

# Domestic Insurgency

Toward Affordable Housing in Vancouver

by

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## **Author's Declaration**

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners. I understand that my thesis may be made electronically available to the public.

## Abstract

Vancouver's persisting housing crisis has decoupled dwelling prices from local income through persistent capital investment oriented dwelling typologies and restrictions on land availability. Vancouver, as one of the first North American cities to reach a post-sprawl condition, must correct policy and land use to acknowledge changes in dwelling preferences, demographics, and land value to provide a new mass housing strategy.

Once contradictory policy is aligned to affordable housing values, the thesis proposes a housing framework for the private sector to profitably build dwellings suitable for a range of local incomes. The framework targets Vancouver's most prominent, repetitive, and artificially underused land, its low density house neighbourhoods, to resurrect a middle density housing typology to respectfully transition neighbourhoods to affordable dwellings. Using a three pronged approach of neighbourhood improvement, flexible design for occupant control, and a focus on sharing, dwellings are drastically reduced in cost due to efficient space and material planning while simultaneously increasing living benefits to building inhabitants and its existing neighbours. Traditional thresholds at the dwelling and building scales are reimaged to support smaller living spaces and urban development in established neighbourhoods that create new co-dependent beneficial relationships and dynamically mitigate frictions, rather than eliminate them altogether. Ultimately, the framework provokes a wave of disruption in the housing market in response to current crisis conditions by making living more communal, shifting the focus from investment to human capital and by reinstating affordability as a key facet in the living standard formula governing housing design.

The framework is an insurgent force that provides affordable housing through the private sector despite distorted high property costs, using existing property and economic mechanisms to create an alternative competitive affordable housing type. It is also an insurgency within the built fabric of the city, inserting itself within established neighbourhoods currently fortified against change and in progressing ideas of co-living and participatory design. Overtime, efforts to improve neighbourhoods for existing residents, putting people first, and creating a sustainable growth strategy capable of housing new residents for the long term, it is the ambition of this proposal to eventually reach a critical mass to reduce housing prices for all dwellings to restore affordability within the entire city.



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## Part 1 | Reconnaissance

Part 1: Reconnaissance, presents a cross section of the current housing crisis in Vancouver. By looking at the history of the housing market, economic operation, magnitude, and government intervention, a story emerges explaining the crisis's origins, persistence and complexities. It also explains why urgent action is required, and how past and planned government interventions are destined to fail to create any long lasting price relief. By comparing historical market conditions, investment, and government involvement that produced affordable housing to current market behaviour, differences are found that are causing crisis and objectives are set for the purpose of correcting market dynamics.

# Housing Crisis Summary

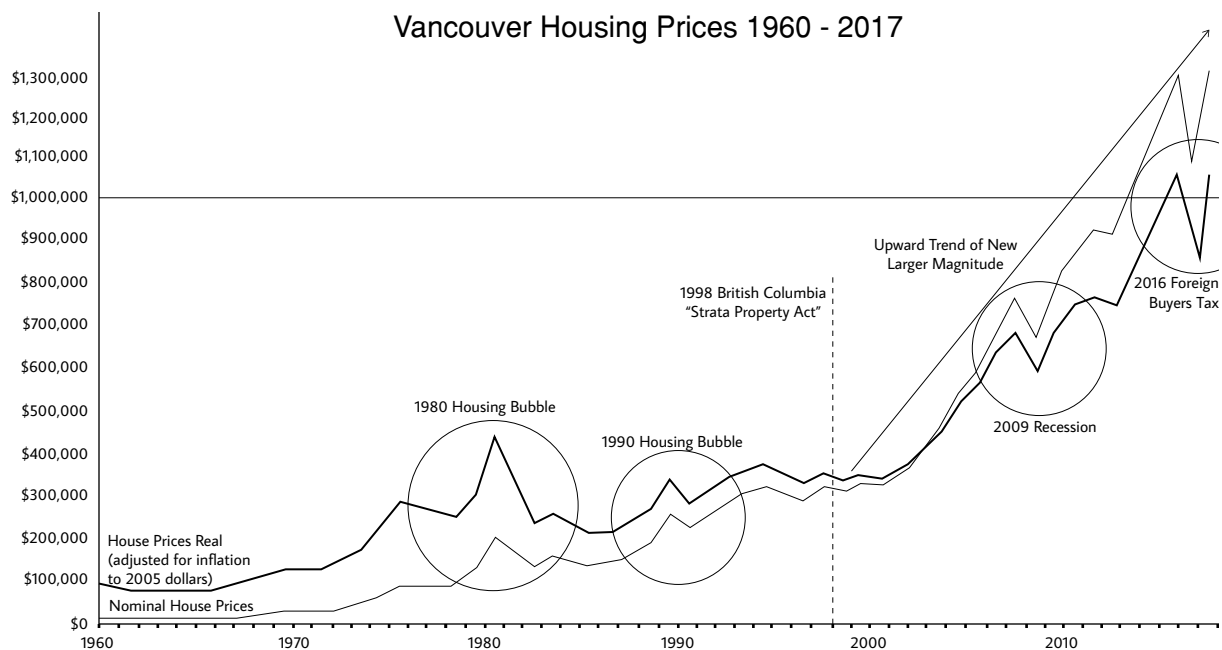


Figure 1.1.1: Market behaviour differences before and after the 1998 British Columbia “Strata Property Act” and major housing market price events. Source: Real Estate Board of Greater Vancouver (REBGV) average price chart

Vancouver’s affordable housing crisis has only worsened in recent years, despite receiving attention from all levels of government. The CMHC (Canadian Housing and Mortgage Corporation) clearly defines affordable housing as a dwelling that requires no more more than 30% of one’s income, yet today, almost half of Vancouverites do not meet this threshold. Amongst new entrants demanding dwelling, the problem is even more pronounced and only getting worse.

In 1998, the Government of British Columbia instituted the Strata Property Act<sup>1</sup>, which governs rules around ownership in condominium developments.\* Since the implementation of this act, Vancouver’s housing unaffordability has skyrocketed out of control. The exceptions to this trend were short periods of reprieve during the 2009 global recession, and again after a 15% foreign buyers tax was imposed on the Metro Vancouver Region in 2016. Both events were predicted to trigger a housing price correction by economists, however neither lasted more than a few months, and the market in both cases returned to record high prices within a year. Economists, observers, and journalists have been writing about the impending catastrophe of a housing market collapse since the early 2000’s. A Vancouver newspaper, The Tyee, writes in a 2008 article entitled “Bring on the real estate crash” that Vancouver, already the most expensive housing market in the country, is long overdue for a large correction.<sup>2</sup> After the 2009 recession failed to provide a sustained decrease in housing prices, Macleans published an article in 2010 entitled, “Vancouver Housing Market: No Logic” setting a trend that persists in the crisis narrative.<sup>3</sup> This narrative can be paraphrased as; don’t worry, the market is not behaving normally, and we believe that this indicates that there will be an impending correction that will restore housing affordability. Traditionally, housing

\*Note: The Strata Property Act succeeds the 1979 Condominium Act which first allowed Strata Ownership in BC. However the Strata Property Act improves conditions for investors by codifying conflict resolution procedures, and makes building operations and transactions clear and easy to complete without resident interference. BC Real Estate Association. “Improving the Strata Property Act.” Report. Sept, 2010.

markets experience boom and bust cycles, like all capitalist systems, and historically, extrapolating past trends has been a very successful method to predict future housing market behaviour. However, by now, 20 years into an accelerated upward trend that is creating a prolonged housing affordability crisis, it is time to reflect on why this cycle is by far more extreme in length and value than any other in the past.

Most economists consistently admit that economic fundamentals cannot explain current housing market dynamics in Vancouver, and are shocked that current trends are even possible. A report by the CMHC in 2017 claims that only “75% of price gains were driven by fundamentals.”<sup>4</sup> referring to the fundamental unhindered relationship between new dwelling supply and new demand produced by population growth, in which housing economics is based upon. University of British Columbia Geography Professor David Ley remarked on the unrelenting increase in housing prices stating “we are in an absolutely bizarre situation”,<sup>5</sup> while senior economist at National Bank, Marc Pinsonneault described the market as “especially worrisome.”<sup>6</sup> In a 2016 quarterly housing affordability report by the Royal Bank of Canada, analysts described real estate price growth in Vancouver as “astounding”, that “housing affordability is being crushed” and that “unfortunately, further price acceleration in recent months suggests affordability will likely deteriorate even more in the period ahead.”<sup>7</sup> Statements professing shock and confusion are not in short supply.

Much of this confusion is caused by the broad and complex nature of the housing affordability problem. The CMHC reports that “No one simple measure emerges as an obvious candidate for addressing the challenges posed by high priced markets.”<sup>8</sup> Furthermore, experts examining the crisis within their field, are often stuck in their respective silos of expertise, and do not have the mandate to confirm that influencing factors beyond the fundamental supply and demand relationship, have not distorted their analysis, potentially compromising their conclusions. The clearest example of this problem is the continued practice of treating the growing real estate price trend as a housing bubble. This familiar housing market pattern, which occurred twice around 1980 and 1990 in Vancouver, occurs when demand outpaces supply. In a housing bubble, increased prices due to housing demand temporarily attract speculators, which drive prices unsustainably high prompting the overbuilding of new dwellings, which in turn, creates an oversupply of housing.<sup>9</sup> At this point, the prices peak because there are not enough buyers, speculators exit the market, and real estate prices rapidly fall to pre-bubble levels, in what is commonly referred to as a correction or crash. This cycle historically lasts between two to three years, compared to the current upward trend alone, which has persisted for 20 years. Despite the massive difference in size and scale of previous housing bubbles, and indications that investment demand is not leaving the market, analysts continue to ignore the lack of success analyzing this precedent has produced in predicting the future of the current market thus far. This has resulted in continuous prophecies of imminent price corrections which continue to be invalidated. Douglas Porter, the chief economist at BMO capital markets reports that yet again the “canadian housing market bubble has vanished without a crash”, “It has ceased, expired, and gone to meet its maker”, and that meanwhile affordability is expected to deteriorate as there are “no signs speculation and investment have shifted.”<sup>10</sup> While this does not mean housing prices will necessarily continue indefinitely along the current accelerated upward trend, the differences in relation to previous housing bubbles already provide enough evidence to doubt whether a correction would follow precedence and restore housing affordability. Other plausible scenarios might see a smaller correction, or simply a stagnation that would not restore housing affordability since the market is not being driven completely by fundamentals. In the essay “Zombification of Canada”, economist Brian Romanchuk writes, there is “no indication that house prices must collapse and it is entirely possible that house prices have hit a permanently high plateau because of systematic policies to the preferences of the financial sector.”<sup>11</sup> It is therefore critical not to be complacent in the belief that the market will eventually fix itself, and action must be taken to find and neutralize the influences which are driving housing unaffordability. Instead of assuming the housing market is dealing with the same set of conditions of the past, what is required is to broaden the search for causes beyond the relationship of supply and demand, and look for influencing factors.

There are two types of influencing factors that can drive a housing market off course from a goal of affordable housing. The first, is the gravitational pull of a market to the bias of those creating the rules within which the free market operates, so that the goal is not affordable housing. The second is policy, urban environment, and demographic interference that influence the supply and demand relationship, preventing these forces from reacting to each other, thereby breaking the fundamentals of the system.

First, the market bias appears to have changed in 1998, from rules favouring housing supply with strong rental unit development, to a focus on housing as a tradable commodity in the interest of investment attraction and the creation of capital. The book *Saving Capitalism*, by Robert Reich, reminds the reader that free markets are a “human construct”<sup>12</sup> in which regulations should not be seen as hampering a free market but as a crucial component in balancing the market tenants of public interest and capital. There will always be a bias in the market toward either tenant, as “someone is always writing the rules of the market”. As affordability has deteriorated and investment returns have drastically improved, it is clear that the market has been rewritten during this trend heavily in favour of investment. According to acclaimed futurist philosopher Ramez Naam in his book, “The infinite resource: The power of ideas on a finite planet”, while capitalism has proven itself to be a superior economic technology to other systems, it must be safeguarded through rules in the market from its fundamental flaws, to preserve its ability to serve the public, which does not have a direct monetary value.<sup>13</sup>

The market’s second fundamental flaw is the dependence on infinite resources, when in reality there is a finite supply. When supply is unable to react to demand completely, market fundamentals do not function as a reliable economic system. The poorest segment of demand is pushed out while the rest participate in intensified competition which leads to unreasonable prices that do not effectively serve the public it was created to provide for. Changing circumstances have strained housing capacity and typology to a point where supply is chronically not meeting demand, and remaining supply is focused on serving the wealthiest investment segment of demand. In the past two decades, urban growth patterns, consumer preferences, demographics, and government involvement have shifted while the response to these forces through unit types, building types, and zoning bylaws have not shifted in a complementary direction, creating friction in the supply/demand dynamic. These issues constitute the influencing factors on the market. In addition to persisting factors, the rewriting of the rules of the market have added a much larger investment demand that has yet to be fully dealt with through policy initiatives. This has pushed domestic architecture to become increasingly a manifestation of what Vancouver architect Matthew Soules describes as the “financialization of architecture”.<sup>14</sup> To address these issues, urban growth must be provided by a mass housing densification strategy, located in the most sought after areas of the metropolitan area that are underdeveloped, and for emerging individuals and households seeking alternative living and social relationships. To achieve this architectural and urban environment outcome, zoning policies and building code must be adjusted to these goals, and residents and community groups must regain some control over development and ownership of the higher density housing supply from corporate developers and investors.

Unfortunately, those who write the rules of the market have the power, and so an outright change in direction by limiting investment demand cannot be depended on, nor would such interventions address the increasingly finite and inappropriate housing supply problems created by influencing market factors.<sup>15</sup> Investment is also not necessarily negative when used to invest jointly in both property and people, and plays an important role in the housing market system which currently relies solely on private investment to provide housing. The path toward housing affordability is therefore to restore the ability of influencing factors to react to the supply and demand relationship freely, in a way that pushes the market bias to a more balanced position between both public interest and capital, thereby addressing the flaws in the system that are currently being ignored. This bottom up approach can create an insurgent force that everyone can participate in. The design of a competitive alternative to existing dwellings that are closer to the manifestation of public interest than investment, and that can overcome the high land values created by the crisis to provide affordable housing, has the potential to restore the fundamentals in the market. By undermining the financial bias in the market while simultaneously embracing investment for housing typologies that are economically viable through calibrating influential factors to current conditions in the urban environment, demographics, and land value, the private sector can overtime change course to better serve the public interest.

# Economics of the Housing Market

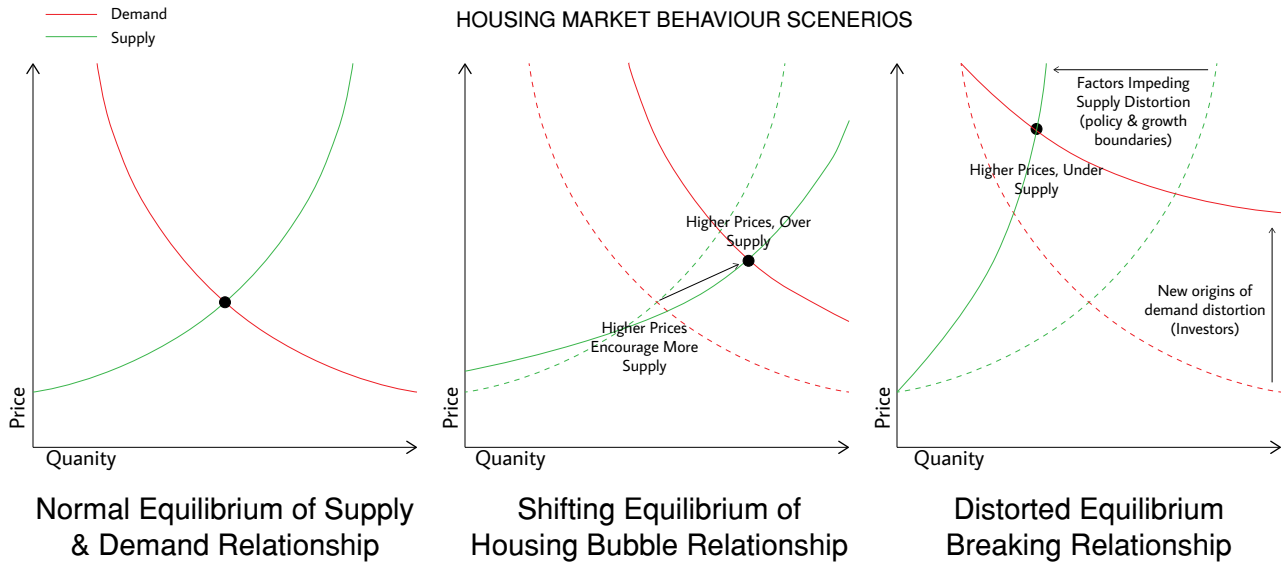


Figure 1.2.1: The differences between a working market, a shifting bubble market, and a distorted market. The first two charts are produced by economists while the third is created by comparing dwelling prices to population growth and housing supply.

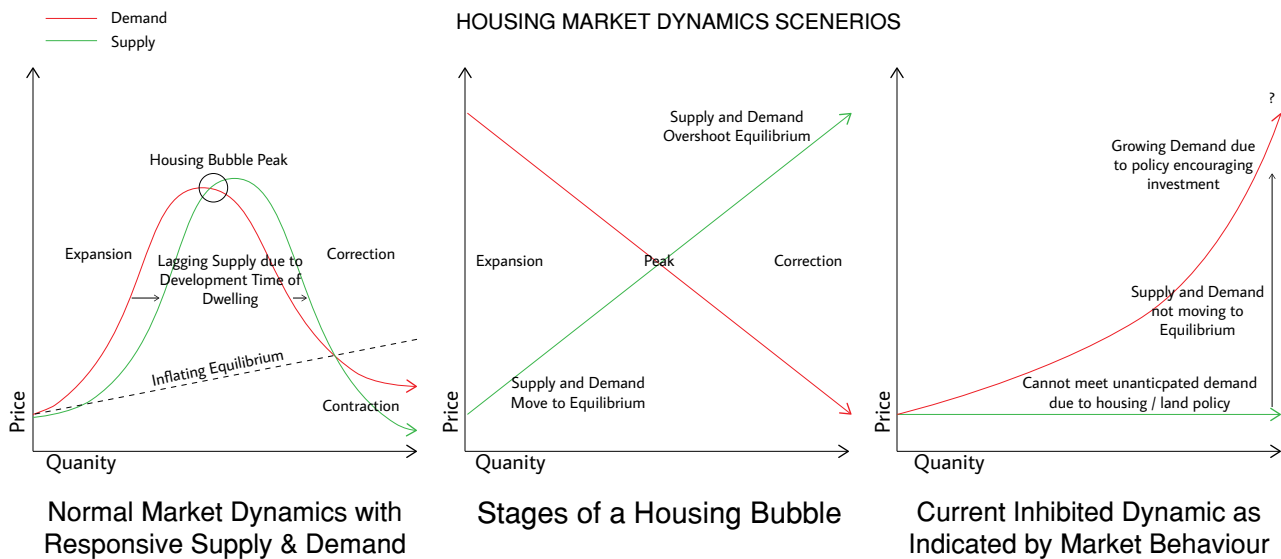


Figure 1.2.2: The first two charts are produced by economists showing housing bubble dynamics and stages. The third is created by analyzing statistics indicating forces are not moving to equilibrium and therefore not currently headed to a housing bubble

A simple analysis of housing market fundamentals is necessary to understand the current market conditions that are creating accelerated inflation, in comparison to market conditions needed to stabilize lower affordable prices. A housing market fluctuates on the forces of supply and demand that apply forces on each other, and which constantly push the relationship out of equilibrium.<sup>16</sup> A housing market where supply is less than demand, creates a housing shortage and prices will increase because of greater competition for a limited product. When supply is greater than demand, a housing surplus is created and prices will decrease because property is competing for a limited pool of buyers. These are commonly referred to as “the sellers and buyers markets”, respectively indicating which group has the power to influence the outcome of the market. When the forces react to each other, they will overshoot an equilibrium where theoretically housing availability would perfectly satisfy demand due to lagging response and inconsistency. When housing prices increase, it is usually because building dwellings takes time, meaning even when increased prices incentivize new dwelling construction, there is a lag before the supply can come online to match the demand resulting in more dwellings than required being built to reach equilibrium.<sup>17</sup> That same lag means that while prices are declining, new dwellings might appear on the market that were started during a period of increased prices, making the market overshoot. Since the market can never stabilize at equilibrium, the focus should be on minimizing lag time as much as possible so that boom and bust cycles are shorter, minimizing the degree in which peaks and troughs stray from equilibrium. This requires rules that make demand more predictable such as reducing speculation and by making supply flexible, to prepare development opportunities so that future markets are sustainably affordable.

A key issue which is preventing policymakers from recognizing that supply is not outpacing demand and therefore failing to see these market fundamentals being hindered, are the statistics that correlate population growth with unit construction. According to the population to unit ratio chart in figure

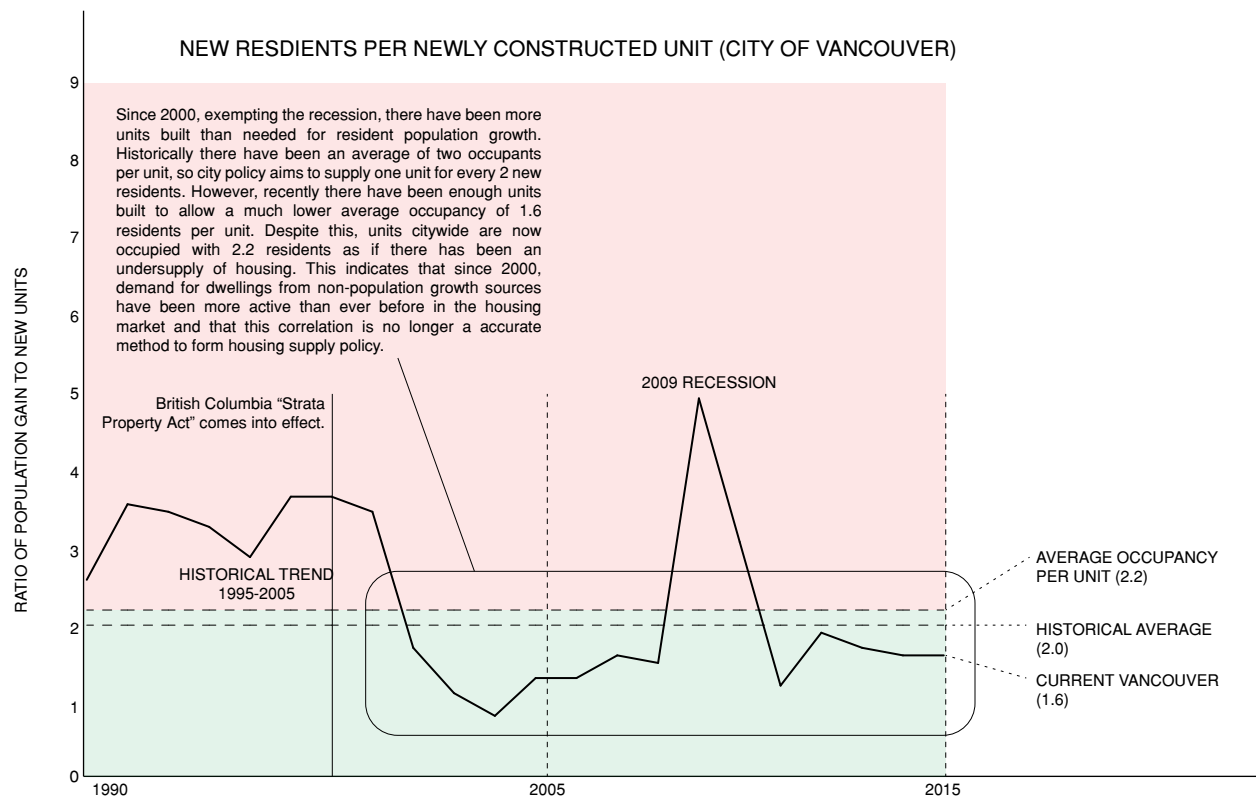


Figure 1.2.3: Correlation between population growth and unit supply. Since around 1998, apart from the recession, unit supply has been higher than population increases have required.

2.2.3, unexpectedly, since 1998 when investment controls were eased, the market has been oversupplying demand produced by population growth. Yet, as we know, since 1998 the opposite effect than one would predict has occurred, and upward prices have accelerated indicating an undersupply. Additionally, the number of people living in a dwelling unit has increased from the historical average of 2 people, to the post 1998 average of 2.2 people per dwelling indicating further undersupply.

There are many ways the correlation between population growth and dwelling supply should not be trusted to formulate policy. The strongest evidence is presented by all other metrics of housing affordability such as price and availability which provide the opposite view, and are more reliable since they do not rely or corruptible correlations. The urban development institute shows “inventory of unsold homes hit a record low in 2017 for the metro Vancouver area”.<sup>18</sup> Secondly, since the trend reverses around the notable time of 1998, it is very likely that investors have been absorbing a great deal of that demand. While it is almost universally accepted that investor demand is playing a role, this correlation is used to set land use policy, which has been only creating capacity for estimated population increases. City planners defend this practice professing to have no interest in accommodating investor demand, while approving large condominium developments obviously catering to that demand. For supply and demand to function, policymakers need to either reject investor demand completely by banning it from participating, or accept investor demand and revise the supply required accordingly. By not doing so, the city is following a policy that is biasing investment over public interest. The impacts of constraining supply which are increasing housing prices are chosen over risking a housing price correction, which may have occurred if land use policies had allowed it to do so. Economists fear that empty investor units would be sold off rapidly in the face of a price correction potentially causing a massive oversupply that would crash housing prices.<sup>19</sup> However this fear is proactively protecting invested capital while preventing housing affordability. It is also not an entirely accurate picture due to the changing realities of the city and human dwelling.

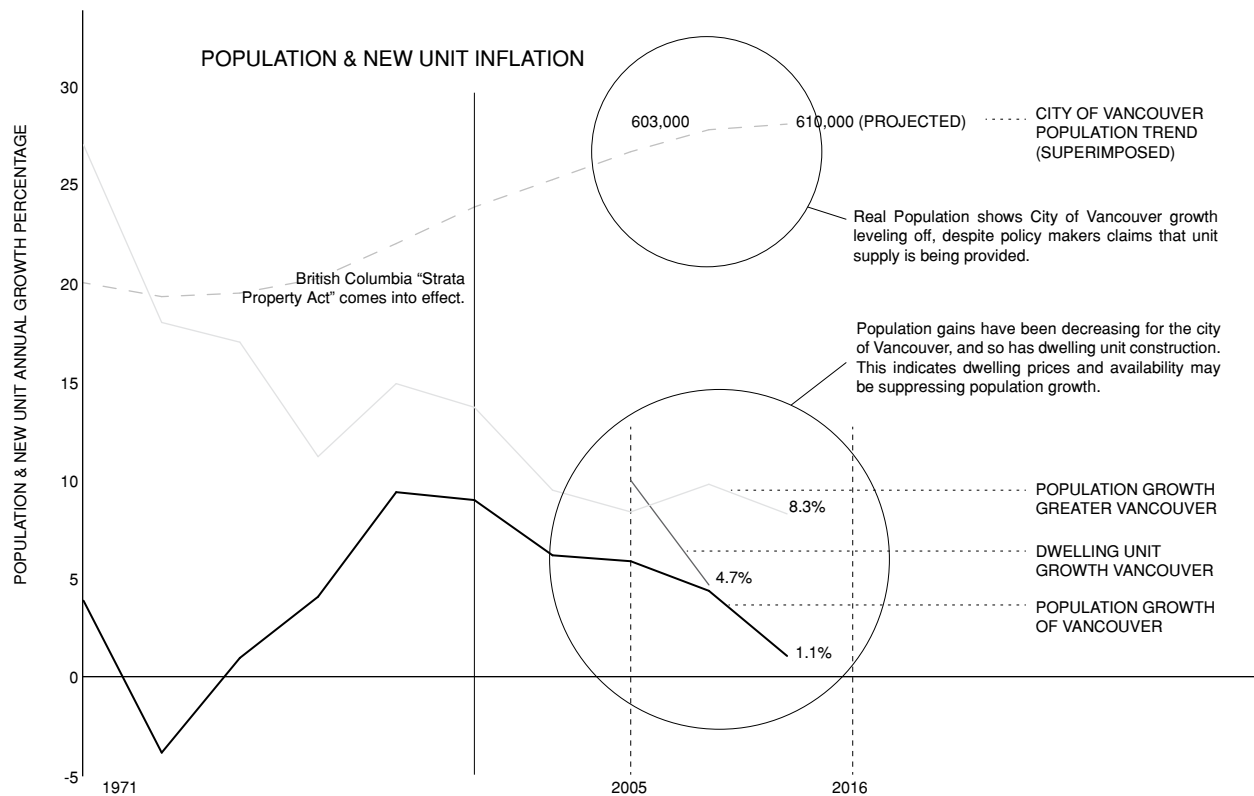


Figure 1.2.4: Indicates a slowing population growth since 1998 and the potential that dwelling production has actually decreased.

Vancouver in the last 20 years has grown into a global city and the entire world has changed with advancements in technology and connectivity, and so Vancouver is attracting a more diverse population and establishing itself as a hub for investment. This population includes students, an increasingly mobile workforce, temporary migrants, foreigners with second homes, tourists, and even regional commuters with secondary dwellings producing the possibility of a non-permanent population that may not declare themselves as residents but may be occupying a dwelling anyways. New home sharing services such as airbnb further constrict the actual dwelling supply for permanent residents. In 2015 total airbnb listings in the City of Vancouver were 4628, 71% being entire homes and apartments.<sup>20</sup> This number was found to be rapidly growing by 100's of listings each month. While none of these factors are inherently bad, ignoring them when creating land use policy can only lead to a chronic undersupply and housing unaffordability.

Population estimates also ignore the effects of high housing prices on migratory demand. In 1998, population growth had peaked at 9%, but since then growth has been shrinking to just 1.1% by 2015. The city's growth has been leveling off and is predicted to decrease further, despite well documented increasing preference to live in urban areas. Due to this decline, it is possible for unit construction to decrease but still appear as if there is an oversupply when presented as a ratio of dwelling to population growth, hiding supply capacity issues. The correlation ignores the possibility that higher prices are making the city inaccessible for many people who may want to live in Vancouver, but cannot afford to anymore. Therefore a scenario where investors flee would more than likely incite local lower income groups that have been priced out of the market to return, insulating the city from a investor exodus. A recent poll by ledger found a large pent up demand for housing among millenials. Only one third of this emerging demographic own a dwelling in Canada, but 61% living in shared accomodations want their own living arrangements, but cannot afford it.<sup>21</sup> Resident takeover from investment interests would prevent a major empty housing surplus avoiding prices lowering to an economically damaging extent because there is such a major backlog in housing demand from real potential residents.

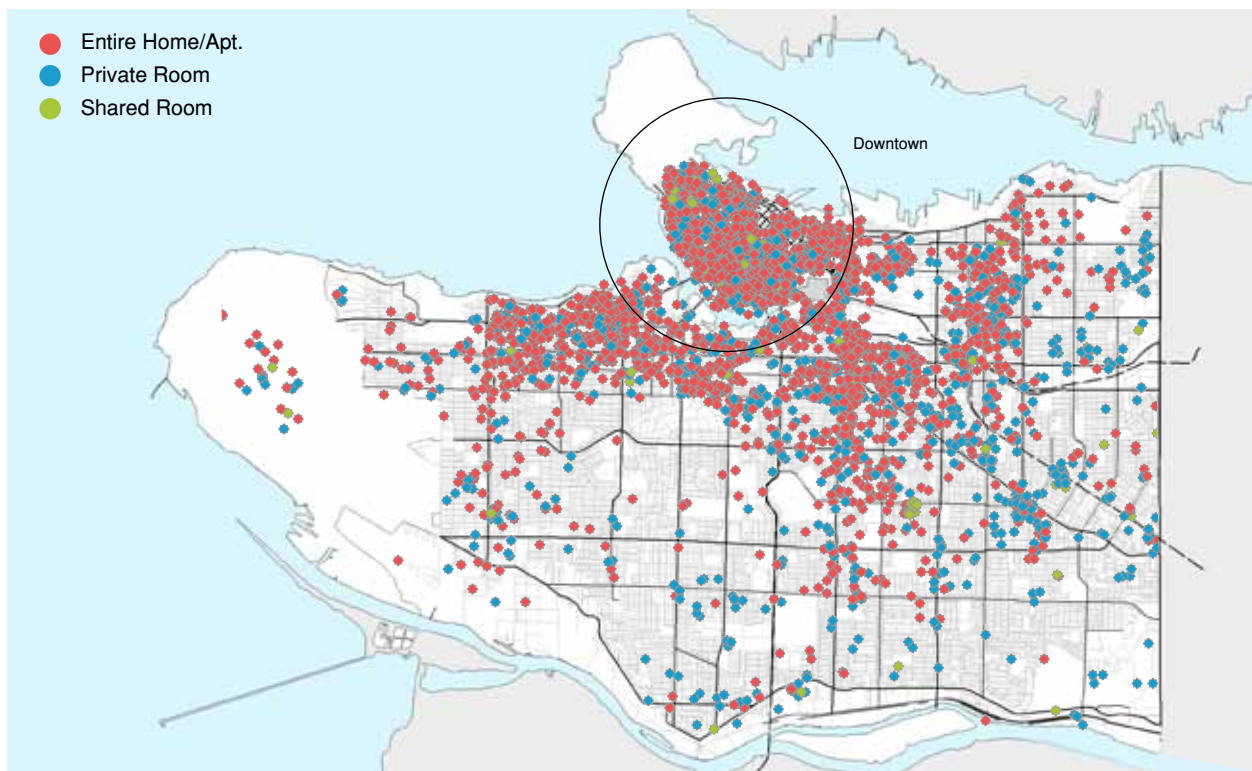


Figure 1.2.5: Airbnb Listings, June 1st, 2015. The number of short term rentals alone are equivalent to a 14% increase in population growth from 2011 - 2016, which is the same time period Airbnb has been active in Vancouver.



# Housing Affordability Magnitude

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While there is debate around the cause of the crisis, there is consensus that the housing affordability crisis is a major problem. The millennial generation is forced to confront the question of whether they will ever achieve stability in their living arrangements as prices soar out of reach.<sup>22</sup> Price inflation has created a growing generational inequality of homeowners to those who do not own property, exacerbating negative social and economic trends of wealth inequality while endenturing new entrants to precarious amounts of debt. People's lives are constrained as dwelling choices such as location and housing attributes are hampered by affordability and availability. The crisis strains environmental movements that seek to contain urban sprawl with pressure to open more land for development despite growing opposition to further environmental degradation. Obtaining labour or affordable labour is becoming more difficult (especially for entrepreneurs and small local businesses) as living in the city becomes increasingly unrealistic to many. Exoborberant housing prices tie up wealth so that everything else essentially becomes more expensive. The crisis has stoked divisions in communities, where some choose to scapegoat the rising housing unaffordability on immigrants.<sup>23</sup> The housing solution should therefore not just improve housing affordability but be aware of the accompanying consequences of the crisis and work to improve these conditions, since the public interest is much more significant than a simple financial issue.

Beyond real estate prices destroying affordability of ownership, larger effects have changed the rental market as well. Since investors have pushed many residents out of affording ownership, more people are renting for longer periods of time, while rental buildings are increasingly converted to more profitable investment opportunities. This has created a market with decreased purpose built rental units and increased demand to rent, applying pressure on rental rates and availability. In the Goodman Report



*Figure 1.3.1: Picture of hundreds of people attending a one bedroom dwelling unit available at the Vancouver Fairview Co-op in April 2017, which displays the impact high prices and low vacancy is having on Vancouverites. Co-op wait lists have three to four year waits, with most closing lists after four years, making finding housing in the co-op system very difficult. They are severely under supplied because they offer more affordable units and do not attract investor demand. Unfortunately, because Co-ops regulate their dwelling prices below market value, they cannot keep up with demand during times of inflated market rates and property prices inhibit the ability of Co-ops to afford to artificially keep their rates low. Therefore due to lack of investment incentives and the increasing economic burden of further development on increasing land values, Co-ops in their current form cannot solve the housing crisis.*

by HQ Commercial, the rental shortage was attributed to policies disincentivizing rental properties and by people being priced out of ownership, who continue to rent instead.<sup>24</sup> The housing crisis has therefore affected the entire housing ecosystem furthering the need for intervention.

The following charts capture the insanity in finding a place to live, and the financial burdens being imposed on people to maintain the high price of dwellings in Vancouver for the investor class. Currently, many homeowners and lower income groups remain in Vancouver because they bought in before accelerated price growth and are enjoying their dwelling assets increase in value. This has insulated segments of the population and allowed some to access significantly more wealth than their incomes would allow. However, as more of the population are forcefully exposed to current dwelling prices through the process of younger generations, new entrants, and renters replacing long term residents, the housing affordability crisis will become increasingly impactful to everyone seeking a primary dwelling in the city.



Figure 1.3.2: Hundreds rally for affordable housing action in Downtown Vancouver in September 2016.

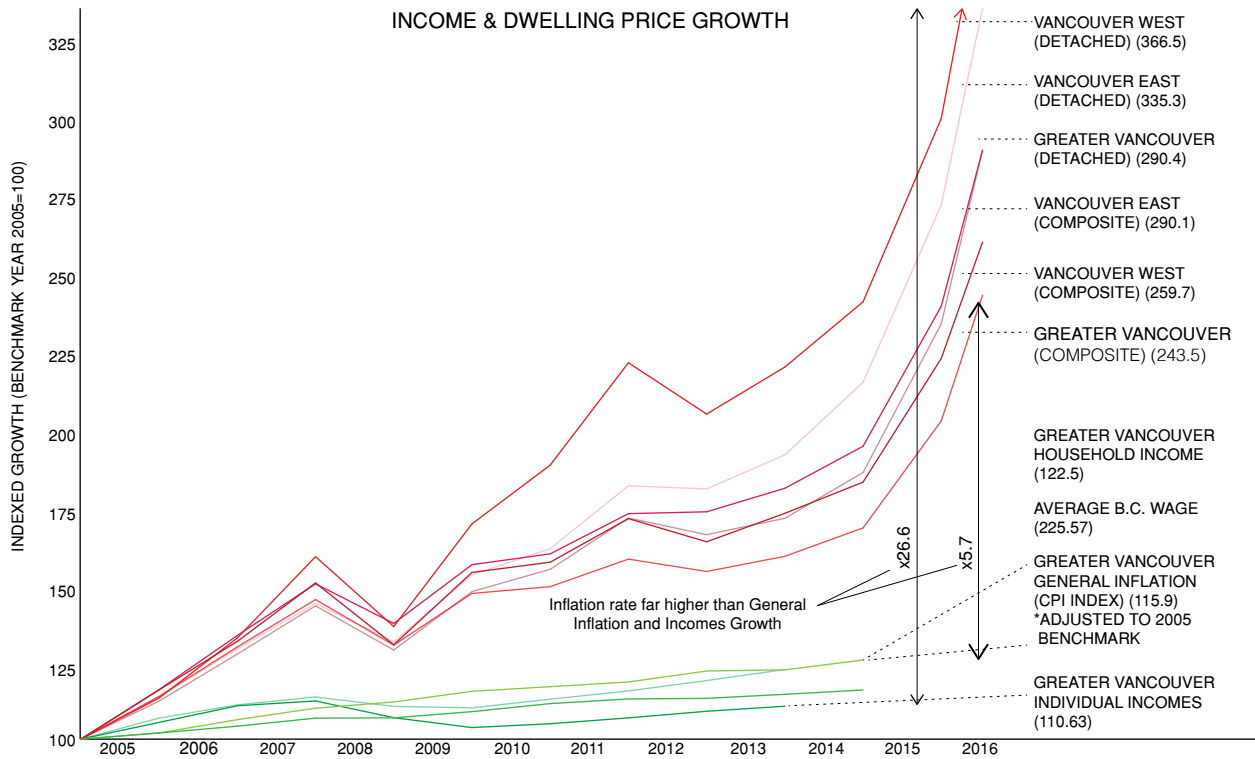


Figure 1.3.3: Indicates the decoupling of housing price growth in comparison to income growth and general inflation. Dwelling inflation since records began in 2005 show price growth 5.7-26.6 times higher than income.

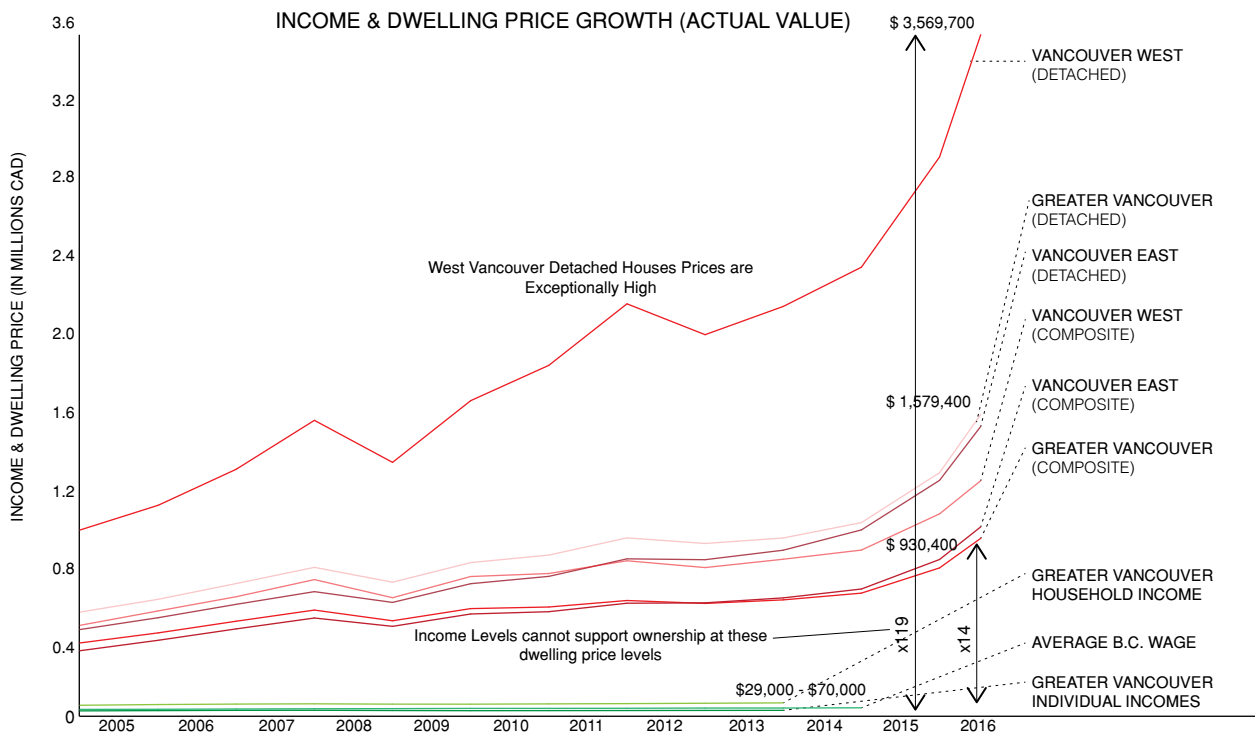


Figure 1.3.4: Shows actual real estate values to average annual wage and household income. Dwelling prices are 14 to 119 times higher than annual average incomes.

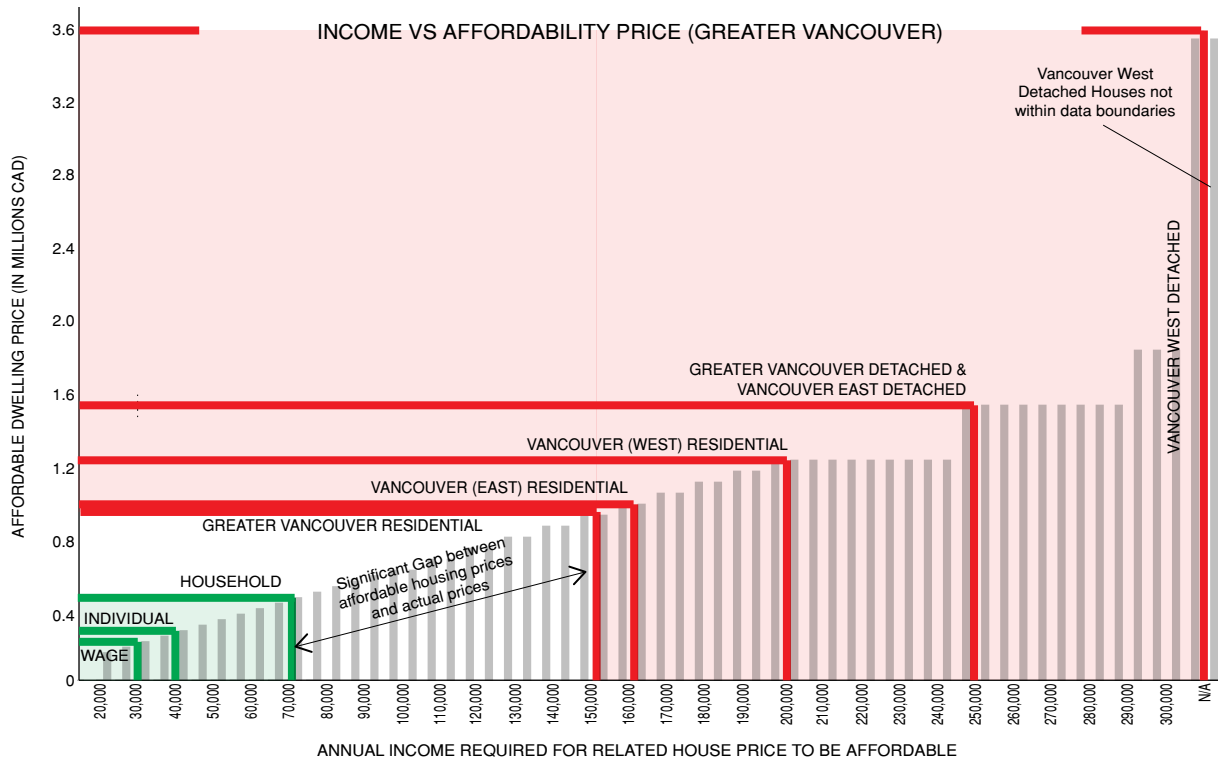


Figure 1.3.5: Shows disconnect between home prices that vancouverites can afford compared to real unaffordable dwelling prices. Incomes range from 30,000 - 70,000 while prices require incomes of 150,000 - 300,000+.

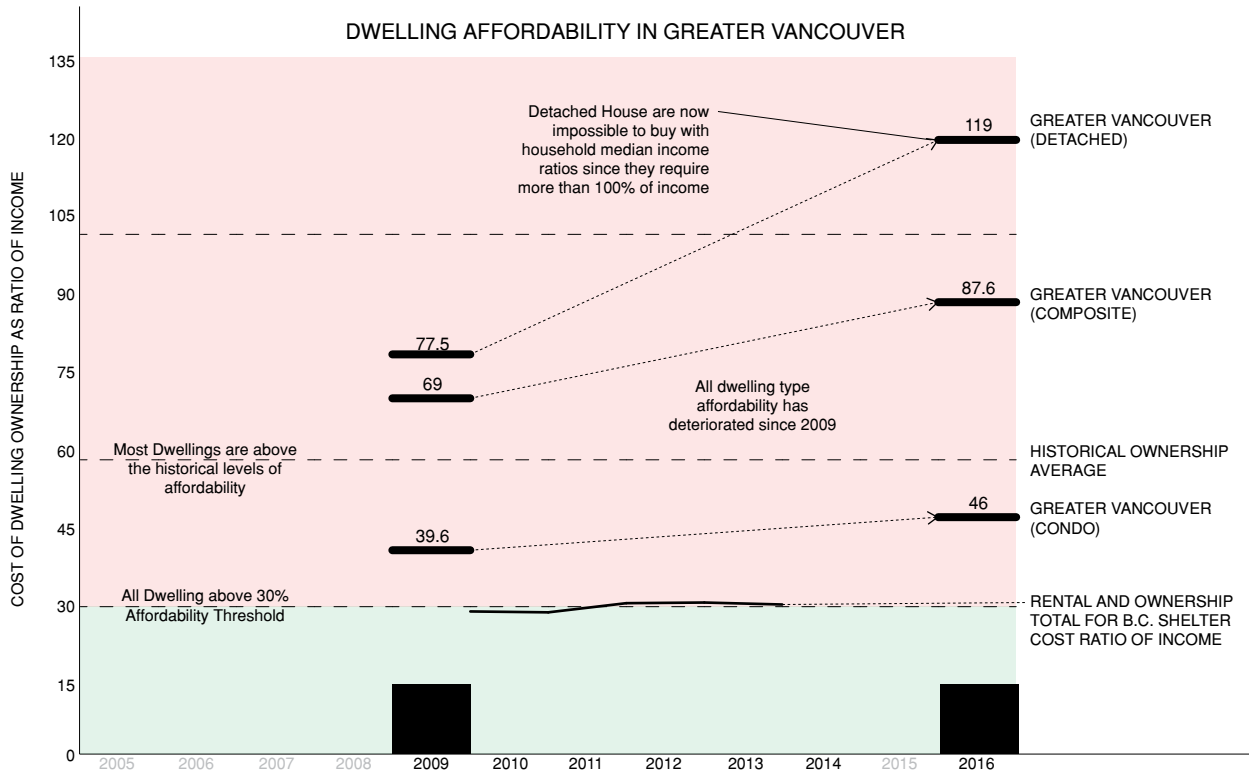
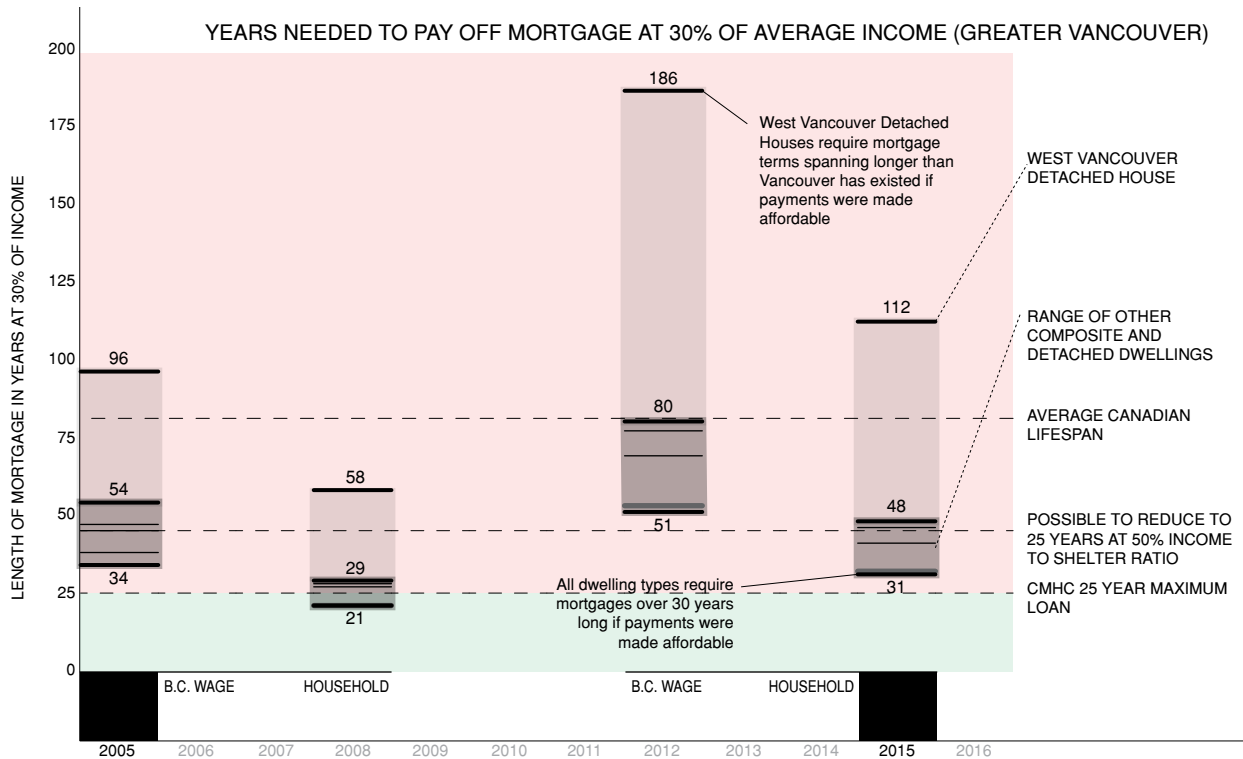
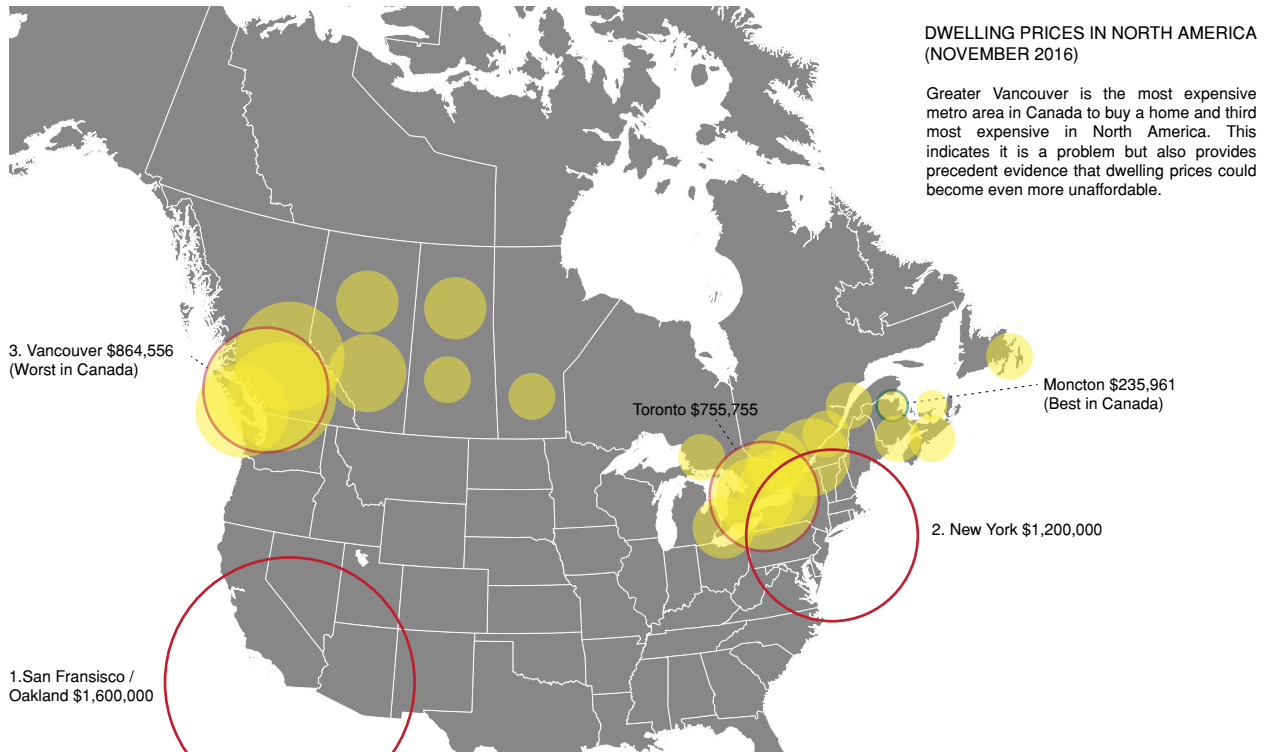


Figure 1.3.6: Percentage of income required to afford a dwelling in Metro Vancouver. An average income earner must dedicate 46% to an impossible 119% of their earnings, compared to the 30% affordable benchmark.



*Figure 1.3.7: Hypothetical mortgage lengths, if mortgages were capped at an affordable 30% of income. No dwelling would qualify as an insured mortgage by the CMHC, and some span longer than Vancouver has existed.*



*Figure 1.3.8: Affordability comparison of recorded Canadian cities and more unaffordable cities in America. Indicates Vancouver has a particularly extreme affordability crisis.*

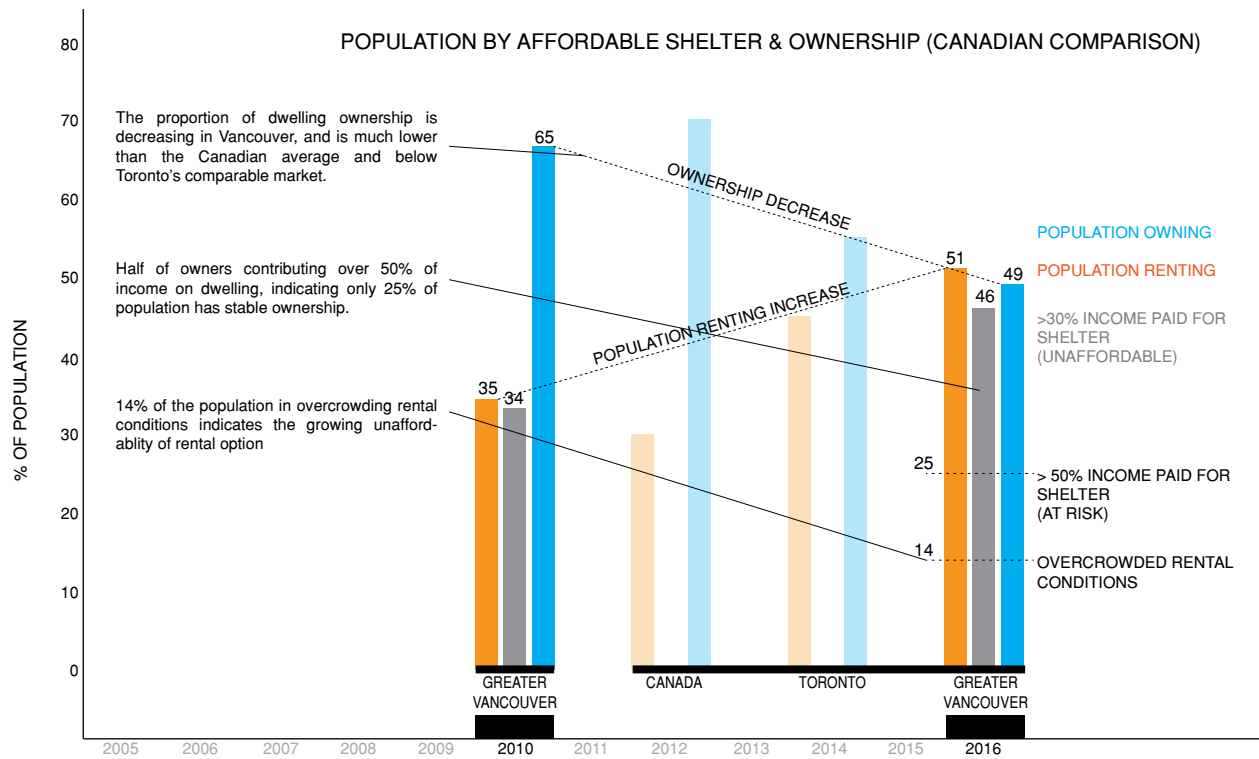


Figure 1.3.9: Indicates a slowing population growth since 1998 and the potential that dwelling production has actually decreased.

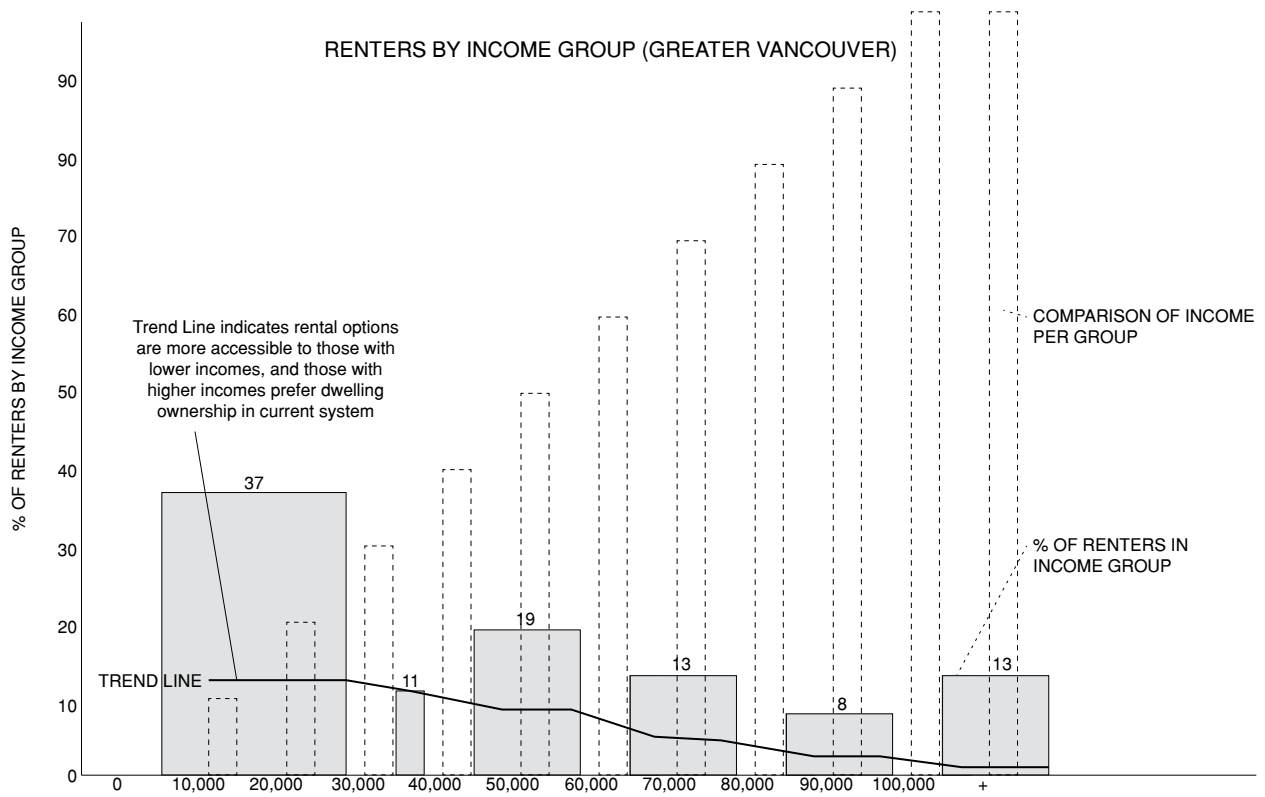


Figure 1.3.10: Indicates a slowing population growth since 1998 and the potential that dwelling production has actually decreased.

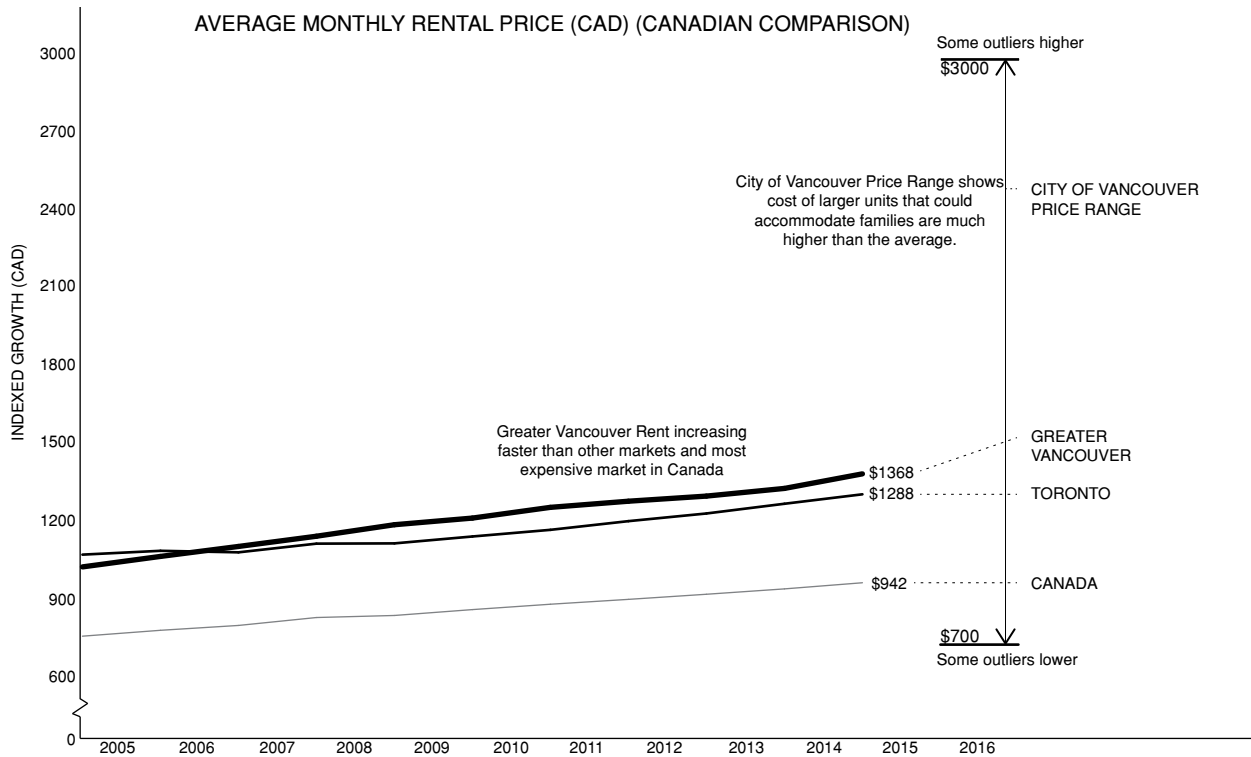


Figure 1.3.11: Indicates a slowing population growth since 1998 and the potential that dwelling production has actually decreased.

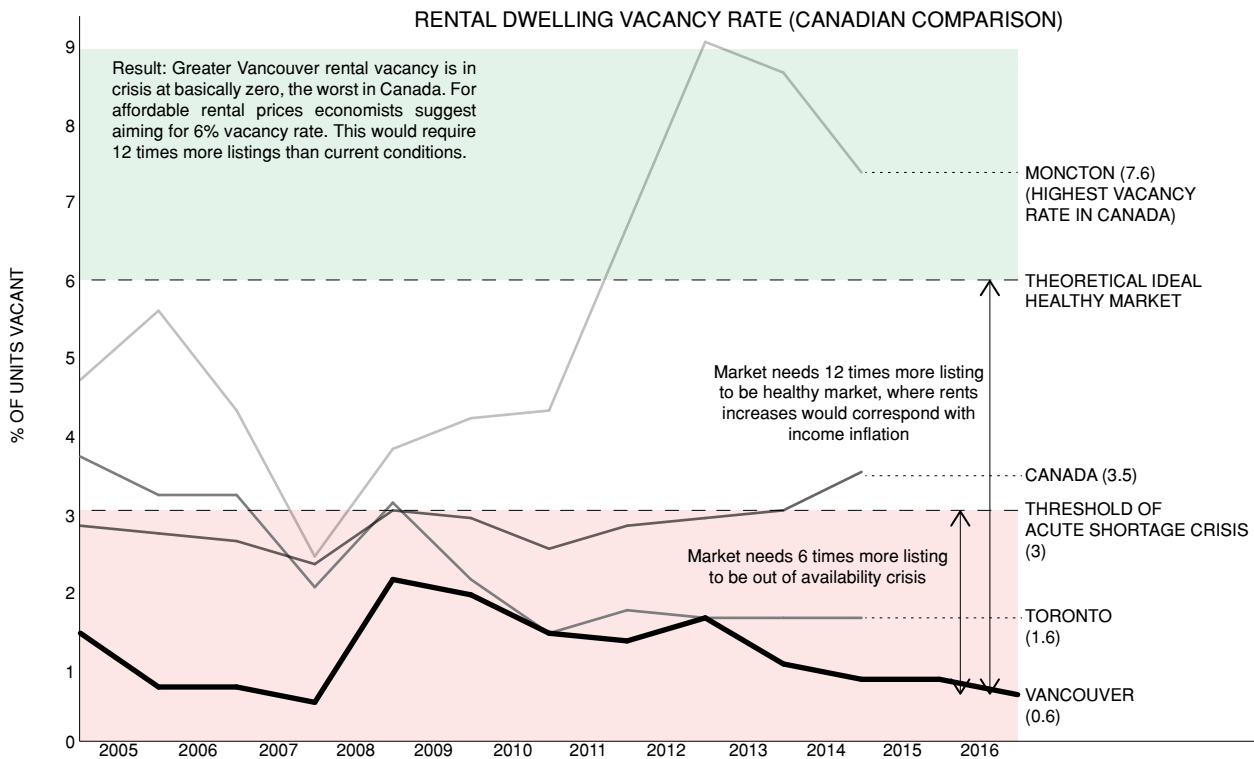


Figure 1.3.12: Indicates a slowing population growth since 1998 and the potential that dwelling production has actually decreased.

# Analysis of Government Involvement

Three tools have been cited or used by the government as interventions to improve affordability so far, of which none have been sustainably successful, largely because they do not address the market fundamentals. The three tools are selective new taxes, central bank monetary policy through interest rates, and the imposition of market restrictions.

Taxes have been the most effective tool used so far, but the effects have not been lasting, indicating their inability to affect the underlying forces of the crisis. The Canadian Real estate Association believes “without dealing with real fundamental issues facing housing, these changes (taxes) are only able to provide temporary relief as evidenced by the recent recovery of the Vancouver market.”<sup>25</sup> The most significant tax is the 15% foreign buyers tax, which successfully produced a drop in prices for a few months, but has proven to be ineffective because the presence of foreign investors is only a small portion of problematic housing policy and many foreign investors do not directly or transparently buy the dwellings. A study by Jack Favilukis of UBC’s school of business show that only 2% of condos are owned by foreign investors so the tax did not affect a broad range of the demand. He also found that while foreign buyers only slightly increase price of real estate, estimating foreign ownership is very difficult.<sup>26</sup> A more recent report by Statistics Canada, estimates foreign ownership being closer to 5%, and at over 7% in condominium developments,<sup>27</sup> which would account for almost a third of new units built after 1998 being foreignly owned instead of accommodating population growth. Due to weak oversight of foreign buyers, many navigate around the tax through money laundering,<sup>28</sup> local real estate agents flipping real estate with foreign money,<sup>29</sup> and legal loopholes that include the ability for foreigners to legally flip (effectively scalp dwellings like concert tickets) presale condos without tax.<sup>30</sup> As found in an investigation by the Globe and Mail, Vancouver real estate agents see a “foreign flipping frenzy” on condos before construction completion, noting the luxury features are making them dependent on foreign money. The tax amount, 15%, is quite small to investors who are searching for stable long term investments, considering housing prices have been commonly increasing 20% annually or more in recent years. Additionally, this tax does not apply to domestic investors, further reducing the impact on curbing investors.<sup>31</sup> Other taxes include an empty dwelling tax, which has been criticized as impossible to enforce<sup>32</sup> and an airbnb tax which may increase supply a bit, but also hurts residents using the service to deal with higher housing costs.<sup>33</sup> These taxes have generally brought in extra

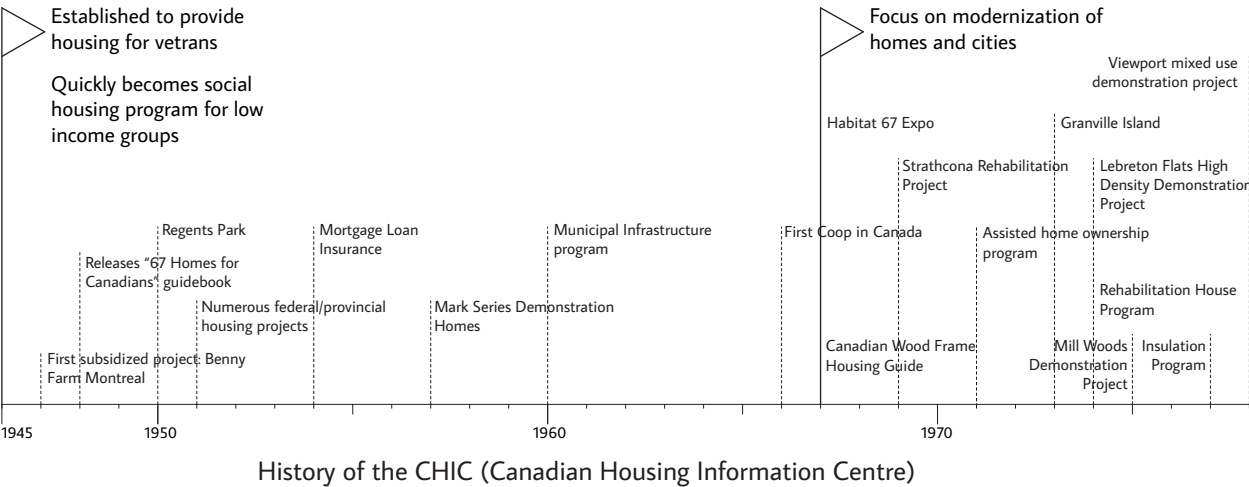


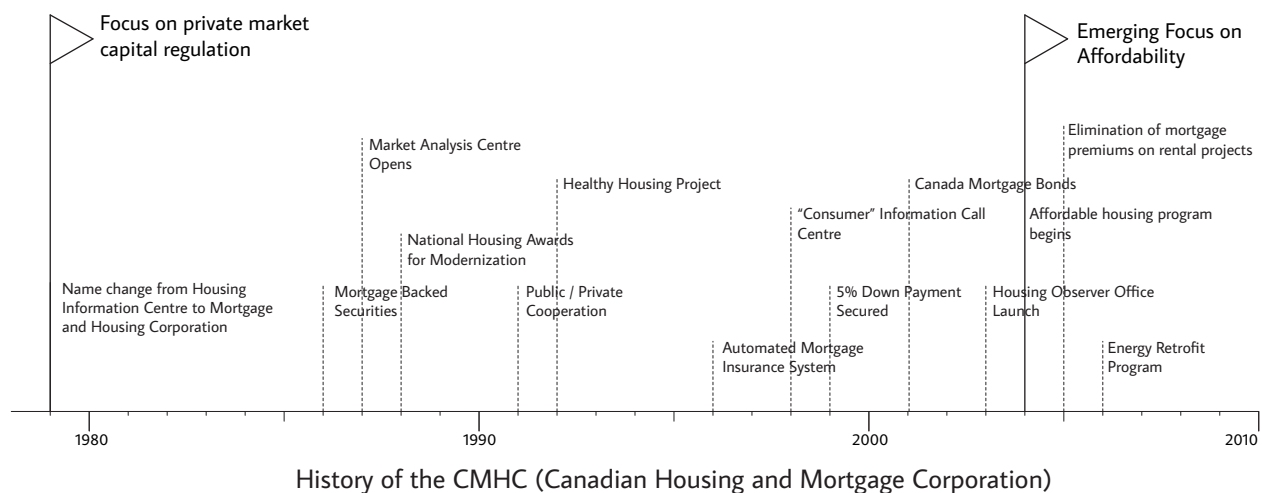
Figure 1.4.1: CMHC historical milestones showing the corporation shift from public housing producer to private investment regulator mirroring government priorities related to housing



revenue but done little to secure housing affordability in the long term. In the article, “condo prices reached new highs” investors are “holding out for better prices making inventory and new listings scarce.”<sup>34</sup> since any decrease in investment results in an increase in local backlogged demand when prices dip, indicating a perceived confidence in local demand. Therefore, taxes alone, without dealing with supply issues, cannot create affordability.

