on the high end of the estimates typically found in the literature. (Meen 2011; Meen and Whitehead 2020) Our definition of Households differs from that found typically in the literature, and including suppressed households in our metric likely causes some of the effect observed, as suppressed households proxy for a range of latent demand pressures, including households who moved out of the region or failed to move to the region because of high home prices. The confidence range on our coefficient estimate is quite large, reducing our confidence in the point estimate. But combined with results from the literature, as well as economic theory, this reinforces the notion that prices will decrease in response to increased housing supply relative to household demand.

In our modelling we assume a demand elasticity more in line with what has

been reported in the literature and run scenarios for (inverse) elasticities between -1.25 and -2.5, with our main scenario at -1.75. This is at the lower end of the credible interval of our estimates for Vancouver and consistent with estimates commonly found in the literature that tend to be in the range between -1.5 and -2. (Meen and Whitehead 2020)

6.3 Economic viability

Economic viability is a necessary condition for redevelopment to take place at an appreciable level. Preferences are diverse and some development may happen under economically unfavourable conditions, but only sporadically. One exception may be where owner-occupiers become developers themselves and take action to develop housing on their own lot. They face different financial constraints than a developer required to buy a lot, redevelop and then sell the units. Owner-occupier developers may have emotional attachment to the location and accompanying ambitions, for example to provide housing for family members on their own lot, leading them to evaluate the redevelopment decision in more than purely economic terms. It is difficult to model these cases, and we largely set them aside.

In Figure 45 we show the overall economically viable development option in Metro Vancouver, split into policy regions and the existing use that redevelopments would replace. Some of the development potential in the TOA areas is already enabled, by existing area plans. As noted in previous sections, in some cases existing area plan densities already exceed the minimums laid out in the TOA legislation. For TOA areas, we split out existing uses by low-density residential (equivalent to uses affected by SSMUH policy replacement), purpose-built rental (where we may see special concern about loss of secure rental stock), and other uses. We return to consideration of existing purpose-built rental stock in later sections, but here we note that profitable redevelopment of this stock comprises only a small portion of the net new dwelling growth we could expect from TOA intensification. A far larger portion comes from redevelopment of low-density residential uses - largely single-family detached - currently within TOA catchments. As a result, there may be few costs to future redevelopment potential under provincial policies paired with municipal protections of existing purpose-built rental stock, as are commonly found within OCPs.

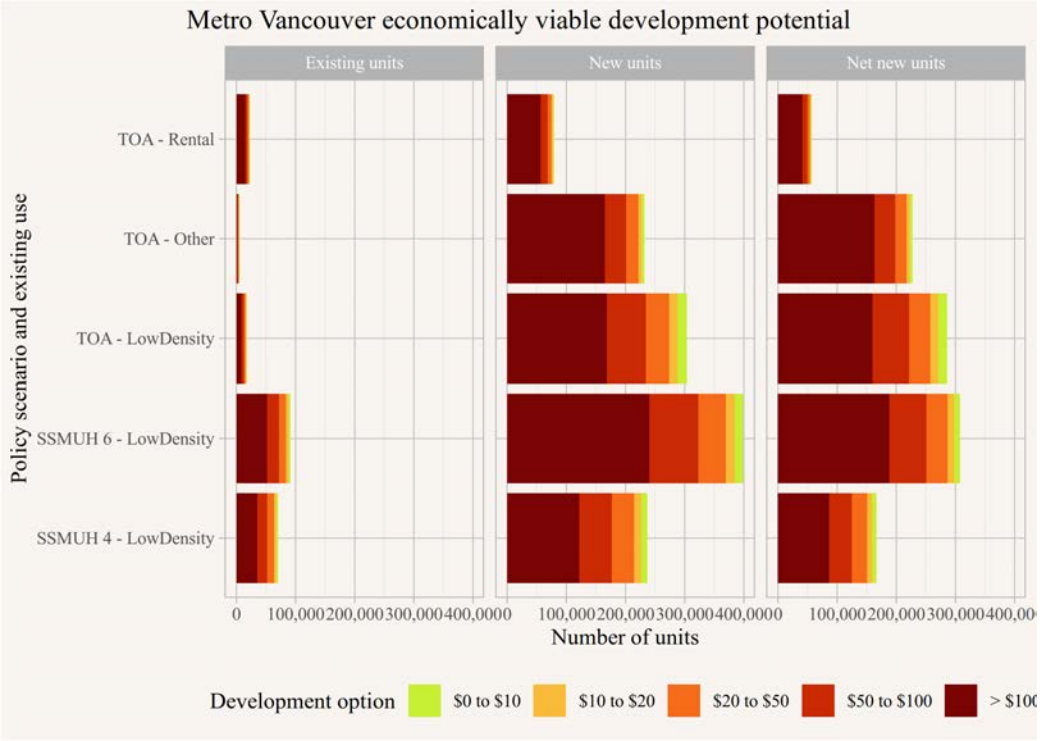


Figure 45: Economically viable development option enabled by the SSMUH and TOA policies. Some of the development in the TOA areas is already enabled in principle by existing area plans, mostly in parts with existing higher density use and outside of the low-density portions.

6.4 Redevelopment probabilities

Economic viability is only a necessary condition for redevelopment, in most cases redevelopment also requires the existing owner to sell the property. As we show in Appendix B the rate of single family property transactions hovers between 5% and 10% of the existing stock across regions and years, which gives a baseline to inform future property transactions. In the SSMUH areas and low-density parts of the TOAs we simulate property transactions at historic rates, and assign redevelopment probabilities for each transacted property based on the excess value above cost and expected developer profit generated by redevelopment, heuristically setting redevelopment probabilities at 10% for zero excess value, where existing use competes with new multiplexes,

and 90% at $100/sf excess value, interpolated logistically. This heuristic is informed by previous work modelling teardown-replacements of single family homes (von Bergmann and Dahmen 2018; Dahmen, von Bergmann, and Das 2018). In TOAs we require minimum site frontages and areas in order to enable development, which we model by pricing in an assembly premium.

For development of existing higher-density uses we assume that these transact mostly on an asset-based approach that depends on the profitability of redevelopment. However, property markets are sticky and we model transaction probability resulting in roughly a 50% chance a property transacts over a 10 year timeframe if we estimate $100 per buildable square foot excess value above and beyond usual developer profit expectations.[22] In the TOA areas we expect municipalities to add additional ACC charges on top of DCCs. ACCs are fixed rate charges and we account for these by modelling a range of ACC charges. This will lead to a very large variation in the projected build-out in the TOA areas.

Because of the difference in nature of these redevelopment patterns we will report on redevelopment of existing lower density use and existing higher density residential or commercial use that is zoned for mixed use separately.

Applying these probabilities we can step forward through time to determine how many properties will likely get redeveloped, and what the expected net gain in units is. Putting these pieces together we summarize our redevelopment prediction model in Figure 46.

[22]Embedded in this cap on development probability at around $100/sf excess value is an implicit recognition of the option to wait for further upzoning and improved market conditions to develop.

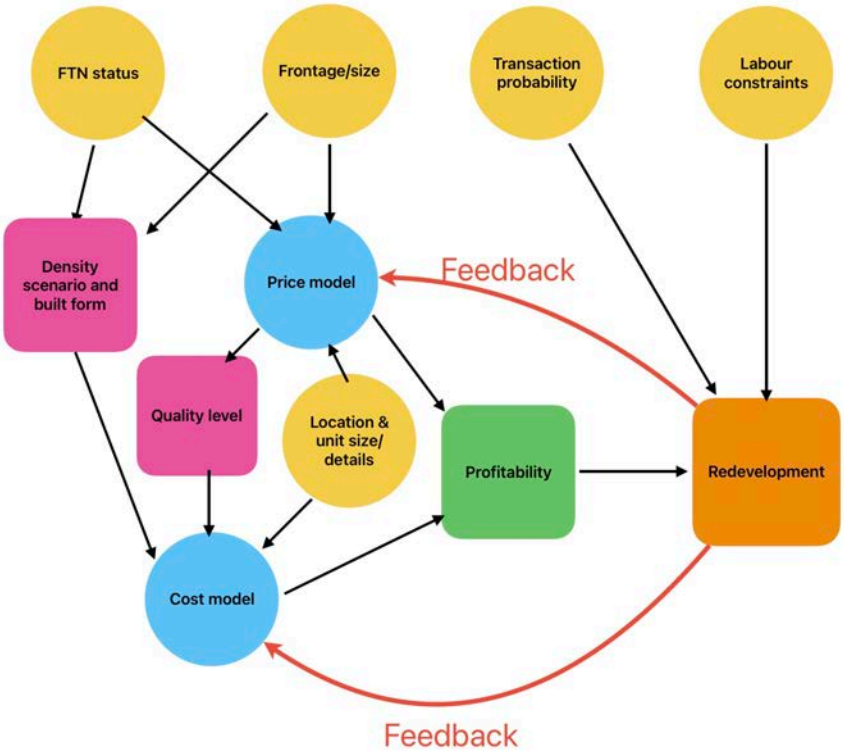


Figure 46: Redevelopment over time

Focusing in on current low-density use Figure 47 shows the number of properties we can naively expect to turn over in one year in each of the areas. In practice, this will initially be limited by labour and other development industry constraints and grow over time, before viability of projects get impacted by likely continued increases in land prices and suppressed sale prices due to increasing supply.

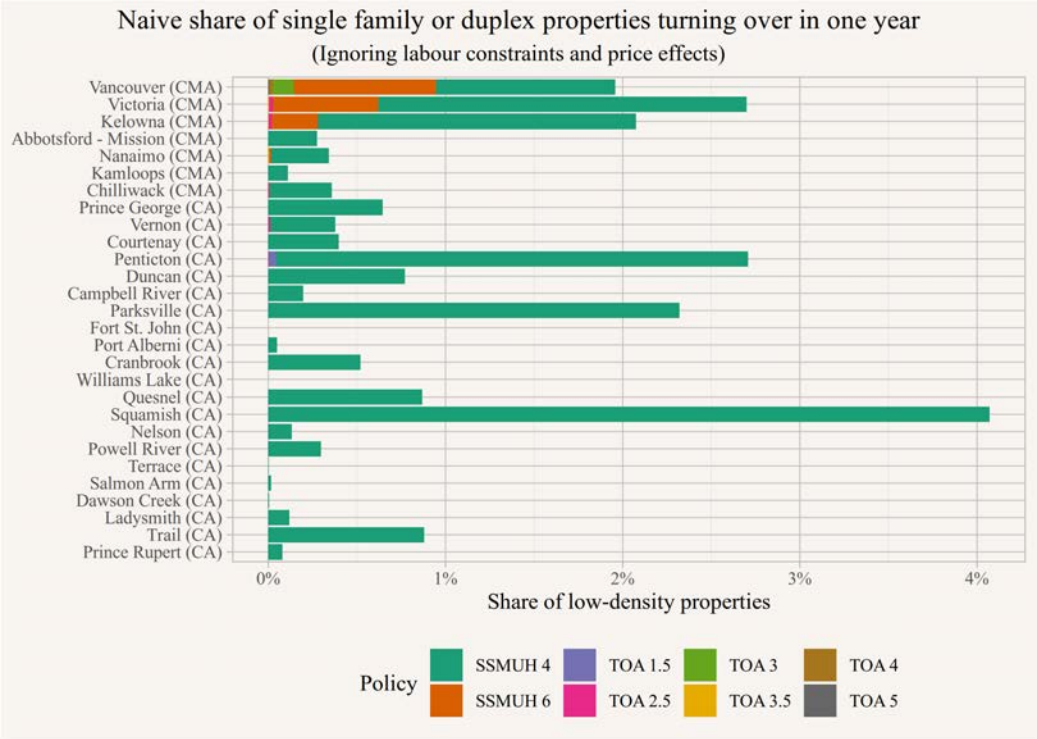


Figure 47: Expected rate of low-density redevelopment, ignoring labour constraints and price impacts.

Turning to the number of units created, and looking at the relative increase of the total dwelling stock, not just the low-density stock, Figure 48 shows that the higher density TOA policies result in a proportional higher increase of net new units.

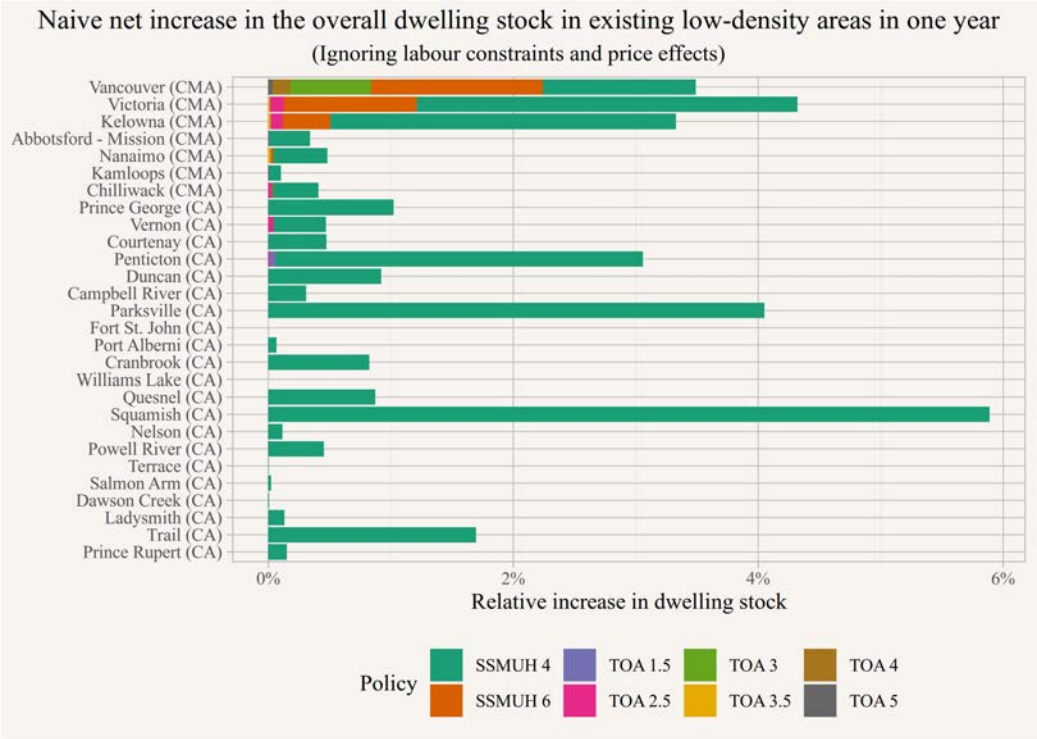


Figure 48: Expected net increase in dwelling stock due to redevelopment of low-density housing, ignoring labour constraints and price impacts.

On top of this we might see redevelopment of current higher use properties, like existing commercial zoned for mixed use, existing condominium developments or existing purpose-built rental. Modelling of the expected turnover is difficult due to the highly idiosyncratic commercial property market, under our development assumptions we expect these to contribute in much smaller shares as shown in Figure 49.

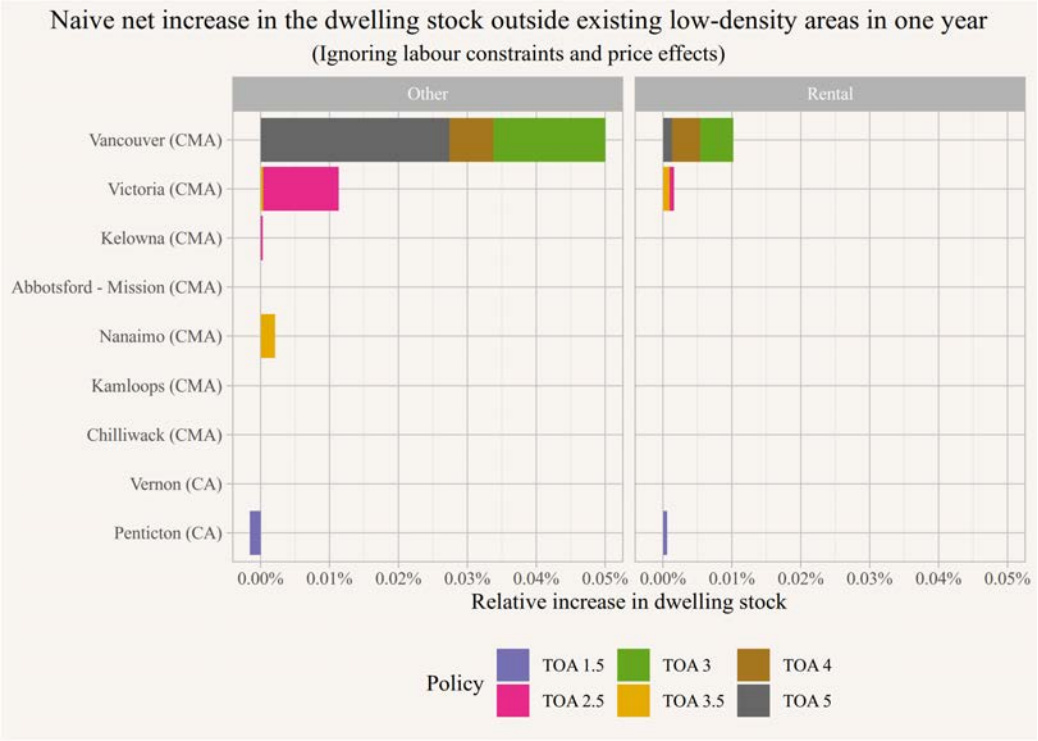


Figure 49: Expected net increase in dwelling stock due to redevelopment of low-density housing, ignoring labour constraints and price impacts.

In total these projections suggest an annual increase in dwelling stock of around 45,000 dwelling units, around 34,000 of which in Metro Vancouver. In Figure 50 we relate this to historical dwelling starts in the areas surveyed by CMHC. For Metro Vancouver this would result in roughly a doubling of dwelling starts, with some smaller regions in British Columbia seeing higher effects.

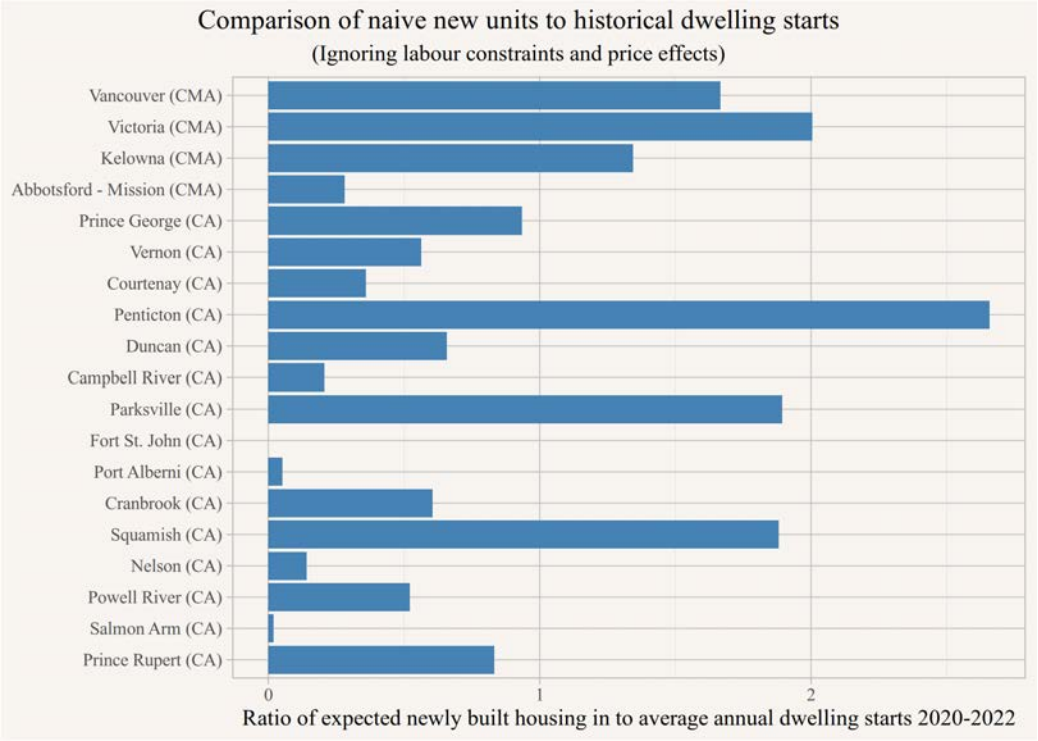


Figure 50: Expected multiplex and apartment dwellings compared to historical dwelling starts

This suggests that labour constraints will become a significant bottleneck once the municipal planning constraints are lifted. Evidence from New Zealand suggests that the labour market will adjust, but that will take time. (See Figure 51.)

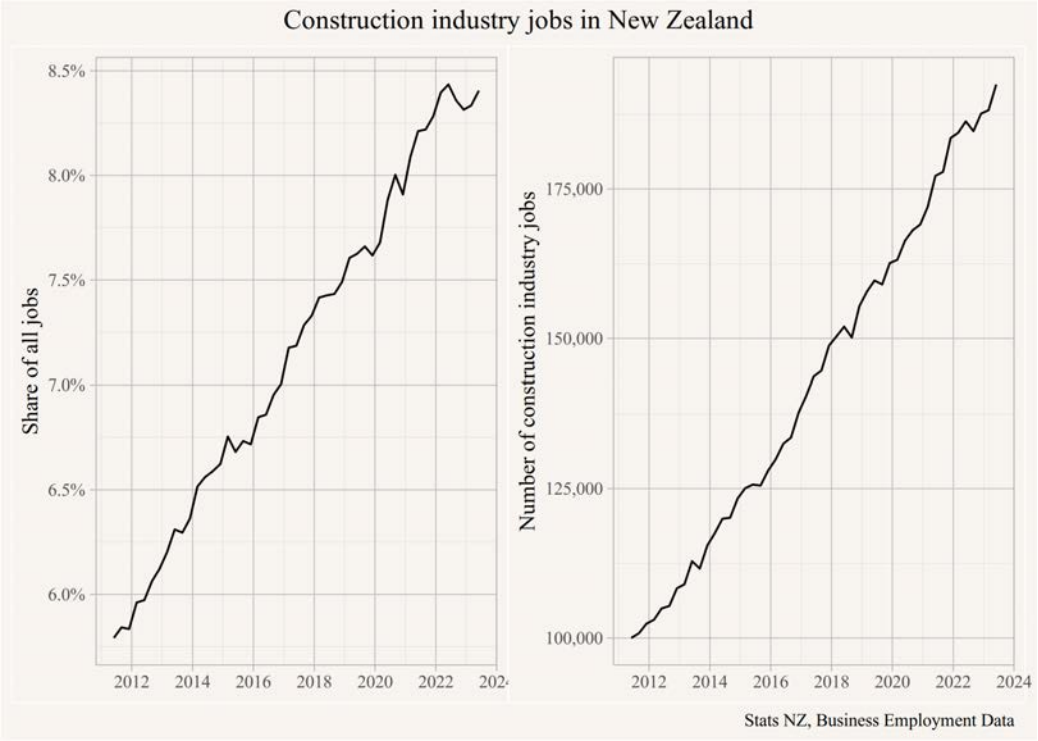


Figure 51: New Zealand construction sector employment

Comparing that to longer timelines in British Columbia we note that construction industry share of employees has fluctuated considerably (see Figure 52), most notably in the run-up to the Olympics which triggered a strong labour force response in face of the increase in construction activity. (Somerville and Wetzel 2013)

Figure 52: British Columbia construction sector employment

While the New Zealand example, as well as the historical timelines for British Columbia, suggest that the labour force adjusts based on labour demand, these changes don't happen instantly and labour force constraints will limit the rate up uptake estimated above in the near term.

Labour force constraints will increase price pressures on construction costs, while at the same time standardization of regulation and designs, and reduction in regulatory uncertainty, will put downward pressure on construction prices and increase the ability of developers to work across municipalities.

The ability to build multiplexes will likely result in a re-allocation of construction resources away from single family construction and repair construction, which are most closely connected to multiplex construction. There may also be a smaller shift away from apartment construction into the denser forms based on frame construction. These shifts can help alleviate some of the short-term labour constraints.

To assess the capacity to re-allocate construction resources from single-family to multiplexes, we compare the average number of single-family starts to the expected number of multiplex buildings. (See Figure 53) This suggests that demand for multi-family construction could be met to a significant extent by the existing construction labour force in many regions, with Penticton, Vancouver, and Victoria being notable exceptions. While multiplex buildings will contain several units and may be larger than single-family homes and thus are likely to take more construction labour than individual single family homes, this comparison gives a good indication of potential efficiency gains by re-allocating labour away from single-family to multi-family construction as we expect that most single-family teardown/redevelopment will instead redevelop into multiplexes. Especially in centrally located areas that we project to see higher multiplex uptake this would re-allocate labour from one-for-one single family teardown-replacements, which improves housing quality but keeps quantity largely unchanged (von Bergmann and Dahmen 2018), to multiplex construction which increases both quality and quantity of housing.

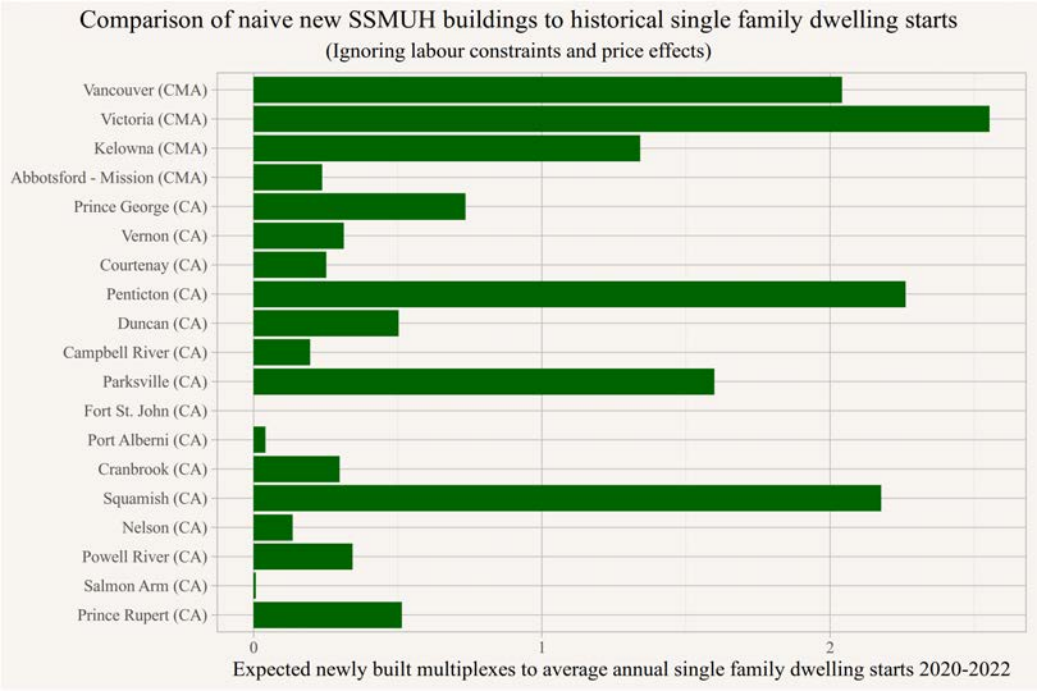


Figure 53: Ratio of expected multiplex buildings to historical single detached building starts.

We model labour constraints as initially limiting the uptake of projects to the number of single family starts in recent years, and then increase the labour force by 30% per year. This will require significant increases in construction industry wages to attract workers from other sectors and from out of province to work in BC. Average construction sector wages in BC have been near the Canadian average, but generally below Alberta's wages. The strong increase in construction employment in the run-up to the Vancouver Olympics was accompanied by a modest increase in construction wages relative to peer provinces. (See Figure 54).

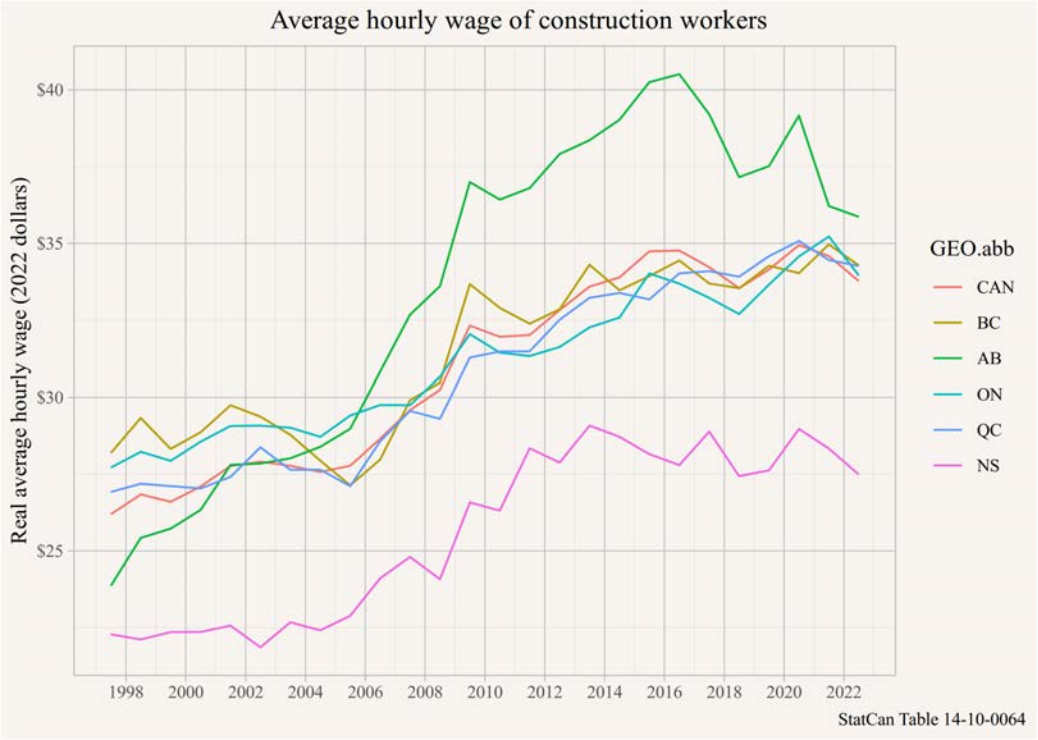


Figure 54: Construction wages in British Columbia relative to other provinces.

The modelling allows for an increase in construction cost to support a strong expansion of the labour force.

6.5 Land cost and price of housing over time

Next to labour constraints, another factor that can limit uptake is the impact of new supply on prices. Of course this is a feature of restoring supply elasticity to BC's housing markets, a key outcome of the reform. As prices go up, supply goes up in response. As prices decline, supply goes down. Naive application of our estimated demand elasticities for Metro Vancouver suggest that if 34,000 new dwellings were created, amounting to a supply bump of 3.1%, this would result in a 12% decrease in prices using our estimated elasticity, or a 5% decrease using elasticities of -1.75 that we use for our main scenario, all else being equal.