Secondly, rising interest rates are seen as a way to price some of the public demand out of ownership thereby relieving some of the pressure on the supply. David Madani at Capital Economics believes interest rates will slow the market in 2018.<sup>35</sup> There has also been growing concern that increased interest rates will lead already stressed households to default on their mortgages creating a new source of supply.<sup>36</sup> These are awful conditions to rely on to lower housing prices because the results are further lack of affordability to mortgage holders and the loss of homes for others. Such policy only benefits banks that are given this guidance to increase their rates and shifts the bias even further toward investment. Financial policy’s role in slowing over inflation of housing is also restricted in what it can do since all other general inflation is low as described by financial analysts in the article “Don’t bet on the central bank.”<sup>37</sup>

Third, are various new restrictions imposed on both the supply and demand. In Toronto, new restrictions on annual rental rate increases were brought into effect in 2017<sup>38</sup> resulting in a number of developers from withdrawing from projects, or switching projects from rental to ownership because the move has made building rental properties less attractive.<sup>39</sup> The shift away from rental in response to this restriction cannot just be boiled down to developer greed either. While policy encouraging maximizing profit exists, developers face rising costs in property, labour, materials and government levies due to pressures in investment demands meaning a lot of the price gains in dwellings aren’t actually contributing to profit, making regulated rental units not only potentially less profitable but completely uneconomical in some cases.<sup>40</sup> This restriction does not achieve much anyways, as it only locks in already unaffordable rates for current renters while creating less availability for future renters and therefore should be avoided by Vancouver. Another recent Canada wide restriction to go into effect in 2018 is the stress test requirement on all new mortgages.<sup>41</sup> While this test may end up saving some Canadians in the future from



disastrous mortgage defaults, it is effectively another barrier to an estimated 50,000 from owning a home, with incomes equivalent to previous generations that would have easily qualified for a mortgage in more affordable housing markets.

Generally, these actions have been weak on investment demand, hard on real public demand for dwelling, and unhelpful in stimulating more supply. Therefore their effects have not reduced housing prices.<sup>42</sup> The bias of government intervention toward investment protection has long been shifting this way since the creation of a cohesive housing policy during world war II. As reflected in a chart showing CMHC milestones, what once was a government vehicle to supply housing and provide construction and quality expertise to home builders has morphed into a mortgage regulator reflective of the investment bias today.

There are signs that this crisis has become so widespread and prolonged that it may be reversing the course of government intervention to again build, or at least finance, affordable housing due to increasing political pressure. All three levels of government have in 2017, committed funds to affordable housing: \$40 billion at the federal level through a new national housing strategy and introduction of the Canada Housing Benefit,<sup>43</sup> \$2 billion at the provincial level,<sup>44</sup> and a \$600 million commitment from the City of Vancouver.<sup>45</sup> Unlike the 20th century, large scale affordable housing mega projects are understood as impractical, and suitable land for such a project would be hard to come by today. The government's expertise in housing is long gone, and existing building types are too inefficient to bring housing projects to a worthwhile scale. The size of the problem, with almost half of the population reporting unaffordable housing circumstances means this allocated budget needs to be extremely strategic to make any meaningful changes to affordability. Despite these problems, the government is showing signs of pursuing this route anyways. The City of Vancouver announced plans to help "a few hundred" people by subsidizing their rents to relate to their income and the provincial government has begun a new homeowners low interest loan program.<sup>46</sup> The underwhelming effect of these programs due to inefficient use of funds, will never have a budget able to serve a city of almost 700,000 residents. Instead of repeating historical strategies in producing supply, the focus should be on funding new prototypical mass housing strategies which maintain living quality and affordability while being able to compete with private investment typologies. This would achieve two things. One, it would mean costs put into affordable housing projects would generate a profit for the government to invest in future projects, and two, it would produce a viable model for private industry to adapt so that affordable units are more widely available so that the government is not trapped into providing housing in perpetuity.

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## Part 2 | Strategies

Part 2: Strategies identifies influential factors and market bias while justifying how they need to change to produce an insurgent housing framework. Past and present behavior of these factors such as urban planning, zoning and building code, property, investment, and financing are analyzed to develop strategies that realign broader policy and attitude with the goal of affordable housing to make an architectural intervention successful. Current demographics, growth patterns, and housing qualities are recognized in their contemporary form to reconsider how their changes have affected the housing market today.

# Historical Development of Vancouver

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Historically Vancouver has had more success in creating conditions for affordable housing. Since its establishment as a settlement in the 1860's, housing has primarily been provided through a capitalist free market, and since the 1920's, the city has kept similar building codes and zoning bylaws. However despite the persistence of these factors, a housing affordability crisis has occurred. The following series of maps, recording every decade of urban growth within the municipality and metropolitan area of Vancouver reveal how changes in the built environment have not been responded to, and that the failure of these factors to react to changes have contributed to the housing crisis that the city endures today. Vancouver has persevered through frequent boom and bust cycles, periods of great and absent private investment in housing, and economic reinvention from logging town, port, manufacturer and today's service and information based industries.<sup>1</sup> The difference now is that Vancouver is unable to grow outwards, and until policy makers respond to Vancouver's new post-sprawl condition, it should be expected that the housing market behave in a way that is out of line with the past.

Since the arrival of colonists in 1850, the Vancouver region, as many other cities around the world still do today, relies on the outward expansion of urban borders.<sup>2</sup> In maps of historical growth, every decade produces territorial expansion except for the 1930's due to the effects of the great depression. Growth strategies can be divided into 4 distinct periods. From 1850-1900, Vancouver existed as a settlement. Newcomers settled around timber mills, logging encampments, agriculture, and along trading routes where development existed within the wilderness, and therefore land was not an issue at this time.<sup>3</sup> The city urban growth period followed from 1900 to around 1945, over which time Vancouver filled out to its modern municipal boundaries. Streetcars were constructed into new neighbourhoods, and the Bartholomew Plan was put into place in 1929, establishing an efficient grid to the municipal boundaries that housing could be developed within. During this time, the population soared, and by 1930, Vancouver surpassed Winnipeg to become Canada's third largest city.<sup>4</sup> The city enters its regional urban growth period from 1945 to 1990 as streetcars are discontinued and Vancouver begins to build regional highways. Although the city reaches its municipal boundaries by 1950, the growth pattern distinctly shifts to neighbouring municipalities as the region embraces modern car culture and absorbs growth in the spaces between its established towns. As the maps show, regional growth shifts from individual centres around historical settlements to development around large metropolitan infrastructure projects such as bridges, highways, and airports. Shopping malls spring into existence to service these bedroom communities. This indicates the growth is not a result of the success of the individual satellite towns but as overflow population accommodation for the City of Vancouver. The switch to suburban growth essentially allows the city to continue expanding outward despite increasing distances. Within the city, zoning bylaws are changed in the west end on the downtown peninsula and in a ring around the city centre to allow for densification. These previously low density house neighbourhoods provided thousands of lots to be assembled into a variety of types and scales at an unrestricted pace, complimenting the regional house sprawl.<sup>5</sup> By 1990, Vancouver reaches its final period, when industrial land is retired and converted for dwelling purposes. From 1990 to present outward expansion for the first time has abruptly declined in contrast to its exponential curve upward, despite continued increases in population growth for the metropolitan area. The absence of outward growth has persisted for 30 years indicating there is no longer territory available for further urban development. Instead, planners have relied on the conversion of underused industrial land to support high density condominium development. Since the city's economic transformation away from industry, large parcels of prime central waterfront lands became underused prompting the city to remediate them for the 1980 World Expo, and then rezone them to residential use. When charting residential densification area with zoned industrial land, there is a clear correlation between the increase of multi-unit dwelling land and the decline of industry, indicating a heavy reliance of growth accommodation on this strategy.<sup>6</sup>

The final growth period produces a number of anomalies compared to the historical development of the city. While densification has existed for some time, and the city has been at its borders since 1950, there has always been a supplementary supply of housing at the outer edges of urban territory.<sup>7</sup> For the first time, densification must become the primary source of housing for the metropolitan area, and zoning laws and city planning have not changed to reflect this new reality.

Secondly, past development was encouraged and effectively infinite, as greenfield development was limitless. The Bartholomew plan for instance laid out ambitious growth capacity, instantly providing development guidance to all land within the city.<sup>8</sup> Maps show fluctuations of expansion between decades, such as relatively slow growth in the 1970's compared to a boom in the 1980's indicating a versatile supply able to respond to market conditions. Additionally, densification took place within multiple large neighbourhoods with a fine grain of ownership, making a variety of development possible in numerous locations across the city. In contrast, urban planners are now releasing density according to projected population growth, not market forces, and development is heavily concentrated on large industrial lots in minimal locations. This has resulted in a housing shortage along with a singular, largely inappropriate supply for people's needs and incomes. Additionally, the new large scale building typologies are unsuited for the context of the majority of the rest of the city, threatening the established urban fabric.

Thirdly, while speculative investment in real estate has always been a driver of growth for the city, there has always been a second supply available for the working class, which is not provided for through the concentrated conversion of industrial land. Speculative investment is evident in much of the urban fabric and must be recognized as a major source of wealth for the city. For example, the creation of Stanley Park in 1900 was part of a scheme to raise nearby land values for housing development.<sup>9</sup> In the 1910's, Shaunessy to the south of downtown adapted a free flowing street pattern encompassing boulevards and large lots for mansions.<sup>10</sup> In the 1920's, construction of the Lions Gate bridge was commissioned by the Guinness family to add value to their planned suburb, the British Properties on the North Shore.<sup>11</sup> Later, communities in the west, southland estates, and along the mountain slopes were all developed for wealthy segments of the population. However, simultaneously there was always a second supply of working class housing. At first, when land values were still low, modest working class detached houses were built in the east end of the city, which is still noticeable looking at income distribution today. As land values increased, the densification of the 60's and 70's lead to a large supply of affordable rental units. These non-investment housing markets are absent today due to land values reducing affordable housing viability and the consolidation of the industry into an oligarchy of developers. The nature of large developments concentrated in uninhabited areas have lead to the condominium typology favouring commoditized dwellings built as vessels for capital. While housing markets in the past involved local wealth, globalization has brought greater demand for luxury housing requiring more, not less, attention to ensuring a secondary supply of working class dwellings.<sup>12</sup>

While converting abandoned industrial sites makes economic sense, this land supply is running out since the remaining industrial land belongs to the western terminus of the Canadian railroad system and busy international shipping port crucial to the city's wealth. With no new land available, and as demand for dwelling continues to apply pressure on affordability, densification will have to target the underused land of detached house neighbourhoods for future supply. During economic shifts, low density housing areas were historically transformed to suit the needs of the city. When Vancouver expanded lumber mills, built its port and railways, and expanded commerce and industry, low density neighbourhoods were consumed during transition. In the 1960's-70's, residential densification redeveloped a ring of detached house neighbourhoods around the downtown peninsula. It is only recently that these neighbourhoods, despite remaining as the majority of land within Vancouver have become entrenched to their important role of accomodating the dynamic changes of the city and adapted a position of preservation. This stance continues despite current density being increasingly uncoupled from property value. If such land is to be developed, current condominium development constructed at the large scales of uninhabited industrial properties will have to cede to new typologies that acknowledge existing occupants of established neighbourhoods and the fine grain of property, the built form, and infrastructure.<sup>13</sup> Otherwise backlash against future development will only grow, further jeopardizing future housing supply capacity.

Due to the new post-sprawl state of Vancouver, restricted supply of developable land, constrictions on dwelling location and variety, lack of working class housing, and artificial stifling of low density neighbourhoods, these influencing factors have upset the status quo between development and land control policies. As a consequence, new strategies to provide an adequate supply of affordable housing must be devised to repair the fundamental supply and demand relationship of the market.

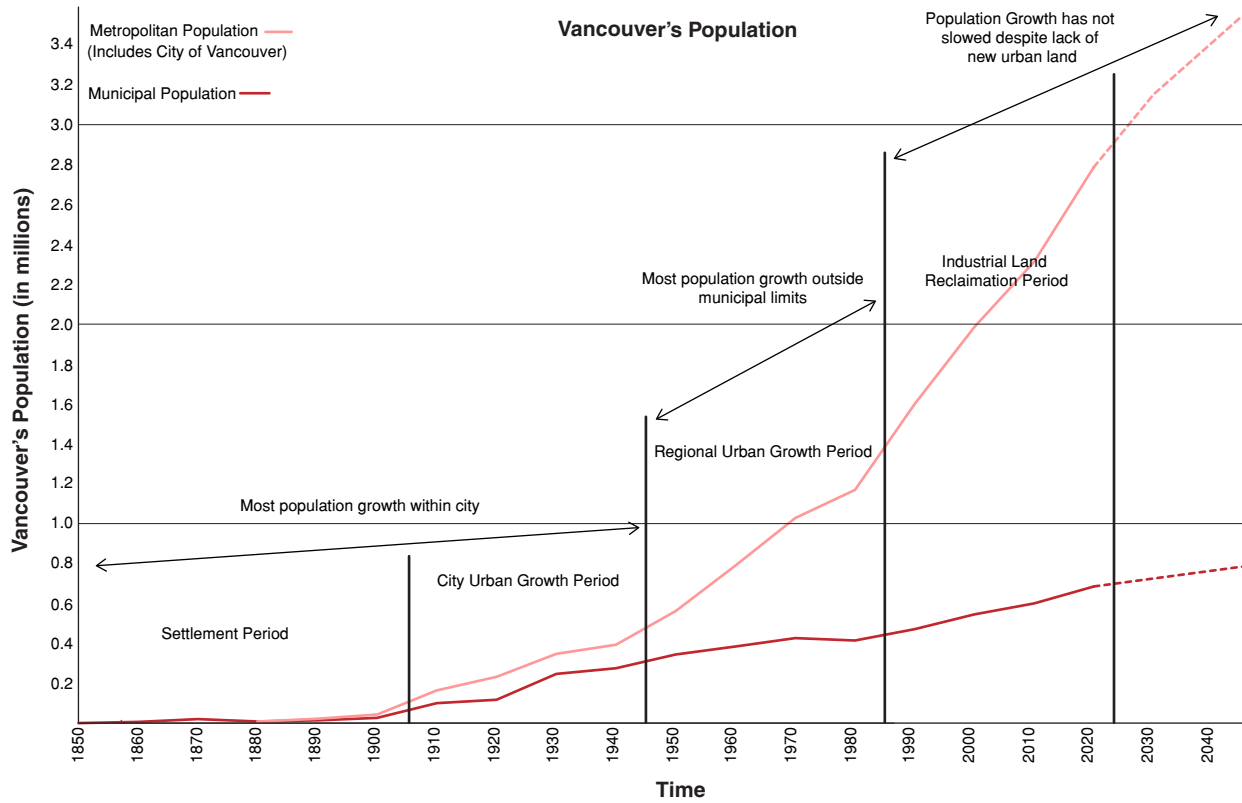


Figure 2.1.1: Vancouver's historical population growth

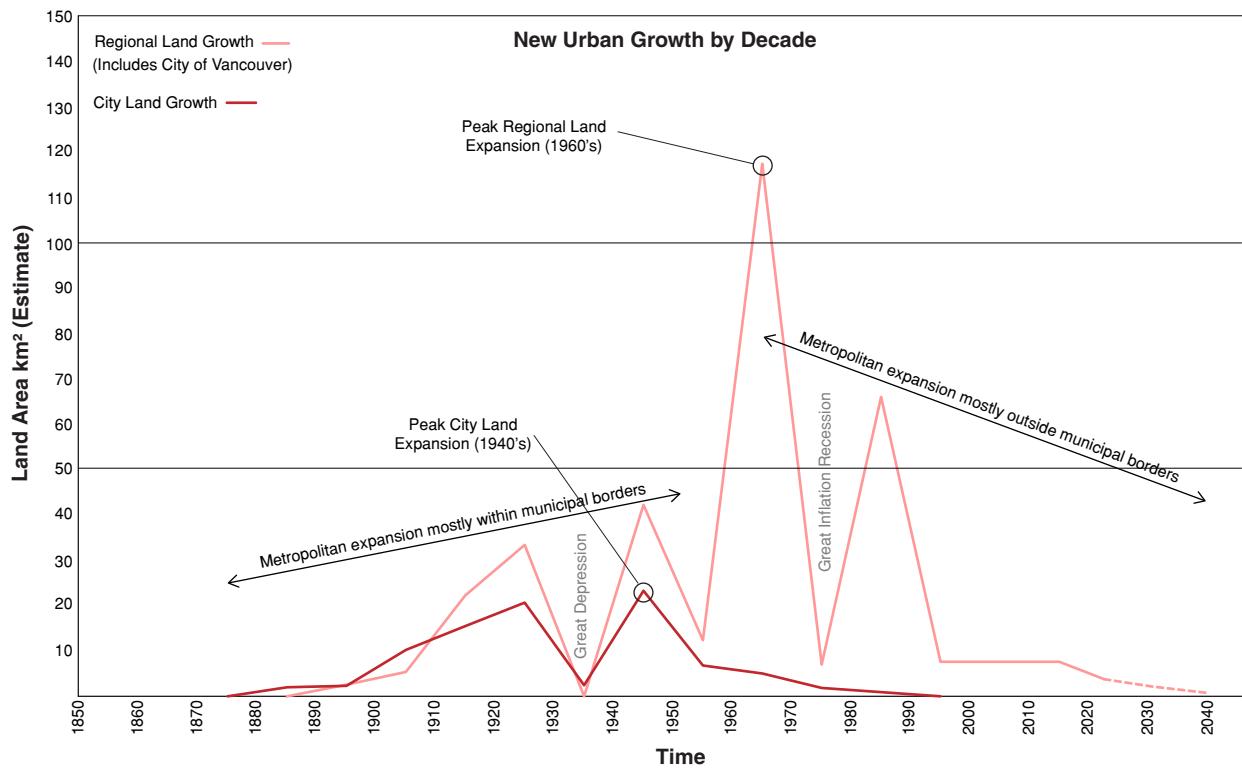


Figure 2.1.2: Vancouver's Urban Territorial Expansion

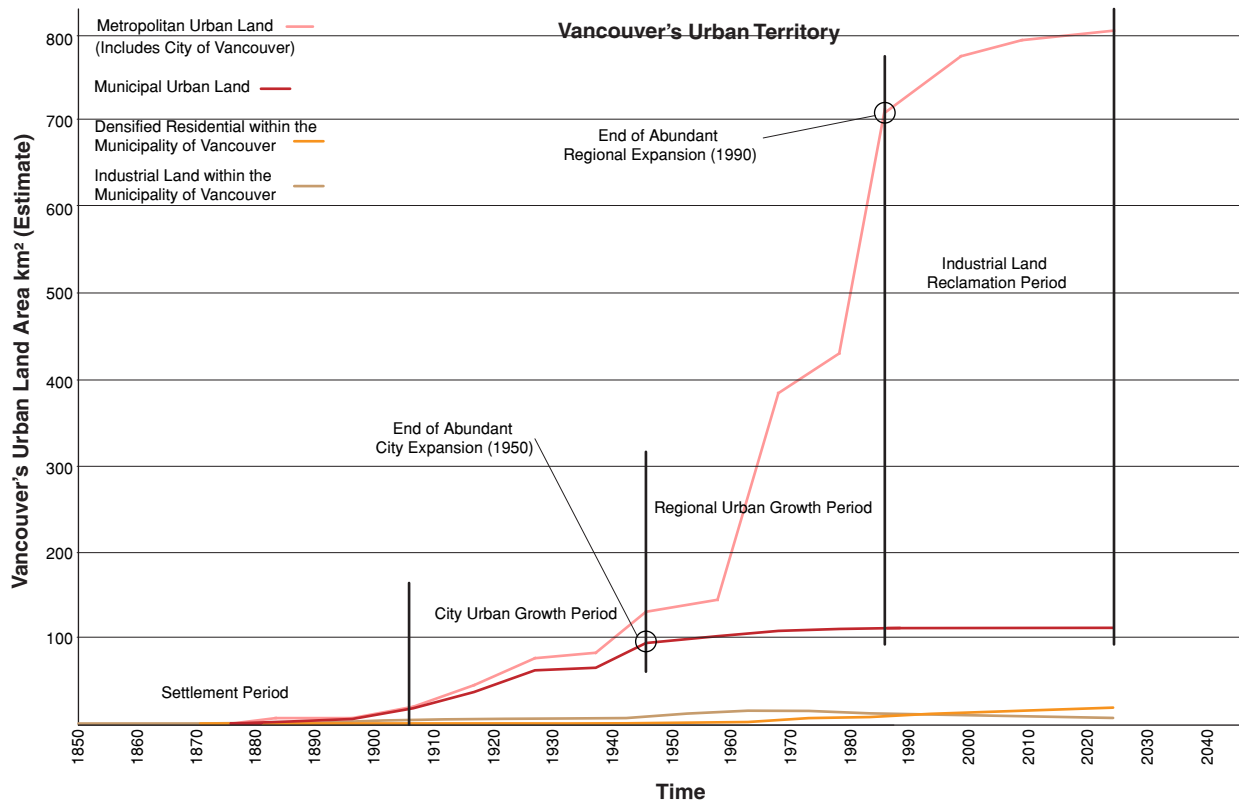


Figure 2.1.3: Vancouver's Historical Urban Territory

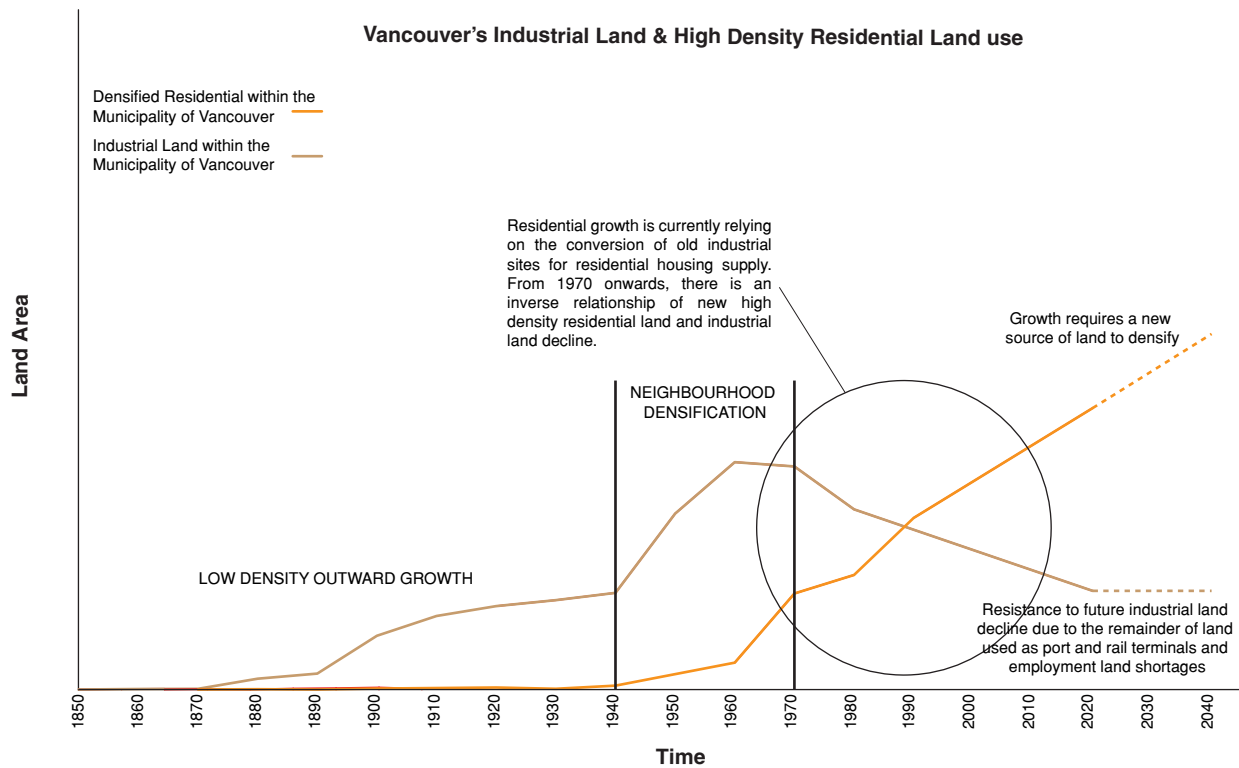


Figure 2.1.4: Vancouver's Residential Densification in correlation with industrial land.

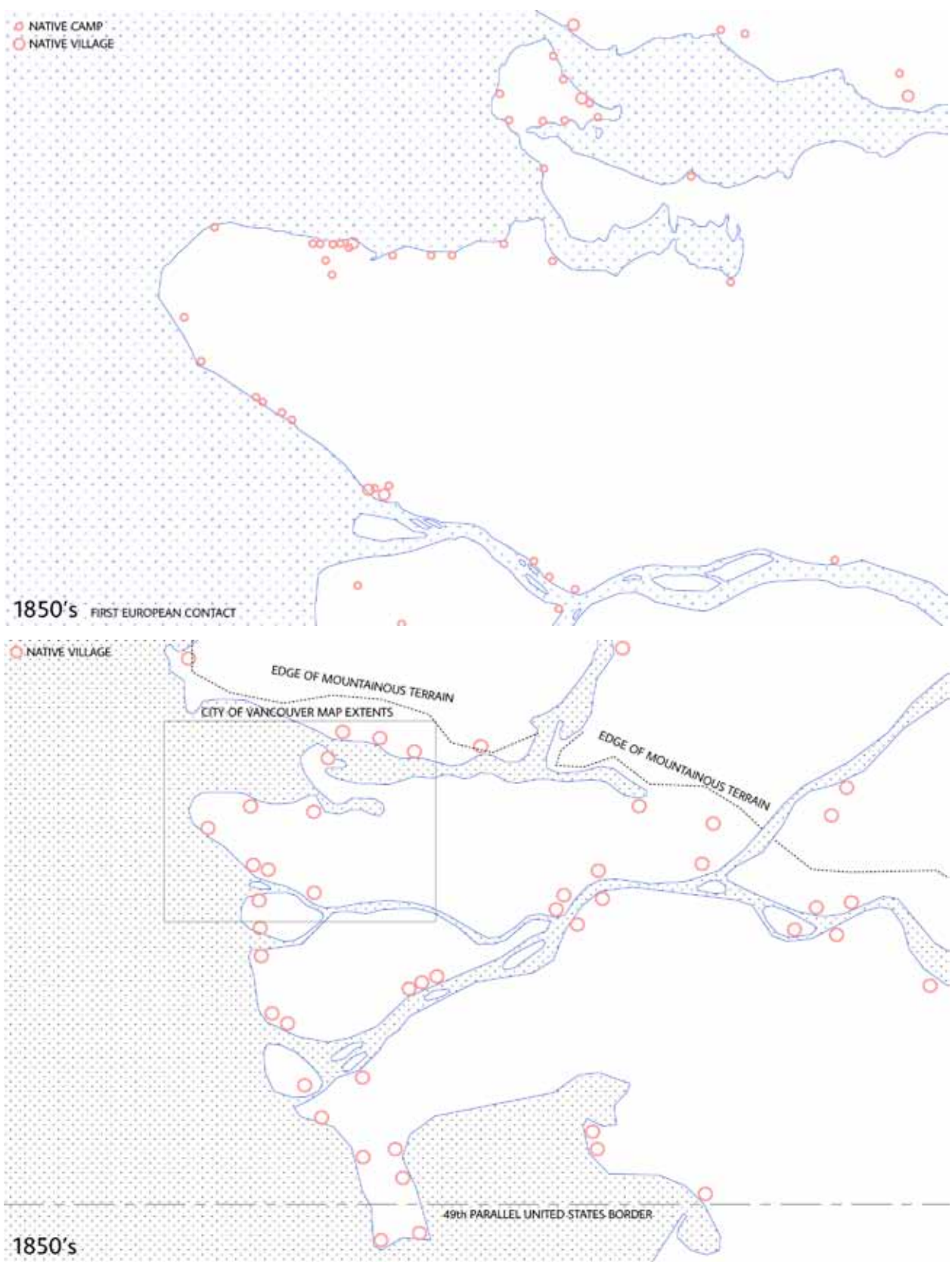


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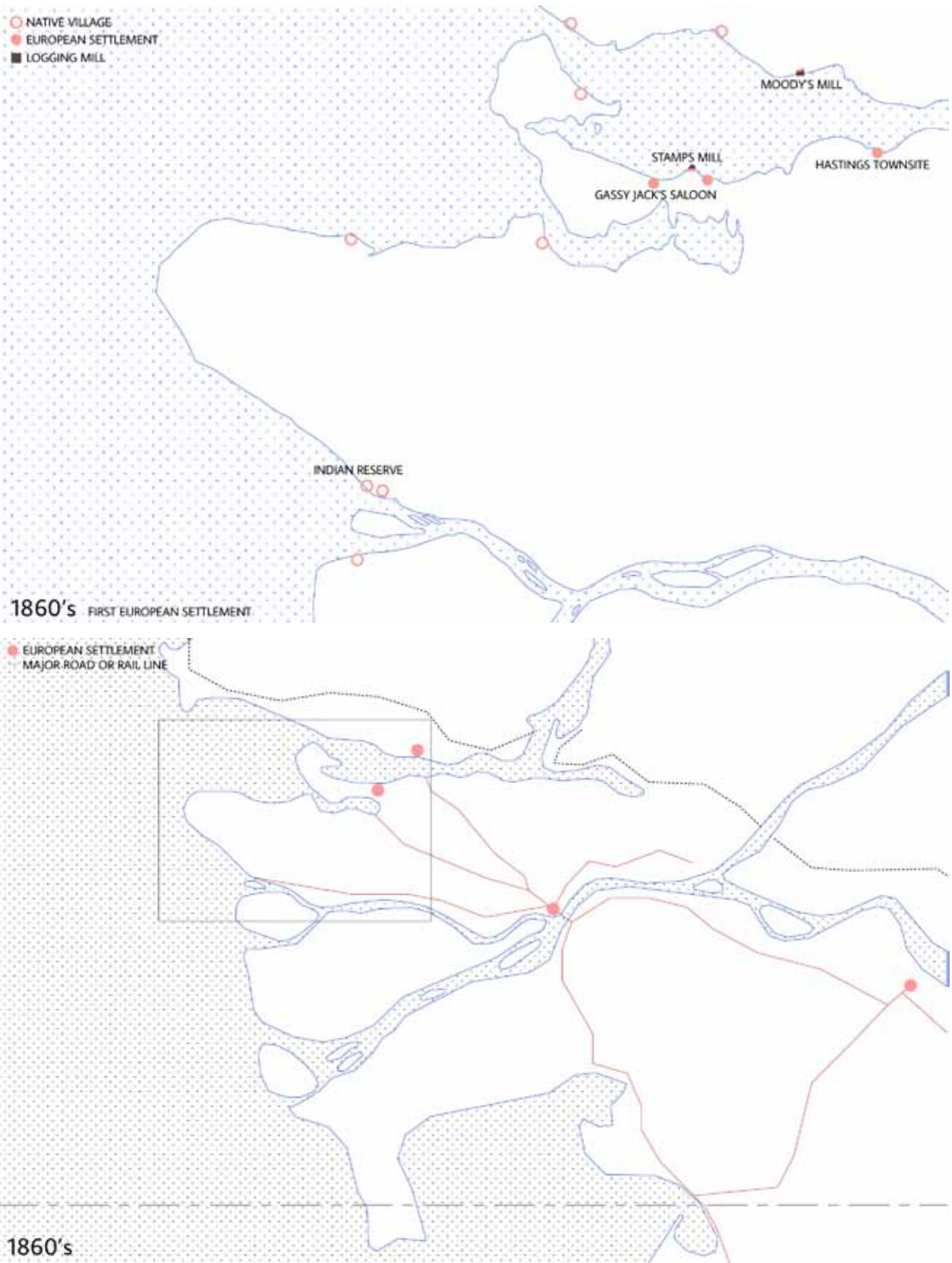


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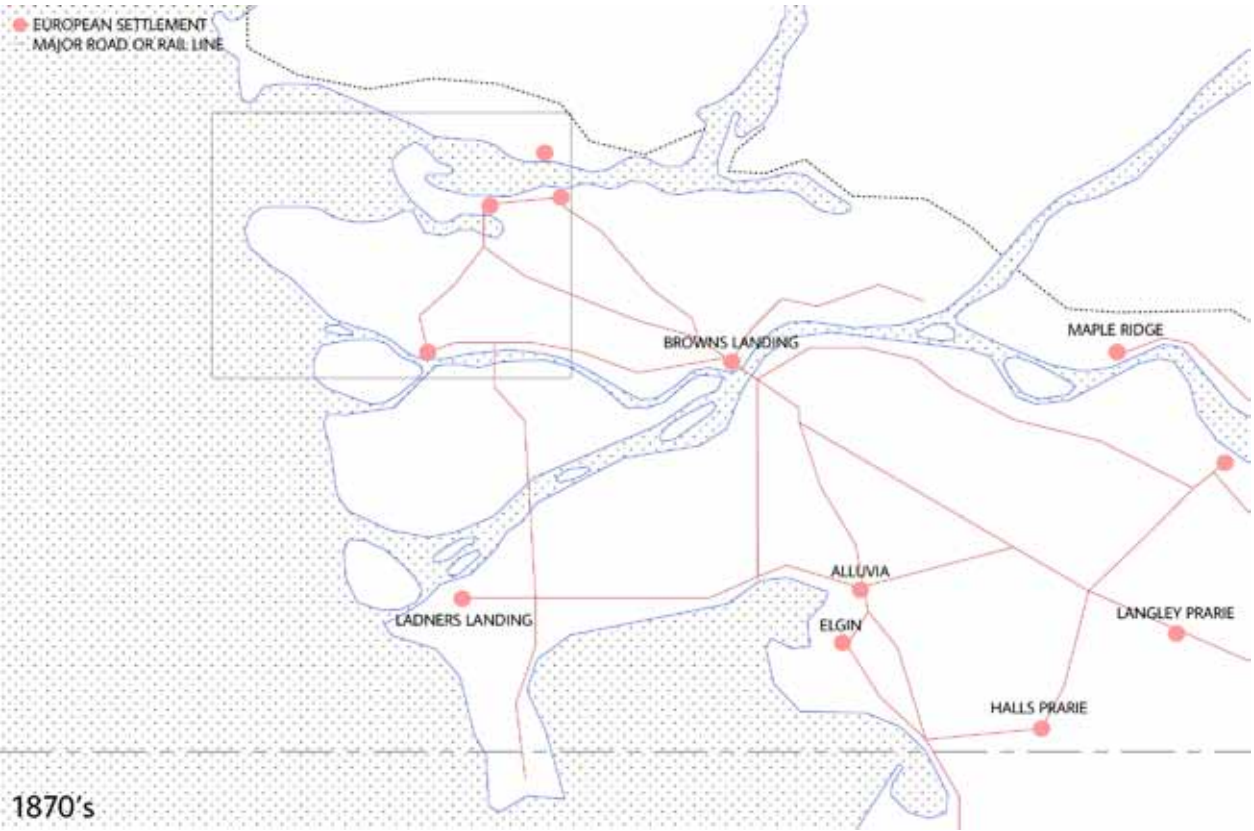
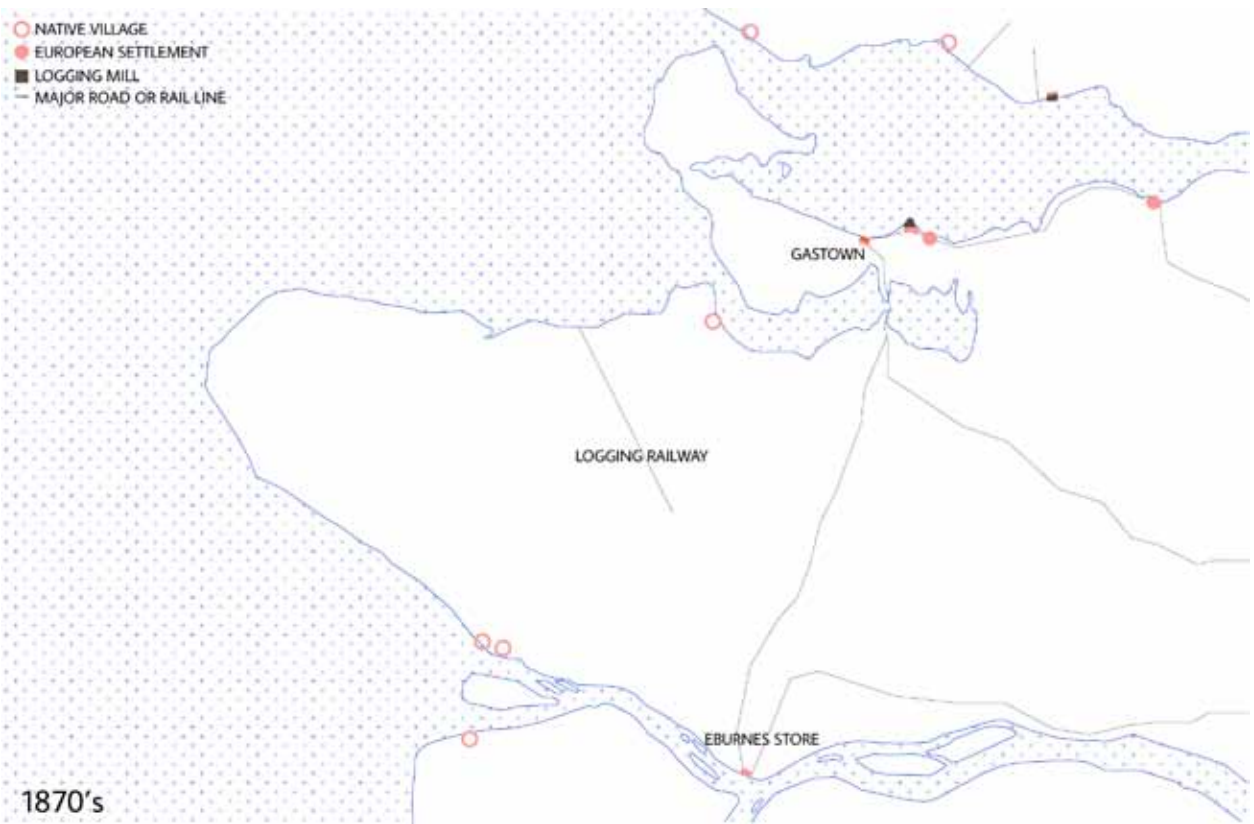


Figure 2.1.7



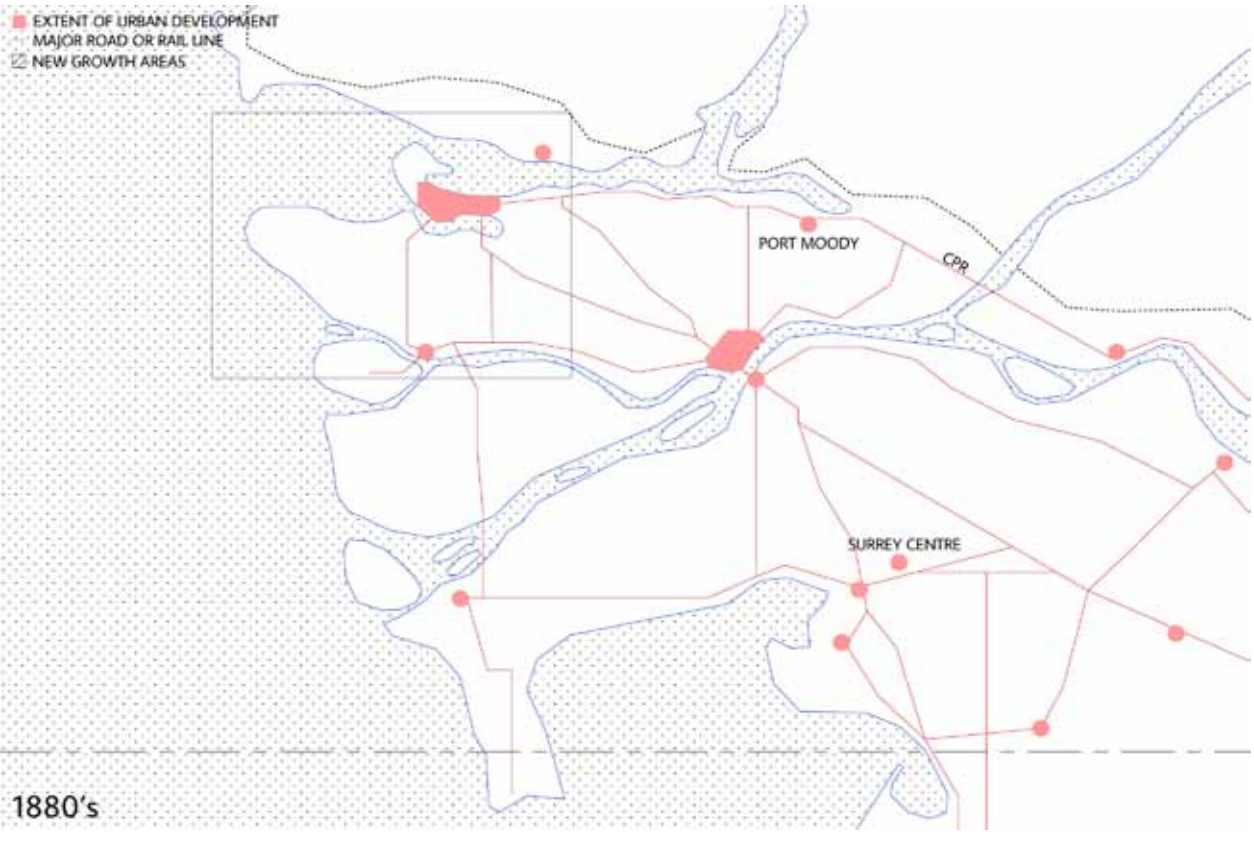
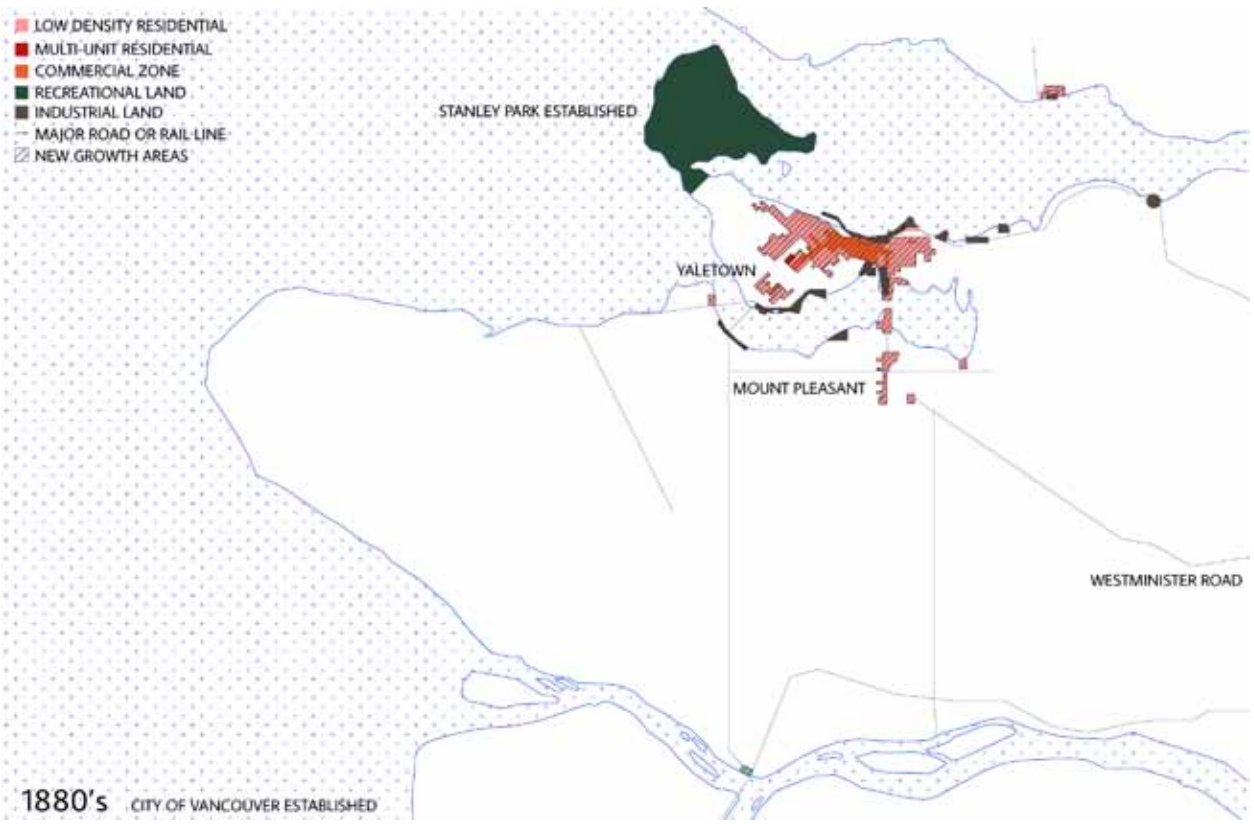


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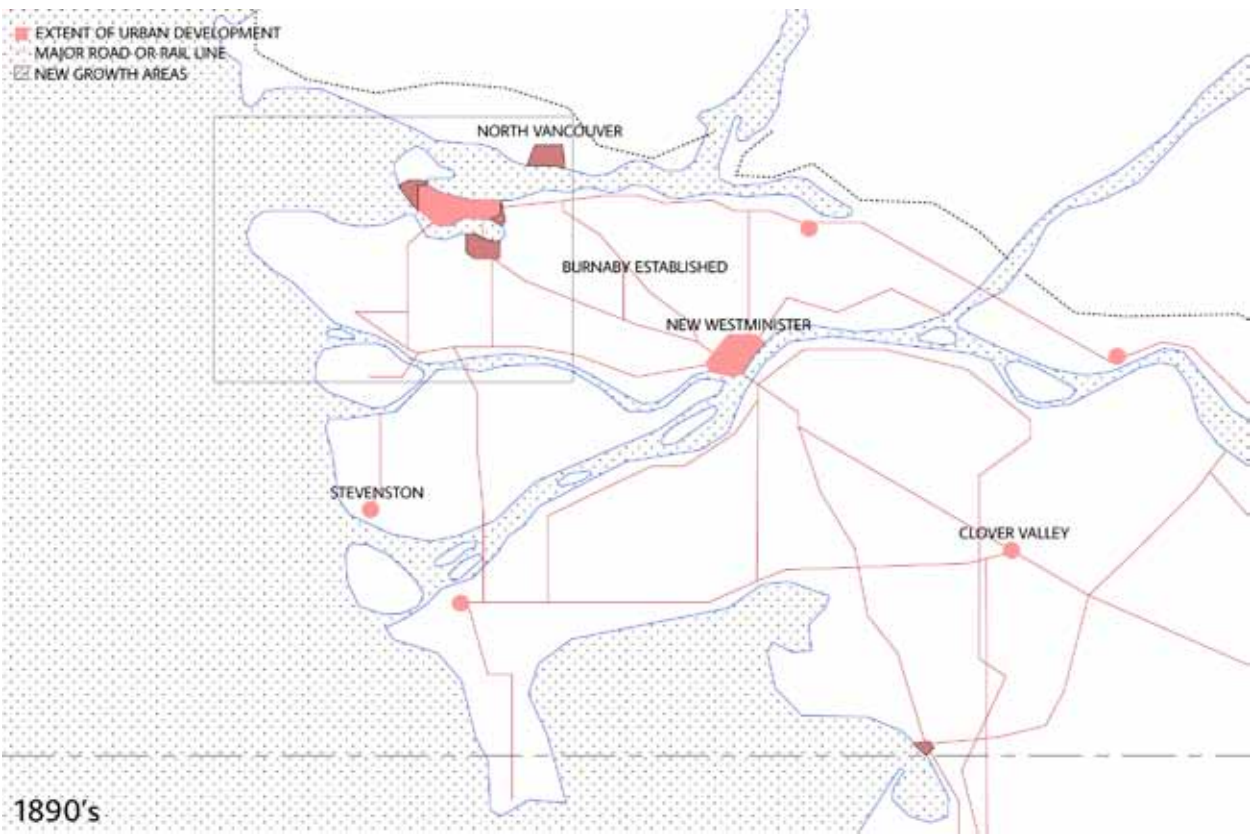
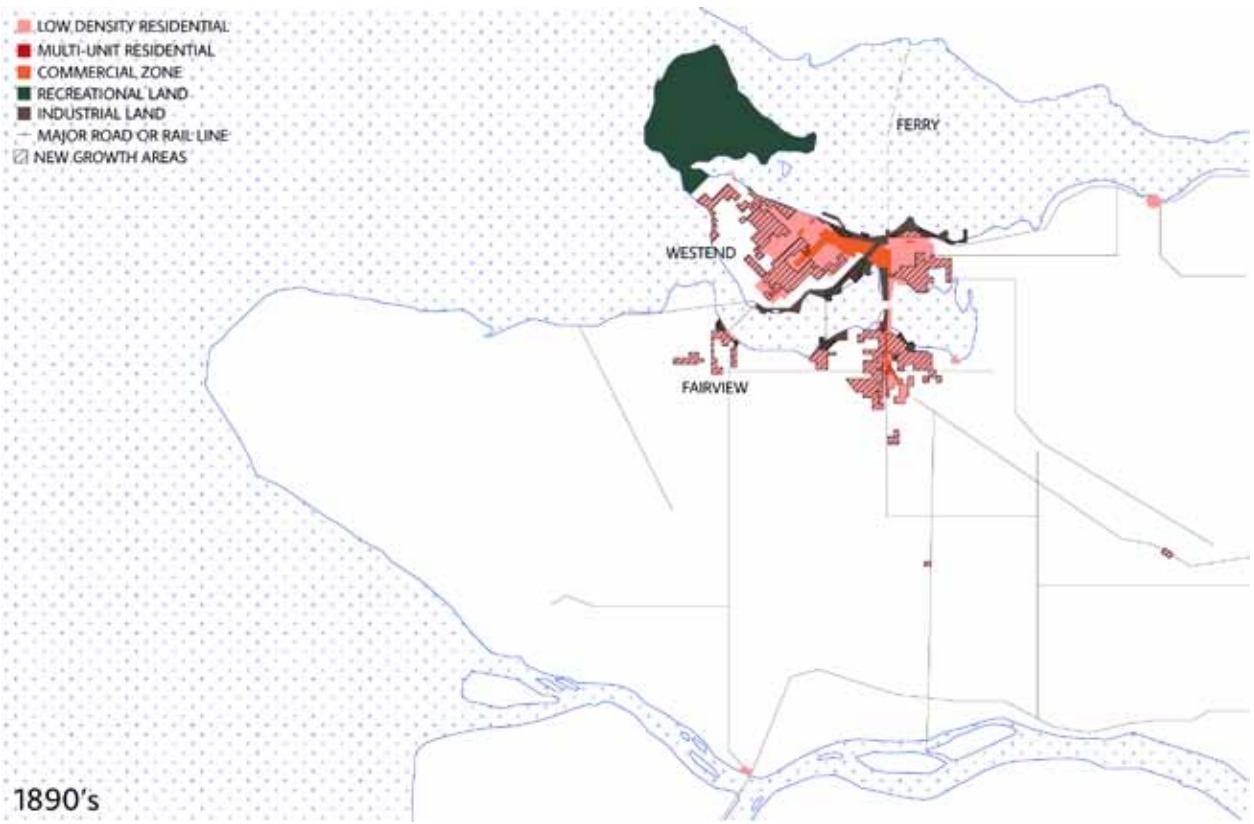


Figure 2.1.9

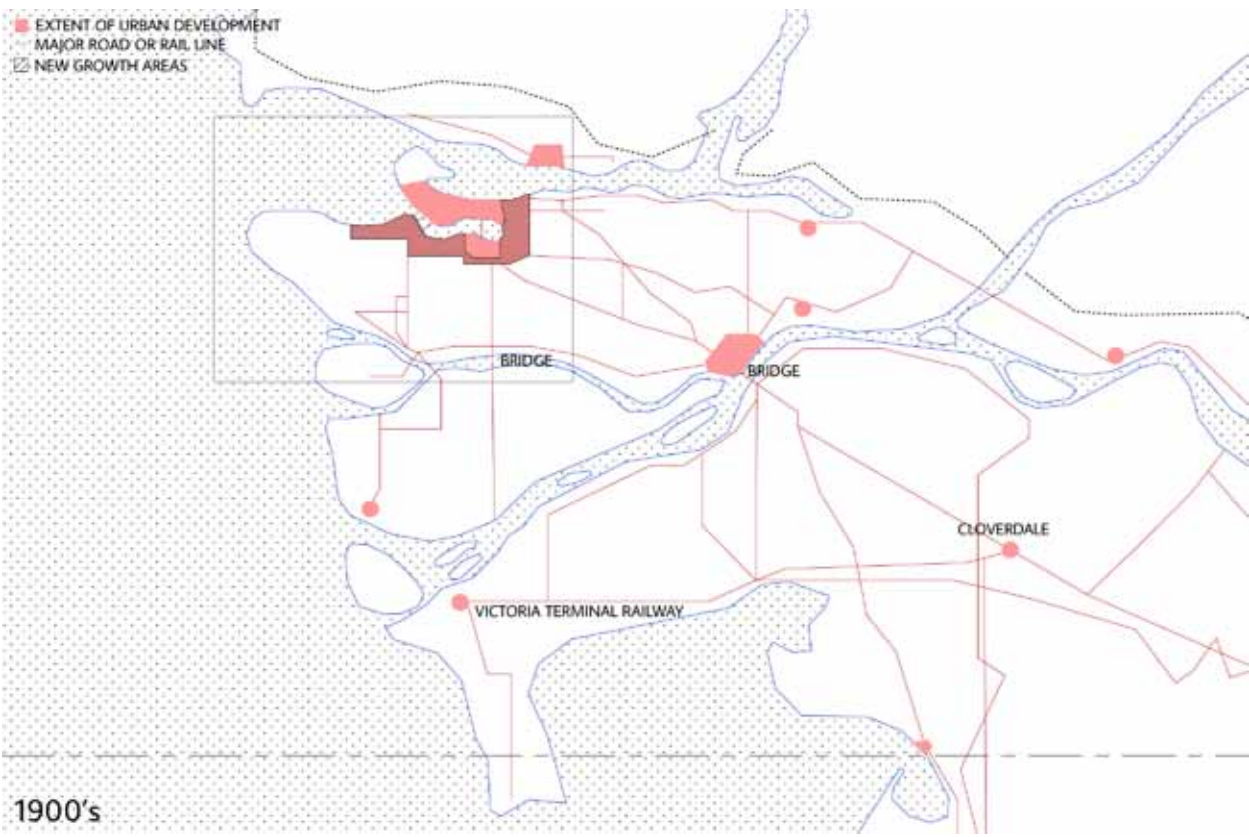
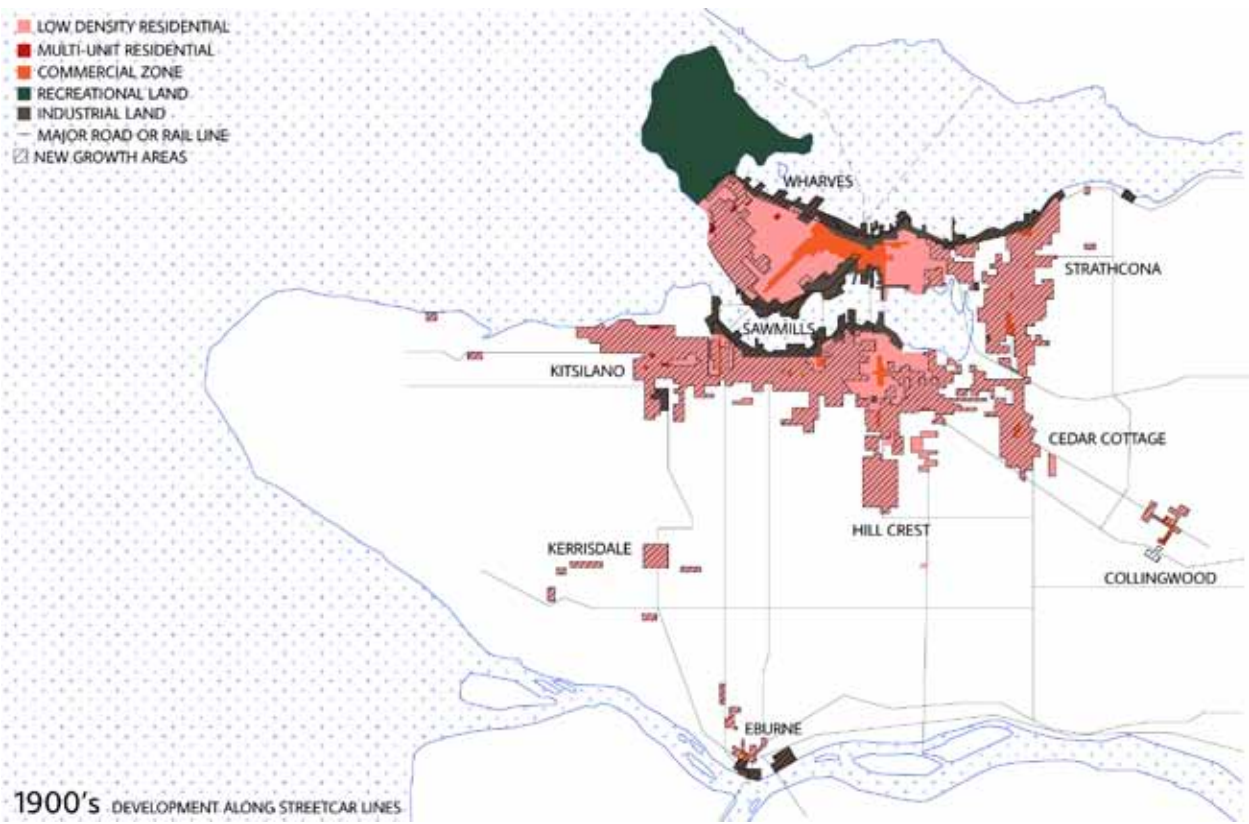


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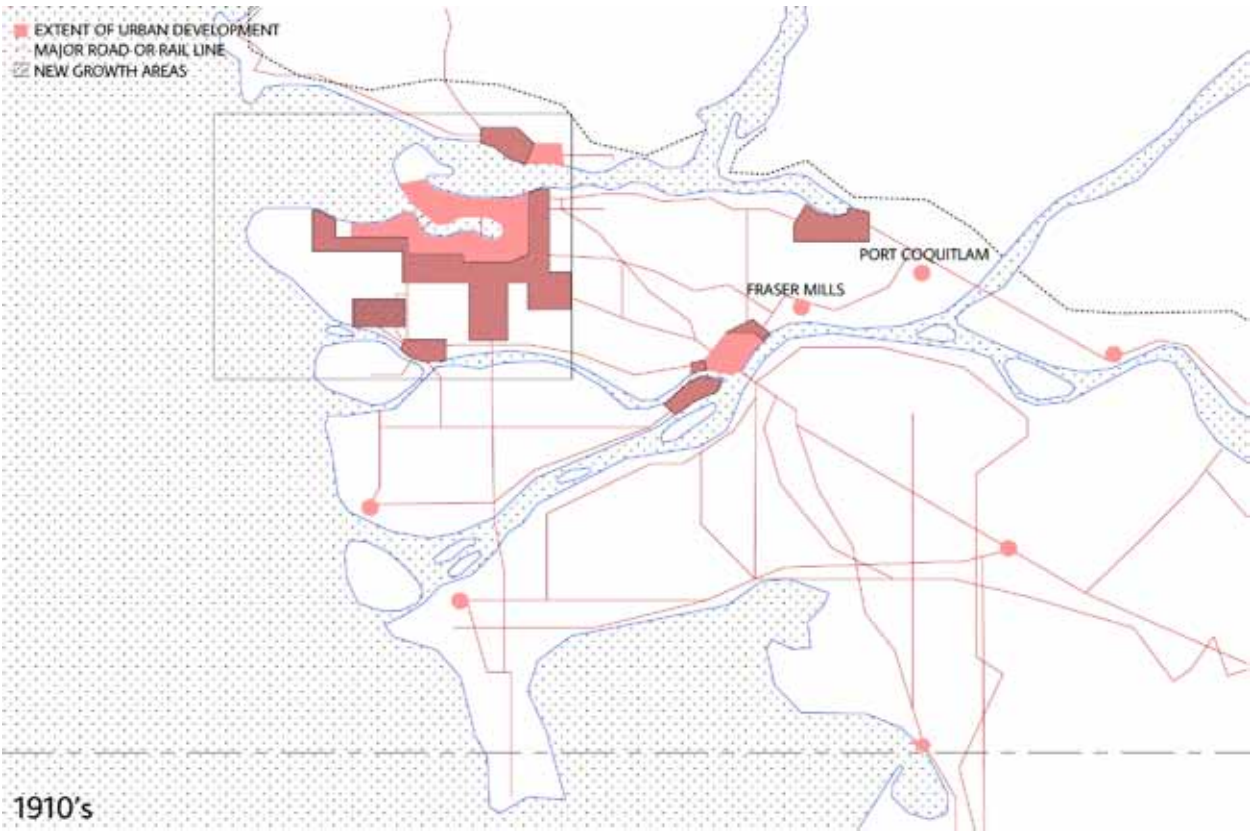
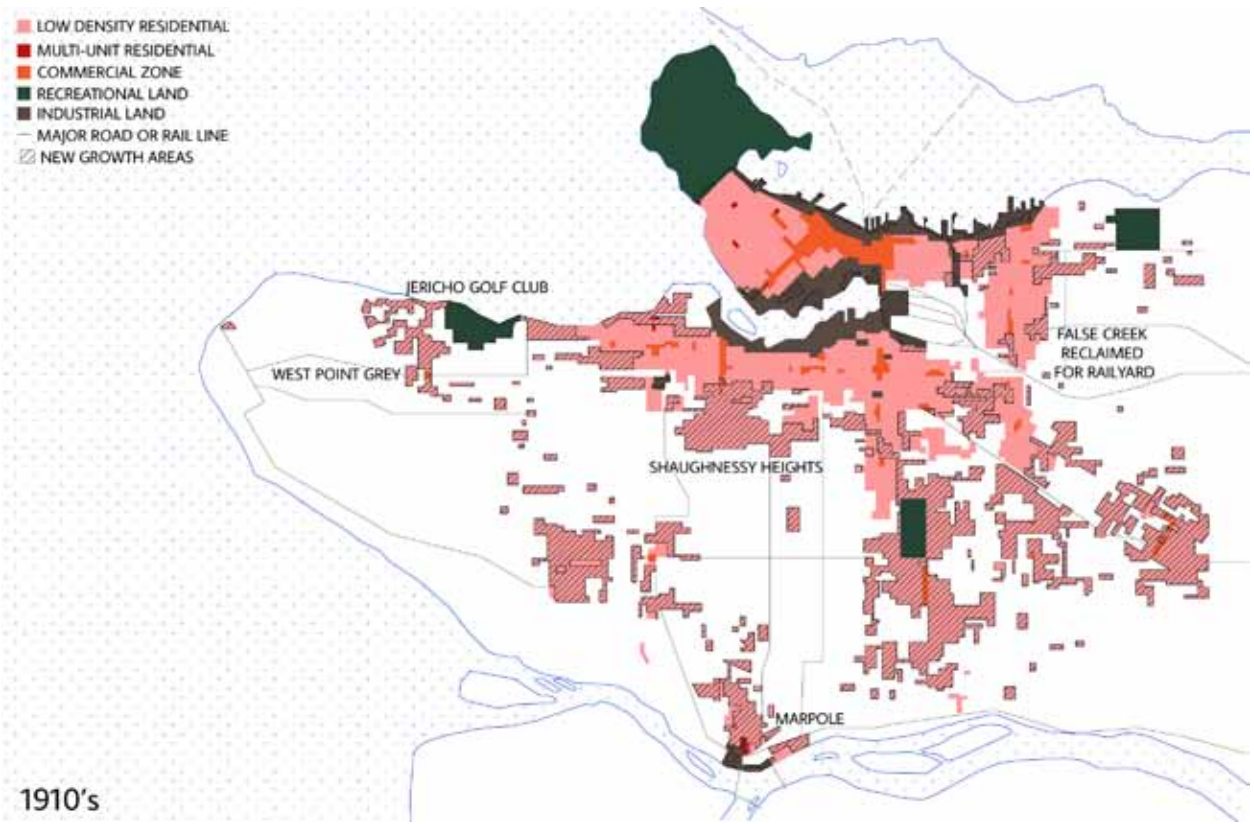


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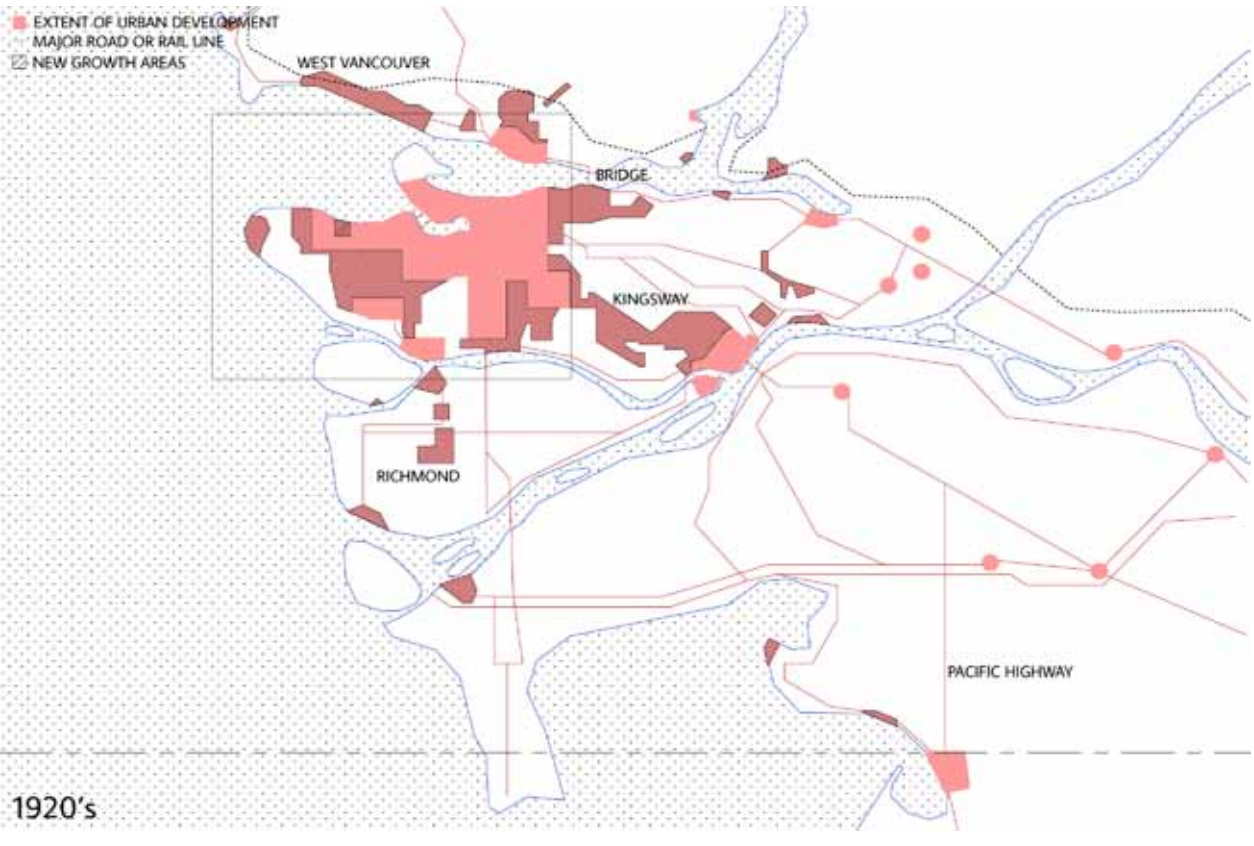
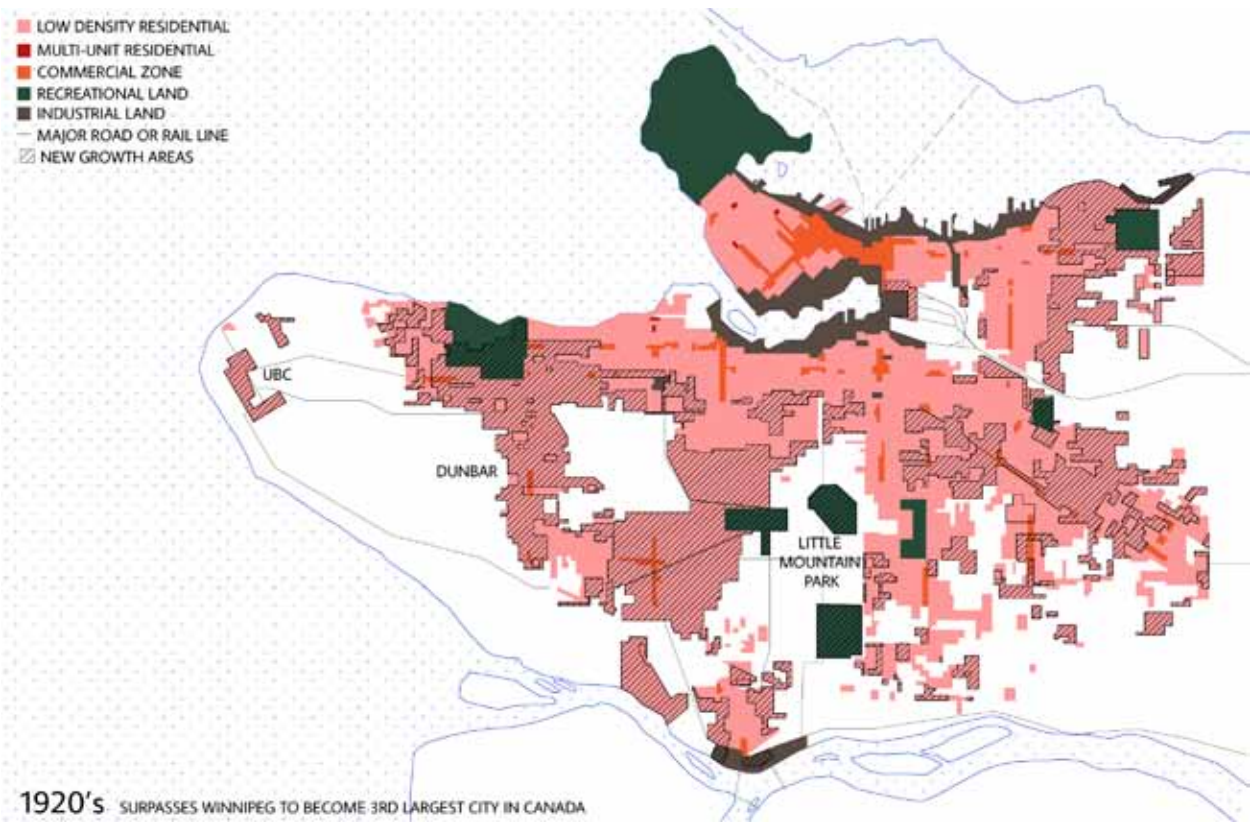