Price effects may impact both the estimated selling prices of multiplexes as well as land prices for buying single detached homes. Generally we expect price effects to be heterogeneous across dwelling types and geographies, driven by complicated mixtures of the following mechanisms:

- In built-out areas like Metro Vancouver, single family detached houses will overall become more scarce as they get replaced by multiplexes. This will exert upward pressure on prices of single family properties and their land.
- Increased supply of housing will on average decrease prices, particularly in segments where multiplexes act as good substitutes for other kinds of housing. Our modelling indicates that all else equal buyers prefer the single family form over multiplexes, but do prefer centrally located multiplexes over single family forms at the fringes, especially in larger metro areas where commutes from outer areas to the centre can be quite long. This suggests upward pressure on single family properties in the central areas and downward pressure of single family properties in the outer regions. This is consistent with the experience from New Zealand.
- Increasing the supply of multiplex housing will exert downward pressure on nearby apartment condominium prices, as our modelling indicates that all else being equal buyers prefer multiplexes over apartment condominiums.
- Increasing the supply of centrally located housing in TOAs gives people more choices to trade off between commute times, access to amenities,

and housing costs, increasing overall efficiencies in the housing market. We expect this to put downward pressure on apartments with longer commute to the main jobs centres and worse access to transportation options.

- Changes in the makeup of originally exclusively single detached neighbourhoods due to the introduction of multiplexes may introduce disamenity effects, e.g. due to more shadowing and some people's preferences for exclusivity. This may put downward pressure on prices of existing single detached homes and their land.
- Changes in the makeup of originally exclusively single detached neighbourhoods due to the introduction of multiplexes may introduce amenity effects, e.g. due to higher population density attracting new services to locate nearby. This may put upward pressure on prices of existing single detached homes and their land.
- Increased supply puts downward pressure on rents, lowering the rental investment value of all properties, which is felt especially in submarkets with a higher share of non-owner occupiers ("investors"). This also puts downward pressure on the prices of single family properties and their land to the extent that they house renters in accessory dwelling units or the main unit.

The specific mixture and net effect of these impacts remain difficult to predict. We attempt to account for this uncertainty by including a variety of scenarios concerning background prices in our modelling, but incorporating supply elasticity effects on prices for multiplex and apartments, as detailed in Appendix A. Of note, experiences from Auckland and Kelowna suggest that prices of existing single family properties and their land are, on net, fairly unaffected by the policy change to allow multiplexes, but there is a small bump after announcement of policy. We estimate a range of potential land lifts following announcement, with our modelled scenario centering on 7.5%, reflecting new development opportunities and roughly mirroring the experiences of Kelowna and Auckland. In the short to medium term supply effects take the form of declining prices and rents.

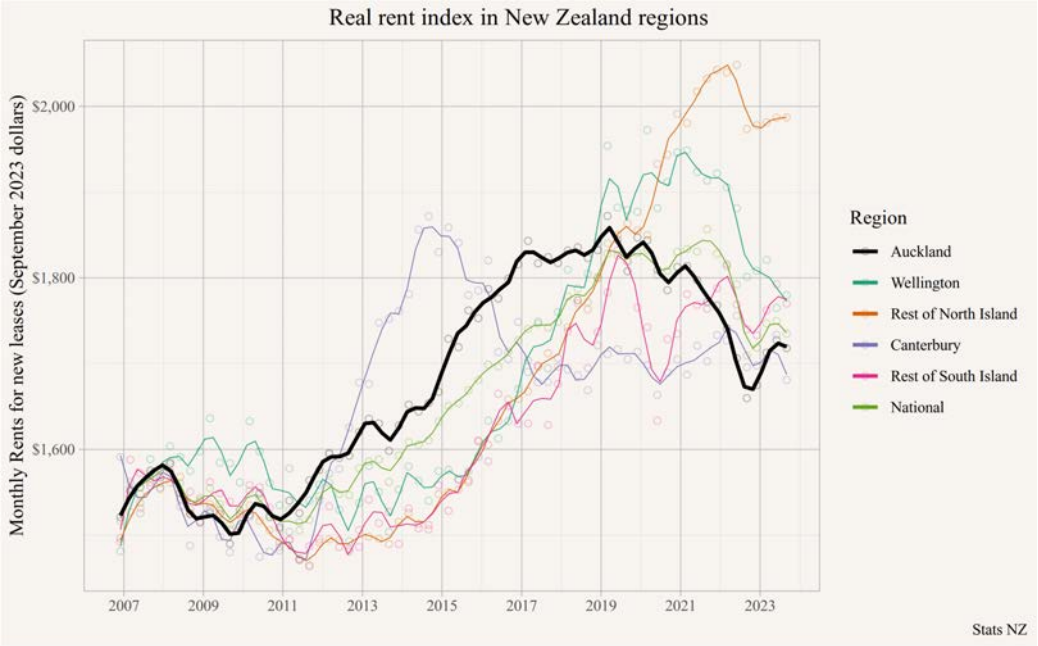


Figure 55: New Zealand rent index for new leases.

Figure 55 shows the rent trajectory for Auckland relative to other regions in New Zealand. Auckland was leading rent growth prior to the AUP reform, which came in in late 2016 not long after which real rents started to flatten and then declined. The rest of the country underwent various zoning changes starting 2020 and onward. Rents in the Canterbury region increased strongly after the Christchurch earthquakes of 2010 and 2011, which kickstarted a building boom.

6.6 Five and ten year projections

Taking the one-year redevelopment probabilities that don't factor in labour constraints, the comparison to recent single family home starts, and the ramp-up in construction seen in New Zealand, and adding in results from our modelling price elasticities, we develop a heuristic to estimate build-out of multiplexes of five and ten year timeframes. This requires a fair number of assumptions:

- Initial annual labour capacity for multiplex buildings starts at around

half of recent annual single family home starts, recognizing that multiplex buildings are more complex than single-detached, and builders will take time to adjust to building multiplexes that come with additional layers of building code, including fire separation. This also recognizes that uniform provincial legislation will make it easier for new entrants to the developer market, including from other provinces, and also the scaling up of existing multi-family developers.

- We assume labour capacity will scale up roughly in line with what New Zealand has experienced, resulting in a doubling of building permits over a three year period.
- We assume that other home construction work unrelated to the missing middle scenarios will continue at least at current rates, and multiplex housing adds on top of that. This is consistent with our labour force constraints assumption, where initially labour force is to a large extent diverted away from single family home construction (tear-down and rebuild cycles) with little flow from multi-family construction. Historically real prices have increased around 4% per year on average, we model two background prices scenarios, one with a 4% annual background price increase and one with a 2% annual background price increase. The background price increase is assumed to affect both single family as well as multiplex prices, but as discussed below, multiplex prices also fall due to increased supply. We discuss the impact of this and other assumptions on longer term outcomes further in Section 6.8.
- The addition of multiplexes decreases the price for new multiplexes according to modelled demand elasticities, but prices to buy out existing single family properties remains unaffected by this. Demand elasticities are difficult to estimate for a variety of reasons, given the large uncertainties on the demand elasticities estimated in Section 6.2 we shrink the point estimate we obtained toward elasticities commonly found in the literature and run a range of scenarios with coefficients between -2.5 and -1.25, with our main scenario using a coefficient of -1.75.

Given these assumptions, we project out redevelopment probabilities as before, then cap the number of new multiplexes based on our modelled labour constraints, and model supply effects for the following year by applying price elasticities. In Figure 56 we show the cumulative share of single family properties we expect to get redeveloped under these assumptions over ten years'

time.

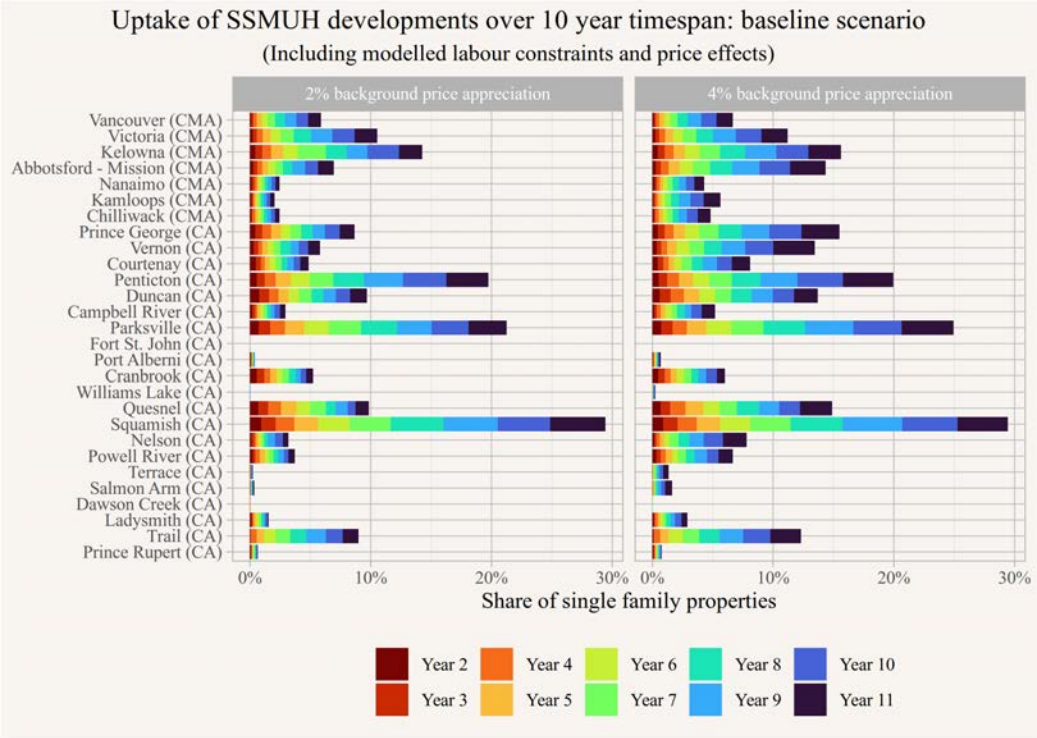


Figure 56: Ten year projections including labour constraints and price elasticity modelling.

Of note, in most communities we expect the redevelopment of single family properties will be quite gradual, filling in slowly rather than all at once. Some metro areas may see faster uptake than others. It is also the case that we expect the speed of uptake of redevelopment options to vary greatly by neighbourhood within urban areas.

The net increase in dwelling units expected from the SSMUH reform over time is depicted in Figure 57. In many regions the modelled net increase in building stock due to the SSMUH initiative is substantial, amounting to between 114,000 and 131,000 net new dwelling units in Metro Vancouver over the course of ten years, corresponding to an increase in the building stock between 10% and 12% due to new multiplexes.

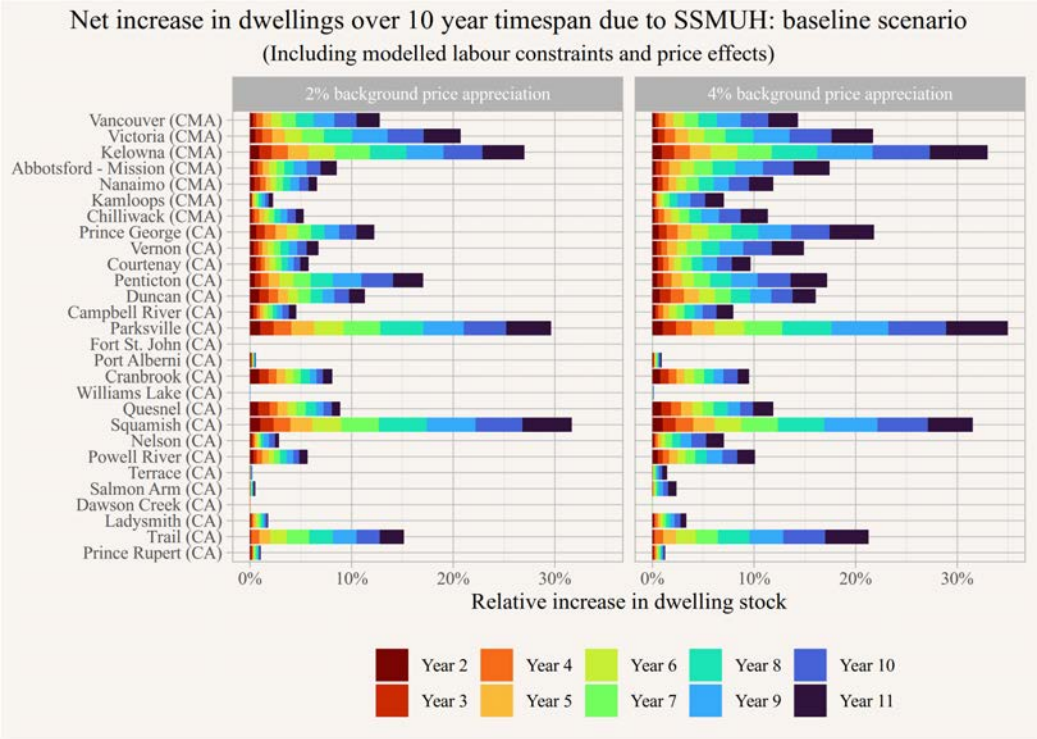


Figure 57: Cumulative net increase in dwelling units under multiplex scenario over a ten year timespan.

Initial labour constraints, including the need for the construction industry to adapt to multiplexes, lead to an initially low turnover that increases over time, before the impact of supply on price declines for multiplexes starts to impact viability and construction slows down. We next add in projections for TOA development to these SSMUH projections. The breakdown of new housing by density scenario is depicted in Figure 58.

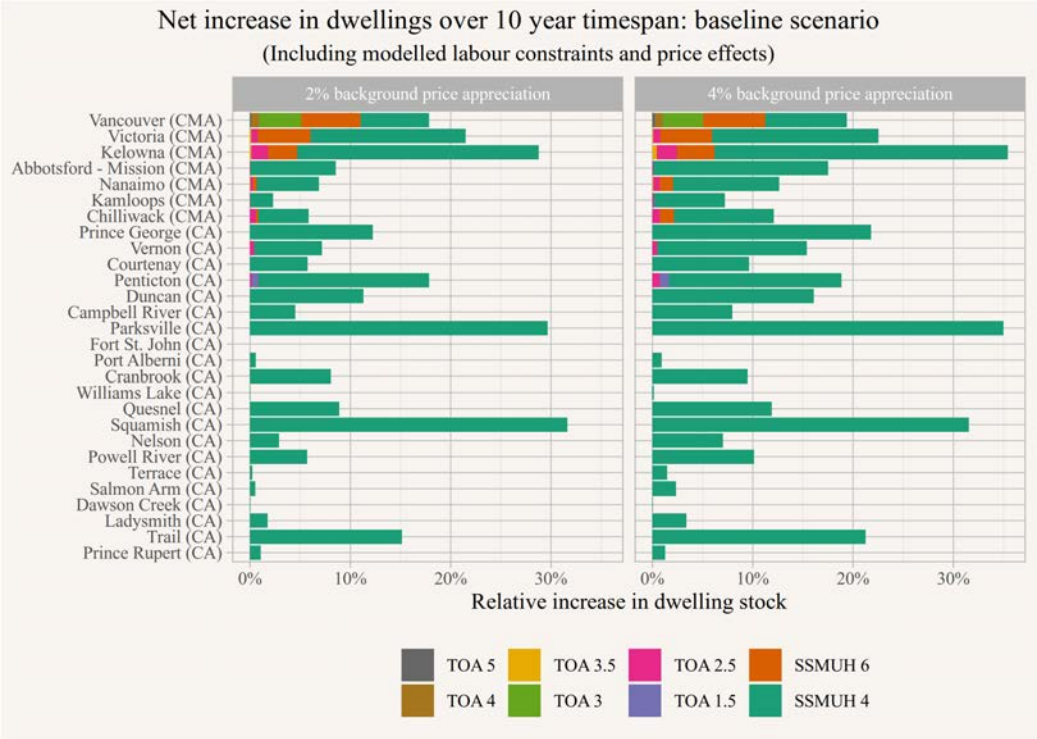


Figure 58: Cumulative net increase in dwelling units under SSMUH and TOA policies over a ten year timespan.

The effect on multi-family prices is shown in Figure 59, where the assumed background price appreciation is marked by vertical dashed lines. As in other projections, we explore two base scenarios for background housing price appreciation, assuming properties might be expected to appreciate at either 2% per year or 4% per year. Annual appreciation would lead to expected price gains of a little over 20% or a little less than 50% across ten years' time. But the proposed reform would work against these price increases, reducing the price increase for multiplex and apartments. In expensive parts of the province, like Metro Vancouver, where we expect to see rapid uptake of multiplex and apartment options, price reductions could be correspondingly dramatic, and prices for multiplex and apartments could even decrease relative to today. In areas where we project very low uptake on multiplexes there won't be much effect on multiplex prices. They will rise at similar rates as the assumed background price appreciation.

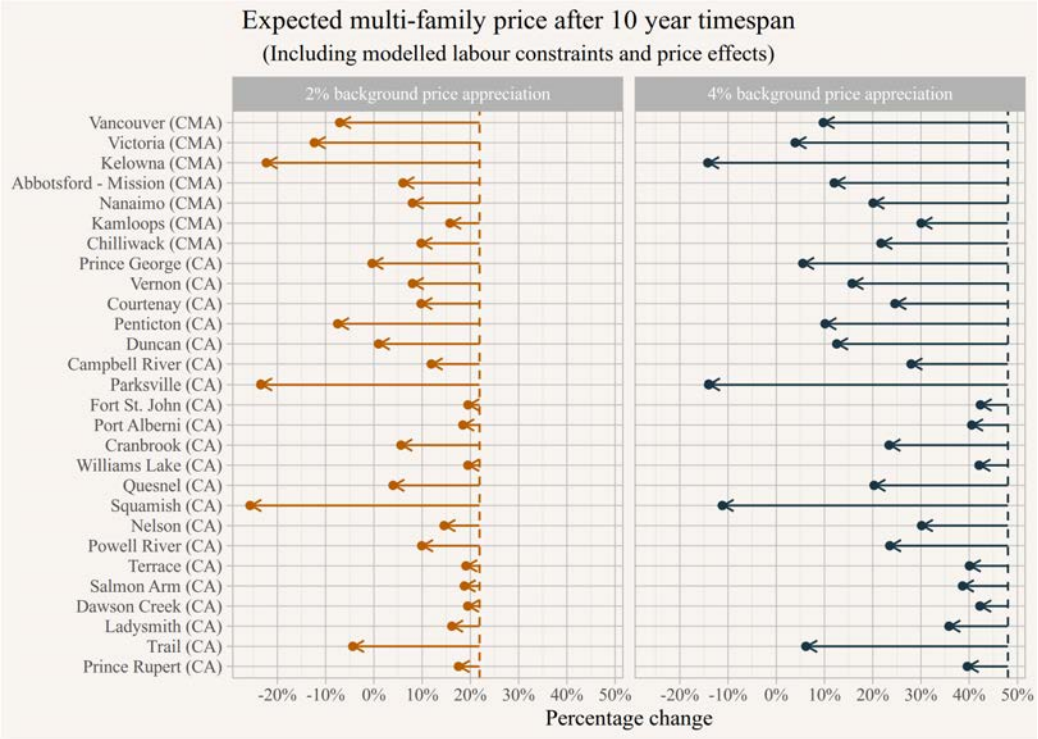


Figure 59: Price effects of SSMUH and TOA policy on multi-family housing, showing reduction relative to assumed background price appreciation.

Some of the construction in the TOA areas is not directly attributable to the TOA policy but already enabled by existing area plans. Figure 60 shows just the effects stemming from the redevelopment of existing low-density enabled via SSMUH and TOA policies, but excludes the effects of redeveloping purpose-built rental or other higher density residential or non-residential uses and gives very similar results, partially because redevelopment of existing rental and non-residential use is difficult to predict and treated conservatively in our model.

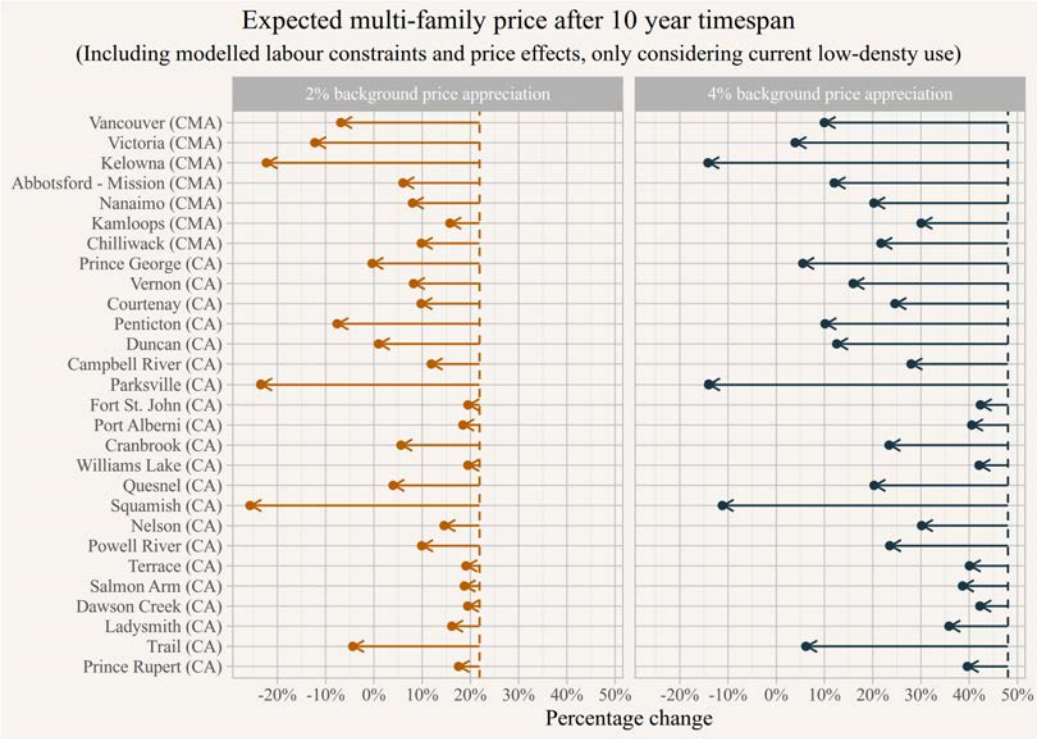


Figure 60: Price effects of SSMUH and TOA policies, only considering redevelopment of current low-density housing, on multi-family prices, showing reduction relative to assumed background price appreciation.

We augment these estimates of our main scenario by considering a broader range of assumptions for demand elasticities which are designed to capture a variety of possible impacts of lowering prices on in-migration rates from other parts of Canada, and also allow for variation in soft costs and profit expectations due to simplified and outright zoning. This results in a broader range of estimated turnover and construction of multiplexes as depicted in Figure 61.

Figure 61: Projected growth in dwelling units over 10 year timespan, range of estimates ascross multiple scenarios

Focusing in on Metro Vancouver, likely to see some of the largest impacts in our modelling, this broader range of scenarios estimates a wider range of between 140,000 and 174,000 net new dwelling units over the course of ten years. This amounts to an increase in Metro Vancouver's building stock between 13% and 16%. The corresponding cumulative price effects over a ten year period are shown in Figure 62.

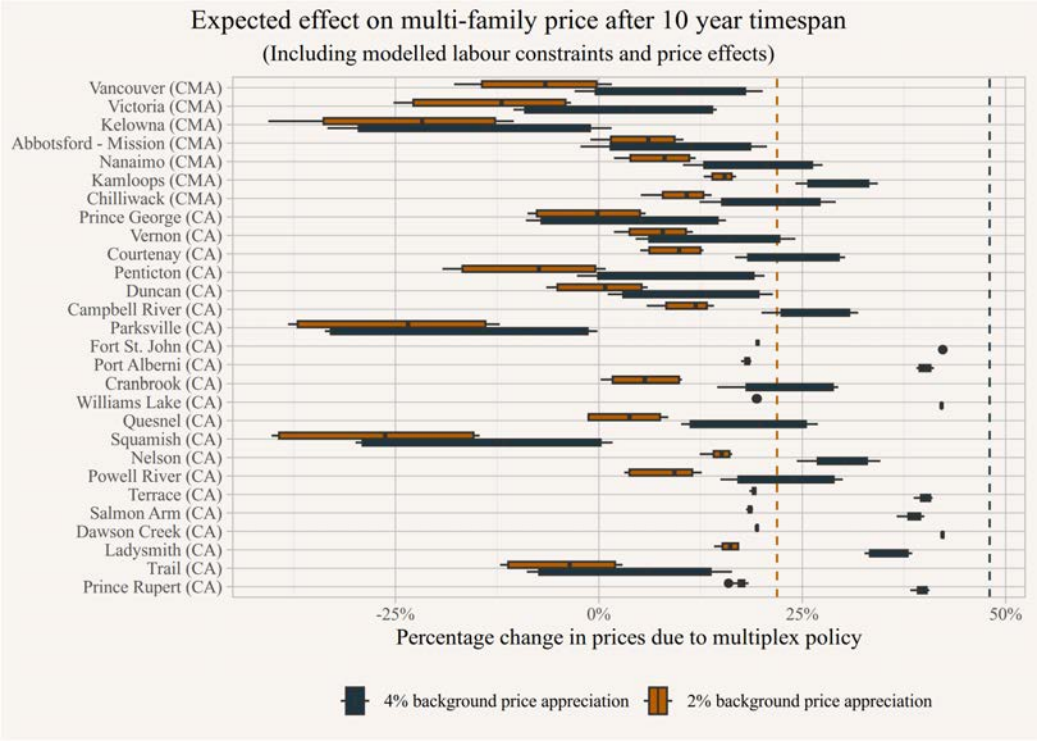


Figure 62: Price effect of multiplexes over 10 year timespan, range of estimates ascross multiple scenarios, compared to the counter-factual cumulative price appreciation indicated by the vertical lines.

The variation between these scenarios suggest how enabling multiplexes and denser housing near transit across broad areas can boost supply elasticity.

6.7 SSMUH in the City of Vancouver and City of Victoria

The City of Vancouver and the City of Victoria passed their own multiplex legislation earlier this year. We note that the policies implemented by these two cities differ from the SSMUH policy, both cities cap housing at lower densities and add density bonus charges which aren't part of the SSMUH policy. The City of Victoria policy was passed in January 2023 and was amended in September 2023 to relax some conditions; by December 2023 it has had only a few applications. The City of Vancouver multiplex policy was

designed to be minimally viable and result in about 150 new multiplexes a year.

In Figure 63 we show the estimates of net new units produced in Vancouver and Victoria if they adjusted their multiplex policies to match SSMUH expectations.

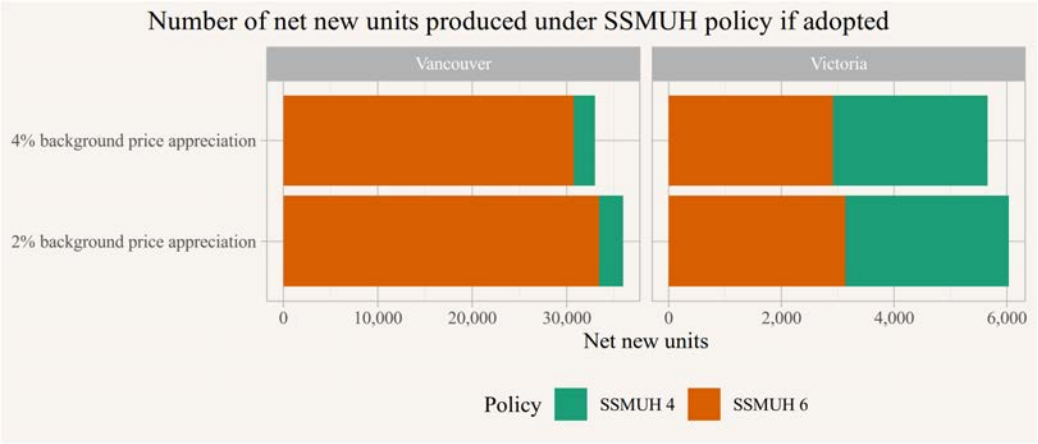


Figure 63: Net new units produced in the City of Vancouver and City of Victoria assuming SSMUH policies applied there.

Our estimates under the assumption that the municipalities conformed to provincial SSMUH expectations are substantially higher than the roughly 400 net new units a year or 4,000 net new units over 10 years the City of Vancouver expects their own missing middle policy to produce and the interest we have seen so far in developing multiplexes in Victoria. Figure 64 translates that into the number of multiplex projects instead of net new units for easier comparison.

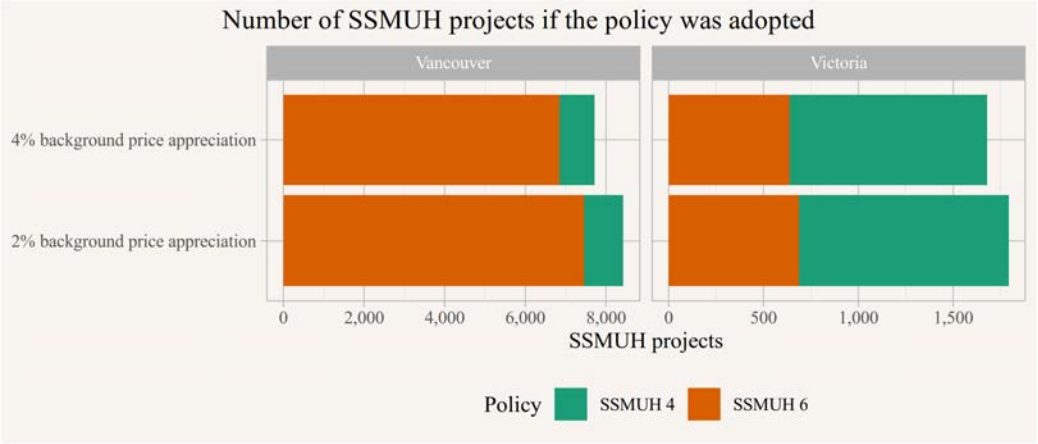


Figure 64: Net new units produced in the City of Vancouver and City of Victoria assuming SSMUH policies applied there.

These estimates of around 8,000 multiplex projects over 10 years, or 800 a year under SSMUH, substantially higher than Vancouver staff estimates of 150, which we explain by the significantly higher floor space afforded under the SSMUH policy as well as larger geographic coverage (including RT zones) and the absence of density bonus charges. Moreover, the SSMUH policy results in higher net new units per project through broader application of 6-plexes through almost the entire city based on the current frequent transit network.

6.8 Steady state

Housing markets typically don't clear within one year, and when broad changes like the modelled reform are introduced it will take time for markets to adjust and reach equilibrium. Here the pace of multiplex development interacts with prices, returning a measure of supply elasticity to markets. If multiplexes develop quickly relative to demand prices will drop and pace of development will slow down. If demand continues to grow or if other construction activity slows down, then the price effect of new multiplex supply will get dampened and the pace of development will drop less or even increase over time. The scenarios we showcase illustrate this.

With multiplexes as an outright development option, with a construction type that has a low barrier of entry, corresponding to a geographic scale

that is considerable given the broad prevalence of single family properties by land area, and given the relatively short construction timelines, we anticipate a significant increase in supply elasticity. This means that developers will be able to act fast in response to demand shocks, limiting or even partially reverting dramatic price increases of the sort BC has recently experienced.

We see this in the modelled outcomes, which show that we will see more multiplexes get built if background price appreciation is higher or if the price effect of adding new housing is lower, thus counter-acting some of the background price increases. Enabling multiplexes over broad areas as an outright development option restores the market mechanism for housing production that has been broken by restrictive zoning and discretionary approvals processes.

As the total numbers suggest, the net addition via the multiplex scenarios alone won't be enough to make up for the roughly half a million units CMHC estimates we need by 2030 to revert to affordability from the early 2000s. Our modelling assumes that other multifamily construction continues, and keeps prices in check to varying degrees. We treat the multiplex zoning as a floor on what is allowed, assuming that municipalities are expected and encouraged to go beyond these minimums in higher demand areas.

Where we show a large wedge between what multiplexes are projected to sell for and what it costs to build them, including land inputs, municipalities could be encouraged to allow for higher densities than the minimums modelled here, enabling these denser forms of housing through outright zoning and streamlined approvals processes. An important assumption is that no value capture beyond the DCCs we assumed are introduced, or that any value capture that is implemented is done carefully enough to adapt to changing viability and allow for prices to drop. We discuss this in more detail in Section 7.

Overall, if zoning is set allowing densities broadly in line with what developers would find profitable to build given market conditions, then over the medium to long term the price of housing would approach minimum profitable production costs, including land inputs. (Glaeser and Gyourko 2018)

7 Value capture

Value capture is possible when the value of land in a potential new use or density exceeds the value of a property in its current use. The wedge between current and alternative land uses occurs when government land use regulations constrain supply, such that developers would pay a higher price for the land once the alternative used was permitted and still achieve "normal" profit targets.[23] When this value becomes unlocked through changes in land use policies, the benefits will be distributed in varying proportions to incumbent land owners, developers, and the construction industry depending on the extent of competition within each of these groups and in the absence of a mechanism to capture this increase in value for the government.

Capturing a portion of the value unlocked by relaxing supply constraints can be attractive for municipal governments. But value capture is not without its costs. It effectively operates like a tax on developing at higher densities and can be expected to reduce the likelihood that such development occurs. The extent to which value capture reduces development is sensitive to assumptions about landowner behaviour. In the long-run, successful, widespread upzoning will reduce the prices of higher density units relative to single family properties, limiting the overall change in land values from the rezoning (as demonstrated by New Zealand). The greater the affordability gains through newer higher density units built out over the medium to long term, the smaller the upzoning increase to land prices.

The central question for land value capture is how to efficiently capture excess value that would otherwise get capitalized into land value, and accrue to incumbent land owners, while interfering as little as possible with supply effects that positively impact affordability. Economists generally view land value capture as a tax on development, which like any similar levy reduces the level of activity in the behaviour subject to the tax. However, the problem of insufficient supply is the absence of development, so that reducing incentives for development to occur undermines the fundamental motivation for upzoning. (Manville 2021) Despite this fundamental dissonance, there are scenarios where value capture may be fairly efficient. Standard economic

[23] Local investment in transportation or other amenities (e.g. parks) can also raise land values and create a framework for taxing the increase in land value through tax increment financing. This is generally understood as capturing the positive financial externality rather than benefiting from the relaxation of supply constraints.

theory on taxation shows that the details depend crucially on the shapes of the demand and supply curves, which depend on market conditions as well as the regulatory environment. If supply is inelastic (steep) relative to demand, then most of the incidence of the tax is on land owners who get lower prices than they would otherwise. If supply is elastic (flat) relative to demand then most of the incidence is on consumers of housing who face higher prices and rents from the increases in development costs. The reform modelled here is aimed at returning supply elasticity, and correspondingly we could expect the incidence of a tax on development to shift over time. What complicates the analysis is that the process though which value capture affects housing markets is through the decision by landowners to sell to developers, which is an inter-temporal supply decision, sell today, or at some point in the future.

7.1 Implementing value capture

A related issue to value capture is whether new development should pay the costs of increases in local capital infrastructure necessitated by the new development. Development cost charges and levies (DCCs) reflect the current approach, where growth "pays its way:" the infrastructure, environmental, and social costs of new homes are borne by developers and ultimately end users of new homes. The alternative, which was the norm prior to the 1980s, is for the entire tax base, the general population including incumbent property owners and businesses, to pay for all local government capital costs.[24]

[24]Prior to 1993, a major source of funding for critical infrastructure came from the Province to local governments in the form of revenue sharing (e.g., a portion of income taxes and other taxes). Between 1993 and 2000, this revenue sharing program was phased out.

DCCs were implemented in the LGA in 1977. The "Development Cost Charge Best Practices Guide" (2000) provides some history on DCCs:

"History of DCCs in British Columbia Prior to 1958, the costs of off-site municipal infrastructure services required for new development were typically paid for by the municipality, with no ability to recover the costs from the developer. In 1958, the Municipal Act was amended to permit an Approving Officer to refuse approval of a subdivision plan, if he/she was of the opinion that the cost to the municipality of providing public utilities or other local government works and services would be excessive. To mitigate the possible rejection of subdivisions, municipal councils began to enact Excessive Subdivision Cost Bylaws or Impost Fees to try to cover the infrastructure costs from new development. However, the courts ruled these bylaws were invalid because although the Approving Officer had the power to refuse subdivision approval, municipalities did not have the power to charge for any resulting infrastructure costs. A series of Municipal Act amendments

The economics of the former is that if new development is the marginal demand for capital projects and social infrastructure, then the new development should pay the marginal cost, including social costs and externalities imposed on local communities. Alternatively, there are financial efficiencies that enhance affordability in having the cost of growth paid in higher property taxes over time rather than up-front in higher house prices. We see this question of what costs should any new development be required to pay to be socially worthwhile to be largely a political question that is beyond the scope of this study.[25]

Value capture goes beyond the capital cost paradigm of DCCs and suggests that government, local or provincial, should use the increase in land value, gains to developers, and rents to the construction industry to enhance general revenues. The use of these revenues are not limited as are DCCs and can be available for diverse priorities such as alleviating homelessness or generating improved community amenities beyond those needed to support new development. In the absence of value capture, we expect any windfall gains from rezoning to accrue primarily to incumbent property owners, which can exacerbate inequalities in wealth without the landowner providing a social benefit. This is particularly the case if the biggest windfalls are in the areas with highest home prices. Additionally, even with value capture, the gains to municipal revenues may accrue in better off jurisdictions, exacerbating tax base inequalities, which could not be addressed without provincial intervention.

The design of value capture beyond cost recovery involves several trade-offs. As noted by the province ("Community Amenity Contributions: Balancing Community Planning, Public Benefits and Housing Affordability" 2014) inefficient or excessive charges will reduce housing supply limiting the gains in housing availability and affordability from upzoning. Another trade-off in

attempted to address the court ruling. In 1968, development permit powers were enacted which allowed municipalities to designate development areas and control the development of land in those areas. In 1971, this legislation was replaced with land use contract powers. Impost fees levied under a land use contract were found by the courts to be valid. In 1977, land use contract powers were eliminated, and the current authority to impose development cost charges was introduced."

[25]The marginal demand pays marginal cost argument requires that the costs truly be incremental costs from growth alone. Also, some costs that are imposed by new homes should not fall on the first to be built but averaged over all growth in the relevant period.

value capture policy is between simplicity and efficiency. Setting an across-the-board price per square foot of value capture charge imposed everywhere in the Province would be simple and straightforward. However, it would both deter marginally profitable projects and leave the large majority of value in the hands of owners where the wedge is large, i.e. where the redevelopment option is "deep in the money."[26]

A different question is whether costs should be negotiated and evolve over the course of a project's life, or instead should be fixed and transparent within various clear types and geographies of redevelopment. Negotiated value capture allows local governments to fine tune the charges to local housing market conditions, with lower costs in areas where development is more marginal and higher where the windfall gains from rezoning are largest. But this comes at the cost of greater uncertainty and longer development times, increasing development costs and the required developer return. Similarly direct negotiations often raise transparency concerns. By contrast, fixed value capture charges provide certainty and clarity and reduce development time, all of which lower the total of development costs and the return developers require to undertake a project. Fixed value capture can be finely graded by geography and permitted density while retaining the benefits of transparency.

Simultaneously attaining the objectives of reducing waste from underdevelopment and avoiding leaving large amounts of money on the table requires differential pricing based on permitted FSR and the economic value per square foot of newly built space. Such pricing need not be negotiated and can be explicit, but would be context-specific. For example, the Province could (a) forbid or cap density bonus pricing for the baseline of 1.00 FSR and four units on 33'-50' lots, six units on 50+' lots, and 1.5 FSR near transit, but then (b) allow larger per square foot charges for density in excess of these Provincial floors. In this way, marginal projects could proceed while allowing value capture when the gain to redevelopment is large.

The extent to which density bonus charges of type (b) should be allowed is a question that divides analysts (and our own project team). Manville (2021) observes that upzoning does not create value, but rather merely reallocates value, if generally in a progressive direction, and for that reason favours

[26]Because a fixed property value must be surpassed by redevelopment profitability for feasibility, a constant per square foot charge can kill redevelopment even when the profit per square foot of new development exceeds the value capture charge.

broad property taxation over development charges as a mechanism to redistribute land value. By contrast, Gyourko (1991) argues that impact fees may make densification more politically palatable, and hence expand supply. If a community that would otherwise only allow the Provincial floor on zoning becomes motivated by the possibility of value capture to allow greater density, the outcome is both more homes and more government revenue.

Overall value capture is available only because zoning has artificially created scarcity and high prices, and excessive value capture can contribute to scarcity and high prices by killing marginal deals. On the other hand, there may be social value to redistribution of the gains from relaxing zoning, and in some circumstances value capture can also encourage development by making upzoning more attractive to politicians. Value capture is more of an obstacle to development in settings in which other factors (such as construction or planning bottlenecks) aren't holding back development.

7.2 ACCs

In November 2023 the province introduced a new development-finance tool, the Amenity Cost Charge (ACC). This allows municipalities to set fixed charge on new development that complements the DCC legislation to collect fees to pay for amenities and to do so in a more transparent and predictable fashion than by community amenity contributions (CACs) under the current system tied to rezoning. These are intended to be set as to "not deter development". However, in practice, we expect that ACCs will be set such that they pull some projects below economic viability. Even so, we expect a substantial number of projects will remain viable. We are unable to quantify the additional boost to development viability from the introduction of transparency and certainty, but both serve to reduce development risk and increase project viability.

Figure 65 shows the effect of different levels of ACCs on the aggregate amount of additional development. Outside of the Vancouver CMA, ACCs as high as $200/sf eliminate the net dwelling growth from the land use reforms. The figure highlights the trade-off between adding ACC charges to finance local public amenities and the overall level of new development.

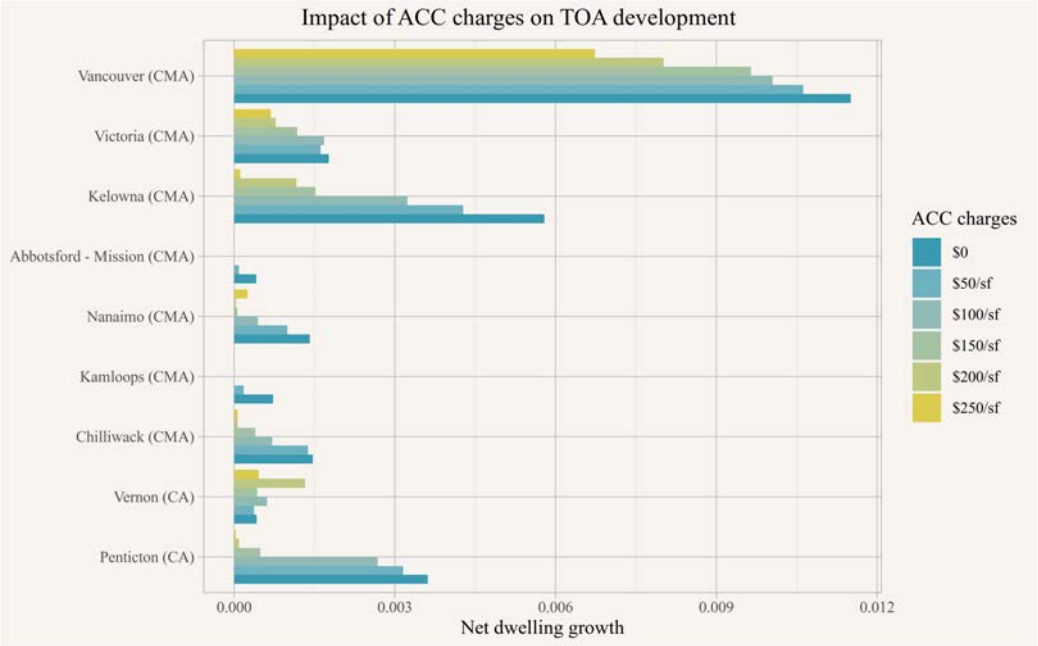


Figure 65: Likely impact of ACC on development in TOAs. The development process is modelled with a stochastic component, and especially in jurisdictions with fewer TOA areas the modelled impact of ACCs on our scenarios is noisy. ACCs should be set carefully not to overly restrict development and suppress supply effects and the potential for prices and rents to fall.

These results highlight the importance of ensuring an appropriate balance between the desire and need to raise revenue for public capital projects from new development and the effect of these charges on the level of development. As ACC and DCC charges raise the floor of the cost of housing, they create a tradeoff between financing capital projects to meet growth by charges on new development and the viability of the same new development. This does suggest the need for regular review of ACC policies and levels. Reducing the level of ACCs and DCCs to preserve the viability of new supply, by necessity would result in an increased reliance on property taxes, which spreads the cost across all properties.

7.3 Inclusionary zoning

Inclusionary zoning (requirements that some enabled units are affordable) acts as a specific form of value capture directed at a specific social purpose. Inclusionary zoning has the virtue of establishing a tangible connection between affordability and densification, and can operate directly against income segregation. Unfortunately it shares with value capture generally, and specific policies such as density bonus fees, the vice of discouraging density. The requirement that a unit be rented (or sold) at a level below market is equivalent to some dollar per square foot charge.[27] In-kind requirements may also involve administrative costs, enforcement risk to government, and some waste to beneficiaries. In a market with sufficient rental unit options, the recipient of an affordable unit is thought by economists to be no better off, and likely worse off, than if they received cash in the amount of the value capture and were free to spend that cash however they chose. This is less true, and the gains of a cash transfer increasingly flow to landlords, the tighter (low vacancy) the rental market.

Overall we find that inclusionary zoning requirements would be especially likely to undercut the viability of the kind of small infill developments promoted by our modelled reform.

8 Socioeconomic impacts

In this section we walk through some of the socioeconomic impacts we anticipate from the proposed reform. These include general impacts on reorganizing BC's economy and reducing segregation and more specific impacts on displacement patterns and rental markets, paying special attention to their intersection with various social statuses.

The biggest socioeconomic impacts of our modelled upzoning reform include greater economic opportunity and greater affordability, but lower housing value appreciation. The lower housing value appreciation applies primarily to owners of apartments and multiplex or rowhouses, with more heterogeneous patterns for single family property owners, some of whom may see gains while

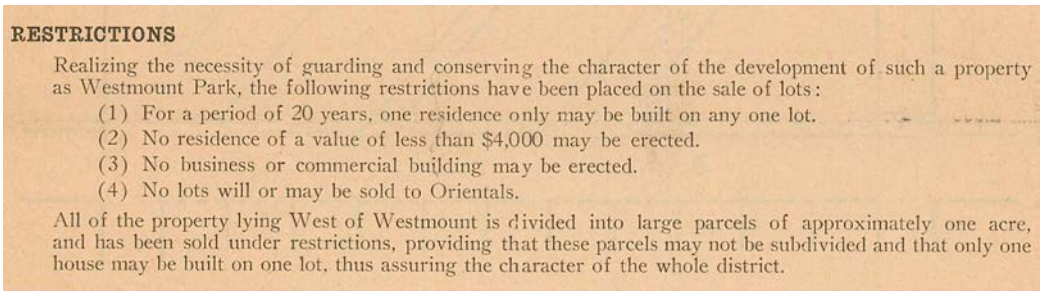
[27] A simple calculation of the charge is the difference between the market value of a unit per square foot and the capitalized net operating income of the affordable unit per square foot.

others see losses. The greater economic opportunity results in a net gain from the reform for BC residents as a whole. But greater affordability and lower housing price appreciation work together to redistribute benefits from current property owners to current renters and those looking to form new households. This mirrors the cost and benefit analyses recently undertaken for reforms in New Zealand (PWC 2020; PWC and Partners 2022), generally resulting in a net gain overall from increased opportunity and economic growth, but also redistributing the flow of benefits from incumbent property owners to renters.

An important distinction for policy purposes is between the impacts of upzoning on home prices and rents to end users versus land value. The value of built space in apartments and townhomes falls with upzoning relative to status quo because upzoning will lead to more space being built. There is likely a smaller effect on the value of built single family homes, as the upzoning will add more livable space, but reduce built space within single family homes. Land values may rise or fall with upzoning. The value of buildable land at a given location is roughly equal to the product of the amount that can be built on the site times the difference between the cost per square foot to build and the price per square foot of built space. In areas that are not part of the upzoning, we would expect buildable land value to fall, because the upzoning will reduce the price of built space and likely raise the cost of construction. For areas that are upzoned, buildable land values may rise or fall, as the reduction in the wedge between the price and cost of built space is now offset by an increase in the amount of space that can be built on-site. The latter effect will be particularly pronounced on areas within TOA zones. For single-family homes, the increase in allowable quantity is more modest. Thus, for existing homes, the effect of upzoning will depend on the fraction of value in the home that is attributable to structure and lot size as amenity versus the fraction of value attributable to the option to redevelop buildable land. The buildable land share is generally small for townhomes and particularly apartments and larger for single-family homes in expensive locations. The buildable land share will also be large in areas that are part of TOAs. (Strange 1992; Turner, Haughwout, and van der Klaauw 2014; Davidoff, Pavlov, and Somerville 2022)

An additional impact of our modelled upzoning reform is to reduce socioeconomic segregation by neighbourhood. Single-family detached zoning was historically enacted in many neighbourhoods as a means of preserving social

exclusion (Lauster 2016). Limiting developments to expensive single houses on large lots kept out those with lower income or wealth. These restrictions were often linked to racist exclusion as well, as in this portion of an ad for lots in the Westmount Park neighbourhood of West Point Grey from 1927, extracted from the City of Vancouver Archives (Orr-Hamilton 1927). Enabling 4-plex and higher density options within neighbourhoods reduces a prominent means of socioeconomic exclusion, enabling more people, or more diverse backgrounds, to live in more places.



RESTRICTIONS

Realizing the necessity of guarding and conserving the character of the development of such a property as Westmount Park, the following restrictions have been placed on the sale of lots:

(1) For a period of 20 years, one residence only may be built on any one lot.
(2) No residence of a value of less than $4,000 may be erected.
(3) No business or commercial building may be erected.
(4) No lots will or may be sold to Orientals.

All of the property lying West of Westmount is divided into large parcels of approximately one acre, and has been sold under restrictions, providing that these parcels may not be subdivided and that only one house may be built on one lot, thus assuring the character of the whole district.

Figure 66: Advertisement for Restricted Property in Westmount Park (West Point Grey) from 1927, City of Vancouver Archives

Below we focus on a narrower view of socioeconomic impacts, examining how our modelled scenarios relate to risk of displacement and aspects of the rental market. We assume that owner-occupiers are never displaced in this analysis. They may experience negative effects on their property values and exposure to nuisance associated with nearby development (e.g. loss of sunlight), but they are not at risk of losing their homes through our modelled reforms, and will be enabled to set their own prices for moving. We assume that renters within the secondary rental market (primarily in suites within detached houses) remain at most direct risk of displacement from redevelopment under the SSMUH initiative. By contrast, a broader set of renters, both in primary and secondary markets, are at risk of displacement from the TOA initiative, but many of these renters also already have protections in place, making assessment of overall risk more difficult. We first analyze socioeconomic effects involving potential displacement for the SSMUH initiative below before turning to the more complex issues involved in the TOA initiative.

8.1 SSMUH impacts

Secondary suites are inherently flexible living spaces, and difficult to fully track. To find secondary suites here, we rely upon Census data, combining single-family detached and duplex categories. This method records much higher rates of suites than permit data (von Bergmann and Lauster 2021a). We recognize here that the Census will not capture all secondary suites, but they have deployed various methods to better record suites since 2001. In some cases, these methods may result in overcounts of suites, as when they've been reabsorbed into the main house. These suites will often show up as "empty", secondary suites are the most "empty" form of housing in the Census. (von Bergmann 2018) In other cases, the Census will not have fully recorded a suite that has been added, or miss cases where multiple suites have been added. Of note, if the Census categorizes a house as containing more than two dwelling units, it will be re-categorized as a low-rise apartment building. Overall, we anticipate that Census counts of suites are likely slight underestimates, but we are confident that any adjustments made to Census figures won't significantly change the results presented in the sections below.

8.1.1 Displacement Patterns and Rental Markets

In our models exploring likely results of reform, we only look at single-family detached (possibly suited) properties likely to turn over and redevelop into 4-plex, 6-plex, 4-storey, and 6-storey or related forms. We can consider the former potential teardowns, and the latter potential new builds. We begin our impact analysis by examining the proportion of residents of potential teardowns and potential new builds likely to be renters. We assume teardowns will be selected from non-stratified older detached houses and houses with suites (>5 years old), while new builds will generally be stratified and come in forms most closely related to Census categories of new (<5 years old) row houses or low-rise apartments. As such, both losses and gains to rental stock are assumed to be in the secondary rental market.

Drawing from Census 2021 data, we can see that older housing in each of our categories of interest is less likely to contain renter households than the newer housing enabled by reform, even when we assume stratification. Furthermore, older single-family detached and suited housing is especially less likely to contain renters relative to newer stratified row houses and low-rise apartments.

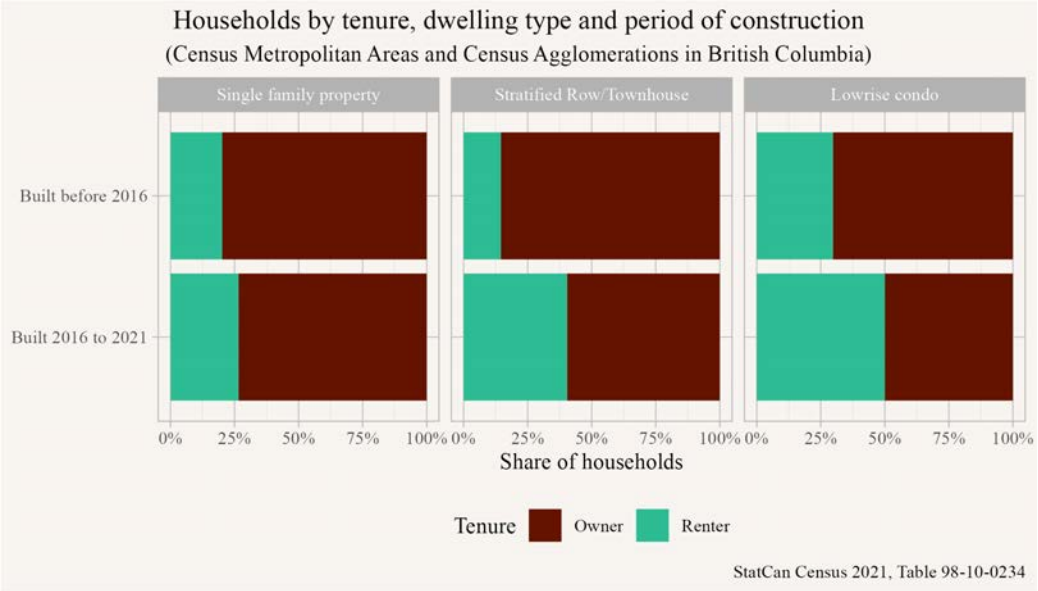


Figure 67: Households by dwelling type and tenure. Single family properties include single-detached houses, houses with secondary suites, and laneway houses.

Not only are new stratified row houses and low-rise apartments more likely to contain renters, but the new reforms will produce more of these kinds of dwellings for every single-family house torn down (with or without a secondary suite). Drawing upon our assumptions and based upon distributions of renters across existing housing stock in the 2021 Census, we expect that every tear down and redevelopment is likely to result in significantly more rental units added to the secondary market than are displaced. The multiplier effect for additions to the rental stock depends upon the balance of detached single-family houses and suited houses torn down set against the specific additions made by our multiplex and apartment options. For instance, given the balance of older houses between detached and suited, we would expect that every 100 redevelopments into a 4-plex would result in a loss of 23 dwellings in the secondary rental market, but a gain of 162 new secondary market rentals, resulting in a net gain of 139 dwelling units to the secondary rental market. These gains come on top of expected new opportunities for renters to become home owners within the expanded housing stock likely to be owner-occupied, increasing from 90 to 238 owner households.

This accounts for more than one household living within some existing single family properties, and is visualized in Figure 68.

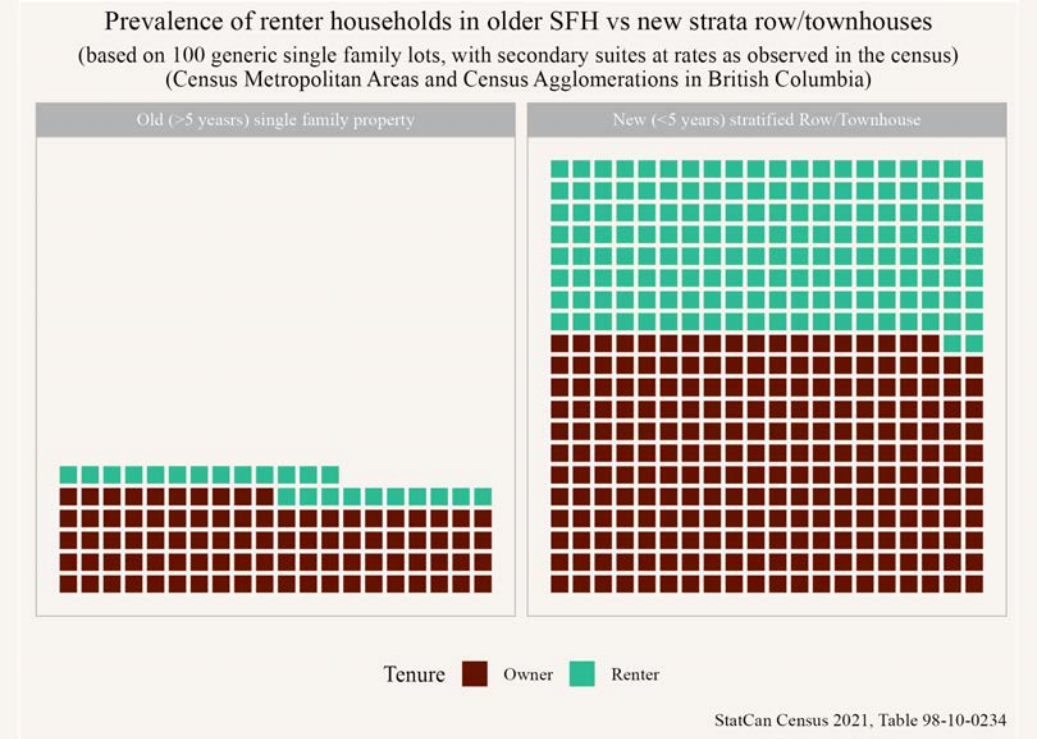


Figure 68: Households by tenure in existing single family properties compared to redeveloped multiplexes, extrapolating tenure from Census data for new stratified row/townhouses. Single family properties include single-detached houses, houses with secondary suites, and laneway houses.

Overall, we predict that the proposed reforms and resulting redevelopment will result in net gains to secondary rental stock. Based upon existing scholarly research, we expect these gains, as well as gains in owner-occupied housing stock, to set in motion vacancy chains that benefit all renters, as those moving into new home ownership and rental housing free up older rental stock, which are occupied by renters who themselves have moved from other rental units. The evidence is that new construction, even with rents at the higher end of the rental market distribution, generates vacancies for both moderate and affordable rental units through these vacancy chains (Asquith,

Mast, and Reed 2023; Bratu, Harjunen, and Saarimaa 2021; Mast 2021).

In addition to households moving between units and creating vacancies, over time buildings also end up catering to different markets. With depreciation, housing units decline in quality and transition down the quality ladder of housing sub-markets. Renovation moves units up the ladder and units are held in place through maintenance costs that increase with age. As buildings age, they deliver fewer "housing services" (the blend of quality and quantity), so that the supply of affordable rental units is primarily older buildings that used to cater to a higher end of the rent distribution, but have "filtered" down the quality ladder. (Rosenthal 2014) shows that in general rental housing filters downward at 2.5 percent per year, based on the income levels of occupants as housing ages. In models of filtering, increased new construction will result in faster filtering down of existing units: (von Bergmann 2019) shows that within Greater Vancouver, Census tracts that saw relatively more new housing units built between 2006 and 2016 also saw relatively more growth in the number of low-income households. Consistent with this, housing is more likely to filter down in less regulated markets (Liu and Yannopoulos 2022). As well, in the absence of new construction, units offering affordable rents in more expensive areas are likely to increase rents over time, filtering up instead of down (Holmes and Somerville 2001). The research on filtering suggests that housing market conditions for less well-off households are likely to improve as a result of the uptick in new construction from the upzoning modelled.

While added housing choices and better responsiveness of housing to demand pressures is good for renters, redevelopment of existing housing poses the risk of direct displacement of tenants. Direct displacement can be highly disruptive and deserves special attention.

Under BC's Residential Tenancy Act, tenants in secondary rental markets are generally exposed to greater risk of displacement than in the primary rental market due to landlords' ability to evict tenants for their own use of the property. Tenants may experience direct displacement due to redevelopment, as well as direct displacement through sale, a landlord moving in, or other reasons that aren't connected with redevelopment. We expect this policy to lead to new paths for direct displacement for existing tenants of houses and secondary suites. At the same time, the policy may redirect and even diminish other forms of direct displacement. Crucially, the form of

infill development promoted by this policy leads to significantly less direct displacement than most alternative ways of adding housing.

As shown above, most single family properties do not house renters and correspondingly their redevelopment won't result in tenant displacement. However, some properties do house renters in secondary suites or the main unit, and these tenants will be displaced if the property gets redeveloped. Importantly, this kind of displacement is already occurring via teardown and redevelopment into options already available to property owners (single-family houses and duplexes). We expect that most redevelopment happens at the natural rate of sales of single family properties, and any such sale, whether resulting in redevelopment or not, brings a high risk of tenant displacement. New owners might claim the home for owner use, and in many cases tenants will start the search for a new rental already once the property is for sale and move not in response but in anticipation of a possible eviction by the new owner. From the perspective of the tenant this is similarly disruptive as an eviction for owner use or redevelopment. Taken together sale of property and landlord use are the reason for 63% of all forced moves in Canada (Hayes 2022), indicating that just the sale of a property comes with high displacement risk. Redevelopment of the property increases that risk to certainty, and to the extent multiplex policies lead to greater redevelopment than existing policies, the differential increase in risk is the main channel by which multiplex redevelopment leads to direct displacement.