Figure 2.1.12

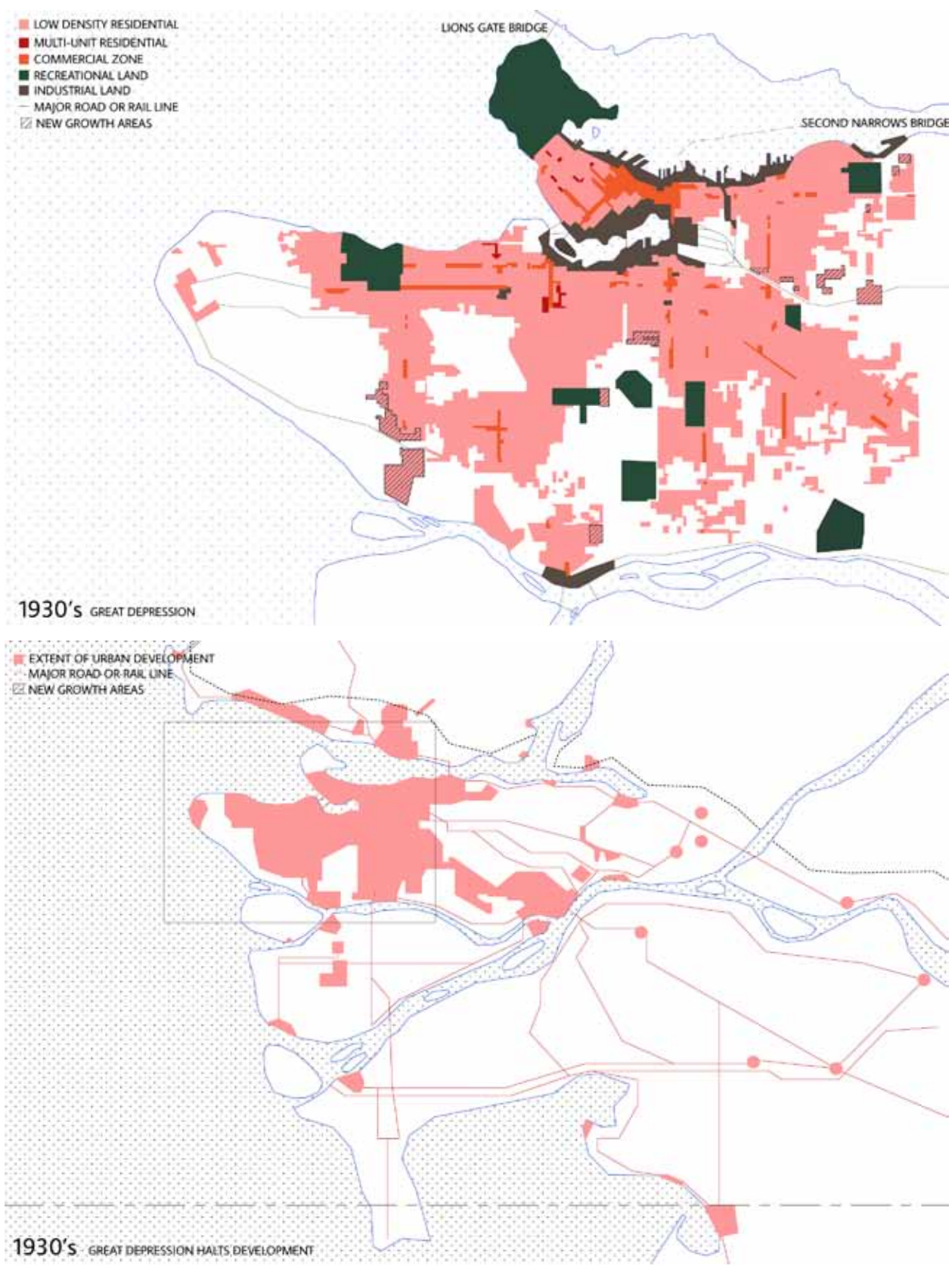


Figure 2.1.13

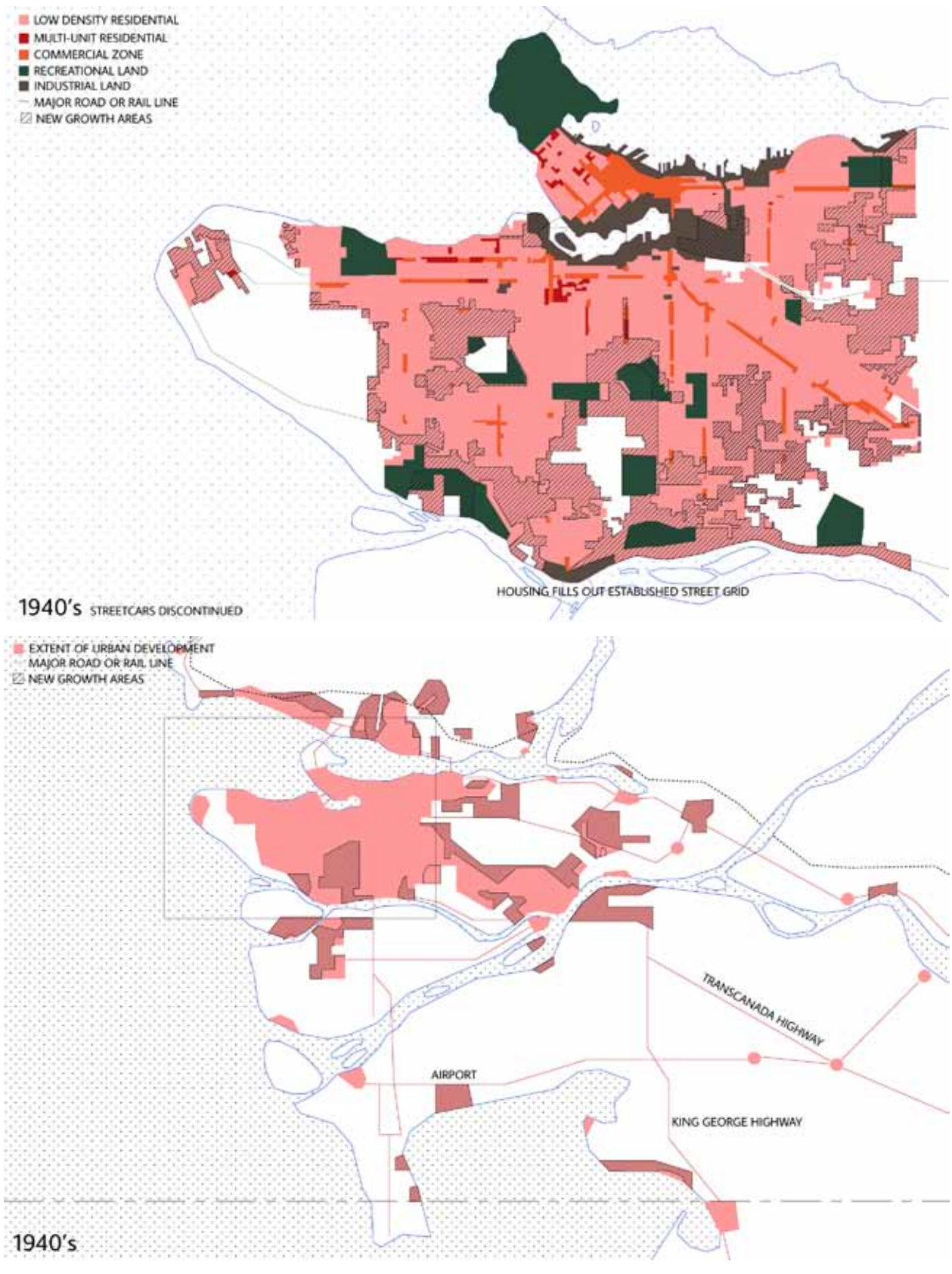


Figure 2.1.14

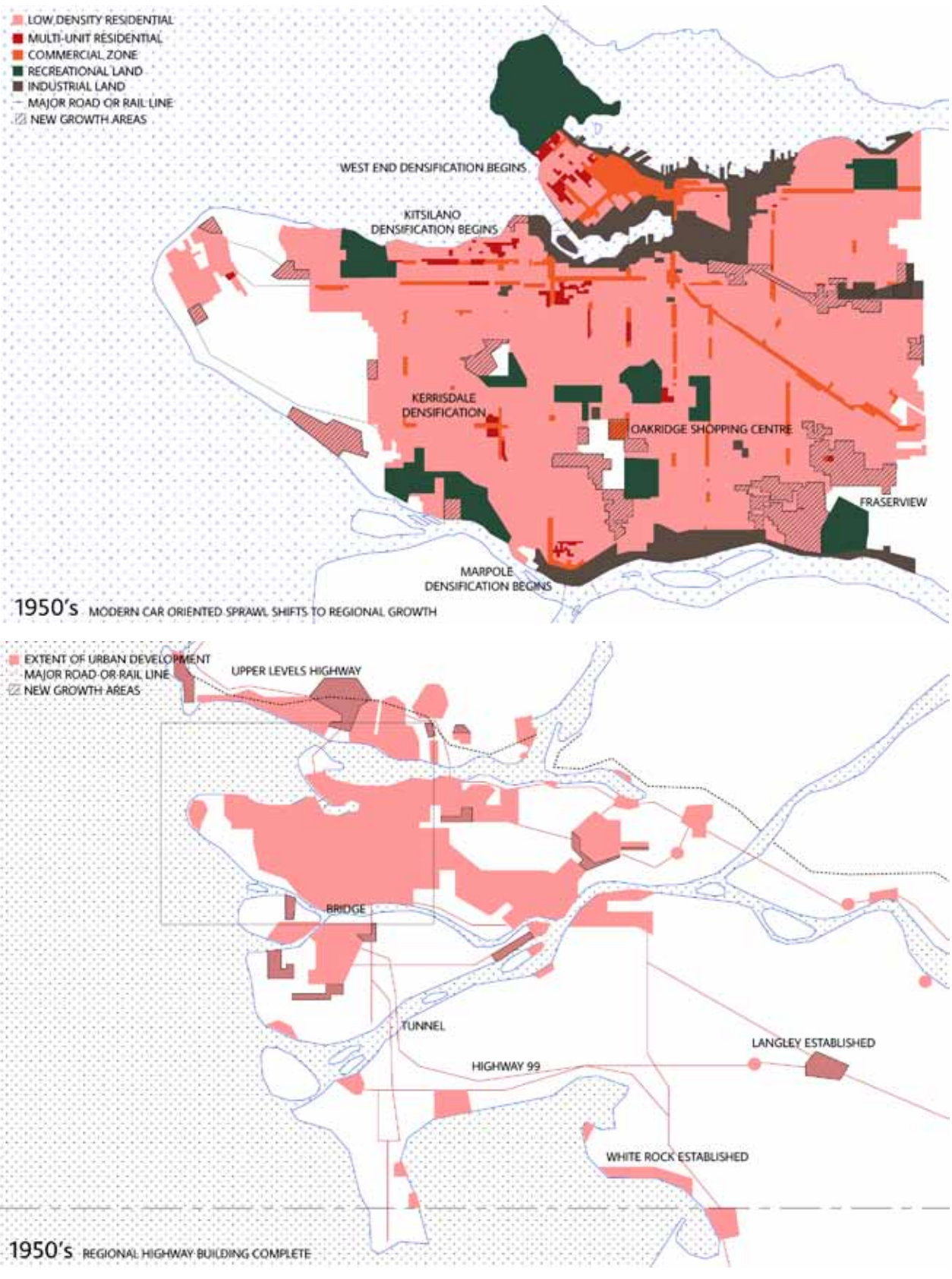


Figure 2.1.15



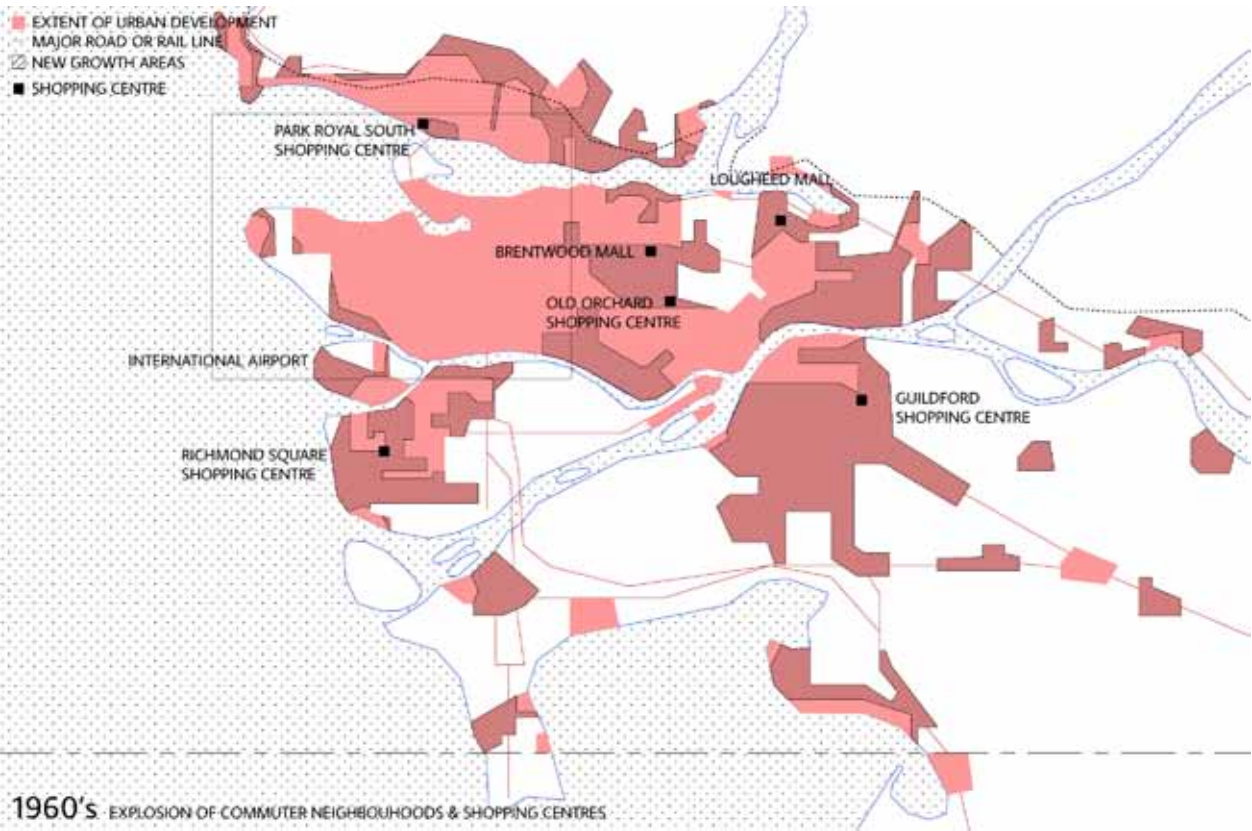
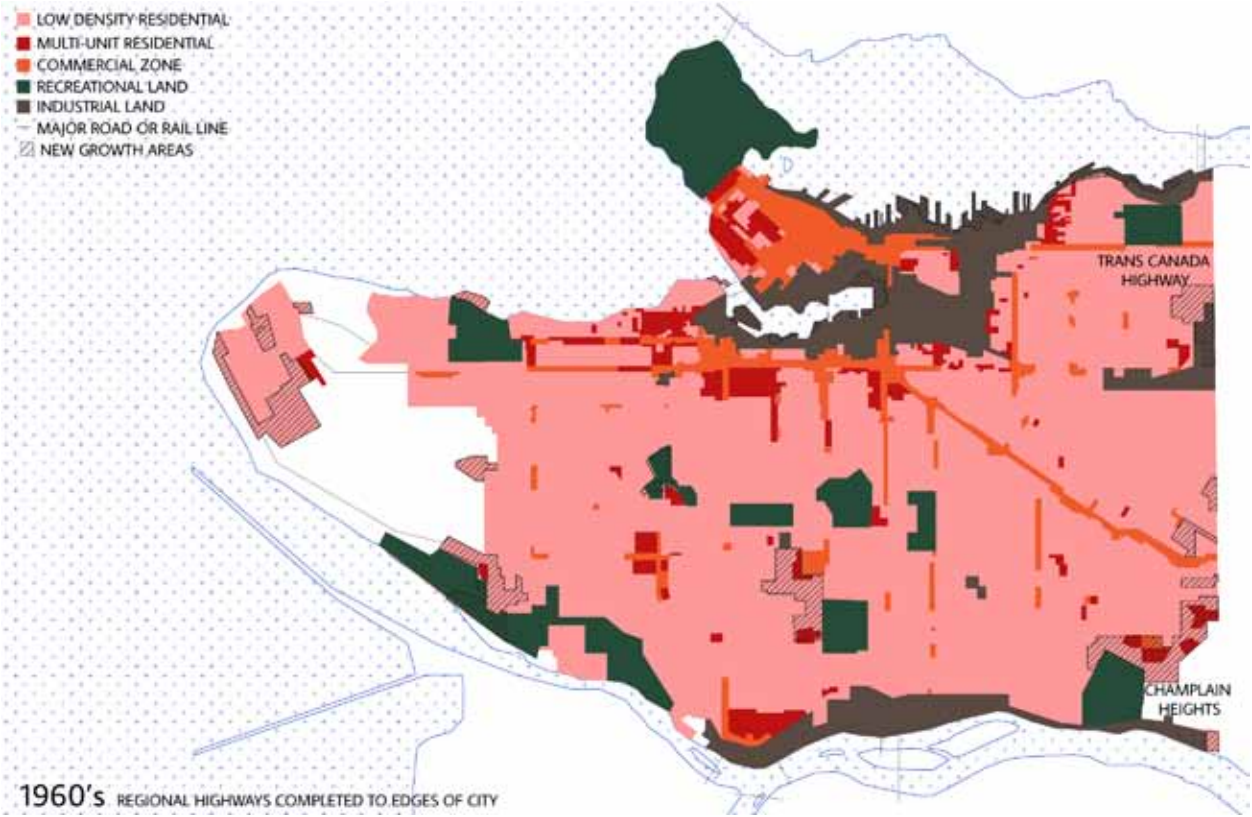


Figure 2.1.16

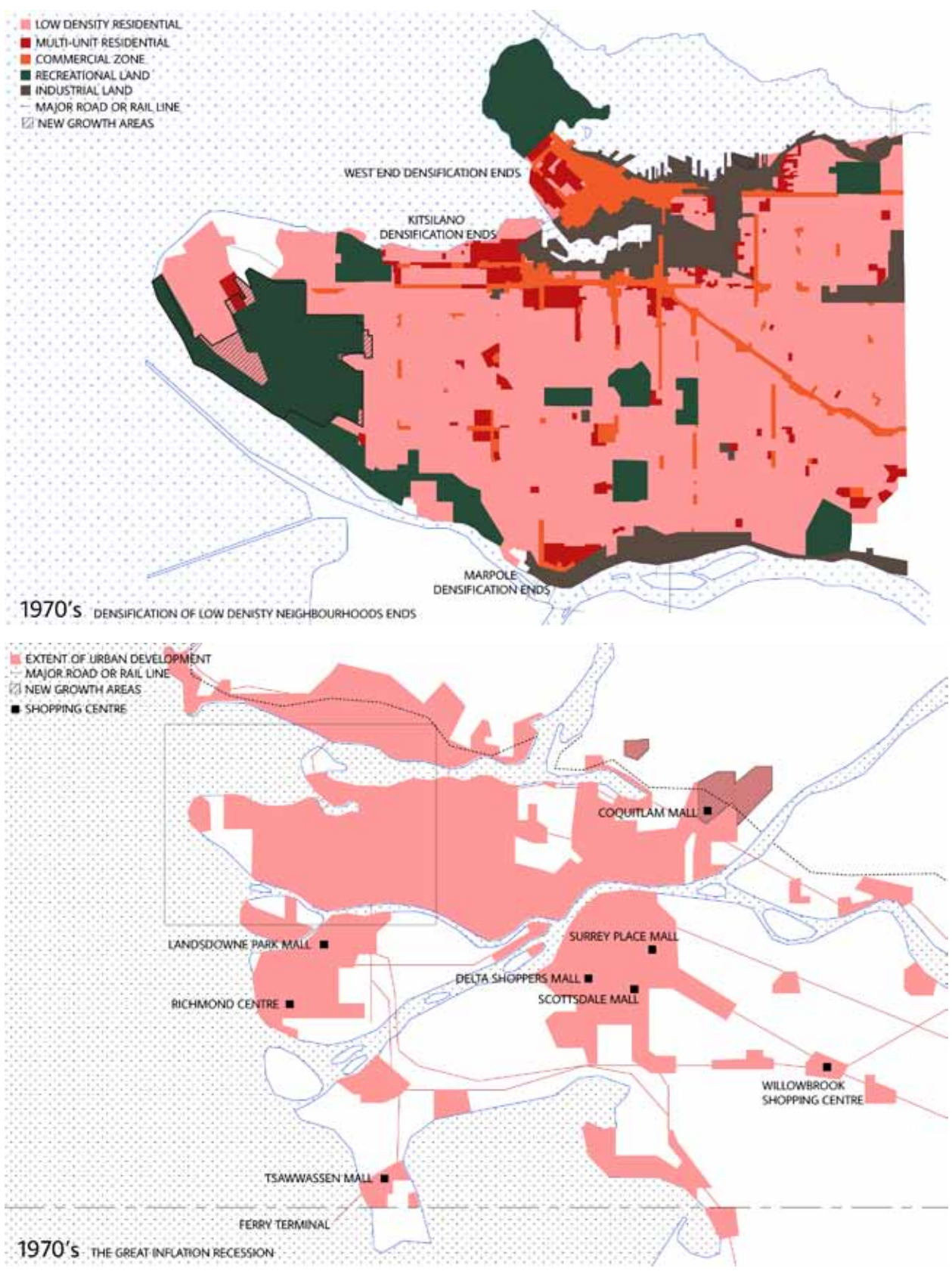


Figure 2.1.17

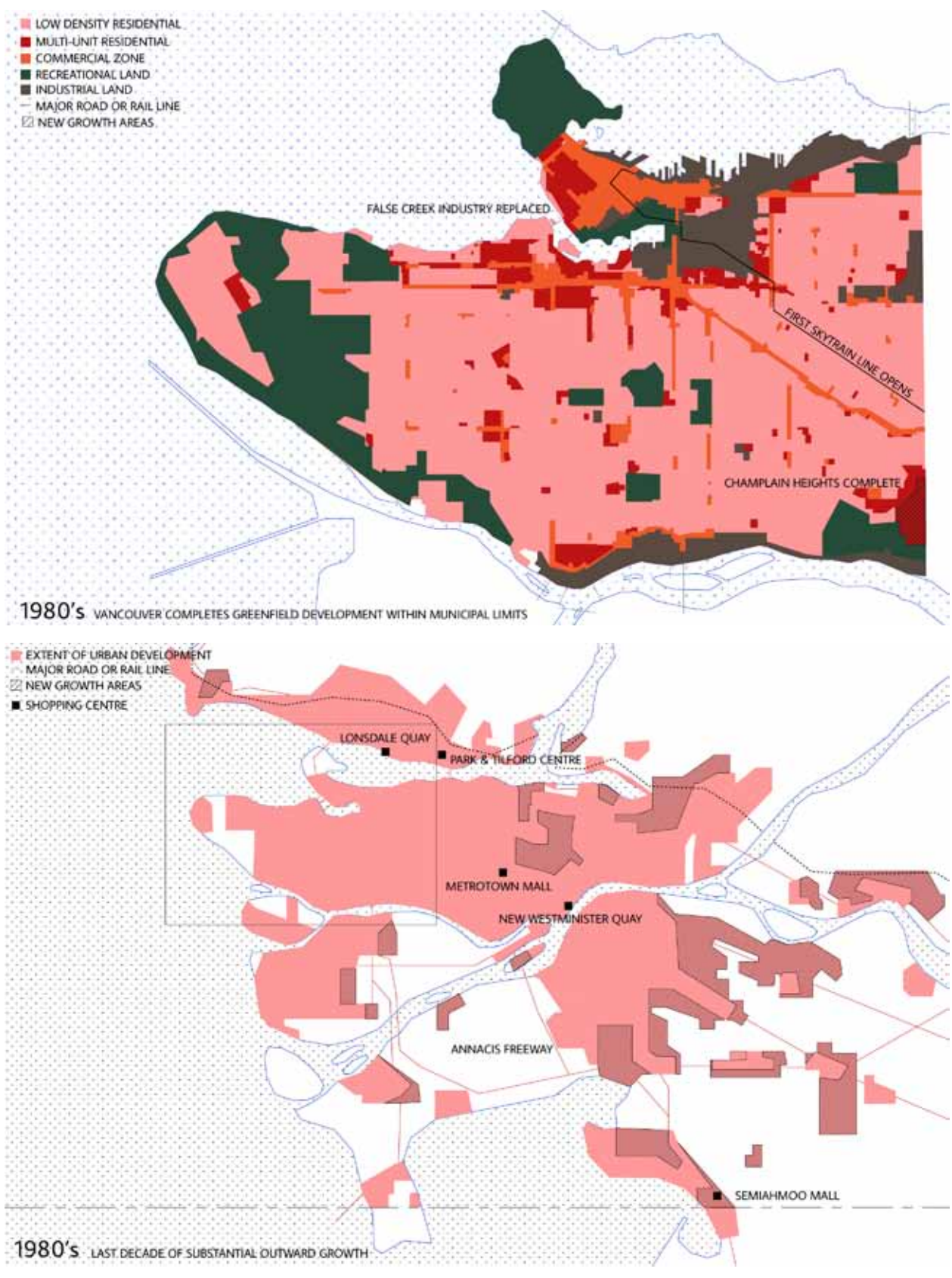


Figure 2.1.18

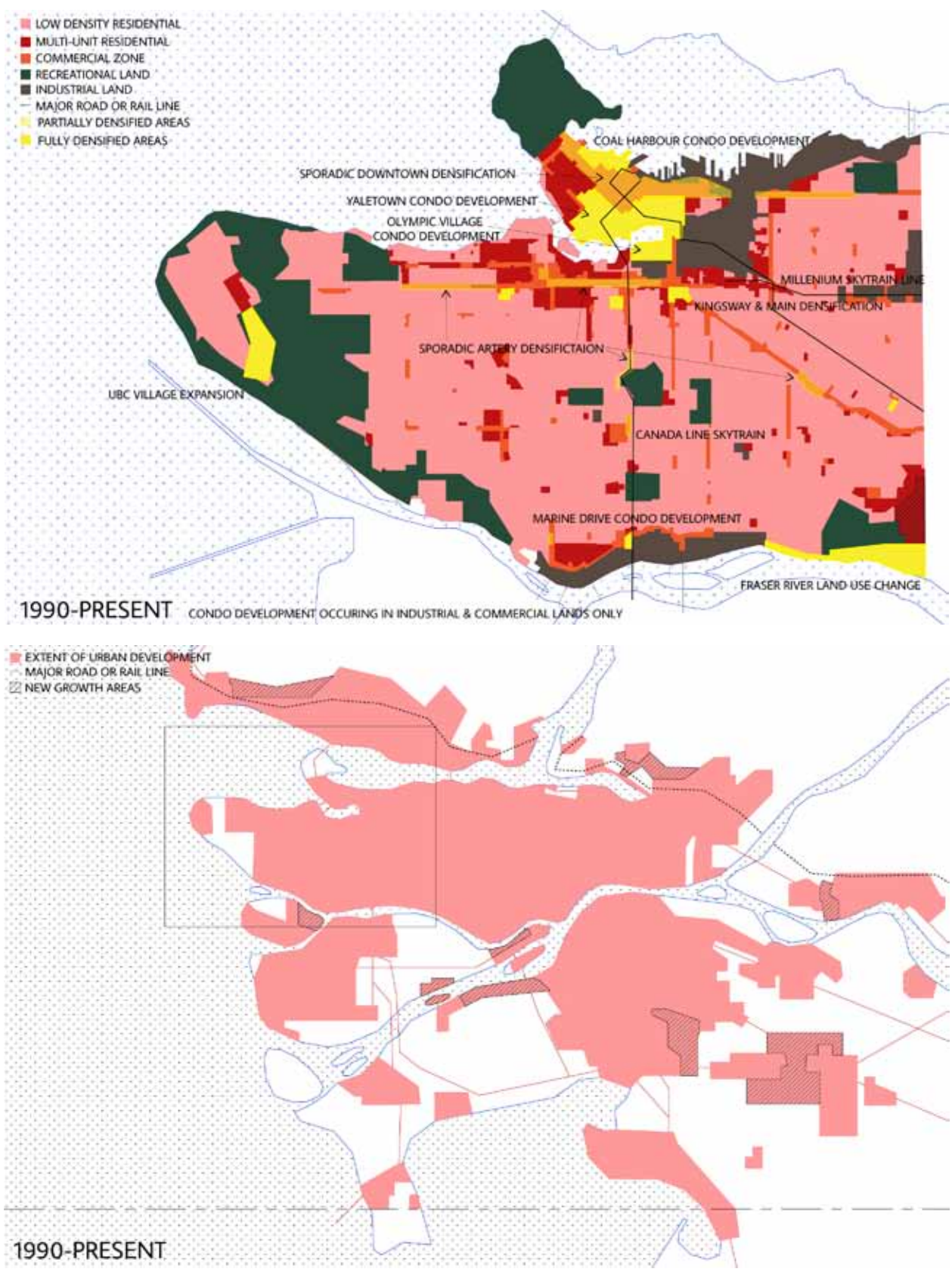


Figure 2.1.19

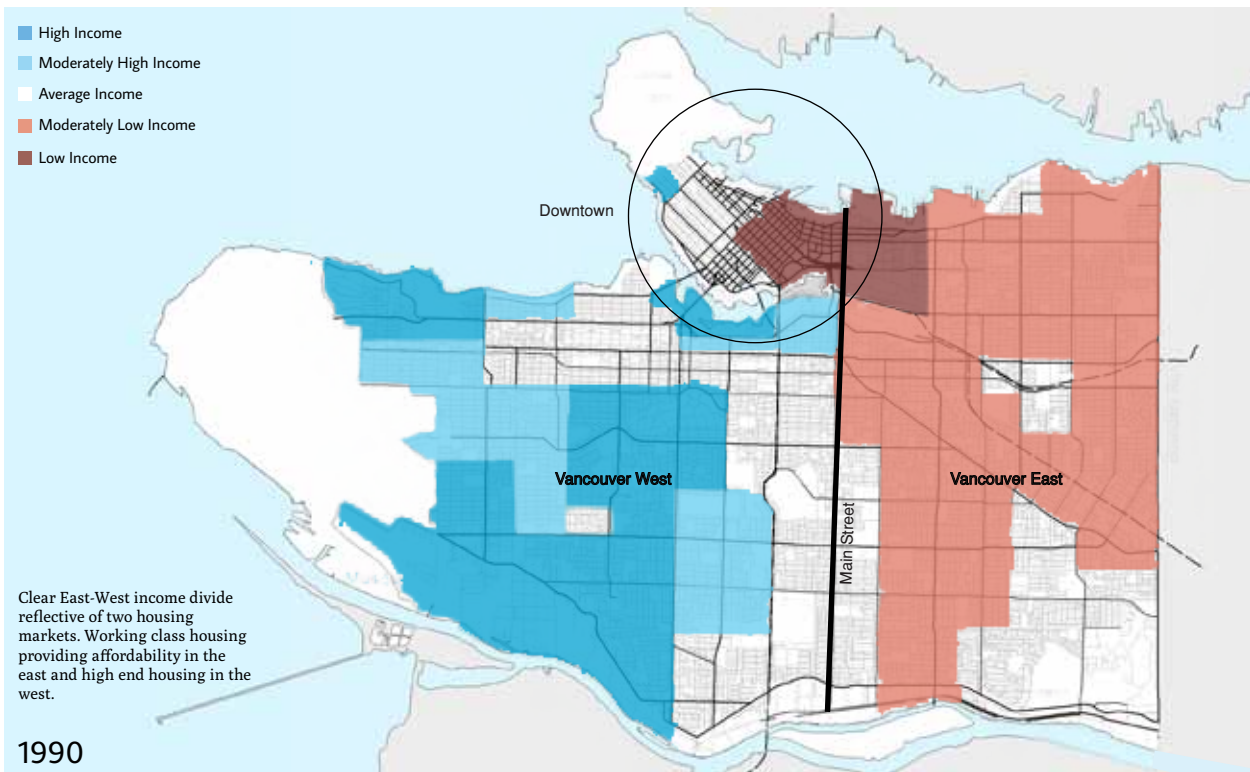


Figure 2.1.20: Vancouver's 1990 Income Distribution by Census Tract

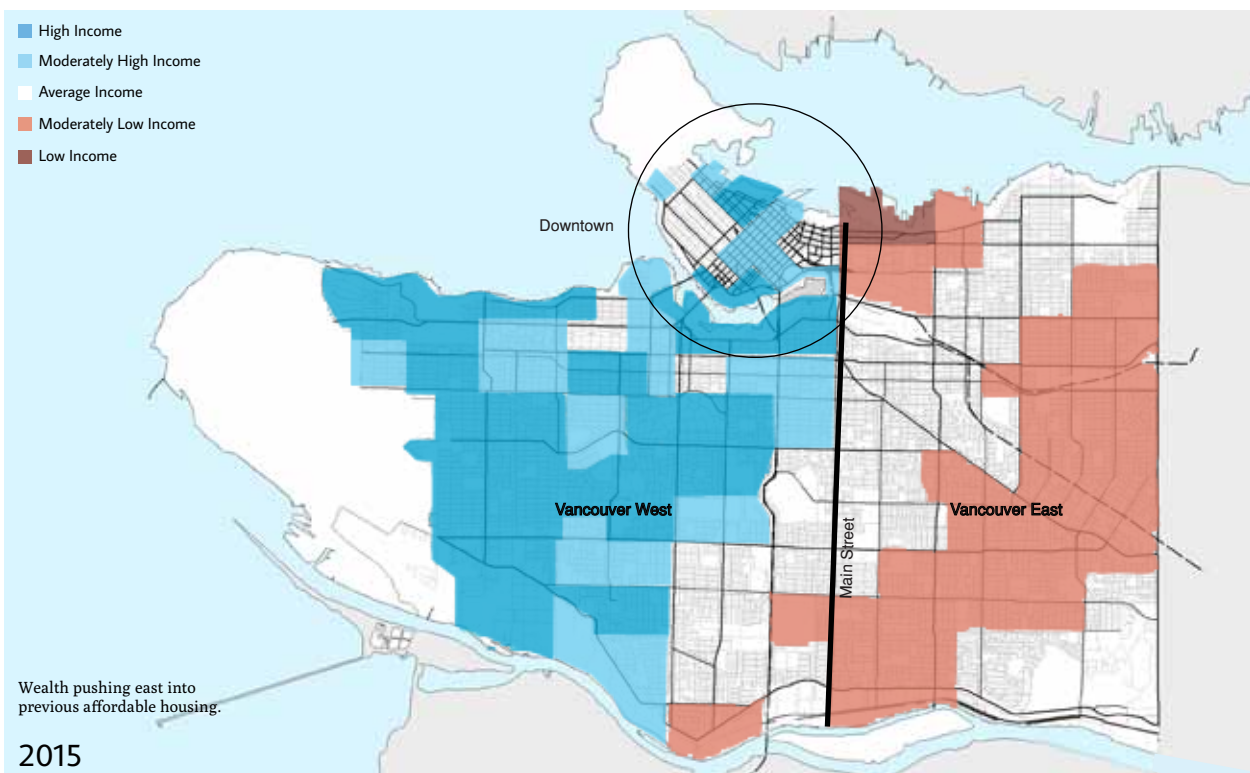


Figure 2.1.21: Vancouver's 2015 Income Distribution by Census Tract

# Transition to Post Sprawl

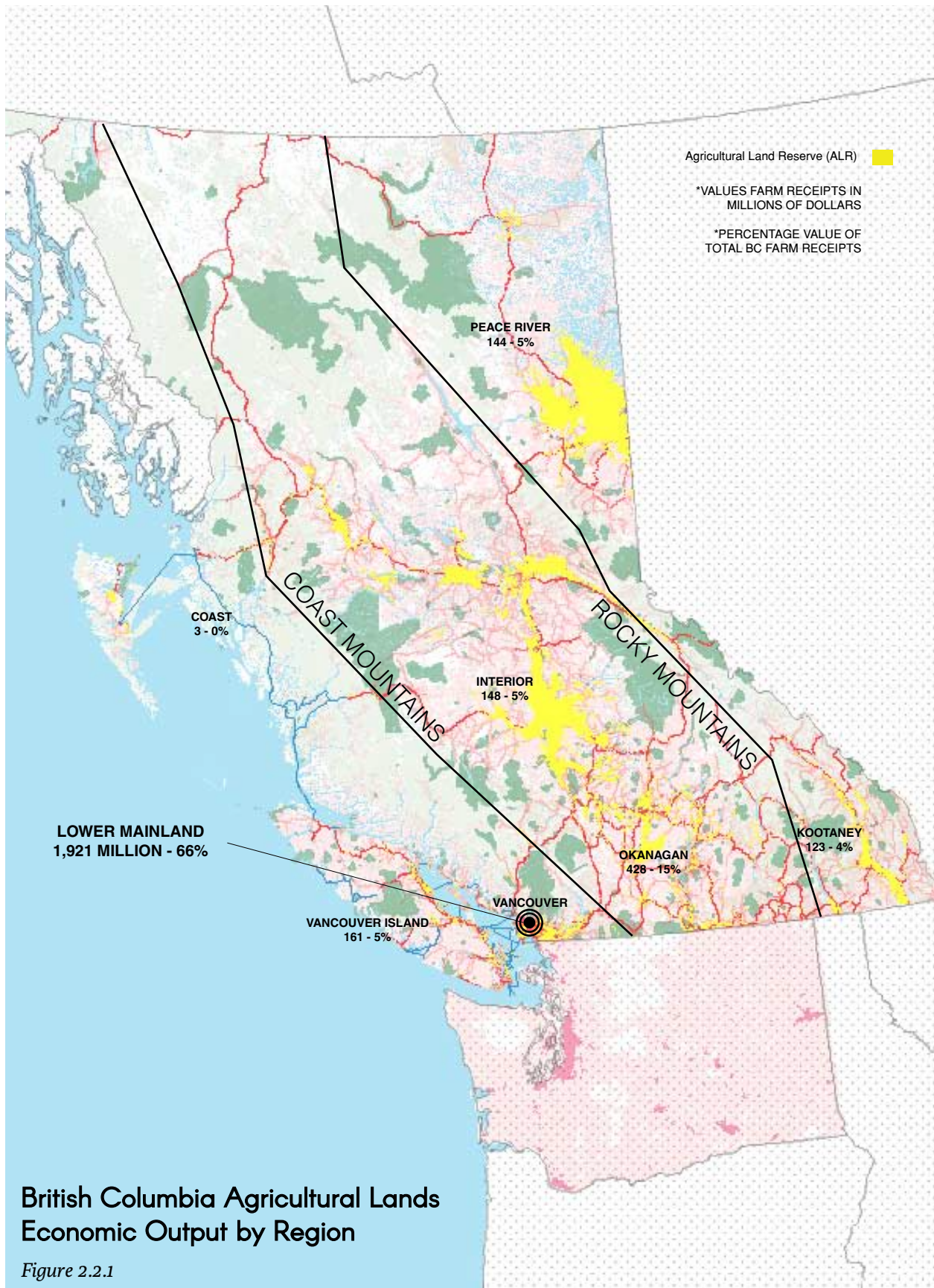
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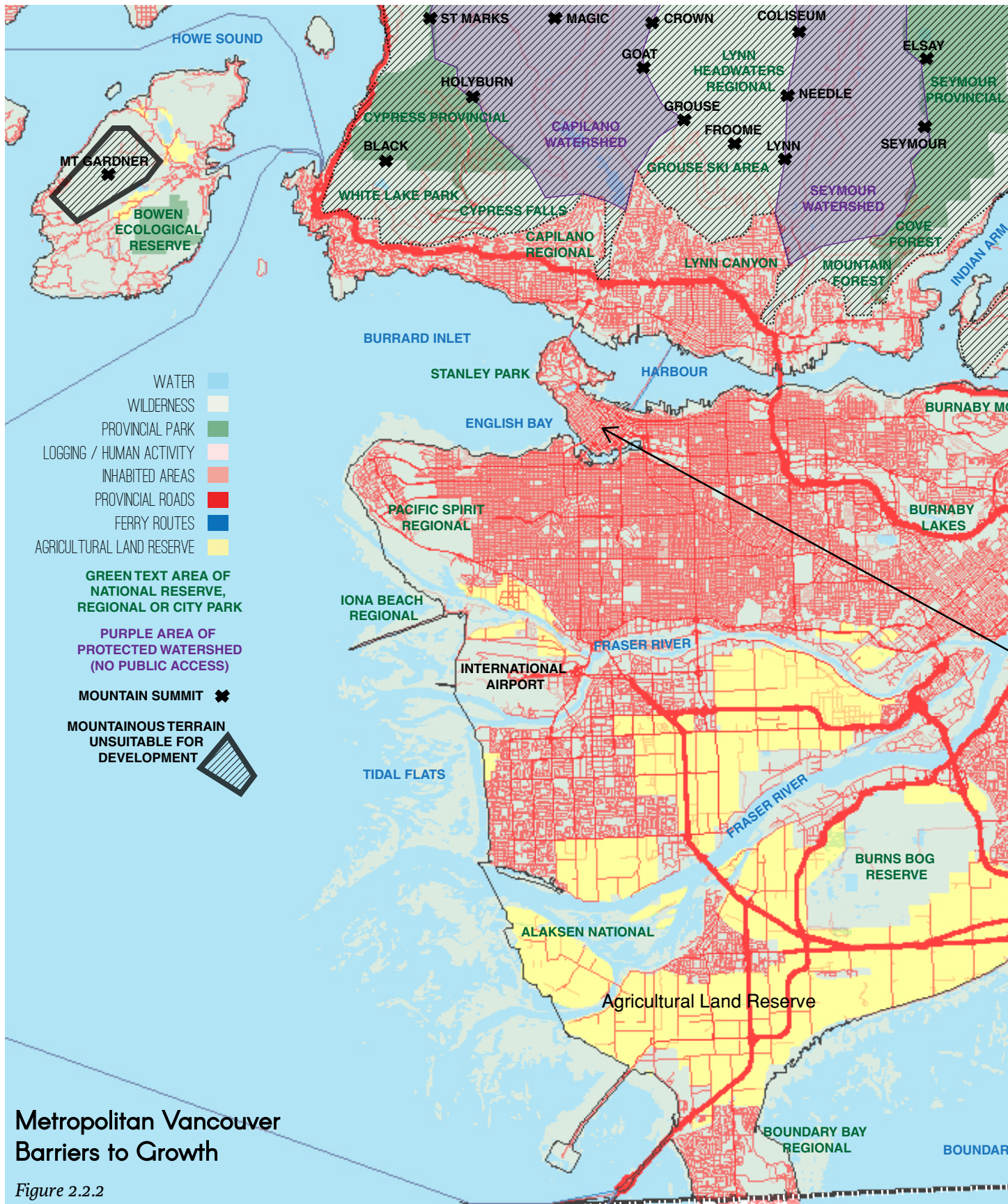
The city can no longer grow outward and must depend on new densification strategies to adjust to its post-sprawl reality. In the last 30 years since 1990, outward growth in the region has been less than the 10 year average of the past 100 years.<sup>14</sup> During this time, growth has filled the remaining leftover territories to the extent of the metro areas capable limits. These borders are drawn by an ocean, rivers, mountains, conservation areas, water collection zones, political boundaries and protected farmland. While population growth over Vancouver's existence has seen extreme fluctuation, which can impact urban expansion, population increases in the last 30 years would have constituted a much greater swelling of urban boundaries than what is seen today, if new territory was possible.<sup>15</sup> This is a reflection of the region's growth limits, but also a shifting of preference in dwelling location and neighbourhood qualities that are becoming more central and dense. Therefore, due to imposed restraints and preference, accommodating growth needs to embrace its post-sprawl future to be successful in providing enough housing to create an affordable market.

Geography poses the largest challenge in outward growth and is the most influential reason that Vancouver, as an urban centre of just under 3 million inhabitants has reached its limits well before other cities like Toronto, which continues to build outwards despite a population of 8 million people. Vancouver was founded on the delta of the Fraser River which flows from the Fraser Valley, runs through the city, and empties into the Strait of Georgia. Other "Sounds" or large bays such as the Burrard Inlet create large natural harbours integral to the establishment of the city, but create additional challenges for connections to the north. Much of the coastline has already been reclaimed and fortified to varying extents along its shoreline, and since oceans are expected to rise, attempting further land reclamation would be risky. New innovative solutions such as a floating expansion into the sea would be difficult to execute because of unclear approval processes, development responsibilities, engineering, timeframe, and require expensive new infrastructure. Waterways are already congested by port and recreational traffic representing important trade wealth for the city. Vancouver is obsessed with views, regulating sightlines, and the built environment along the waterfront, establishing relationships to the water's edge in the form of recreational areas, marinas, and shipping terminals making such expansion unfeasible.<sup>16</sup> Spanning further bodies of water to connect to existing land mass such as to the relatively close Sunshine Coast to the west have been studied by the provincial government and found to be impossible due financial and engineering restraints.<sup>17</sup>

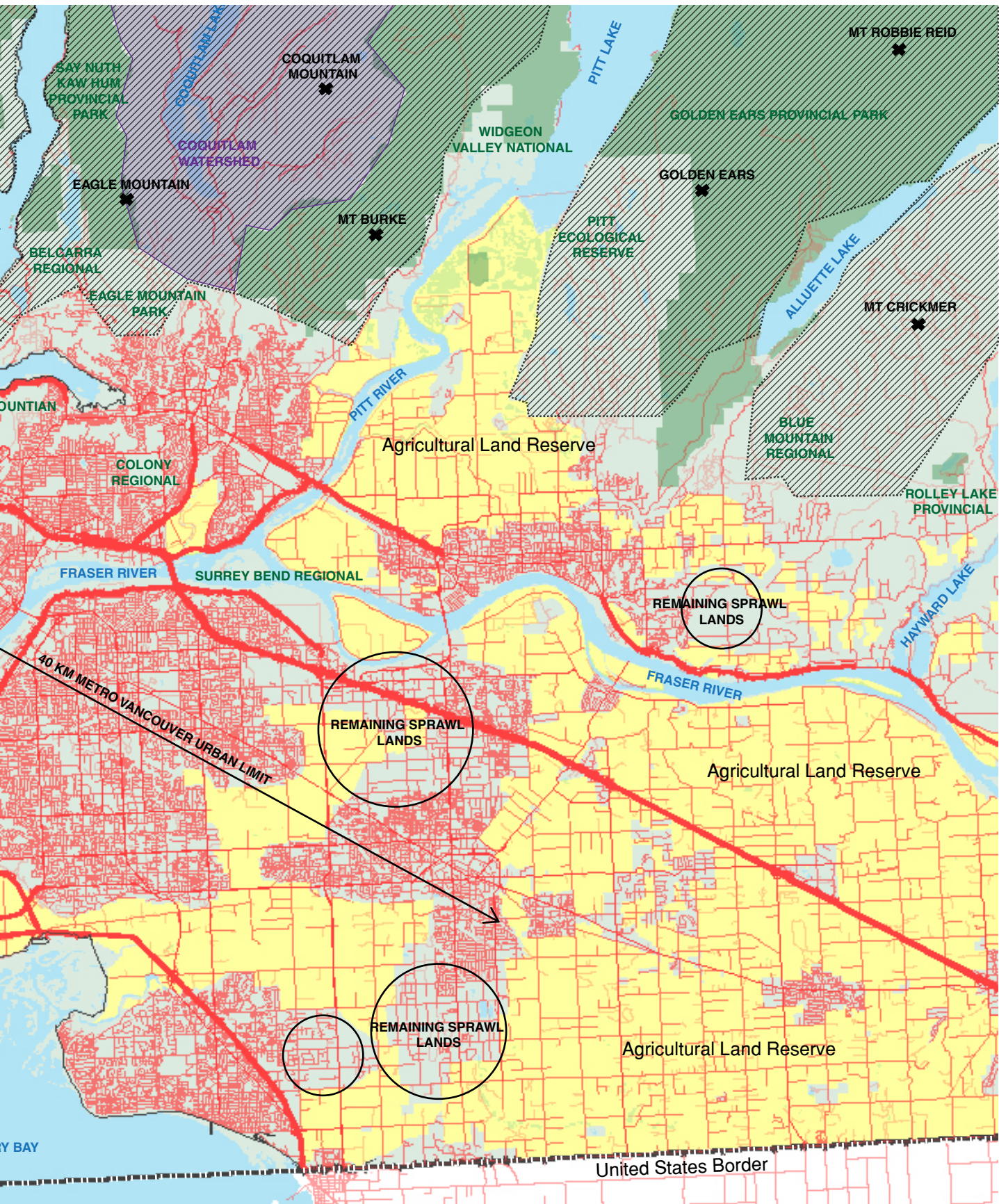
The remaining delta is bounded by undevelopable mountains in the north, and the United States border at the 49th parallel to the south. The mountains have been developed at their bases to form the "north shore" communities but cannot continue upwards with typical development practices due to an increased rugged slope. Regardless, this boundary has been protected through a web of parks, reserves, and restricted water collection zones barring any future unconventional attempts of urban expansion to the north.<sup>18</sup> The parks future's are secured because they are widely used, well advocated for, and are an important feature of the city's identity, beyond their obvious environmental value. The water collection zones are secured even further, restricting all public access to safeguard the source of 90% of the metro areas water supply, making development around these narrow valley reservoirs even more unthinkable.<sup>19</sup> To the south, the American border's completely separate and uncoordinated governance, economy, visa and resident restrictions, border travel delays, and distance from the city centre makes expansion here impractical.

These boundaries mean the distance to the edge of the city varies from downtown. To the north-west, the urban boundary lies only 4km from the metropolitan centre because of the ocean and mountains, while to the south-east, a majority of the city's expansion was able to occur toward the Fraser Valley to a more expected 40 km distance. This results in hard growth boundaries that have not been overcome despite housing demand for decades indicating no viable strategies to expand in over three quarters of









potential directions from the city centre creating growth challenges equivalent to a city of much greater size.

This leaves the remaining non-urbanized land in the Fraser Valley and river delta, almost all of which is assigned by the government to the ALR (Agricultural Land Reserve). The ALR was created to protect the agricultural industry in British Columbia, since due to its mountainous terrain, the province has a limited amount of arable land.<sup>20</sup> This land has often been criticized as being underutilized in the metro area during the affordability crisis. The ALR policies themselves have often been questioned for allowing the nearest land to the city to be turned into large subsidized estates rather than productive farmland.<sup>21</sup> However, although ALR governance could be improved, most of the land creates an oversized economic impact and irreplaceable local food source for the city. Despite being a tiny slice of the provinces overall agricultural land, due to its riverside sediment, southern climate, access to infrastructure, nearby consumer market, and labour, the agricultural land of the Fraser region accounts for 66% of all agricultural

## Metropolitan Vancouver Barriers to Growth

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*Figure 2.2.3: Harbour Traffic. Burrard Inlet.*



*Figure 2.2.4: Northshore Mountains. Lonsdale Quay.*



*Figure 2.2.5: Protected Watershed. Cleveland Dam at Capilano Watershed*



*Figure 2.2.6: Agricultural Land Reserve. Fraser Valley.*

output (in dollar value) in the province.<sup>22</sup> Without this land, the agricultural industry would be reduced by 2 billion dollars, making it a fraction of itself and unable to adequately supply local affordable food. Since there is a very strong awareness of food quality, environmental impact, and a growing 'eat local' trend, decreasing the ALR does not align with the established goals of the city, especially if there are other less consequential opportunities to restore housing affordability that have yet to be explored.

All barriers might be circumnavigated with varying degrees of expense and imagination, but continuing past all of these boundaries would have negative consequences and therefore growth beyond them should be avoided. In the article "The house price ripoff",<sup>23</sup> the author argues that the lack of intensification allowed within the existing urban boundaries has created a far worse self imposed land shortage than stopping growth at the urban edges.



Figure 2.2.7: Northshore Recreational Lands. Grouse Mountain.



Figure 2.2.8: Delta Wildlife Preserves. Burns Bog.



Figure 2.2.9: U.S. Border. 0 road.



Figure 2.2.10: Native Land Claims. Pacific Spirit Regional Park.

# The Argument for Densification over Sprawl

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While it is almost universally accepted that land use policy is now a factor in the housing crisis, there are two camps. One with the belief that land use rules preventing mass densification is the problem and the other, in articles such as “Why can’t I buy a house with a yard” believe that urban containment is the issue. Advocates against urban containment argue there is an artificial land shortage, not from how current city land is used, but by how planners have designated borders of the city through policy. They argue current land use rules stopping sprawl are not serving the purpose of regulating land for use, but are compelled by a “leftist ideology, over influenced by Jane Jacobs.”<sup>24</sup> These arguments ignore crucial realities in present day metro areas indicating that sprawl will not solve the issue. Voices in the housing debate, such as Dr. Nathanael Lauster in “The death and life of the single family house”<sup>25</sup> believe the single family house is an oppressive housing type designed to exclude low income groups. Lauster describes the land as “locked up reserved only for millionaires. I think expanding into that land and enabling more diverse housing options would enable more affordability.”<sup>26</sup>

Demographics research in the United States, which has followed similar fluctuations of urban patterns, confirms the “reversing pervasive trends of urban decline of the 20th century’s final decade, opportunity is once again flowing into urban cores of the nation’s largest metros.” They are becoming “increasingly youthful and well educated centres”.<sup>27</sup> In the article “The return to sprawl is more about supply than it is demand” because policy has created a situation where land use has not adjusted to recognize or produce more urban space, even though that is where the populations preference has shifted. Data produced by the National Association of Realtors confirms densely packed inner city single family house neighbourhoods are most desirable, but tend to be expensive and hard to build in.<sup>28</sup> This is resulting in a perceived health in sprawling suburban neighbourhoods even though many buyers have opposing preferences that are inaccessible, because of the lack of affordability and availability. Therefore, many buyers would overextend their finances to be able to live in their preferred area, resulting in persisting high prices in the inner city even if sprawl was restarted. If land use isn’t open to accept new demand where it is desirable, than new less desirable homes at the boundary will not be able to replace this supply.

Greenfield development is also at odds with Vancouver’s well known perception as a “green city”, residents augmented awareness of environmental issues, and the city’s ambitious sustainability goals. Given the choice, residents want to live near the city centre, and this should not be ignored. The right type of supply in the right location is crucial in relieving housing pressures. The oversimplification of the market has lead advocates against containment to ignore all non-numerical considerations beyond achieving more housing units. Location and human preference matter, and simply supplying enough units would be a good start, but it would not solve the crisis or fully restore the fundamental supply and demand relationship.<sup>29</sup> Suburban greenfield development simply does adhere to the values of residents, and so another solution should be found to accommodate growth.

There would be consequences on infrastructure and quality of life if sprawl proceeded that would not align with general demographic and cultural trends. Some of these trends are embodied in city mandates, such as the goal for 50% of all trips made in Vancouver to be non-auto.<sup>30</sup> This is required because the region lacks right of ways to accommodate more traffic and is already one of North America’s most congested cities. Metropolitan Vancouver is split into pieces by navigable waterways kept open for industry creating additional challenges in regional mobility, especially for edge cities. Crossings such as the Patulla and Richmond tunnel are at the end of their lifespans but continue to be precariously delayed due to the extraordinary multi-billion dollar costs in replacing these traffic choke points,<sup>31</sup> therefore outward growth only worsens struggling infrastructure budgets. In the past, while the city had a small footprint and as technology made travel faster, growing outwards was logical. At this point, with the metro boundary 40 km from Vancouver’s downtown peninsula and over congested roads with no space or money to expand them, low density sprawl dependent on the car is simply not in the public interest. In the article “You can’t

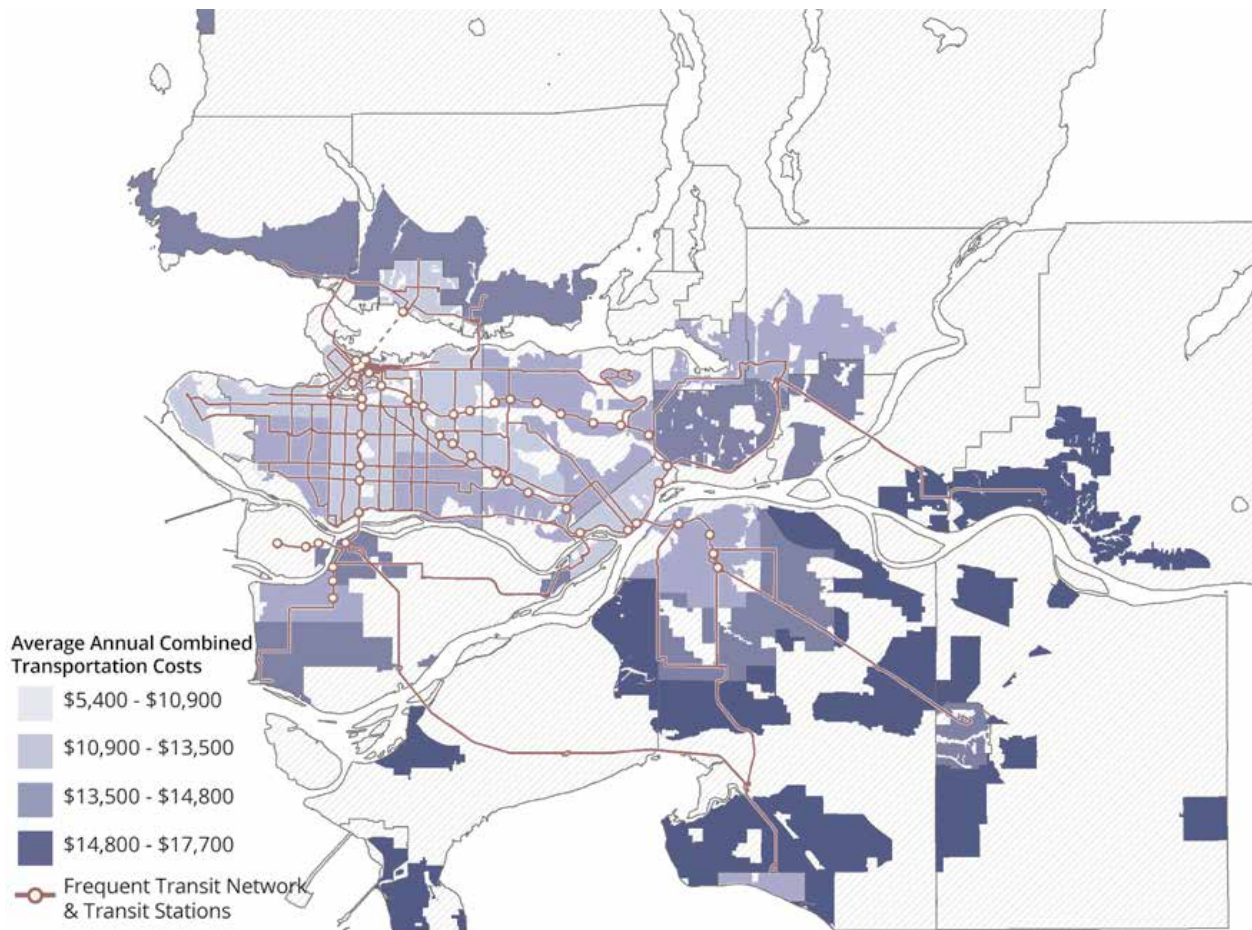
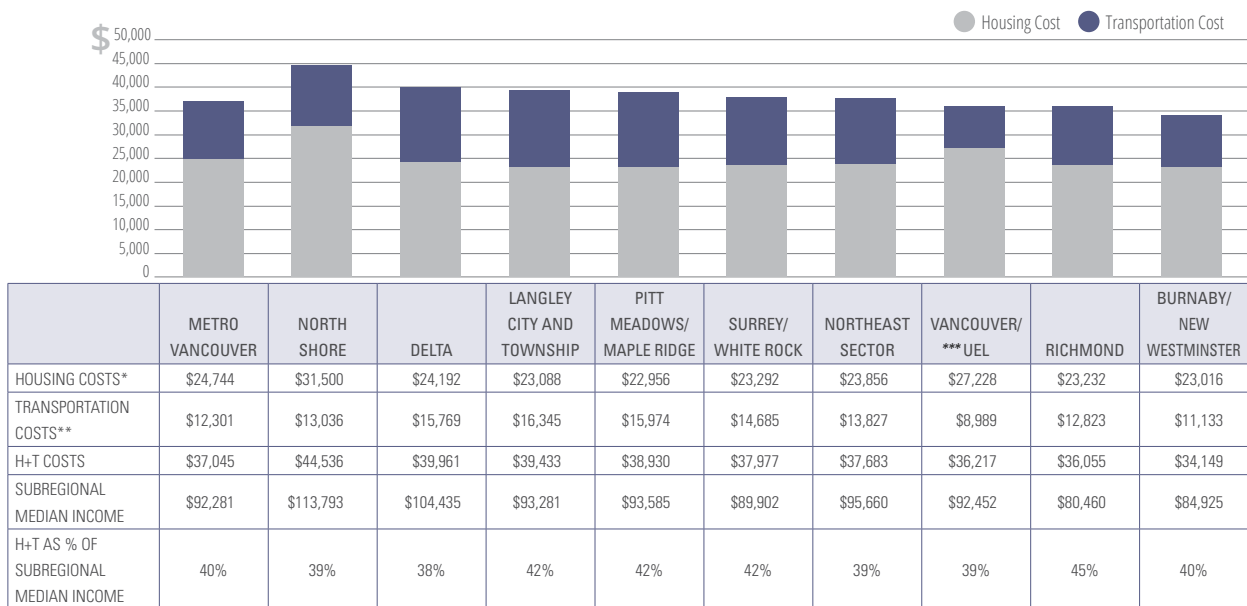


Figure 2.3.1: Combined average annual transit and auto costs for working households (2011)



\*Housing costs represent average payments for all homes owned by working households with mortgages.

\*\*\*UEL: University Endowment Lands (UBC area)

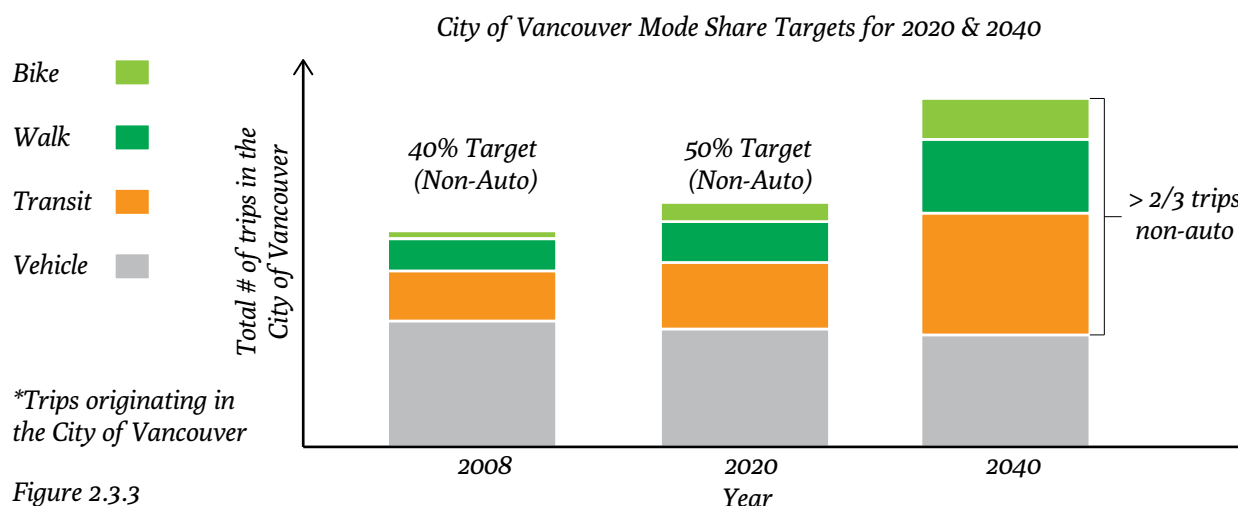
\*\*Transportation cost estimates are representative for working households, regardless of tenure.

Figure 2.3.2: Combined housing and transportation cost burden for working households with mortgages.

get a house but you can get a hairy commute”, studies find house seekers facing a growing commute by having to look farther and farther away which is increasing strain on congested regional infrastructure.<sup>32</sup> A recent report by geographer at Simon Fraser University Andy Yan, found that although housing prices were lower at the edges of the city, real costs of living when factoring in commuting to the core through transportation costs, stress, and commute time, made buying higher priced housing close to Vancouver’s city centre similar to the cost of housing at the edge of the metro area.<sup>33</sup> At a time when all Vancouver metropolitan cities are creating strategies to ensure growth supports mass transit expansion rather than automobile reliance, growth should be redirected to low density neighbourhoods to update their ability to support alternative modes of mobility, rather than add more problematic development.

The unaffordable city has already produced enormous regional commutes. Some commute hours by ferries with limited sailing times from places like Nanaimo and other wealthy individuals even take float planes to the downtown core from the Gulf Islands and Victoria. Due to the financial and mental strains of doing so, this cannot become the norm, and therefore further outward expansion should be discouraged regardless of barriers preventing it. Sprawl cannot produce the quality of life it has been able to provide in the past, due to its current travel time from the city centre and it is uncertain that in the long-term, this option would create more affordable than downtown properties. It is unlikely that sprawl would have a significant effect on house prices in the region considering the reversed preference to urban centre dwelling and changing demographics. Therefore the city should accept its new post-sprawl condition and develop policy to make densification an effective housing supply.

The detached house is now at the edge of urban densification, the next housing wave to follow sprawl. Its type and density no longer suitable for many of its locations is ripe to be replaced. However, current high density dwelling is not providing the character, qualities or amenities that a detached house can provide and occupied landowners do not want to see change as it is changing now. This has led to a status quo between two competing undesirable outcomes. Less housing availability or the unconvincing transformation of established neighbourhoods. A third option must be created that successfully enhances living conditions through densification, where more of the integrity of the neighbourhood is maintained, transformed more slowly, spread out, while providing alternative housing types to appease the appropriate demand. Planners should take advantage of the upcoming renewal to encourage an increase the quality of life of these neighbourhoods for the general improvement of the city, and to prevent anti-development sentiment from existing residents.



## Regional Congestion Points



Figure 2.3.4: Lions Gate Bridge. 1 Lane + 1 Alternating



Figure 2.3.5: Pattullo Bridge. 2 lanes each direction.



Figure 2.3.6: George Massey Tunnel. 1 Lane + 2 Alt.

## Edge City Commutes

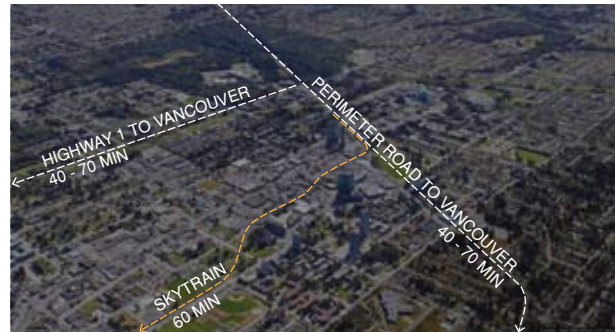


Figure 2.3.7: Surrey

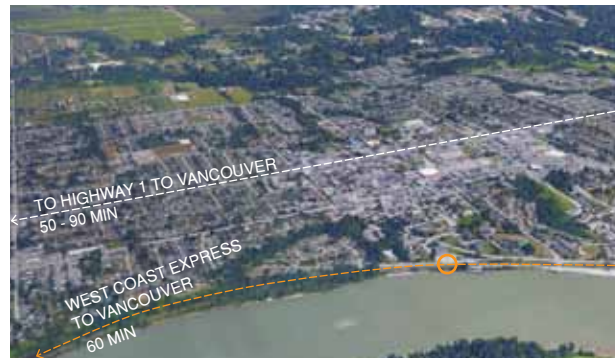


Figure 2.3.8: Maple Ridge



Figure 2.3.9: Langely

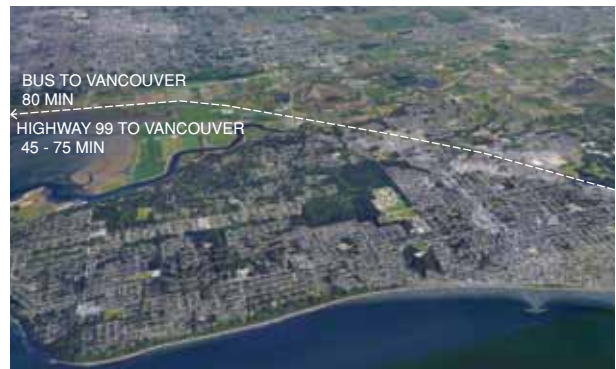
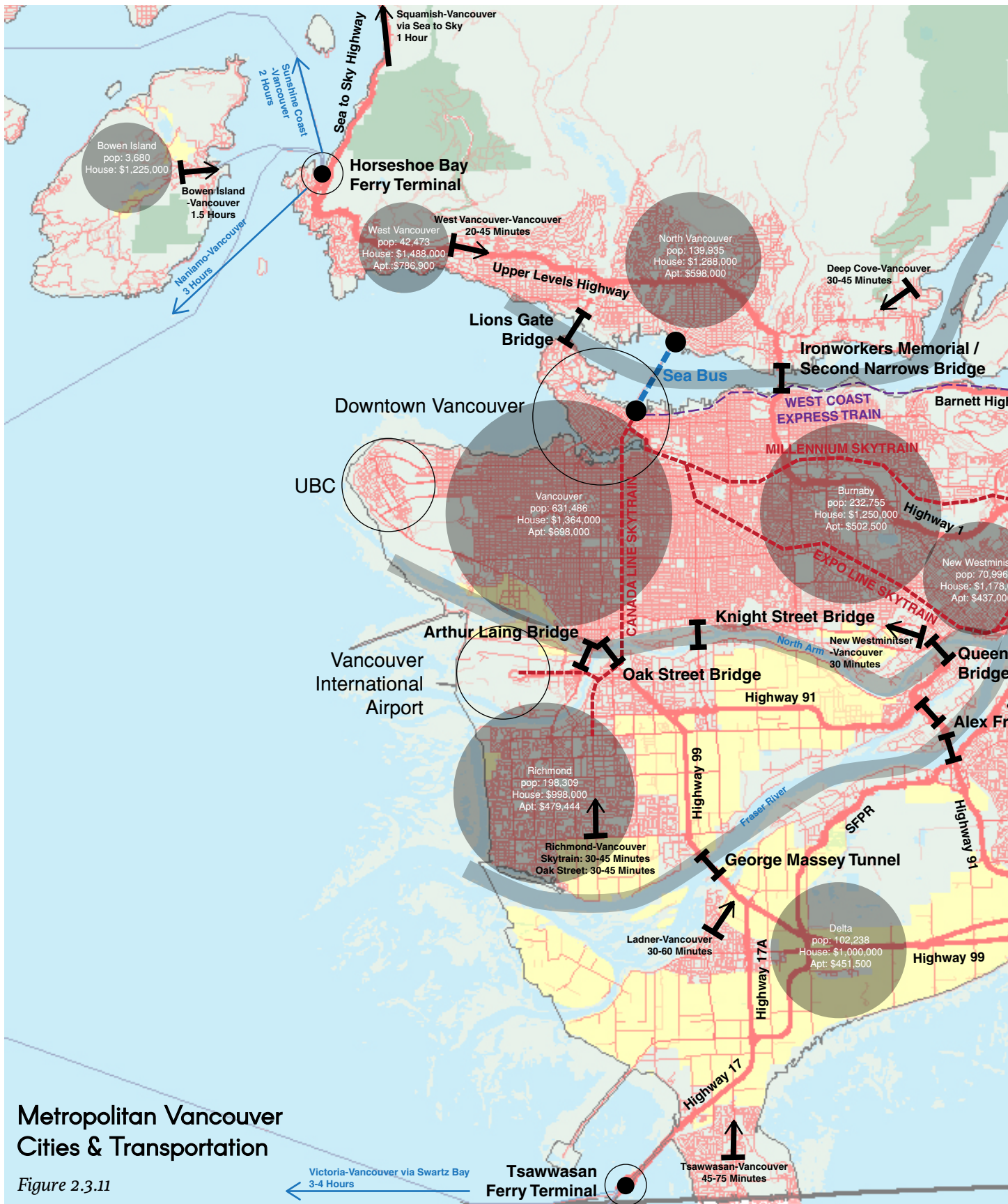
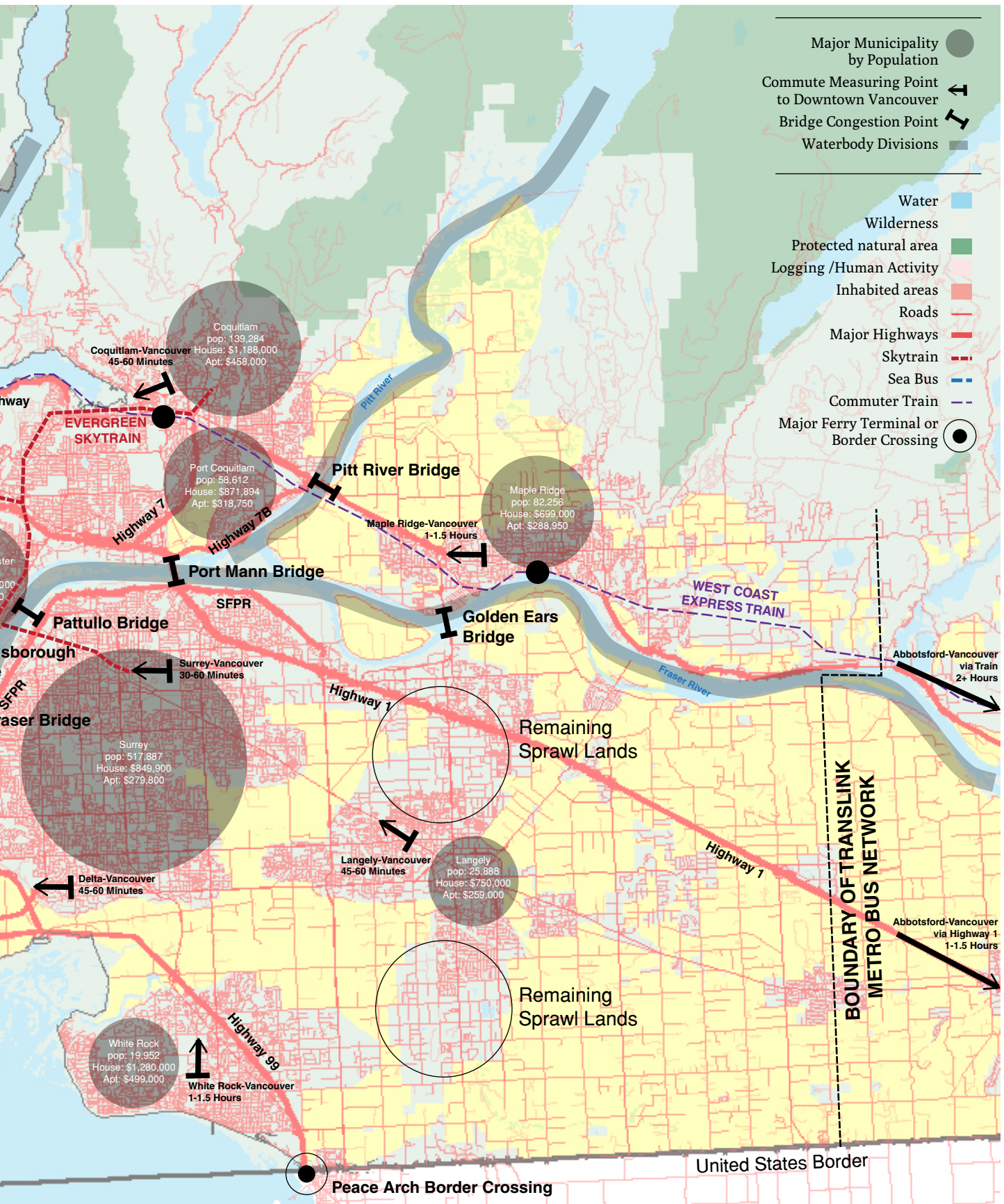
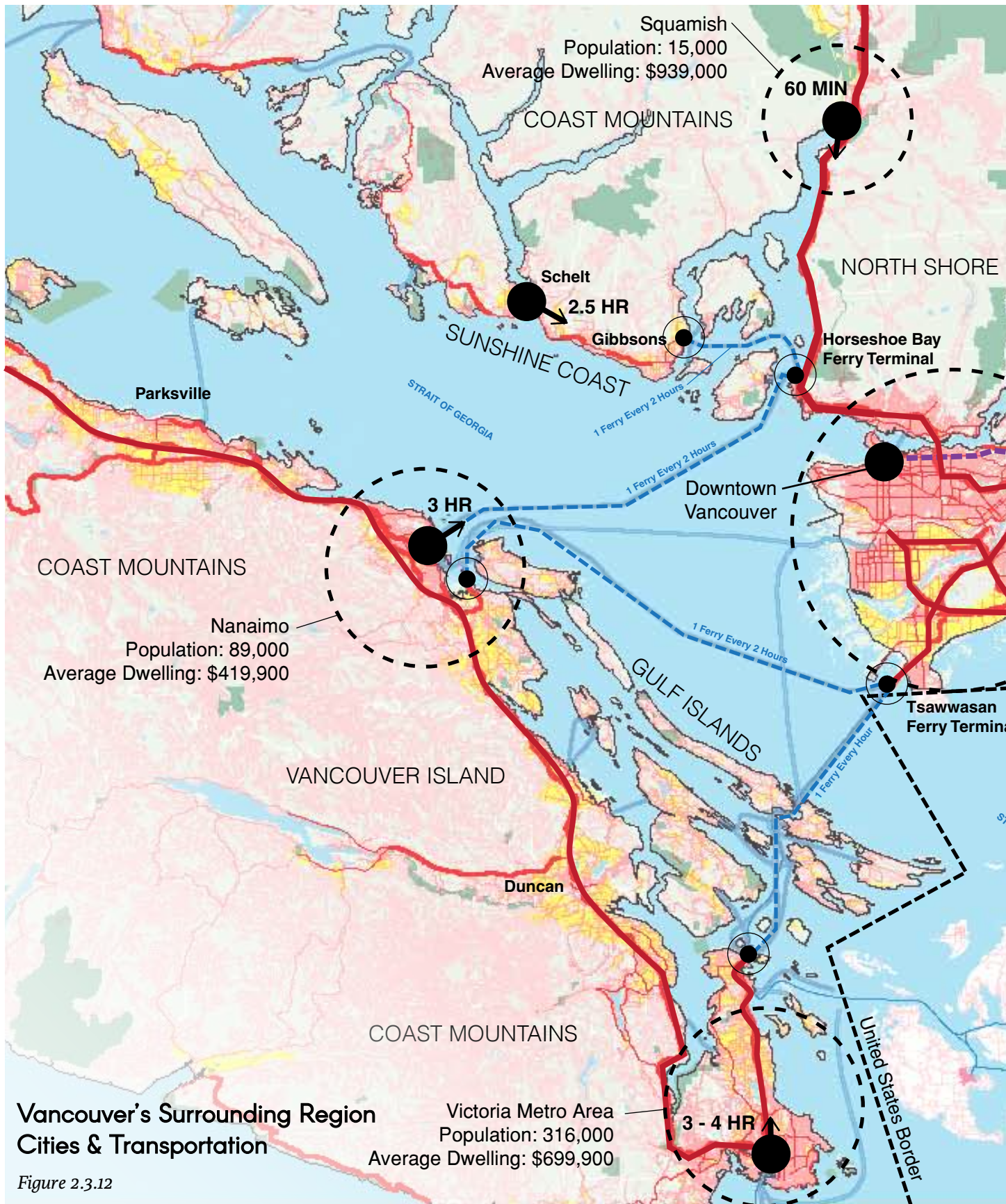


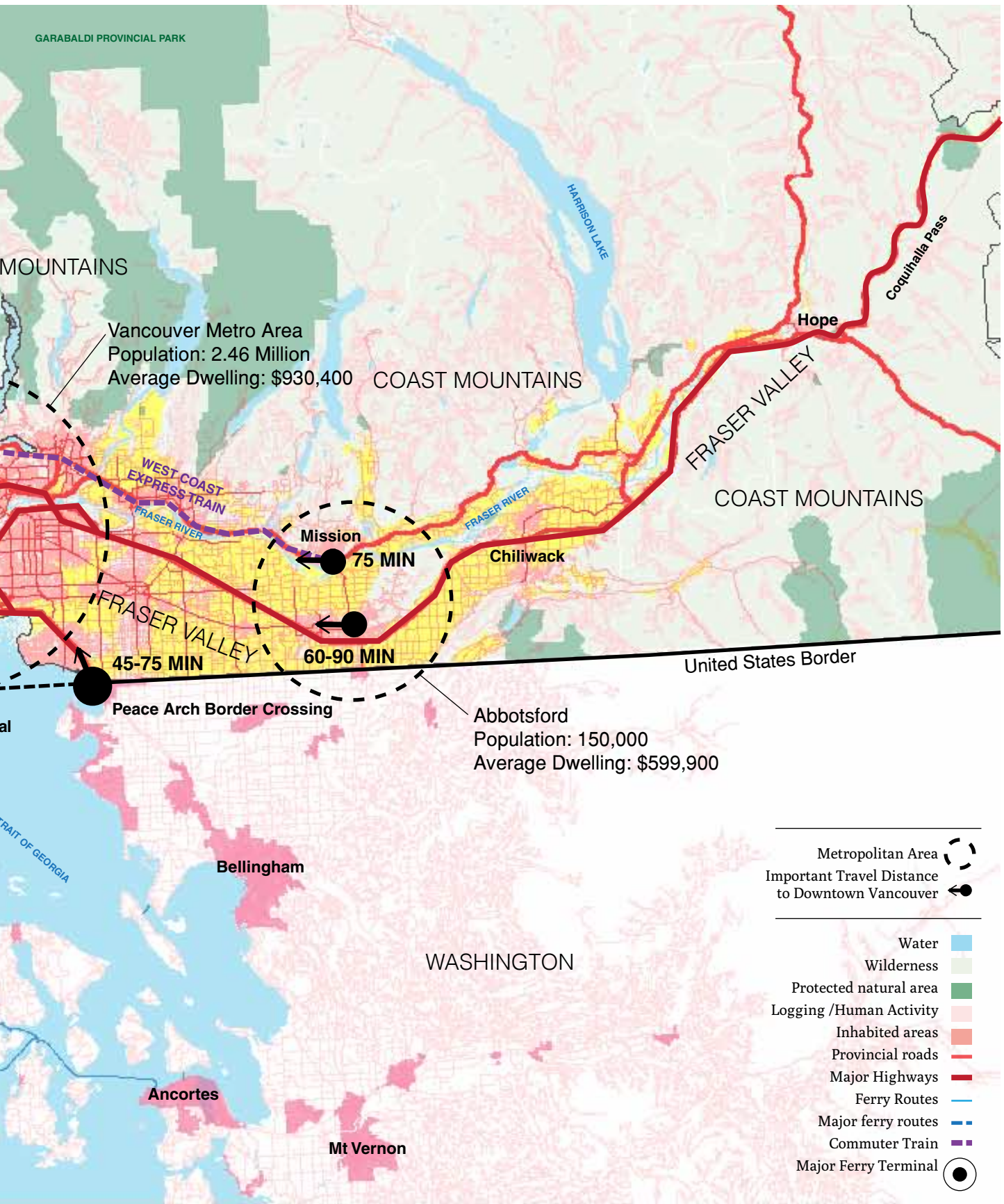
Figure 2.3.10: White Rock











# Supply Capacity

Prezoning and excess capacity are required for the private sector to keep pace in supplying unpredictable demand. Vancouver architect and urban planner Michael Geller writes in an article entitled “Affordable housing concerns here to stay” that “land restrictions on low density housing land barring the subdivision of large lots, unit restrictions, and measures preventing medium density housing mixes such as small townhouses and apartments are pointlessly contributing to the housing affordability crisis.”<sup>34</sup> Prezoning would encourage supply by creating certainty around density, reduce processing time of development permits, and encourages a greater mixture of building types and scales. Bryn Davidson, architect at the Vancouver architecture firm Lanefab, provides a written response a public policy address by Vancouver general manager Gil Kelleys. Bryn disagrees with Kelleys belief that “we may not need to make any large interventions into the current zoning map because we already have necessary zoned capacity to take us to 2040.”<sup>35</sup> This estimation depends on a projected decline in population growth, heavily relies on case by case zoning changes, and assumes all units will reach full dwelling capacity despite the documented involvement of investors. Most troublingly, it treats a dwelling capacity as a number as if all dwellings were made equal in size, price, location ect. assuming every unit built will be suitable for the needs of estimated population increases.