The displacement risk of tenants due to the multiplex policy has to be compared to the risk of tenant displacement under other development patterns resulting in a similar increase in housing units. Development on greenfield or brownfield sites leads to no tenant displacement, but holding urban containment boundaries and industrial land protections constant, especially in the larger metro areas, there are few such sites left. Furthermore, they may not be in locations where development to higher densities is viable, resulting in low probabilities of redevelopment. Redevelopment of existing commercial properties, for example along arterials as is done in many parts of the province, can also add housing without direct displacement of tenants where Commercial zoning has excluded housing. But this pattern also allocates housing onto arterial roads, where pollution can negatively influence health. It is no surprise that our models show people prefer to live on less busy roads. Historically we have seen a lot of redevelopment directly affecting existing low-rise rental or strata developments, which results in vastly higher

displacement risk for tenants than adding an equivalent amount of housing on single family properties.

On balance, we believe that between the low share of single family properties with renters, and the high displacement risk pertaining to a sale irrespective of a single family property getting redeveloped, the residual risk of displacement due to the multiplex policy is low compared to most alternative ways to add infill housing.

8.1.2 Gender and family type

While vacancy chains should insure that renters overall benefit from reforms, we also compare the residents of the particular types of rental stock lost and gained to consider whether differences in residents suggest attention should be provided to the potential inequities under a GBA+ analysis. In effect, it is possible that the rental housing stock lost serves distinct groups of renters from those most directly provided new housing options, and both the time between teardown and rebuild and frictions in vacancy chains (including higher rents at turnover) could lead to worse outcomes for some groups, even as renters overall benefit. Here we look at how our teardown and new-build scenarios intersect with renters by gender and household type, visible minority and Indigeneity, and income.

Unfortunately, data enabling complete matching to our groups and scenarios of interest are only available for the 2011 Census (PUMF), but where possible, we have cross-checked these results with the less complete data from later Censuses and find the same general patterns pertain. In analyses below, we highlight groups of interest from an equity perspective, though we do have the power to run all of the fine-grained intersecting analyses we would like. Our strategy is simple. We provide basic information for how groups of interest are distributed across all renters in British Columbia. Then we turn to their distribution across the tenants of old single-family houses (including suited houses coded as non-stratified 'duplex' in the Census) characteristic of our teardown scenarios. Finally we turn to the distribution of renters across groups within the newly built stratified rowhouses and low-rise apartments characteristic of our new-build scenarios. First we examine the intersection of gender and household type. We run these analyses for BC as a whole, and the potential for differing patterns by region remains a key caveat of our findings. (See Figure 69)

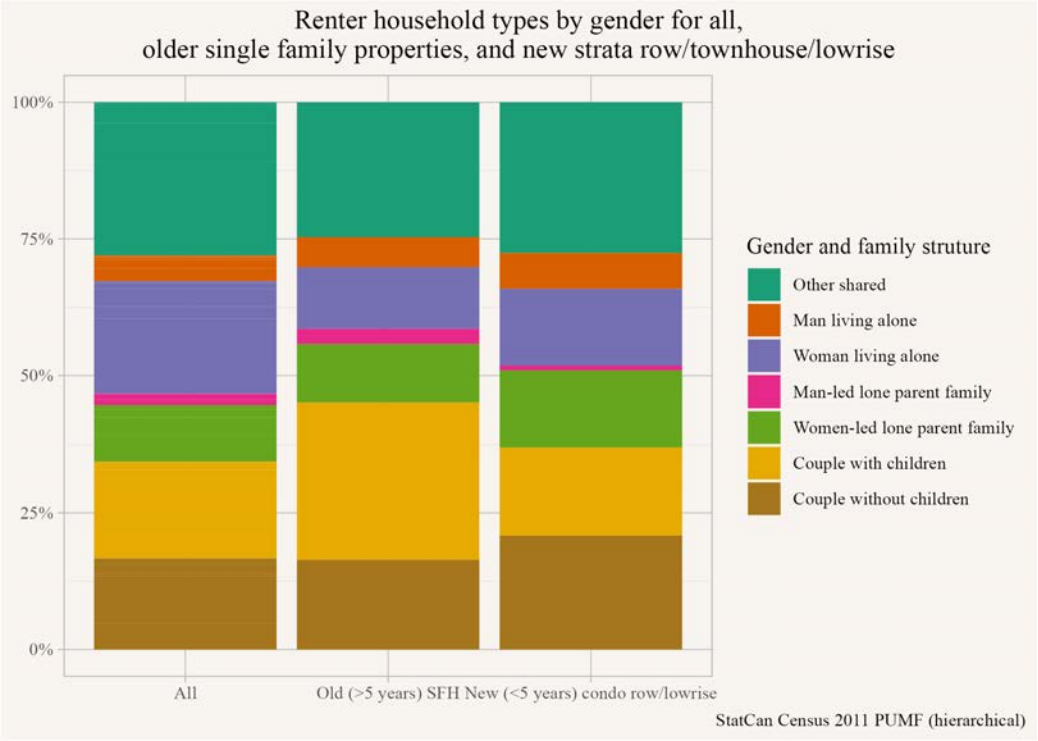


Figure 69: Gender and family type of renters by housing scenario. Single family properties include single-detached houses, houses with secondary suites, and laneway houses.

As of 2011 data, renters living in our teardown scenarios (old single-family detached or suited houses) were most likely to be couples with children, relative to both renters as a whole, and renters in our new-build scenarios. By contrast, our new-build scenarios seem likely to better accommodate single mother renters, as well as women living alone. The better accommodation of renting single women, with and without children, by our new-build scenarios (new stratified row houses and low-rise apartments) may relate to issues like safety concerns (Jones and Teixeira 2015), better addressed by new rowhouse and apartment living.

8.1.3 Visible minority and Indigenous identity

We next consider the distribution of visible minority and Indigenous identity for renters across our scenarios. (See Figure 70) In general, on a per unit

basis, more visible minority renters find housing in new stratified rowhouse and low-rise apartments of the kind matching our new builds than in the older housing matching our teardowns. The opposite relationship is the case for renters with Indigenous identity. This may reflect the characteristics of band housing, which could not be separated out in this data. Yet further attention to housing circumstances of people with Indigenous identity is warranted.

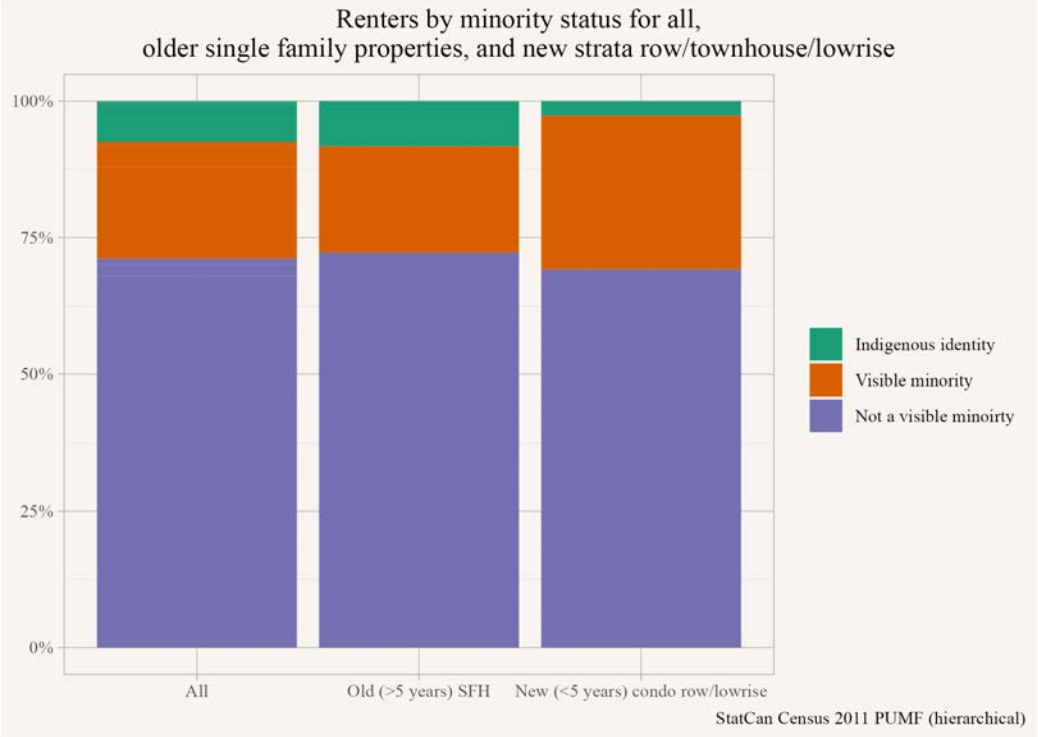


Figure 70: Visible minority and Indigenous status for renters by housing scenario. Single family properties include single-detached houses, houses with secondary suites, and laneway houses.

8.1.4 Adjusted family income

Finally we look at how our teardown and new-build scenarios house renters by adjusted family income bands. (See Figure 70) Tenants renting older single-family or suited housing tend to have higher adjusted incomes than renter households overall. Those renting housing matching our new-build scenarios have more bifurcated incomes. More households with the lowest

adjusted incomes rent in new-built strata row-houses and low-rises. But the same is true of households with the highest adjusted incomes.

There remains some uncertainty about these distributions. For instance, it is possible the strong representation of the lower adjusted incomes in new housing is partially an artifact of the temporal disjuncture in the way incomes from the previous year are matched to respondents by their current housing in the Census year. This can intersect with recent newcomers, who are more likely to lack income data for the prior year in a way to overemphasize lower income. However, this also highlights the out-sized importance of new housing in providing opportunities for newcomers.

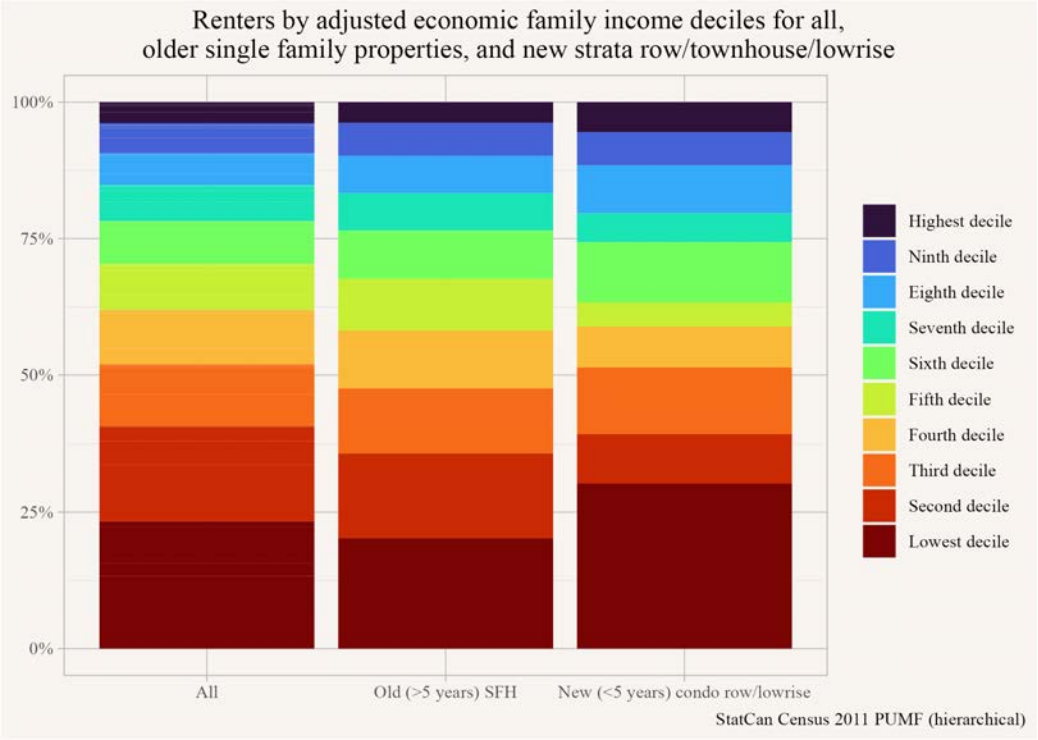


Figure 71: Adjusted family income bands for renters by housing scenario. Single family properties include single-detached houses, houses with secondary suites, and laneway houses.

On a per unit basis, the data suggest that our new-build scenarios may improve housing options for those with the lowest adjusted incomes relative

to existing tear-down scenarios. Overall, per unit analysis of data suggests replacing our teardown scenarios with our new-build scenarios is likely to produce promising outcomes for renters from an intersectional equity standpoint. In particular, renting single mothers, women living alone, and visible minority residents of British Columbia see improved outcomes in the kinds of housing the modelled reform would produce on a per unit basis. As noted above, the multiplier effect of new units made available to the secondary rental market through upzoning reforms further dramatically improves projected equity outcomes for all renters. All renters would also see improvement in prospects for transitioning into home ownership.

8.1.5 Security of tenure

While the SSMUH multiplex policy may produce some primary (purpose-built) market rental units, we expect that the vast majority of rental units produced via this initiative will be secondary market rentals within strata, as modelled above. Secondary rentals are an important part of the overall housing system, allowing for flexibility and adaptation to preferences of people wanting to own vs rent. But the cost of that flexibility is additional insecurity for tenants, insofar as landlords can more easily evict tenants for own use or sale of property. Indeed, we see most tenant displacement through forced moves occurs in the secondary rental market. (Hayes 2022) We expect rentals resulting from stratified multiplexes will offer higher security of tenure than rentals in secondary suites, including within houses, but less security than in purpose-built rentals.

British Columbia already has the second highest share of renters in the secondary market among all provinces, likely accounting for its comparatively high rate of forced moves. The province may wish to consider additional protections to tenants within the secondary rental market to reduce displacement and increase the security of tenure associated with new housing being constructed. Potential upsides for greater protections for existing tenants should be balanced against the potential risks of slowing the development of new housing and incentivizing landlords to remove secondary rentals from the market in anticipation of sales or redevelopment. The province, and municipal governments, may also wish to further incentivize the construction of purpose-built rental buildings. Density bonusing on top of the reform modelled here could greatly increase rental development, following pilots of

similar programs in a variety of municipalities (e.g. Vancouver's Moderate Income Rental Housing Pilot Program and Secured Rental Policy).

8.2 TOA reform impact

The TOA densification policy covers a much broader range of current land uses than the SSMUH policy as rolled out by the province. There are many single-family detached houses within TOA catchments, effectively subject to the same analysis as above. But significantly higher densities could also prove attractive for redevelopment of existing strata and purpose-built rental apartment buildings, as captured in the primary rental market within CMHC Rental Surveys. There are different calculations for these properties. Strata buildings require greater negotiation with multiple owners and provincially mandated wind-up processes, potentially making them less attractive sites for redevelopment. By contrast, purpose-built rental buildings generally involve only one owner, but many of these buildings currently come with their own protections within municipalities, especially within areas containing transit investments. For example, Vancouver has in place an expansive Tenant Relocation and Protection Policy (TRPR), already enhanced along the Broadway Corridor SkyTrain extension (City of Vancouver 2022b). Similarly, many cities have density bonusing for developments containing purpose-built rental housing, and these may be configured on top of provincial reforms.

8.2.1 Where are at risk purpose-built rental buildings located?

In Figure 72 we highlight the location of purpose-built rental buildings by number of units across Metro Vancouver. Overall we can see that the purpose-built rental stock varies in its overlap with TOAs. Important portions of the stock, particularly within the Broadway Corridor and near Metrotown, are located within current TOA densification areas. But other portions, like the West End neighbourhood of Vancouver, are not included in densification areas.

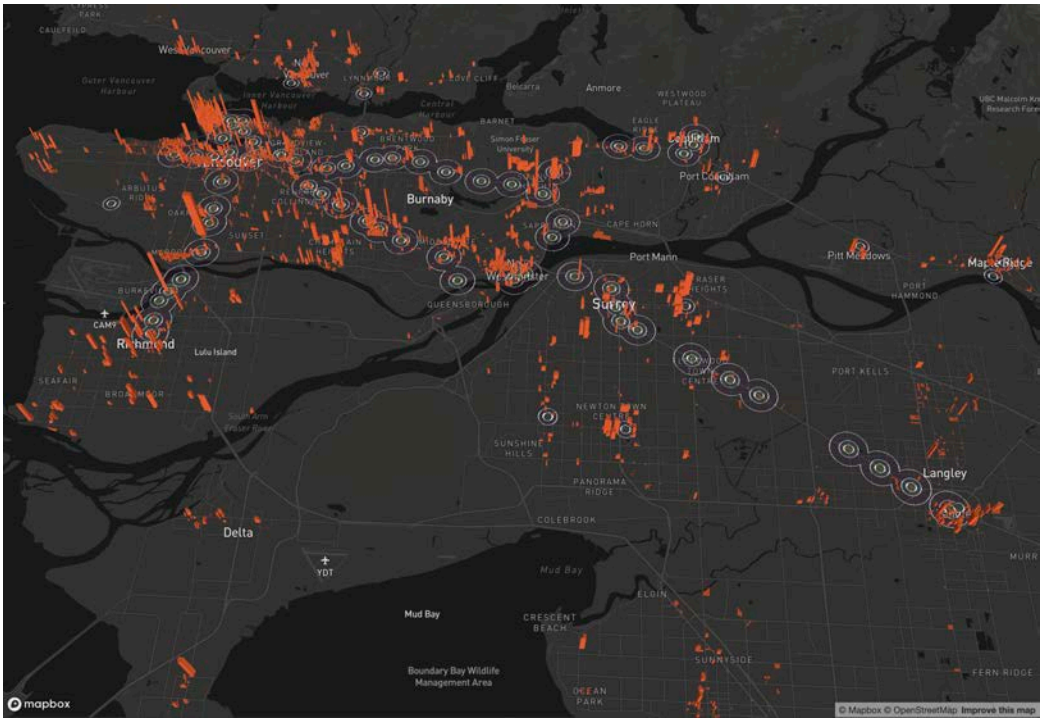


Figure 72: Metro Vancouver Purpose-Built Rental Buildings

8.2.2 Existing protections for purpose-built rental buildings

Some purpose-built stock is non-market. Non-market housing may see redevelopment and significant new development (more on this in section below), but the processes involved are likely to differ from those considered here. Some purpose-built rental stock is in areas protected by historic preservation designations. These are effectively removed from TOA redevelopment consideration. While we cannot map these protections for the Metro Area as a whole, we show how non-market and historic areas alter the map of rental stock at risk of redevelopment for the City of Vancouver, where we have data on the location of non-market housing, in Figure 73.

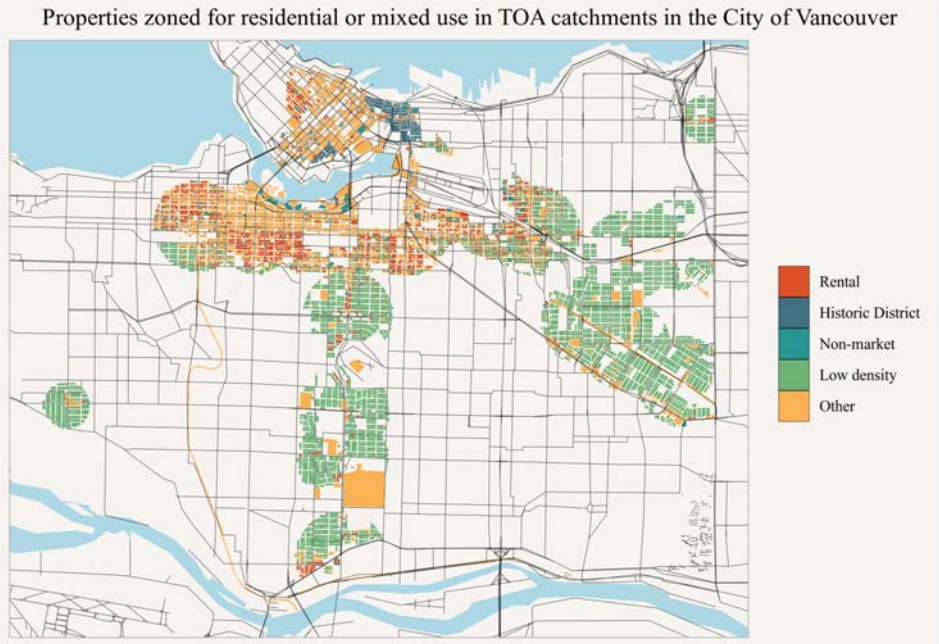


Figure 73: Properties zoned for residential or mixed use in TOA catchments in the City of Vancouver, breaking out non-market housing, purpose-built rental (including in mixed use), Historic Districts, existing low-density residential use, and others, such as condominium apartments and commercial uses.

The map highlights how the purpose-built rental within the Broadway Corridor remains most at risk. Notably, this stock is protected directly by municipal policies prioritizing parcels for redevelopment with the Broadway Corridor Planning process, and indirectly through tenant relocation policies. Similar planning protects Langara Gardens along the Cambie Corridor, where the City is enabling infill tower development without existing tower demolition as a means of avoiding displacement and preserving rental stock. But the downtown TOAs also reach some rental buildings in the West End, and Marine Gateway reaches some rental in Marpole, which might require additional attention. Overall, much of the purpose-built rental within TOA catchments is already covered by OCPs or similar planning laying out opportunities for redevelopment in the context of installing protections for existing stock and tenants.

Given the plentiful sites for redevelopment within TOA catchments, there are generally few disincentives to maintaining or strengthening municipal or provincial protections for existing rental stock and tenancies within Metro Vancouver. In Figure 74 we compare the development option for eligible land area within TOA catchments by whether they currently contain purpose-built rental stock.

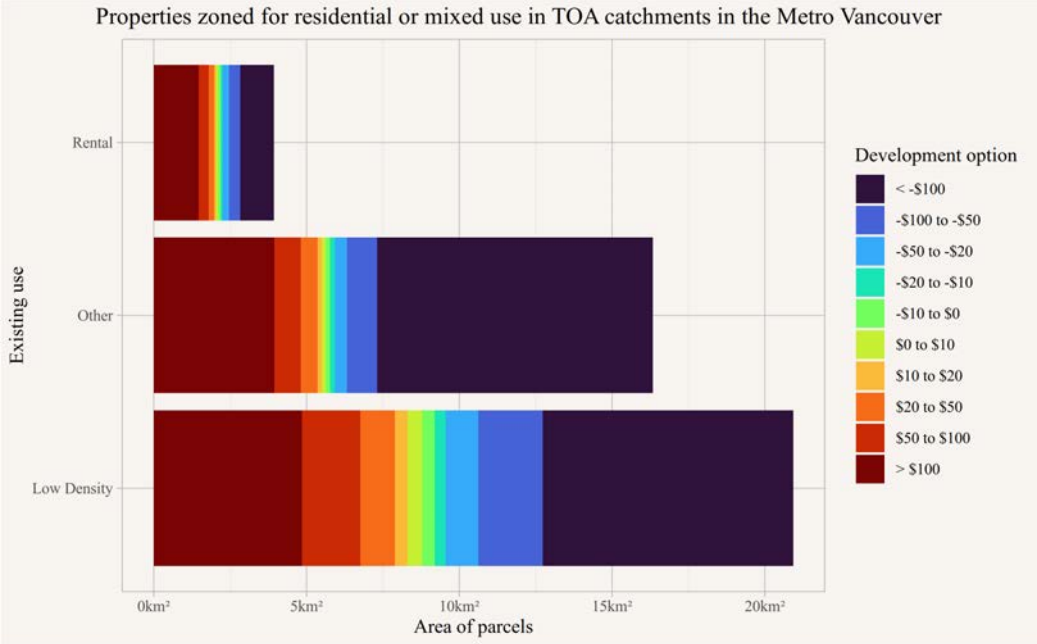


Figure 74: Land area of properties zoned for residential or mixed use in Metro Vancouver TOAs by existing use and development option.

Much of the land containing rental stock would likely be redeveloped in the absence of the various rental protections discussed above. But overall there is a great deal more land within TOA catchments likely to be redeveloped without any rental stock. There are likely few disadvantages to prioritizing this land for redevelopment. We check on this assumption by comparing models for likely 10-year net dwelling completions including and excluding purpose-built rental stock in Figure 75.

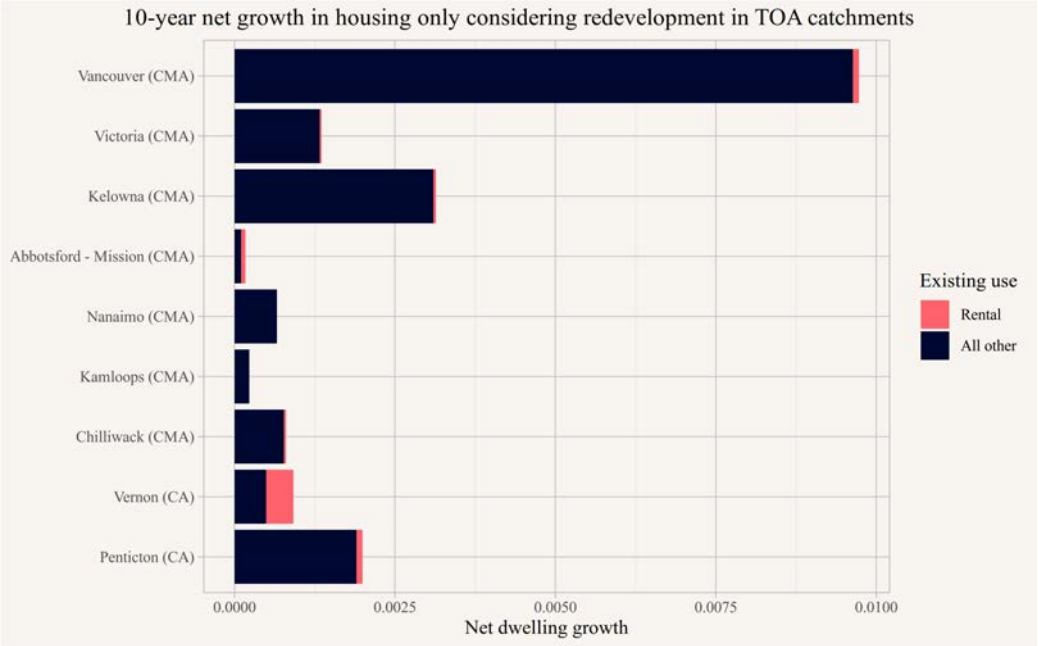


Figure 75: Likely net new dwellings over 10 years in TOA areas, comparing contributions from replacing existing rental housing to replacing other uses.

In absence of including purpose-built rental stock, other redevelopment options tend to move to the fore in Metro Vancouver, filling in the gap. For some other metro areas, where bus exchanges lifted to TOA densities are currently surrounded by lower-density purpose-built rental, this pattern may not hold. In these places, municipalities may want to consider the tradeoffs in protecting existing purpose built rental stock relative to what can be gained by adding a great deal more housing. In the short run, for Metro Vancouver strong renter protections are unlikely to greatly deter development of new housing, but in other metro areas strong renter protections may come at the cost of new transit-oriented development. In the long run, a variety of other issues, including structural integrity and earthquake preparedness, may contribute to the need to redevelop older purpose-built rental stock, and it may be wise to revisit the tradeoffs in existing rental stock protection.

We point out again that the redevelopment projections follow a stochastic process. Our modelling does not pay attention to possibly different redevelopment probabilities for existing rental vs other existing uses, which might

skew this. This should not be interpreted as saying that existing rental stock is at low risk of redevelopment, but rather that discouraging the redevelopment of existing rental will have little impact on our overall projections of net new dwellings.

8.3 Non-market housing

The lack of sites zoned to enable density has been a primary barrier to the construction of more non-market housing. When non-market housing providers are forced to go through rezoning, it adds cost and uncertainty to the development process. In addition, public hearings over supportive housing projects often, if inadvertently, promote prejudice and stigma, making those intended to be housed by such projects feel unwelcome.

This report does not directly consider non-market housing as part of the proposed reform. However, outright zoning for higher density should greatly increase the viability of non-market housing development across the province. In effect, instead of competing with commercial developers for a narrow range of developable sites, non-market developers will potentially have a much wider range of sites to choose from without having to worry about expensive, uncertain and stigmatizing municipal approval processes. Land values may rise slightly in central parts of metropolitan areas, but examples from New Zealand and Kelowna show that increases in land values were moderate and not sustained, decreasing the cost of land inputs to housing in the medium to long term.

The province may want to consider adding a density bonus for non-market housing on top of the proposed general density scenarios associated with this reform to privilege non-market housing projects looking to acquire land, as well as those looking to utilize their existing lands more intensively. Density bonusing gives non-profits additional ways to reduce land costs by building up in high-demand areas. For example, a density bonus from 2.00 FSR to 3.00 FSR enables non-profits to deliver the same amount of housing on two-thirds of the required land, lowering land costs. Such density bonuses could be tied to support of a project from BC Housing, CMHC, and municipal governments interested in supporting non-market, non-profit housing development and operations.

9 Accompanying legislation

For this exercise, we initially built modelling scenarios based on existing upzoning legislation and zoning codes. These include zoning reform legislation from New Zealand (New Zealand Ministry for the Environment 2022, 2021a, 2021b), Washington (State of Washington, House of Representatives 2023; Housing Development Consortium 2023), and Oregon (State of Oregon 2019, 2022), as well as changes in Kelowna, Kimberley, and Victoria, BC. These offered potential models for similar legislation at the provincial level in British Columbia. We were then provided details on provincial SSMUH and TOA initiatives which we re-entered into models for the current iteration of the report.

We estimate the number of dwelling units per lot and expected unit sizes given lot specific maximum floor space ratios and assumptions on building setbacks from lot lines. These in turn yield our estimates of the likely construction costs and sale prices we apply to residential lots across the province. Our modelling did not account for many of the additional requirements that municipalities apply to built form to shape and control development. These include maximum heights, maximum lot coverage, minimum and maximum building dimensions, building separation, method of computing floor area, horizontal angles of daylight, and external design features, which can together or individually determine and potentially undermine the housing supply goals in raising density through increasing the maximum allowed outright floor space ratios. For example, narrow lots combined with large side-yard setbacks can make it difficult to design side-by-side layouts supporting multiplexes. large front and rear yard setbacks can prevent adequate lot coverage to achieve given floor space ratios when configured within restrictive height limits. To be effective, reform legislation intended to lead to upzoning may need to speak to all the diverse ways municipalities can restrict development. New Zealand and Oregon found it useful to draft specific code to serve as the minimum density to be supported by municipalities (New Zealand Ministry for the Environment 2021a, 2021b; State of Oregon 2022), enabling much quicker implementation of reform than waiting for municipalities to adjust their own codes.

Minimum parking requirements per unit can be another impediment to development. Requirements for on-site parking either reduce the amount of space than can be built upon or used for outdoor purposes (if above ground) or add

the substantial extra expense (if below ground). Many recent reforms, including in New Zealand (New Zealand Ministry for the Environment 2022), have banned municipalities from imposing parking requirements on developments, especially near transit. Removing the ability of municipalities to mandate parking does not preclude developers from adding it where they find it feasible to do so. However, removing the mandates can open many more options and locations for potential developments, improving their feasibility and range. Removal of parking requirements may be particularly helpful for smaller scale purpose built rental projects near transit.

Our scenarios assume the current building code, but we note that building efficiency and overall design and livability may be improved considerably by loosening aspects of the code. For instance, allowing point access blocks (Eliason 2021) allows multi-floor apartment buildings on smaller lots. Beyond our assumption of current building code, our scenarios generally assume development is not substantially hampered by the other municipal regulations as detailed above. We assume up to 50% lot coverage and setback and height rules that support the densities derived from our modelled floor space ratios. We assume that there are no minimum parking requirements, but that developers will provide some at-grade parking. For the lower-density scenarios of four units on a 50' wide lot this could be one space per unit via parking pads or parking elevators in the back, for higher density scenarios in the frequent transit network the parking ratio may be lower or may be provided underground, depending on demand.

10 Limitations

There are a range of assumptions underlying the price model and the cost model as described in Section 3 and Section 4, which impact the results of this study throughout. We mitigate some of the uncertainty around assumptions by running a range of plausible scenarios and reporting on the range of outcomes. However, this does not account for the full range of model uncertainty. In particular:

- The model does not consider variation in the rate of sales of single family properties. The multiplex initiative could plausible increase the rate of sales of single family properties, either by the development option raising prices and thus incentivizing more owners to sell, or by

owners selling because they don't like the way their neighbourhood is changing. Increased rates of sales will only have limited impact on the pace of turnover of single family properties to multiplexes because our model predicts turnover rates significantly below the average rate of sales for most regions. But this may be different in select sub ares.

- The cost model has fairly good information for construction costs in Metro Vancouver, as well as some of the other larger regions, but construction cost and construction quality assumptions in smaller population centres may vary from the ones used in the modelling and might distort our estimates of viability of multiplexes.
- The cost model makes assumptions about development quality based on the overall estimated price distribution in each municipality, assigning high quality construction to multiplexes in relatively pricey areas and lower cost construction cost in less price parts of each jurisdiction. The exact distribution, and the implications on prices of multiplexes, is difficult to estimate and this may introduce model errors that could go in either direction.
- The depth of the market for multiplex properties varies by price point, the market for high-end multiplexes in expensive neighbourhoods will likely get exhausted faster than the market for multiplexes at lower price points in less expensive neighbourhoods. To the extent that this happens the model may over-estimate the development potential in high-priced neighbourhoods and under-estimate the development potential in low cost neighbourhoods.
- On a related point, preferences are heterogeneous, which may lead to development in areas where our model predicts low development probability. Low probability development events are difficult to get right and small model errors or heterogeneous preferences can lead to noticeable upward deviation from predicted development outcomes in ares identified as low probability by the model.
- The model works with fixed interest rates. In the medium to long term interests rates will change, increasing interest rates will negatively effect the production of multiplexes through rising financing costs, as well as lower prices for finished multiplexes, while at the same time depressing the value of single family properties used as land inputs. On net, higher

interest rates negatively impact overall viability and the number of new housing units.

- The model assumes fixed real hard costs, but hard costs can fluctuate. At the same time, broad zoning reforms can lead to productivity boost and specialized designs that lower hard costs. We do include a scenario with efficiency gains in soft costs coming from faster timelines and increased certainty that come with uniform outright zoning, and also include a scenario with escalating hard costs, possibly because of increased construction labour demand and pressure on building material supply chains due to increased levels of construction.
- We do not consider infrastructure constraints like sewer, water or electric capacity that might complicate residential infill, especially in areas where we project strong uptake. In rare cases where planning is unable to upgrade infrastructure at a rate sufficient to support infill development a geographically staged approach, coupled with an effort to fast track infrastructure upgrades, may be necessary.
- Future demand shocks are difficult to predict and to model. We run a variety of scenarios using uniform long-run background price appreciation rates that model the effect of demand shocks averaged over several years. However, more realistic fluctuations in background price growth lead to lower overall housing production and higher overall prices than the model predicts using averages because of the time it takes for new housing to get built and the market to clear.
- The modelling does not take current zoning into account, we did not have access to comprehensive zoning data that details allowed densities and forms. In some cases existing zoning may allow the same or higher use as the modelled scenarios, and these properties redeveloping may not be due to the considered scenarios but would have happened anyway. We expect this to be rare, although the Kelowna example discussed in Section 6.1.2 shows that this does happen. In other cases, like in Coquitlam as discussed Section 6.1.3 where fourplexes are allowed conditionally, the change to outright would likely significantly accelerate the production of fourplexes.
- The modelling does not take Official Community Planning into account. Though we provide illustrative examples of OCP to TOA com-

parisons, we could not integrate all the ways in which the two are likely to interact following enactment of provincial TOA legislation.

- The total effect of the missing middle upzoning may be somewhat dampened if it siphons labour capacity away from other multifamily construction projects in BC. We model the missing middle labour force to mostly come from single family construction, attracting out of province labour, and growing BC's construction labour force. This may be overly optimistic, especially in Metro Vancouver where a fair amount of construction is projected to be within TOA catchments, which might substitute construction from other projects that would have been built in absence of the modelled TOA and SSMUH densification. Especially in the initial years until the labour force has had time to adjust this might lead to substitution instead of addition of dwelling units produced by the legislation. Of note, the more profitable options for development, the faster the construction labour force is likely to grow, suggesting that substitution effects dampening growth early after reform may be accompanied by more growth later.

Limitations to our Socioeconomic Analysis include:

- We do not model the effects of potential displacement for existing residents of purpose-built rentals, largely because we anticipate existing municipal protections for this stock and for existing tenancies will continue under provincial TOA legislation.
- Census data availability was limited. The 2021 Census data has not been fully released. We were able to use released data to establish the proportion of renters in each housing scenario compared, but not to perform more detailed analysis intersecting by social status. Publicly released Census microdata from 2016 also does not contain detail on the range of housing types needed.
- Data from the 2011 Public Use Microdata File (PUMF) National Household Survey (replacing the long form of the Census for that year) enabled analysis of intersections by social status, but may not be up-to-date. We defaulted to 2011 instead of the 2016 because the 2016 PUMF data does not allow for accounting for secondary suites, which we feel are important to include in the socioeconomic analysis.
- Socioeconomic analyses of SSMUH were performed for the province as

a whole. Results within regions may differ, corresponding to different composition of housing types by region. Similarly, the composition of household types, visible minority and Indigenous status, and income bands will differ by region across BC, potentially affecting results. We are unable to provide analyses by region due to limited data and in feasibility to obtain custom tabulations within the limited timeframe of this work, as well as concerns about sample size. The complexity of TOA initiative overlap with existing plans and protections, especially for renters, makes it difficult to perform comparable analyses.

- Robustness checks show that the price model struggles with properly capturing prices of lots that are significantly larger than the norm in a given jurisdiction. We attribute this to the marginal value of land decreasing with lot size that is not well-captured by only regressing on $\log(land_area)$ and not including higher order terms. We feel that sticking with our parsimonious model outweighs the advantages of better capturing large lots with higher order land area terms as large lots aren't very common. However, large lots tend to cluster as they are often the product of zoning with high minimum lot sizes, and thus also result in local clusters of spatial autocorrelation of the model residuals.

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Appendix

A Alternate scenarios

There is considerable uncertainty about future demand for housing across British Columbia. Changing labour market conditions within British Columbia can lead do differential migration pressures within the province, changing labour market conditions across provinces can shift interprovincial migration patterns. Changing immigration targets and non-permanent resident admissions impact the overall influx of people into Canada, amplifying trends in internal migration.

In the main report we incorporate these uncertainties by considering a 2% as well as a 4% background real price appreciation. In this section we complement these assumptions by also considering scenarios with lower and higher demand pressures, modelled by a 0% and 6% background price inflation. The background price appreciation is assumed to act on all properties, while supply effects from multiplexes are assumed to only act on single family properties. We run a variety of assumptions on demand elasticity, that is how adding multiplexes impacts prices of multiplexes. Combined with the range of assumptions on background price appreciation this also effectively covers a scenarios where multiplexes lower (or rise) the price of single family properties by using scenarios of lower (or higher) background price appreciation and stronger (or weaker) supply effects of multiplexes on multiplex prices.

The choice of 0% and 6% price appreciation to supplement our main 2% and 4% scenarios is further motivated by the experience from Auckland, where after an initial price bump for single family properties there has been little to no further price appreciation (see Figure 34). The 6% price appreciation scenario is motivated by Vancouver's strong historic price growth that on average exceeds 4%.

With this in mind, Figure 76 shows how many dwellings are projected to be added on net via the missing middle proposal under the 0% and 6% background price appreciation scenarios and a range on assumptions on demand elasticities. In a 6% background price appreciation scenario the modelling predicts a stronger supply response. This also highlights how in some areas few multiplexes would be built under current market conditions, but multiplexes become viable if prices rise.

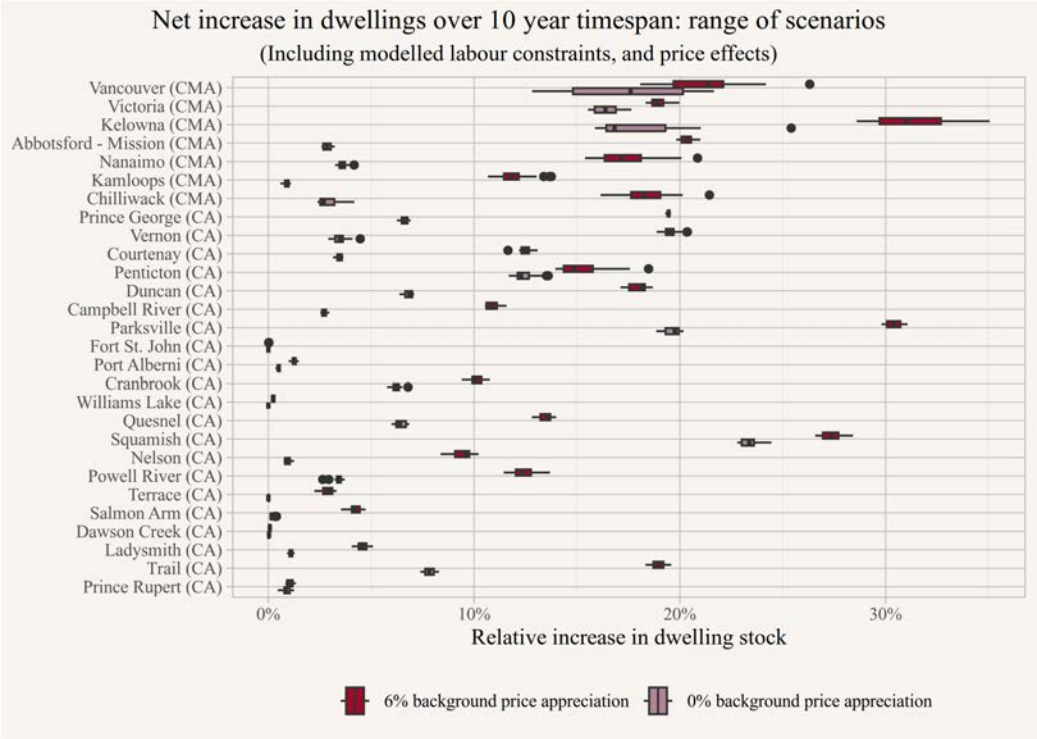

Figure 76: Cumulative net increase in dwelling units under multiplex scenario over a ten year timespan, with lower impact of supply on prices.

The projected price effects due to the added multiplexes are shown in Figure 77. As expected, in the higher background price appreciation scenario the stronger supply response also results in a larger price effect. However, a 6% annual background price appreciation translates into a 79% background price appreciation over 10 years, and the projected housing added via the missing middle initiative is not able to fully compensate those increases.

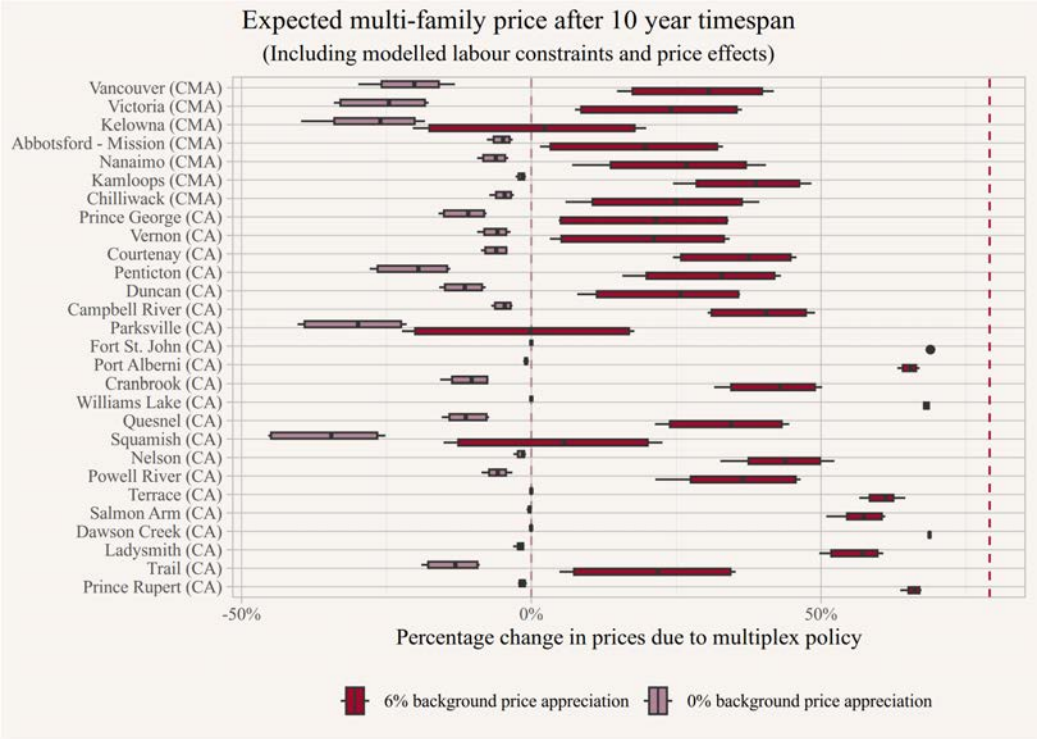

Figure 77: Price effect of multiplexes over 10 year timespan: range of scenarios

On the other hand, in a 0% background price appreciation scenario we see that the missing middle initiative is able to lower real prices in a noticeable way, by around 20% in Metro Vancouver.

B Rate of sales

Historical rate of sales of properties give information about the normal pace of transactions as owners move out of their home and sell, or sell a rental property they hold. In this report we are primarily focused on single family properties, that is properties with single ownership which may also have a secondary suite or laneway house in some jurisdictions.

Redevelopment decisions are usually closely associated with a property transaction, in particular when developing strata titled multi-unit properties. Our

approach assumes that development up to 1.5 FSR can happen without assembly, whereas 2 and 3 FSR development options require at least 50 foot of frontage to be viable in our current building code environment.

We survey historical rates of single family property sales across regions and the jurisdictions therein throughout the province.

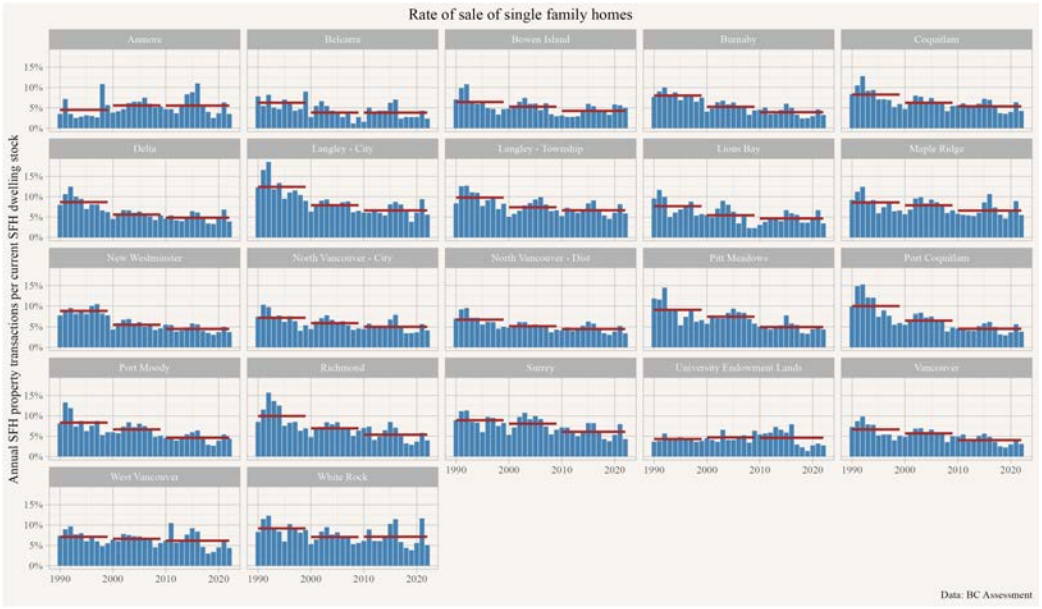

Figure 78: Sale speed in Vancouver area

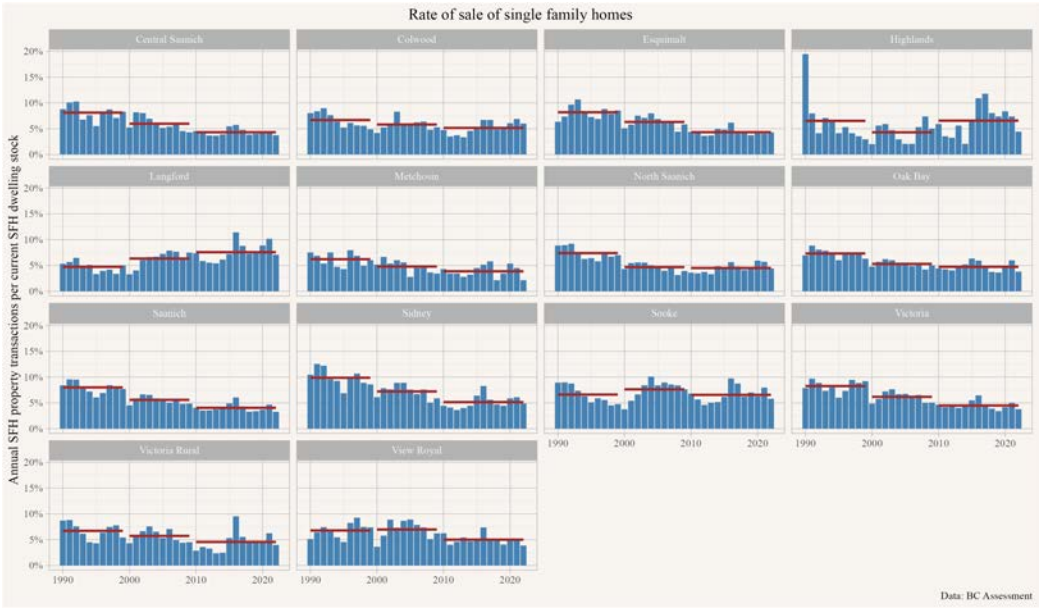

Figure 79: Sale speed in Victoria area

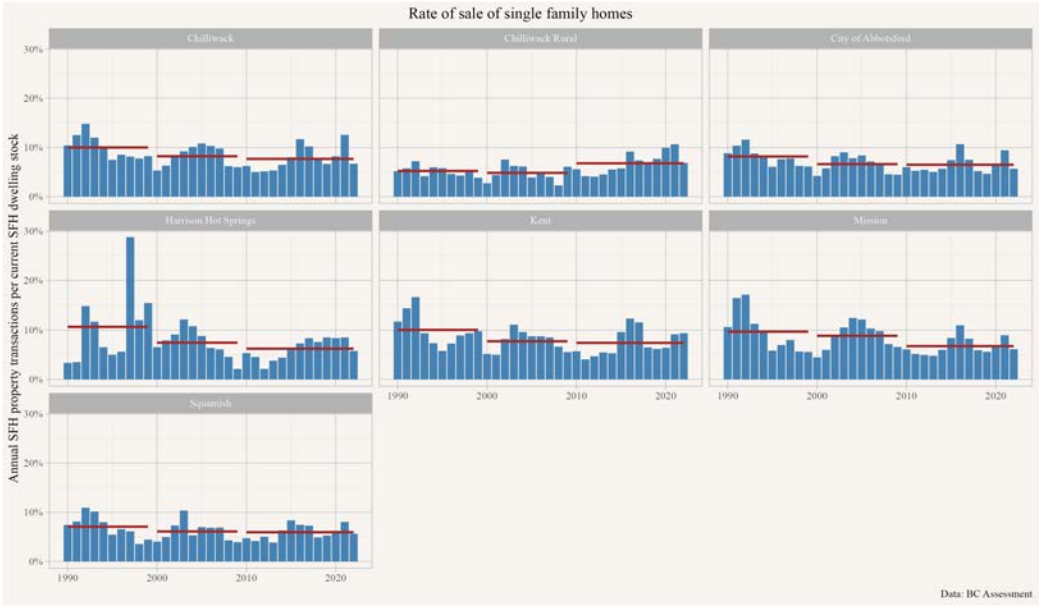

Figure 80: Sale speed in Abbotsford/Chilliwack area

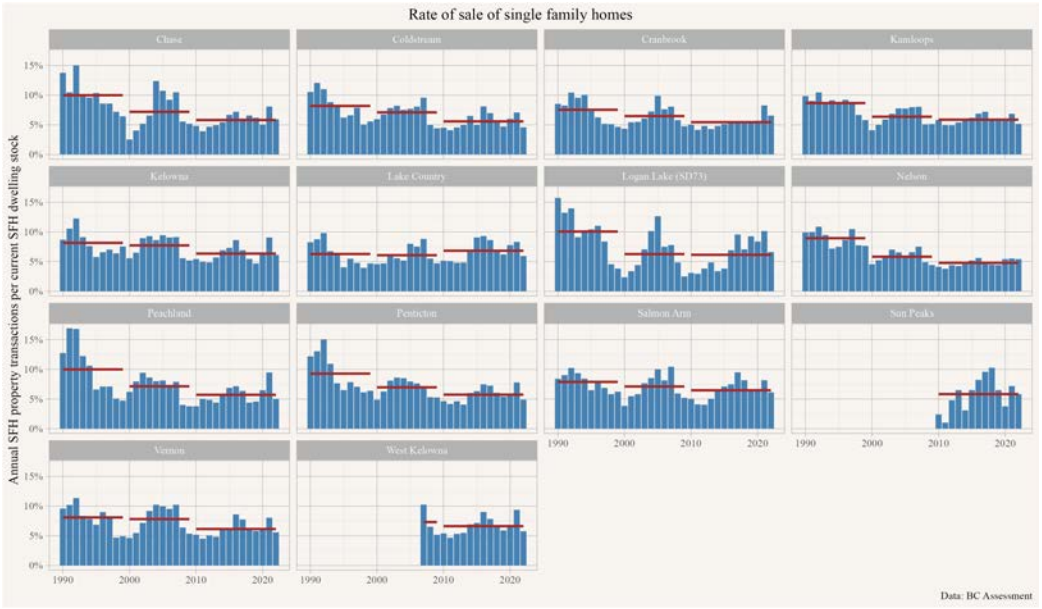

Figure 81: Sale speed in Okanagan area

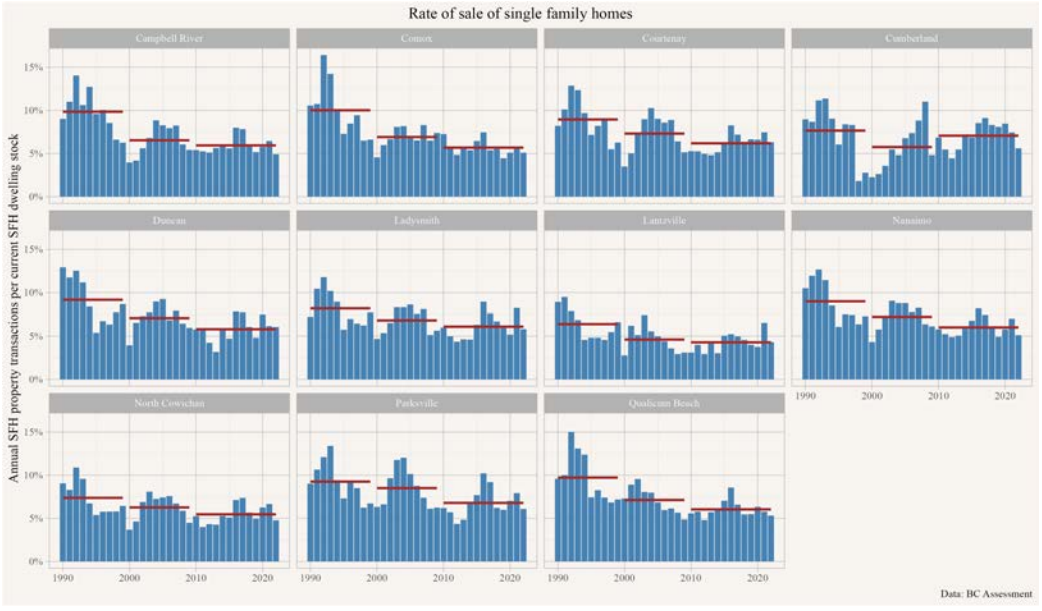

Figure 82: Sale speed in Vancouver Island area

C Frequent transit network

These reference maps show the frequent transit layers used for modelling. They may not precisely match provincial requirements or transit plans that incorporate planned increases in services.