Dwelling attributes such as size, number of rooms, amenities such as laundry, and location must be variable to accommodate affordability, preference, and household type. These needs are difficult to predict

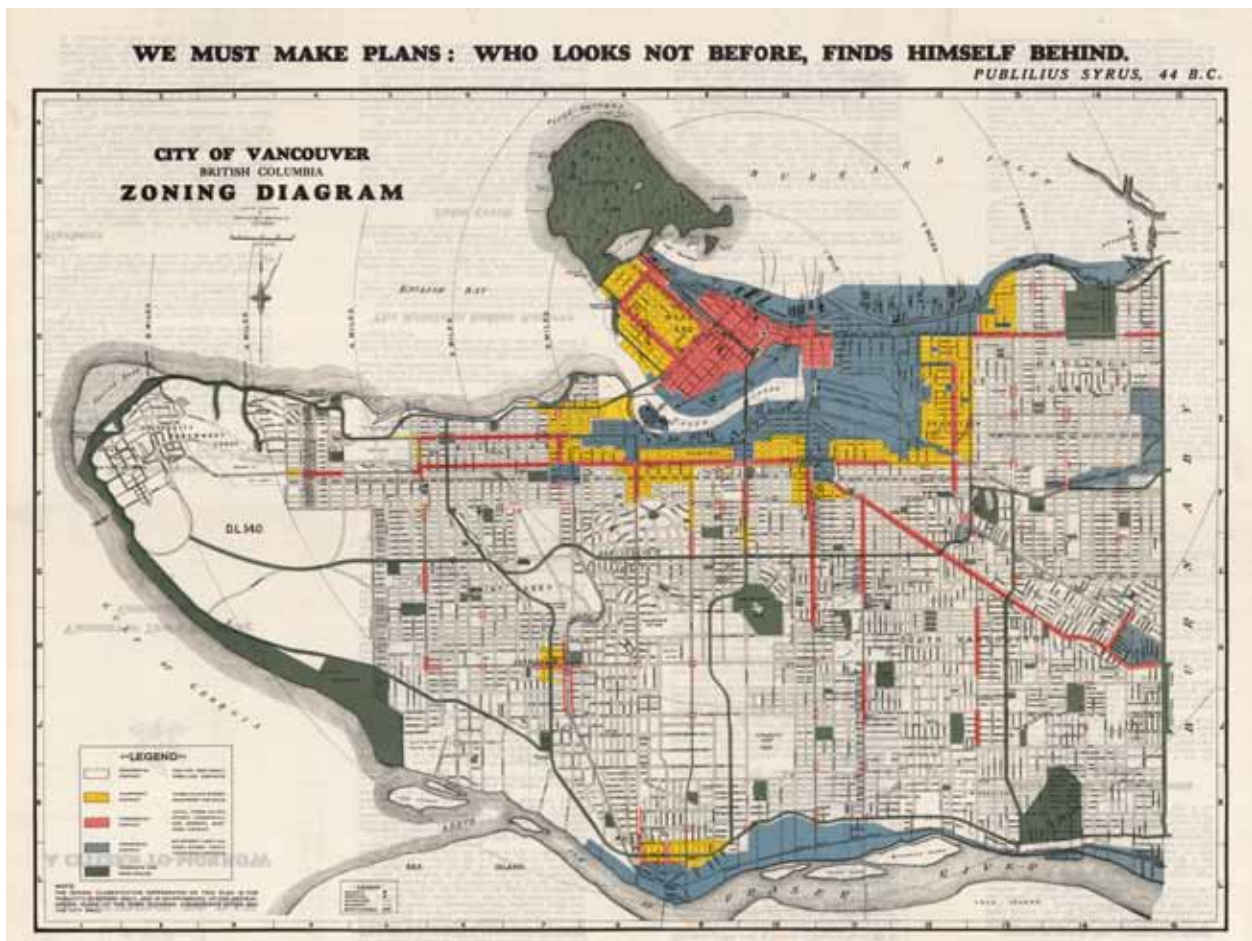


Figure 2.3.4: Vancouver zoning map of 1931. Coloured areas show employment & mid-high dwelling density.

and always changing.<sup>36</sup> Considering some types of development are more profitable than others and therefore more likely to be built, the luxury end of the market receives a high amount of competition while the affordable end goes underserved. This is especially true in periods of overvalued property because units cannot be decreased in size enough to make affordable dwellings profitable, so relatively low cost luxuries are added to justify the required selling price of the unit.<sup>37</sup> Therefore zoning capacity must overcompensate for growth to take into account the inevitable mismatching of people's needs with dwellings and encourage the excess supply to compete for lower income individuals. In the current system, people are replaced by higher paying investors as indicated by a recent report counting over 10,000 people migrating to other parts of British Columbia in 2017, or spend too much of their income on the luxury options available to them.<sup>38</sup> An Ontario study reflective of this issue found that "70% of people living in Ontario have homes too big or small for their household". The report blamed policy limiting viable housing typologies for the disconnect.<sup>39</sup> In the book "The maze of urban housing markets: Theory Evidence and policy", there is a "Demand of individual housing attributes" which means "Housing is not a unidimensional metric of services." There are considerations within consumer preferences for "tenure choice, household spatial allocation, maintenance" and other variables that affect supply capacity projections.<sup>40</sup> If the supply is not reflective of population needs, then demand will remain unsatiated without the allowance of unhindered additional supply to account for market misalignment. Since it is well documented that the housing market is building luxury unaffordable units for investors, it is crucial to recognize that the housing crisis is not just about a shortage of supply, but a shortage of appropriate supply. This renders supply capacity projections not only useless, but illusionary and damaging because it creates the false impression of successfully managing the housing market.

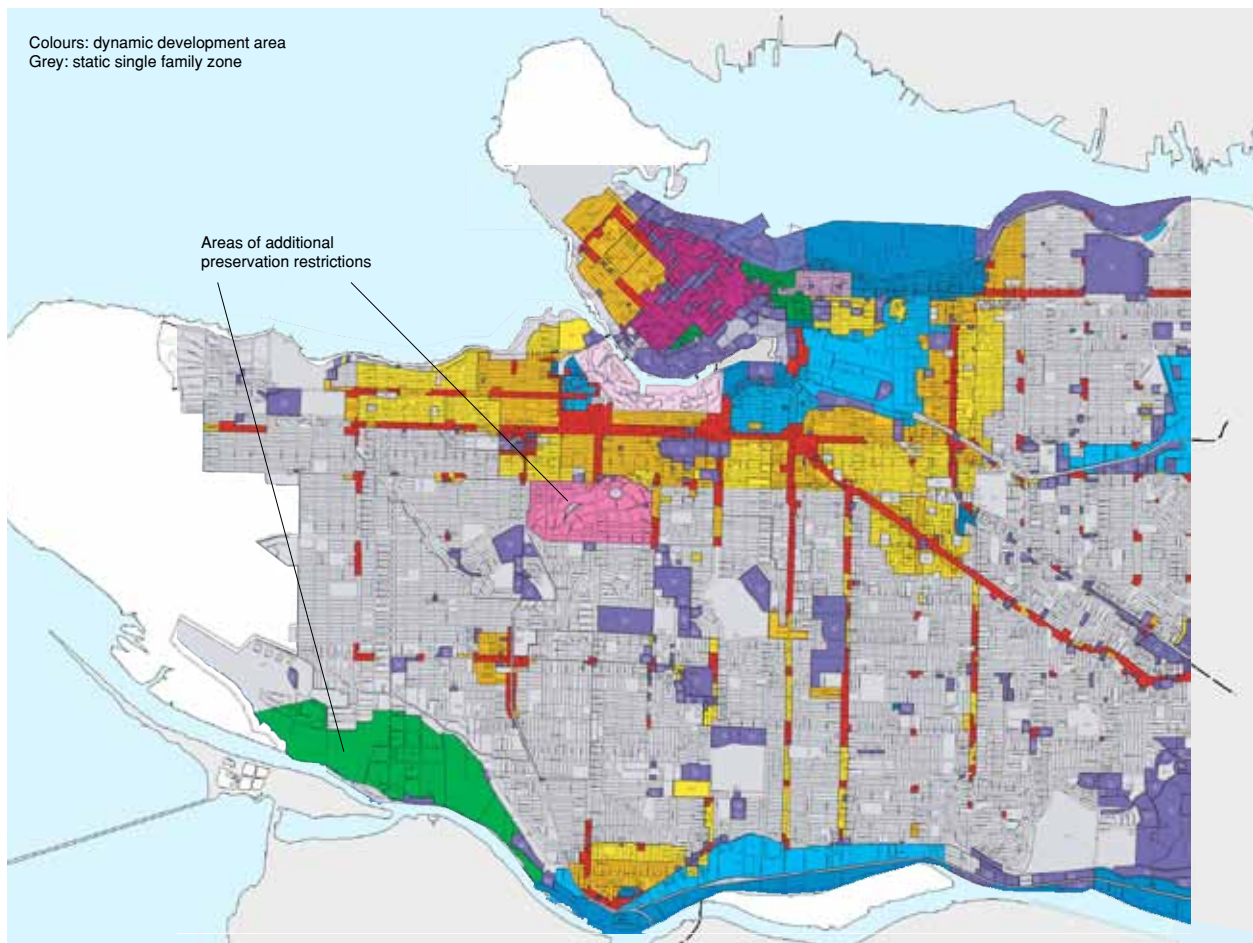


Figure 2.3.4: Vancouver zoning map of 2017. Coloured areas show employment & mid-high dwelling density.

The inhibition of development is stunning when one compares a zoning map from 1931 to the zoning map in 2017.<sup>41</sup> Despite almost 100 years of growth resulting in millions more people in the metropolitan area, the addition of pre-zoned land for development is hardly any larger. This has put immense pressure on land values, which keep a majority of the city artificially underbuilt and forces an intense concentration of dwelling towers in the limited permitted zones. The zoning appropriately show Vancouver as two cities, one as coloured on the maps as highly dynamic and intensely growing in the downtown core, employment lands, and arteries, and the blank low residential zones representing the static preservation of an increasingly unviably priced housing typology. The preservation as a consequence also splits its citizens into two categories creating a minority that have their wealth and urban surroundings protected at the expense of tenants without real estate enduring increased dwelling cost pressure, decreased living space, and decreased dwelling choice.<sup>42</sup>

Within the supply permitted currently by city planners, Bryn finds policies that further decrease dwelling diversity and affordability. Vancouver's heavy reliance on rezoning applications on a per project basis favours only large scale projects, even though this scale may be inappropriate to its context. This in part has led to the neglect of the "missing middle", which is finer grained development such as small apartments, fourplexes ect. Pre-designated pockets of high density are less likely to provide affordable units while also not being able to serve city wide demand, in terms of dwelling location.<sup>43</sup> Bryn points to a map of laneway house approval locations, a type of densification recently allowed within the static areas across the city which show supply reacting to demand evenly across the city. Bryn notes modern "missing middle" typologies are not impossible to plan for, pointing to a tiny pocket of land near Broadway and the Kingsway which requires development to be small apartments and ground oriented densification. While this pocket was implemented to provide a transition zone between the large condominium development and established detached house neighbourhood, this type of development is a positive example for citywide growth. As long as supply capacity is restricted and designated in concentrated pockets, dwelling affordability cannot be achieved.<sup>44</sup>

To reverse these problems, Bryn suggests a series of initiatives to diminish government impediments of housing market supply forces. Bryn believes the industry wants to build more dwelling options, but is prevented from doing so due to the consequences of supply capacity policies.<sup>45</sup> By loosening densification restrictions on the static portion of the city, land will be available to accommodate all demand while handing more freedom to property owners, and spreading out the economic benefit from the housing boom. These increases in pre-zoning would encourage a variety of "missing middle" typologies which have proven to make housing markets more affordable.

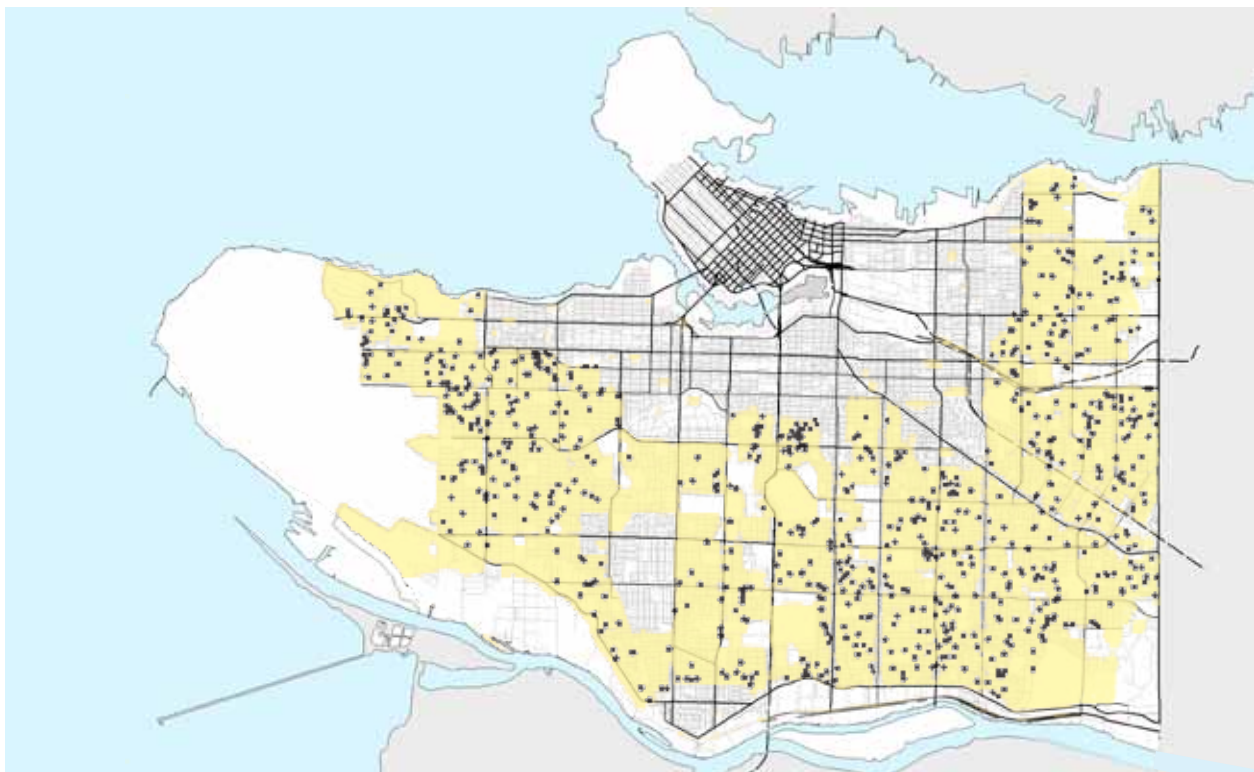


Figure 2.3.4: Map of all lane way house approvals prior to February 2013

### Pre-zoned vs. Re-zoned Development Outcomes

Pre-zoned land results in finer grained development. The a greater number of smaller projects creates more variety of dwelling types and is more contextually appropriate for the established scale of residential neighbourhoods. Finely grained development provides more opportunity for development character, later improvements, and customization as a result of greater autonomy over ones dwelling or building. Buildings are often

more modest and more likely to be built for the community. Investor involvement is diminished in smaller projects as these dwellings are harder to manage from a distance and have a lower profile in the real estate market. Retail units are appropriately scaled for local business, and street scapes are more dynamic encouraging more customers in comparison to condominium retail which regularly secures only national chain stores.



*Figure 2.3.4: Condominium development as a result of re-zoning applications in Vancouver*



*Figure 2.3.4: Established neighbourhood urban fabric in Vancouver*



*Figure 2.3.4: Densification as a result of pre-zoning higher density of an established neighbourhood in Vancouver.*

# Vancouver Densification Precedents

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There are three notable Vancouver districts that have densified detached house neighbourhoods in the past, so it is not unthinkable that an established neighbourhood could be successfully densified in the future. Through most of Vancouver's history, the majority of residential dwellings were houses with the exception of apartments in the historic gastown area and surrounding downtown peninsula.<sup>46</sup> However, by the 1960's, the first of three low density neighbourhoods begin to be significantly redeveloped. The first wave is the West End neighbourhood, which began as mid rise apartments and was transformed into the high rise apartments that it is known for today.<sup>47</sup> Despite its persisting natural and traditional neighbourhood qualities, the west end achieves a density of 28,078 people per km<sup>2</sup>, making it the one of the most densely populated census tracts in North America.<sup>48</sup> Comparably, McGill's student ghetto is 30,084 people per km<sup>2</sup>, while the densest pocket in Canada is St James Town in Toronto at 60,915.<sup>49</sup> In contrast to most 20th century rental apartment projects which replaced neighbourhoods, often leading to poor living conditions, the west end simply rezoned existing residential lots leading to a sustainably vibrant community. The densification process preserved the street blocks and property ownership. Walkability, green space, and clusters of existing detached houses remain and its central location, close to downtown allowed the neighbourhood to benefit from existing services. Sporadically over 25 years, 3-5 house lots would be amalgamating for point towers and mid rise apartments that include small lawn setbacks which eased the neighbourhood into its new urban form. The neighbourhood is still popular due to its large stock of varied rental housing, proximity to waterfront parks and downtown, diversity of the urban realm, maintenance of vegetation, and lively character. It remains a hybrid of a detached house neighbourhood and urban centre.

Around the same time, two other neighbourhoods began densifying. One, directly across the bay in Kitsilano and the other at the opposite end of the city in Marpole. Both were developed with similar principles but with mid rise developments capped at 4 storeys resulting in detached house / multi unit hybrids.<sup>50</sup> These neighbourhoods developed around spines of retail along the arteries into downtown and provides a mixture of urban experiences. Many of the remaining detached houses that coexist with the densification have had interior renovations to accommodate multiple units.

Importantly, the rezoning of these three neighbourhoods at the same time acknowledges the effect of location and land value. Each neighbourhood could provide different development opportunities in three unique conditions and price points. The west end is most urban and central, and was therefore allowed to develop high rises to achieve a density that was economically viable for its high land value and to support higher demand to live at that location. Kitsilano, across the inlet was the middle ground which was removed from downtown by false creek but close enough to be considered a central location. Its proximity to unique waterfront amenities made it a desirable place for middle class residents. Finally, the third district, Marpole, developed affordable rental units at the opposite end of the city but provided an economical choice for the working class and was more central to employment centres like the airport and manufacturing jobs in the metro's periphery. The bold densification of rezoning a large area of low density neighbourhoods at varied locations and prices provided ample diversity of supply to compliment the regions outward suburban growth and secure affordability through this development period.

By the time city centres were rebounding from their global decline of the 1970's, Vancouver's economy was changing and industry had left the downtown core creating new development opportunities for housing.<sup>51</sup> These converted lots continue to form the basis of where most condo development has occurred to date. Within the City of Vancouver, the neighbourhoods of Coal Harbour, Yaletown, and the yet to be completed Olympic Village are the main clusters of condominium development, while to a lesser extent there is sporadic densification throughout the commercial downtown core, transportation nodes, and arteries of the city, all of which are sited on previous employment lands. These neighbourhoods are master planned for much larger scale buildings than ever before in Vancouver and have developed methods





*Figure 2.5.1: West End neighbourhood arial photograph*



*Figure 2.5.2: Kitsilano neighbourhood arial photograph*

of view cones, podium/tower, and mixed use to maximize land value.<sup>52</sup> Future plans mimic this formula throughout the region as properties further from the core that were previously industrial, shopping malls, institutional, or historic retail cores are repurposed for condominium development.<sup>53</sup> This densification strategy is significantly different from past development because it produces a lack of variety and is mostly built as a purchasable commodity rather than livable rental units. It also ignores the community and economic value of small scale employment and retail buildings to the vibrancy of the city. Large development can replace fine grained urban fabric here while being blocked in residential zones because there are no inhabitant stakeholders. Unfortunately the concentration of redevelopment on this land is displacing small local business, cannibalizing commerce identity in places where Vancouverites often go to shop and come together. Articles such as “property price surge has another victim - small business” lament damaged communities by local entrepreneurs moving away and local establishments shutting down.<sup>54</sup>

Taking advantage of underused lots in central locations makes sense, and has produced fairly decent living conditions if affordability is not taken into account. However, convertible industrial land for development is running out and planners are turning to farther and farther locations from the downtown core to accommodate condominium development. The next large condominium project is at Oakridge mall, kilometers away from the city centre and beyond large swathes of underused detached house land.<sup>55</sup> To accurately respond to land value, and desirability of central location, housing typologies suitable for residential neighborhood context should be developed so that these neighbourhoods can be densified to achieve the supply capacity necessary to provide affordable dwellings.



Figure 2.5.3: Aerial photograph of proposed Oakridge development site in relation to city centre densification.

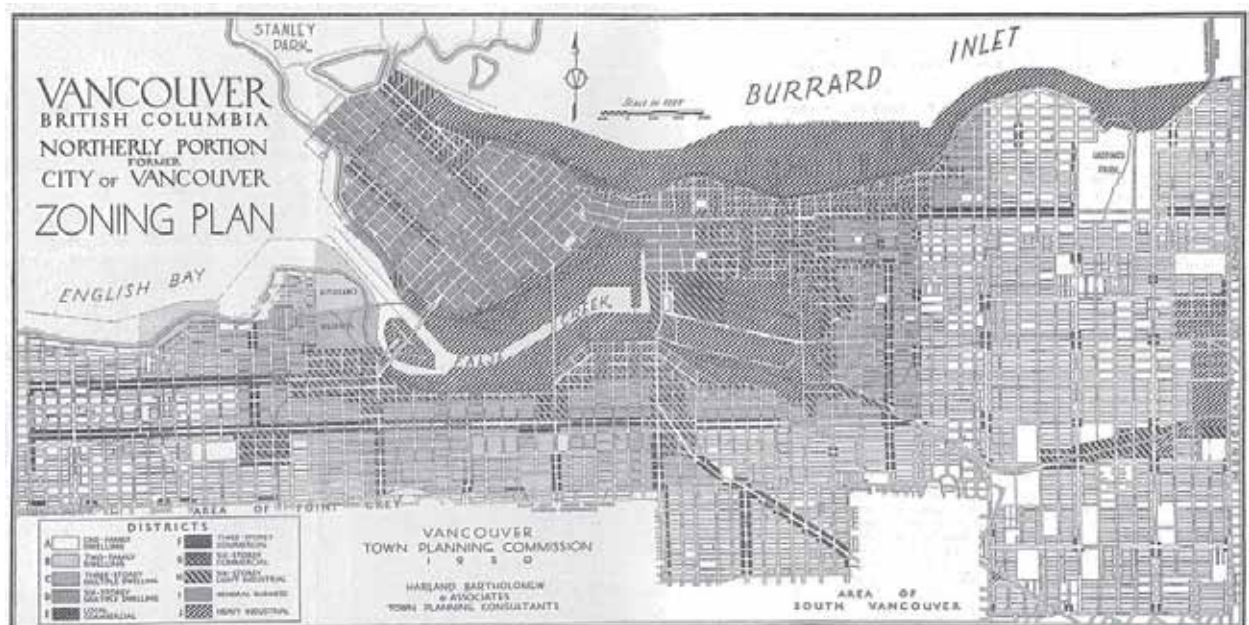


*Figure 2.5.4: Marpole neighbourhood arial photograph*



*Figure 2.5.5: Yaletown condominium developments arial photograph*

# Distillation of Dwellings & Urban Commonalities



from Harland Bartholomew & Associates, 1929. A plan for the city of Vancouver, British Columbia, including Point Grey and South Vancouver and a general plan of the region.

Scan by BTaworks

Figure 2.6.1: Bartholomew Plan, 1929.

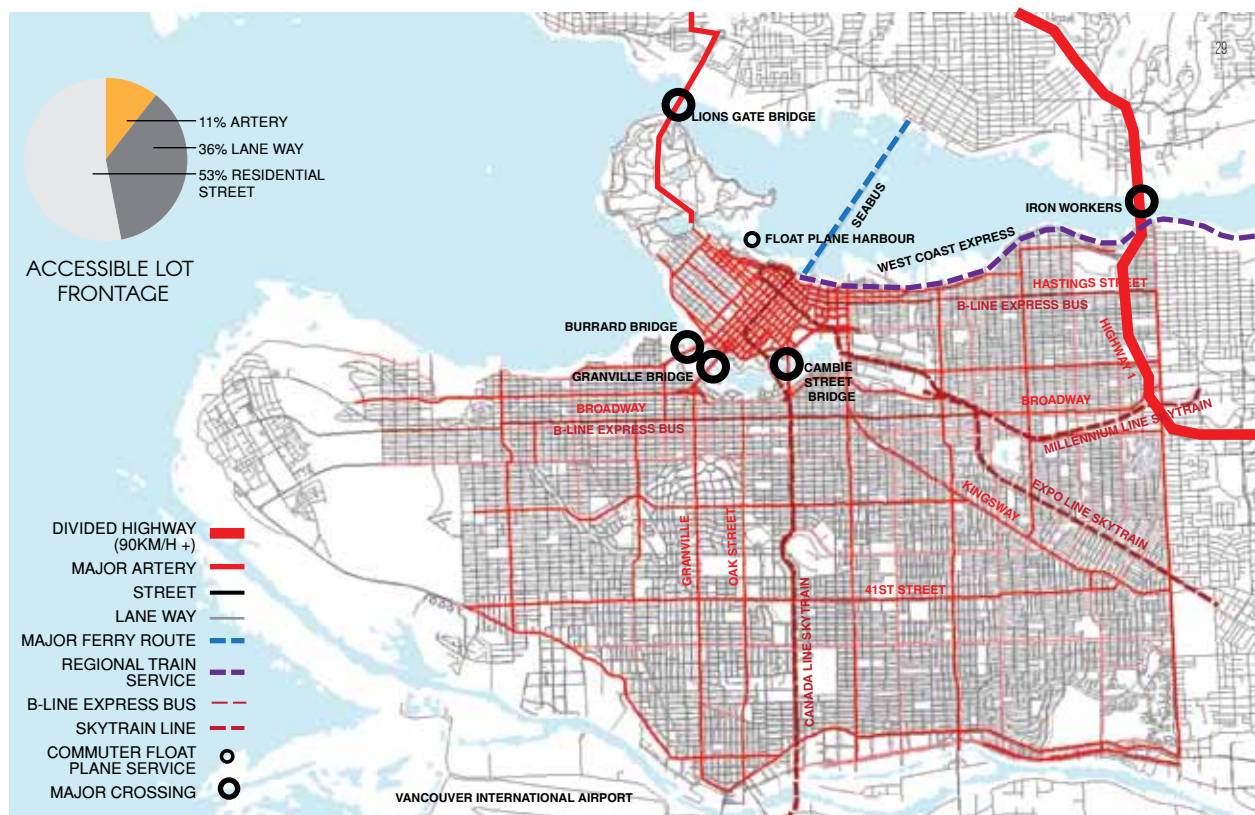


Figure 2.6.2: City Transportation Infrastructure

## Urban Commonalities

The city, as it exists now, has a high number of standardized development conditions and a limited number of dwelling typologies. These lots and typologies are generated through the restrictive government policies and economic realities of the city over time. By understanding the commonalities of developable land and available dwelling options, a strategy to reimagine properties and compliment the housing stock by introducing new dwelling types can be created.

As a result of the well followed Bartholomew plan of 1929 which continued the established grid of the city to today's municipal boundaries, most of the city is uniform in its urban form, infrastructure, servicing, orientation and property division. The plan is a grid of residential streets which at regular increments are interrupted by arteries where most vehicular traffic and transit service are found as well as commerce and retail. The grid stops in pockets to provide adequate space for large city parks, schools and other civic institutions.

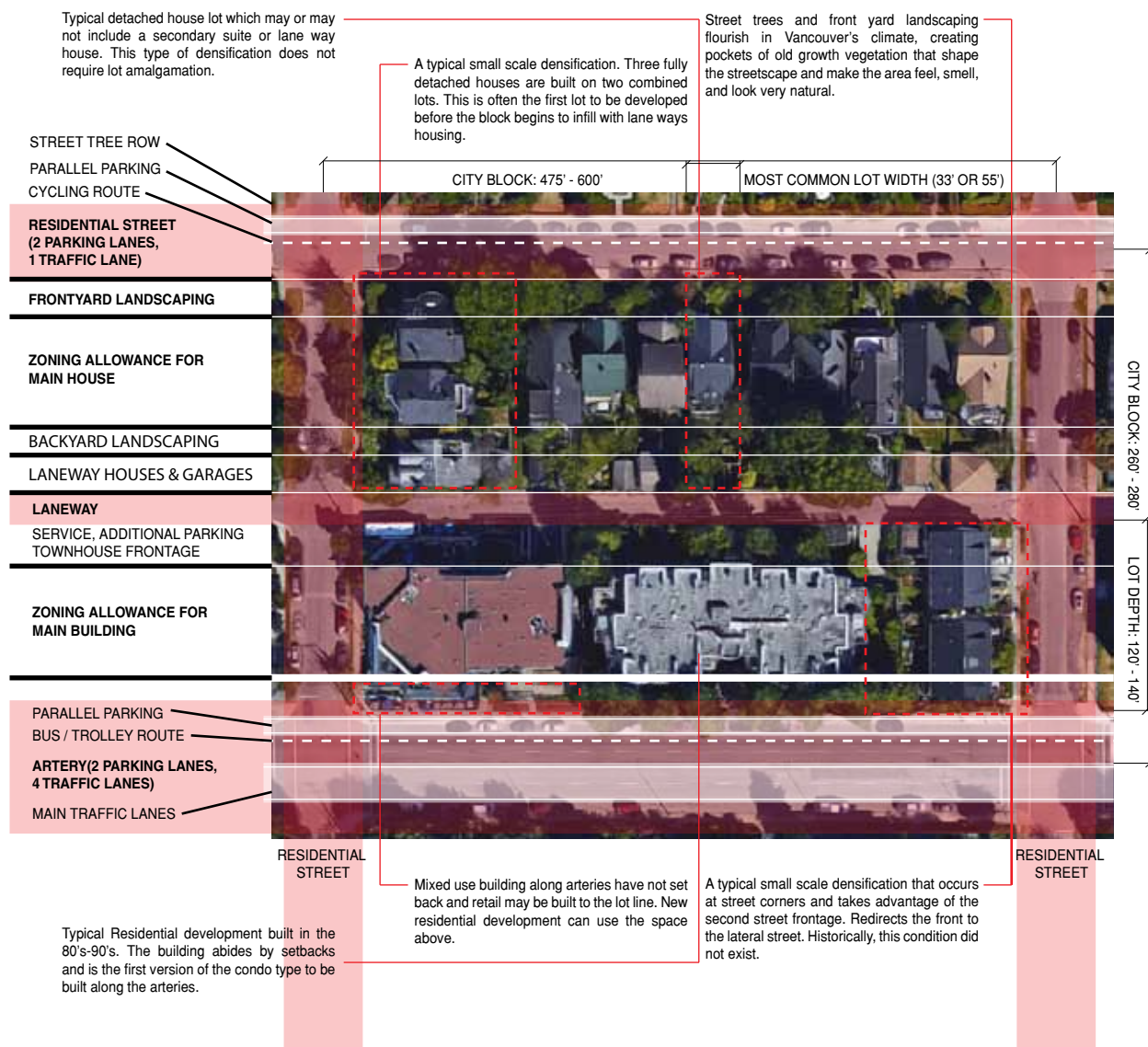


Figure 2.6.3: Typical city block at artery, lane way, and residential street

# Typical Vancouver Rights of Way

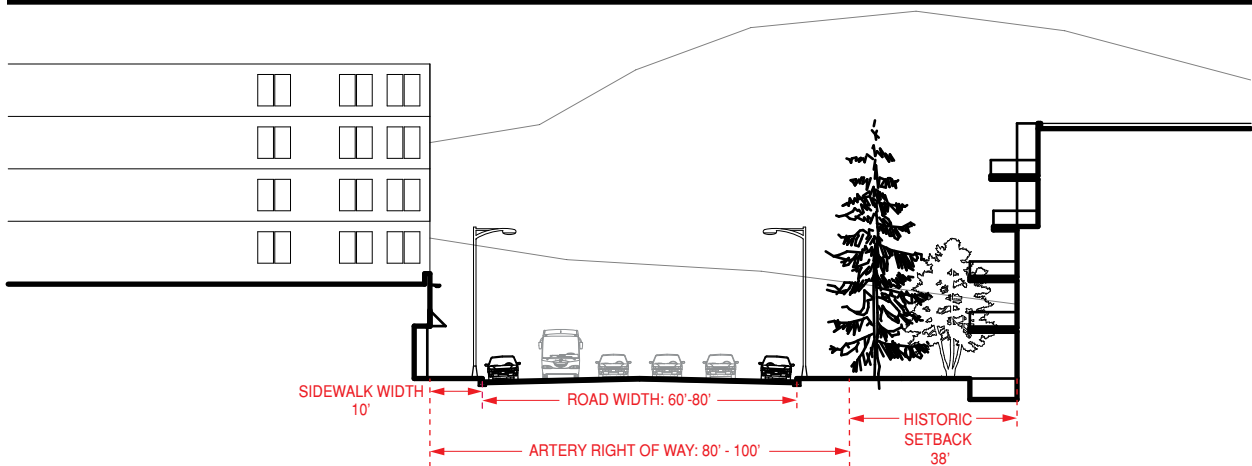


Figure 2.6.4: Artery Road Section

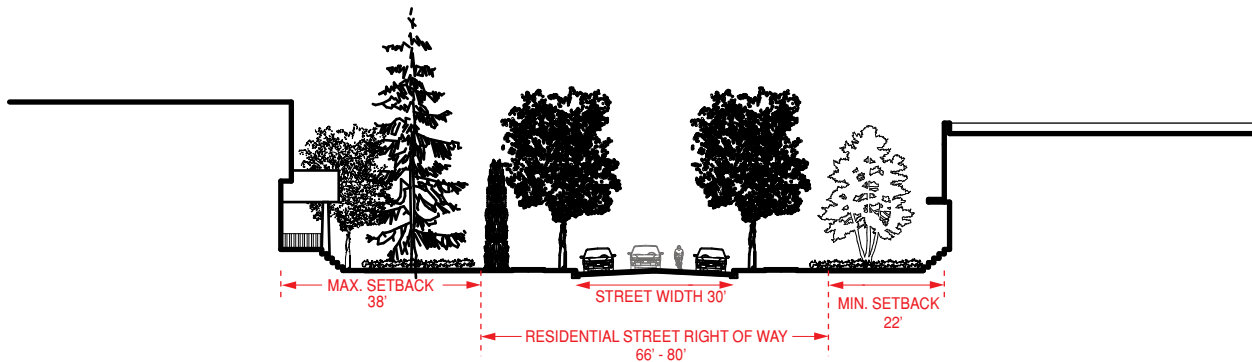


Figure 2.6.5: Residential Street Section

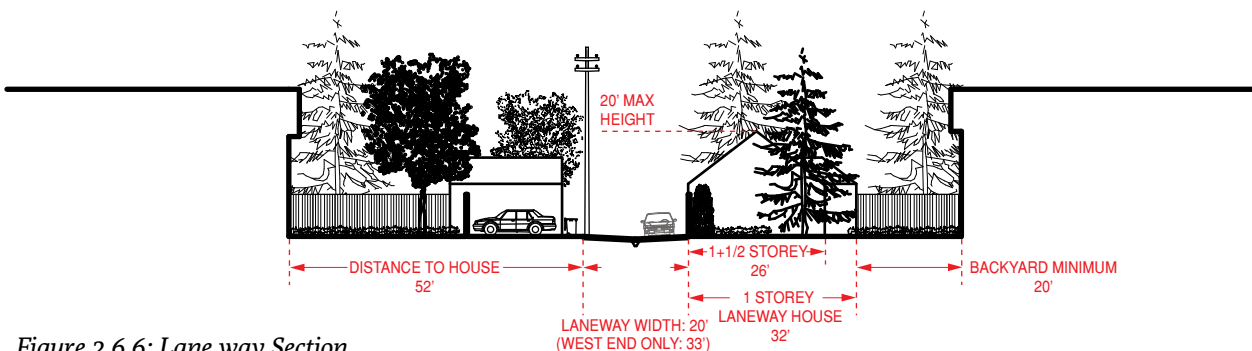


Figure 2.6.6: Lane way Section

The grid can be broken down into three main public thoroughfare types with consistent rules governing their urban form. The 60-80 ft. wide residential street, is the most common form. The streets are generally one lane with cars lined on either side, include a varying allowance for street trees, many of which create flowering canopies in the spring, a sidewalk and then private front yards

with a 20 ft. setback before reaching a set of stairs climbing half a storey to a porch and first story of a house. This means basements are partially exposed and referred to as garden suites when renovated into secondary dwellings. Residential streets are used for cars reaching their destination, pedestrians, and are often converted into prioritized bikeways, creating a second layer of cross city



Figure 2.6.7: Artery Streetscape



Figure 2.6.8: Residential Streetscape



Figure 2.6.9: Laneway Streetscape



routes. Second are the lane ways, which are 14 ft. in width (except in the west end where they are 20 ft.) and are the rights of way for services such as electricity, water, and garbage collection. Traditionally they are used as a means to an end to access rear garages but are being reinvented as green spaces and opened into fully functioning mini streets as lane way houses transform their identity. Last are

the arteries forming the corridors in which higher density dwellings and wall to wall retail buildings are built. Arteries are generally 90- 120 ft. wide and include 6 lanes of traffic and are more heavily navigated.

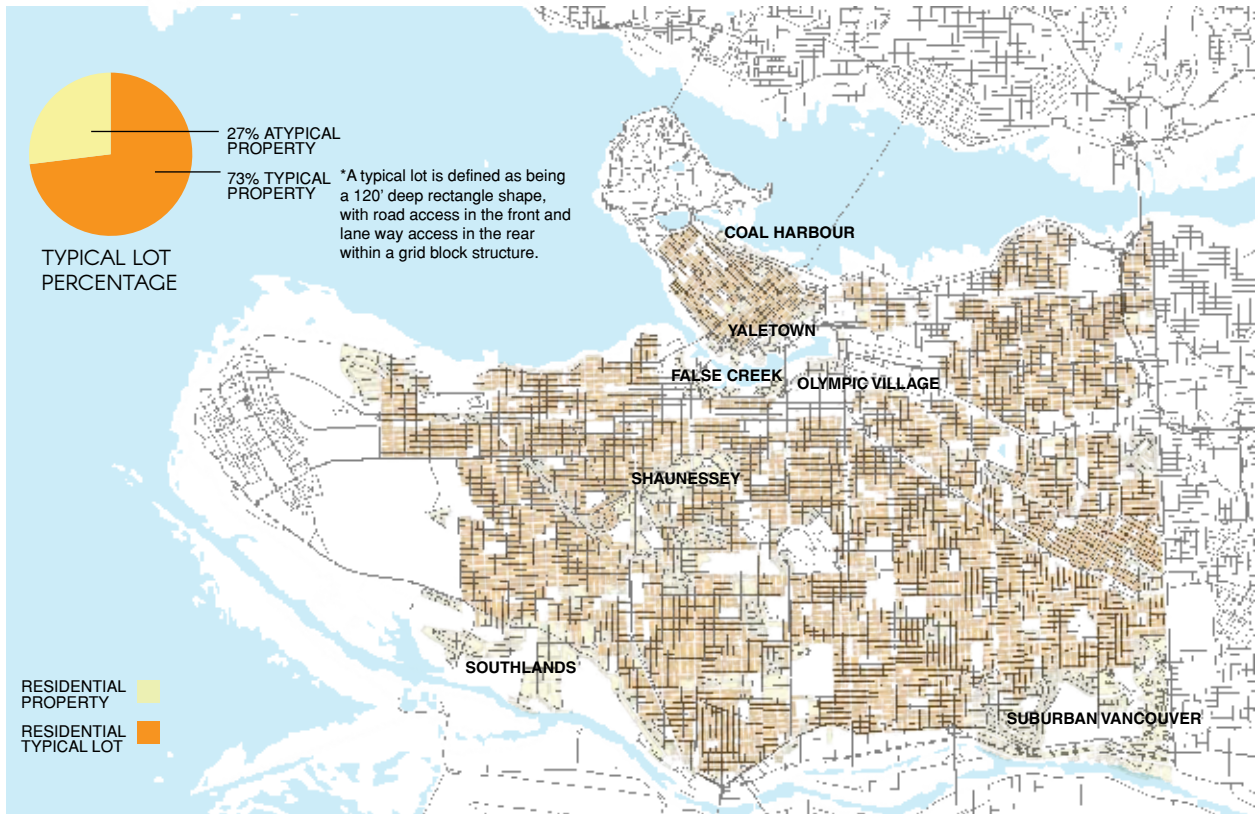


Figure 2.6.10: City Transportation Infrastructure

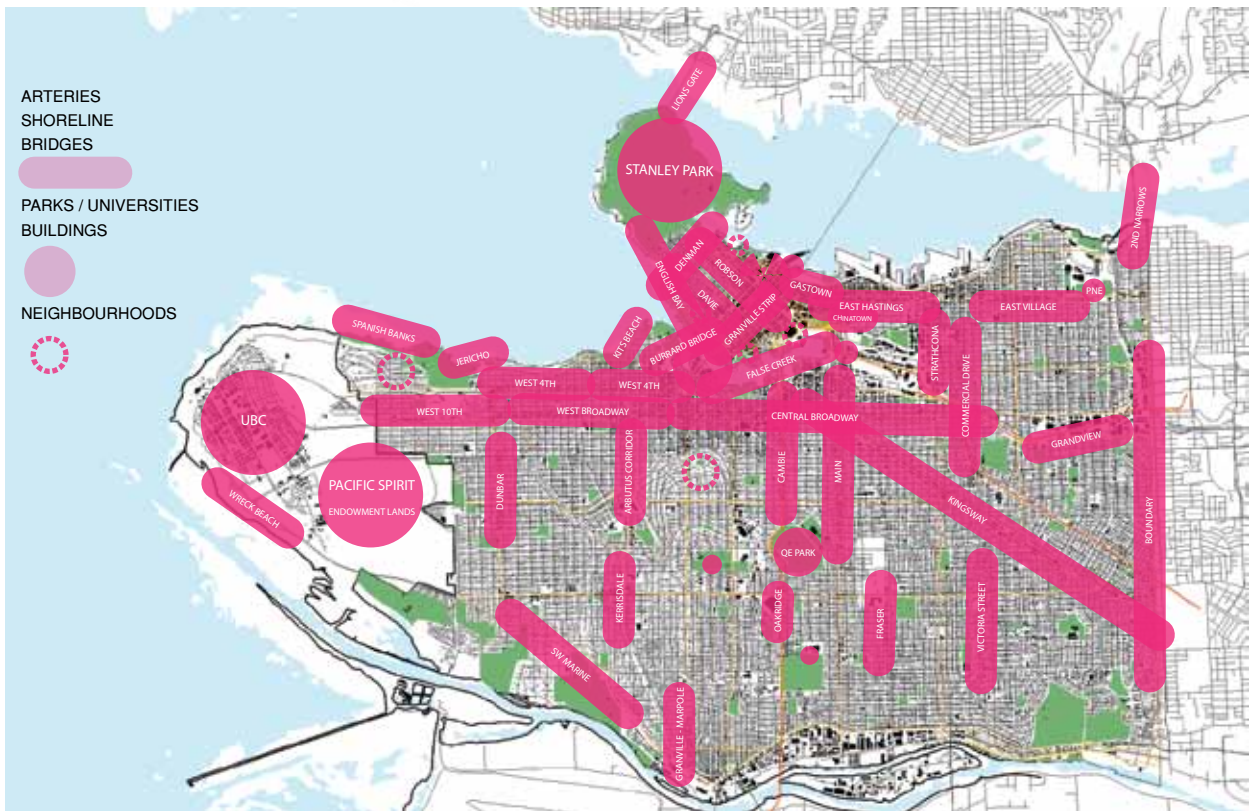


Figure 2.6.11: Identifiable places to a Vancouverites. - Places of gathering, navigation points and character.



## Atypical Lots

Atypical lot clusters not only provide less potential in scaling an affordable housing densification strategy due to their unique conditions, but are often either already built at a high density that would make redevelopment unjustifiable, are an entrenched enclave of wealthy citizens, or are found at the far edges of Vancouver and do not provide the best transportation or amenity options for higher density dwellings.

**Coal Harbour, Yaletown, Olympic Village:** Clusters of condominium development at high density

**False Creek:** Medium density complexes with complicated ownership arrangements making development complicated.

**Shaunessey:** Entrenched wealthy enclave

**Southlands & Suburban Vancouver:** Far from city services and transportation. Southlands are a low lying flood plane and suburban Vancouver has complicated ownership arrangements making development complicated.

## City Vibrancy

Currently, arteries are earmarked for densification. This strategy makes sense because they follow transit lines and retail which could be improved with higher populations nearby. However, condominium development is reducing limited employment land and is building retail units that are often out of reach for local small business. The fine grained shopping streets are being replaced with large scale buildings and storefronts changing the face of these important places of exchange. The polar opposite views of absolute preservation of residential streets and development incentive of arteries should be moderated to accommodate growth in each, while leaving the most important places to the history and community of each neighbourhood intact. Contextually respectful development, affordability, and the simultaneous protection of important pieces of city fabric while off loading some demand from arteries to residential streets would result in less disruption to the city's identity.

## Typical Lots

Lots with low density residential that are mostly detached houses account for almost 80% of all private property in the city. All of these lots abide by the same RS-1 zoning bylaws governing massing and lot configuration. Since the city's infrastructure is standard across the city, and the Bartholomew Plan of 1929 extended the original street grid across the entire city, property subdivision is also standard. Furthermore, of this major land source, 73% of that property has similar dimensions and servicing. Lots have a frontage onto a residential street or artery that is 33' or 50' wide. The lots run 120' deep to a rear lane that provides servicing and parking access. Since this condition covers a majority of developable property in Vancouver, and the current built form is unreflective of the land value of this property, a densification strategy that can be duplicated on these sites will have the most impact for a new affordable dwelling typology. This strategy has the advantage of being easily replicated across close to 65,000 lots within the City of Vancouver alone, and can be found across the city, allowing for this mass housing strategy to reach every neighbourhood.

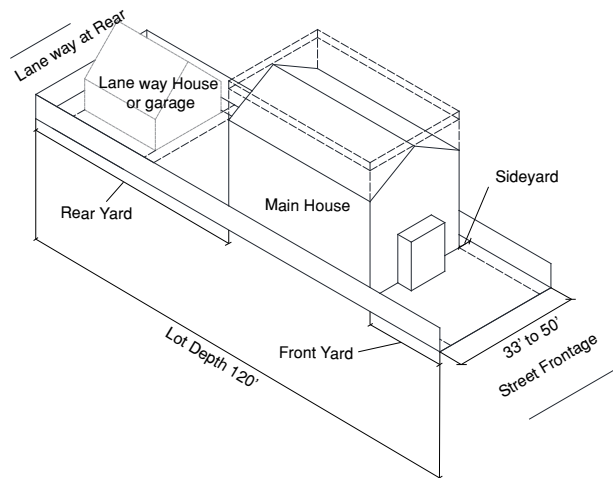
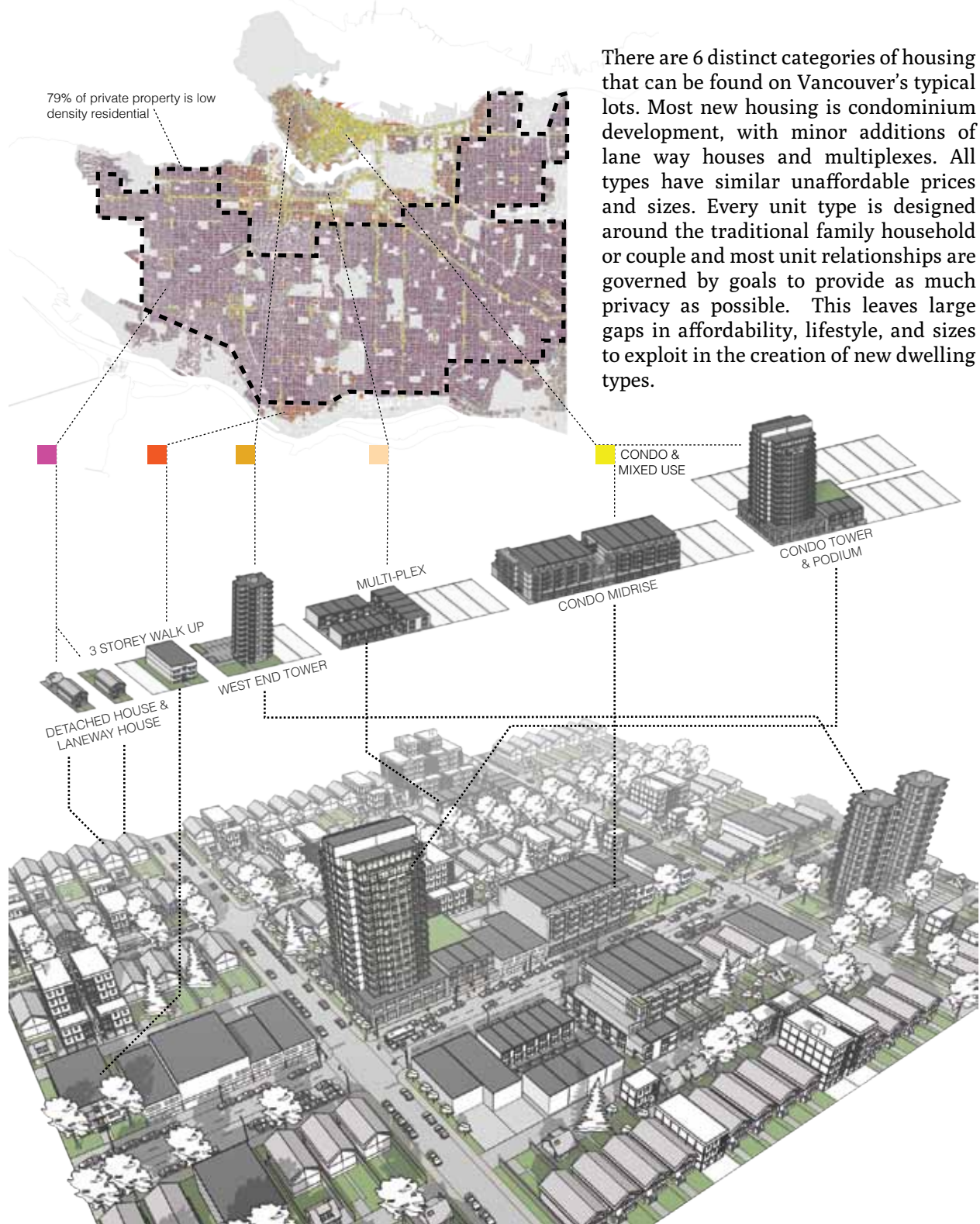


Figure 2.6.12: Typical lot parameters

# Existing Vancouver Housing Typologies



There are 6 distinct categories of housing that can be found on Vancouver's typical lots. Most new housing is condominium development, with minor additions of lane way houses and multiplexes. All types have similar unaffordable prices and sizes. Every unit type is designed around the traditional family household or couple and most unit relationships are governed by goals to provide as much privacy as possible. This leaves large gaps in affordability, lifestyle, and sizes to exploit in the creation of new dwelling types.

Figure 2.6.13: Existing Vancouver Housing Typologies on typical lots at city, building, and neighbourhood scales.

# Detached House + Lane way House & Secondary Suite

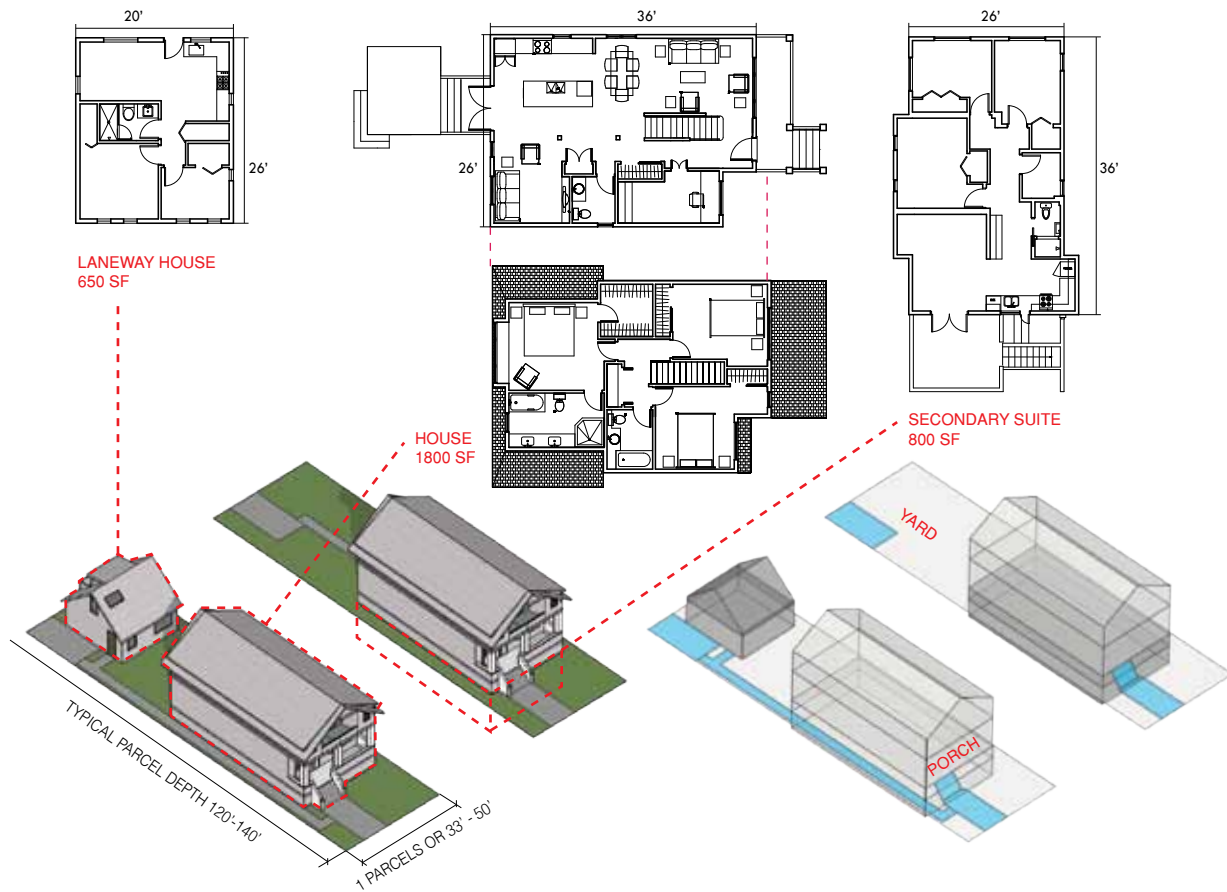


Figure 2.6.14: Typical house lot configuration and floor plans

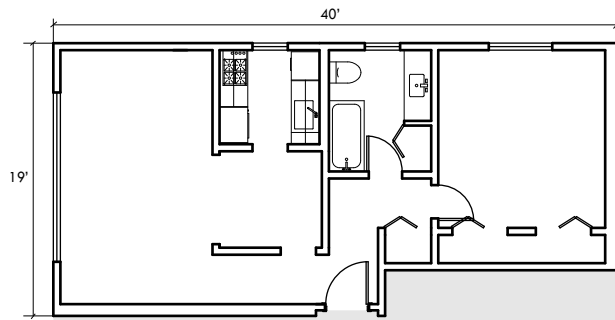


Figure 2.6.15: House with Secondary Suite below



Figure 2.6.16: Lane way House Interior

# 3 Storey Walk-up



This type often has 12 to 14 units per building accessed by a central open stair with access to the front and back through public halls. Unit layouts are almost always one bedroom and are commonly spacious but outdated in design as most are around 30-60 years old. They are found along arteries, and in neighbourhoods at the edges of higher density development, acting as transitions between houses and other building types.

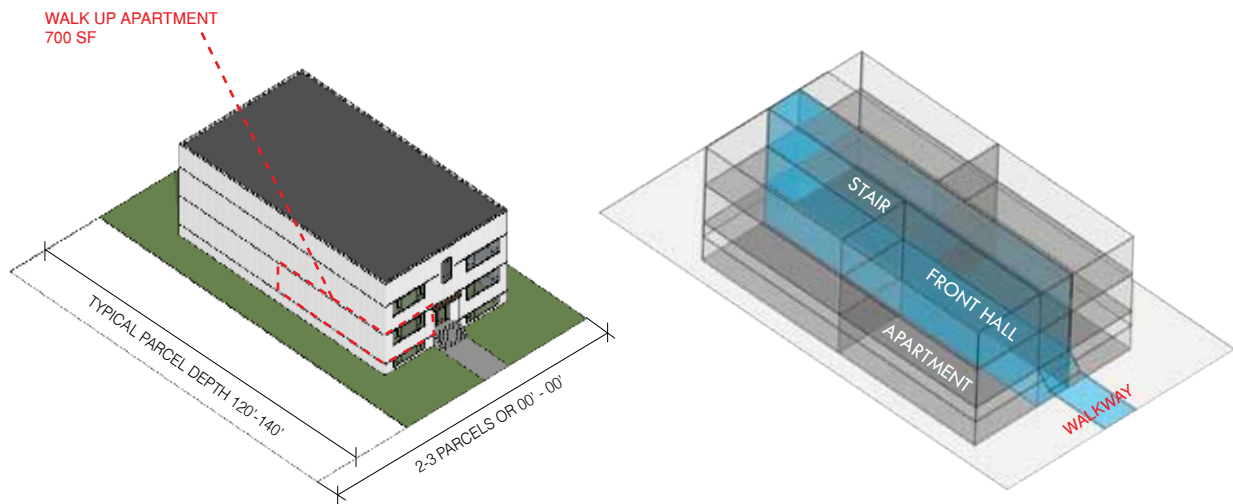
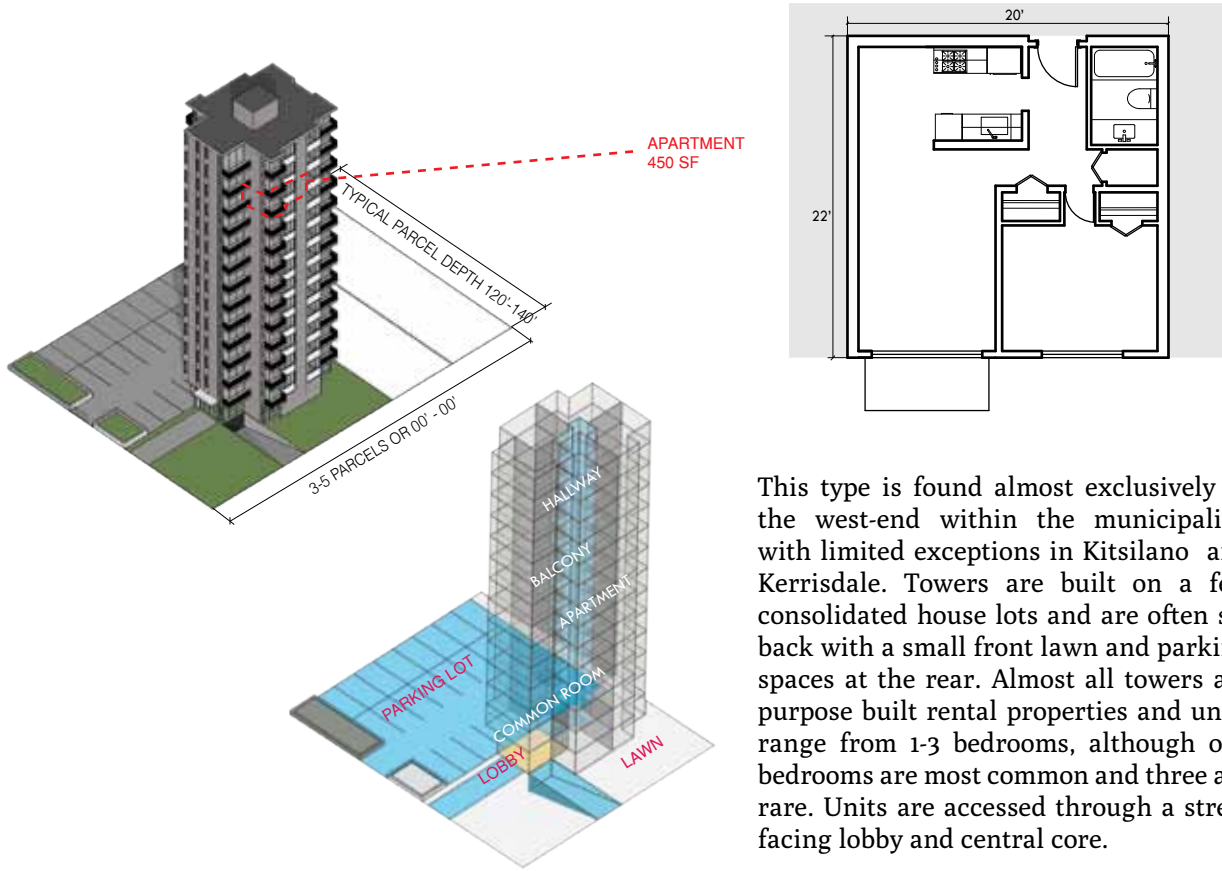


Figure 2.6.17: Typical Walk up lot configuration and unit floor plan



Figure 2.6.18: Typical walkup

# West End Tower



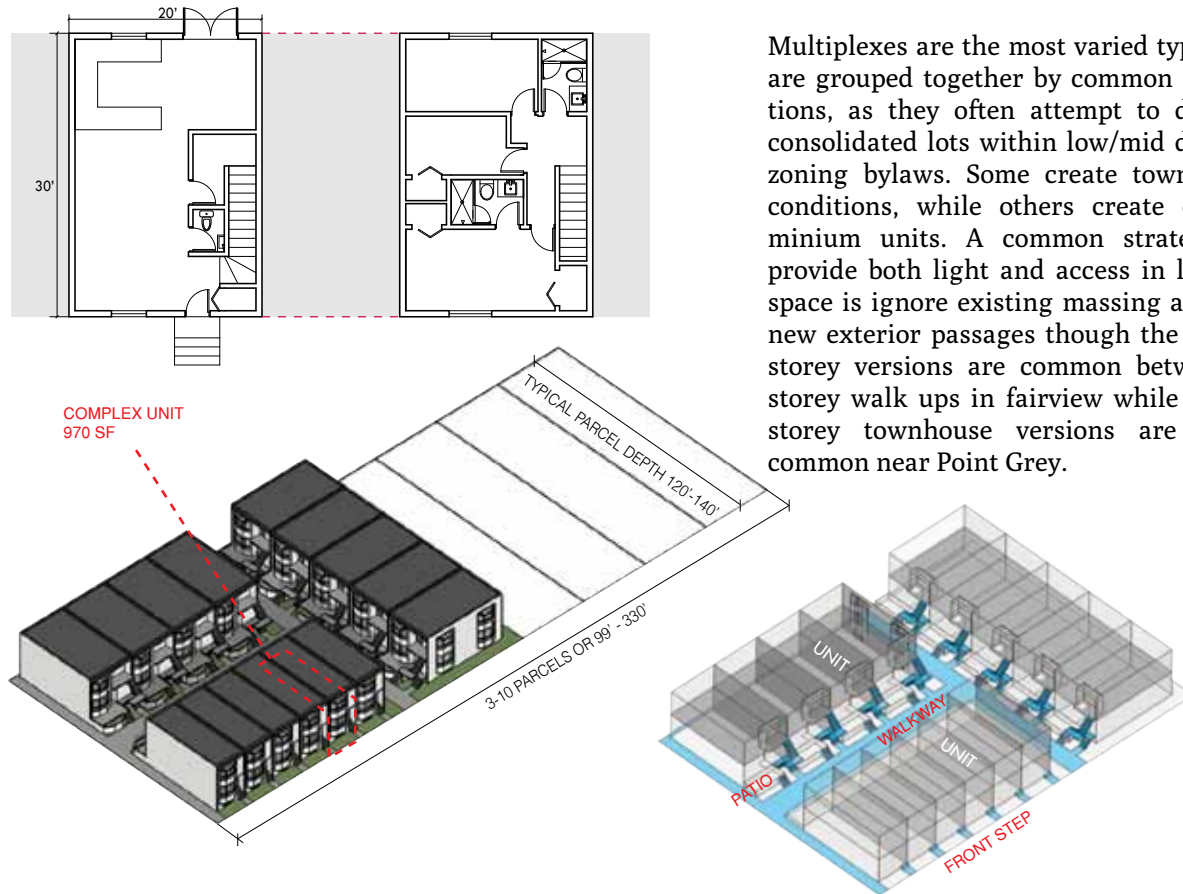
This type is found almost exclusively in the west-end within the municipality, with limited exceptions in Kitsilano and Kerrisdale. Towers are built on a few consolidated house lots and are often set back with a small front lawn and parking spaces at the rear. Almost all towers are purpose built rental properties and units range from 1-3 bedrooms, although one bedrooms are most common and three are rare. Units are accessed through a street facing lobby and central core.

Figure 2.6.19: Typical West End Tower lot configuration and unit floor plan



Figure 2.6.20: West End Skyline

# Multiplex



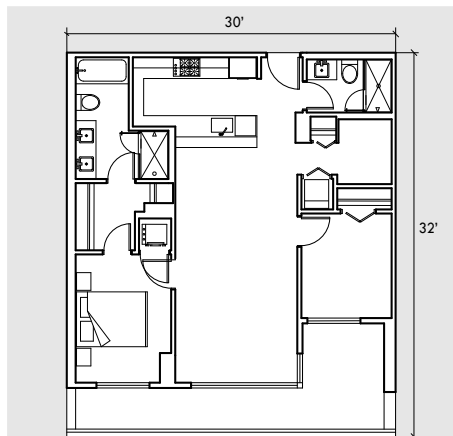
Multiplexes are the most varied type, but are grouped together by common limitations, as they often attempt to densify consolidated lots within low/mid density zoning bylaws. Some create townhouse conditions, while others create condominium units. A common strategy to provide both light and access in limited space is ignore existing massing and cut new exterior passages through the site. 4 storey versions are common between 3 storey walk ups in fairview while new 2 storey townhouse versions are more common near Point Grey.

Figure 2.6.21: Typical Multiplex lot configuration and unit floor plan

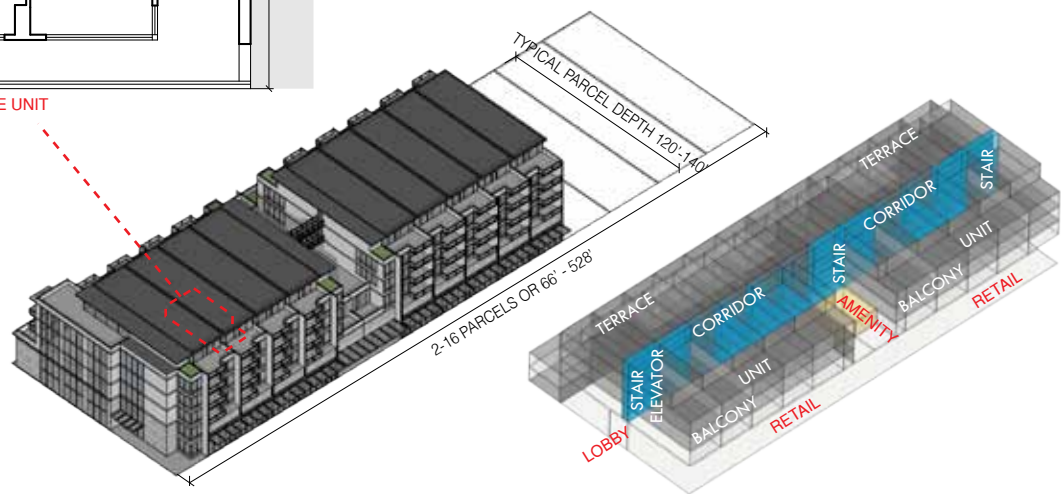


Figure 2.6.22: Pepper Ridge, Fairview, Vancouver. A common multiplex type with central exterior entry.