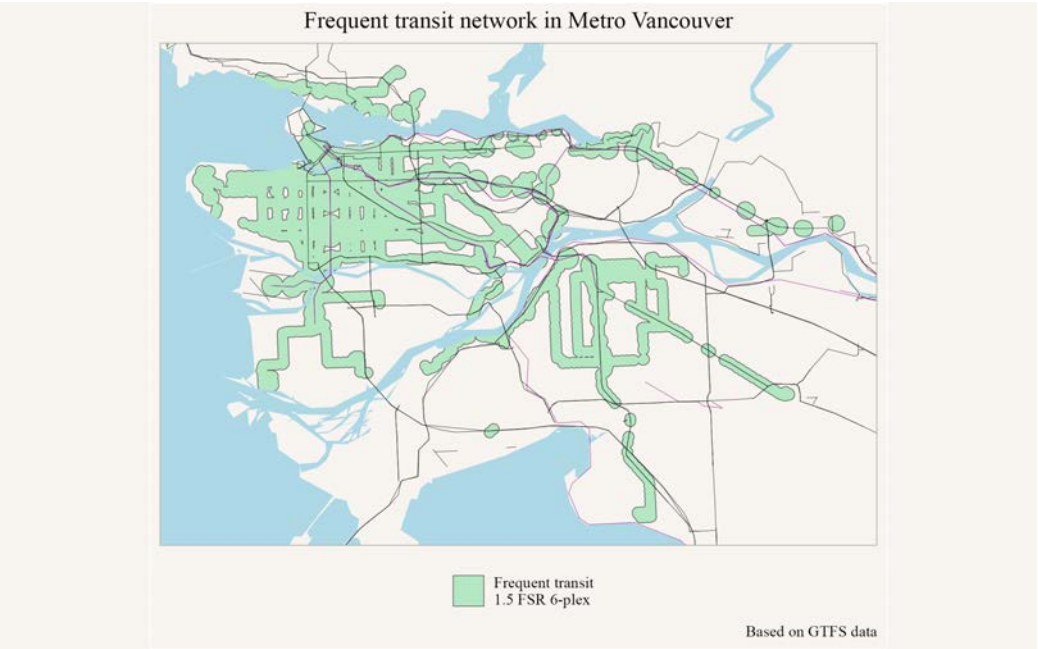

Figure 83: Frequent transit network in Metro Vancouver

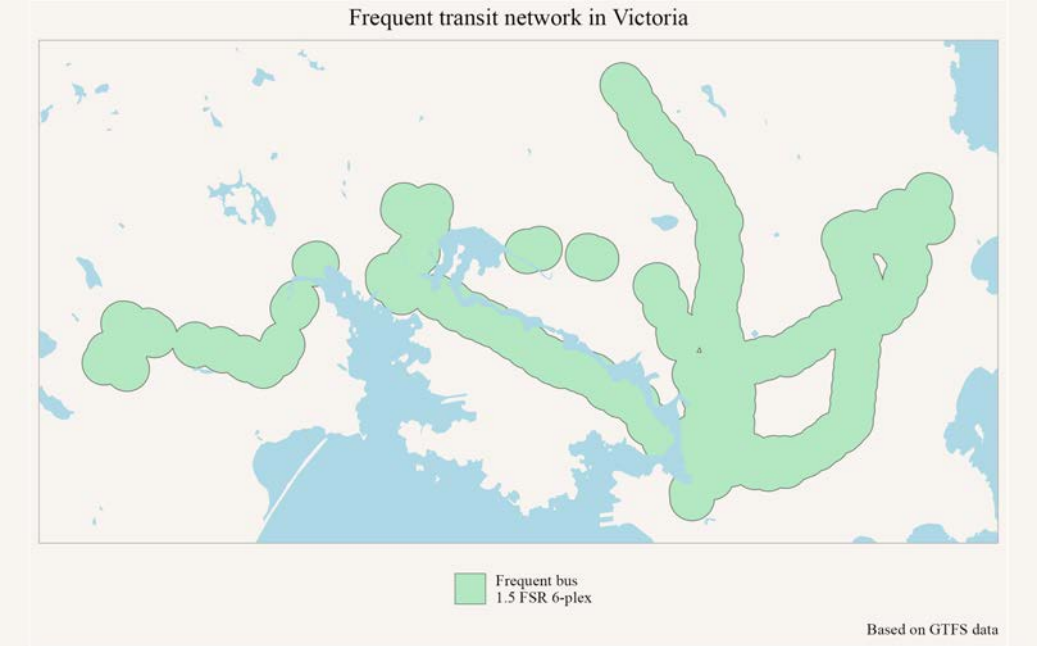

Figure 84: Frequent transit network in Metro Victoria

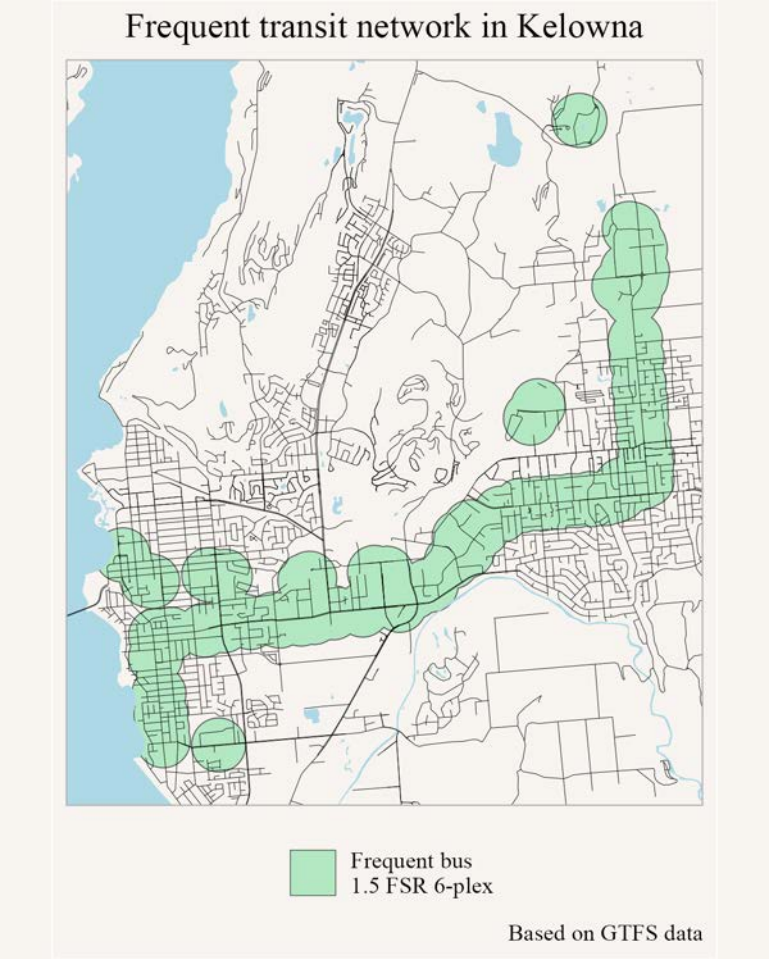

Figure 85: Frequent transit network in Metro Kelowna

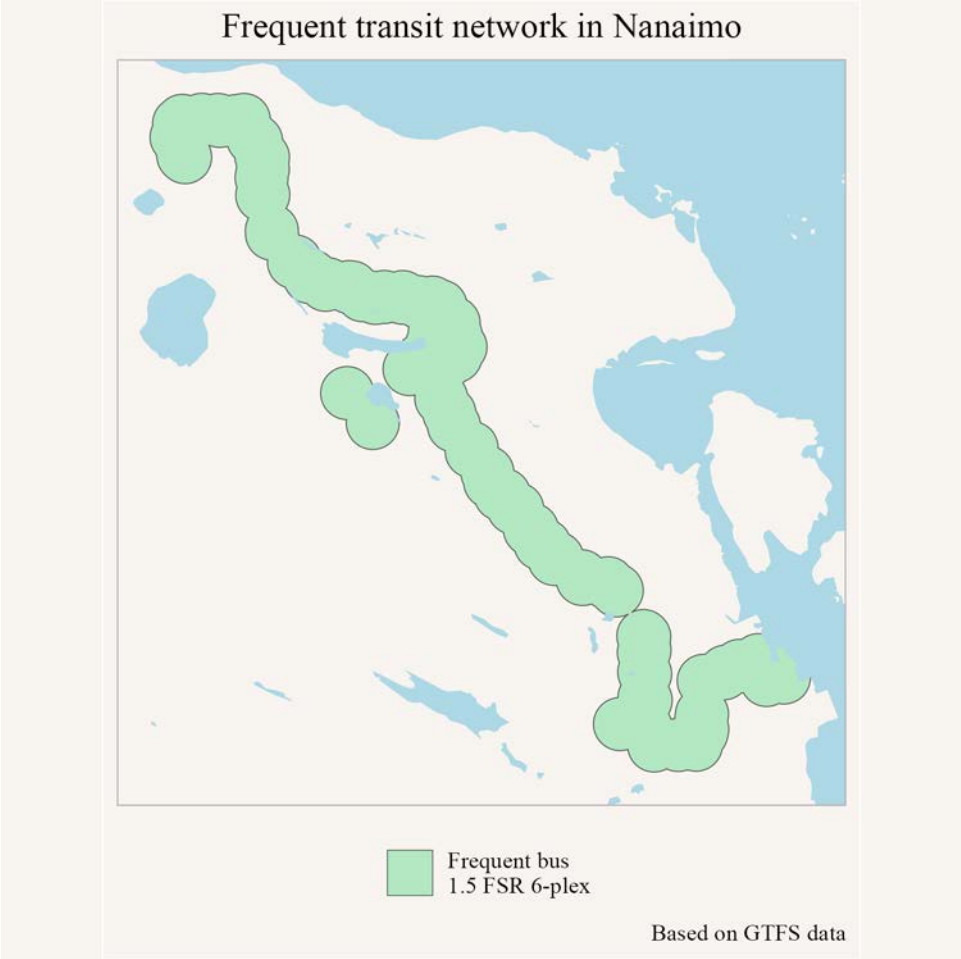

Figure 86: Frequent transit network in Metro Nanaimo

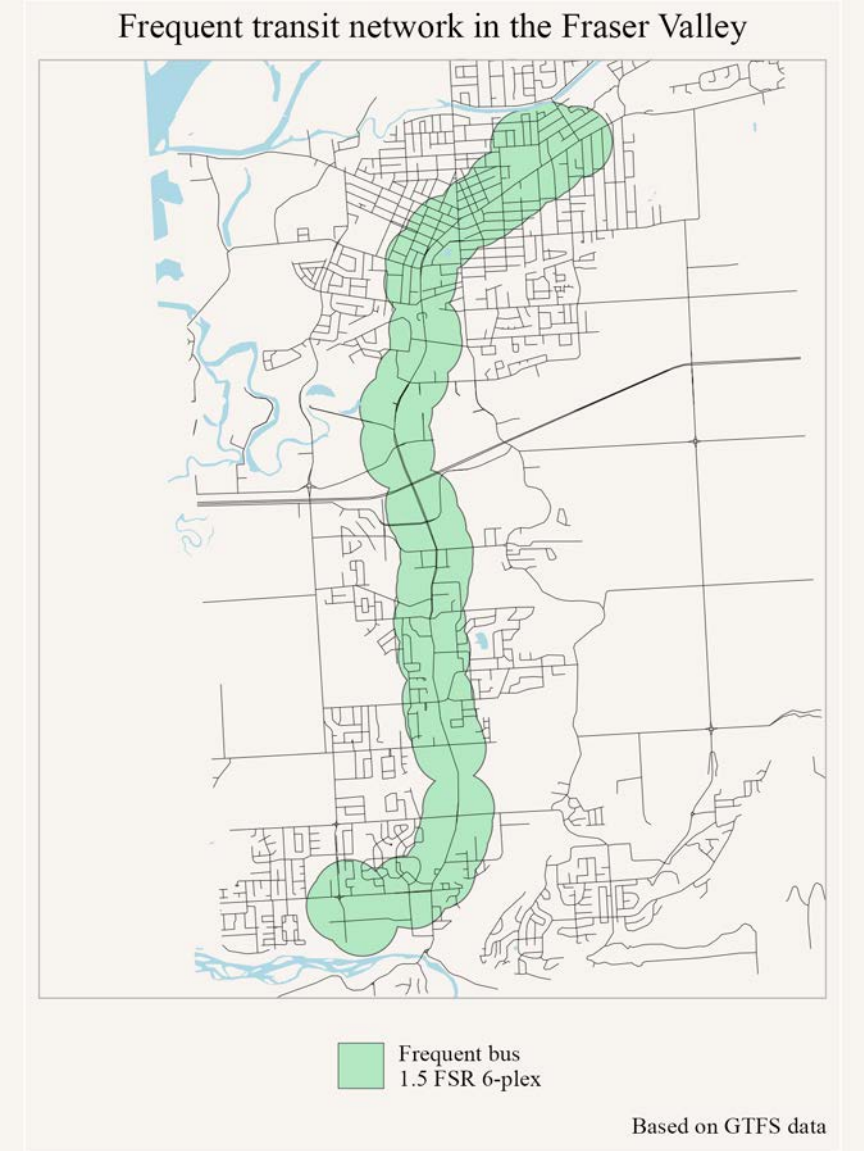

Figure 87: Frequent transit network in the Fraser Valley

D TOA area

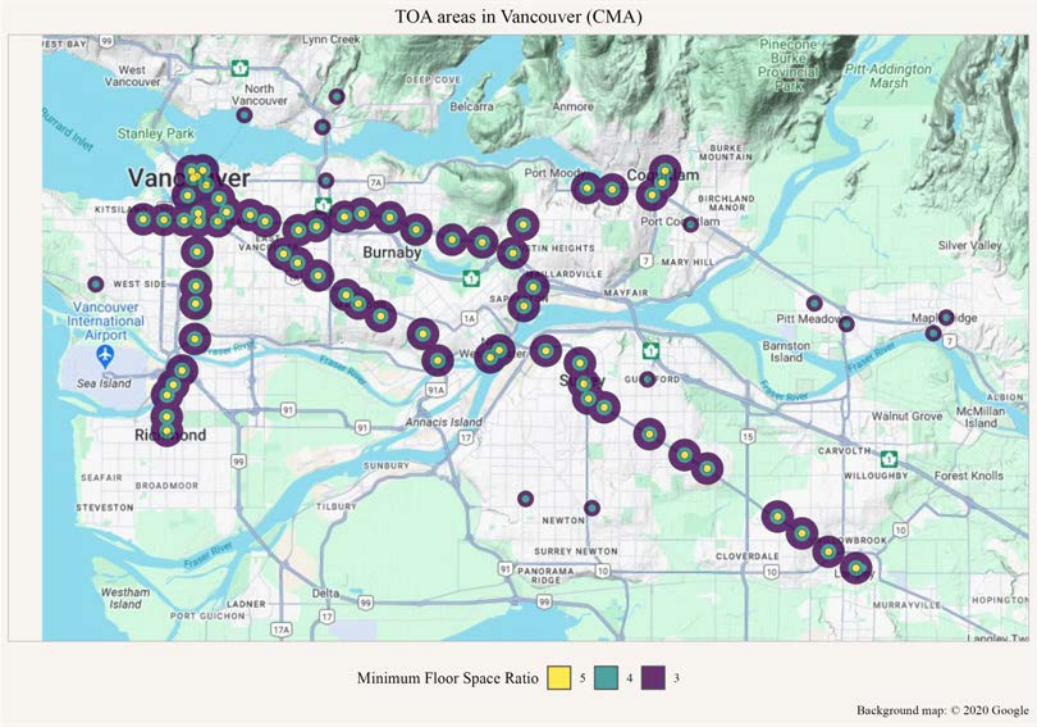

Figure 88: TOA in Metro Vancouver

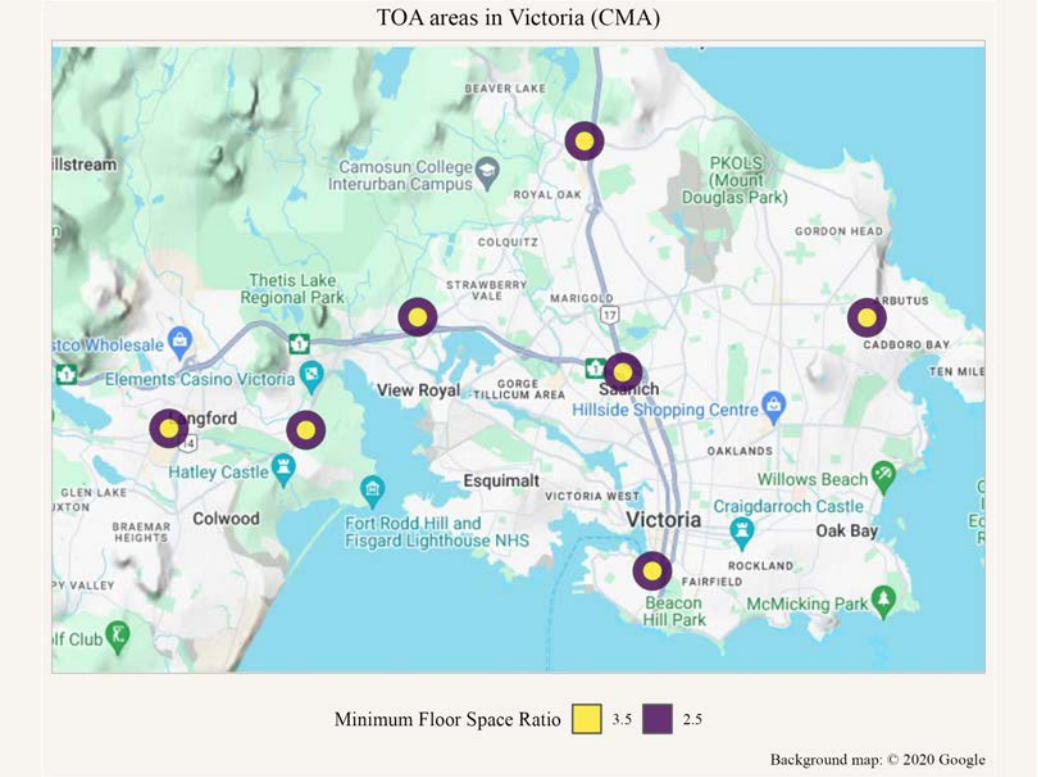

Figure 89: TOA in Metro Victoria

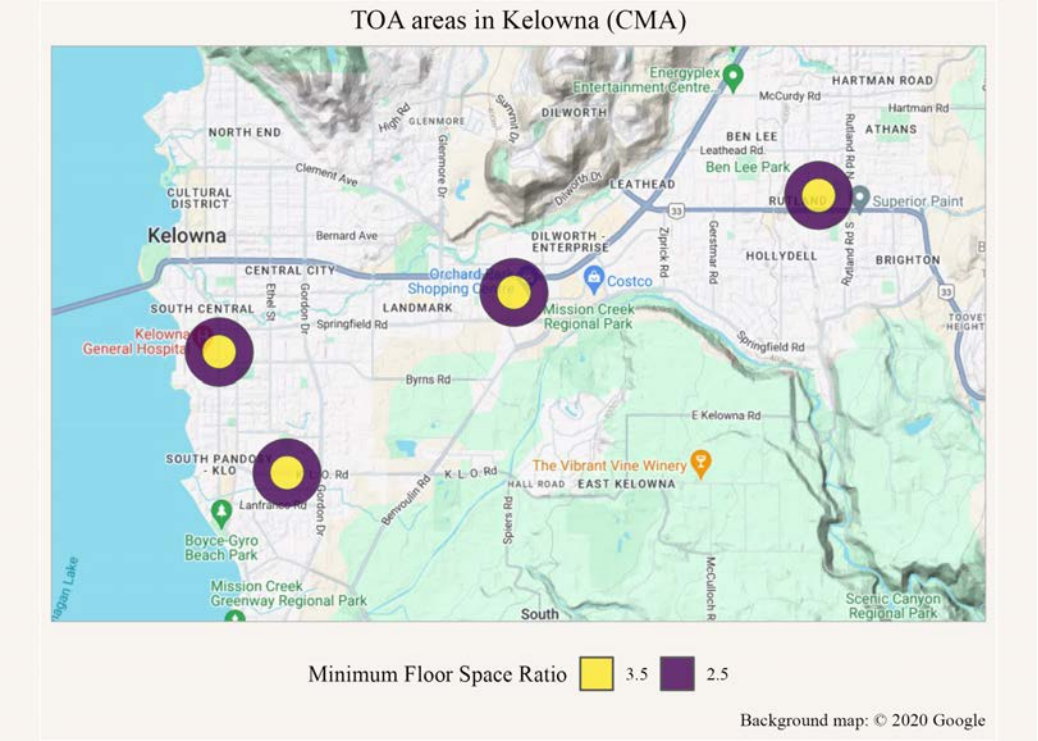

Figure 90: TOA in Metro Kelowna

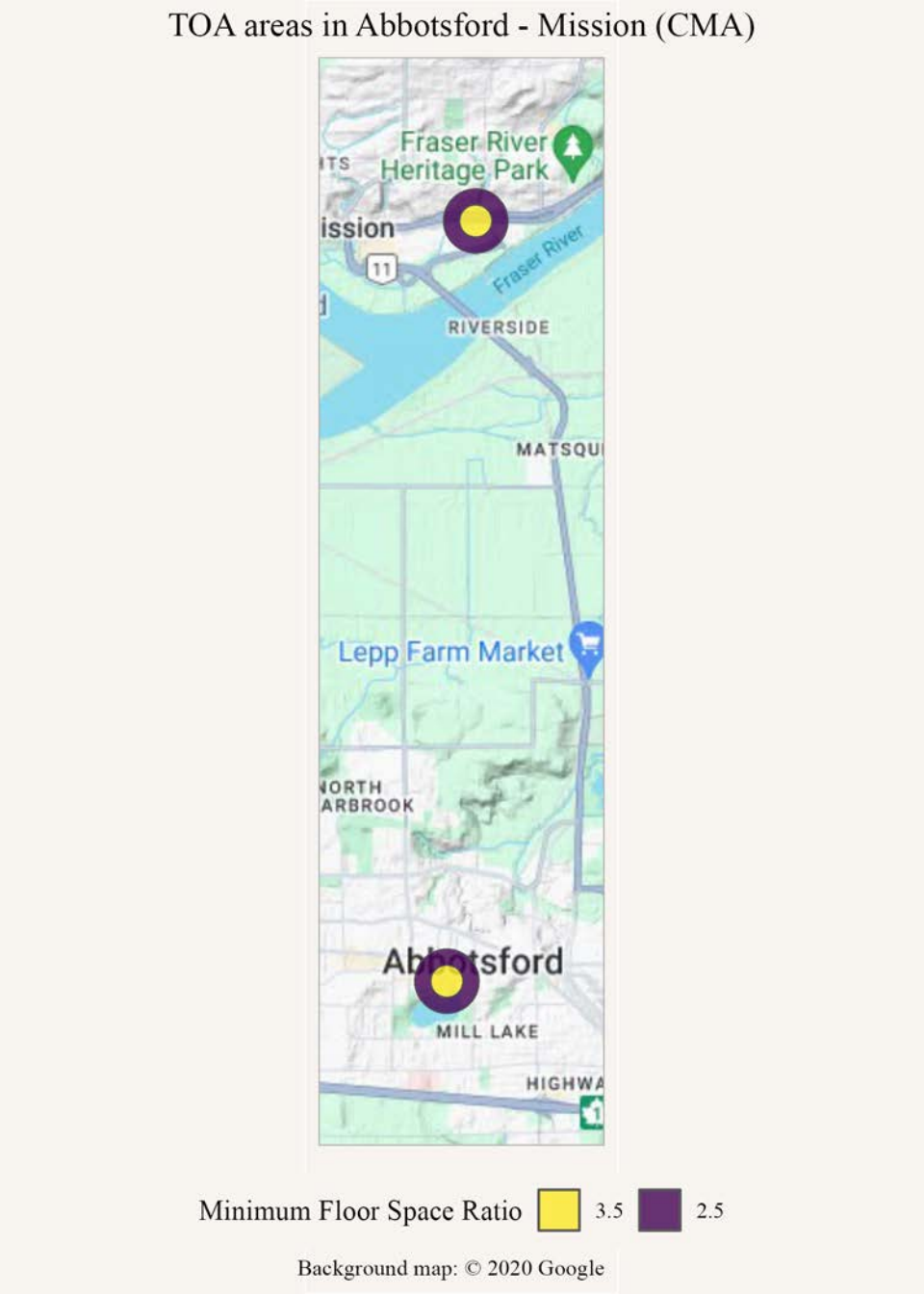

Figure 91: TOA in Metro Abbotsford-Mission

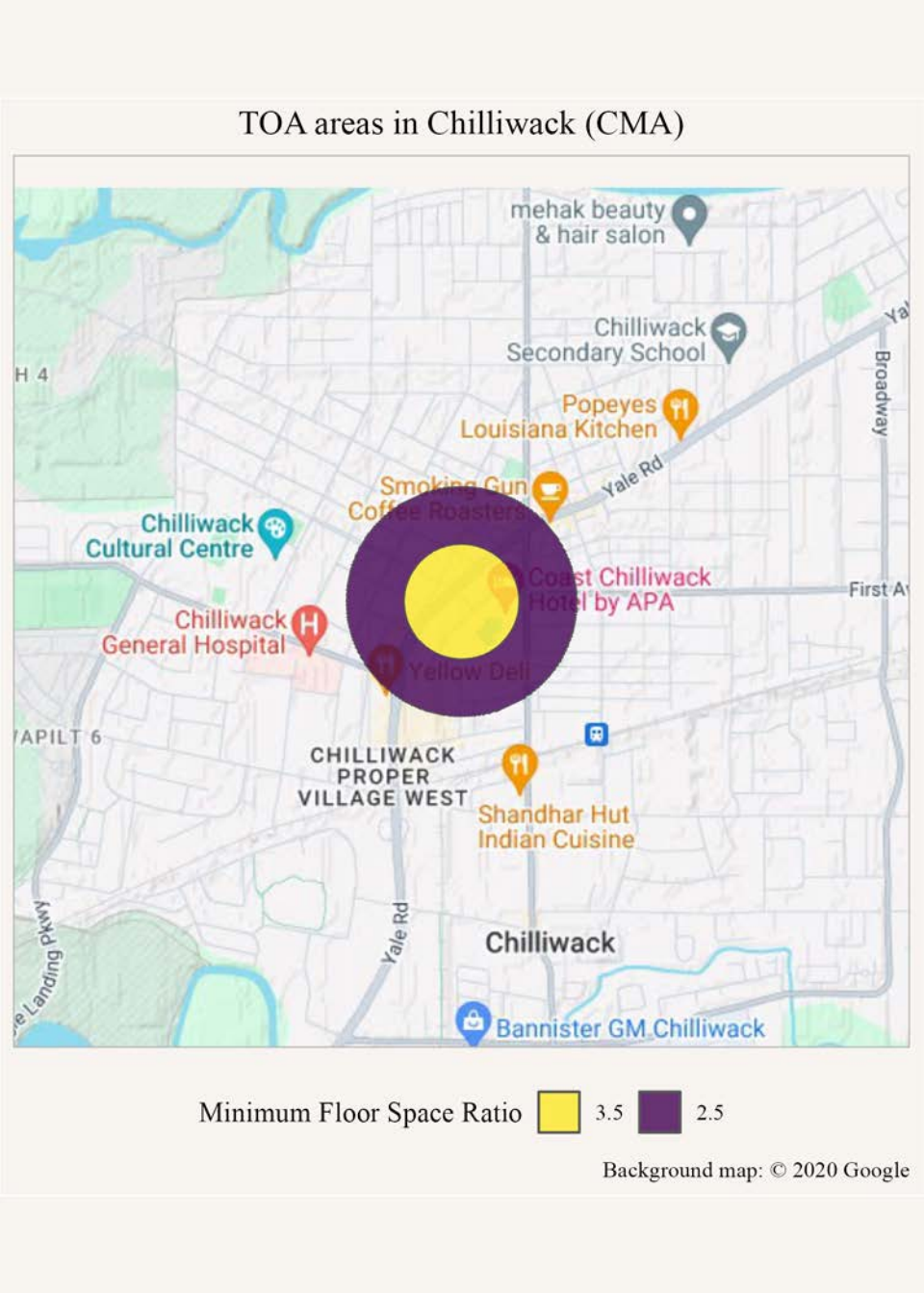

Figure 92: TOA in Metro Chilliwack

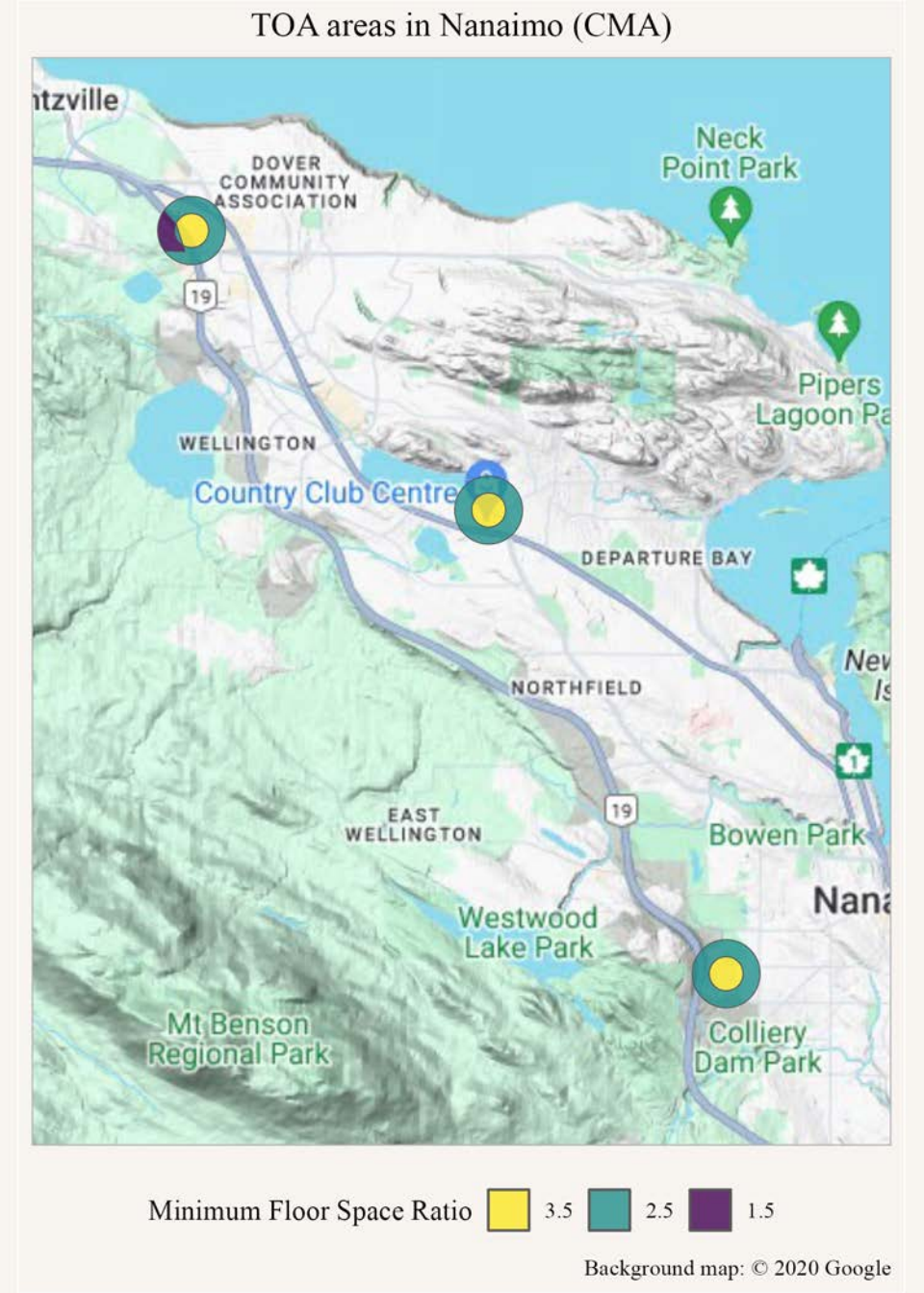

Figure 93: TOA in Metro Nanaimo

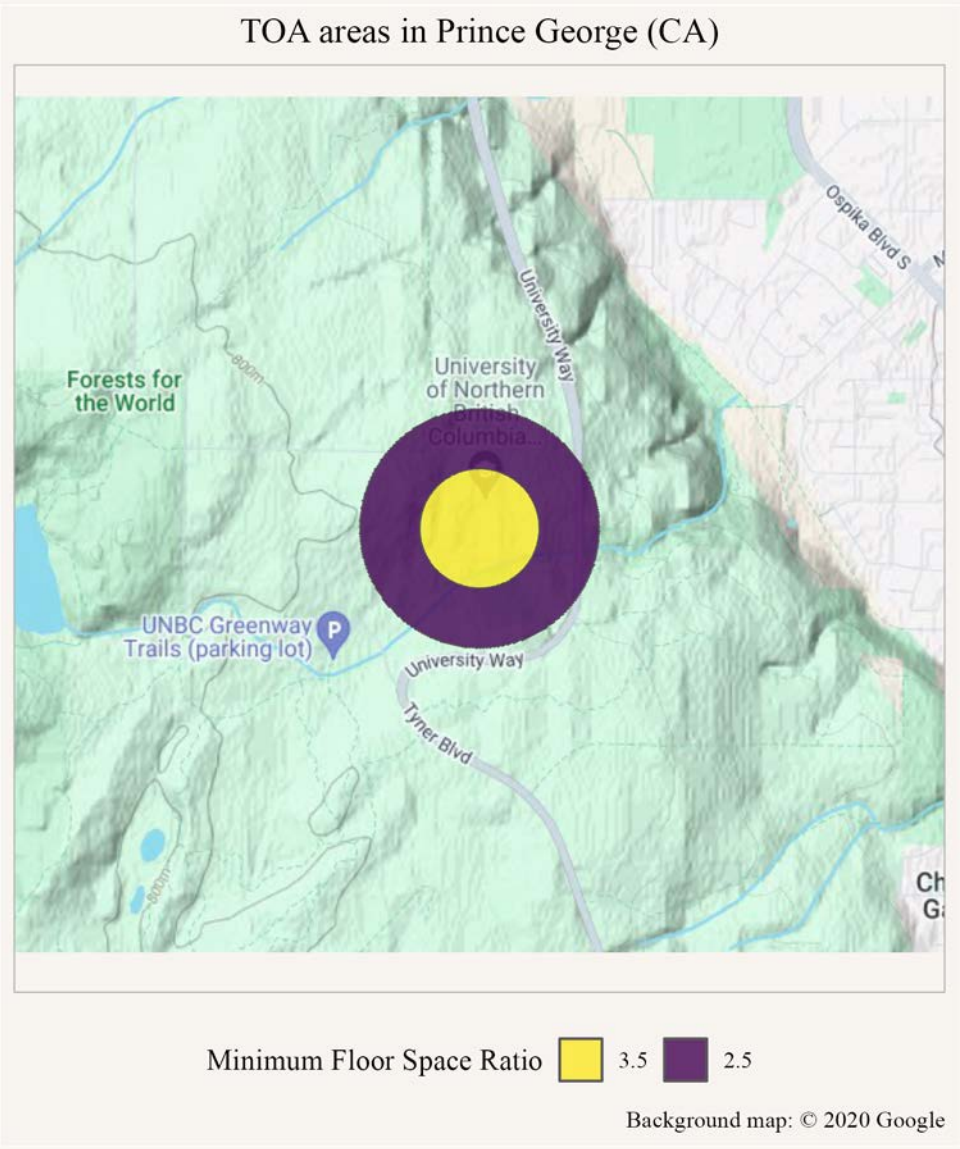

Figure 94: TOA in Prince George

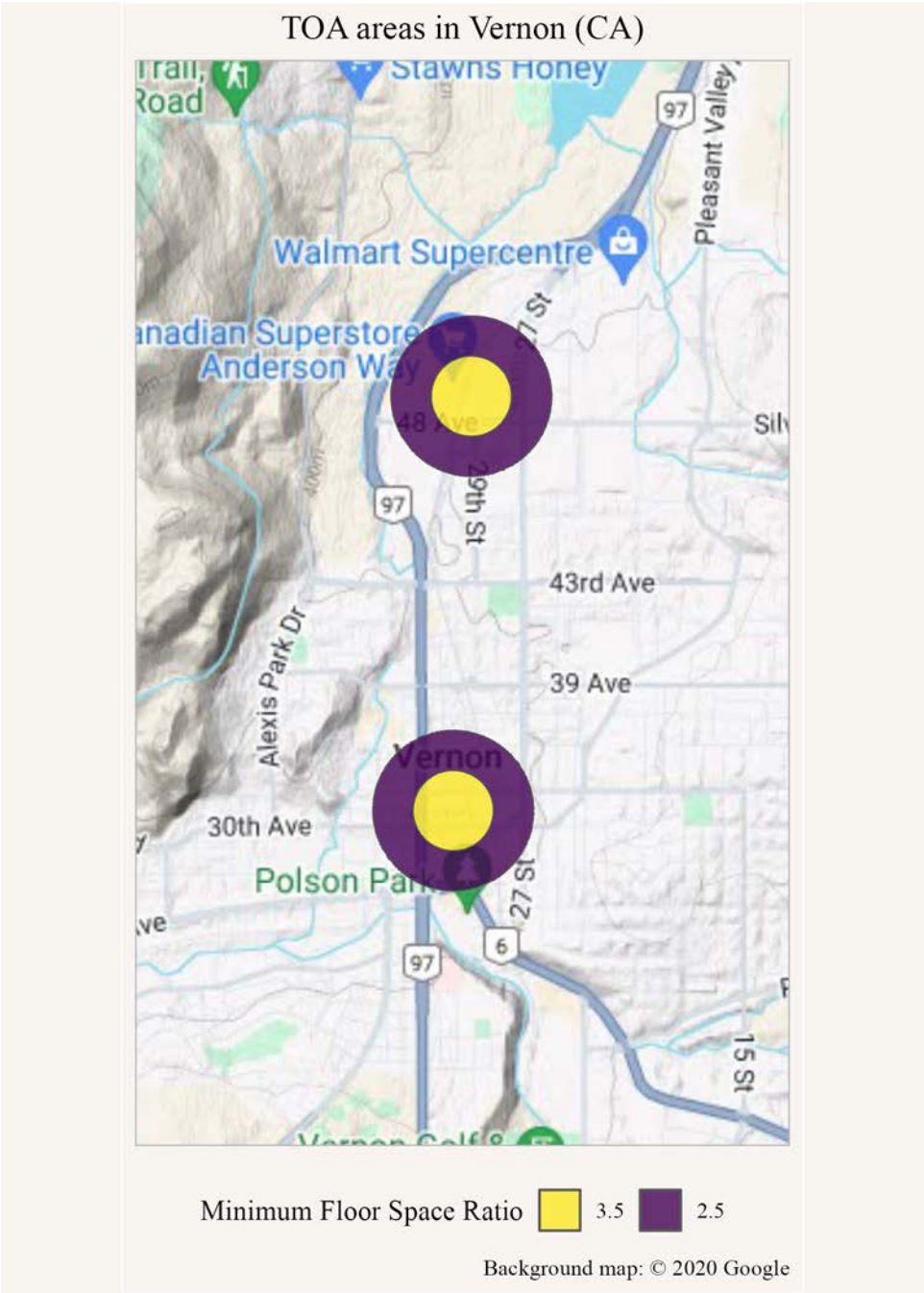

Figure 95: TOA in Vernon

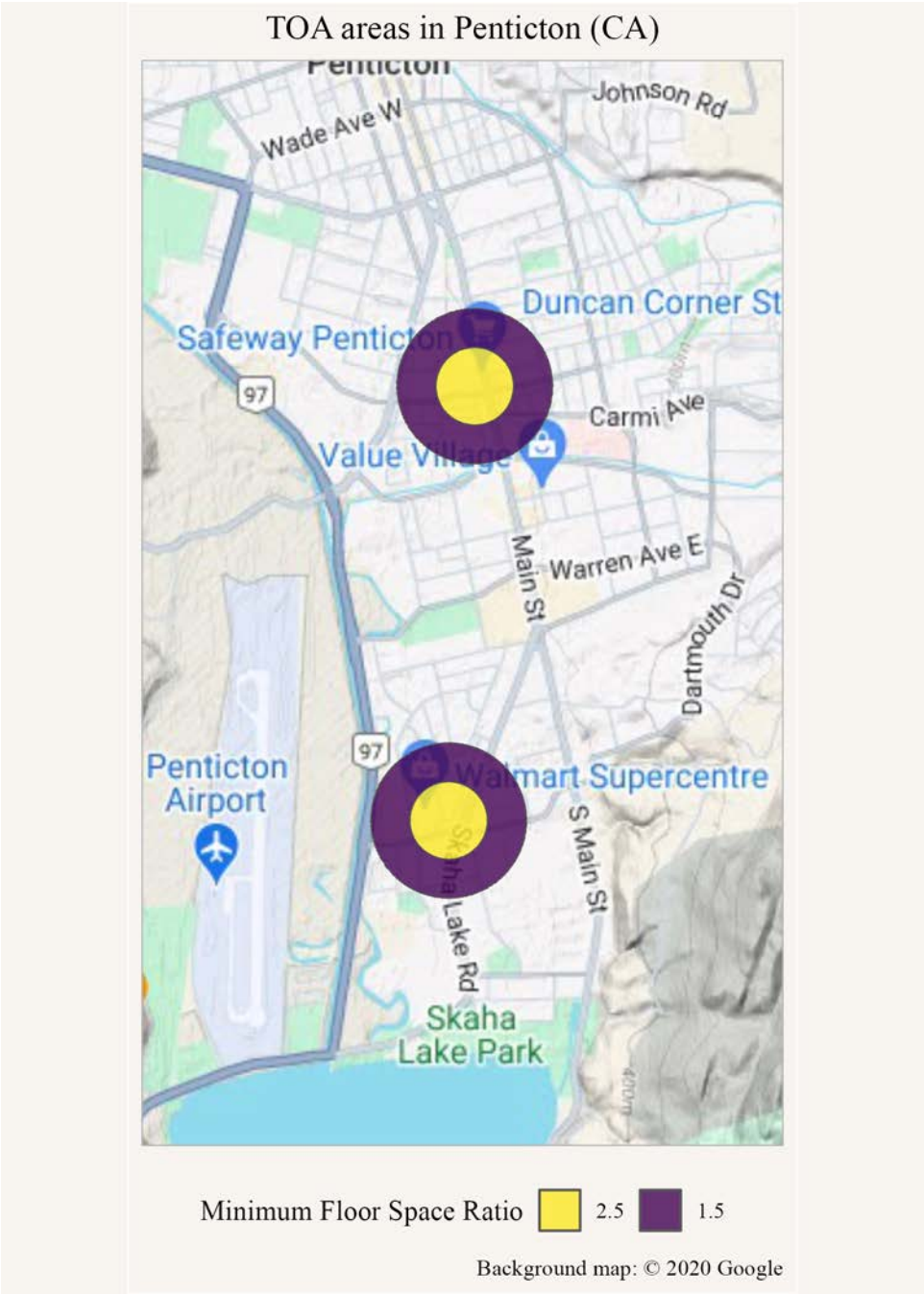

Figure 96: TOA in Penticton

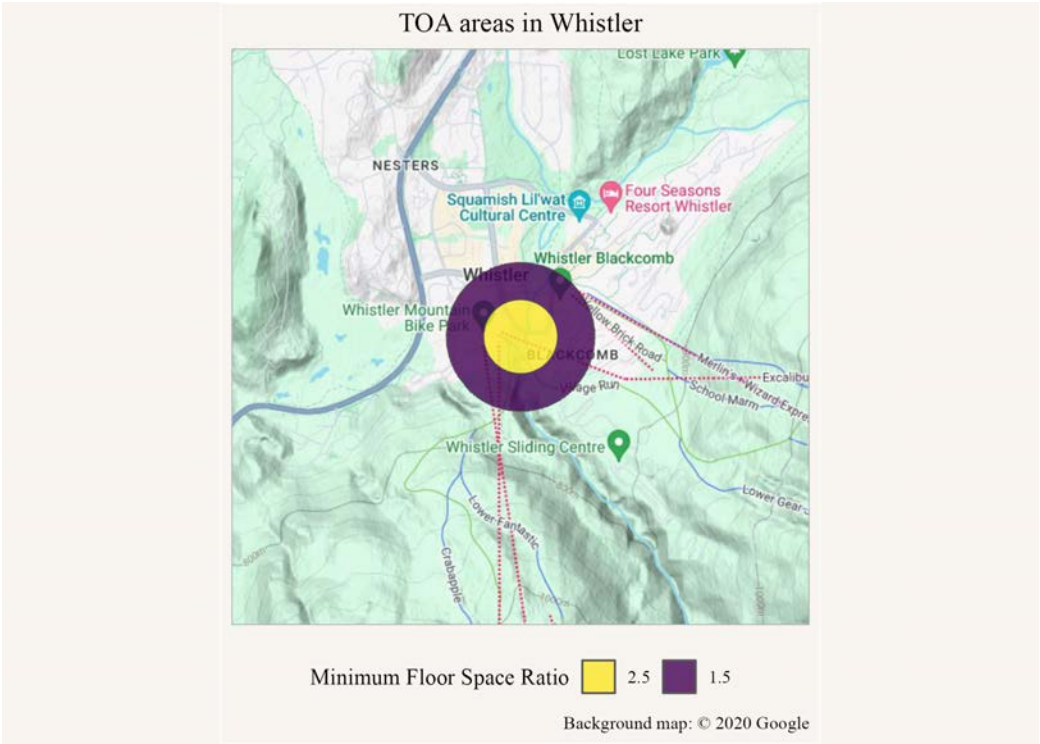

Figure 97: TOA in Whistler

E Geographic regions considered

The report targets all Census Metropolitan areas (CMAs) and Census Agglomerations (CAs) in British Columbia, collectively referred to as Regions", and the municipalities therein, excluding First Nation reserves and treaty areas. The analytic work is based on BC Assessment jurisdictions, which don't always map one-to-one onto Census geographies. Table 7 gives a detailed breakdown of municipalities and jurisdictions considered for each region. Within each region we follow the provincial SSMUH framework to consider current single family or duplex use as eligible for SSMUH, importantly excluding areas outside of regional growth boundaries where they exist and where we had data available. We also exclude lots larger than 2 acres as a proxy for rural areas.

Jurisdiction	JUR	Number of parcels	Share in region
Vancouver			
Vancouver	200	217,811	100%
Surrey	326	170,718	100%
Burnaby	301	91,207	100%
Richmond	320	87,738	100%
Coquitlam	305	52,746	100%
Langley - Township	311	51,241	100%
Delta	306	35,904	100%
North Vancouver - Dist	316	35,261	100%
Maple Ridge	312	33,375	100%
New Westminster	220	26,204	100%
Port Coquitlam	224	22,355	100%
North Vancouver - City	221	20,837	100%
West Vancouver	328	17,359	99%
Port Moody	225	13,530	100%
Langley - City	216	11,464	100%
White Rock	236	9,663	100%
Pitt Meadows	319	7,560	100%
Lower Mainland Rural	739	4,845	100%
University Endowment Lands	631	1,373	100%
Anmore	501	853	100%
Lions Bay	537	615	98%
Belcarra	504	357	93%
Lower Mainland Rural	736	59	100%
Lower Mainland Rural	744	55	92%
Victoria			
Saanich (SD61)	308	32,287	100%
Victoria	234	31,948	100%
Langford	327	17,424	100%
Saanich (SD63)	309	9,116	100%
Colwood	213	7,231	100%
Oak Bay	317	6,859	100%
Sooke	349	6,741	99%
Central Saanich	302	6,723	99%
Sidney	476	6,421	99%
Esquimalt	307	5,325	97%
North Saanich	332	5,207	99%
View Royal (SD61)	401	4,043	99%
Metchosin	344	1,805	99%
Highlands (SD62)	362	825	100%
Highlands (SD61)	361	150	100%
View Royal (SD62)	402	23	100%
Highlands (SD63)	363	8	100%

(continued)

Jurisdiction	JUR	Number of parcels	Share in region
Saanich (SD62)	389	4	100%
Kelowna			
Kelowna	217	44,831	99%
Kelowna	214	15,239	100%
West Kelowna	364	14,848	99%
Lake Country	331	6,749	97%
Central Okanagan Rural	723	5,521	96%
Peachland	318	2,966	99%
Abbotsford - Mission			
City of Abbotsford	313	50,171	100%
Mission	314	14,797	100%
Chilliwack			
Chilliwack	303	34,903	100%
Chilliwack Rural	733	3,772	99%
Kent	310	2,863	98%
Harrison Hot Springs	527	1,975	99%
Kamloops			
Kamloops	212	38,386	100%
Sun Peaks	544	1,839	100%
Chase	512	1,522	99%
Logan Lake (SD73)	538	1,386	100%
Logan Lake (SD74)	536	4	100%
Nanaimo			
Nanaimo	250	39,267	100%
Lantzville (SD 68)	350	1,661	100%
Lantzville (SD 69)	351	80	98%
Prince George			
Prince George	226	31,332	100%
Vernon			
Vernon	233	19,841	99%
Coldstream	304	4,750	98%
Courtenay			
Courtenay	204	13,196	100%
Comox	412	6,295	100%
Cumberland	516	1,892	100%
Penticton			
Penticton	222	16,524	100%
Penticton Rural	777	397	89%
Duncan			
North Cowichan	315	14,561	99%

(continued)

Jurisdiction	JUR	Number of parcels	Share in region
Duncan	207	2,278	100%
Campbell River			
Campbell River	336	15,120	99%
Cranbrook			
Cranbrook	205	9,356	100%
Cranbrook Rural	702	5,156	99%
Parksville			
Parksville	559	7,707	100%
Qualicum Beach	565	5,107	100%
Squamish			
Squamish	338	10,766	99%
Fort St. John			
Fort St John	420	9,190	100%
Taylor	577	859	100%
Port Alberni			
Port Alberni	223	9,231	100%
Salmon Arm			
Salmon Arm	322	8,754	100%
Prince Rupert			
Prince Rupert	227	7,597	99%
Port Edward	564	1,155	98%
Powell River			
Powell River	330	6,492	99%
Trail			
Trail	232	4,131	100%
Fruitvale	521	871	100%
Warfield	588	832	100%
Montrose	548	489	100%
Nelson			
Nelson	219	4,786	100%

Table 7: Jurisdictions by geographic region

F Price surfaces and development option across regions

These graphs show the model results described in Section 3 and Section 5 for the other regions considered. The price surface shows the geographic distribution of the estimated prices a standardized new multiplex unit is estimated to sell for as described in Section 3.3. The development option shows the difference between the expected price per square foot a new multiplex unit to the cost to redevelop the existing use into multiplexes, including buying the land and developer profit as described in Section 5. The distribution of single family properties by development option for each jurisdiction is shown in the third graph.

While the model is applied on a lot by lot basis and the maps reflect that, the model is not designed to have lot level accuracy but is designed to be accurate at the broad neighbourhood and jurisdiction level. The maps are intended to show the geographic distribution of the model results, not to show the price or development option for specific lots.

F.1 Victoria

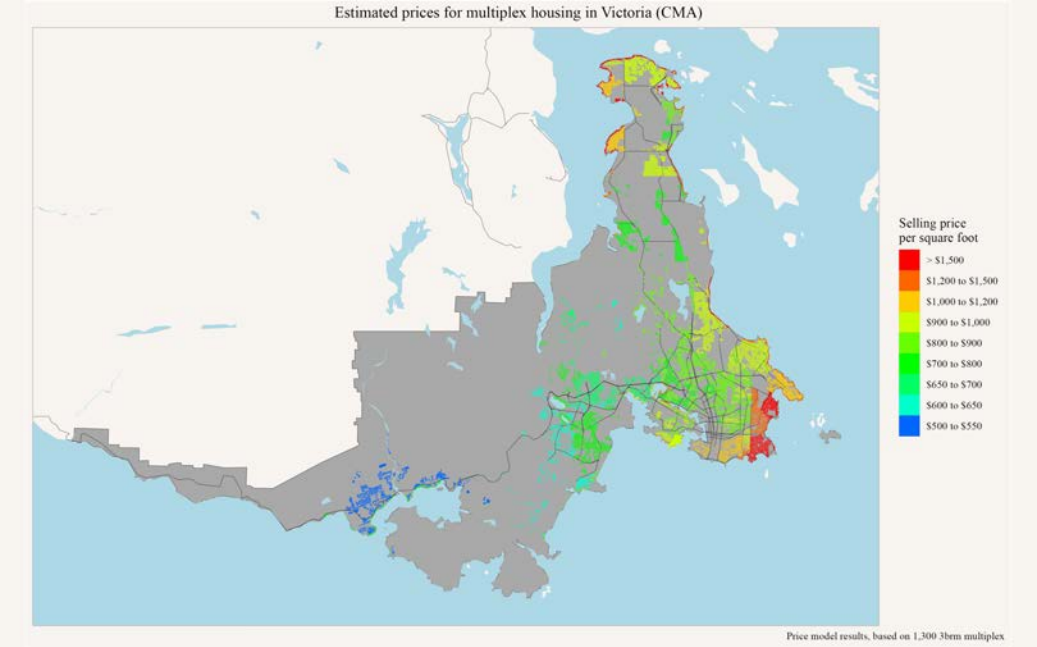

Figure 98: Victoria price surface for hypothetical 1,300sf 3 bedroom multiplex unit, price per square foot.

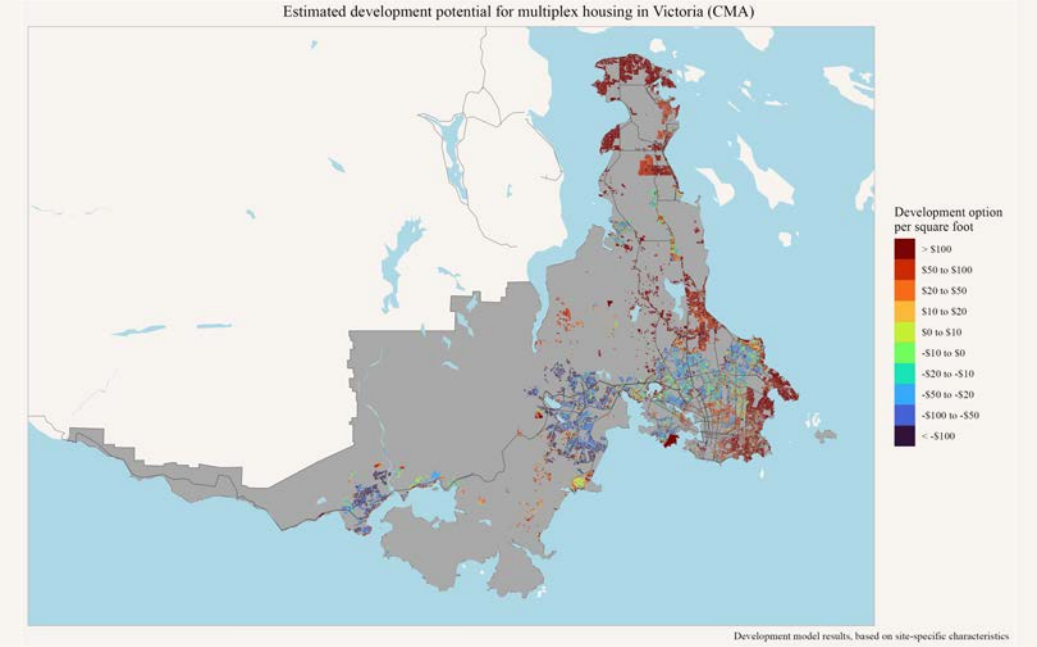

Figure 99: Victoria development option, expected prices per square foot beyond profitable cost to deliver multiplex housing.

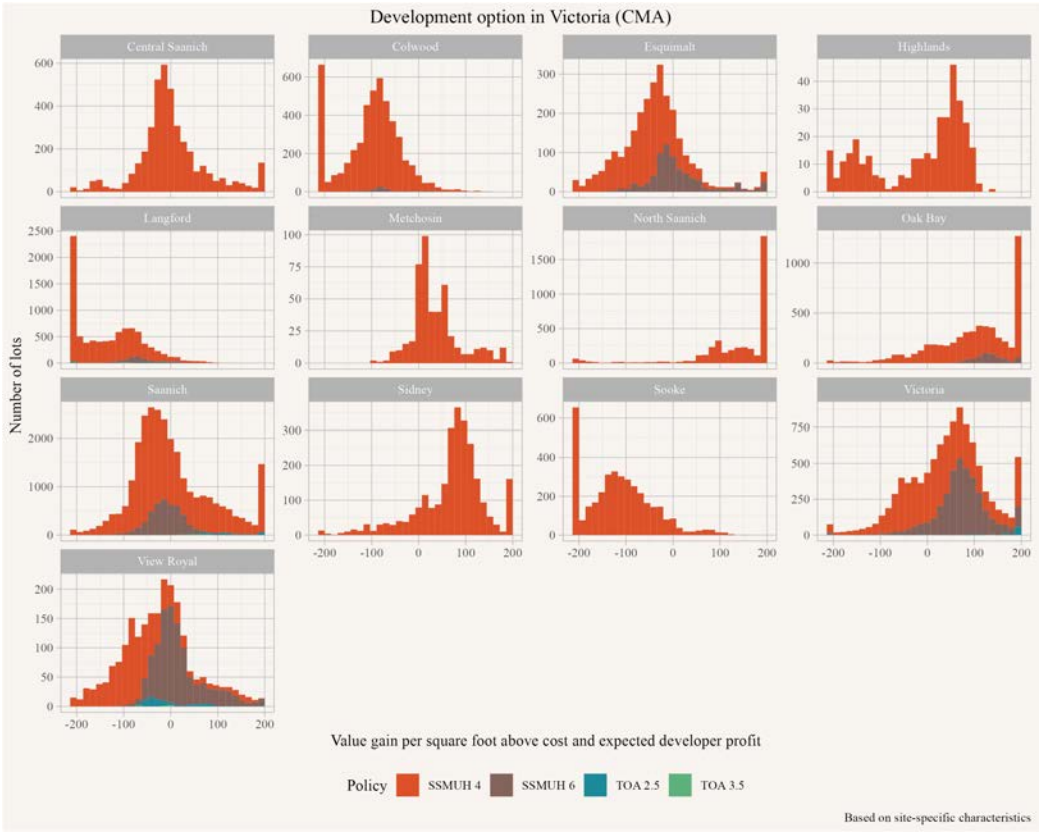

Figure 100: Victoria development option summary by jurisdiction, expected prices per square foot beyond profitable cost to deliver multiplex housing.

F.2 Kelowna

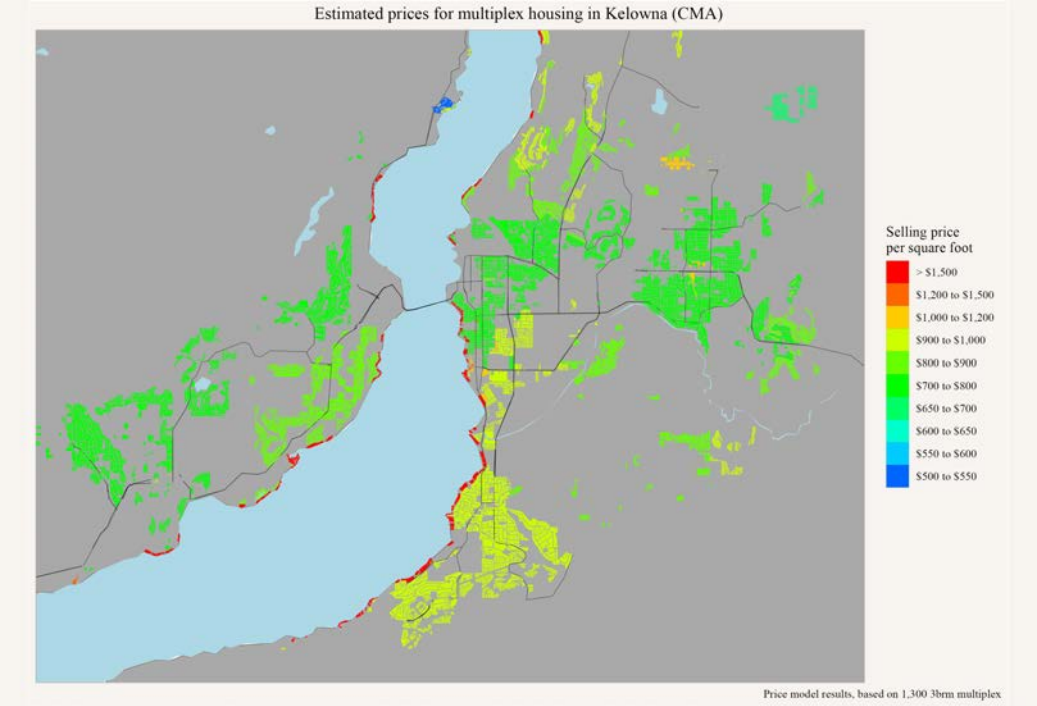

Figure 101: Kelowna price surface for hypothetical 1,300sf 3 bedroom multiplex unit, price per square foot.

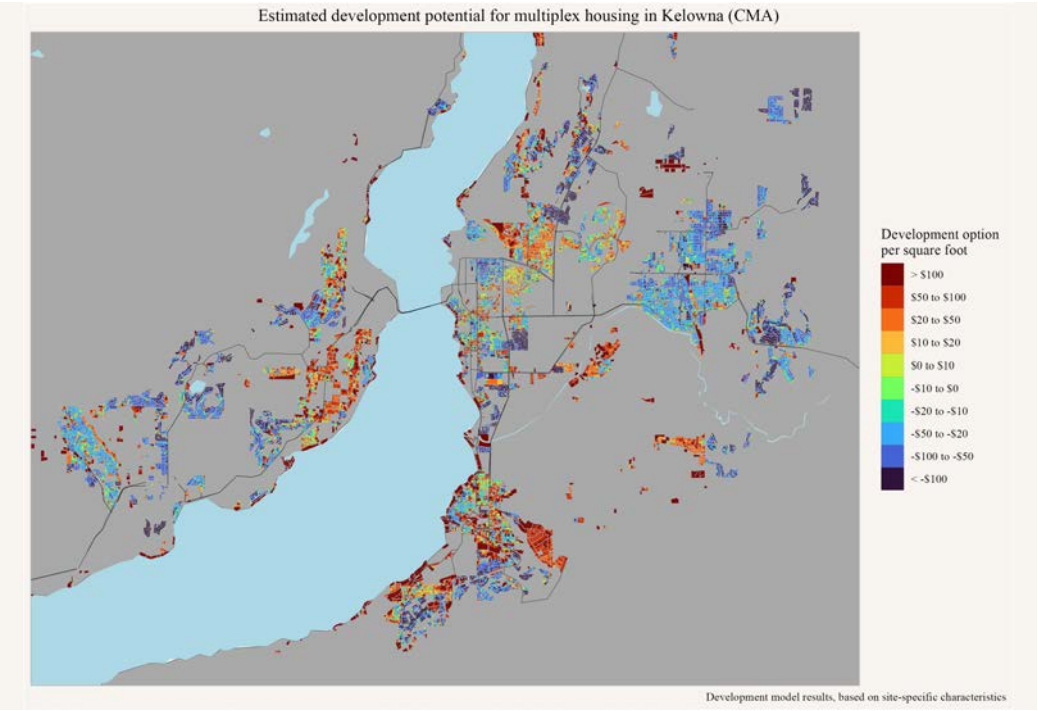

Figure 102: Kelowna development option, expected prices per square foot beyond profitable cost to deliver multiplex housing.

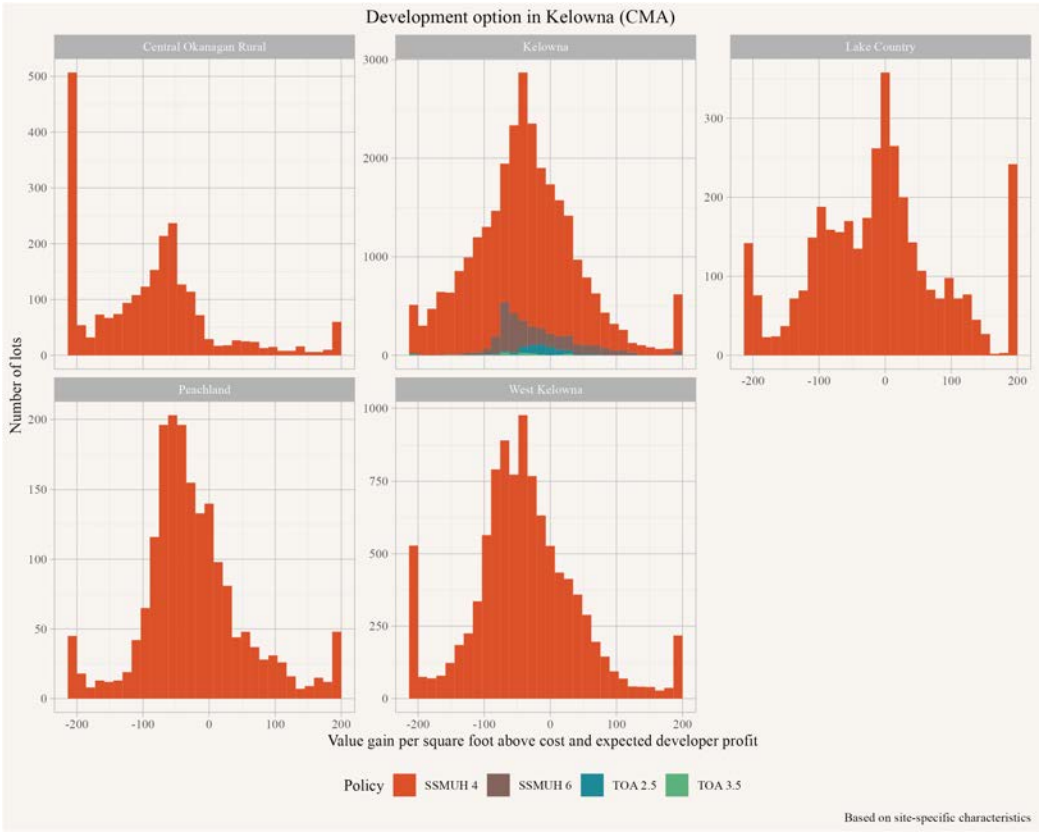

Figure 103: Kelowna development option summary by jurisdiction, expected prices per square foot beyond profitable cost to deliver multiplex housing.