# Mid rise Condominium



MIDRISE UNIT  
900 SF



Mid rise condominiums stretch along artery corridors and are relatively new. Frontage facing a main street includes retail with a small setback and frontage facing a street is often lined with small terraces and townhouses. The units are accessed by sterile double loaded corridors. Units are 1-3 bedrooms, more open but smaller in design and often include a balcony or terrace.

Figure 2.6.23: Typical Mid rise lot configuration and unit floor plan



Figure 2.6.24: West 4th at Burrard St. and West 1st Street at Manitoba St.

# Tower & Podium Condominium

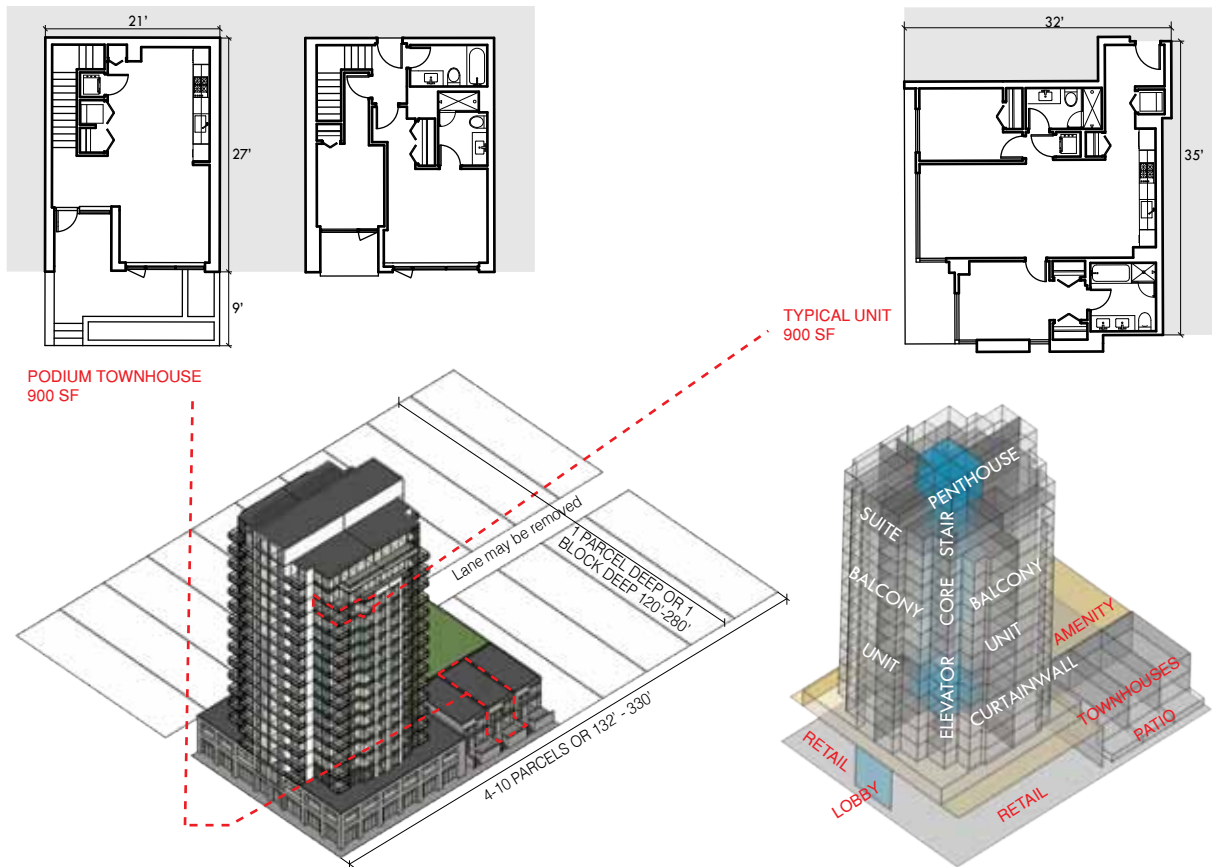


Figure 2.6.25: Typical Walk up lot configuration and unit floor plan

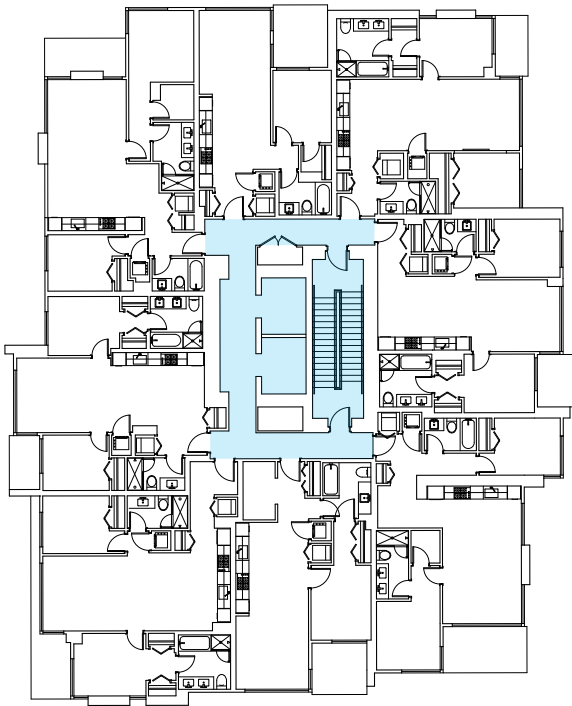


Figure 2.6.26: Condo podium with townhouses



Figure 2.6.27: Condo tower & podium





Condominium towers often include three types of unit, townhouses in the podium surrounding an internal parking garage with amenity terrace on top, tower unit with balcony, and penthouse with terrace on the top two floors. Due to zoning policies, enclosed balconies are often included at difficult to occupy dimensions as they are exempt from FSR calculations. Units are accessed from sterile corridors, and layouts are designed to limit signs of occupation and encounters. Units are deep to allow for more efficient bulky massing but are designed around large glazed openings which are the saleable feature of this dwelling type, the view. Occupants give up control of building operations, iteration, and dwelling character in order to live undisturbed and to increase the viability of inactive investment in the property.

Figure 2.6.28: Access core condominium typology

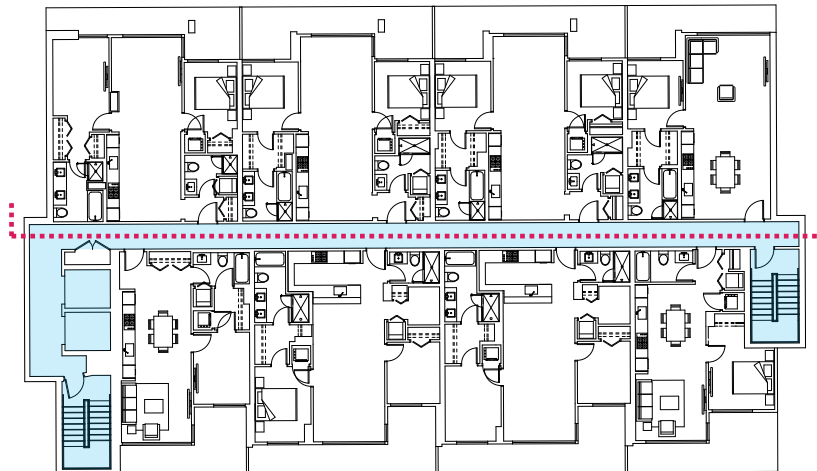


Figure 2.6.29: Corridor condominium typology



Figure 2.6.30: Corridor elevation showing sterile entryway.

# Land-Use Policy and Building Code

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To mitigate the potential downsides of development in established neighbourhoods, land use policy and building code need to align with an aspired density and urban quality, while being updated to consider affordability and new living preferences. Land bylaws that regulate setbacks, height, aesthetic, function, and ownership structure, were implemented to preserve suburban qualities thought to be the necessities of livability when a majority of Vancouver was built decades ago. These policies reflected the value of land related to income and land availability at the time. However, because they haven't changed significantly in 100 years, the result today are dwellings absolutely contradictory to urban environments, land value and availability. Current zoning regulations are stifling capacity, competition, and urban diversity which as a result is exasperating an inequality of wealth and contributing to the housing crisis while not providing substantial benefits to the public interest in doing so. The Canadian Real Estate Association warns "without significant changes to land and rental policies alongside dramatic change in housing preference among buyers, city centres will become even less affordable".<sup>56</sup> Low density zoning bylaws manufacture a self inflicted land shortage which systematically betray the public interest. New urban, dynamic, and affordable neighbourhoods are prevented in the pursuit to protect capital investment, and appease aging unrealistic perceptions of housing held by those that entered the housing market before unaffordable price increases began 20 years ago.<sup>57</sup> According to Atlas Groups "source for the new-home market intelligence report", the "decline in housing inventory is a direct reflection of how difficult it is for the industry to bring product to the market" citing major challenges in available developable land and out of date zoning bylaws.<sup>58</sup> Since almost 75% of zoned land in Vancouver is designated as low density housing in what is the centre of a growing regional metropolis, reversing these bylaws is long overdue.<sup>59</sup>

Modern zoning rules in North America were originally derived from ordinances developed in the late 1800's in Chicago by property developer Jess Nicholas.<sup>60</sup> Nicholas advocated for suburban deeds, (the predecessor of zoning), and believed urban neighbourhoods should be abandoned because the ordinances aiming to create modern living conditions and housing commodification were incompatible in an urban environment. Suburban deeds were designed to stabilize land values to make investment less volatile. He believed land not under regulatory control was "unstable merchandise" that needed to be constrained and standardized. Nicholas advocated for an "architecture of bureaucracy" where efficient production is first and foremost, in an effort to make dwellings "the construction of certainty."<sup>61</sup> Neighbours were seen as a risk to the enjoyment of one's own property and a potential land value danger. In the book *Homeownership and the Financial Underclass* written by American lawyer Mechele Dickerson, zoning continued these motives through the 20th century, making suburban settlement exclusionary to affordable housing with restrictions such as minimum property sizes.<sup>62</sup> Such conditions are allowed to exist because landowners, who pay property taxes and are the most permanent resident, carry political clout that is unmatched by other groups. Lingering rules from the past that clash with goals of housing creation, affordability, and preferred built environment qualities remain due to the lack of political will to fight the decreasing minority of entrenched "not in my backyard" property owners of previous generations. "Who did this? We did. I and my generation of oh-so-progressive NIMBYs, and the progressive politicians we elected, and the progressive bureaucrats we hired. "We have NIMBYs putting up fights and barriers to decent housing for millennials," says Murtaza Haider, a Ryerson University professor who is an expert in real estate."<sup>63</sup> Zoning standards are so widespread and similar in North America that the public has not been exposed to any other successful system, and therefore opposition has not materialized despite the consequences. Citylab reports on Chicago studies that found the urban environment today is crafted much more by zoning bylaws than how we imagine and desire our urban spaces to be.<sup>64</sup> Bylaw protection "amounts to the public subsidization of property investment insurance" while putting non-owners in an increasingly unavailable and unaffordable market.<sup>65</sup> In a report released by the World Resources Institute, cities are singled out for emphasizing home ownership and problematic land use policies that are in every case making the Global Housing Crisis Worse.<sup>66</sup>

**Exceptions to the Detached House Norm:**

**3 Storey Walk-up Ring:** 20's-70's apartments presently preserved as rental housing.

**Kerrisdale:** Historic village densified around retail strip with 60's-70's apartment towers.

**Marpole:** Historic community for Fraser River Industry

**Suburban Vancouver:** 80's - 90's development that rejected the grid and adapted modernist urban design. Dwellings are built in semi-detached clusters around dead end parking lots and winding collector streets.

**Southlands:** Preserved as hobby farms and ranches in Fraser River flood plane, now developed as large estates for the super rich.

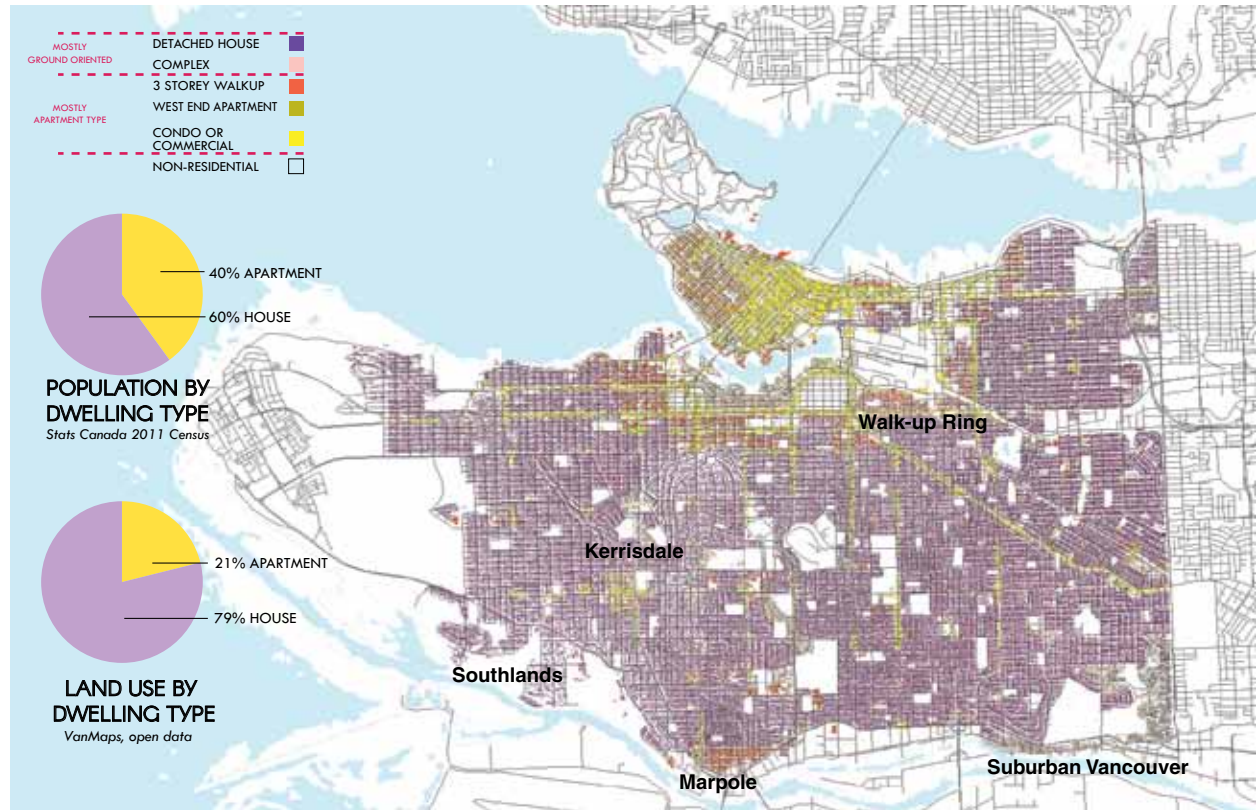


Figure 2.7.1: Dwelling type land area within the City of Vancouver

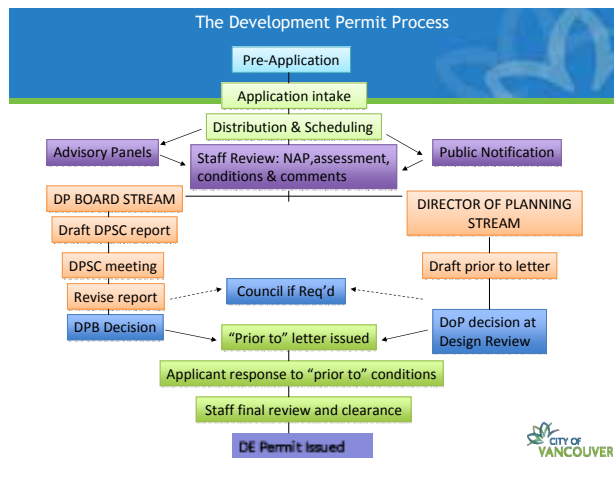


Figure 2.7.2: Development permit flowchart

**Development Permit Process**

As a result of zoning laws only allowing densification as large, high impact developments, the development permit process is long and complicated to protect the public interest. However this process is reflective of the failure of zoning in most of the city to facilitate integrated, smaller scale densification that would require less project by project oversight. The development process makes dwelling construction more expensive and delays completion, negatively impacting affordability. The Greater Vancouver Board of Trade is lobbying the city to reduce processing times to ease housing affordability noting "development permits and building permits that in some instances can take between 5 and 7 years to roll out for a developer."

This poses the question: who is benefitting from this investment protection today? Of the decreasing 49% of Vancouverites who own their dwelling in the city,<sup>67</sup> most will not benefit from higher property prices. Since all dwelling have risen in value, everywhere, those remaining in the city are only trading one unaffordable dwelling for another without any gain in accessible wealth while paying higher transaction costs.<sup>68</sup> If a profit is taken by downsizing, the property owner often subsidizes or provides a suite on their property for their children and downsizing at all is difficult because there are very few housing typologies available. Only in leaving the region entirely, or by having a secondary investment dwelling can an individual take advantage of the gain in value. Indirectly, it is often argued that everyone benefits from the influx investment has on the local economy, but the construction industry could easily be successful in building more affordable housing for the local pent up demand and the economic reward is clearly not reaching most Vancouverites as the income inflation has shown to be significantly trailing the costs of dwelling affordability, resulting in the net loss of accessible wealth.<sup>69</sup> As Doug Porter, the chief economist at BMO summarizes, “Nobodies cheering except real estate agents. The trapped wealth of the unrelenting housing boom.”<sup>70</sup> There is well documented evidence that housing booms damage economies. “One widely cited U.S. study estimated that creeping regulations and land-use restrictions have cost the country \$1.4-trillion in economic growth.”<sup>71</sup>

Specifically, zoning policy discouraging increases of population density and built form beyond a standard detached house neighbourhood is damaging to the city since there is no benefit of restricting growth at these levels. Rules around maximum heights, setbacks, usage, and aesthetics should all be reviewed with the goal of identifying unreasonable restriction. Zoning should instead encourage growth to reach a predetermined balance between living and neighbourhood quality with population density and massing, which may fluctuate with conditions overtime as dwelling preferences and costs shift. Housing affordability must also become a key attribute in living quality formulas because if a standard is not accessible financially, than a disproportionate segment of the population will see living conditions worsen. Evidence of this is reflected in reports of declining satisfaction of living arrangements in the millennial generation that has been the worst hit by unaffordability.<sup>72</sup>

Often times, rules ignore the realities of these neighbourhoods, prohibiting even development that would have no effect at all on a neighbour. Large vegetation and hedges often tower over sidewalks and adjacent properties equivalent to a 2 storey building at lot line. Fences enclose backyards so that an adjacent single storey addition in a backyard would not really be noticed. Pitched roofs already reach heights of at least three stories and aligned houses would have no impact from a modest upward addition of their neighbour. There are many examples of pre-zoning built form relationships, such as buildings without setbacks and dispersed multi-unit housing that do not seem to negatively affect the livability of surrounding properties. In addition, as the centre of a regional metropolis, property owners should not be entitled to static non-urban conditions in perpetuity, as this stifles urban vibrancy, land efficiency, and growth vital to a city. In the book “Housing Design: An International Perspective” the origin and history of the house are found to be inherently non urban.<sup>73</sup> Higher density residential development needs to be recognized as different from health, safety, and sanitary concerns that were present when land use regulations were first imposed 100 years ago, so that regulations today are recognized as drastically over protecting against non-existent threats.

When densification is allowed, the current system of accommodating growth through rezoning applications encourages more intrusive, unwanted forms of development that are inappropriate for an established detached house neighbourhood, accidentally creating even more opposition to growth. Instead of finely grained densification within the existing fabric, developers amalgamate properties into an oversized whole, and undertake construction that operates as a separate entity from its context. Zoning is damaging economic and spatial viability of small scale properties, furthering the loss of urban environments that create dynamic streetscapes, diversity, and are at a more manageable scale for occupant interaction. Since zoning allows for no dynamism and hardly any new density, growth is performed at intensified points on a case by case basis with the goal of preserving as much of a neighbourhood as possible through making a specific intervention as effectively dense as possible. This means the goal isn't

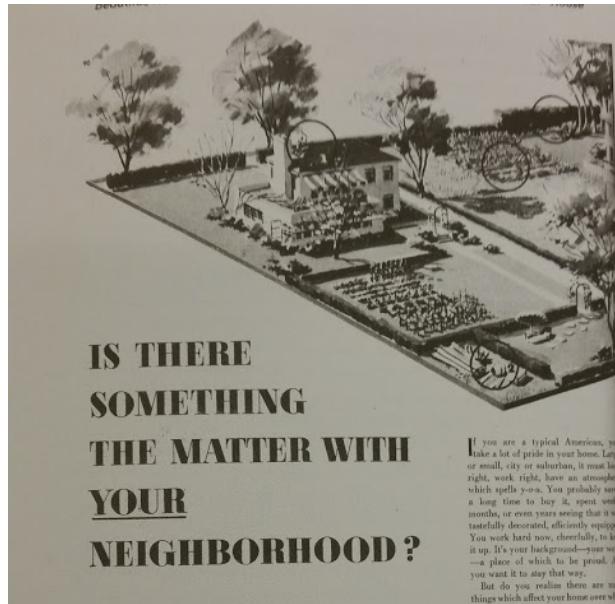


Figure 2.7.3: Faye D. Littleton. “Is there something the matter with your neighbourhood?” *House Beautiful*, 1944, 90.

## Neighbour Expectations

Zoning rules were developed to prevent “nuisances” such as large renovations or changes of use. This was a welcome change in the volatile and polluted industrial city producing both investment and quality of life protection. However, through the unintended application of zoning on urban centres and widespread policy, individual control of land has been significantly reduced and housing has been commodified to a point of detachment from incomes. As the city is embraced for its diversity and activity once again, land values have skyrocketed, and employment becomes increasingly service and digitally based, zoning protections from neighbours should be reduced. The easing of zoning from preventing change can allow residents to use their space more efficiently, potentially creating new income streams and new dwellings. It would also allow a transitional densification where a neighbourhood as a whole develops overtime in contrast to the high density insertions of condominiums.

to enhance a neighbourhood, but to limit its perceived destruction as development is viewed in this case as impossible to be integrated into the existing fabric as a new field of experience. The practice of requiring lots to be amalgamated to accommodate growth has consequences beyond the destruction of successful city fabric. A study by the Vancouver real estate association found that “orphan lots” that hold their land for ransom by developers create precedence for continued price increases, with a recent extreme example pushing a single detached housing lot to sell for 11 million dollars due to land assembly, which ultimately gets passed on to dwelling cost.<sup>74</sup>

Modern building codes compound the necessity of lot assembly to accommodate higher density, and degrade affordability and living quality attributes. Building code demands the isolation of units and access in the interest of fire division, resulting in unjustifiable floor plate inefficiencies for micro-dwellings and single lot development. Even though a building floor plate may behave and be sized similarly to a detached house, code would require unviable access and fire division requirements for a multi-unit layout making finely grained intensification uneconomical. Many European jurisdictions today require just one fire exit on small multi unit buildings which has lead to a much more dynamic middle density housing segment.<sup>75</sup> In North America, many middle density typologies died with the demise of the exterior fire escape despite its icon status for cities like New York.<sup>76</sup> While nothing could be more important than surviving a fire, it is also important not to overburden construction with measures that make building types uneconomical and damage living quality in discriminatory ways, that add no additional safety that does not already exist. For example, by keeping communal access spaces in a building of micro-units sterile from occupancy, the distance to a stair might be equivalent to crossing a penthouse condo living space. In this way, equivalent floor space and travel distances require more space dedicated to fire safety, disproportionately depreciating the value of smaller units. In the article “Small Footprints, big steps”, the writer argues “If we are serious about providing quality housing so the net generation has some hope of living in this city too, then we need to be more flexible and diverse in our housing needs”.<sup>77</sup> The resulting un-socialization of access and the isolation of units, while requiring more space and stricter guidelines to provide the solitary function of multiple fire exits and fire divisions, oppresses social configurations that do not conform to investment protection of living arrangements beyond traditional family or solitary living. It is important to acknowledge realistic performance alternatives to the prescriptive building code that fails to consider all building sizes. For example, a second exit stair may not be necessary to design to

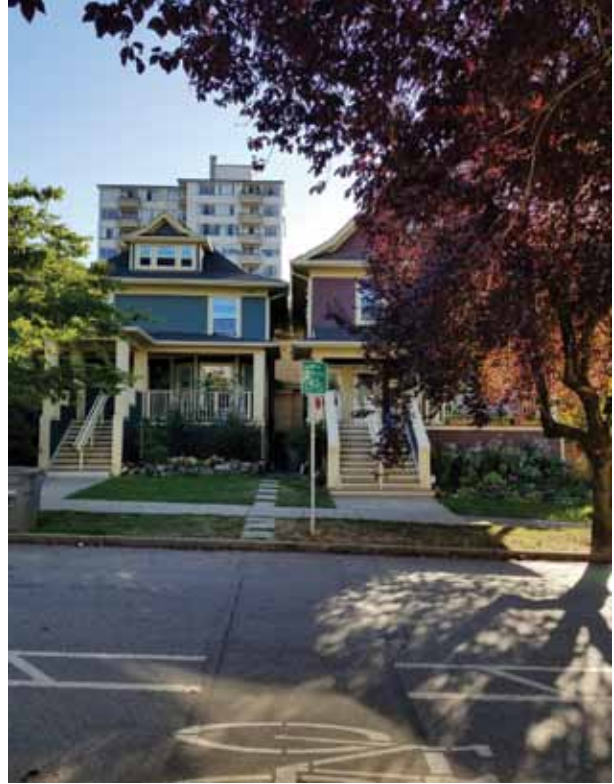
a high standard where buildings are short enough that a delay in use in an emergency produces shorter exit times than a tall building, and where the footprint is small enough that one fully standard stair would remain conveniently accessible. This practice is already applied to low density housing where a window of a certain size is considered an appropriate secondary exit in a two or three storey house, so an intermediate provision for mid sized buildings would not be without precedent.<sup>78</sup> Allowing access routes of shorter lengths to be inhabited also makes sense since travel time to a protected exit would be less delayed than a long corridor even in the presence of potential obstacles and a fire would be more easily detectable. Therefore, a strategy at a reasonable midpoint for middle density development would effectively ensure safety and quality while making the building scale viable.

Many projects that have been permitted have damaged public trust in development because development has not met the expectations and hype often spun by new projects as a result of terminology that is too broad, masking the inability of zoning and building code to recreate desired results. Historical and contemporary urban growth are referred to with the word “urban” which is often a buzzword to gain support for new development. However the term “urban” covers a large spectrum of consequential attributes such as massing, property size, and interior spaces that are unproductive and misleading in proposal discussions. To overcome development resistance, the project must deliver everytime.<sup>79</sup> The lack of terminology has limited public discourse from targeting certain desirable qualities. Urban has become synonymous with the large scale development because that is the only type of building that zoning and building code allows resulting in the stigma that any urban densification in established neighbourhoods will be unsuitable, and currently, resistance groups are often right. Densification in these neighbourhoods must have development policies that provide an additional level of understanding to the communities to be densified, concentrating on more intangible sub-qualities of urban, such as vibrancy. Changes such as restricting the number of lots that can be amalgamated, and encouraging single lot development through new zoning regulations and building code would both maintain similar appearances of property ownership and scale that mirror adjacent detached houses and make it more feasible for an array of other groups to provide housing.<sup>80</sup> Groups and landowners without the resources to assemble lots and develop mega buildings could more easily develop at the scale of a single lot which would have more credibility to neighbourhoods. Groups with differing interests and roles in housing would also produce more vibrancy and housing diversity, which may include resident associations such as co-ops and the BC tiny housing collective, homeowners, and small scale developers and start-ups.<sup>81</sup> Dynamic zoning that responds to the context of each lot would also help transition neighbourhoods from low to medium density, while minimizing the impact on the quality of life in adjacent detached homes. This would slowly upgrade the common field to a domestically scaled medium density urban typology that would be more sustainably affordable for the metropolitan centre land value would be better reflected.

Signs of willingness to accept a similar approach to growth in these neighbourhoods are shown with the emergence of small scale densification trends, the most popular of which is the laneway house typology. These houses are a great start in transitioning the neighbourhood to higher density, taking advantage of underused land, expanding dwelling typology, and introducing actors such as property owners to participate in dwelling development. The large pre zoned areas for laneway houses and domestic scale provide versatility to locate these dwellings where they are needed most and offer the ability to customize ones home.<sup>82</sup> However, regulations remain quite rigid on the manifestation of the laneway house, requiring strict massing that generally only accommodates one bedroom and ownership rules limit laneway houses to remain secondary rental suites on a primarily detached house property making them uncompetitive enough in comparison to existing houses to help ease unaffordable prices.<sup>83</sup> In addition, the power dynamic of the renter being subject to the owners power often leads to attempts to socially isolate the unit from the rest of the property through fencing and shrubs to maintain yard privacy often negatively creating friction. In addition, the laneway house does not make a lot efficient enough to be affordable at current property prices and is not at a scale of mass housing that can support enough growth to be the primary strategy to replace suburban sprawl. It should therefore be seen as an introductory measure to bridge the dwelling availability gap while a more affordable, growth accommodating typology is developed.



*Figure 2.7.4: Vine & 5th, Kitsilano. Old buildings create moments of resistance to zoning while creating no negative urban dynamics. Why does zoning want to prevent these buildings from being developed today?*



*Figure 2.7.5: Helmeken st., West End. Houses built before zoning regulations are everywhere but not noticeable unless one looks for them. Why does zoning insist on sideyard setbacks that create unusable space when land values are so high?*



*Figure 2.7.6: Vine & 11th, Kitsilano. Ironically, older buildings that do not follow zoning rules are often protected from redevelopment due to their important role in providing less expensive rental dwellings. Why does zoning prevent the construction of more of these buildings?*



*Figure 2.7.7: Front yard hedges are common and grow well in the mild climate. The city even provides guidelines for how to trim them at sidewalks. Why is large massing allowed as a privacy screen for a single dwelling while massing in the form of an apartment for multiple dwellings is not?*



Figure 2.7.8: Olympic Village - Condominium Development & Employment Lands



Figure 2.7.9: West End - 60's-70's High Rise Development



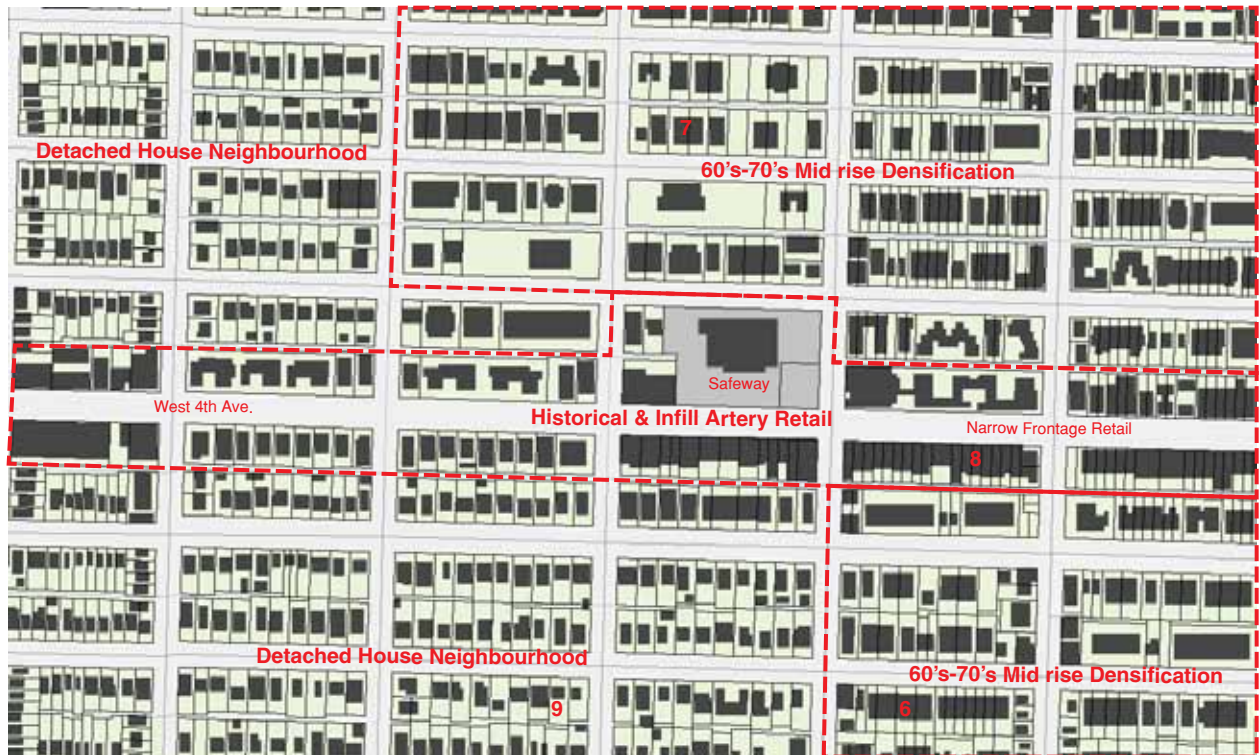


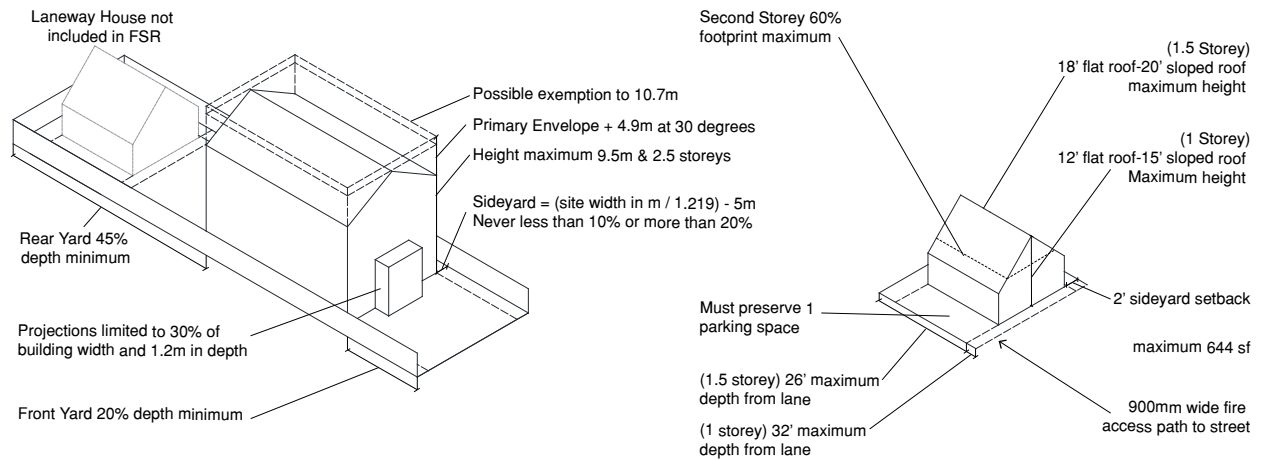
Figure 2.7.10: Kitsilano - Artery retail, 60'-70's mid rise densification & detached house neighbourhood



### Massing & Property Comparison

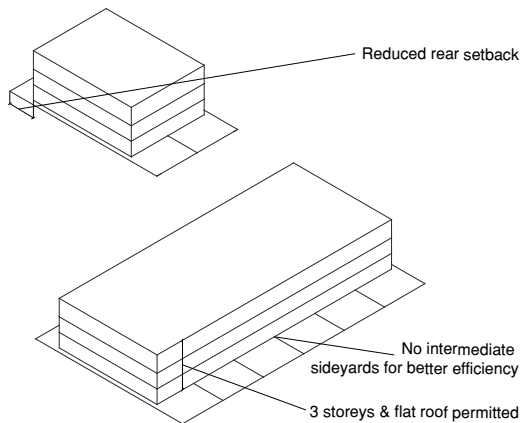
Current Condominium Development amalgamates lots resulting in large massing, long frontages at street level, and less vegetation in the public realm. While current Condominium development is being built in previous employment lands without existing residents or vegetation, transplanting this typology into detached house neighbourhoods as shown near Kitsilano, would require significant massing, frontage, and property changes, destroying neighbourhood character. In comparison, high rise densification in the West End and Mid rise densification in Kitsilano have much smaller footprints and include areas of vegetation. There is also large variation in building shapes and sizes. Narrow retail frontages create dynamic shopping streets, are more viable to smaller businesses, and increase walkability. Proposed densification within established neighbourhoods should acknowledge the roll a fine grained urban environment has in creating livable places.

Figure 2.7.11: Comparison of neighbourhood lot sizes and massing



**Single Lot FSR: 0.6**

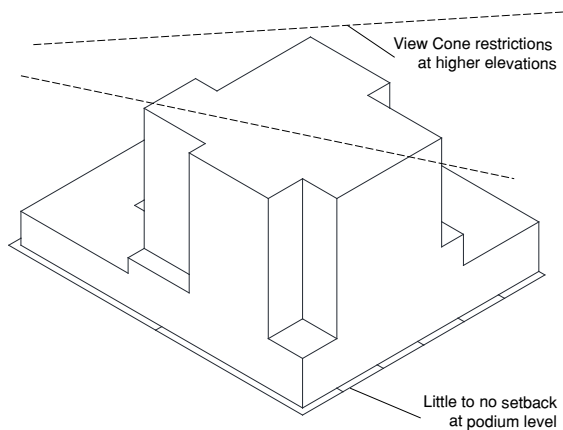
**+ Laneway House FSR: 0.16**



**Site Restriction Comparison**

The larger the lot, the more efficient zoning regulations allow development to use the site, putting smaller projects at a distinct disadvantage. The 60's-70's densification respect the same front yard setback as existing houses but slope restrictions on height maximums are relaxed allowing for a third storey, while more area is taken for the building footprint in the rear and side yard setbacks are reduced to perimeter edges. Even though an entire area is densified, single lot projects cannot exceed single house regulations, placing an unnecessary burden on site usage.

**60's-70's Densification FSR: 1.80 - 2.00**



Larger projects also command attention from politicians and planners due to their potential impact on the neighbourhood and scale of investment. While small projects must stringently follow restrictive guidelines, large development companies use their influence to negotiate higher densities.

If the city wants to encourage different housing typologies and affordable housing, it must relax site use on single lots to permit viable floor plate sizes for multi-use apartments and enough FSR to absorb high land values through profitable floor area. This must be done as a sweeping zoning strategy rather than project by project negotiation for smaller scale projects to be confidently invested in and be constructed at an affordable density.

**Condominium FSR: 6.5 - 20**

*Figure 2.7.12: Comparison of allowable FSR to development size*



Figure 2.7.13: Houses > 0.6 FSR



Figure 2.7.14: 3 Storey Walkups > 2.0 FSR



Figure 2.7.15: Condominiums 6.5 - 20 FSR



# Emerging Densification Strategies

## Summary

Three relatively new densification strategies are being currently allowed or being tested for development in established neighbourhoods. The laneway house, corner house, and laneway apartment are all densification strategies being pursued with both positive and negative effects. Unfortunately, none of the options divide property costs enough to make them affordable, and density produced by these strategies may not be enough to keep up with demand, especially the laneway and corner houses. The laneway apartment is most successful but is also most awkward in relation to the existing house. It produces the most unequal dwelling condition on the lot where one dwelling is accessed by the street, has a front yard, is autonomous, and takes up half the site while the apartment contains stacked tight units accessed from the lane. By developing a laneway apartment, the historical value of the house is saved and streetscape is preserved. However, if this strategy was to be implemented at a large scale, the city would be split into two, with select wealthy inhabitants along streets, and the majority of residents crammed into

the laneways. The typology doesn't scale to become a positive city building mass housing strategy. Instead laneway apartments could serve to densify lots with moderate heritage value while other lots could be redeveloped completely to coexist with detached house neighbours. Complete redevelopment makes dwellings more equal and uses space more efficiently. It would also acknowledge the house as a no longer viable typology in relation to current property values, stopping an outsized sacrifice of land to save them for the multimillionaire minority that can afford them.

## House Redevelopment

Zoning rules and building code encourage the commodification of housing by making the most profitable option for detached house lot redevelopment the construction of mansions in the place of old, small houses. The practice increases massing and reduces historical value, while making housing even more unaffordable, with luxury sizes and features catering to investment demand. It also fails to increase the number of dwellings on site. Zoning rules should not allow this to happen.



Figure 2.7.16: Typical before and after house redevelopment resulting in more unaffordable dwellings

# Laneway House

**Densification of single family lot by 1 dwelling**  
**Typical unit type: 1 BDRM**  
**Rentable only**

Laneway houses effectively begin a transformation process of detached house neighbourhoods without destroying existing buildings or character. They take advantage of under used lot area, public right of way frontage at the rear lane, expand dwelling options, and enable property owners to participate in developing their community. The scale of these houses are similar to existing buildings and allow for customization. The large pre-zoned area makes densification versatile, permitting laneway houses to freely respond to areas of high demand.

However, regulations make the manifestation of the laneway house rigidly the same size, mostly allowing only 1 BDRM units due to space constraints. They also only provide one extra dwelling per lot, as other secondary suites are banned if a laneway house is built, and they can only be rented. This densification is not close to enough to divide the inflated property cost to make it affordable as 3 million dollar properties would still price dwellings over a million dollars. Additionally, the power dynamic between renter and owner often leads to attempts to socially isolate the unit from the rest of the property through fencing and shrubs to maintain yard privacy often negatively creating friction. Therefore, laneways are an effective introductory measure to bridge the dwelling availability gap while a more affordable, growth accommodating typology is developed.

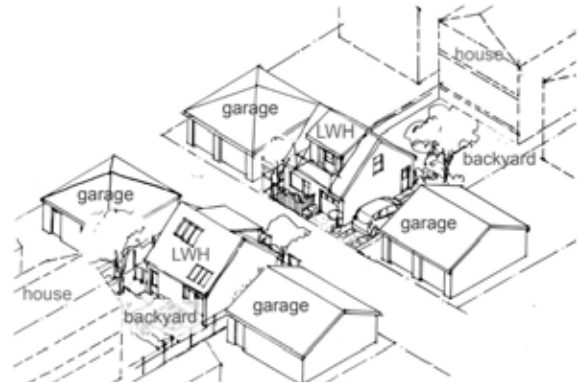


Figure 2.7.17: Official City of Vancouver laneway house guidelines example illustration



Figure 2.7.18: Existing Vancouver laneway houses



Figure 2.7.19: Picture series showing unequal space division between laneway house (left) and primary house

# Corner House

**Densification of single family lot by 1 dwelling**  
**Typical unit type: Full scale house**  
**Purchasable**

Corner Lots are the easiest to densify as the rear of the lot has direct access to a street allowing property subdivision. Full size houses are slipped into the rear yard of an existing house. The benefits are similar to laneway houses but are usually built larger and therefore suffer from even worse affordability, often costing over a million dollars. While space is less constrained allowing for a more family appropriate typology with 2 or more bedrooms, the addition of just one more dwelling on a lot is not reflective of the high land value.



Figure 2.7.20: Plan of corner condition which allows for property subdivision along north-south street.



Figure 2.7.21: New additional corner house in severed back yard of existing house circled in red.



Figure 2.7.22: New additional corner house in severed back yard of existing house circled in red.

# Laneway Apartment

**Densification of single family lot by 3-12 dwellings**  
**Typical unit type: Studio / 1 BDRM**  
**Rentable or Purchasable**

The first of three planned laneway apartments built in the west end as part of a city trial to create additional density in the already densified neighbourhood. Laneway apartments are more effective at providing affordable housing than other infill strategies because they more closely reflect the real value of real estate. They can be configured to provide anything from microunits to three bedroom units. The footprint and height efficiently use the site without significant impact to its surroundings due to its single lot scale. Currently the city is permitting this typology in the west end because it is not a detached house neighbourhood and lanes are 33' wide compared to the rest of the city's 20' lanes.

This strategy still doesn't achieve dwelling prices affordable to median income and leaves the detached house using most of the lot inefficiently. It also creates very tight units and isolates units in a similar design to a condominium development. However if this strategy was allowed across the city, it is dense enough to have an effective on affordability considering there are around 90,000 lots that could develop 3-12 additional dwellings.



Figure 2.7.23: Site plan of laneway apartment



Figure 2.7.24: Map of limited territory of laneway apartment due to zoning regs. & lane dimensions



Figure 2.7.25: Laneway Elevation, side elevation, and neighbouring relationship of new laneway apartment.

# Building Code

## Mid-size Building Discrimination

Rules governing exits favour larger buildings for floor plate efficiency and are too rigid in defining safe exiting too make mid size buildings economically viable. A building taking up to 6 lots requires the same number of exit stairs as a building on a single lot. Exit stairs and corridors must be to the same standards despite shorter travel distances and faster evacuation times. If the building code accepts exiting a 30 storey building with two exits 45m away as responsibly safe, then a 6 storey building with one exit 2m away and a second emergency route with less stringent standards should provide equal, if not better safety. Mid sized buildings are easier to access via emergency response equipment such as fire trucks and street level hoses making emergency response easier than large towers. However, the rigidity of the building code encourages the larger building. The building code must adapt and recognize multiple methods of providing safety by building condition to allow a wider range of designs to create affordability and appropriately sized infill development. As of now, the single method approach developed for large buildings has aided in completely changing the scale of urban spaces, without contemplating whether that is a desirable change.

### 3.4.2.1. Minimum Number of Exits

- 1) Except as permitted by Sentences (2) to (4), every floor area intended for occupancy shall be served by at least 2 exits.
- 2) A floor area in a building not more than 2 storeys in building height, is permitted to be served by one exit provided the total occupant load served by the exit is not more than 60.

### 3.4.2.5. Location of Exits

- 1) Except as permitted by Sentences (2) and 3.3.2.5.(6), if more than one exit is required from a floor area, the exits shall be located so that the travel distance to at least one exit shall be not more than
- c) 45 m in a floor area that contains an occupancy other than a high-hazard industrial occupancy, provided it is sprinklered throughout.

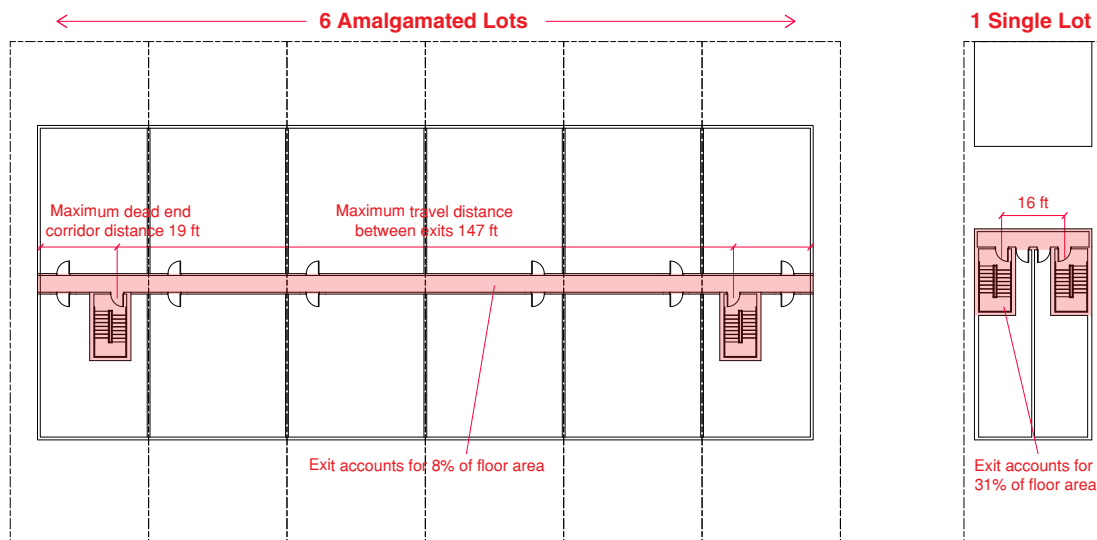


Figure 2.7.26: Current BC building code exit requirement disincentive of mid sized buildings



## Communal Space Discrimination

Unit sizes and social relationships are hindered by building code written singularly for traditional household occupancies. Three plans below show the same floor plate and all include three bedrooms of the same size and configuration. However one scenario provides micro units from a legally occupied access space, a second scenerio provides a separated access space with segregated communal space, and the third is a traditional 3 bdrm unit with insuite communal space. While travel distances and occupant number remain the same, and in the 3 bdrm plan occupants exiting from the bedrooms must navigate a living space to reach the exit, building code requires sterile access spaces when these rooms are considered separate units. An affordable, space efficient design that spreads out the burden of property costs is at a distinct disadvantage. Uncommon sharing of space between residents of separate households, unconventional households, and alternative lifestyles are all unplanned for by the building code. Rigid rules requiring clear access paths and fire separations regardless of distance and area prevent a large spectrum of living models due to prescriptive, not performative safety standards. The building code should not unintentionally control opportunities to inhabit buildings differently.

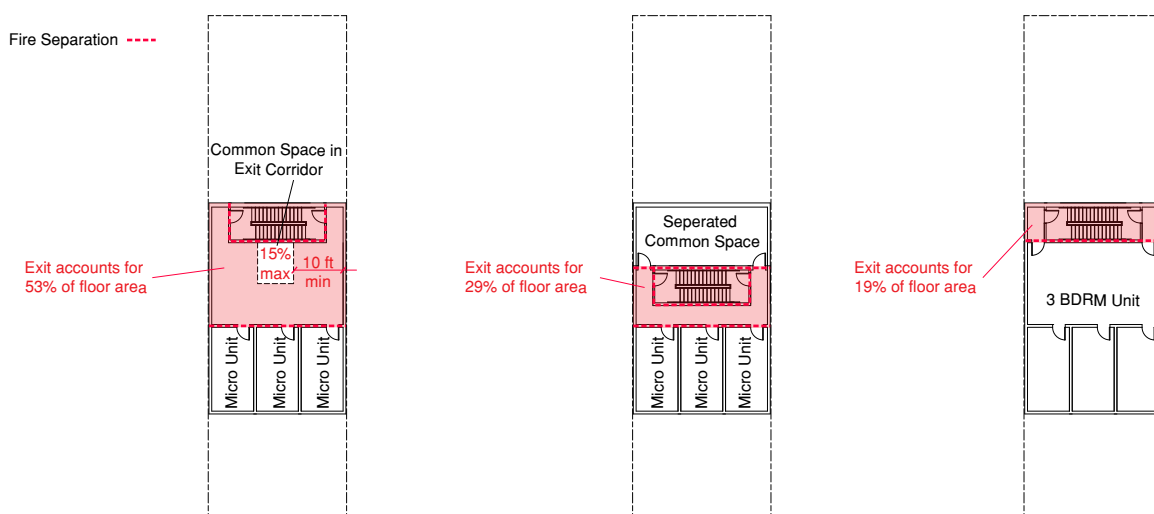


Figure 2.7.27: Current BC building code exit requirement disincentive of small units and nontraditional occupancy.

### 3.3.1.1. Separation of Suites

1) Except as permitted by Sentences (2) to Sentence (4), a suite shall be separated from adjoining suites by a fire separation having a fire-resistance rating not less than 1 h. (See also Subsection 3.3.3. for care, treatment or detention occupancies, Article 3.3.4.2. for residential occupancies, and Article 3.1.8.7. for fire dampers.)

### 3.3.1.4. Public Corridor Separations

1) Except as otherwise required by this Part or as permitted by Sentence (4), a public corridor shall be separated from the remainder of the storey by a fire separation.

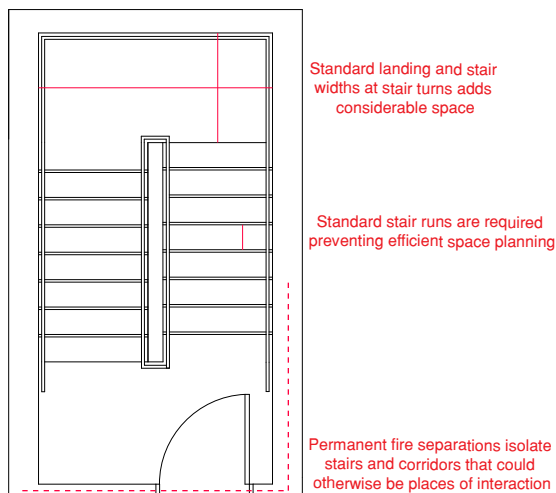
### 3.3.1.9. Corridors

5) If a corridor contains an occupancy, the occupancy shall not reduce the unobstructed width of the corridor to less than its required width.

6) If a public corridor conforming to Clause 3.4.2.5.(1)(d) contains an occupancy,  
 a) the occupancy shall be located so that for pedestrian travel there is an unobstructed width not less than 3 m at all times adjacent and parallel to all rooms and suites that front onto the public corridor, and  
 b) the combined area of all occupancies in the public corridor shall be not more than 15% of the area of the public corridor.

## Discriminatory Stair Requirements.

The historic importance of dwelling access to social exchange, public expression of an individual's home, and connection to the city should not be squandered in the name of safety. Open staircases increase chance encounters and reduce floor by floor isolation. If buildings can achieve quick exiting to multiple stairs through small floor plates and short evacuations due to reasonable building height then fire separations could be relaxed and still provide a level of safety currently provided by larger buildings. Impermanent fire shutters activated in emergency, rooftop places of refuge, or less rigid rules for one of two exits all provide additional safety measures while reintroducing a social dynamic to the exit. During the affordability crisis where land is extremely expensive, solutions that make exits safe but also inhabitable are needed to improve the efficiency of building area. This should similarly be applied to stair dimensions and types. The smaller the building, the more restricted designs become accommodating fully standardized stair dimensions. Stair designs that reduce length or width, or types such as spiral stairs with different dimension ratios at the expense of more variable tread run dimensions should be considered when a building is at a small enough size that the delay by such a design would not make the total evacuation time dangerously longer.



## 3.4.4. FIRE SEPARATION OF EXITS

### 3.4.4.1. Fire-Resistance Rating of Exit Separations

1) Except as permitted by Sentences (2), 3.3.5.4.(3), 3.4.4.2.(2) and 3.4.4.3.(1), **every exit shall be separated from the remainder of the building by a fire separation** having a fire-resistance rating not less than that required by Subsection 3.2.2., but not less than 45 min., for

## 3.4.6. TYPES OF EXIT FACILITIES

### 3.4.6.4. Dimensions of Landings

1) **The length and width of a landing shall be at least the width of the stairway in which it occurs**, except that in a straight run, the length of the landing need not be more than 1 100 mm.

2) Where a doorway or stairway empties onto a ramp through a side wall, there shall be a level area extending across the full width of the ramp, and for a distance of 300 mm on either side of the wall opening, except one side if it abuts on an end wall.

3) Where a doorway or stairway empties onto a ramp through an end wall, there shall be a level area extending across the full width of the ramp and along its length for not less than 900 mm.

## 3.3.1.16. Curved or Spiral Stairs

1) **A curved or spiral stair is permitted in a stairway not required as an exit**, provided the stair has

- treads with
  - a minimum run not less than 150 mm, and
  - an average run not less than 200 mm,
- risers in conformance with Sentence 3.4.6.8.(2), and
- a handrail on each side.

Figure 2.7.28: Current rigid requirements on stair segregation and standards

**Lack of Exit Options**

Secondary exits, such as fire escapes are prohibited by BC building code, stating concern for delay of evacuation and emergency response. However if this is the only concern, building size should be factored into its allowance as climbing six storeys is much quicker than climbing 30, yet exiting requirements remain the same for both scenarios. Exterior stairs often mean greater choice when exiting a unit, providing a valuable second direction to travel rather than depending on a singular exit to a corridor. Exterior exits are often more pleasant than dark enclosed stairs, and being open and within view creates a greater connection to upper level units to the street and provides greater opportunities for neighbourly interactions and inhabited private to public thresholds. With the advancement of building technology, fire fighting equipment, and increased fire safety and warning measures, alternative exit designs should be made available to restore economic viability to mid sized buildings. Alternative stair types should be measured by their performance and the delay they create not exclude them entirely but govern the size of building they are able to service in order to balance the expectations of a more diverse range of buildings.

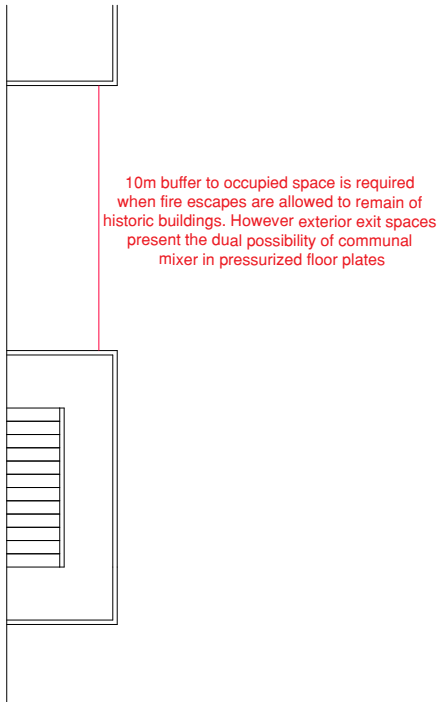


Figure 2.7.29: Current lack of exiting options

**3.4.7.1. Scope**

- 1) Except as permitted by Sentence (2), **fire escapes shall not be erected on a building.**
- 2) If it is impracticable to provide one or more of the exit facilities listed in Article 3.4.1.4., fire escapes conforming to Articles 3.4.7.2. to 3.4.7.7. **are permitted to serve floor areas in an existing building** provided the floor areas served are not more than
  - a) 2 storeys above ground level in care, treatment or detention occupancies, and
  - b) **5 storeys above ground level** in other occupancies.

**Fire Escape Limitation Intent:**

To limit the probability that an exterior exit facility not fully complying with Subsections 3.4.1. to 3.4.6. will be used, which could lead to:

- **delays in the evacuation or movement** of persons to a safe place in an emergency situation, which could lead to harm to persons, and
- **delays by emergency responders** in gaining access to floor areas in an emergency situation, which could lead to delays in the evacuation or movement of persons to a safe place, which could lead to harm to persons.

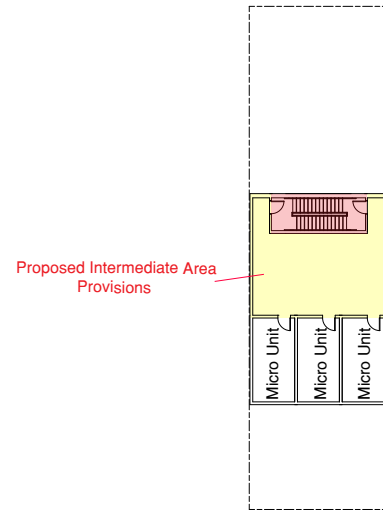
**3.4.7.4. Protection of Fire Escapes**

- 1) If a fire escape serves any storey above the second, openings located in a zone described in Sentence (2), including access doorways in the exterior walls of the building to which the fire escape is attached, **shall be protected by closures** conforming to Subsection 3.1.8.
- 2) The zone referred to in Sentence (1) **extends from any balcony, platform or stairway of a fire escape to a distance**
  - a) 3 m horizontally,
  - b) 10 m below, or
  - c) 1.8 m above.

**Recommendation:**

To accommodate mid sized building, three major recommendations are proposed to make floor plates economically viable and increase the benefit of exit spaces during normal operation.

1. Create rules governing a new communal type of space that is a mix of the currently existing corridors and unit occupancy.
2. Allow for alternative secondary stair typologies that are limited by comparative delay to a standard exit.
3. Create a new part within the building code specifically for mid-sized buildings so that they do not have to unreasonably abide by rules crafted for safety at the scale of an institution.



**Planning for Mid-size Building Precedence**

Most of Europe reduces restrictions of mid sized buildings, which helps to preserve the scale of their urban centres. The European Union is a leader in safety standards and can therefore be depended upon to ensure safe models of development.

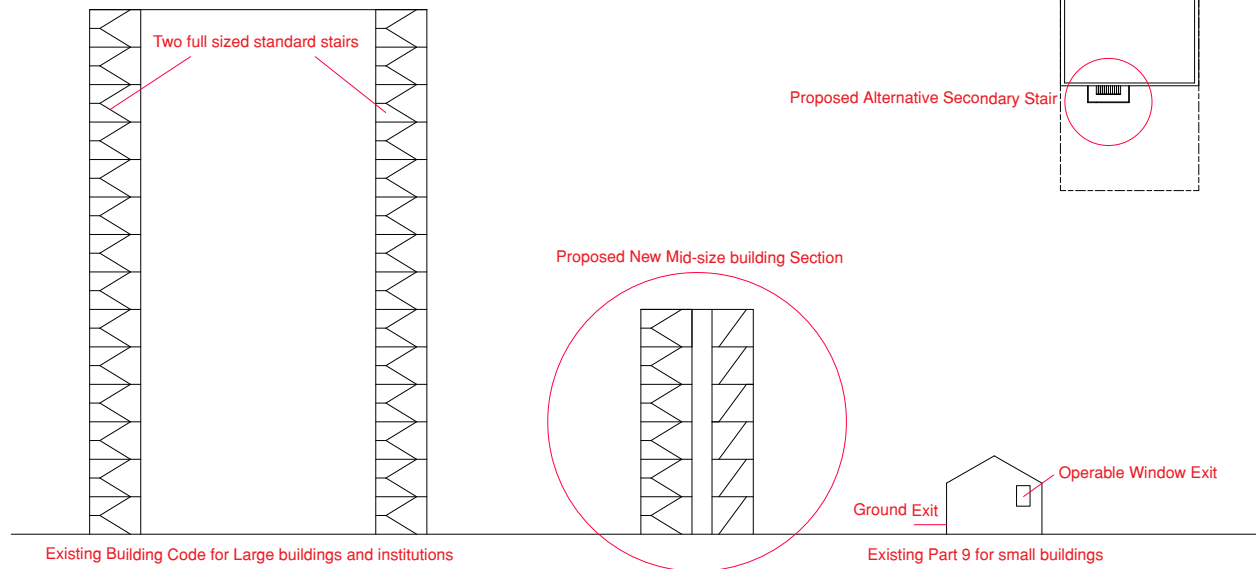
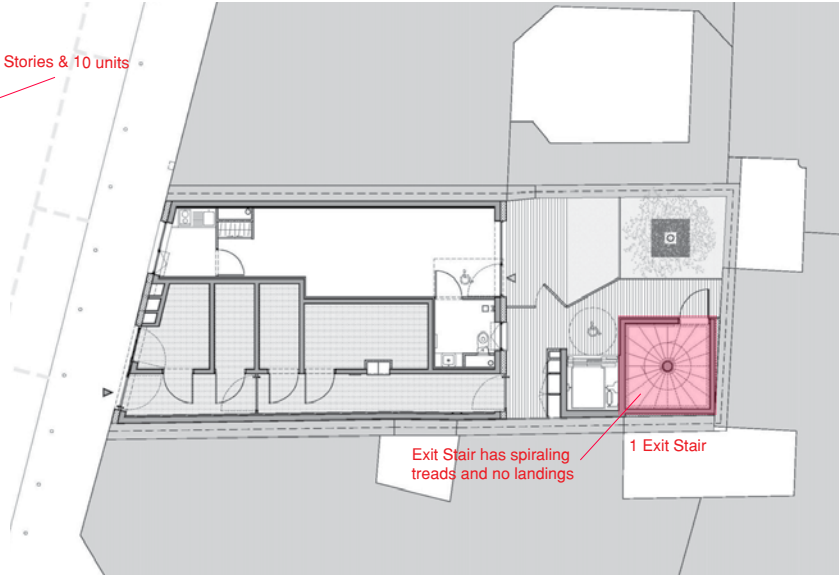


Figure 2.7.30: Example Diagrams of proposed building code recommendations



6 Stories & 10 units



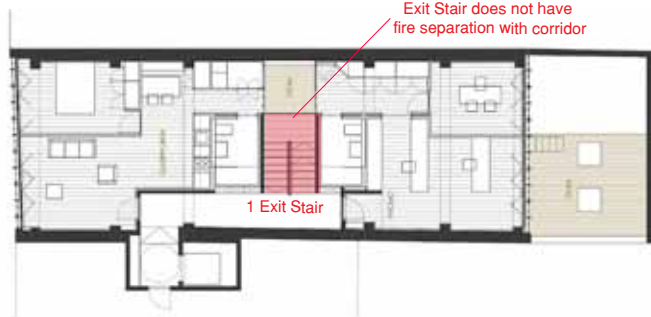
Exit Stair has spiraling treads and no landings

1 Exit Stair

Figure 2.7.31: Rue des Poissonniers Housing / MAAST. Paris, France



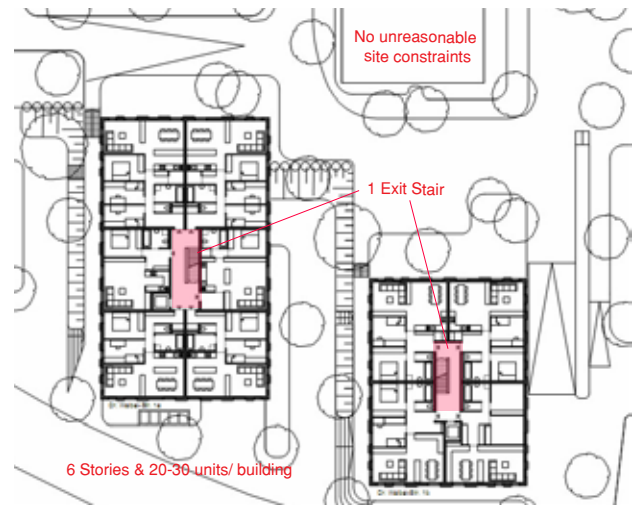
5 Stories & 9 units



Exit Stair does not have fire separation with corridor

1 Exit Stair

Figure 2.7.32: Rehabilitación de Inmueble en C\_Galera 43 / CREUSeCARRASCO. Spain.



No unreasonable site constraints

1 Exit Stair

6 Stories & 20-30 units/building

Figure 2.7.33: Wohnanlage Ulmer / Dietrich | Untertrifaller Architekten. Dornbirn, Austria.

# Unplanned Occupations & Demographics

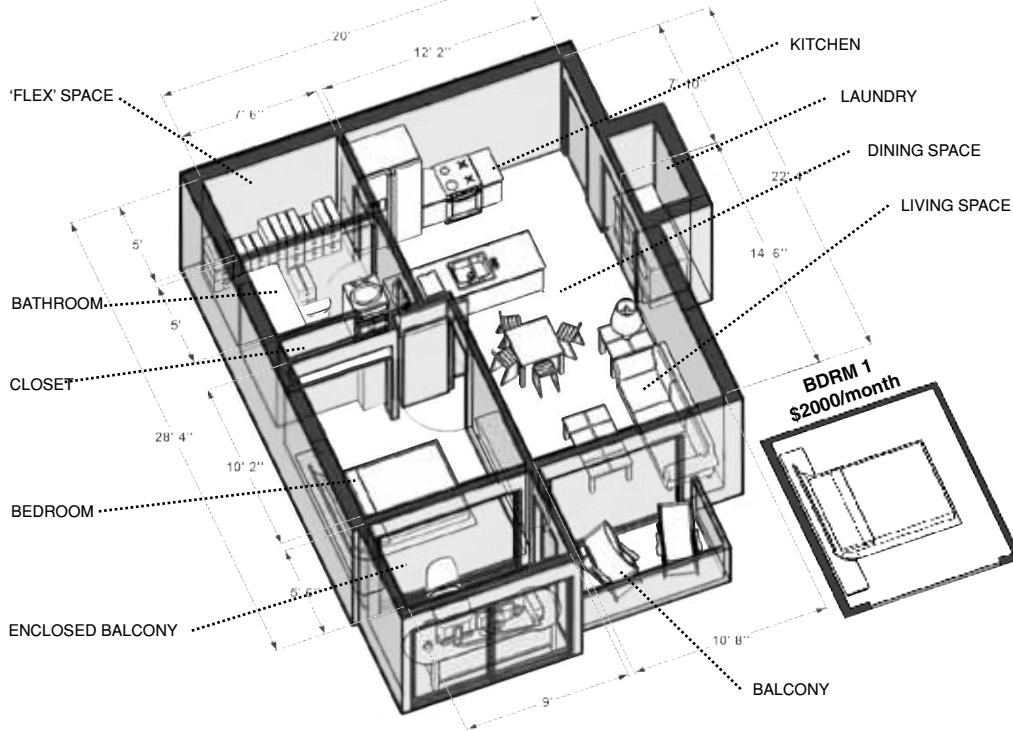
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Housing should not be oversimplified as just another commodity, because everyone requires a place to live, and people often spend a majority of their time at home, which makes housing one of the main factors in quality of life. Currently, housing market prices are commonly presented in media and economist reports along with financial analysis on stock markets and gold prices.<sup>84</sup> This perpetuates the notion of housing as another commodity to invest in, but unlike other products, there is a singular market with limited product selection that one has no choice to participate in. In reality, housing is recognized as a human right and must be given its own set of considerations to ensure dwelling accessibility to everyone. As long as the housing industries main sources of information are from reports commissioned by banks and real estate associations, and success is measured by price inflation, then the narrative delivered to the public, and therefore policy and development, will not stop delivering commodified housing.<sup>85</sup> Since housing considerations are ignoring other important metrics of the market such as living standards, access to employment and services, and affordability, Vancouverites have been adapting to unsanctioned dense forms of living or are moving away. Reconfigured dwellings and alternate occupation of spaces are spreading despite a stubbornly unadaptable housing stock which is pushing unofficial living standards lower due to the intense and formally unaddressed problem of affordability. Others are moving away, at the expense of job opportunities, connections to friends and family, access to services, and a change in lifestyle.

The housing crisis has resulted in an infringement of freedom of mobility and living arrangement choices, where the unresponsive housing stock is stopping residents from their right to participate in the city.<sup>86</sup> This raises the question: Who has the right to thrive in the city? The Canadian Charter of Rights and Freedoms protects one's right to live anywhere in Canada, but expensive dwellings are preventing many from dwelling within Vancouver.<sup>87</sup> A healthy urban environment thrives on social exchange, co-dependencies, efficiencies, and lively spaces. Philosopher Henri Lefebvre notes, the more the city thrives, the more its participants can participate in not just consumer purchasing power but in defining and altering both public places and private property.<sup>88</sup> Geographer David Harvey goes even further, stating that everyone should have the ability to transform and reshape the process of urbanization itself.<sup>89</sup> For these reasons, Vancouver cannot accept its increasing exclusiveness and displacement of low and middle classes. Eventually by these definitions, Vancouver will cease to be a city at all, and instead complete its progression to a resort for the global elite. Yet currently, investment remains the dominant force driving the production of dwelling design and residential urbanism.

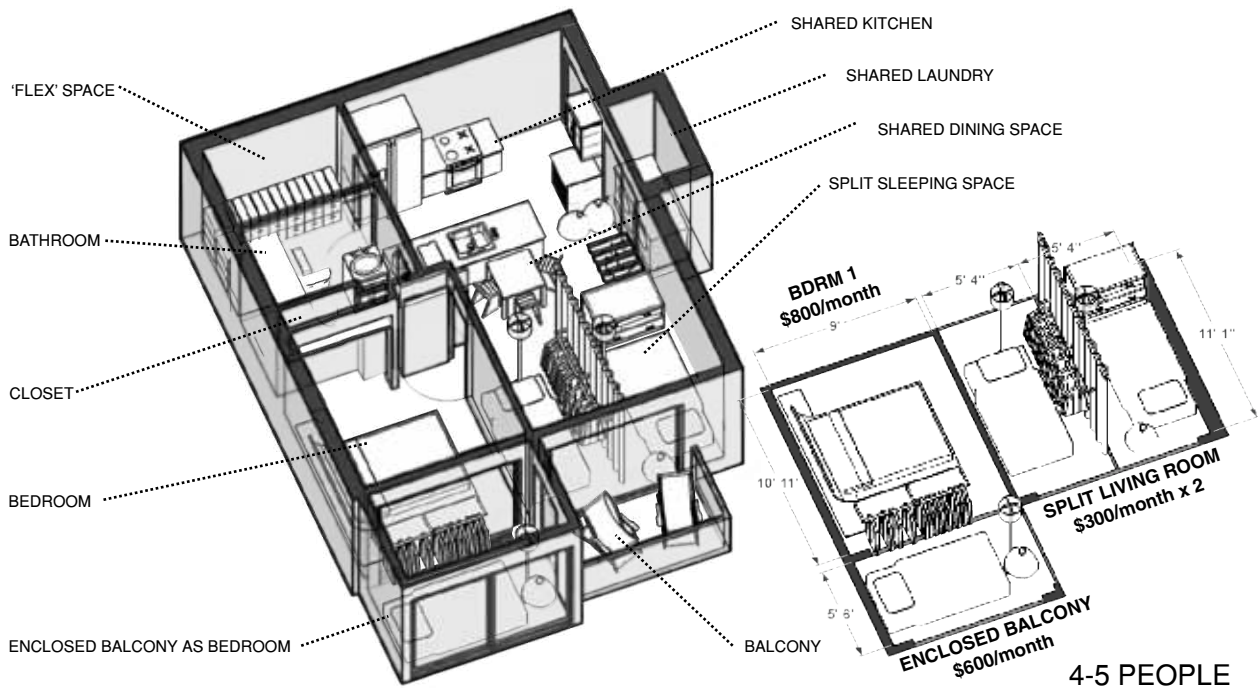
Vancouver architect Matthew Soules writes in an essay entitled "Financialization of Architecture" that the economic transformation that has occurred in the last few decades has led to what he defines as a "finance capitalism" system. This has created "impacts [on the] physical form and organisation of architectural space" which has become so "widespread and normalized [that it] remains beyond scrutiny."<sup>90</sup> Soules traces the finance capitalism effect to the "unique spatio-financial formations designed to maximize the investment asset function to the point of displacing architectures many other possibilities." Soules suggests that as a consequence, the actual purpose of inhabitation in this housing typology has become a secondary concern which is manifested in the struggle occupants have in using the dwellings provided, for the uses and density that they are designed for. Instead condominiums are built for the purpose of the finance capital system, by "heightening the investment asset function by increasing the liquidity of housing itself" through reducing obstacles to ownership, exchange, and security. The typology "strategically individualises and streamlines private financial interests" while creating arms reach governing styles to "collectivise operations and maintenance."<sup>91</sup> The advantage to ignoring the function of inhabitation is that "the more complicated aspects of physical context and lingering human proximities" are removed thereby simplifying, standardizing, and abstracting it as an investment product." The investment is "successfully removed from the unpredictability of public space and the potential nuisances and dangers of noise, pollution, and strangers." because "social contamination" is unpredictable and an investment risk. These social aspects and expression of personality are exchanged for the "value attributed to a view", which has been institutionalized at the urban planning level by city mandated view cones, to produce quantifiable, less risky attributes for the preservation of capital. Soules notes 100 years ago in New York, early

**TYPICAL 1-BDRM CONDO OCCUPANCY**



1-2 PEOPLE

**UNANTICIPATED 1-BDRM CONDO OCCUPANCY**



4-5 PEOPLE

Figure 2.8.1: Planned and unplanned occupancies of a typical existing condominium.

co-op buildings such as “the Chelsea” were valued for their collective spaces, such as the skylit central stair, social mixing chambers, and shared balconies between units. It is only now that individual isolation and maximising views appear as “self evident” luxuries. This example is a reminder that other forms of dwelling may be less investor centric but not necessarily produce less generous living arrangements and that human interaction can form a key strategy in creating affordability, as it is a risk to investment and benefit for an occupant.<sup>92</sup>

Another driver of unplanned occupation being ignored in the production of housing is the demographic shifts of recent decades. and unsuitable housing stock is the large demographic shifts that have occurred in recent decades. The National Post reports, “More Canadians living alone than ever before as family life undergoes seismic shift: census”. This has been caused by an increase in older Canadians, and younger peoples opting to marry later in and life and more often, not at all.<sup>93</sup> This has resulted in one person households representing 28.2% of living conditions in the country in 2016. This the highest recorded percentage for this one person households and the first time it has become the most common living arrangement in Canada.<sup>94</sup> In general,

## Advertisements for Unplanned Occupations

**“Your living area is outlined in red an you can put up dividers for privacy”**

Figure 2.8.2: UBC Roommate Group. Facebook. September 2017.