F.3 Abbotsford - Mission

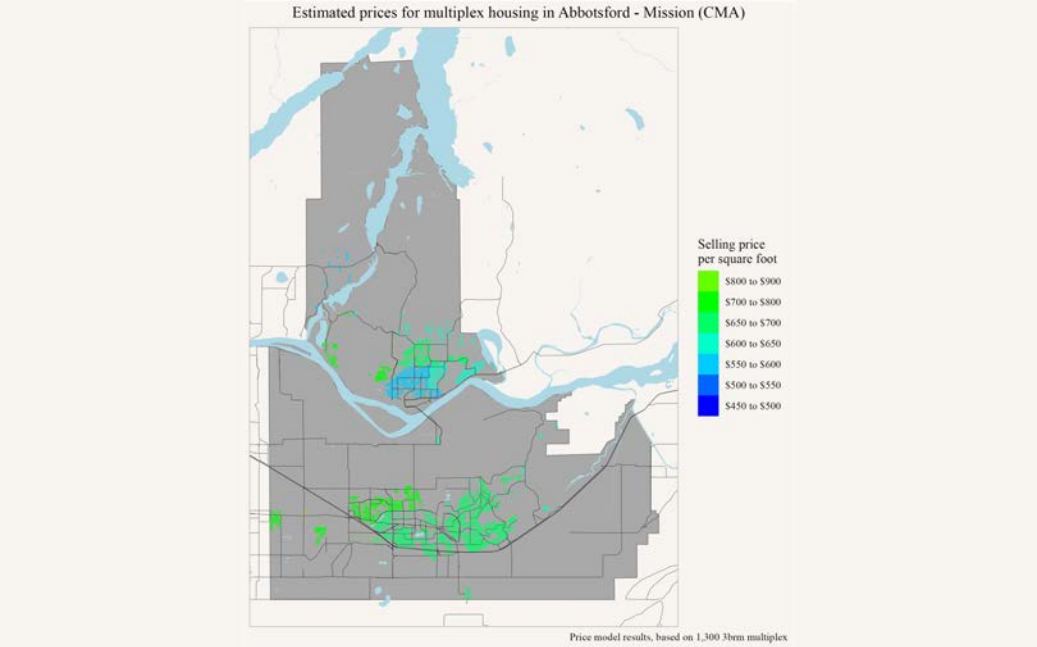

Figure 104: Abbotsford - Mission price surface for hypothetical 1,300sf 3 bedroom multiplex unit, price per square foot.

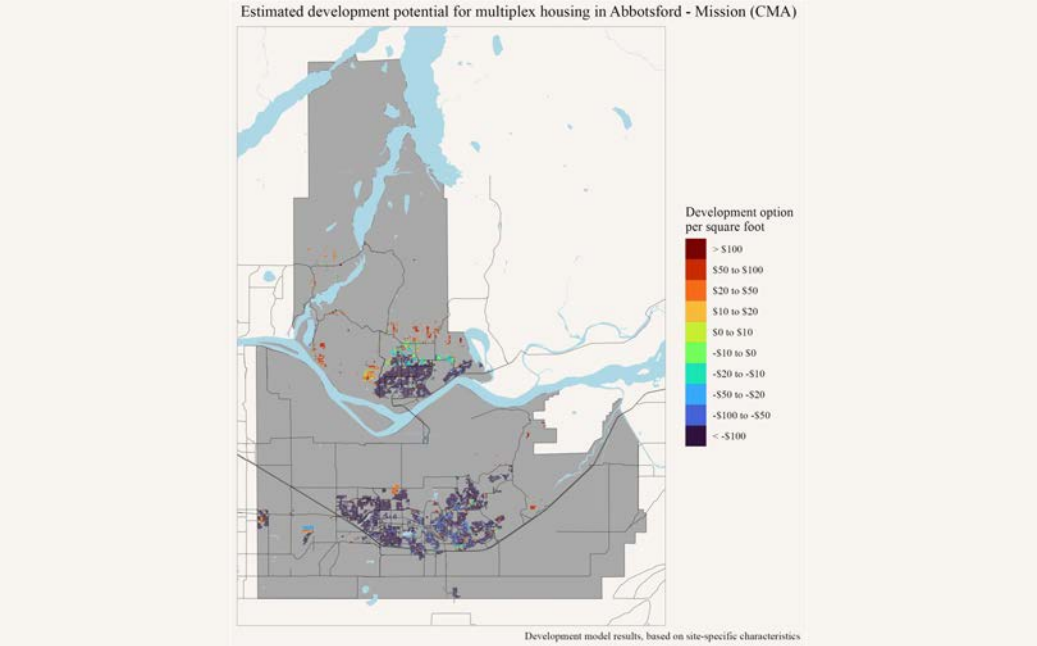

Figure 105: Abbotsford - Mission development option, expected prices per square foot beyond profitable cost to deliver multiplex housing.

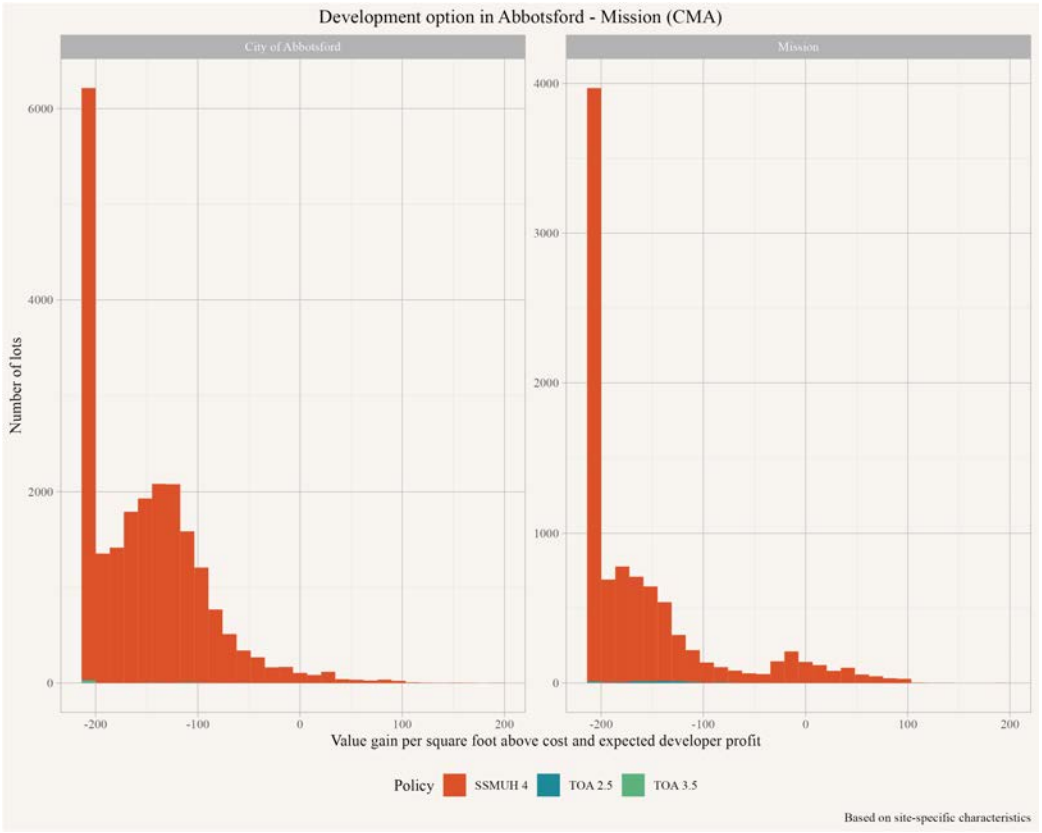

Figure 106: Abbotsford - Mission development option summary by jurisdiction, expected prices per square foot beyond profitable cost to deliver multiplex housing.

F.4 Nanaimo

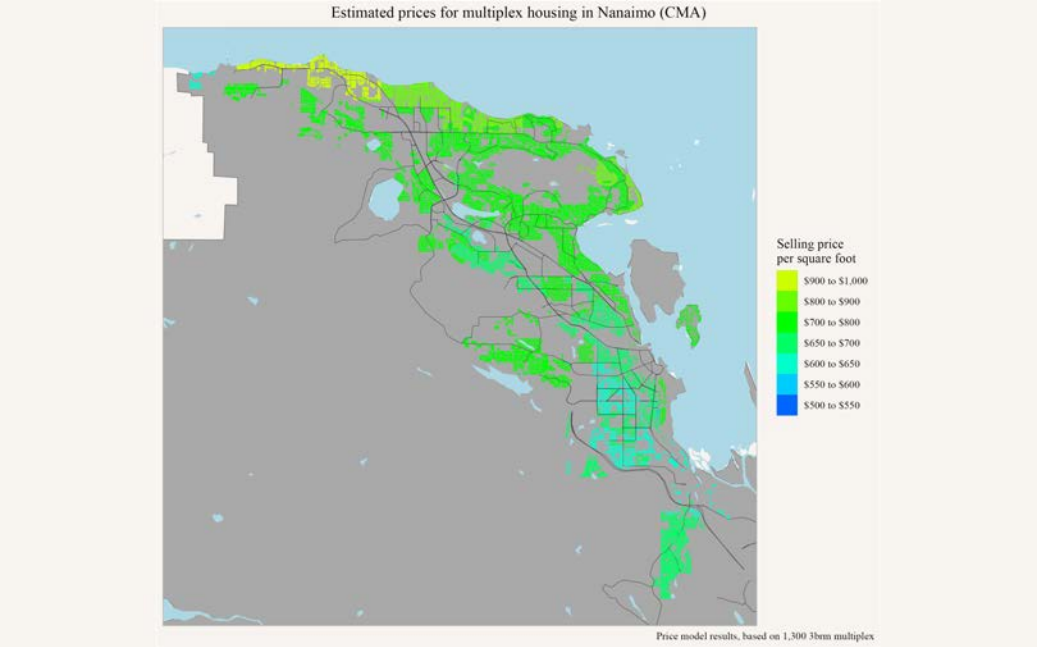

Figure 107: Nanaimo price surface for hypothetical 1,300sf 3 bedroom multiplex unit, price per square foot.

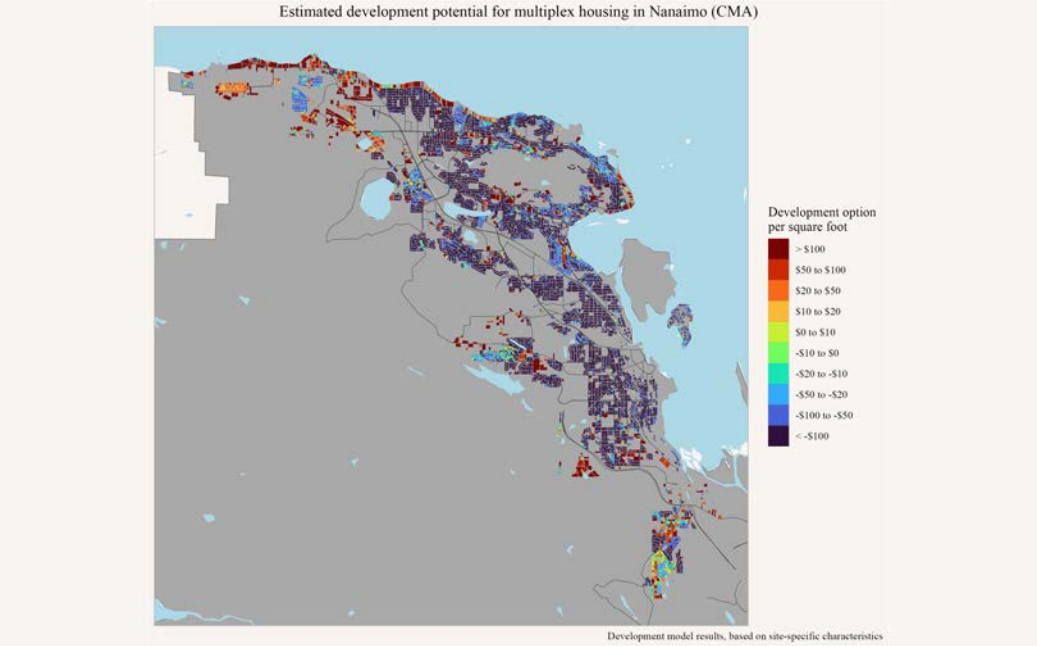

Figure 108: Nanaimo development option, expected prices per square foot beyond profitable cost to deliver multiplex housing.

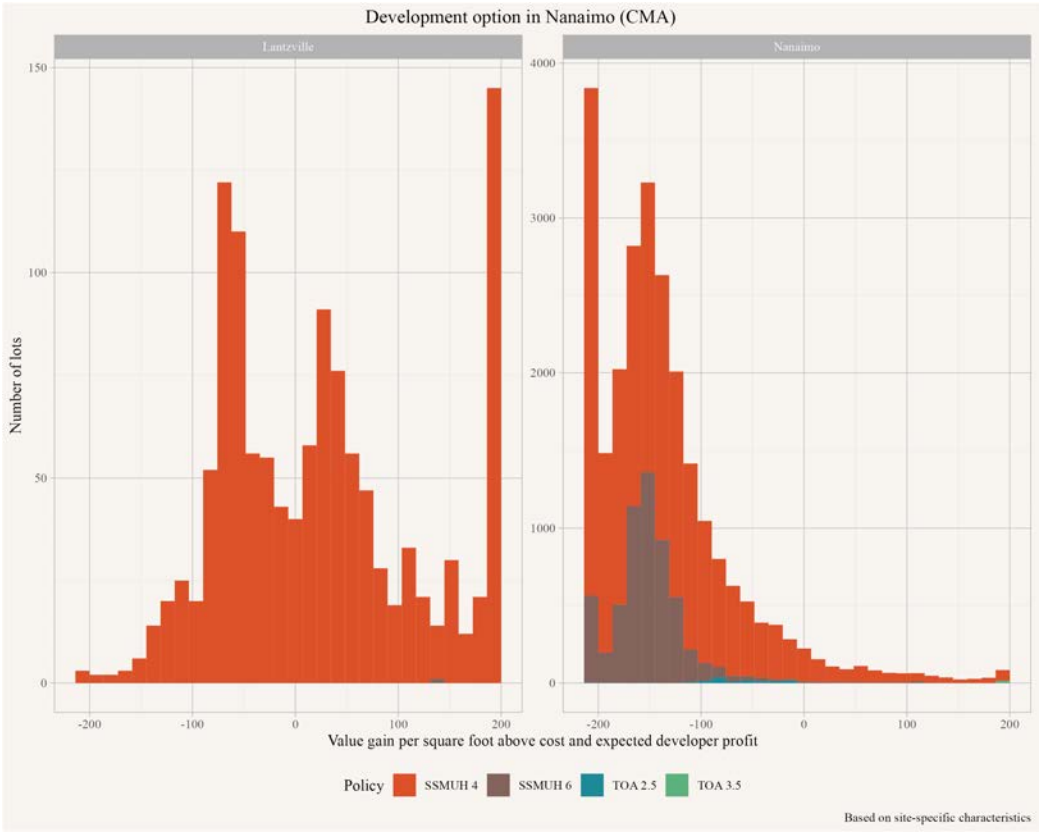

Figure 109: Nanaimo development option summary by jurisdiction, expected prices per square foot beyond profitable cost to deliver multiplex housing.

F.5 Kamloops

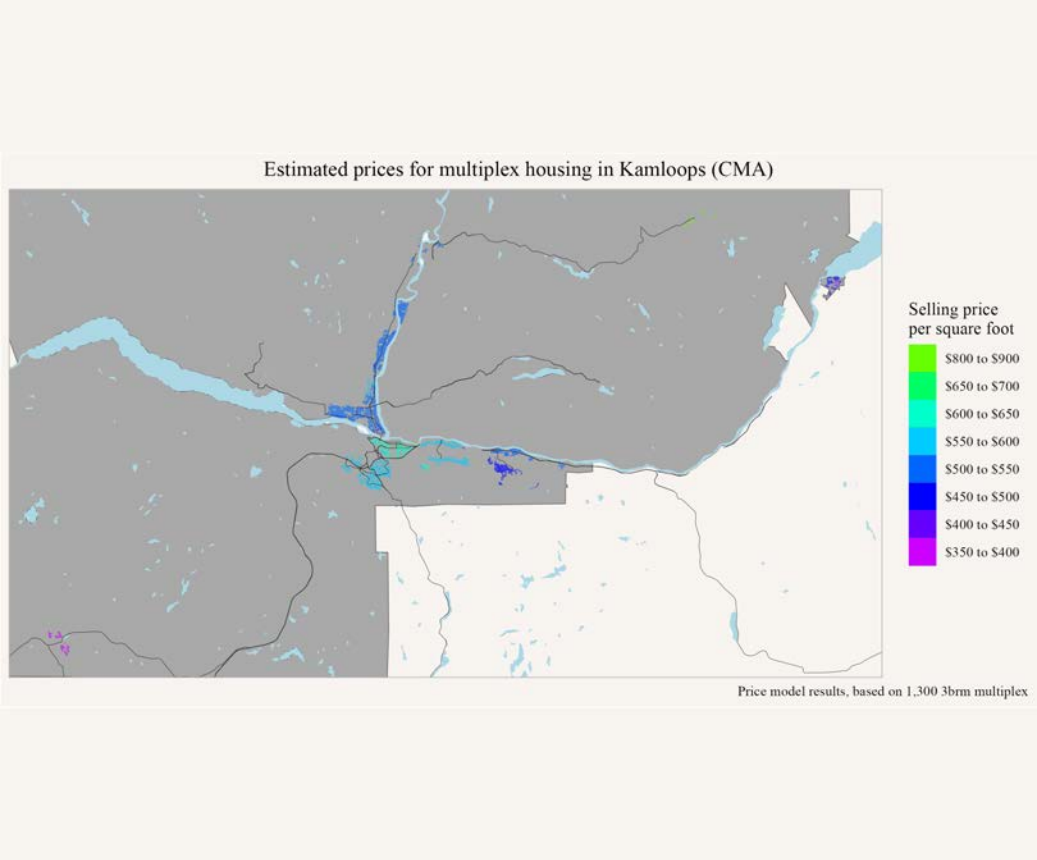

Figure 110: Kamloops price surface for hypothetical 1,300sf 3 bedroom multiplex unit, price per square foot.

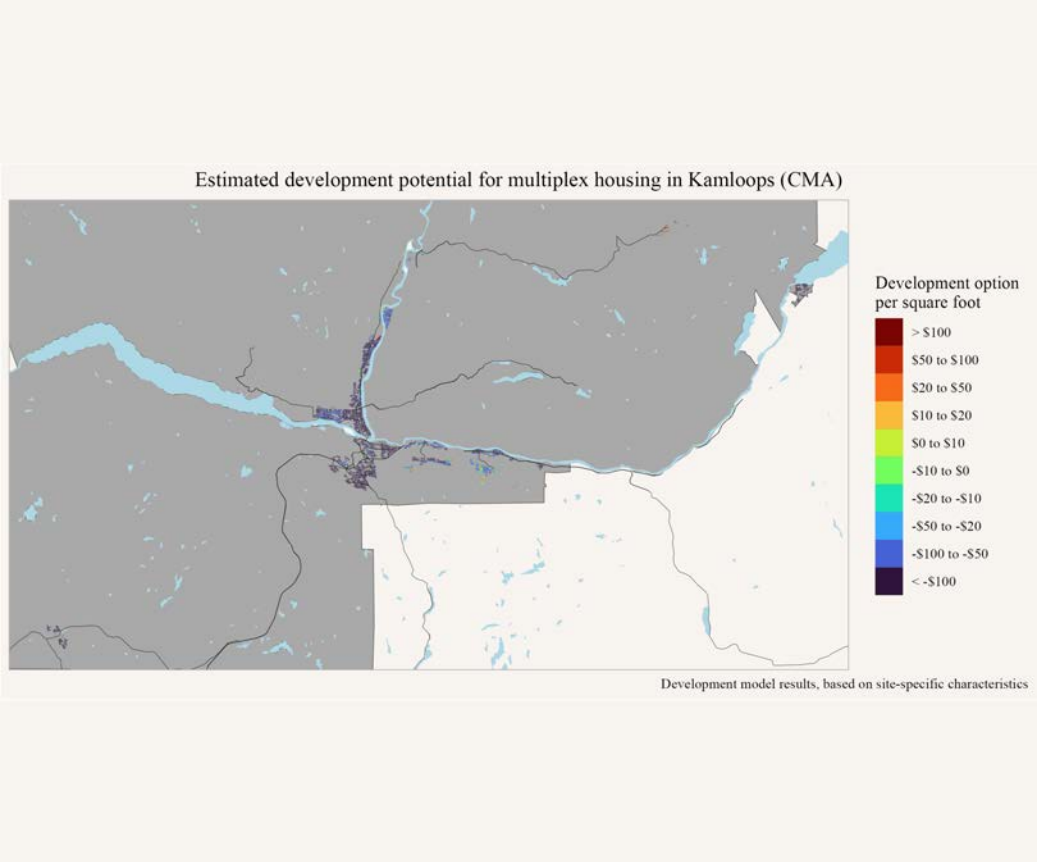

Figure 111: Kamloops development option, expected prices per square foot beyond profitable cost to deliver multiplex housing.

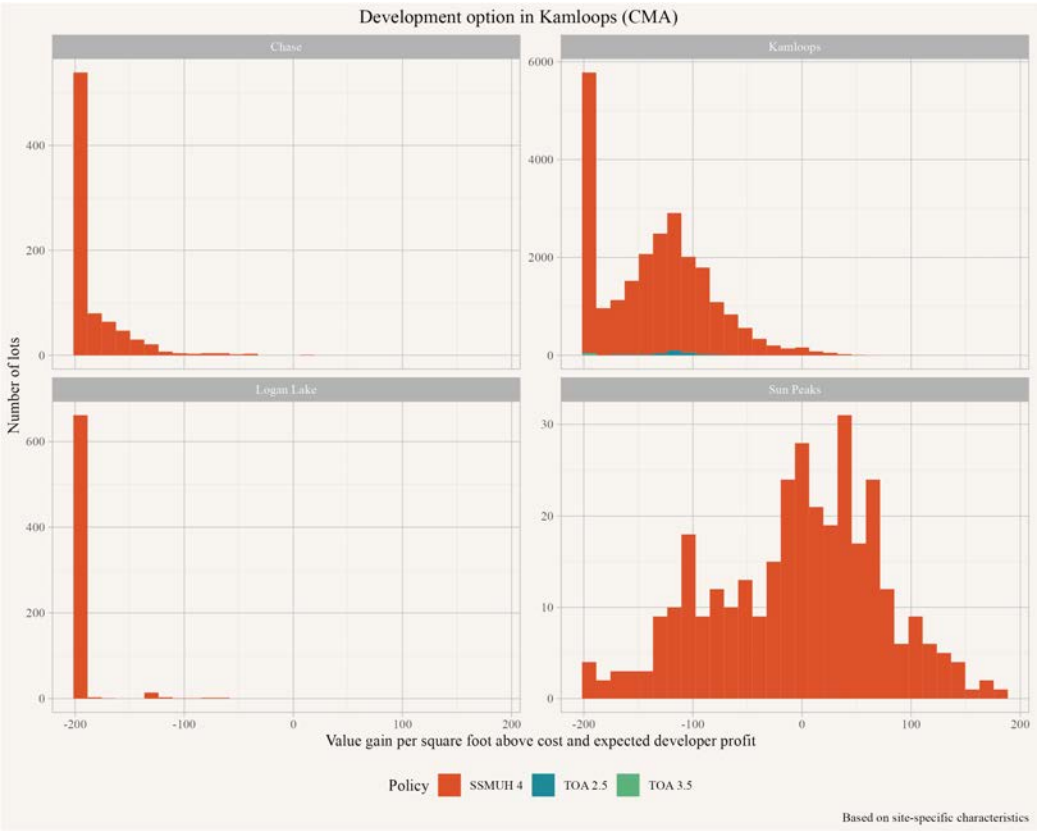

Figure 112: Kamloops development option summary by jurisdiction, expected prices per square foot beyond profitable cost to deliver multiplex housing.

F.6 Chilliwack

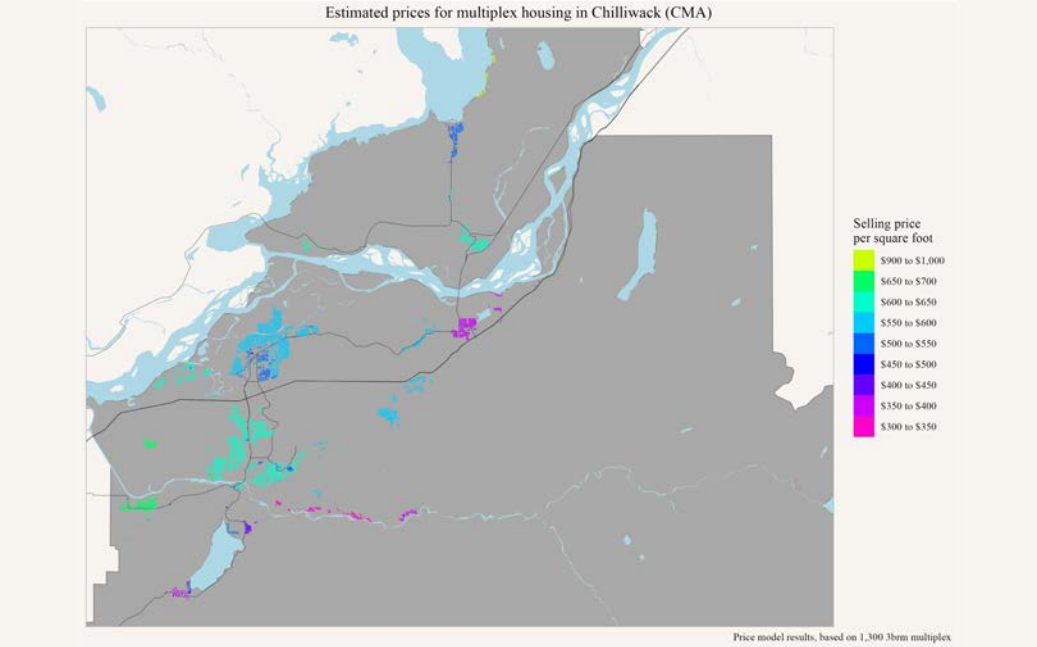

Figure 113: Chilliwack price surface for hypothetical 1,300sf 3 bedroom multiplex unit, price per square foot.

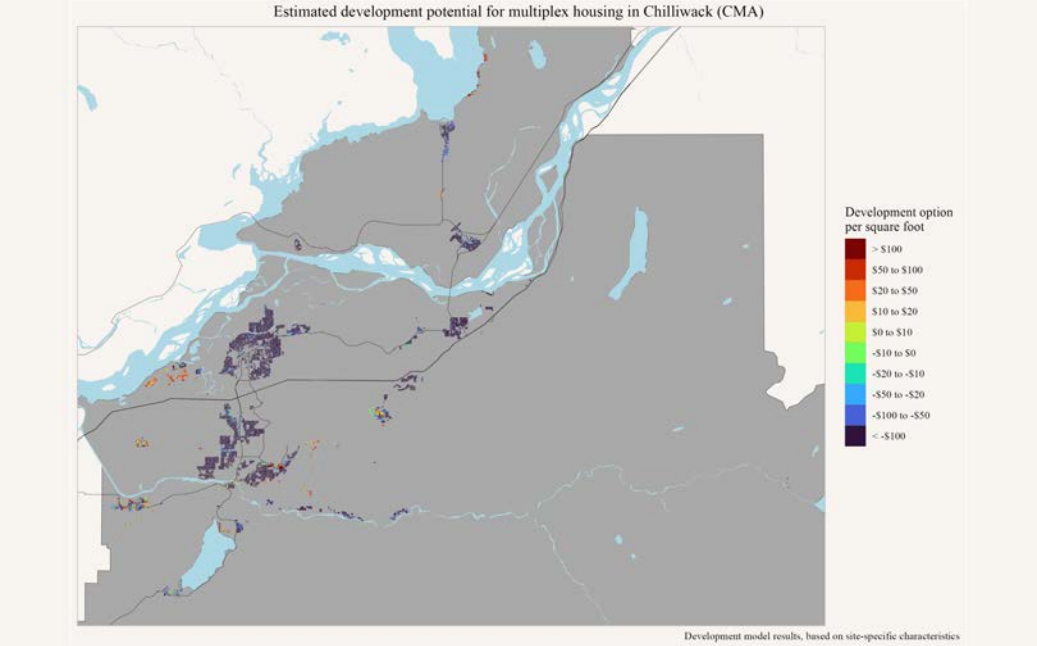

Figure 114: Chilliwack development option, expected prices per square foot beyond profitable cost to deliver multiplex housing.

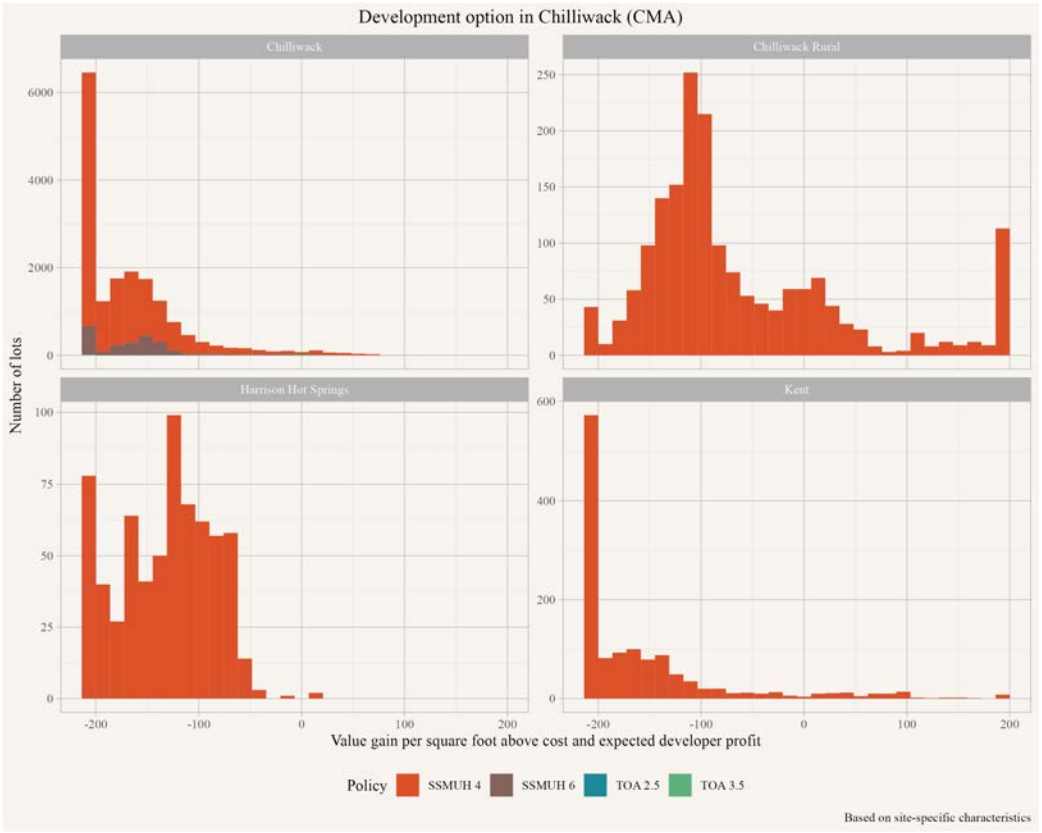

Figure 115: Chilliwack development option summary by jurisdiction, expected prices per square foot beyond profitable cost to deliver multiplex housing.