The floor plan is designed poorly to allow occupants to add an extra bedroom, making unplanned occupancy even less accommodating.

Enclosed Balcony footprint is the size of a double bed and has poor climatic control. The glazing makes the room hot and bright to sleep while at night the room does not retain heat.

**“\$625 – Living room now converted into bedroom”**

Figure 2.8.3: Craigslist. January 2018.



**“\$1000 – Room for Rent”**

Figure 2.8.4: UBC Roommate Group. Facebook. December 2017.





the 2016 census shows a continued trend away from the nuclear family to older couples, younger families delaying having children and having less children, an increase in single parents, and non traditional family relationships such as multi-generational households and same sex couples starting families.<sup>95</sup> Despite these changes, housing has foregone risky experimenting and instead continued producing established nuclear family housing models, pointing to market research and successful sales. However, as there is no option but to continue to buy and rent these units, and the public has not been exposed to a variety living arrangements, this typology will continue to dominate as a safe investment and poorly suit the needs of its occupants.<sup>96</sup>

The disconnect between dwelling and occupants is evident in the most underserved segment of the population, the entrant younger generation, as entry priced housing continues to diminish. While many older groups compare the housing market struggle of this generation to their own housing crisis decades ago, inflation corrected housing prices show the peak housing prices in the 1990's were almost half the price as a dwelling today, indicating unaffordability that has never been experienced before.<sup>97</sup> The unsuitable dwellings being constructed has led to major demographic shifts for millenials. The 2016 census show Canada wide

**“Converting common area into a third bedroom.”**

Figure 2.8.5: UBC Roommate Exchange. Facebook. August 2017.



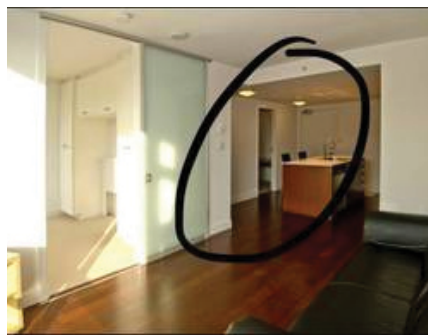
**“\$750 – Brand new den in Westbrook Village”**

Figure 2.8.6: UBC Roommates Group. Facebook. February 2018.



**“\$850 – Spacious Den in Yaletown Condo”**

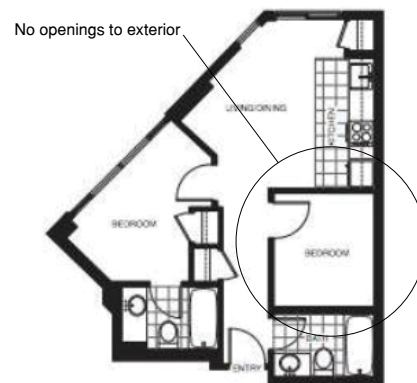
Figure 2.8.7: Padmapper. January 2018.



Upon Conversion, other occupants will have to walk through the new bedroom to reach their bedrooms, balcony, and kitchen

**“\$1200 – Room in 2 Bedroom 2 Bathroom”**

Figure 2.8.8: Padmapper. February 2018.



Den with footprint slightly larger than a single bed and no window

increases in 18-34 year olds living with their parents, which represent 14%, and 50% who remain renting. When asked about their living arrangements, a majority responded that if housing was more affordable, they would not be in the living situation they currently reside in.<sup>98</sup> In Metro Vancouver 17.5% of 25-39 year olds are still living at home compared to 16.3% in 2011. The study recognizes cultural factors playing a role, but responses indicate an estimated 40,000 would leave their parents if they felt they could afford to do so. An increasing number of people are being affected, with 50% of Vancouverites planning to move for affordability reasons and an additional 38% reporting they know someone who has had to move in the past due to affordability.<sup>99</sup>

The Vancouver foundation also found a direct link to affordable housing and happiness in their 2018 connect and engage report as a consequence of unsuitable dwelling production. A reported 14% of residents described themselves as lonely, which increases to 30% of those between 18 and 24, and 38% of those earning under \$20,000, drawing a correlation between participation in social relationships with excess time and money. Many attribute the trend to housing affordability because high dwelling costs are putting pressure of individuals to make more income which reduces free time and because low income earners are being displaced which is severing people from their social supports.<sup>100</sup> Gentrification is not just about progress and investment, but about building systematically for those who are not being displaced.

Despite changing demographics, and therefore housing needs, zoning is still encouraging development of mansions while prohibiting multi-unit dwellings in established residential neighbourhoods which is decreasing smaller dwellings while increasing luxury properties that do not serve the population. Urban design publication City Lab asks in an article entitled "McMansions are losing their shine", "Who will buy the boomers homes"?<sup>101</sup> According to city records, 63% of demolitions in the city between 2010 and 2015 were houses built in the 1920's-1940's, with houses replacing them being 57-94% larger.<sup>102</sup> Jake Fry, a Vancouver housing advocate notes "never before has there been such an imbalance between top and bottom ends of the market in terms of space and affordability" resulting in an "increasingly unequal city".<sup>103</sup> This is going on as the millennial is "forgoing the American dream for the freedom to explore and love what you do, not believing more is better." The younger generation are pushing alternative living models to the nuclear family and large house, showing an acceptance to entry level housing in new forms such as in tiny houses, vans, and cooperative living to circumnavigate the housing crisis.<sup>104</sup> However city planners are not allowing these more modest forms of living due to antiquated living standard ideologies and the housing market system relying on investment centric developers are not set up to produce them. Therefore, people are informally resisting through unplanned occupancy, but are limited in the quality of altered spaces they can achieve due to a lack of design flexibility which are only endured because prices leave them with no other choice.

Although smaller dwelling spaces and communal living are gaining popularity, simply dividing existing dwelling spaces that are not designed for alteration is creating horrible living conditions for the 14% of Vancouverites reported as living in overcrowded homes. Unit prices are rising, but areas are shrinking by hundreds of feet. Within these already smaller units, new dwelling patterns created by occupants have emerged to repurpose existing units to suit their affordability needs at the expense of privacy, climate, light, sound disturbance, and common areas such as work and gathering spaces.<sup>105</sup>

In condominium units, advertisements commonly offer unanticipated spaces as bedrooms. A 1 bedroom condominium is often split up to provide housing for 3-5 people. Flex spaces, which are typically the size of a single to double bed with no window, enclosed balconies of the same size with poor climate conditions, and open living rooms partitioned with cardboard, furniture, or curtains are converted to bedrooms. Houses are repurposed for unanticipated densified dwelling as well. Many houses are split into two or more suites containing a bathroom and kitchen each, and shoehorn rooms of varying qualities into previous basement and living spaces to make the dwelling affordable. By enforcing standards that ignore affordability, inefficient units are not maintaining living quality and actually subjecting people to worse conditions. By not designing for flexible or affordable occupancy, we are failing a growing segment of the population.

There are no middle choices between these rooming situations and a full fledged private apartment. If one overcomes the lack of vacancy, prices are often double or triple from around \$600 for the worst rooms like a partitioned living space to \$1800 for the smallest cheapest studio.<sup>106</sup> The lack of recognition for changing living norms must change so that ways to leverage small living footprints and unit configurations are holistically reexamined. Since repurposing of existing units have been shown to be difficult and produce poor living conditions, and the massings of houses are of low density and inefficiently use lot space, land values demand complete redevelopment of properties to achieve affordability. This way space can be organized to produce an improved quality for the required new types of dwelling that informal changes in occupation and renovation cannot achieve.



Figure 2.8.9: Exterior Stairs for upper unit entry.



Figure 2.8.10: Concrete stairwells to access new basement units from exterior.

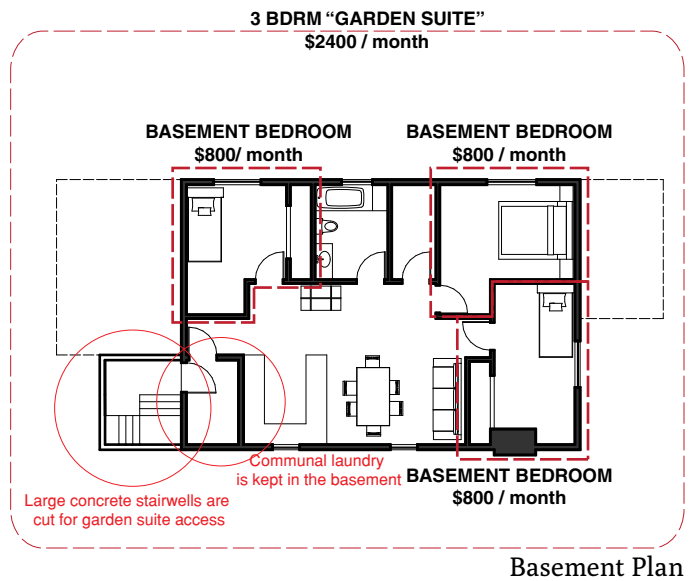
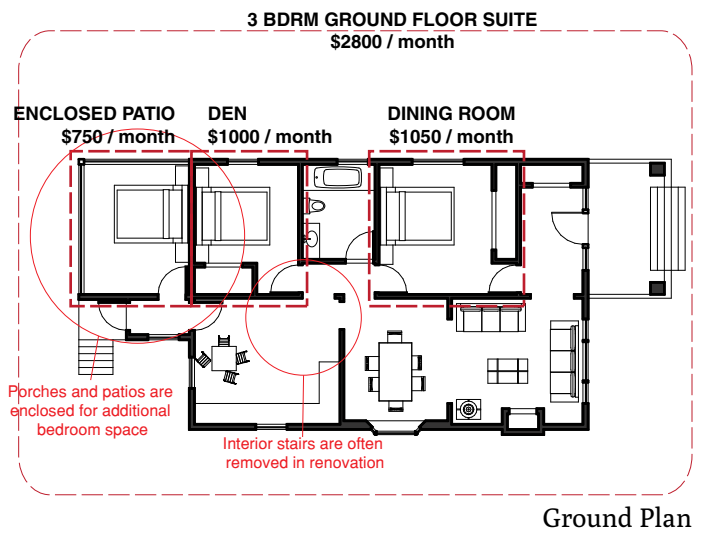
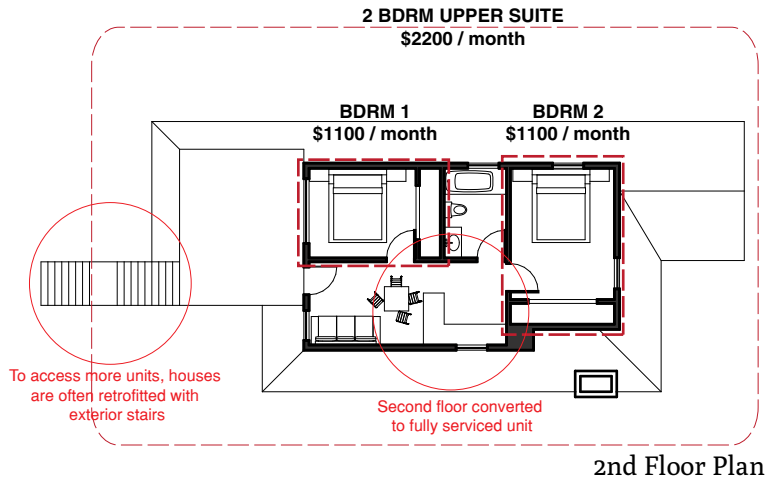


Figure 2.8.11: Unplanned occupancy of a typical multi-unit renovation of an existing detached house.

# Exodus of Human Capital

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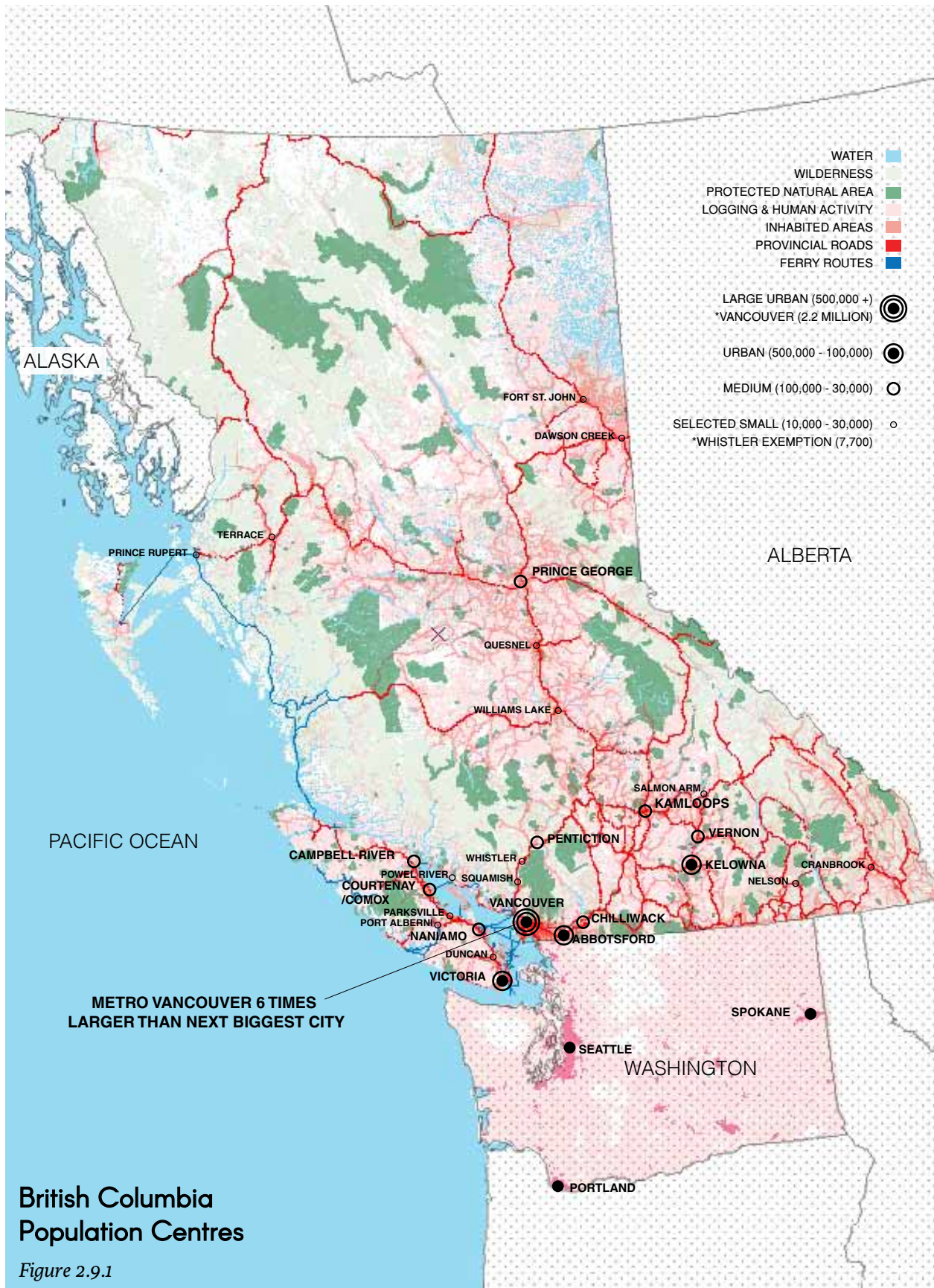
Considering British Columbia as a whole, it is clear that Vancouver provides a unique lifestyle in the province unreplicated anywhere else. There are no other metro areas in BC which are even one sixth the size of Vancouver (2.46 million for Vancouver compared to the second biggest, Victoria at 367,770)<sup>107</sup> and cannot offer the same lifestyle of a modern urban city. Job prospects are considerably lower as well, with Metro Vancouver taking the lion's share of the province's GDP.<sup>108</sup> The number one destination for those leaving is Toronto because those leaving are still looking for urban vibrancy, but Toronto is also suffering its own less severe affordable housing crisis. For those seeking a modern urban life, the options are severely restricted and instead of moving, often turn to living in increasingly substandard conditions.

Vancouver is beginning to experience changes due to the prolonged housing prices, and further consequences are predicted in the long term. As of now, low wage workers in all fields are enduring large regional commutes and are finding fewer places to live despite growing demand for their services. The most obvious effects thus far have been the proliferation of help wanted signs dotting storefronts and the limiting of restaurant hours to deal with labour shortages.<sup>109</sup> "Employers struggle to fill food service, entry level jobs" resulting in "less open hours, suspension of services due to staff shortages".<sup>110</sup> This has added an additional strain to small business, which are already struggling to cope with increased land values. The long term effects of "globalized investment replacing people" are the demise of the lower income working and creative classes.

The article "If people can't afford to work in Vancouver what happens to the city?" suggests that in the long term, Vancouver risks displacing the working class altogether, completing its transformation into a global playground for the wealthy.<sup>111</sup> The essay "Land of destiny" suggests Vancouver is headed toward a conflict between the "owns and own nots" if investment activity continues to dominate the housing market.<sup>112</sup> Globalized wealth already sees Vancouver as a "global resort city", in an article titled "the rising price of heaven" interviewed wealthy immigrants note "developers have rushed to set up offices in Shanghai and Beijing".<sup>113</sup> Recently, an investigation by the Canadian media revealed a Vancouver developer caught in Hong Kong "boasting of pricing ordinary Canadians out of the housing market" at a condo pre sales event, weeks before units were made available to locals.

Generators of culture integral to the organization of dynamic public life are leaving the city due to housing costs too, because they cannot afford the space or time to create. Globally, London, UK, is dealing with the same issue at an accelerated pace since there are other well connected urban centres in England for the creative and low-income groups to find refuge. Studies by academic groups warn "People are moving away from London due in part to its cultural stasis. Other cities will go down the same road unless they invest in people, not property." They report that the millennial generation are largely "Tired of the hustle to find living arrangements the city" and as a result London is experiencing a "hollowing out of social and cultural vibrancy of the city." Low cost housing also gives residents the ability to work less, giving them time to pursue interests and ideas that lead to art projects that contribute to the vibrancy of the city. "Cheap living spaces enable time commitment to unremunerated cultural activity, and low cost space for such activities."<sup>114</sup>

In conclusion, to reverse these negative city transformations, and improve living conditions the housing market must respond to the diversity of needs and desires of the population. Dwellings must be flexible in their occupations and varied in their typologies to recognize everyone's right to exist and participate in Vancouver. If a building can be a "spatio-financial formation" as the result of a "finance capital system" which Matthew Soules believes,<sup>115</sup> than a building type built to provide affordable housing through spatial formations that resists investment through increasing capital exposure to human participation risks should inversely transform the finance capital system to one of human capital.



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## Part 3 | Insurgency

Part 3: Insurgency proposes an urban development framework and architectural manifestation that reflects urban contextual realities and emerging public preferences. The goal is to propose an incremental, reactive, and sustainable framework for building affordable housing that will insert itself into the city and economic system with minimal expectations of government funding or regulatory intervention in rewriting market rules. Through creating an accessible framework for affordable housing that balances public interest and profitability to attract private capital, the framework can undermine the expected result of the current market system and create a domestic insurgency to perpetuate a shift of the entire market back to better degree of affordability.

# Housing Framework Summary

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## Summary

To respond to the challenges of the housing crisis the housing framework proposes new typologies that size dwelling space to reflect an affordable distribution of property value while respecting the limits of transforming established neighbourhoods. This means the housing framework achieves initial affordability through adjusting to market forces so that it is a profitable strategy for the private sector, avoiding government subsidization. The proposal balances incentivizing construction by private investment with building for diverse incomes, lifestyles, living arrangements, and social relationships. The framework targets affordability for the median incomes of the city, specifically groups who did not benefit from the recent property price increases that are most exposed to property inflation such as younger generations, migrants, and renters, and also for those who desire to access their property wealth without leaving the city such as for seniors downsizing or those seeking alternative lifestyles. The framework does not intend to completely replace the need for government funded affordable housing, but limits their required scope to focus on the smaller traditional segment of the population that are inhibited from functioning in society by mental health or opioid epidemic. However, for the majority of the 50% of Vancouver's population spending more than 30% of their income on dwelling, the framework will provide alternative affordable living arrangements to suit a variety of their needs.

## Territory of Insurgency

The City of Vancouver is specifically chosen as the framework's focus since it is the central hub of transportation, culture, and economic activity in the metropolitan area. It has the most services and transportation alternatives to take advantage of and commuters to the city centre can avoid metropolitan infrastructure choke points at regional bridges and tunnels. Land value and therefore demand are highest here, so developing in the city has the most impact where it is needed the most. Specifically, typical lots in low density neighbourhoods are targeted, which are lots 33' wide by 120' deep with laneway in the rear, representing 75% of current detached house lots in Vancouver. (This number includes lots that are 55' wide, but 33' is chosen for design purposes because the space constraints present a more challenging, and therefore more sceptical problem, and it is expected strategies for 33' wide lots would be more easily applied to 55' wide lots than vice versa.) Densification is to be conducted dynamically, requiring a living zoning code where the state of development of neighbouring lots informs the allowable density of each lot. To adapt to established conditions, development is regulated to single lot schemes, and four to six storey mid rise apartments with the goal of harmonious coexistence of houses and apartments that together improve quality of life and carry similar neighbourhood character. This standardization makes the framework applicable to the most amount of land in the city, so that a generous amount of land can oversupply demand sustainably, repermitting market dynamics to takeover the role of setting housing capacity.

## Typologies

The framework must also recognize the diversification of households and individual dwelling from the traditional nuclear family, and leverage alternative relationship combinations between inhabitants to create different sizes and gradients of private and communal dwelling areas to optimize space within new typologies so as to create the most inexpensive dwelling possible without sacrificing dwelling quality. Due to the variety of required autonomy, community interaction, and household sizes, 5 typologies are created (with two variants each of varying density to respond to neighbouring context) which mirror the existing dwelling demands of micro units, studio, 1 bedroom, 2 bedrooms, and 3 bedrooms. All represent examples of single lot development capable of producing affordable units on a gradient of households and co-living so as to include as many preferences as possible within the framework.



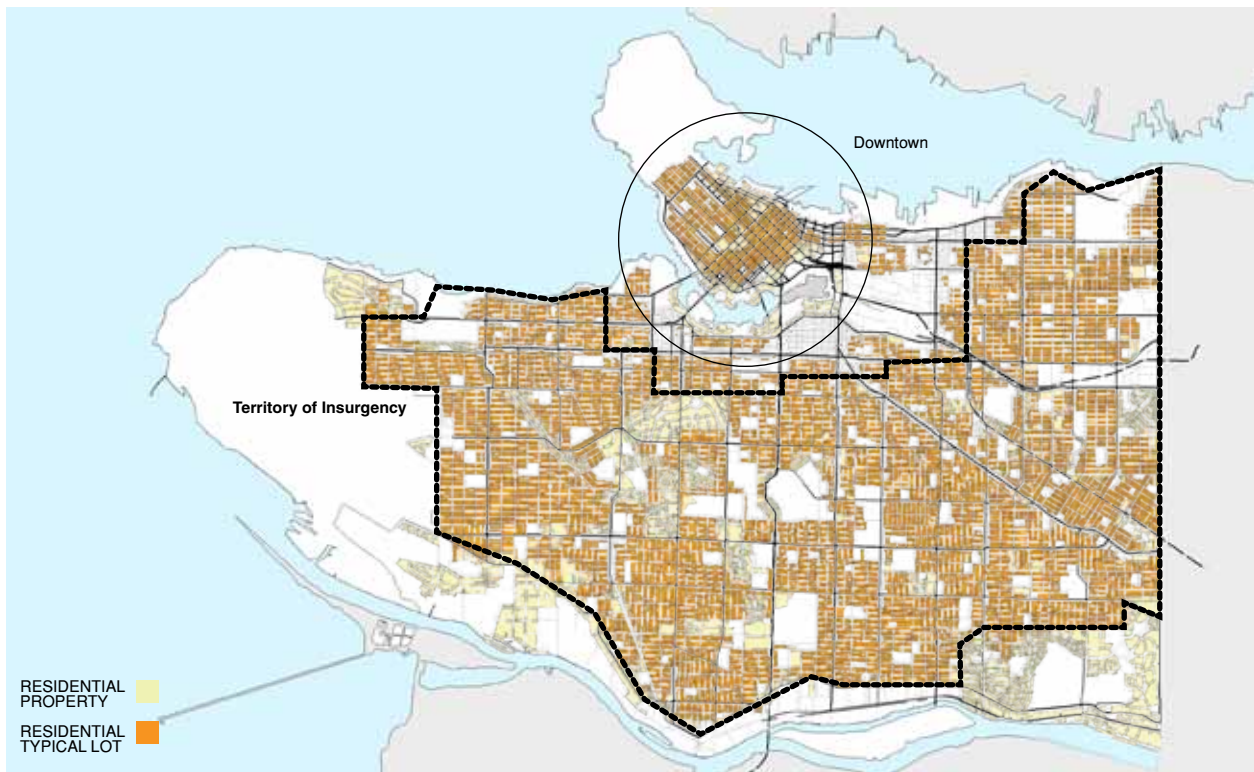


Figure 3.1.1: Map of Territory of Insurgency



Figure 3.1.2: Typologies within existing neighbourhood

# Seminal Principles

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To adapt dwellings to the new realities of Vancouver land prices and availability, affordable housing needs to adapt three key principles in order to be a viable typology for the private market. To respond to the need to support growth by densification instead of sprawl, the framework must be attentive to needs of the established neighbourhoods it is being developed within. To respond to dwelling sizes that must be smaller to accurately reflect land value, and to adapt investor resistant living arrangements, dwelling design must have a heightened focus on creating multi-use spaces and develop opportunities for co-living to be as efficient as possible in space allocation.

## 1. Neighbourhood Specific Design

The World Resources Institute, in their study on the global housing crisis recommends three pillars to improving urban planning to deliver affordable housing which guide the framework towards the proposed City of Vancouver territory. They suggest “repurposing existing infrastructure”, tenancy appropriate for existing residents to avoid displacement, and “acknowledging the urban centre as irreplaceable for its employment and social supports”.<sup>1</sup>

To densify established neighbourhoods in Vancouver, the design must:

- a) Work with existing property and infrastructure so that new development can be inserted without displacing or distorting existing systems so that established development remains viable and development costs are effective.
- b) Occur at a similar scale to existing massing and property so that new development may integrate and coexist with the existing neighbourhood during transition to higher density.
- c) Be predictable so that existing residents can plan for change and existing houses can remain desirable.
- d) Provide guarantees that new dwellings will function and be priced accessibly to existing residents thereby providing benefit for existing residents through housing stock upgrades.
- e) Foster community and have a governance structure where residents are clearly in control of their building so that traditional neighbourly negotiation and involvement acknowledges existing residents and fosters relationships with new occupants.
- f) Provide public amenity in a variety of forms to display tangible improvement of neighbourhood quality of life so that development has more positive qualities than simply increasing the tax base.
- g) Actively work to eliminate identified problems such as privacy invasion and shading through adaptable contextual sensitive massing and by preventing parking shortages and traffic increases through encouraging alternative transportation methods.

## 2. Architectural Flexibility

“economic development comes from enabling local communities to solve their own problems”.<sup>2</sup> -Jane Jacobs

Flexibility allows the architecture to account for unanticipated needs, changing circumstances and additional levels of control for the occupant. Flexibility is best when it is planned for at varying scales and timeframes. Flexibility is a failsafe to failed public consultation. When plans are being made architectural representations can be misunderstood, and public ambitions may not grasp the mission or constraints

of a project. However by planning for active takeover of space by the community, physical space can be tangibly altered and experimented with. Flexibility makes limited space more useful and efficient, so that total space can be reduced with less effect on occupants.

Flexibility can be achieved through:

a) Unit fit out. By leaving units in varying states of completion, occupants can customize and finish their units to their own layouts and price points. Gradual improvements can make purchasing easier and make mortgage payments smaller, giving the inhabitant more control over their finances.

b) Threshold design. Thresholds that can be interacted with to create varying degrees of openness and isolation can instantly change a dwelling from isolated retreat to social space, dependent on the occupants desired activity or mood and maintains one's ability to control their home even in a communal setting.

c) Variable unit layouts. Affordability and demographic composition change over time. By clustering private units, strategically placing communal spaces and access paths, and using simple wood frame construction methods, units may be able to combine and split up long term to reflect the realities of the housing market in the future.

d) Suggestive communal spaces. Communal spaces should be designed to adapt to multiple outcomes by providing an envelope to accept multiple layouts and services such as additional kitchen space while leaving large spaces as open as possible.

e) Plan for changes of use. Amenity should be determined and adapted to resident needs and interest. Instead of designing a specific feature, space should be provided for multiple outcomes such as workshops able to respond to different interest groups, amenity being able to expand into residential space, and rooftops able to receive various types of gardens or recreational terraces.

### **3. Embrace Sharing / Co-living**

In the past, the shrinking of units was achieved by private dwelling optimization to provide improved affordability. This was done via decreasing room dimensions, eliminating corridors and idle space, and reconfiguring the floor plan to combine uses such as kitchens, living and dining spaces. Innovation was limited to the interior arrangement of the private dwelling.<sup>3</sup> However, further shrinkage is increasingly intolerable as these spaces reach their minimum limits that make quality inhabitation possible and therefore new methods of space efficiency must be developed to accommodate smaller dwelling sizes demanded by property values.

Co-living breaks down the outer boundaries of the private unit, and expands living space to span across both private and communal zones so that shared space may increase living space for every individual without requiring more area. It embraces its urban and dense condition by embracing one's neighbours. Rather than design to remove interaction as a method to avoid conflict, co-living accepts a degree of risk for friction to develop, but mitigates conflict through promoting mutually beneficial relationships, creating coexistence that goes beyond empathy and tolerance of other individuals as a consequence of affordability. To weigh against the potential negatives of co-living, including disturbance, less privacy, and the need to negotiate in living spaces, co-dependent relationships must be fostered through spaces designed for everyday use to allow the informal exchange of actions and resources such as child care, cooking, media subscriptions, and specialized skill to exploit that strengths of each other that create tangible benefits.<sup>4</sup>

# Co-living Precedents

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Co-living can produce numerous benefits when its challenges are predicted and prepared for. The how-to book “Sharing is Good” explains its positive impact on community involvement, accountability, innovation, and entrepreneurship. Sharing can benefit larger proportions of the population as costs are less prohibitive when groups invest in things together. Sharing reduces waste and energy consumption improving sustainability by consuming less, helping each other with personal skills, and generally encourages purchasing higher quality items for long term use.<sup>4</sup> In addition, sharing is people centred rather than investment centred which makes co-living more impervious to speculative capital.<sup>5</sup>

Co-living is not for everyone, and this strategy should be understood as complementary to better meet the needs of some of the population and certain periods in an individual’s life. Sharers must be “ready for adventure, have heightened empathy or ability to place oneself as the other, and must break down mental barriers making us fear strangers”.<sup>6</sup> Co-living arrangements are difficult to formally create due to CMHC standards and city bylaws that define occupancy standards, define households, and limit dwelling types.<sup>7</sup> However, Vancouverites are familiar with informal co-living arrangements that have thrived during the housing crisis such as room-shares, house ownership splitting, and secondary suites at the initiative of homeowners, friends, and families.

The proposed framework is actually an intermediate step between completely isolated private dwelling, and room share that depends on communal facilities. The proposal creates a balance of individual autonomy over one’s bathroom, kitchen, bedroom, and small living spaces, while expanding inherently social living spaces into the communal realm. This addresses two often opposing components of the home. Oxford dictionary defines the home “where one lives permanently, especially as a member of a family or household”.<sup>8</sup> This expresses both a physical place and social construct. Canadian architect Witold Rybczyński writes in his book “The most beautiful House in the World” that a home is more than the sum of domestic spaces, but a vessel to create and capture memories.<sup>9</sup> The home must be a retreat where one can recharge from society and be oneself.

In the 1960’s the soviets experimented with communist housing typologies that abandoned the idea of retreat which utterly failed to provide quality of life. In an effort to progress communist ideals, workers and their families were placed in apartment buildings designed solely for communal living. Families were given tiny, fairly open private units for sleeping along large open corridors that lead to large communal cooking, dining and social spaces.<sup>10</sup> However the combination of the eradication of privacy and mistrust of cohabitators dissenting against the system meant inhabitants quickly abandoned the building when able to do so. There was no attempt to manage a relationship of communal space and private retreat because the communist ideology was attempting to remove privacy altogether.<sup>11</sup> To be successful, coliving must respect the essence of home, a place of personal retreat and memories, and pre-existing household dynamics alongside communal aspects.

Throughout modern times, architects have been trying to reconcile mass housing and the preservation of individual autonomy and community which form the basis of domestic qualities we connect the idea of home to.<sup>12</sup> Ideas about actively involving community and individual expression in new mass housing models began modestly before the wars in projects such as Spangen Rotterdam in 1920, which was configured around “The street in the air” which creates landings for all dwellings to affect their surroundings and display their identity, while the building strategically places the main communal building centrally and monumentally in the centre of a courtyard in which all dwellings face.<sup>13</sup> Concurrently, small often rebellious groups tested out affordable and efficient ways of living communally, but never gained widespread success beyond the co-op model of dwelling ownership, which is in its current form just an alternative way to share a traditional private dwelling within communal infrastructure.



Figure 3.3.1: Spangen. Rotterdam. 1920.

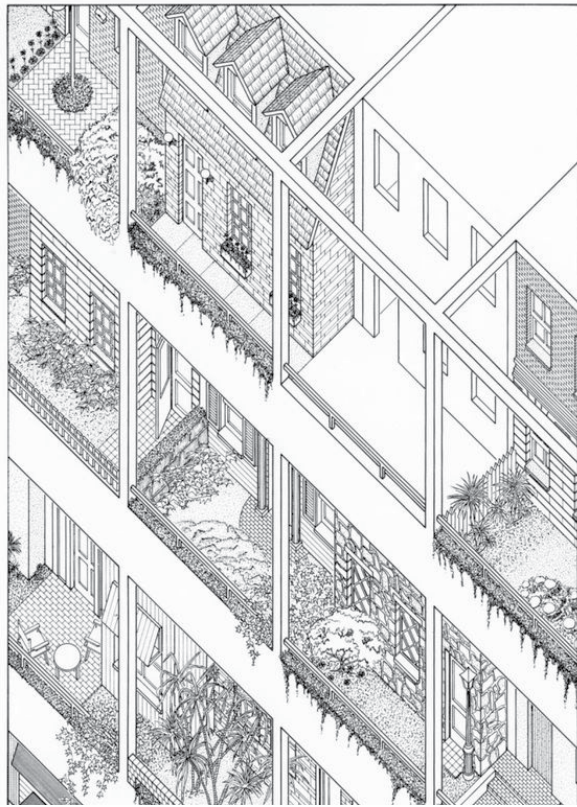


Figure 3.3.2: James Wines. *High Rise of Homes*. 1981



Figure 3.3.3: Smithsons. *Golden Lane*. London. 1952.

After the second world war there was an urgent need for mass housing and the international architecture council CIAM set forth to experiment with large dwelling projects. The idea of the dwelling cluster comes from TEAM X, the successor of CIAM. As CIAM was replaced by TEAM X, work was organized from a technician point of view, but focused on persisting challenges of dwelling dealing with what they coined social fragmentation.<sup>14</sup> Useful building framework ideas were developed. The Smithsons developed the term “cluster” in their search for forms of housing association.<sup>15</sup> Their view was a cluster should be at multiple scales creating a hierarchy of communities of increasing familiarity and negotiation, conceived of as a working system rather than an “aggregate of machines to inhabit”.<sup>16</sup> Le Corbusier developed the term “stem” in which a street like interior is suspended within a building in an attempt to bring the city closer to dwellings of increasingly large and detached multi-unit buildings.<sup>17</sup> Candallis and Woods term “the web” concept in which an infrastructure of the collective is seen as separate and flexible in order to reconcile unstructured installation of individual private dwellings.<sup>18</sup> The housing framework follows the ethos of these building fragments, collecting private dwellings into cluster units to extend living spaces into a semi public realm. Access is open to communal spaces like porches on a street and the building shell acts as a web of infrastructure to support autonomous dwellings within it.

Prompted by housing crisis around the world, and a shifting of society from consumerist to searching for new experiences, there are a number of contemporary co-living precedents that provide valuable strategies in pursuing collective buildings. Songpa, located in Seoul, South Korea, creates a cluster of micro dwellings embedded in communal living space. The project exemplifies how tiny space can have a relationship to collective space, the importance of both spaces to have positive environmental qualities (external walls for light and air), building for different types of people, the importance of flexible but anticipated communal programming at ground and the use of a small urban site.<sup>19</sup> R-50, located in Berlin, Germany, is an example of how a group of 19 families with a common goal can finance their own high density collective housing on an urban site. Small design changes that incorporate shared balconies and communal building living spaces can have a large impact of community.<sup>20</sup>

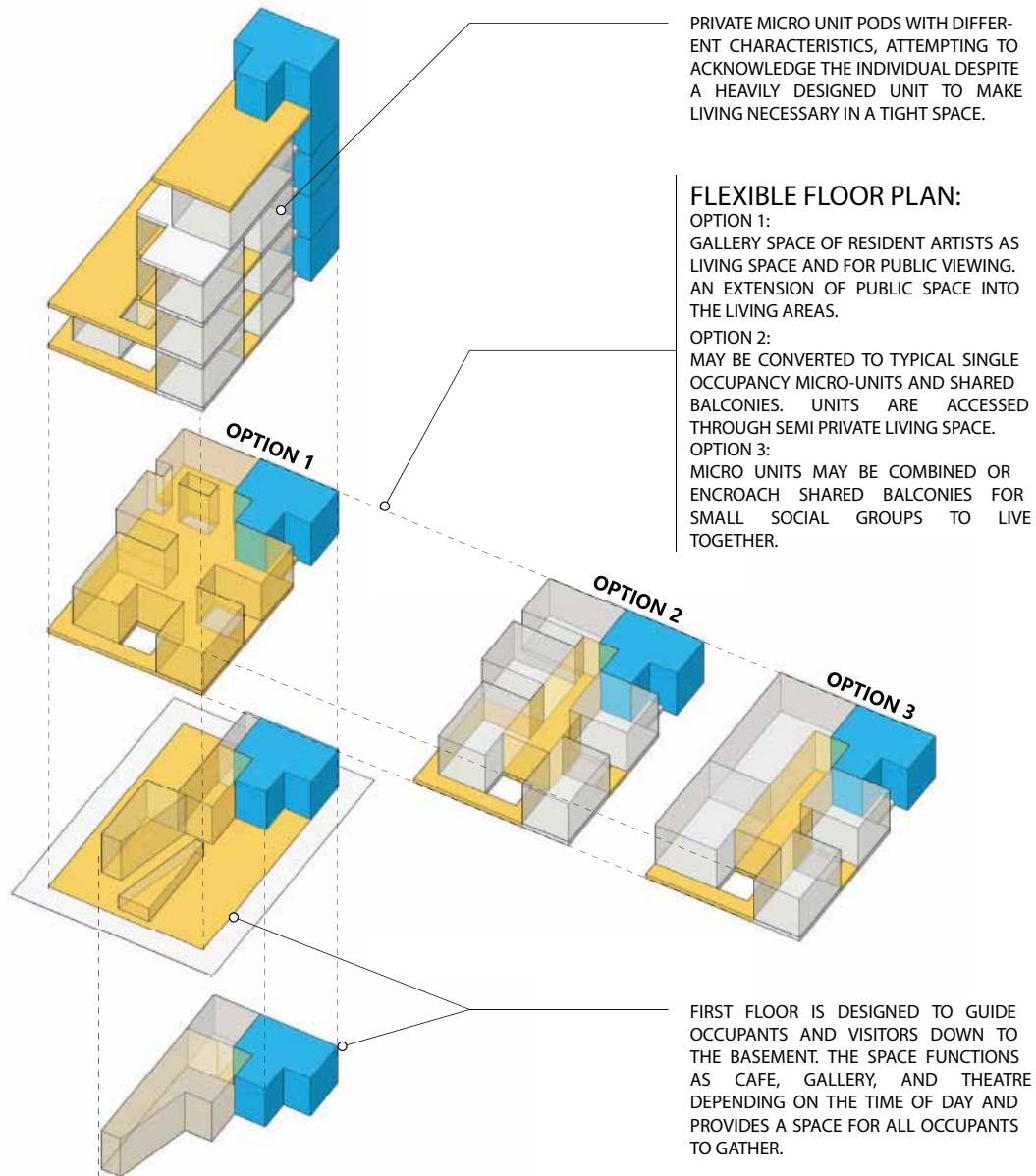


Figure 3.3.4: SsD. Songpa Micro Housing. Seoul, South Korea.

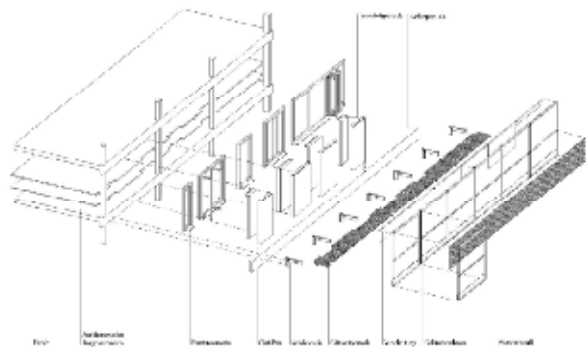
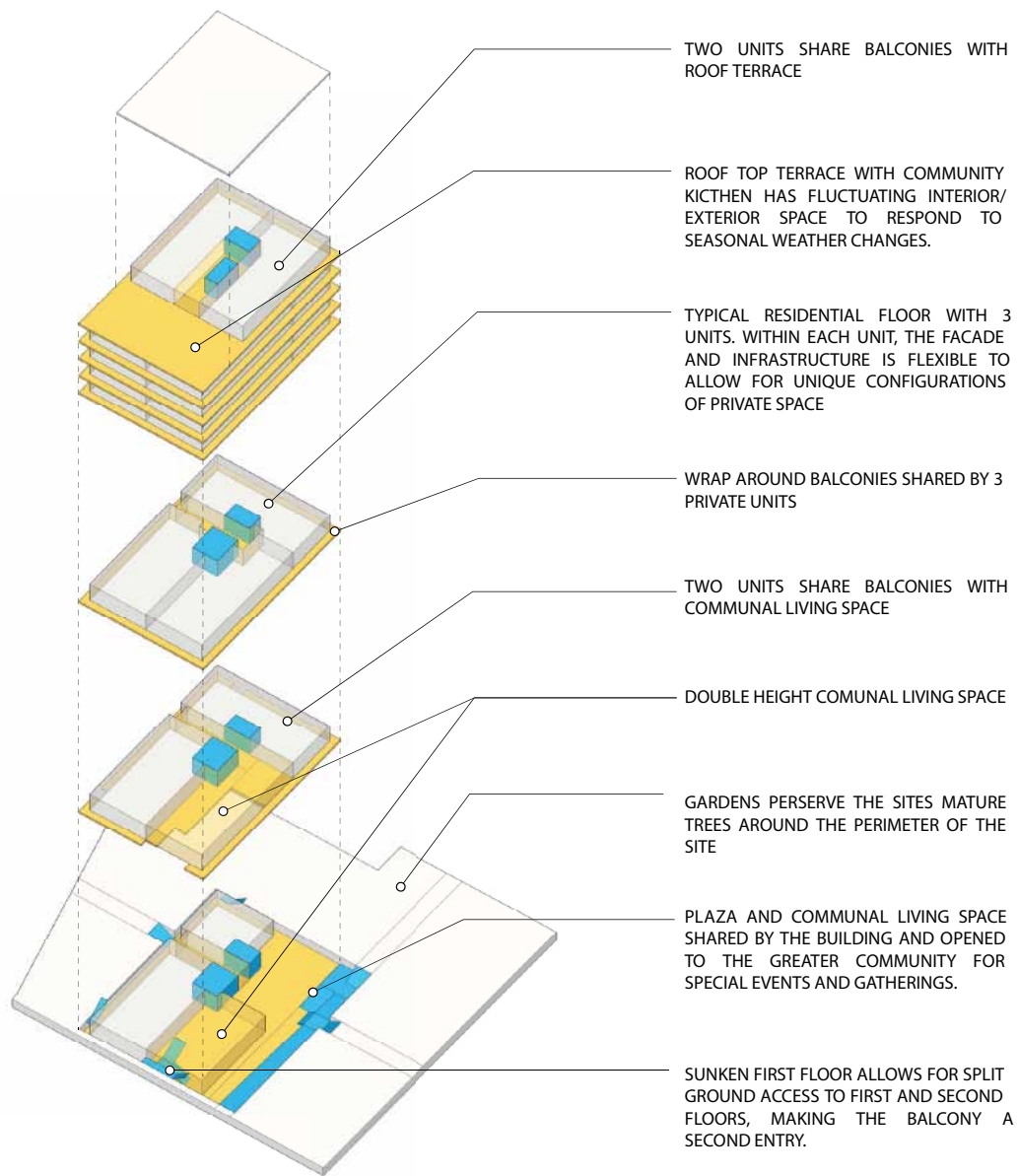


Figure 3.3.5: ifau und Jesko Fezer + HEIDE & VON BECKERATH. R-50 Co-Housing. Berlin, Germany.

The architectural collaborative book, “Together, The new architecture of the collective.” promotes co-living as a solution to both the changing financial and spatial realities of the city, and to reflect the growing cohort living outside of the traditional nuclear household model. “Living space is a scarce resource in the twenty first century - this has become increasingly clear over the past decade. More and more people are living in cities, yet urban living space is limited and property speculation has made it unaffordable for many”.<sup>21</sup> The “Growing trend for one and two person households in many Western industrialized countries is likewise increasing the need for housing.”<sup>22</sup> There are increasing circumstances where people find themselves socially isolated and many people are looking for alternative ways to satisfy their need to belong beyond the family unit though community experience and alternative ways to affordably dwell. Co-living is only natural as growth refocuses of urban places as the city is a hub for collectivity “Throughout the world we are experiencing a renaissance of the city and collective urban life”. “City life is being reorganized into new collective forms of work and consumption.”<sup>23</sup>

Co-living provides opportunity to improve affordability because inclusivity balances gentrification with investment. “City administrations were far too passive in allowing the market to steer urban development, the crucial thing today is to put the utility value of urban space for society as a whole at the centre of deliberations about the further development of our cities, rather than optimize the value of such space as a private exchange commodity.” “The market all too often continues to replicate old typologies that largely ignore actual needs”<sup>24</sup> This marks an opportunity for a disruption in the housing market, but also to reimagine the spaces inbetween that make up the surrounding urban realm to expand living into the public spaces to encourage vibrant community life. “For cities to change for the better - the basic social and architectural principles informing these pioneers must become the yardstick for urban planners.”<sup>25</sup>

These ideals are present in two case studies in “Together”. At the Yokohama Apartment, in Japan, residents are given ample semi public space, in the form of access ways that residents lives and belongings spill into. A large central covered courtyard is entry and communal gathering space with each room above fully equipped with a bathroom and kitchenette. Along the public threshold, a woodworking shop supporting the DIY



Figure 3.3.6: Yokohama Apartment. Access path.



Figure 3.3.7: Yokohama Apartment. Retail Space.



Figure 3.3.8: Yokohama Apartment. Communal Space.





Figure 3.3.9: Spreefeld. Dwelling & Balcony.



Figure 3.3.10: Spreefeld. Dwelling Cluster.

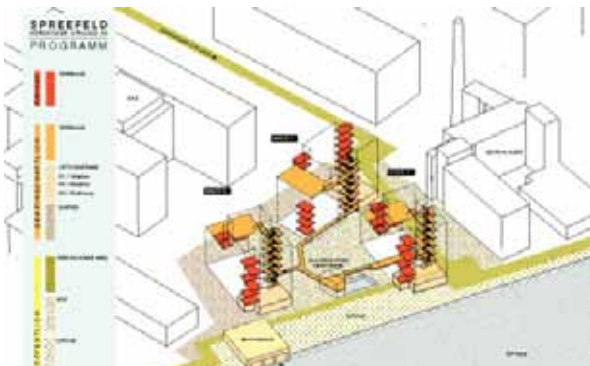


Figure 3.3.11: Spreefeld. Site Layout



Figure 3.3.12: Spreefeld. Communal Kitchen.

spirit of cooperative is situated to be the face of the community, while a restaurant incubator at ground level supports local entrepreneurship.<sup>26</sup>

Another cooperative model is found at Spreefeld, Berlin. Spreefeld was able to achieve a more formal, large development because German banks “don’t just support these projects because they’re sustainable, but also because they are safe investments, not speculative, but rather use and user oriented” The main feature is the clustering of units for every two floors. While some relationships to the communal area are quite detached by stairs and corridors, residents still benefit from low cost extra space and daily interaction. “We are paying for 60 sq m of private space but also another 30 sq m for communal space, but we have access to 220 sm of community space in our cluster and we pay for 5-6sq m for the remaining 1000 sq m of community spaces, roof terraces and garden areas. Decisions are made in a direct way. We know each other and come to arrangements through the scale of boards, advisors, and separate loose organization within our cluster.” “The fundamental policy is that no one is forced to do anything, it’s an anarchist approach, freedom loving approach.”<sup>27</sup> People do things because they want to, which is both interesting and challenging. Participation can be bonding, positive, and rewarding experience that strengthens the coliving model.

From a developer standpoint, the industry is finally starting to tap into the demand for condominium alternatives. Developers in New York such as Urby<sup>28</sup> are beginning to include spaces to facilitate interaction between tenants such as coffee shop lobbies and communal kitchens. Developers like David Berry are trying to engineer ways to have people “emotionally connect” to their home by spatial exploration, recognizing some people due to technology and services that exist today need less space, which can be repurposed elsewhere as a social amenity as in developments in Chicago and Brooklyn by PMG.<sup>29</sup> While the coliving trend is beginning to take hold as a potentially economic opportunity to developers, the current experiments fall short in substantially rethinking dwelling so as to refocus on people over capital or integrate into neighbourhoods, but there is growing evidence that the major stakeholders in the housing market (community, financial capital, and developers) can recalibrate their relationships to produce a much larger variety of successful coliving models.

# Consistent Design Applications

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## Building Composition

All typologies have the same programme and basic layout, with public amenity, bike parking, storage, and service on the first floor, and upper floors dedicated to residential space, both private and communal. All dwellings are connected to communal space within a dwelling cluster via a user controlled dynamic threshold which can be opened or closed to isolate or extend the unit into communal space. Private dwellings are clustered within a communal unit which acts as an extension of everyday living space. Depending on the configuration and size of the private dwelling, space allocation for communal space fluctuates to accommodate the different needs of each household type. To travel between floors, an elevator is provided along with two exits stairs. One exit is designed to be more enclosed as a fire exit and the other is open to communal space at the exterior edge to be a mixing space between floors and secondary means of egress. On the ground floor, a communal lobby is the mixing space for the entire building and provides an area for chance occupant encounters, a place to meet visitors and wait for friends or transportation, and deliveries. There is no basement, so from this space one can access services such as bike parking, mail, laundry, and garbage room. Two additional spaces are included that are designed for both building and public access that are expected to fit into a larger network of specific services provided across all proposed framework development. These spaces are a workshop space for do it yourself projects or hobby enthusiasts to gather and a public benefit space that can be leased for a variety of civic, recreational, service, and business functions, dependent on the needs of residents.

## Architectural Design Tools

The challenges faced in fulfilling the seminal principles of neighbourhood, flexibility, and sharing govern the layout of each building type. The massing response to the context and pre existing lot dimensions are the most problematic conditions because this results in the two most substantial sides of the building running along the lot line, preventing openings in the majority of the envelope. Therefore, communal and private space have to compete for the remaining opening locations. This is complicated further by the requirement to provide two exits within a limited floor plate, while endeavouring to preserve the possibility of unit amalgamation through keeping private dwelling space uninterrupted by communal or access spaces. These challenges lead to the smallest private unit typology, the microunit, being exclusively built on corner lots as a separate strategy with an additional wall for openings. To make the most of expensive land value while respecting the seminal principles and living standards, the following design decisions were made consistently across every typology.

- Scale down units to be fully functional but without any extra space (passages, 2nd bathrooms, bedrooms minimum size for double bed, kitchen has room for small appliances but no more) and provide the equivalent remaining space within the communal unit cluster for equivalent full sized living quarters.
- Immediately adjacent communal space as an extension of unit living space, allowing for seamless transition between the two and programme so that the space can be integrated into daily routine.
- Divide programme so that inherently private spaces are in the private unit, such as bedroom, personal belongings, and washroom, and inherently social functions are in the communal space such as living and dining spaces. The kitchen remains within each private unit, but is always located at the threshold. With this arrangement, the kitchen can straddle its two functions. With the threshold open, it can retain its often enjoyable social qualities. However, because it remains in the private realm, the kitchen is autonomously controlled by a single household or resident to maintain control over kitchen belongings and cleanliness while the threshold can still be completely closed to take on a more functional food preparation

role. In this way, the kitchen can become an extension and support of the communal space, and a link between two realms, or conversely as an extension of private space as a buffer to communal dwelling, dependent on the needs of the occupant.

- Prioritize communal space access to light and views since these are spaces that everyone can enjoy and makes them more likely to be used.
- Maintain a fully functioning unit so that the unit may remain a potential private retreat.
- Always have three or more units share a space. Two units per cluster is more likely to create conflict because ownership becomes unclear. Where possible, maximize the number of units sharing on each floor so that if some units are amalgamated there will still be three or more sharing the space.
- Keep access, servicing, and communal space to the edges of the floor plate so that there is an uninterrupted private unit zone for possible amalgamation / flexibility of unit perimeters.
- Integrate access routes into communal inhabited spaces to allow for chance encounters and exchange between floors, giving residents an opportunity an audience to create an individual or cluster identity within the building. This fosters causal neighbourly relationships, the ability for residents to engage with low commitment to scope out activity, and be unintentionally drawn into exchange when arriving or departing. Active community and exposure to resident specific aesthetic treatment continues urban dynamism into the building to the unit threshold, reducing the disconnect between dwelling and city below, which can sometimes be created by sterile corridors and institutional settings.
- Ensure each unit has at least one view to street or lane.
- Create a simple and clear structural/mech. systems to make the building more accessible to change through routing utilities along communal areas and wood frame construction, which is easier to manipulate.
- Design layouts and relationships for a variety of potentials, but leave varying degrees of completion for further fitout by occupant to make the most out of limited space.
- Design the facade with clear unit boundaries so that an occupant may participate in expressing their individual unit, allowing for incremental change and control over time of both the interior and exterior of the building.
- Ensure amenity is open to the public, monetized as an income source for residents, and easily accessible on the first floor.

# Micro Unit

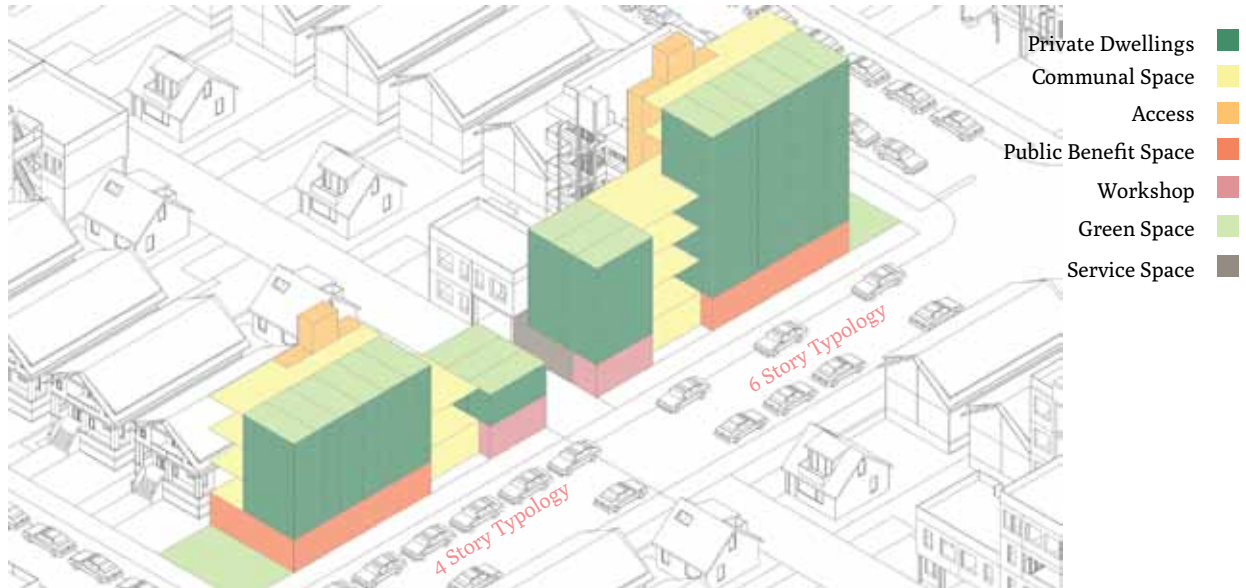
Lot Type: Corner Only 33 x 120' Typical Lot  
 Building Area 4 Storey: 9,283 SF (2.34 FAR)  
 Building Area 6 Storey: 14,159 SF (3.58 FAR)

Unit: 150 SF (Bathroom, Kitchen, Bedroom)  
 Communal Space / Floor: 600 SF + 425 sf Ex.  
 Public Benefit Space: 900 SF  
 Workshop: 200 SF

This Typology takes advantage of the unique corner lots that offer opportunity for more light and views allowing for higher density. These units are best suited for singles, short term, students, entry level housing, travellers and high mobility individuals. Units include a kitchen, bathroom and bedroom to independently function are provided communally per floor to make possible more flexible configurations. These units are the smallest, most pressurized so communal space is expected to be heavily used on a daily basis.

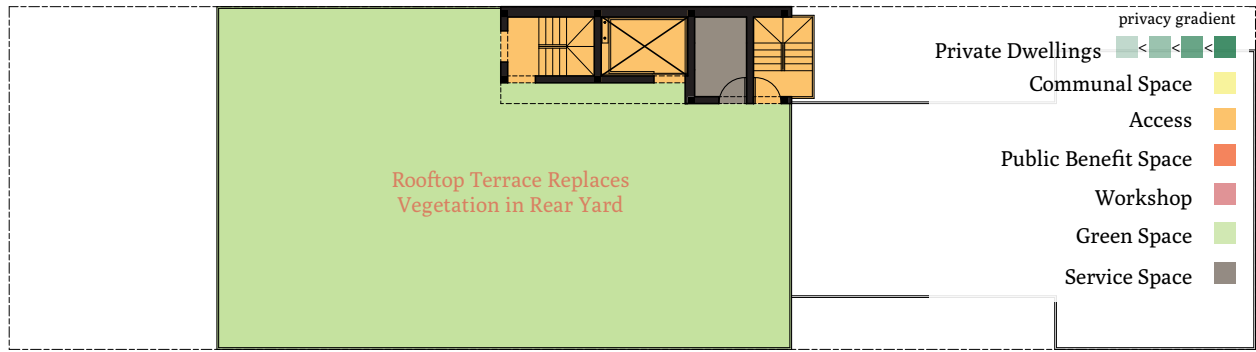


Detailed Axometric

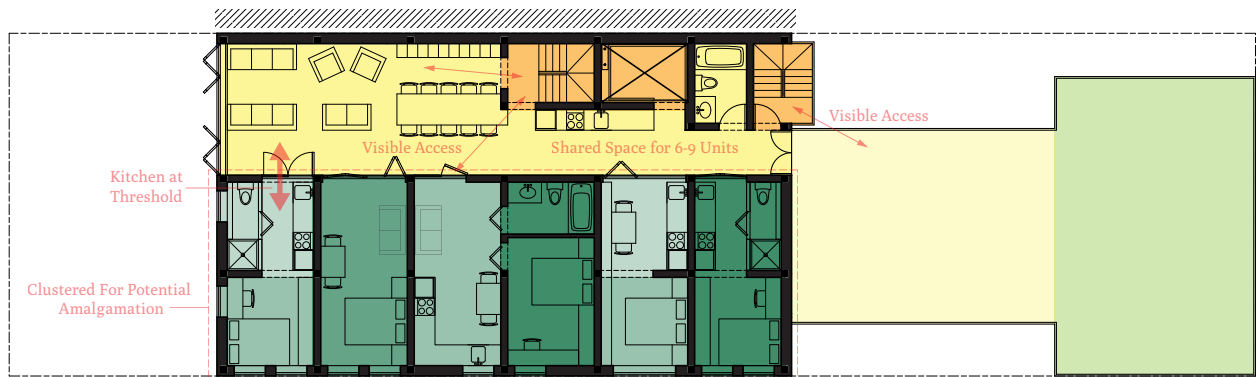


Programmatic Axometric

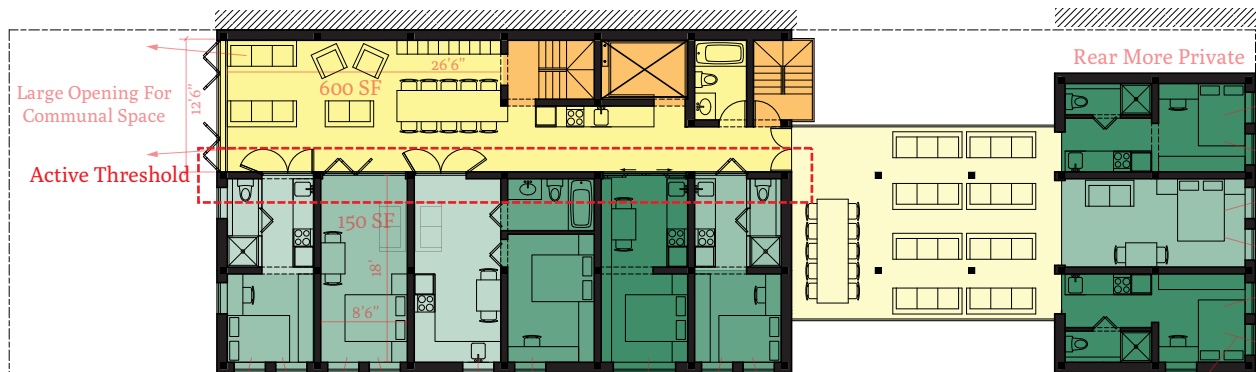
Figure 3.5.1.1: Micro Unit Building Axometric showing Neighbourhood Relationships



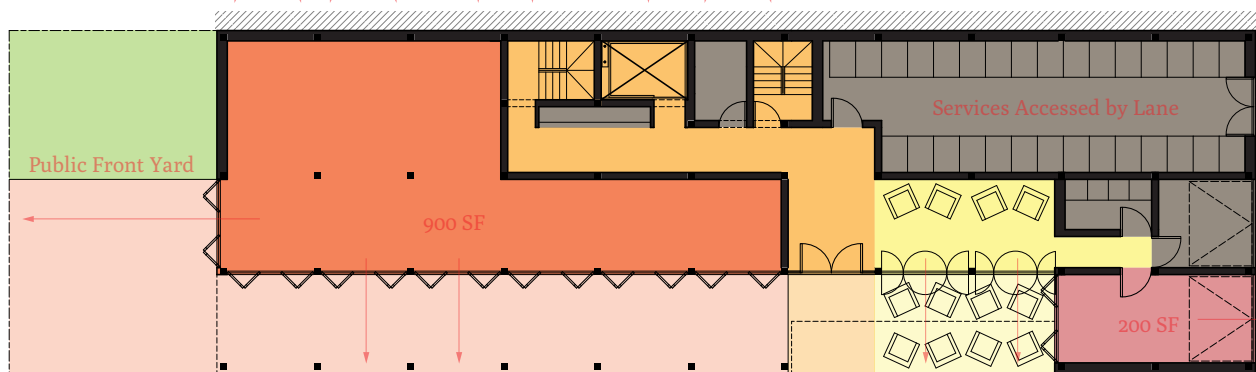
Roof Plan



Typical Upper Dwelling Levels



Typical Lower Dwelling Levels



Ground Plan

Figure 3.5.1.2: Micro Unit Programmatic & Spatial Architectural Strategy Diagrams

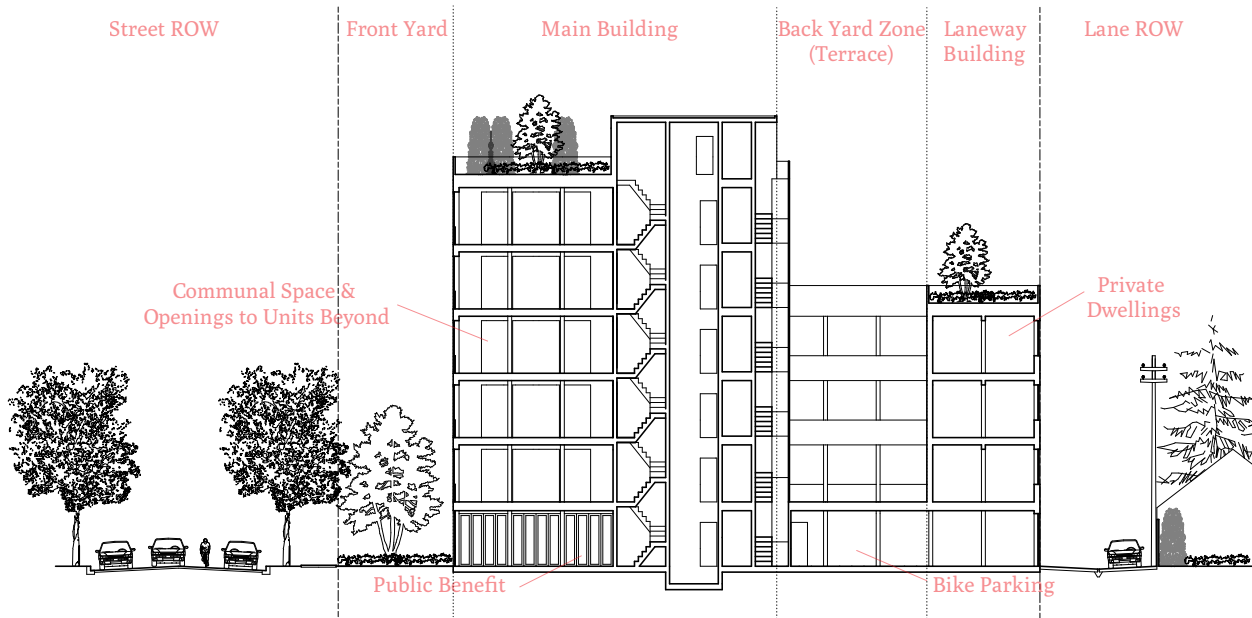


Figure 3.5.1.3: Micro Unit Section

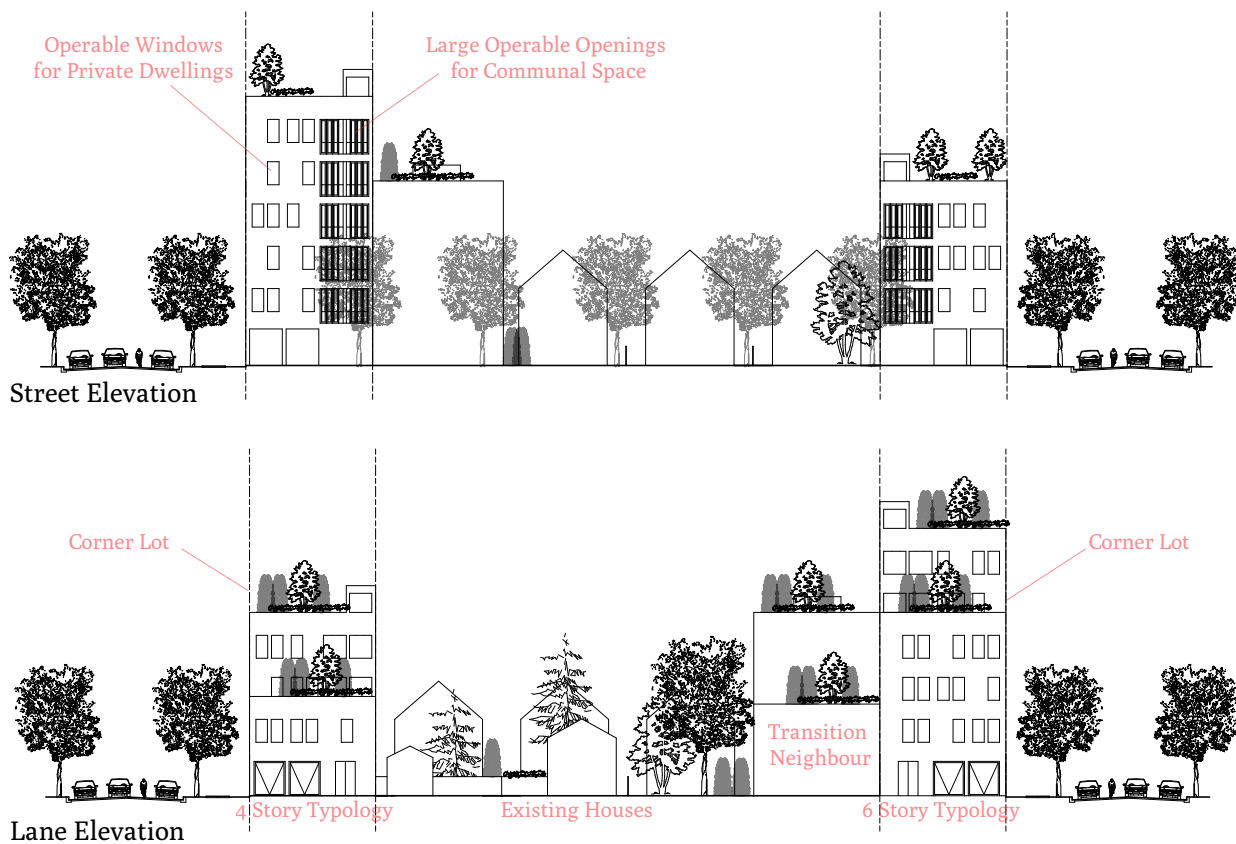
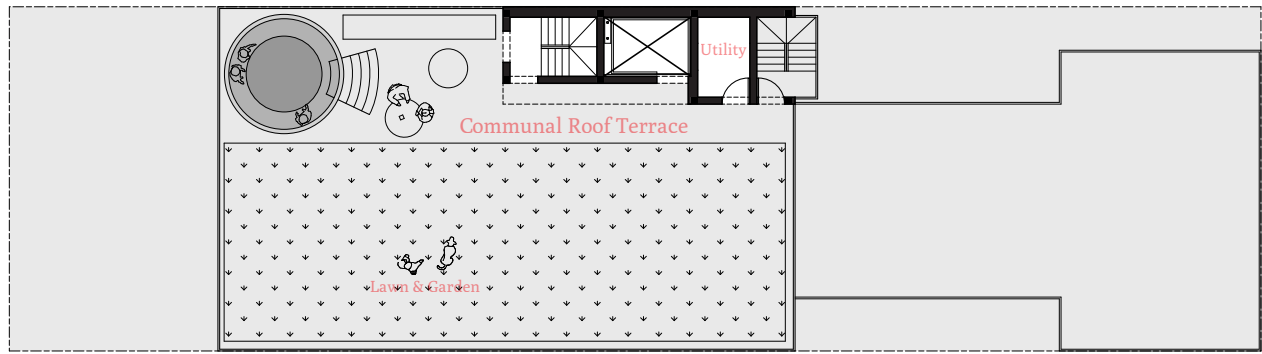
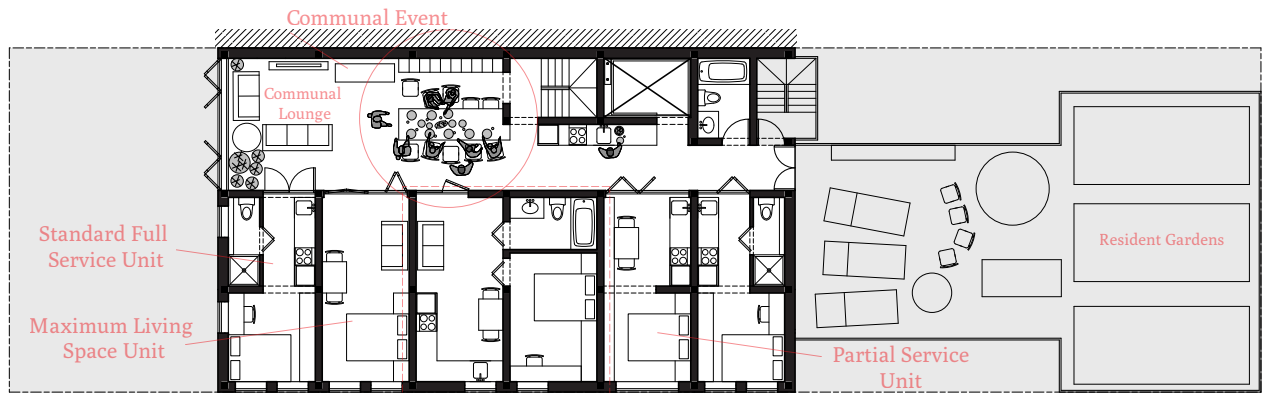


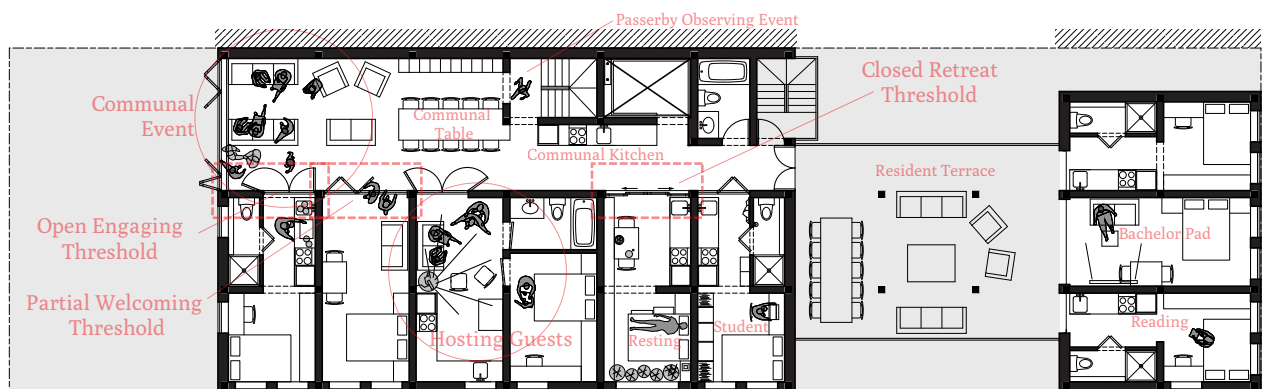
Figure 3.5.1.4: Micro Unit Elevations



Roof Plan



Typical Upper Dwelling Levels



Typical Lower Dwelling Levels

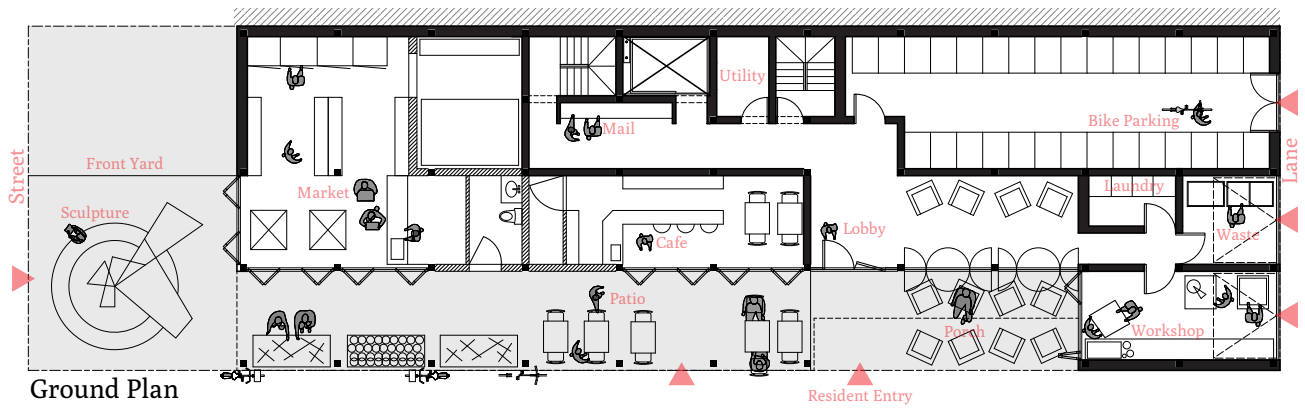


Figure 3.5.1.5: Micro Unit Floor Plans Showing Potential Uses

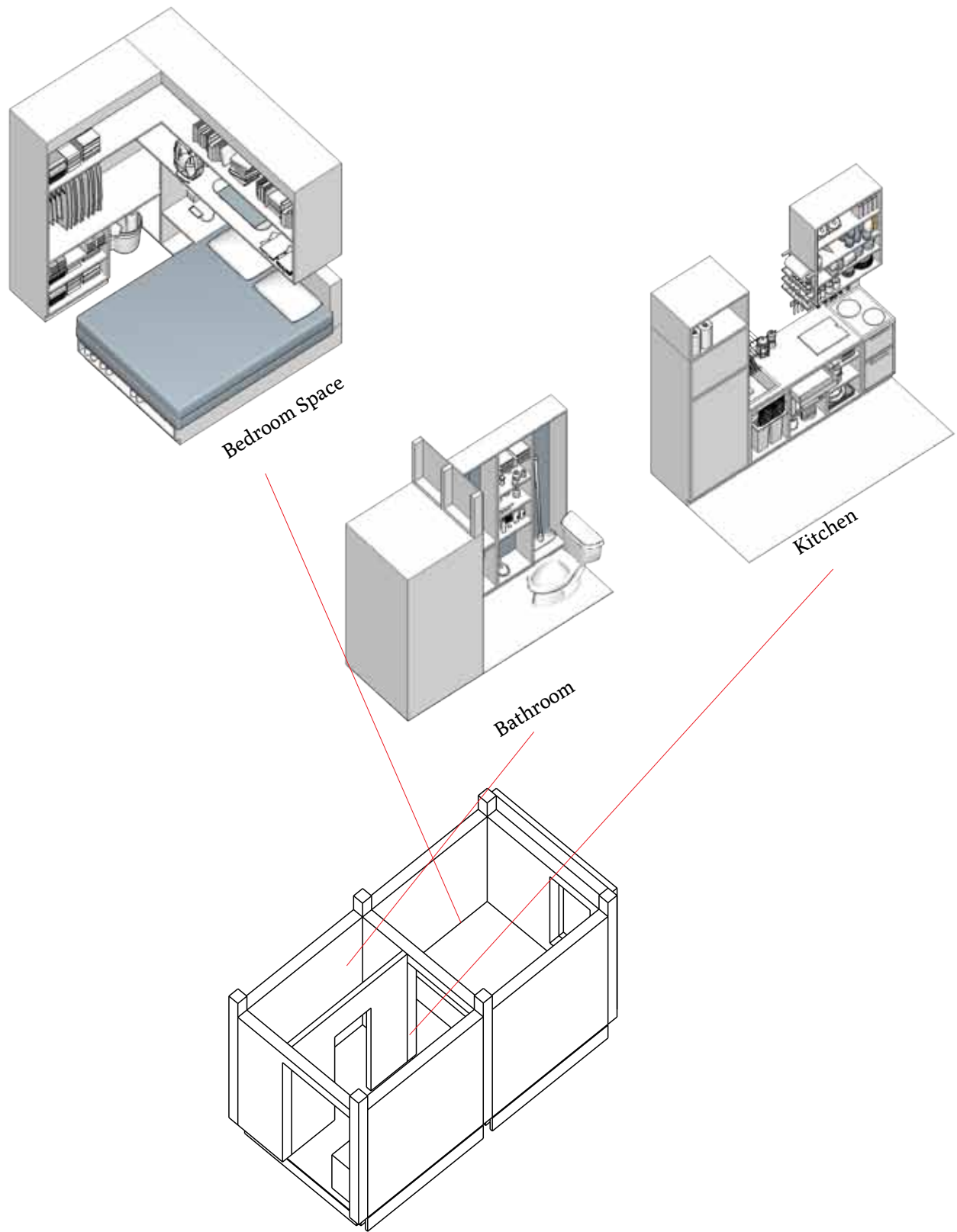
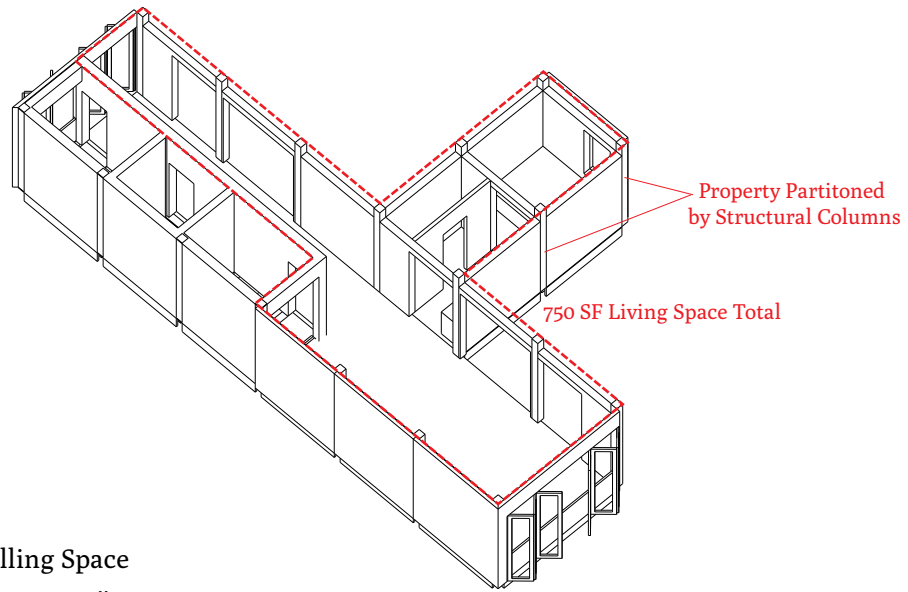
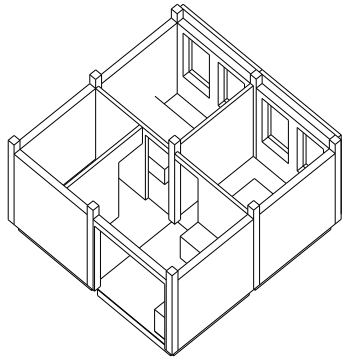


Figure 3.5.1.6: Micro Unit Inhabitation

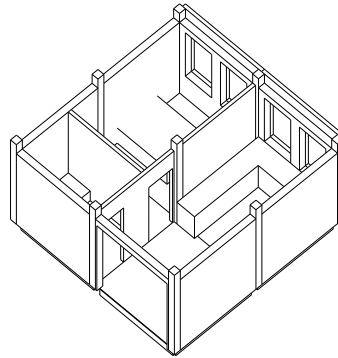




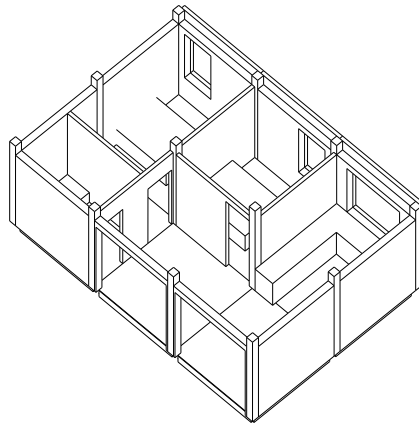
Visualized Total Dwelling Space



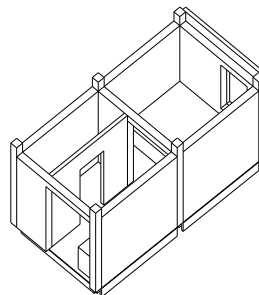
2 Unit - 2 BDRM Configuration



2 Unit - 1 BDRM Configuration



3 Unit - 2 BDRM Configuration



1 Unit - Basic Studio Configuration

Figure 3.5.1.7: Micro Unit Potential Configurations

# Studio

Lot Type: Any 33 x 120' Typical Lot  
 Building Area 4 Storey: 8,300 SF (2.10 FAR)  
 Building Area 6 Storey: 12,300 SF (3.12 FAR)

Unit: 325 SF (Bathroom, Kitchen, Bedroom)  
 Communal Space / Floor: 225 SF + 165 sf Ex.  
 Public Benefit Space: 900 SF  
 Workshop: 200 SF

This typology employs full depth units to provide direct communal access, an exterior facade, and two exits while mitigating the restrictive width of the building through a zigzag party wall design. These units are best suited for groups of friends, students, or independent people that have similar needs to make the intimately scaled communal space work best. Units include a kitchen, bathroom and bedroom/living space along with adjacent interior and exterior cozy communal spaces. This cluster group operates similarly to a house room sharing situation, except rooms are self contained mini-units.



Detailed Axometric



Programmatic Axometric

Figure 3.5.2.1: Micro Unit Building Axometric showing Neighbourhood Relationships

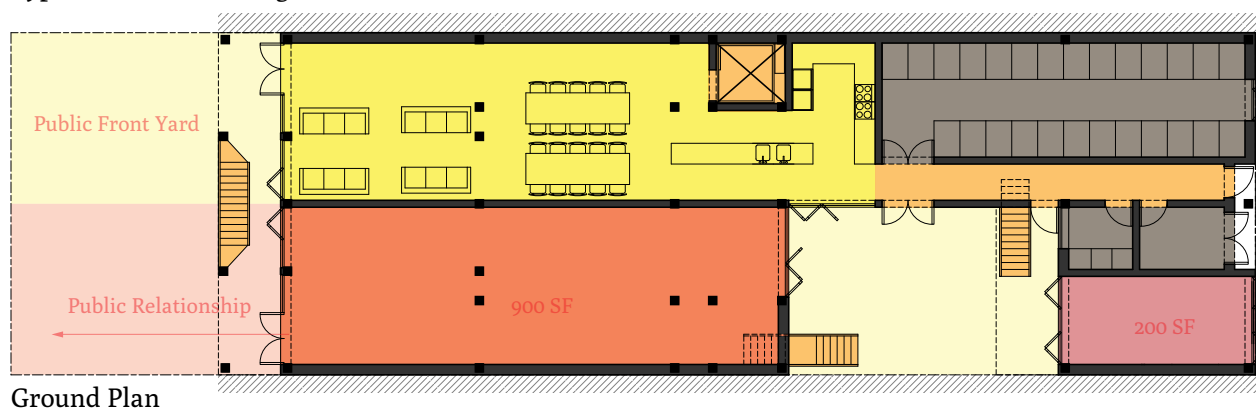
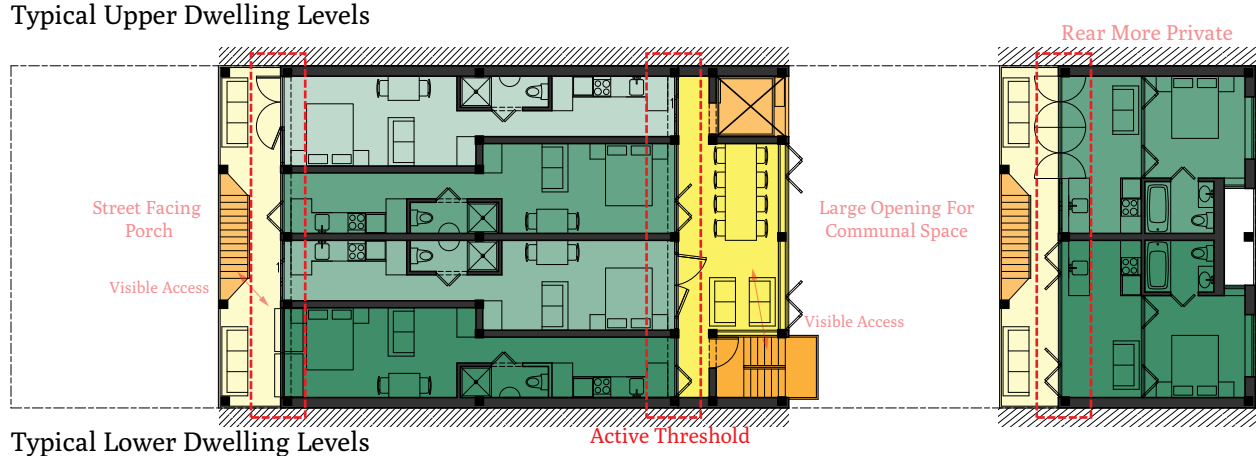
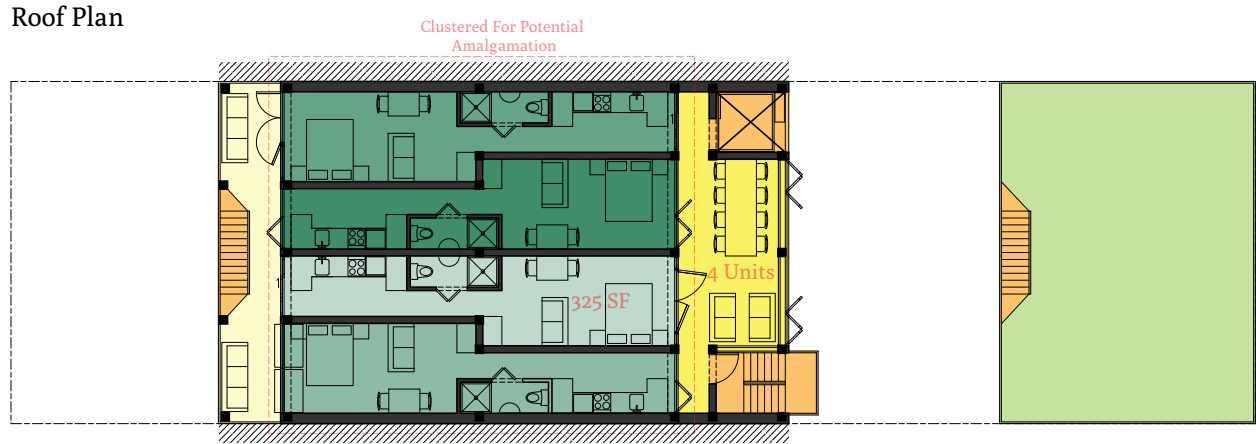
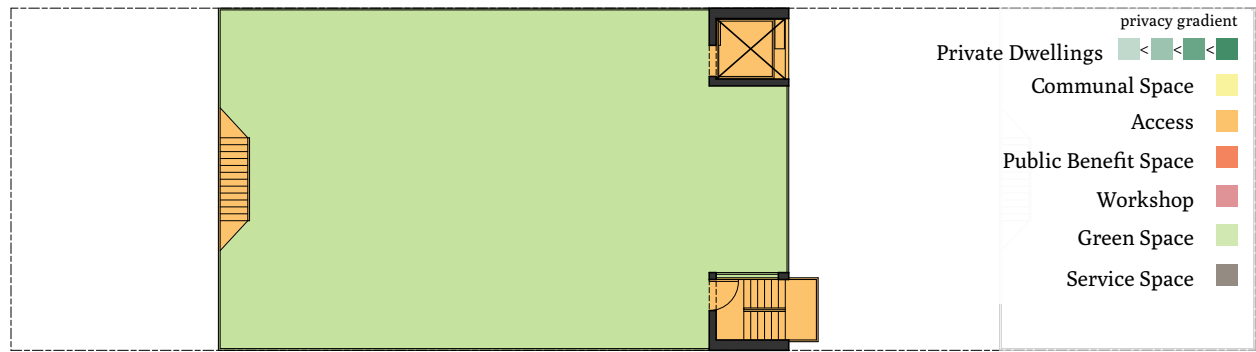


Figure 3.5.2.2: Studio Programmatic & Spatial Architectural Strategy Diagrams

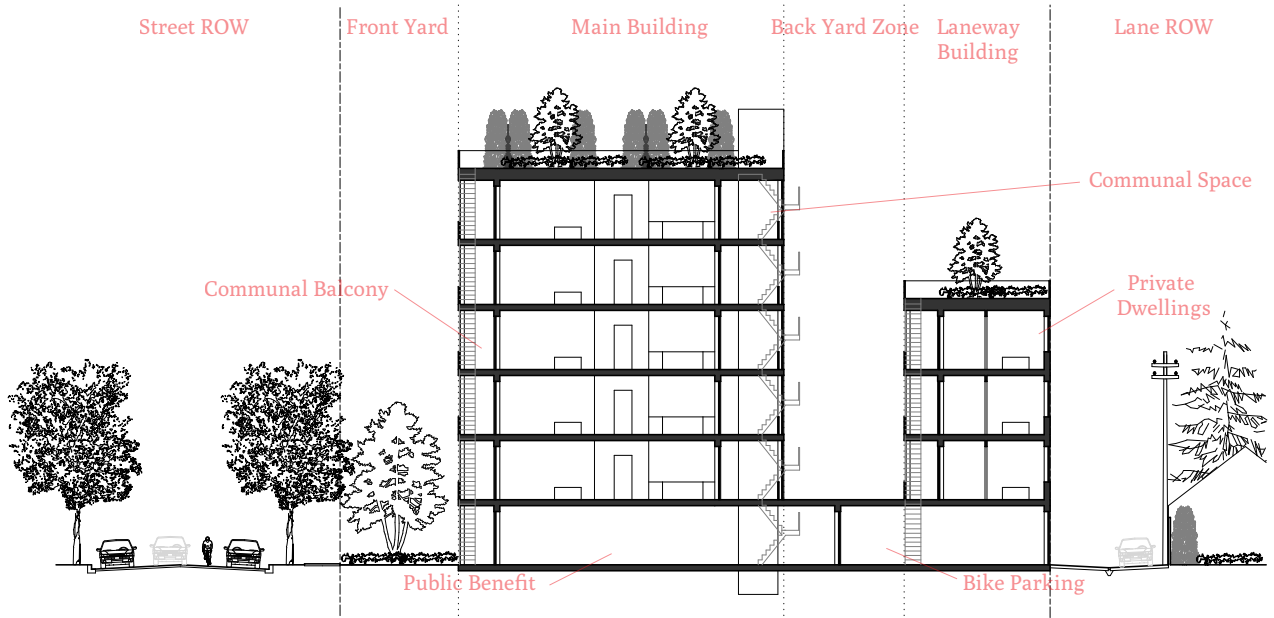


Figure 3.5.2.3: Studio Section

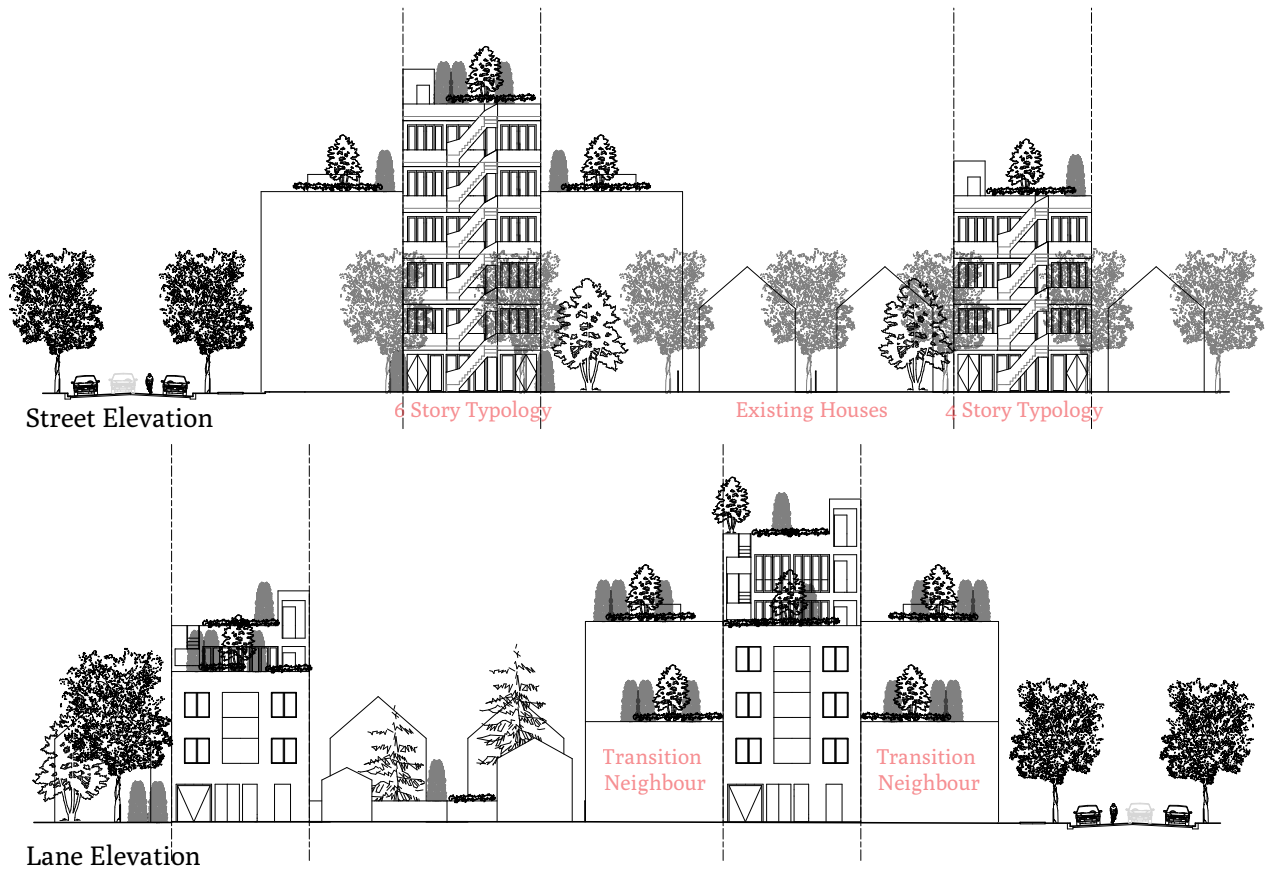
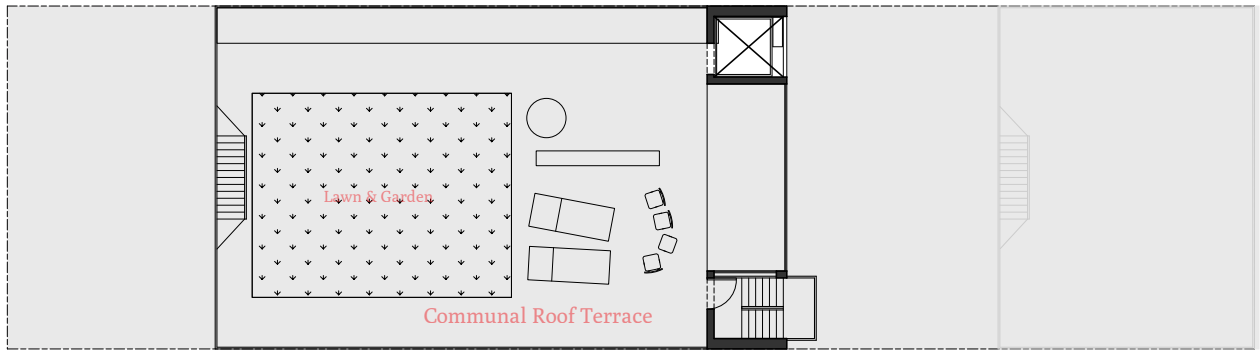
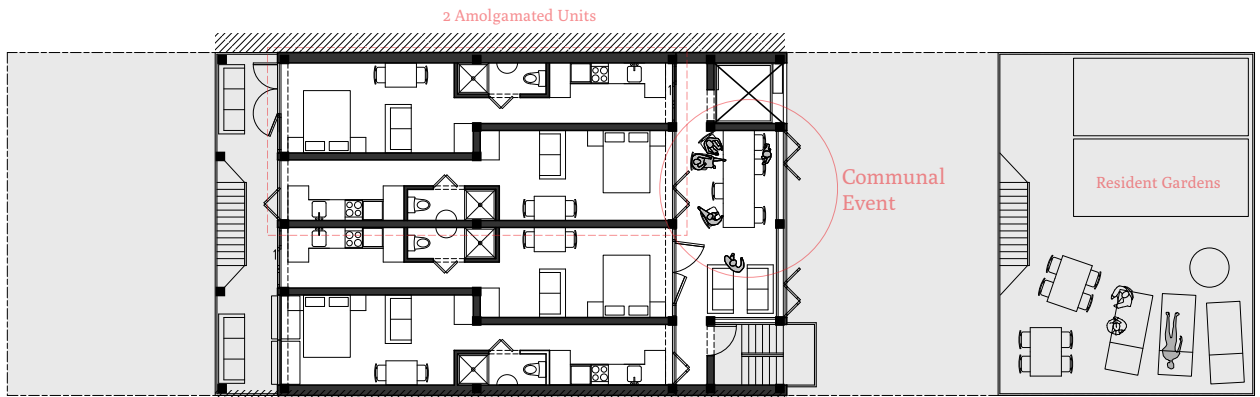


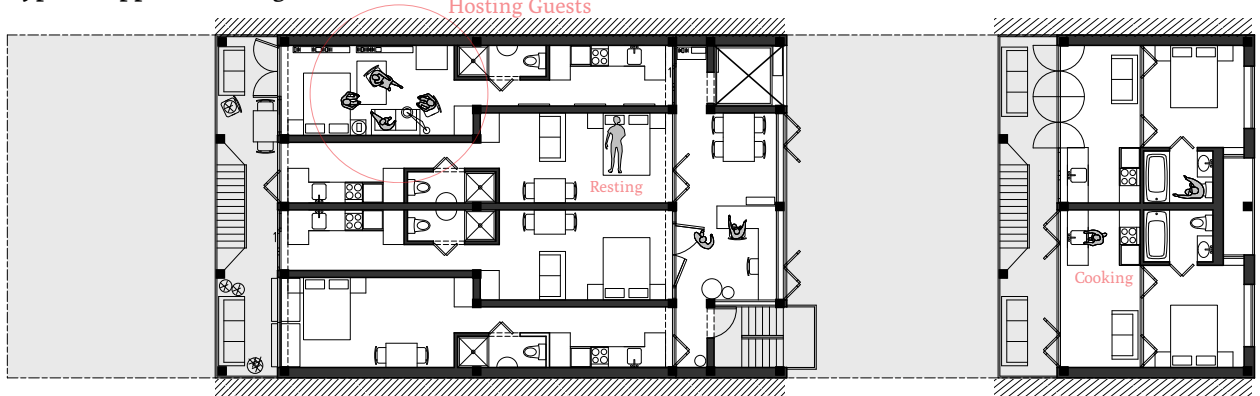
Figure 3.5.2.4: Studio Elevations



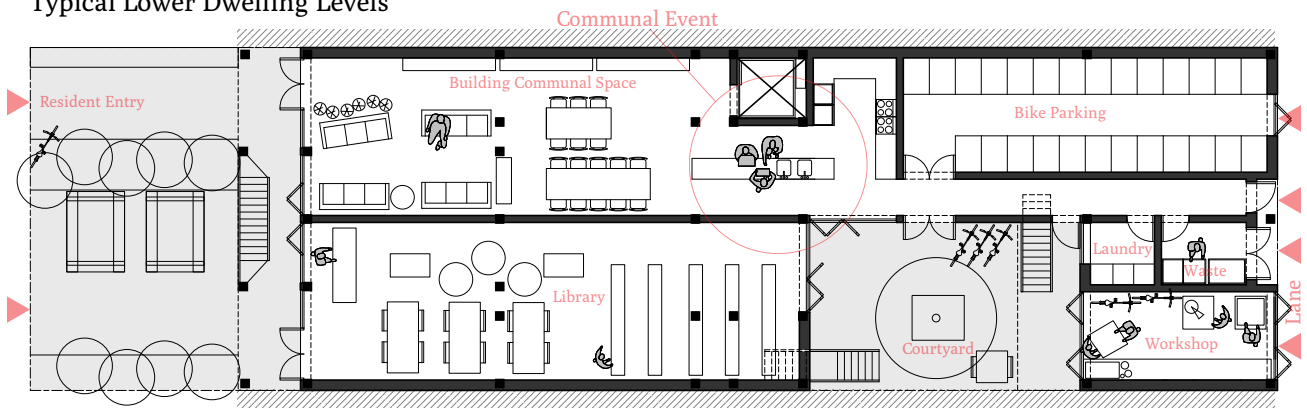
Roof Plan



Typical Upper Dwelling Levels



Typical Lower Dwelling Levels



Ground Plan

Figure 3.5.2.5: Studio Floor Plans Showing Potential Uses

# 1 BDRM

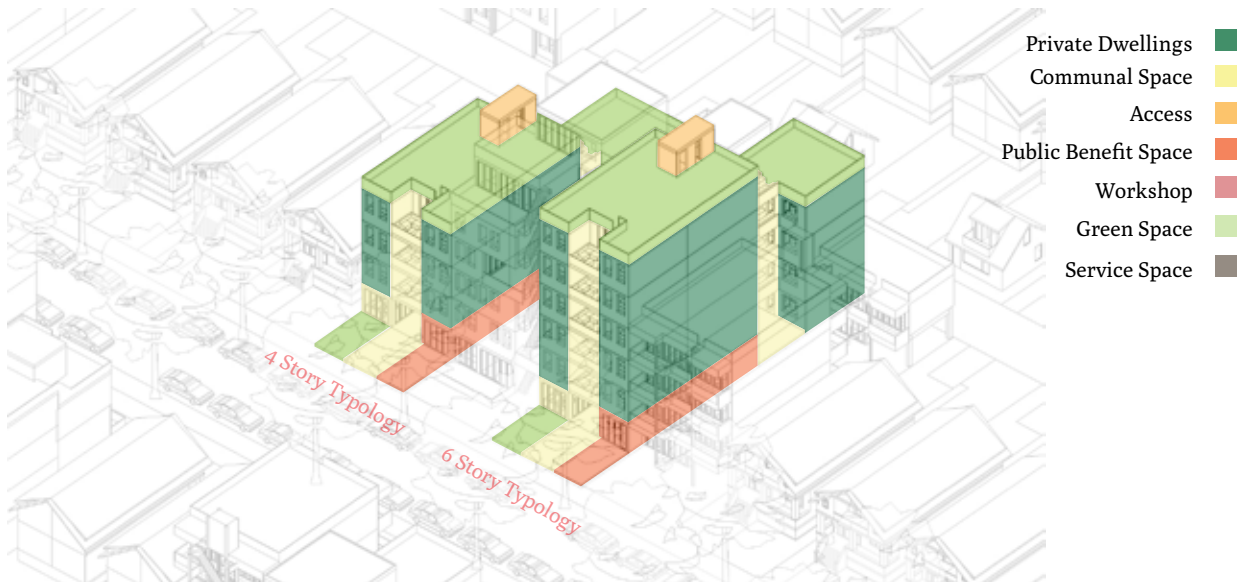
Lot Type: Any 33 x 120' Typical Lot  
 Building Area 4 Storey: 7,300 SF (1.85 FAR)  
 Building Area 6 Storey: 11,480 SF (2.9 FAR)

Unit: 325 SF (Bathroom, Kitchen, Bedroom)  
 Communal Space / Floor: 475 SF + 225 sf Ex.  
 Public Benefit Space: 900 SF  
 Workshop: 200 SF

This typology uses a large through communal area to provide two exits and pushes private units to the corner of the building. These units are best suited to individuals or couples that are interested in living within a community, while maintaining some autonomy such as members of the tiny house collective and seniors. Units include a kitchen/ living space, bathroom, and bedroom and the communal space has a formal kitchen and dining space to encourage co-living. This cluster operates like a co-op where members contribute to the community but do not operate as a singular household.

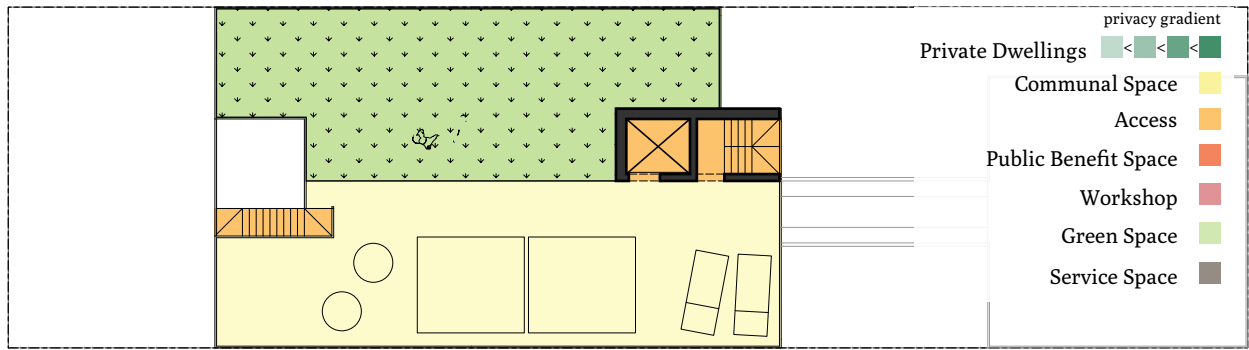


Detailed Axometric

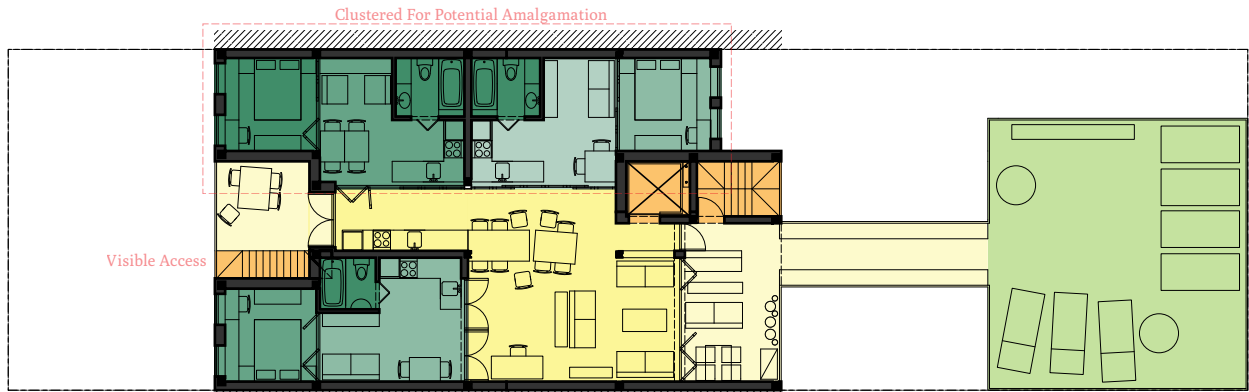


Programmatic Axometric

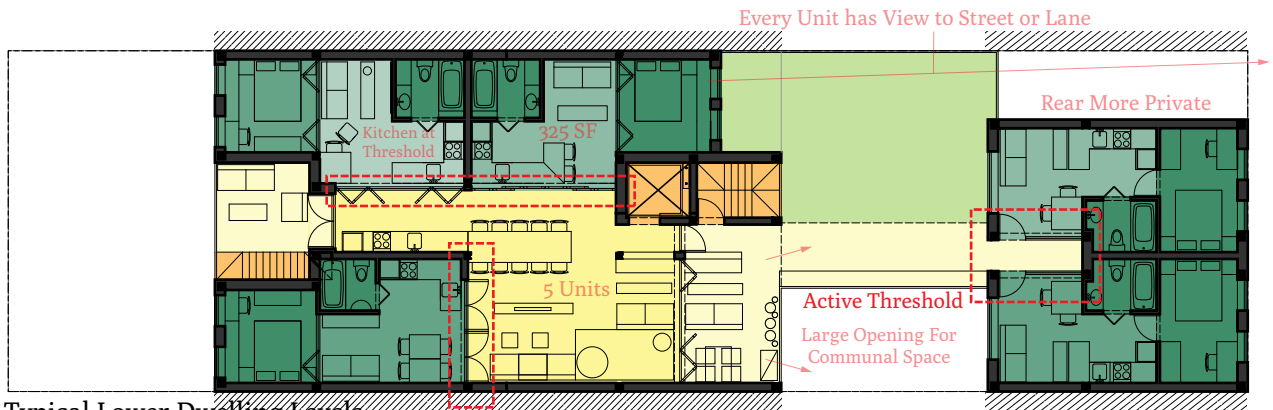
Figure 3.5.3.1: 1 BDRM Building Axometric showing Neighbourhood Relationships



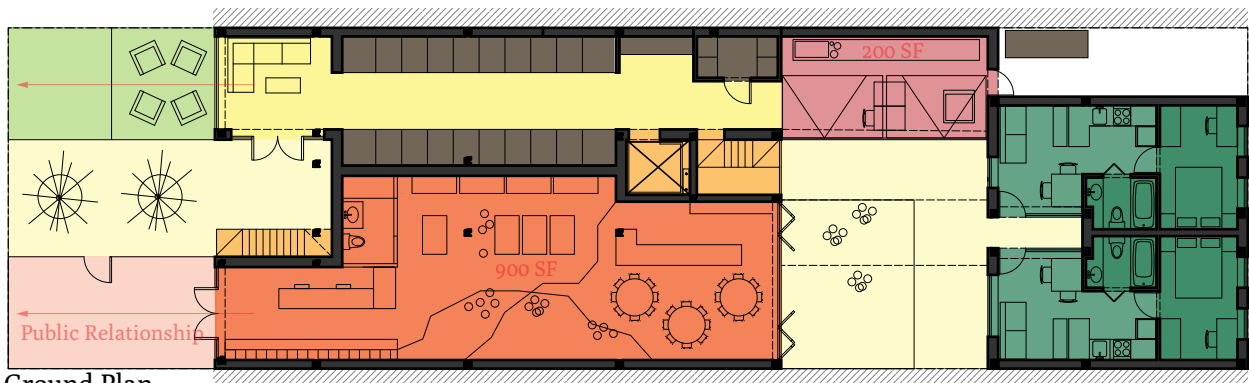
Roof Plan



Typical Upper Dwelling Levels



Typical Lower Dwelling Levels



Ground Plan

Figure 3.5.3.2: 1 BDRM Programmatic & Spatial Architectural Strategy Diagrams

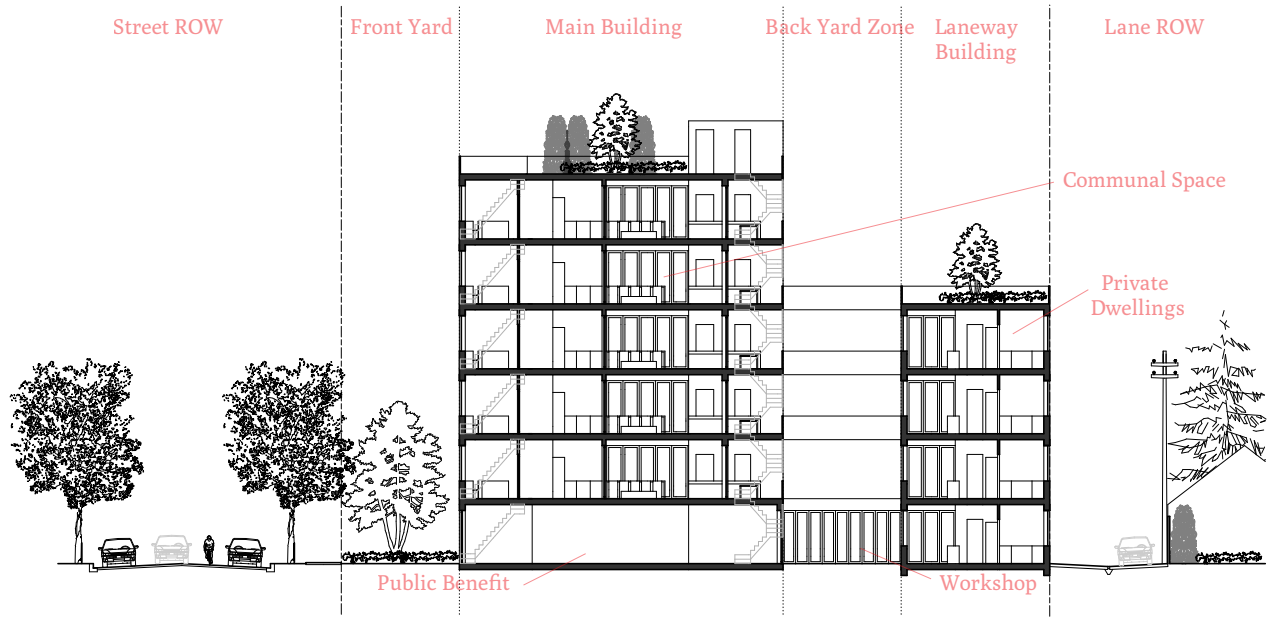


Figure 3.5.3.3: 1 BDRM Section

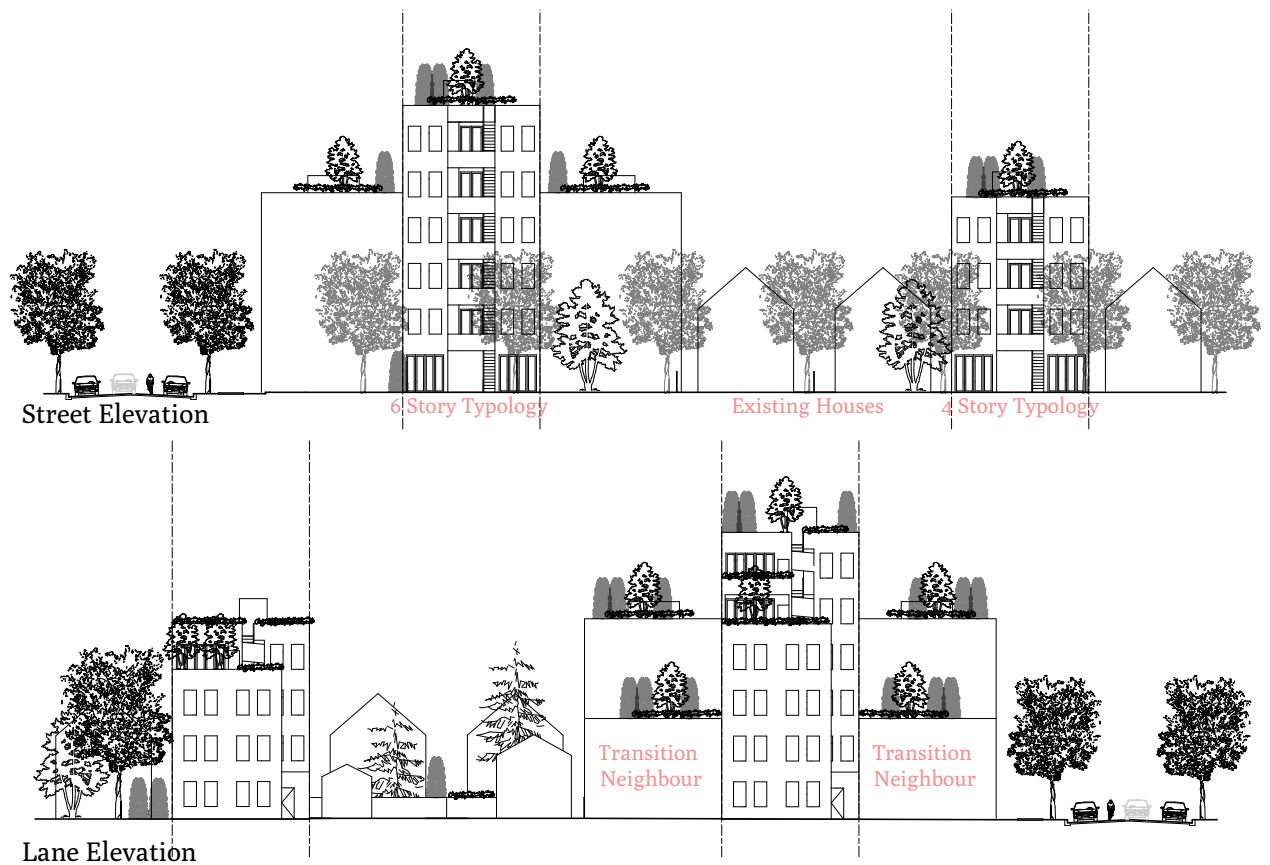
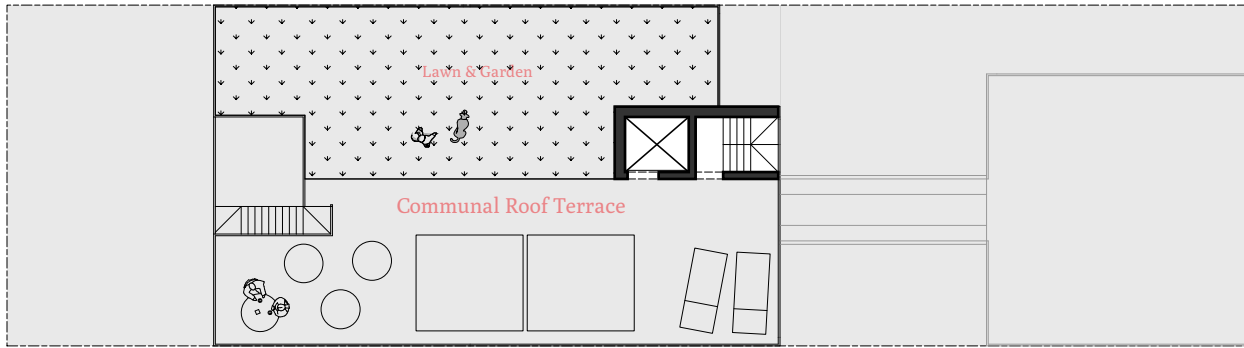
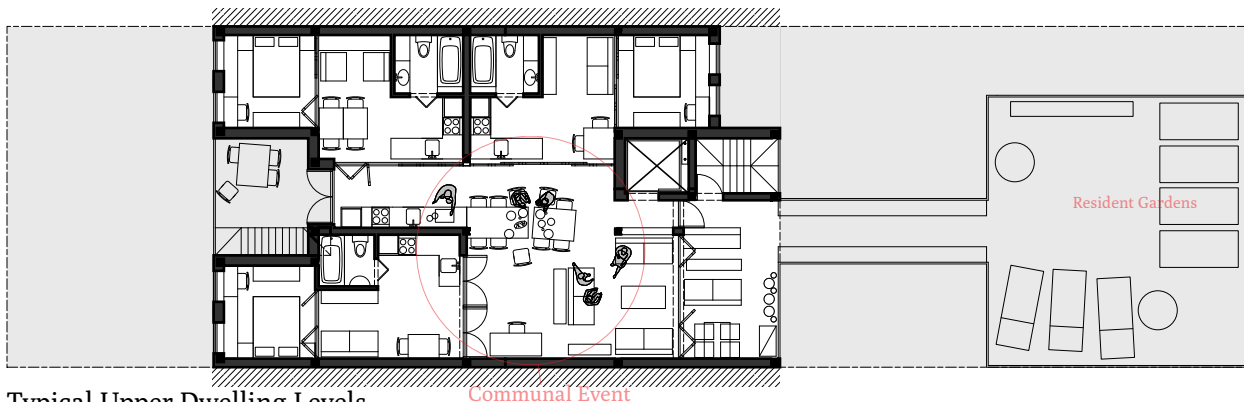


Figure 3.5.3.4: 1 BDRM Elevations

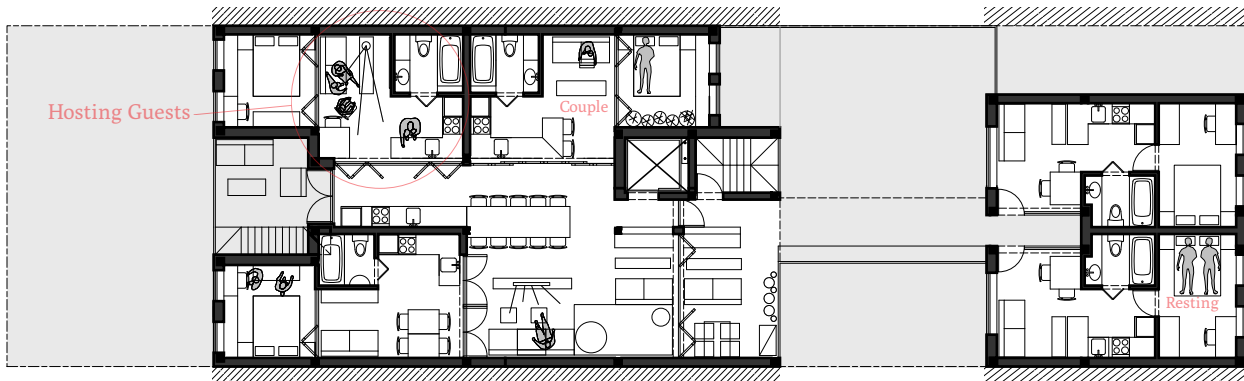




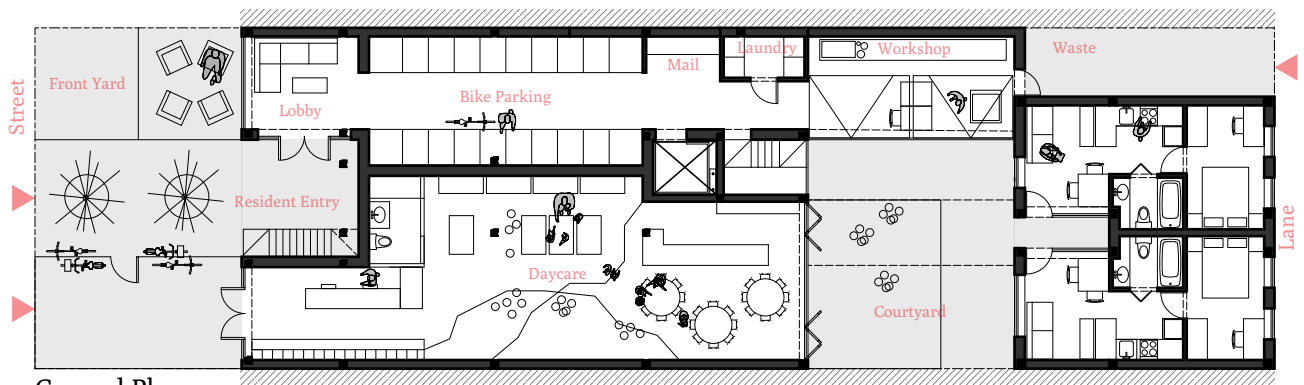
Roof Plan



Typical Upper Dwelling Levels



Typical Lower Dwelling Levels



Ground Plan

Figure 3.5.3.5: 1 BDRM Floor Plans Showing Potential Uses

# 2 BDRM

Lot Type: Any 33 x 120' Typical Lot  
 Building Area 4 Storey: 7,320 SF (1.85 FAR)  
 Building Area 6 Storey: 11,740 SF (2.9 FAR)

Unit: 675 SF (Bathroom, Kitchen, Bedroom)  
 Communal Space / Floor: 365 SF + 150 sf Ex.  
 Public Benefit Space: 900 SF  
 Workshop: 200 SF

This typology uses a skip-stop design with alternating communal space and bedrooms along the front facade and create a 4 unit cluster despite the restrictive floor plate size. These units are best suited for unconventional households, young families, or retired couple requiring a guest bedroom. Units include a kitchen, living room, two bedrooms, and bathroom. The kitchen is strategically placed between private living rooms and communal space. The cluster may be less heavily used, but the opening to the exterior will encourage co-dependent relationships to form such as pet or child care.



Detailed Axometric



Programmatic Axometric

Figure 3.5.4.1: 2 BDRM Building Axometric showing Neighbourhood Relationships

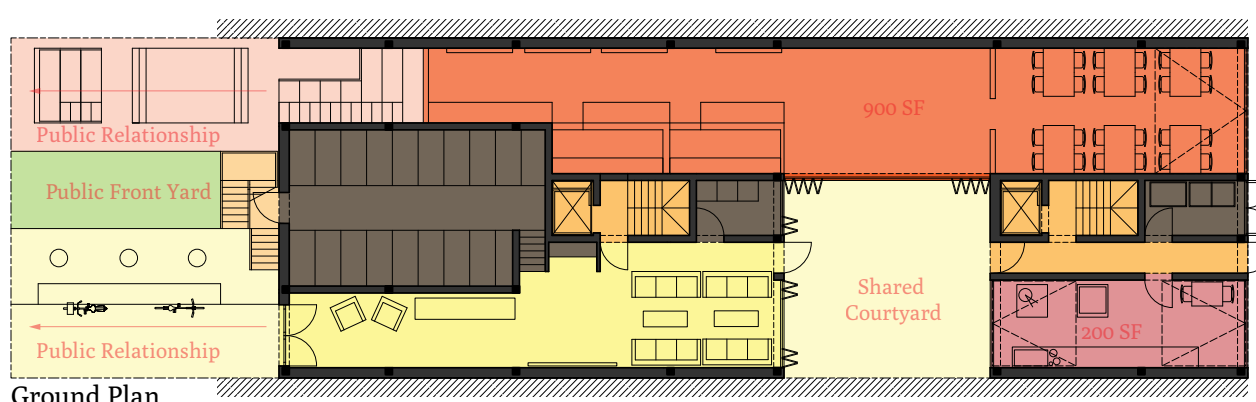
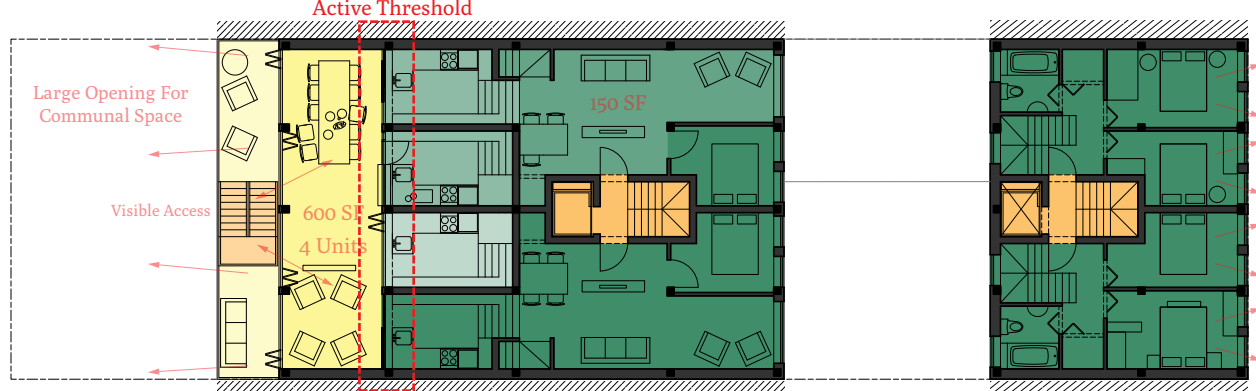
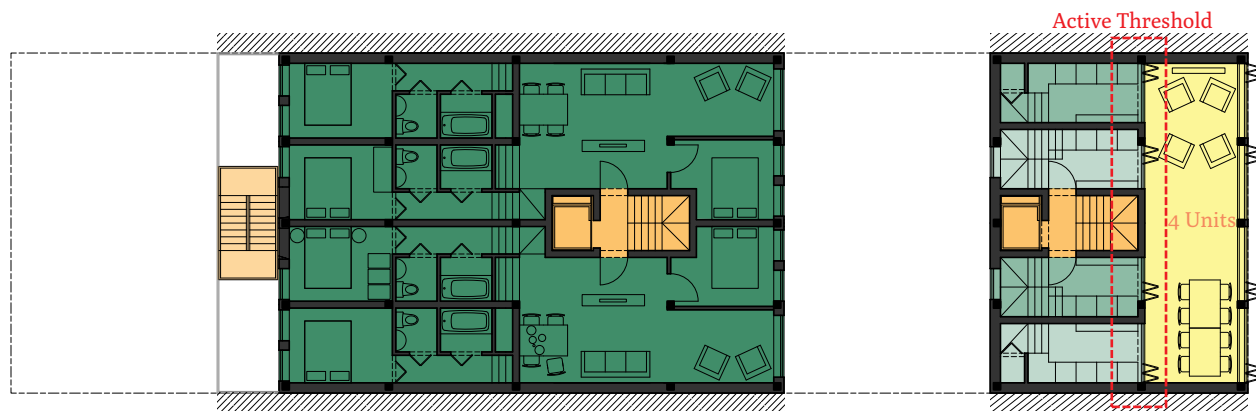
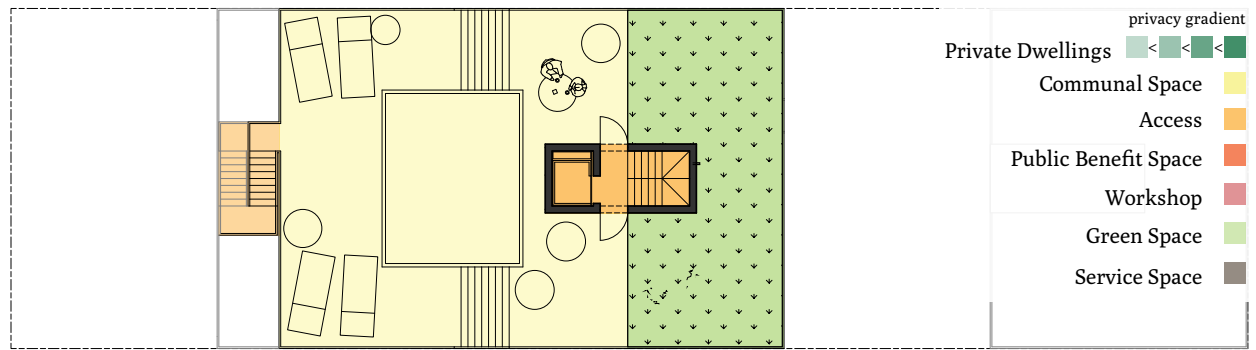


Figure 3.5.4.2: 2 BDRM Programmatic & Spatial Architectural Strategy Diagrams

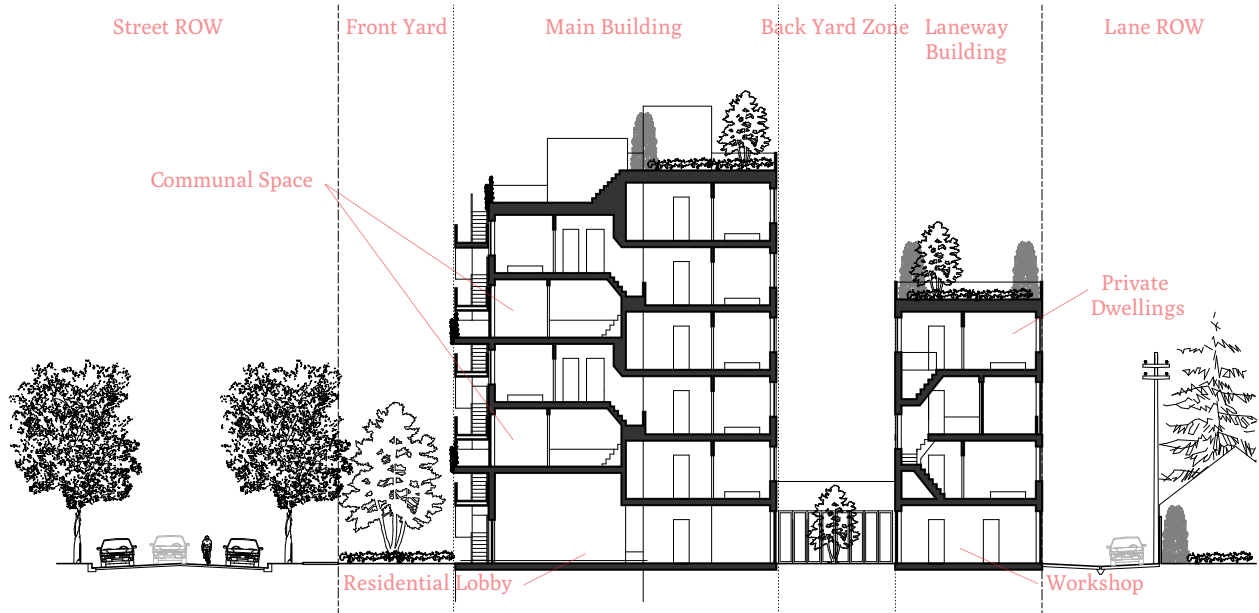


Figure 3.5.4.3: 2 BDRM Section

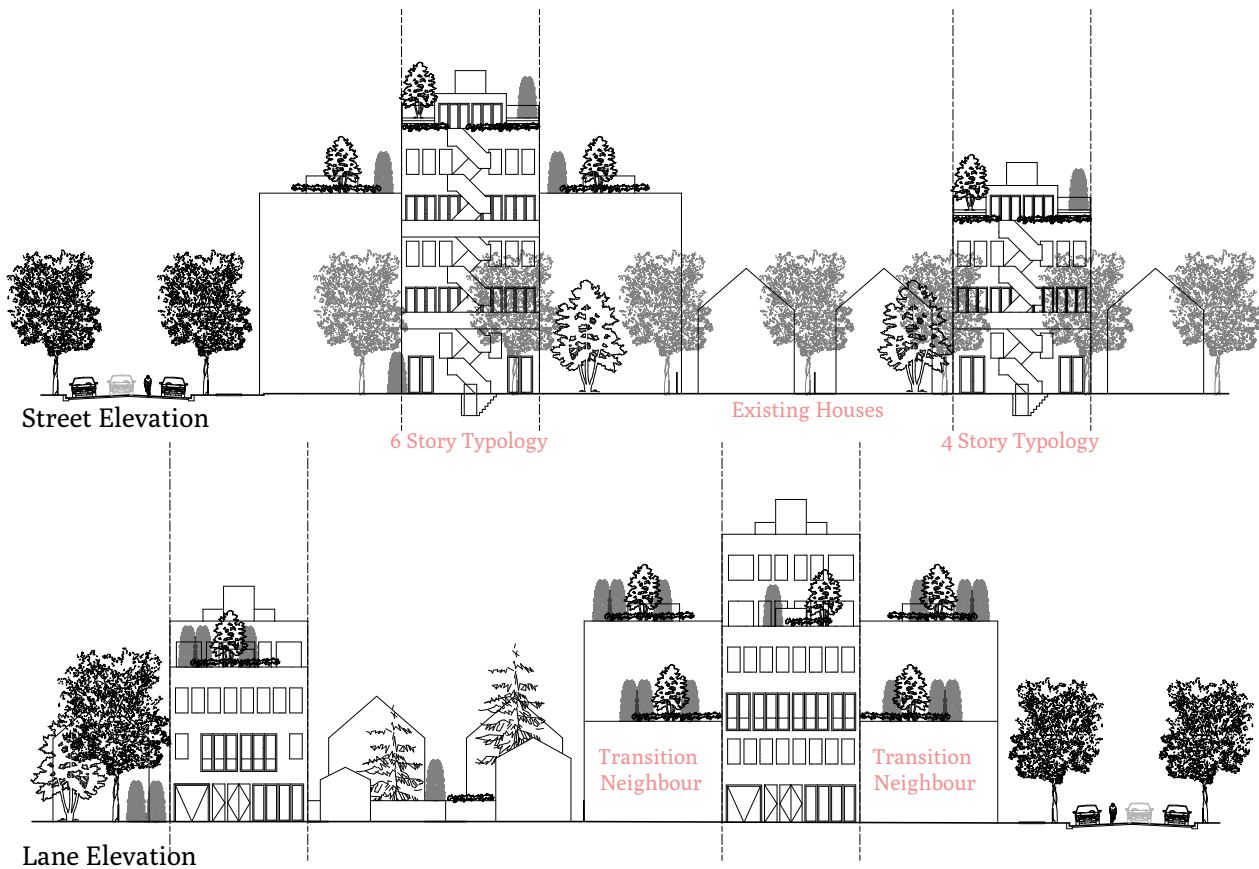
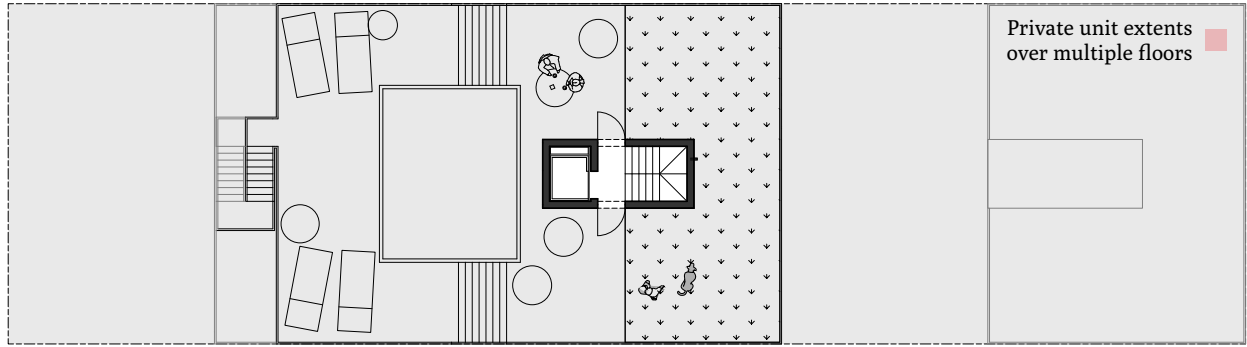
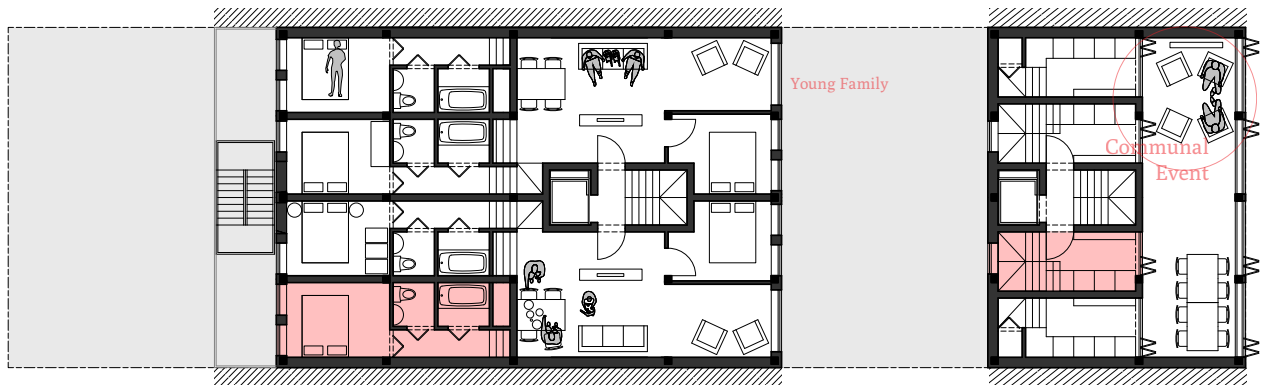


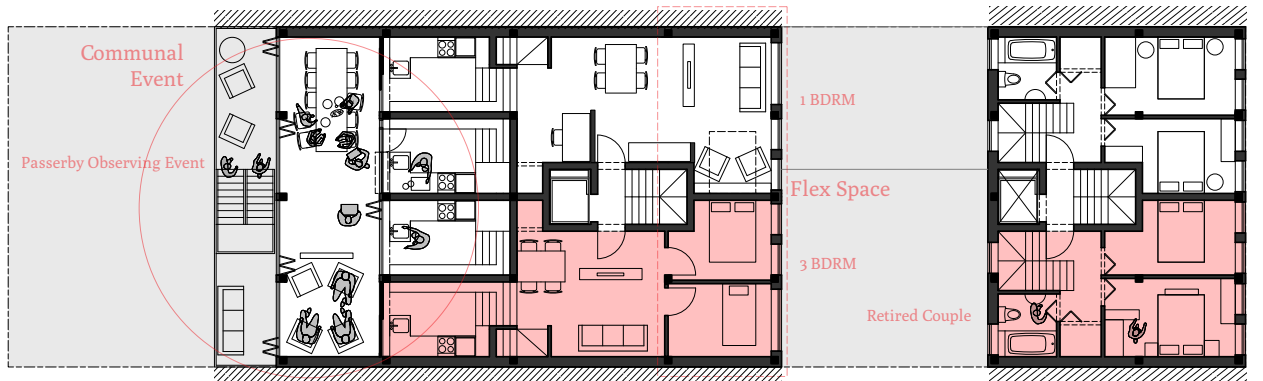
Figure 3.5.4.4: 2 BDRM Elevations



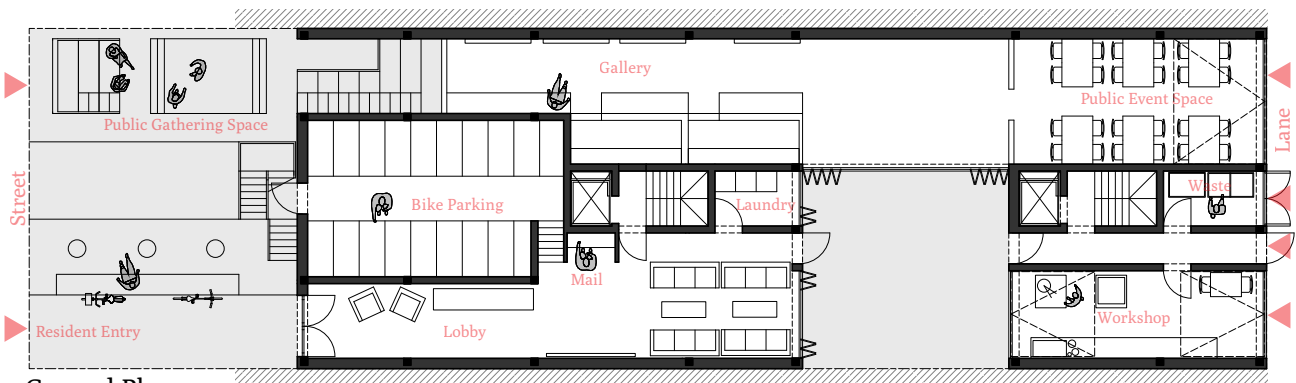
Roof Plan



Typical Upper Dwelling Levels



Typical Lower Dwelling Levels



Ground Plan

Figure 3.5.4.5: 2 BDRM Floor Plans Showing Potential Uses

# 3 BDRM

Lot Type: Any 33 x 120' Typical Lot  
 Building Area 4 Storey: 5,320 SF (1.34 FAR)  
 Building Area 6 Storey: 9,850 SF (2.49 FAR)

Unit: 925 SF (Bathroom, Kitchen, 3 Bedroom, Living) + semi-private terrace 250 SF (avg.)  
 Public Benefit Space: 900 SF  
 Workshop: 200 SF

This typology assembles units in a tetris like fashion to produce unique units and open to above terraces. The semi-private terraces double as a secondary access for mixing with neighbours more conventionally in lieu of adjacent communal space, which is not needed due to the social nature of a three bedroom household and living space included within the unit. These units are best suited to families and households or groups of individuals looking for a more conventional community relationship. Units operate in a similar fashion to a house with personalized address and adjacent exterior space.

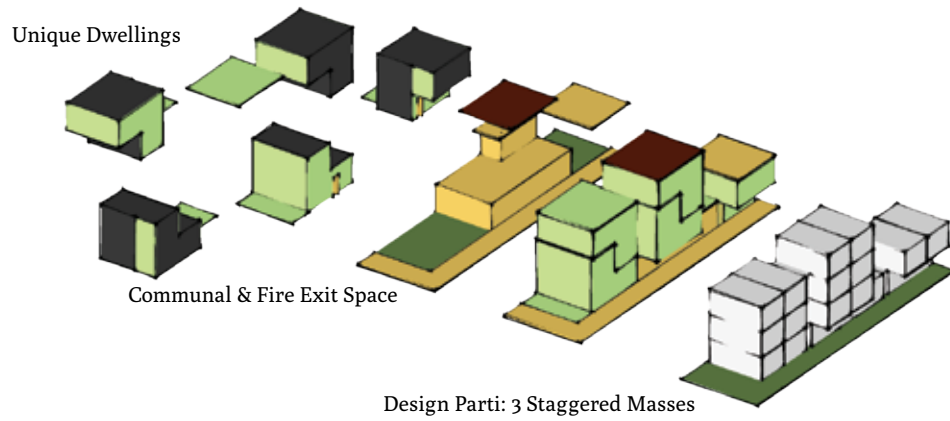


Detailed Axometric

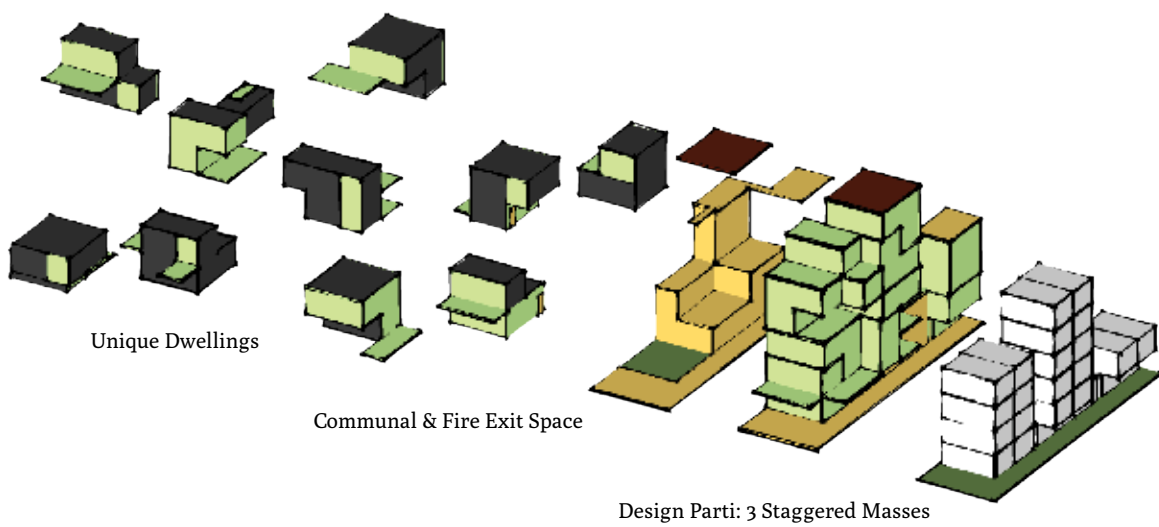


Programmatic Axometric

Figure 3.5.1: 3 BDRM Building Axometric showing Neighbourhood Relationships



6 Storey Typology



6 Storey Typology

Figure 3.5.5.2: 3 BDRM Diagram of private units



Figure 3.5.5.3: 3 BDRM Programmatic & Spatial Architectural Strategy Diagram





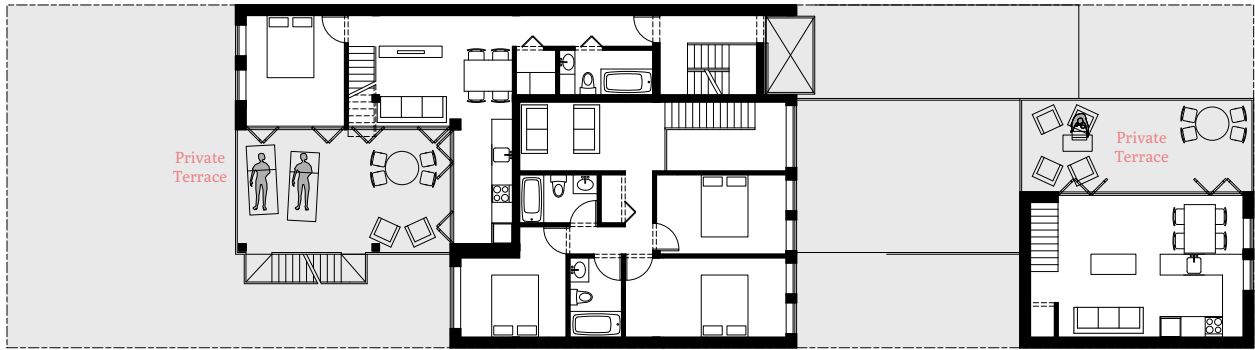
6 - 1/2 Floor Plan



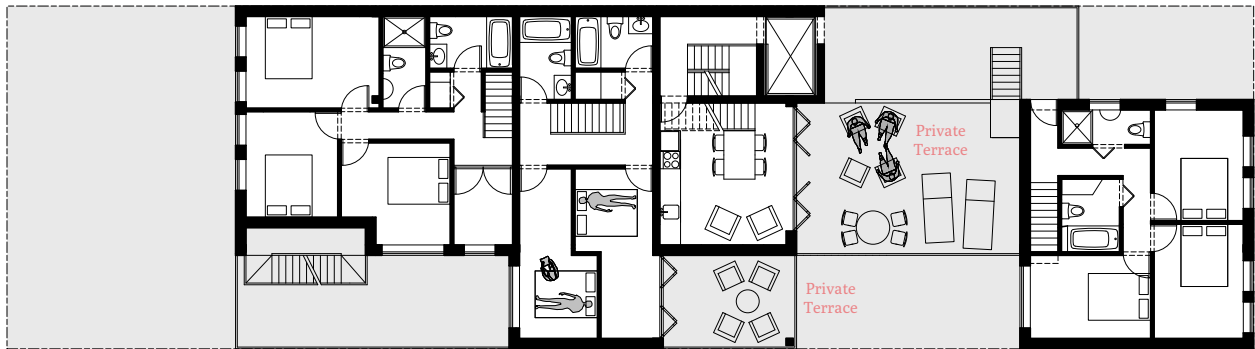
6th Floor Plan



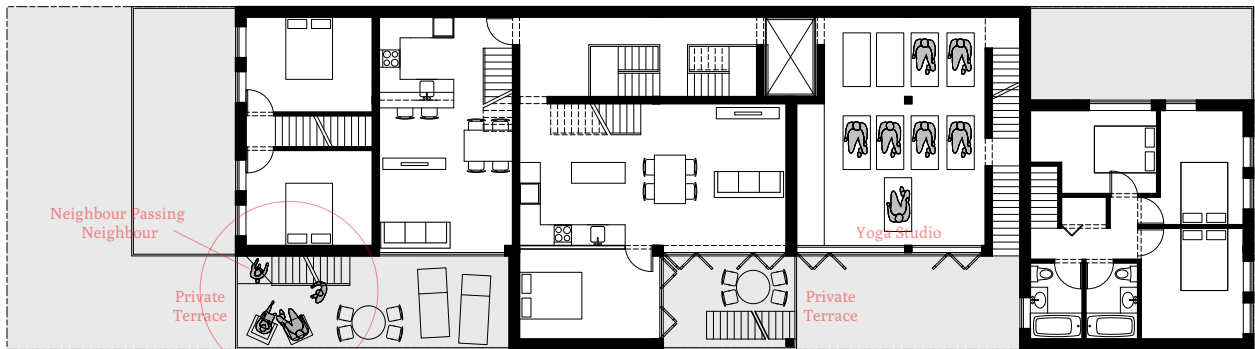
5th Floor Plan



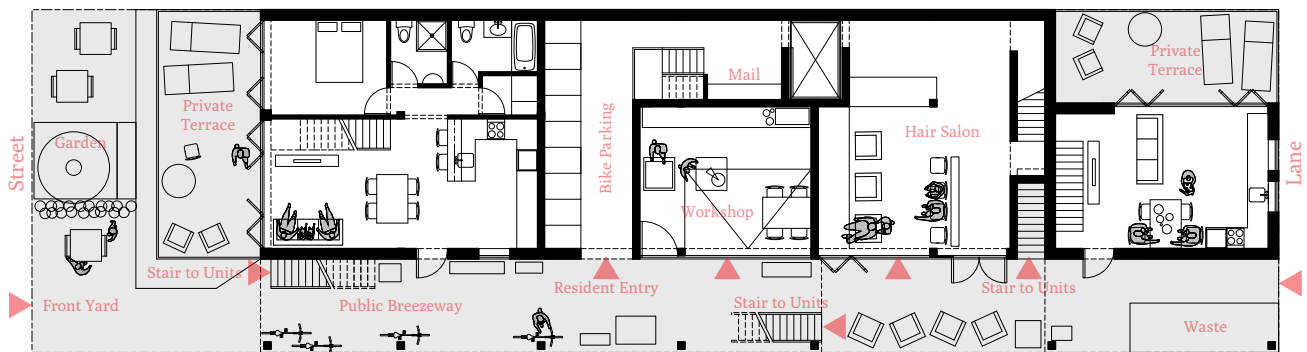
4th Floor Plan



3rd Floor Plan

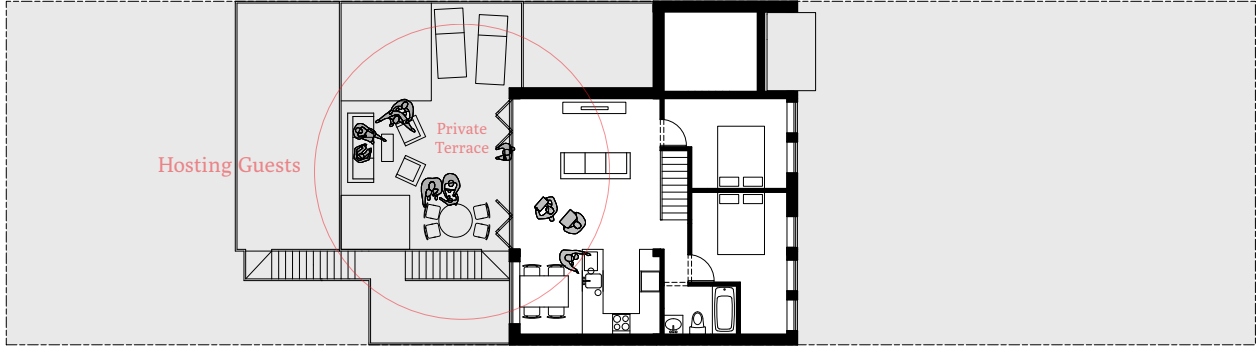


2nd Floor Plan

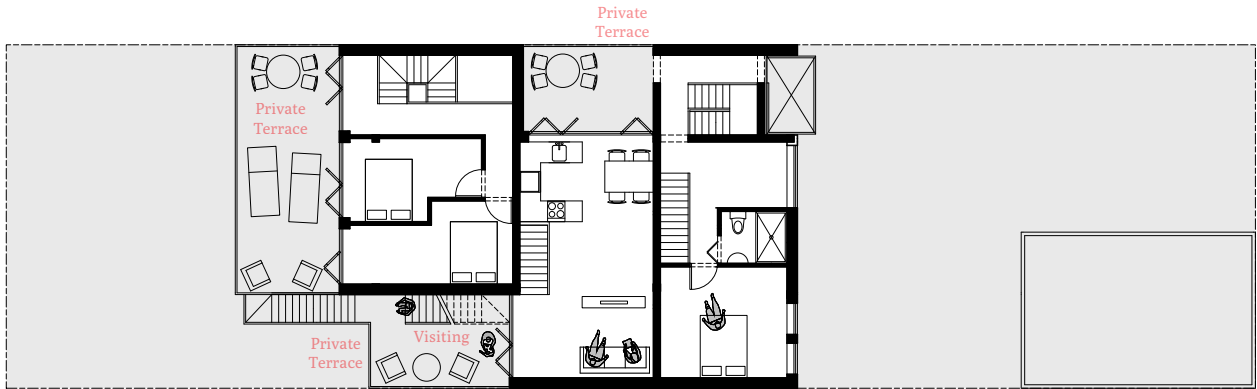


Ground Plan

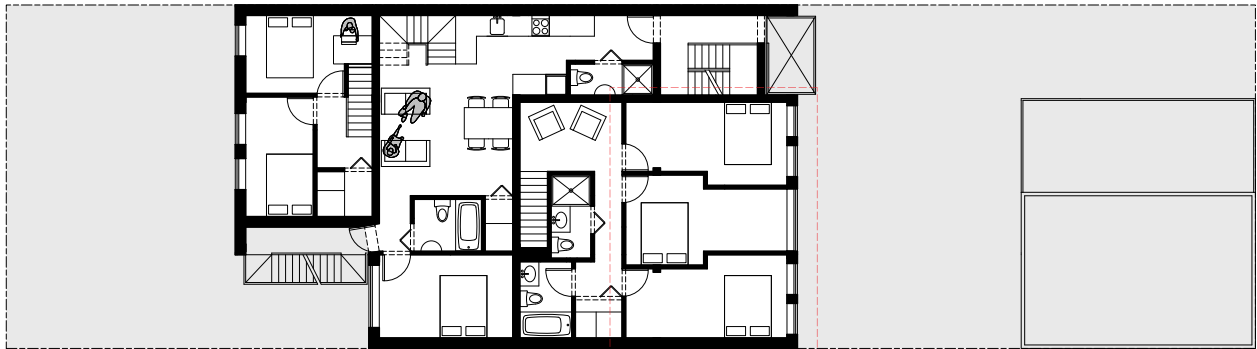
Figure 3.5.5.4: 3 BDRM Floor Plan Showing Potential Uses



6 - 1/2 Floor Plan



6th Floor Plan



5th Floor Plan

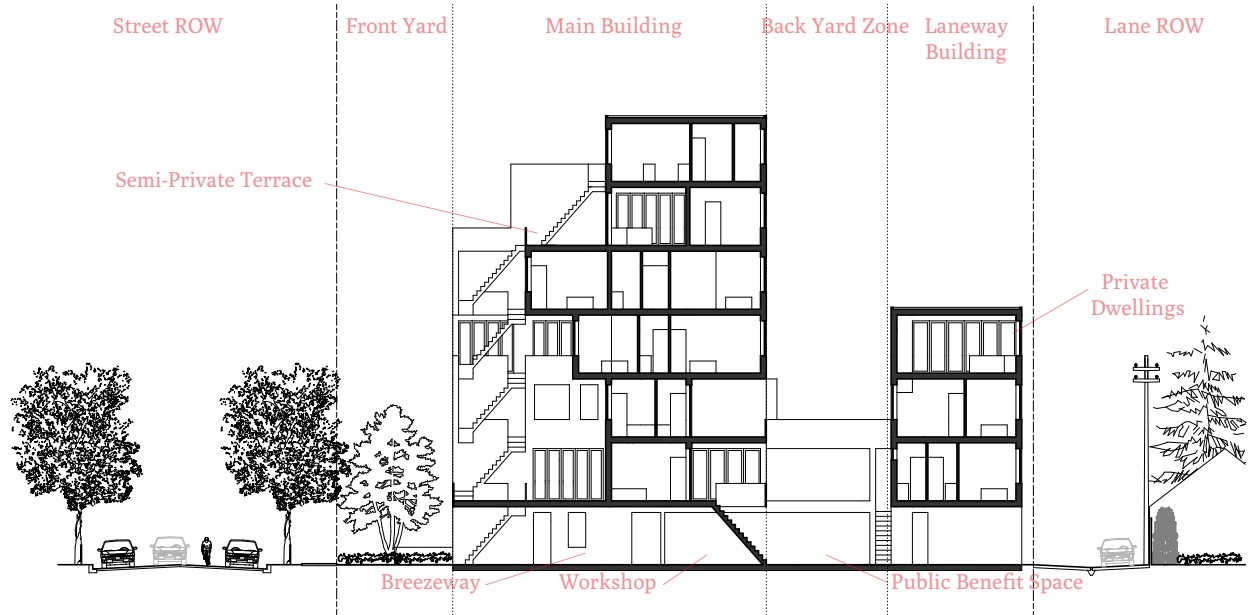


Figure 3.5.5.5: 3 BDRM Section A

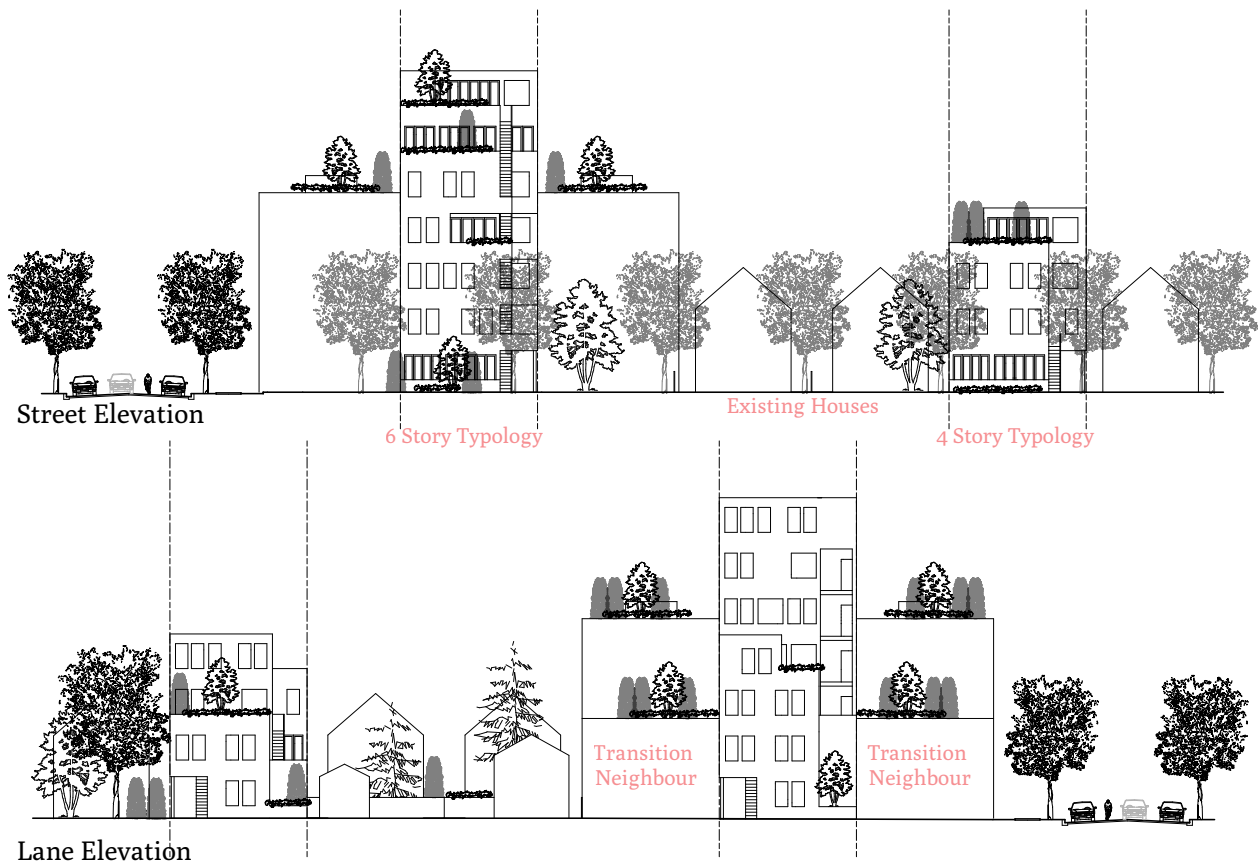


Figure 3.5.5.6: 3 BDRM Elevations

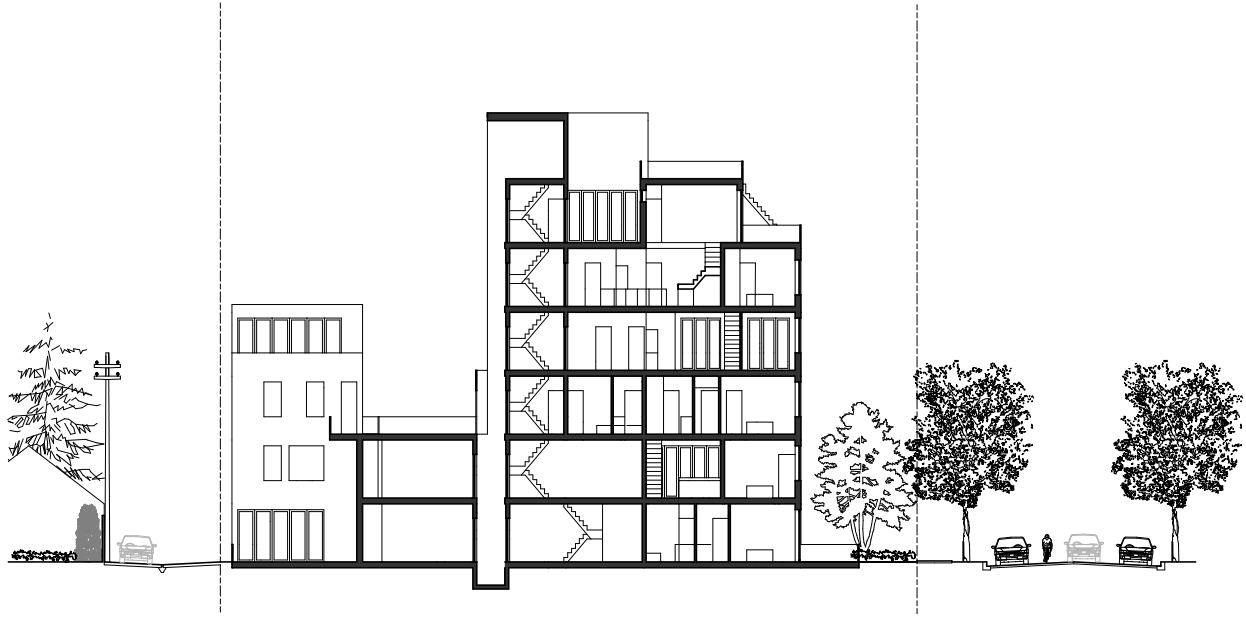


Figure 3.5.5.7: 3 BDRM Section B

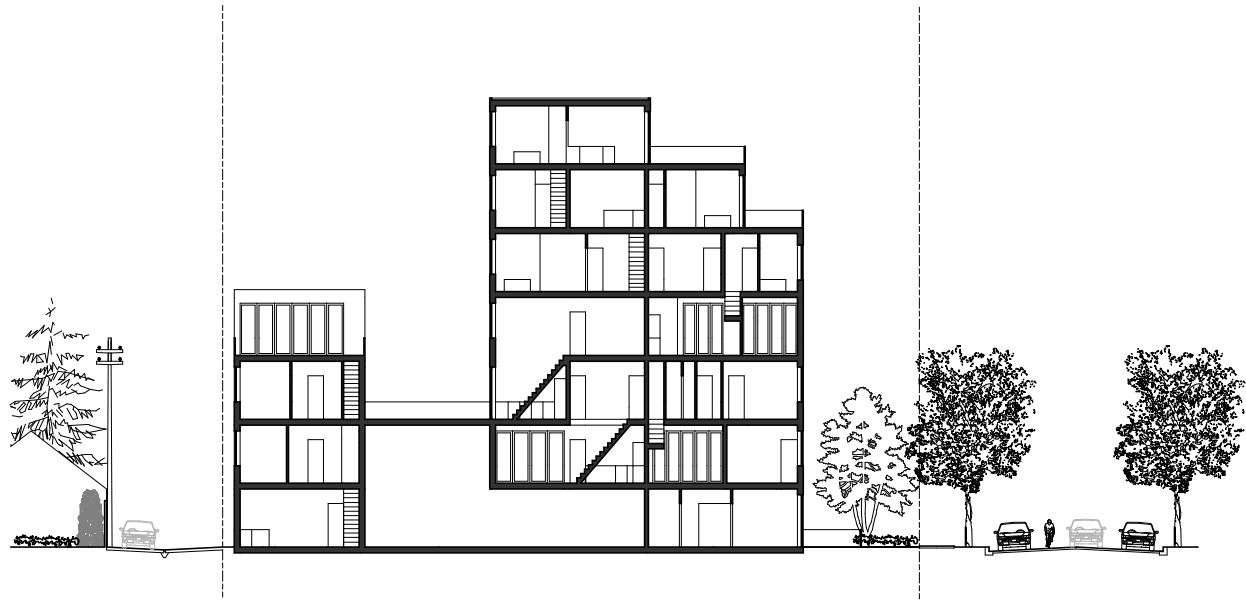


Figure 3.5.5.8: 3 BDRM Section C

# Dwelling

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On typical residential floors, above the ground floor, private dwellings are clustered per floor within cluster communal units. Within the private unit, bedrooms, kitchen, bathroom, and storage are provided, sometimes with additional living space dependent on unit size. The bedroom is inherently the most private and is situated at the opposite end of the private unit from the opening to the communal space. Private kitchens, bathrooms, and storage allow the occupant to individualize their space with personalized items and exist at their own level of cleanliness. This set of functions allows the dwelling to operate even when completely isolated so that the occupant can create a private isolated retreat when required. The kitchen is the most communal space within the unit and is therefore situated directly beside the communal space. The dynamic threshold between these two spaces is a large opening that can be adjusted to create different conditions: fully closed to isolate the unit, partially open to remain semi private but provide access to the communal space or as a welcoming gesture, or completely open to effectively extend the living space between the two units.

The unit cluster connects three or more private units together. It is a flexible living space which leverages the inherent social aspect of living spaces such as lounging or dining areas and provides one generous space for the cluster of private units to share. By using a dynamic threshold that provides the opportunity to isolate or integrate with directly adjacent communal space, the private units are able to be smaller, while providing the same amount of living space overall. This is because the proximity and large open threshold is designed so that occupants are encouraged to conveniently integrate the communal space into their daily routine, therefore becoming much more impactful to dwelling quality than a detached amenity space.

The communal space also acts as a suspended porch for dwellings on the level. Since it is not entirely private, but occupied intermediate space, it can act as a link to the rest of the building. An open access route passes through communal space putting it on partial display and encouraging multi-level familiarity of residents. The communal space is crossed as a final threshold to reach the private unit, so that one can passively observe activity in the space and have chance encounters to encourage comfortable use of the communal space.



Figure 3.6.1: Dynamic Threshold Example - Micro Unit Typology



Figure 3.6.2: Dwelling & Communal Space Example - Studio Typology



*Figure 3.6.3: Communal Space Example - 1 Bdrm Typology*



*Figure 3.6.4: Dwelling Example - 2 Bdrm Typology*





Figure 3.6.5: Breezeway - 3 Bdrm Typology



Figure 3.6.6: Dwelling & Terrace Example - 3 Bdrm Typology

# Public Spaces

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Vancouver does not necessarily require grand new parks. The city has large parks such as Stanley Park and Pacific Spirit, and smaller parks like Queen Elizabeth and Jericho, recreational networks like the seawall, extensive bike routes such as the new arbutus railway greenway, nearby mountains and other easily accessible regional nature reserves. Vancouver is a city of views and promenades, of great beaches and active routes, and close to wilderness landscapes.<sup>30</sup> However, there are very few pocket parks and the city can seem less generous when it comes to providing smaller services at the neighbourhood scale. The restructuring of amenity in high density building could allow for smaller public spaces to fill this gap and mitigate the impact an increase of population might have on public spaces and services.

In exchange for allowing the increased neighbourhood density, and to compliment the small dwelling units of the proposed housing framework, every typology offers three types of new spaces to serve the public and building inhabitants in various ways. As a neighbourhood densifies, these spaces enrich the residential fabric with a network of complementary services that new development and existing residents can share. In contrast to communal spaces linked to private dwelling spaces, these additional spaces provide amenity less integral to daily dwelling living arrangements but accommodate more occasional and recreational needs of residents. The three complimentary spaces are public benefit space, workshop, and front yard.

First, the public benefit space can be an additional domestic space, civic, recreational, cultural, care, retail or business unit, as long as it is determined to be a desirable addition by inhabitants. This expands the existing role of amenity and retail in current residential development from restricted access amenity such as lounges or exercise rooms and retail spaces that serve corporate chains, to possibilities only limited by user imagination. The space would be leased as an income source for the building to maintain its common utilities but with the mandate of providing a public benefit. The space could be leased by the city for civic or recreational purposes such as a library or resource centre, to a group of residents for use as a communal kitchen or clubhouse, for care providers and non-profits who want to improve access with a neighbourhood outpost, and as an affordable space for entrepreneurs to start a business or provide a convenient retail location for social mixing such as a cafe or barber shop. As an alternative to leasing, inhabitants could produce a space they require themselves and open



Figure 3.7.1: Workshop Example - Bike specialization Example - Studio Typology

it up at certain times for a fee as an alternative income source. The public amenity space has a separate street address, street frontage, and front yard entry space to create a public presence.

Secondly, the workshop is not just a place to fix and build things but a gathering space for those with like minded interests. The first workshops in a neighbourhood start out as a general do it yourself support space to encourage the shared maintenance and production of shared space and resources. As the network of densification grows, workshops can specialize and become specific hang out and work spaces for things like furniture and bicycle repair, reciprocally shared between nearby developments and established residents. Possibilities are not limited to uses such as a shed to store neighbourhood kayaks as a meeting point for weekend adventures or as sewing club providing a space to create together. The workshop is local and specialized, so it is expected that visitors have prior knowledge of its location and therefore its public access opens onto the rear laneway. The workshop also opens onto a shared courtyard so that in good weather activity can spill outside and be more engaging within the building.

Lastly, the front yard is no longer needed as a threshold between private and public due to the first floors communal nature, and can therefore adapt a different more productive purpose. The yard, between public benefit and residential entries can provide a small pocket park, capable of more traditional gardens or interactive activities such as a shortstop as an outdoor playspace along a neighbourhood walk, similar to the occasional tire swings and community sidewalk box libraries that currently exist. Public benefit spaces may expand and program their frontage where applicable, or residents may choose an aesthetic entrance to upkeep. The yards would be less a destination and more of an enrichment to a passerby, as front yards provide now, but in a more varied and development appropriate method.

By expanding public spaces cooperatively with private residential construction, public services can be expanded to reduce the stress of new inhabitants on existing some existing services while adding new or more convenient ones for the whole neighbourhood. Having a flexible framework for public space can allow it to react to resident needs resulting in more productive, more intensely used spaces that can foster relationships between the building and the greater community. This model of micro responsibility making up a public network would make ownership of spaces more grass roots, and make it easier for an individual to get involved in its design, participation, or improvement without centralized regulation inhibiting the process.



Figure 3.7.2: Public Benefit Space Example - Library Benefit Example - 2 Bdrm Typology

# Omission of Parking

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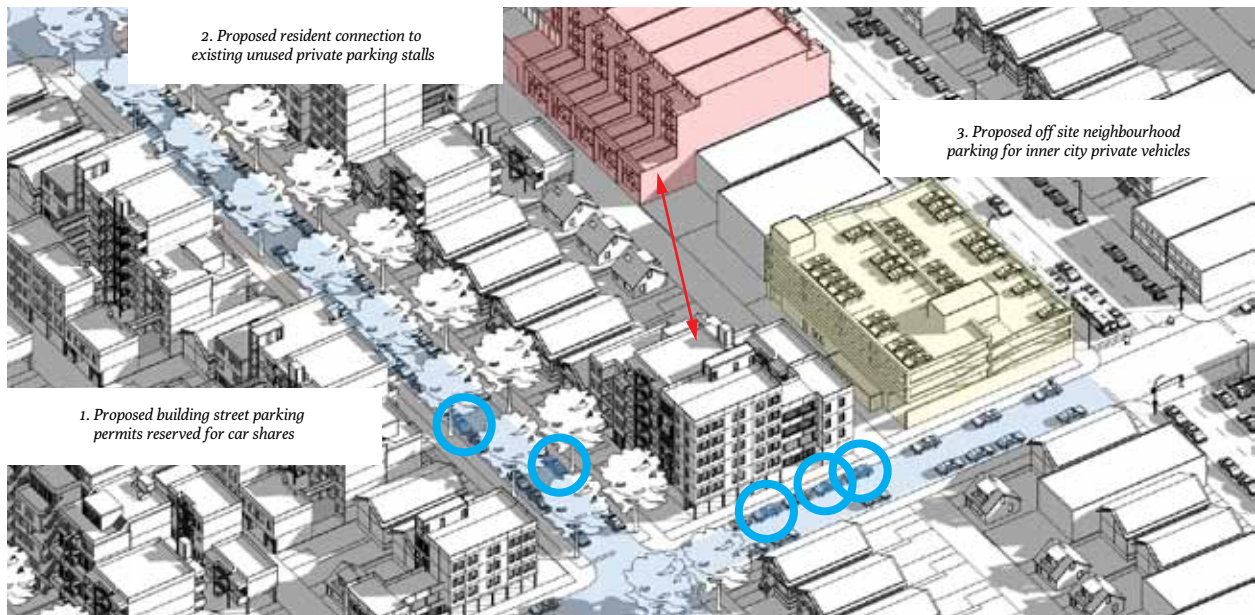
Parking and additional traffic is one of the most common forms of resistance to development in Vancouver, and is therefore critical to address to avoid disrespecting established neighbourhoods. These issues are valid, as studies have concluded in densified neighbourhoods such as the West End, residents take on average 10 minutes to find a parking space, and visitors 20 minutes.<sup>31</sup> Vancouver is often rated one of the worst cities in North America for traffic congestion, due to its lack of major inner city vehicular infrastructure.<sup>32</sup> Fortunately, Vancouver is aiming and succeeding in reducing car trips within the city by improving other forms of transportation.<sup>33</sup> A variety of metrics point to omitting parking from the proposed development.

First, making the street the primary parking strategy for new development would encounter resistance due to lack of space, so the proposed zoning by-laws should include a clause prohibiting the allocation of permits to residents of this housing framework. This would preserve parking for existing residents and reduce new traffic. Residents moving to the development would be aware of this condition prior to occupation and therefore could plan accordingly. Due to transit and bike infrastructure improvements, trips by vehicle within Vancouver have been decreasing and now represent less than half of all trips travelled.<sup>34</sup> The increasing urban condition of the city making other modes such as walking more pleasant, and shifting preferences away from car ownership have decreased drivers, especially among the younger demographics, one of the key anticipated inhabitant groups. Licences issued according to ICBC have declined by 10-15% between 2004 and 2014.<sup>35</sup>

Where cars are necessary, such as in heading to popular wilderness destination outside of the metro area, or for occasional convenience within the city, all 4 car shares currently provide service across the entire proposed territory.<sup>36</sup> As of 2015, over a quarter of Vancouverites were a member of at least 1 car share and their services continue to gain popularity.<sup>37</sup> A critical mass of users has made car sharing exponentially more convenient and affordable. Street space typically allocated to private vehicles could be allocated to car shares as a low cost method to access a car when required.

If one insists on having a car, they should have to bear the additional costs of ownership without the subsidization of non-owners. Currently, one Vancouver study estimates that each parking stall adds 20-45,000 dollars onto the cost of each unit, and that about a third of all parking stalls remain permanently empty when one stall is built per unit because of decreasing ownership.<sup>38</sup> The dimensions of the proposed lot make parking extremely ineffective, and would require the introduction of expensive concrete construction, making on-site parking incompatible with these typologies. Vehicle ownership is also a large expense, with one Vancouver study estimating annual ownership at \$8600 - 13000.<sup>39</sup> To accommodate ownership, an app or city program could connect existing empty parking stalls to those with vehicles to be rented out for a fee. A limited number of offsite neighbourhood parking garages, above or below ground, could be built. Most sensibly however, a network of long range parking centres for both private and shared vehicles at the edges of the city at major transit nodes would allow for car usage outside the city without increasing any traffic in Vancouver, bypassing regional congestion choke points.

The city recognizes the need to constantly innovate on this issue to reach their modal trip targets. In the article "Future Cities: Vancouver, how a city built for cars is changing its ways", Alex Bigazzi, a civil engineering professor at UBC, notes that increasing population density will not only be critical to reduce car trips to avoid congestion, but "repurposing land covered by road and parking will be critical in public space creation."<sup>40</sup> Other cities have aggressively pursued decreasing car use through restricting parking. The City of London has banned new car parking spaces believing "for too long our housing and infrastructure has been built around the car",<sup>41</sup> Mexico City recently enacted a complete reversal to parking, changing their bylaws from minimum parking requirements to banning new parking outright,<sup>42</sup> and even luxury condominiums in New York are moving away from parking, owning their own shared vehicles and offering concierge service instead.<sup>43</sup> Therefore the removal of parking is a positive progressive approach.



“Vancouver is the car sharing capital of North America”  
 -Vancity Report

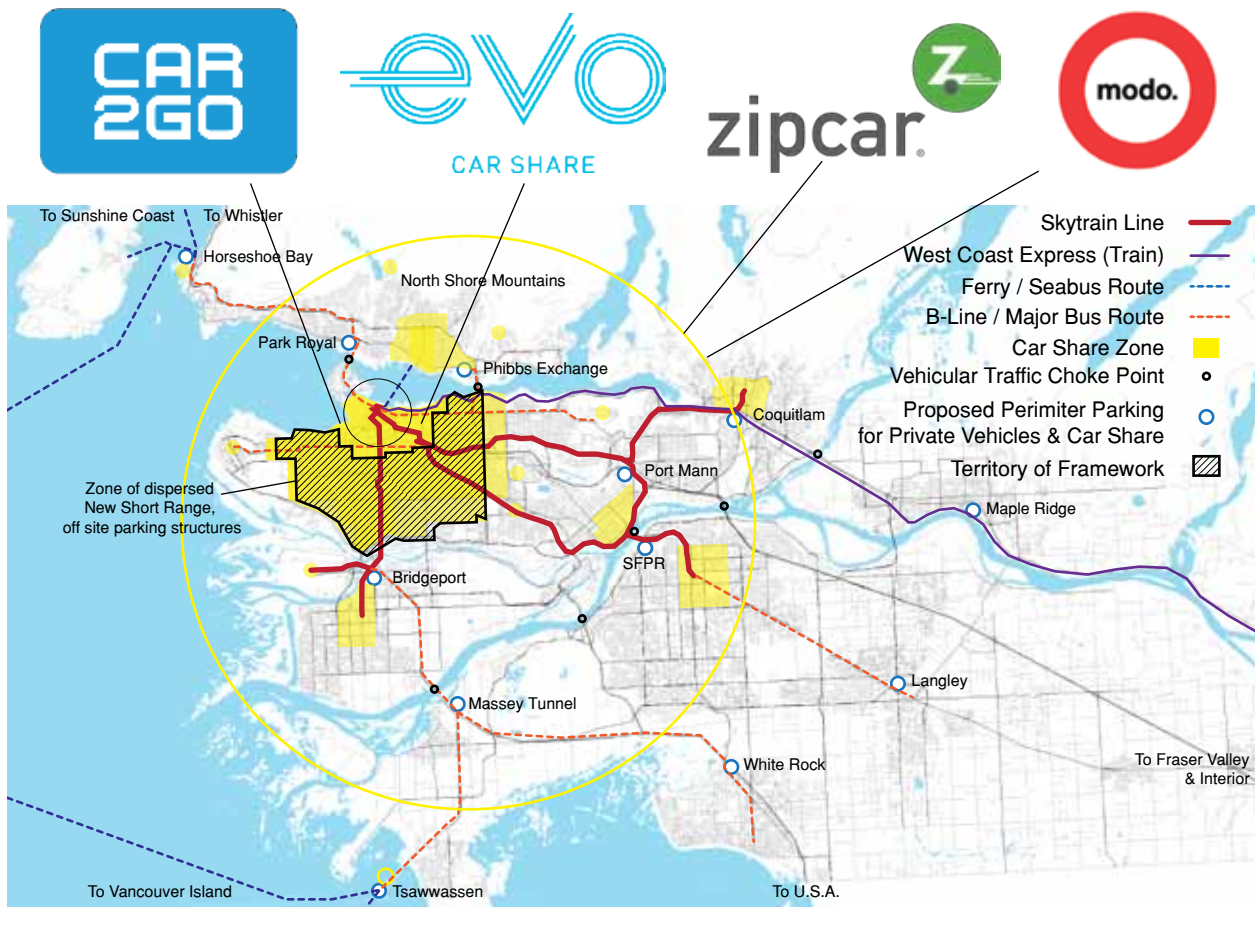


Figure 3.8.1: Existing Car Share Options and Proposed Private Vehicle Parking Alternatives



Figure 3.8.2: Car shares are popular, it is not uncommon to see streets lined with them.



Figure 3.8.3: Zipcar has a number of vehicle types to suit all terrains and longer rentals for road trips.



Figure 3.8.4: Evo Car shares are equipped with bike and ski racks to easily use when leaving the city

<b>Private Vehicle</b>	<b>\$8600 - 13000</b>	<b>Parking Stall Construction Cost</b>	<b>\$20,000 - 45,000</b>
<b>Car Share</b> (Determined by report showing savings over personal car ownership, not per equivalent use.)	<b>\$6752 - 7780</b>	<b>Transit Costs (Based on 12 Monthly Passes)</b>	<b>\$1092</b>
<b>Street Parking Permit</b>	<b>\$0 - 360</b> Dependent on Neighbourhood Density	<b>Cycling Costs</b>	<b>\$350</b>

Figure 3.8.5: Annual Costs Associated with Each Transportation Type

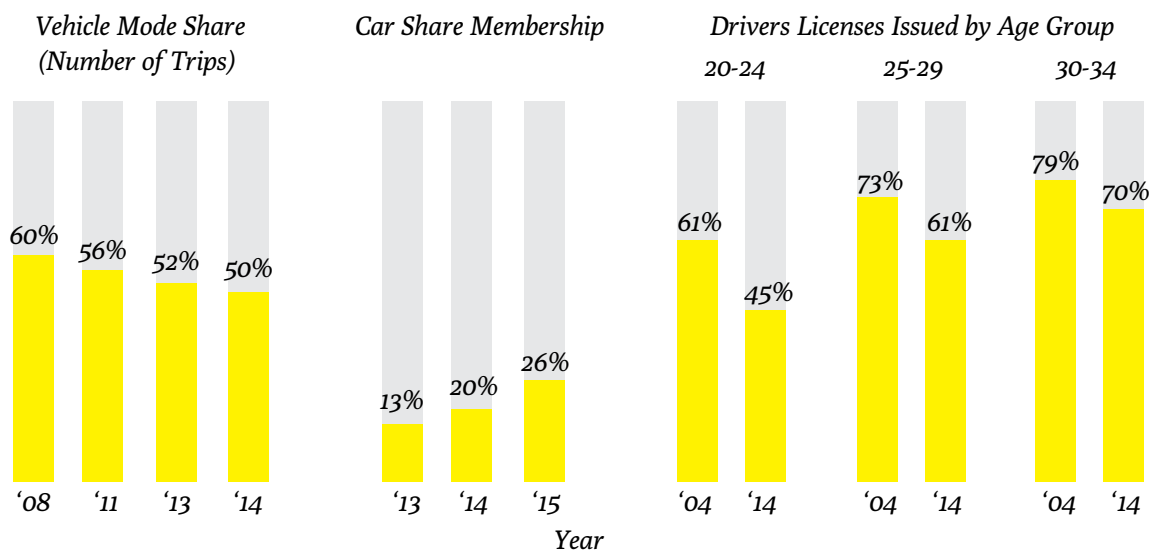


Figure 3.8.6: Metrics showing private vehicle usage declining



Figure 3.8.7: Burrard Bridge, a major link between the Kitsalano and downtown, has built two lane protected bike lanes attracting over 1 million trips in 2017



Figure 3.8.8: Fully seperated bike routes with well marked crossings and seperate bike traffic signals have made cycling a safe and viable option to an increasing number of residents.



Figure 3.8.9: Trip trackers at major cycling points encourage cycling trips

**Bike Infrastructure:**

Vancouver has the highest rate of cycling trips per capita in Canada. Prioritization of cycling improvements such as the expansion of AAA infrastructure, routes, and promotion events have made ridership accessible to all. Cycling routes generally occur on residential streets in Vancouver's detached house neighbourhoods.

**Walkability:**

“Walk Score ranks Vancouver as Canada’s most walkable city in 2017.” Previously densified neighbourhoods have increased neighbourhood walk scores, based on nearby amenity and urban attributes, so the proposal should only improve residents ability to travel to destinations by walking.



**Bus:**

Buses run on arteries within the neighbourhoods, often lined with retail and other amenities. Due to the city road grid, travel by bus is an easy and convenient alternative to driving.

**Skytrain:**

Travelling further within the metro is served by the skytrain and all lead downtown, furthering the selection of non vehicular travel options.

Figure 3.8.10: Non-Vehicular Transportation Options



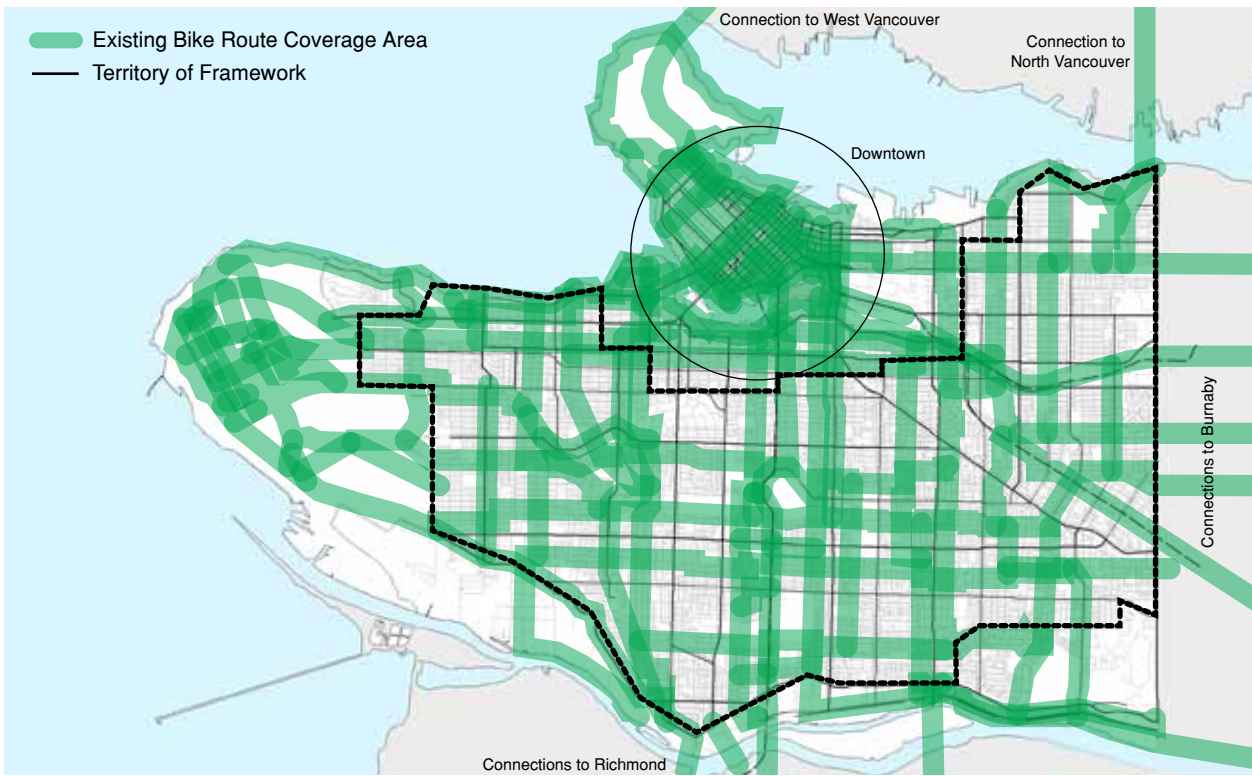


Figure 3.8.11: Map of Existing Bike Route Coverage within the City of Vancouver

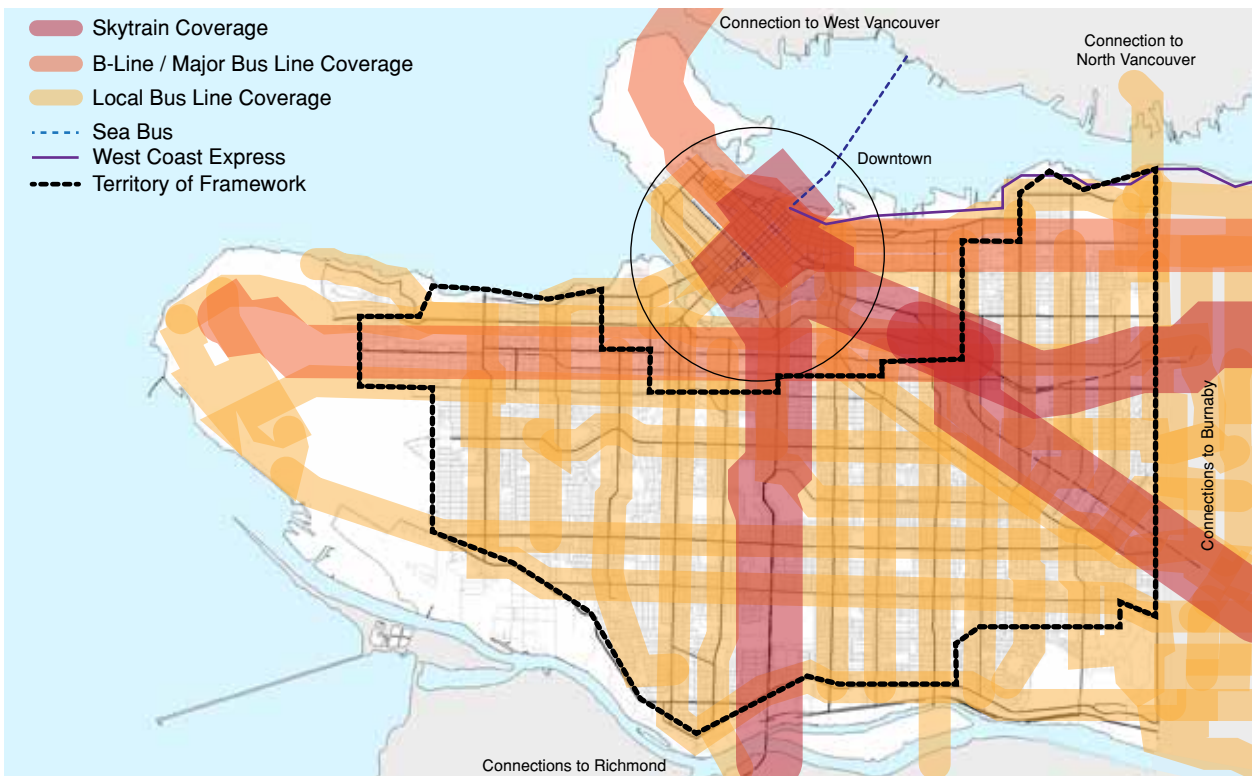


Figure 3.8.12: Map of Transit Coverage within the City of Vancouver

# Forms of Ownership

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Ownership models can take a role in making co-living successful and in preventing investment demand from controlling the market. The unique division of private dwelling, cluster unit, and building as a whole requires three levels of varying ownership and autonomy as opposed to purchasing land with one level, and condominium stratification and co-op agreements with two levels. Both stratification and coop models infringe on the living arrangements of residents. The stratification model is too individualized with absolutely no input from existing residents. Stratification deals with common maintenance by collecting fees to be conducted by a third party and creates rules through arms length boards.<sup>44</sup> The nature of the uninvolved building maintenance and board rules focused on investment protection contributes to making dwellings unaffordable. Co-op structures are often better suited for affordability but police dwelling prices in a way that discourages developer investment which leads to a shortage of supply. Co-ops also often formalize and standardize occupant responsibilities which does not recognize an individual's interests or preferences, and makes communal participation a chore.<sup>45</sup> The extension of living space into shared territory must be addressed by a new model of ownership. Sharing works best when sharers have safeguards such as the ability to decline, research, and come to negotiated agreements with other potential sharers. Therefore ownership must address how occupants within a cluster unit can influence the selection of new members.

The proposed ownership system proposes a three tiered shareholding structure which gives the owner complete ownership over their private dwelling, equally shared ownership of communal spaces within the cluster, and fractional ownership over the entire building, which is free to be sold at any given time. New owners for private dwellings would have to receive unanimous approval for the new buyer from others in the cluster. As a safeguard to the owner, the building may collectively provide oversight to ensure the reasonable reception of a new owner if multiple new members are turned down. Governance would be conducted by direct and open meetings with all owners involved and equally represented if they choose to be, or the building can create a representative from each cluster to convene to make decisions on their behalf. This way residents have a clear path to express their opinion and make decisions more personable, decreasing living restrictions. Responsibilities are formed through shifting informal negotiations to adjust to the needs of all occupants. The maintenance and operation of the building would need finances so a fee would have to be levied on tenants, but participation in maintenance could see the fee waived through labour or other contributions keeping costs low, and encourage bonding and pride in the building.

In rental situations, the system would be similar, with the tenant acting in place of the owner, placing the importance of the participation of the person and not capital. Monthly rent would be split into owner income and building fee so that tenant participation is encouraged regardless of residence model.

It is expected familiar social relationship patterns would emerge within unit clusters. The varying typologies make the cluster adaptable to accept pre existing groups of students that would traditionally enter into a room sharing situation or different cultures that allow multi-generational families to live side by side while maintaining some autonomy. Groups of strangers coming together in a new building could mix and self appoint clusters before building completion to reduce lifestyle conflicts. Groups might assemble by age, ethnicity, profession, household type, living schedules, or decorating preference, but this would be determined by the occupants themselves. Differences might become strengths as well. A young couple with a dog may benefit from an elderly couple next door to watch their pet during work days while the elderly couple benefit from companionship, purpose, and an alert neighbour in case of a health problem.

Building to building, the occupants would own the workshop space, but would enter into reciprocal agreements with other densification projects to make workshop space more efficient to accommodate a greater variety of uses. Public amenity would be leased to the building to contribute to building maintenance costs and the residents would be in control of choosing the leaseholder.

This type of ownership and occupant involvement would ensure equal participation in building affairs while limiting communal space friction. The result would encourage more reactive and creative spaces and a more active community.

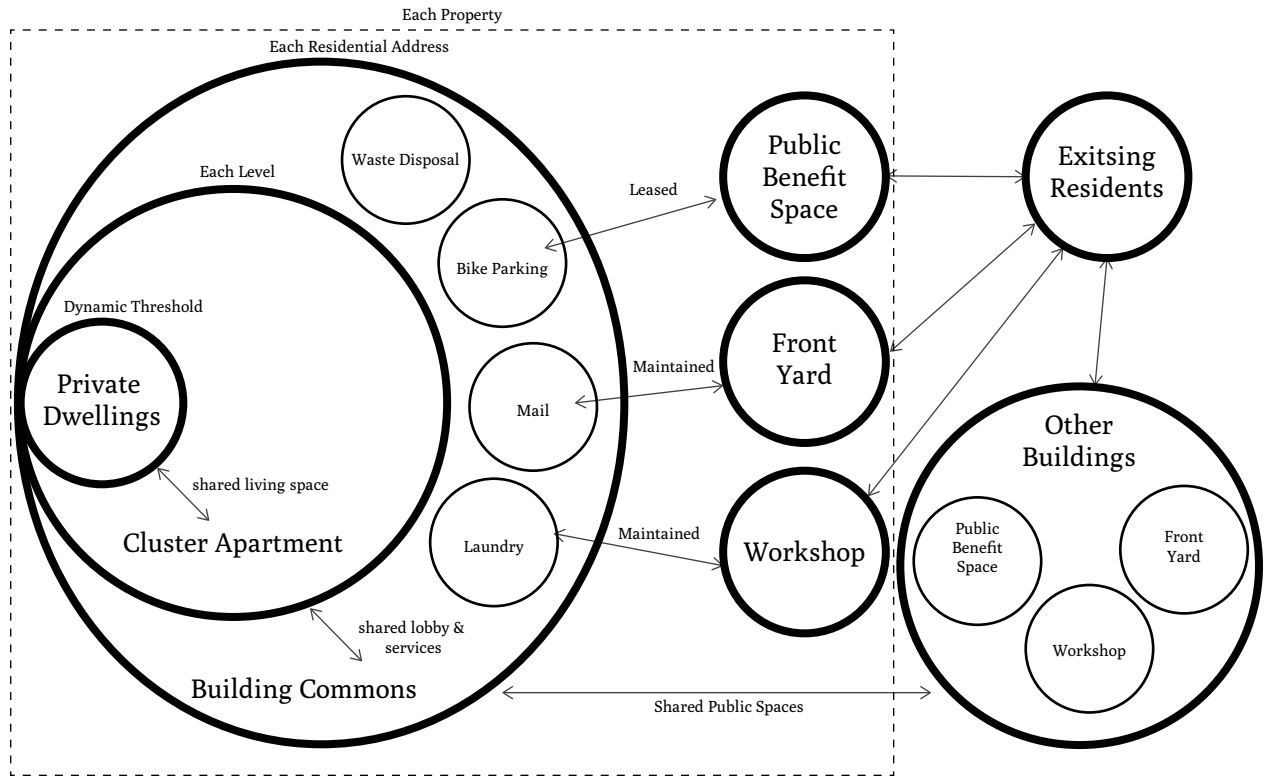
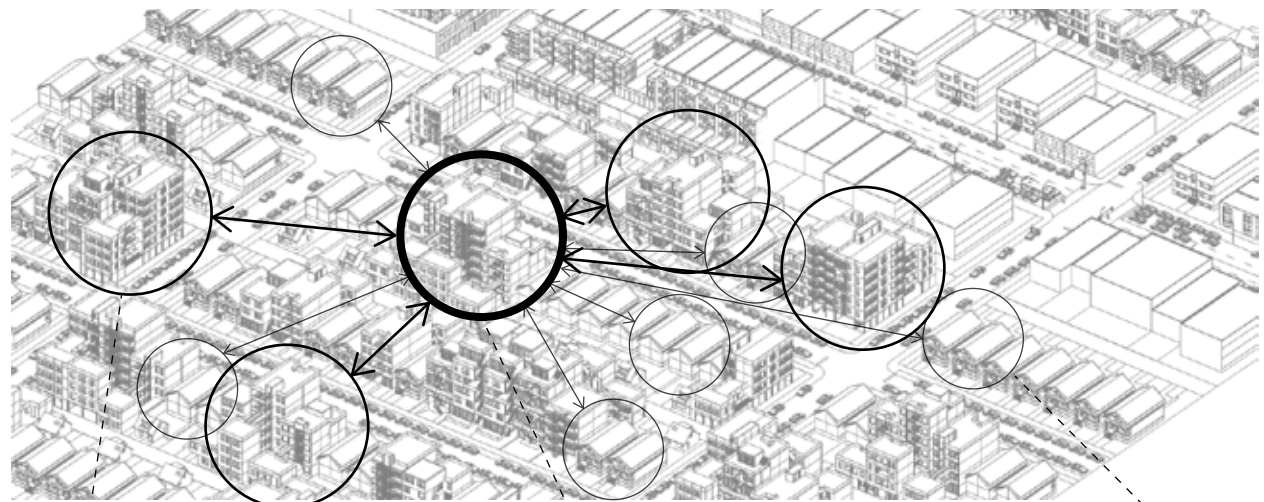


Figure 3.9.1: Building Relationship Structure



**Reciprocal Workshop Agreement**

Network of specialized shared workshops accomodating different hobbies instead of the most generic common amenities repeated inefficiently.

**Example building**

**Exiting residents**

Locals are able to access workshops and benefit from new public spaces and services that vary by development

Figure 3.9.2: Neighbourhood Relationship Web

# Resultant Neighbourhood

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The presence of the housing framework require reinterpretations of existing spaces to satisfy both the existing residents and the changes in dwelling typology. One component that does not change is the 20' setback which creates the front yards. Preserving the setback preserves a wall of built form and leaves space for vegetation and large street trees which is an important characteristic of established neighbourhoods. The front yard remains the domain of the pedestrian with no driveways or parking spaces to navigate across, and the curbline is maintained. Since each lot is required to be developed separately, the frontage rhythm of the street is also preserved so that the horizontal perception of massing is also relatively unchanged. These factors result in a physical streetscape that is very similar to existing conditions. Since the proposed density of dwellings is so much higher than the existing, and the development scheme so finely grained to a single lot, the timeframe of densification is such that these buildings will coexist for a very long time so it is intentional to keep intact the qualities of the street so that negative effects on existing residents are minimal. This contributes to the goal of lessening public backlash against development that slows new dwelling construction and ultimately creates greater unaffordability. Importantly, by expecting no major changes in urban fabric or altering of public rights of way or property division, there are significantly less hurdles for the proposed buildings and empowers individual players to pursue development without relying on any physical reconfiguration by others. What does change is the function of the front yard, which must shift to reflect the differing nature of approach between a detached house and mid rise building, greater population density, and introduction of public programming.

A detached house and multi-unit dwelling have different relationships to the street. The detached house (consisting of traditionally 1, but up to 3 dwellings) is a private domain, with a traditional hierarchical ownership model where one or two residents control the property and it is likely there is some sort of personal relationship with all inhabitants. This renders the building private in comparison the public street. Therefore, for the detached house the front yard serves as a mediating threshold between the spatial poles of public and private. The yard manifests itself depending on the desired outcome of this function. If separation and privacy is a priority, at its extreme, it is not uncommon in Vancouver to find only a small gate in a giant hedge blocking the yard entirely. Others take pride in beautiful gardens, welcoming entrance paths, extending their living space into porches and patios. Whatever the priority is, the yard lies on a spectrum of thresholds serving the function of mediating this public and private relationship. The proposed densification not only proposes a much greater dwelling count but integrates public programmes in its neighbourhood benefit spaces and clubhouses. This means that although the building is residential, at the point of entry, it is not private. At the same time, it is not as public as the street. The shared spaces of the buildings initial reception have an extra layer of communal ownership by the large group of residents and curators of the public programmes. Therefore a threshold function of the front yard remains, yet it is mediating a different gradient where the building is much less private upon approach. In "a house in the city", the book compares the sequence of thresholds that one experiences upon entering a house versus a condominium, A house could include a "busy thoroughfare, side street, lane, courtyard, entrance. The experience of threshold for dwellers of multistorey flats is altogether different. While the sense of detachment is ensured, it is achieved at a cost. They are withdrawn completely from life of the street, and homes are often approached through a sequence of anonymous lobbies, staircases or lift cars and corridors before they are eventually reached".<sup>46</sup>

The following strategies are used to adapt to the new conditions. First, a distinct residential address and a second, separate benefit space entrance are created. Since our current urban environment trains us to avoid entering a building meant as residential, and having a street address is a desirable and orienting detail to relate our home to the city, the residential address is independent. It is instead much more utilitarian in nature, focusing on community. Since the main modes of transport are walking, transit, cycling, and roadside car shares, the front door once again becomes the primary entrance and a much more



Figure 3.9.1: New Street Dynamics



Figure 3.9.2: Example of new front yard functions at densified lots.

chaotic scene of residents pushing strollers, carting in bicycles, or carrying groceries. The reception inside includes space to meet friends, store a bike, post building information, gather mail, and as the primary conduit to the city.

The front yard is therefore in relation to these interior functions. The front yard is also the only significant exterior space at grade, and as such is pressured to assume a more interactive role in the daily lives of the residents. The adjacent benefit space can take over the remaining yard that is not used for the residential address to extend and crucially reveal itself to the public. For example a daycare may construct a small playspace, a cafe a patio, or library a sitting garden and bike parking. So the front yard must convey the character of the address and establish a responsible stakeholder over that space and act to reveal its public benefit. The result is a drastically more occupied front yard with a mix of resident and neighbours all using the space. It is the intention that this co-occupation can adequately replace the interesting streetscapes created by the single owner expressions and diversity of detached houses which contribute so much to these neighbourhoods.

Likewise, the garage and laneway frontage adapt from their existing roles. The new development results in far too many dwellings to accommodate privately owned cars in an affordable manner, but the role of the garage is evolved to provide greater benefit than car storage. The shared workshop space focused on the diversity of people's interests can broaden the opportunities to pursue something that may not be possible within the restrictions of a small unit. These workshops are accessible for the laneway and the lane's function shifts from shared driveway to a micro street of shared spaces in addition to its continuing role for garbage removal and utility servicing. The result is preservation of the right of way for the remaining homes for parking access, but the densification introduces another layer of function and domain for the public. This continues the changing character of laneways brought about by the growing supply of laneway houses already being built in the city.

The architectural relationship of the building to the public realm also shifts. While detached houses, by their nature of centralized and clearly bounded ownership are able to express a singular character and easily denominate each property, multi-dwelling buildings are more complicated. While it is not necessarily bad to replace individual autonomy with a wholistic building design for a collective to identify with, this relationship becomes completely absent of any individual autonomy. Building control is mediated by an intermediate group, producing less domestic spaces which do not relate to the established neighbourhood. To empower the individual and actually encourage some form of regulated chaos to dissuade the extreme levels of investment activity in the housing market, the individual should be able to make some decisions at their own expense to the envelope of their dwelling. This intervention cannot negatively impact other dwellings in the form of shading, thermal barriers, water barriers or structural integrity, but there is a risk of aesthetic clashes. Small details such as facade colour or planters would be rather harmless experiments in giving up control to the unit owner. This would display the new vertical and finer grain of property distribution of these buildings that is similarity present at the scale of a street of houses.

Finally, access is no longer about creating a path around the property to each suite but a navigation vertically, potentially past multiple thresholds to reach a dwelling. Each building has an open stair that is not only visible from the street but also to each floor's common space making navigation much simpler and intuitive. Visiting a friend is a whole lot easier and inviting when you can describe your home as the building on spruce street with the playground in front and the green unit on the third floor, while as you approach you can clearly see the stair route to your destination from the street. The stair provides both a link and social mixer between shared spaces on each floor but a more tangible grounding for each unit to the city as a whole. The stair can be seen as the vertical yard of the building in terms of its function as a mediator between public and private and its potential of chance encounters with neighbours due to its integration with the buildings communal spaces.



Figure 3.9.3: The shift of exterior recreational space to roof tops from backyards and high visibility of stairs.



Figure 3.9.4: New and existing zones of vegetation and division of building facade by ownership of dwelling.

# Neighbourhood Density Comparison

An average low density neighbourhood in Vancouver has an existing density of about 4400 people per km<sup>2</sup>. This rises to around 6800 people per km<sup>2</sup> for many neighbourhoods with modest densification or secondary suites in existing houses.<sup>47</sup> There are about 1793 typical lots in a km<sup>2</sup> averaging 2.2 people per unit and typical lots cover about 36km<sup>2</sup>, which is 65,000 lots total.<sup>48</sup> This section will explore 4 possible densification scenarios to understand the impacts of the proposed housing strategy.

The first scenario assumes the City of Vancouver grows consistently over the next 40 years, adding 200,000 people to its existing 630,000 as of 2016.<sup>49</sup> To achieve this growth, only 8%-19% (depending on occupancy, typology mix, and household type) of typical lots would need to be densified, and if population was distributed equally across this area, population density would increase 150% from existing levels resulting in 6688 people per km<sup>2</sup> to 10,000 people per km<sup>2</sup>. In comparison, the density would still be less than Vancouver's Marpole or Kitsilano neighbourhoods although one can assume growth would be uneven and produce localized densities equivalent to these neighbourhoods. Internationally, neighbourhoods of similar wealth and density can be found in the London borough of Ealing, and among many inner city San Francisco neighbourhoods, such as Pacific Heights.<sup>50</sup>

The proposed housing framework never intends to achieve 100% lot densification, as it is purposely planned to coexist with existing neighbourhoods to preserve detached houses of heritage or architectural value. Population growth would also make this outcome unrealistic because this densification strategy could accommodate far more people than projected estimates, if applied to every lot. However, it is possible pockets may develop more than other areas, resulting in localities approaching 100% densification, which the following three scenarios address.

At the low end, assuming small households and mostly 4 storey typologies, each lot would increase its inhabitants from 2.2 people to an average of 18 people. This results in densities per km<sup>2</sup> of 28,688 people, 9 times higher than existing levels. This is similar to the current density of Vancouver's West end. Another comparable density within Canada is the Church and Wellesley area of Toronto, which is a mix of towers, narrow mid rise apartments and a few 2 storey row houses on either side of a low rise retail strip.<sup>51</sup> Internationally, this density can be compared to the parisian neighbourhood of Pre-Saint Gervais, which is comparative in wealth and relation to the city centre. Pre-Saint Gervais is a mixture of tightly packed two to three storey row houses with backyards and 4-6 storey apartments that are built around the perimeter of the blocks.<sup>52</sup>

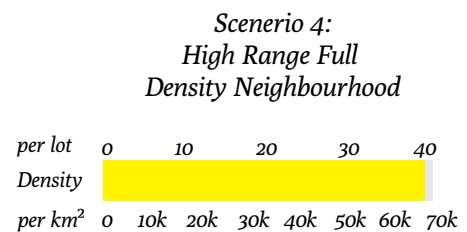
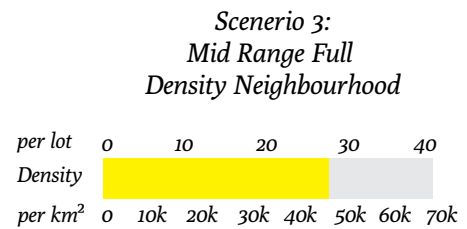
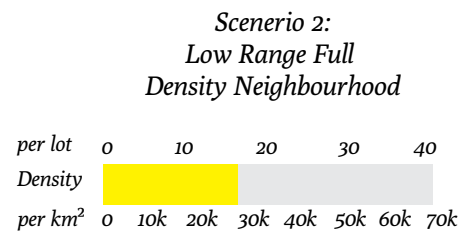
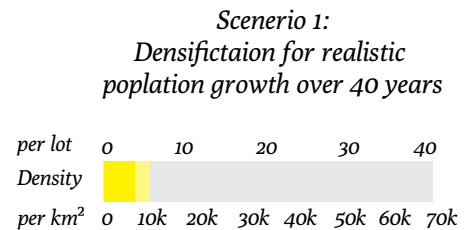
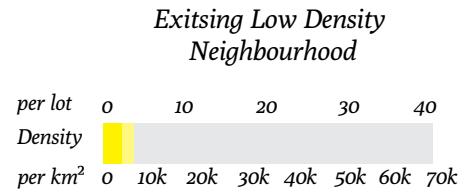


Figure 3.10.1: Density Comparison



**Scenerio 1: 6,688-10,000 people / km<sup>2</sup>**



*Figure 3.10.2: Scenerio 1 proposal*



*Figure 3.10.3: Pacific Heights, San Francisco. From Above.*



*Figure 3.10.4: Pacific Heights, San Francisco. Streetview.*



*Figure 3.10.5: Ealing, London. From Above.*



*Figure 3.10.6: Ealing London. Streetview.*

**Scenerio 2: 28,688 people / km<sup>2</sup>**



*Figure 3.10.7: Scenerio 2 proposal*



*Figure 3.10.8: Church & Wellesley, Toronto. From Above.*



*Figure 3.10.9: Church & Wellesley, Toronto. Streetview.*



*Figure 3.10.10: Pre-Saint Gervais, Paris. From Above.*



*Figure 3.10.11: Pre-Saint Gervais, Paris. Streetview.*

**Scenerio 3: 48,411 people / km<sup>2</sup>**



*Figure 3.10.12: Scenerio 3 proposal*



*Figure 3.10.13: Bloor & Young, Toronto. From Above.*



*Figure 3.10.14: Bloor & Young, Toronto. Streetview.*



*Figure 3.10.15: Wong Tai Sin District, Hong Kong. From Above.*



*Figure 3.10.16: Wong Tai Distrct, Hong Kong. Streetview.*

The midrange scenario would see an increase to 29 people on average for each lot, a 14.5 times increase over current levels resulting in a population density of 48,411 km<sup>2</sup>. In Vancouver, this is comparable to Olympic Village. A comparable density in Toronto is the Bloor and Yonge street area which is mostly a mixture of tall condominiums and apartments. Interspersed historical low rise retail, office and hotel uses, and inefficient siting and podiums at street level contribute to the appearance of higher residential density than actually exists.<sup>53</sup> Internationally, the Wong Tai Sin District in Hong Kong has similar densities and is home to middle income earners. The district includes similar wall to wall 2-6 storey housing blocks, as well as tall residential towers and large parks that create a mixture of spaces that create large fluctuations of dwelling density within the neighbourhood.<sup>54</sup>

The final scenario assumes all building are 6 stories and inhabited to their maximum occupancy, which is the most unlikely outcome. Each lot increases to 40 people, an increase of just under 20 times the current rate. The density would be higher than any existing neighbourhood in Vancouver, resulting in 68,134 people per km<sup>2</sup>, while still coming short of of Canada's densest neighbourhood, St. Jamestown in Toronto, which has a density of 82,433 people per km<sup>2</sup>.<sup>55</sup> Internationally, Yorkville in New York has a similar density, which is a neighbourhood on manhattan's upper east side. Yorkville is mostly 5 storey tightly packed apartments with a few towers and very few breaks in the urban fabric for open spaces.<sup>56</sup> All of the comparisons produce widely different urban environments which point towards the manifestation of the densification strategy being much more important than their respective population densities. The housing proposal in Vancouver, interestingly, is the only strategy that is interested in the preservation of street vegetation which will have a large effect on the experience of the neighbourhood.

The full density scenarios (2-4) accommodate population increases of 1,0327,68, 1,742,796 and 2,452,824 respectively, which are all well over the existing population of the city. At a certain point while approaching this level of density, the proposed housing framework will not be needed or function as intended as the neighbourhood transforms into an urban place, existing infrastructure fails to provide services, and the proposed building typologies become too repetitive and unrelenting in ultra urbanized conditions. At this point dynamic zoning should be upgraded again to suit the needs and context of future conditions, but for at least the next 40 years, this densification strategy will be able to successfully integrate into existing neighbourhoods. It is also worthwhile to note the impact that changing from supplying dwellings for population growth to building for affordability has on the density of dwelling projects. Dwellings must be dense enough to accommodate population growth, account for the speculative value of the land, concentrated development, and uneven distribution of desirable dwelling attributes, creating a density that does not correlate to real population increase. This has resulted in the need of this housing proposal to build at densities suitable to accommodate at least a million more people to produce affordability within the challenges of real estate prices today, which shows the continued impact that a financial capital housing market system has on the urban environment of the city.

**Scenerio 4: 68,134 people / km<sup>2</sup>**



*Figure 3.10.17: Scenerio 4 proposal*



*Figure 3.10.18: St Jamestown, Toronto. From Above.*



*Figure 3.10.19: St Jamestown, Toronto. Streetview.*



*Figure 3.10.20: Yorkville, New York. From Above.*



*Figure 3.10.21: Yorkville, New York. Streetview.*

# Pre-Existing Requirements

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## List of Requirements

With the following changes and conditions, the housing framework would become a viable affordable housing typology capable of competing for developer investment for its production in the private sector. The changes tap into existing trends and ideologies, but require action and education to align outdated rules to the purported beliefs to governing regulators.

1. Land use policy would acquire the new dual mandate of protecting existing quality of the urban environment and allowing for higher density providing affordable neighbourhood enhancing dwellings, which could be implemented to incrementally increase density with few negative consequences. This requires the complete rewriting of the zoning code so that it is focused on densification opportunities and the protection of dwelling quality in the interest of the entire population, rather than the singular mandate of preservation of financial capital in the interest of existing homeowners.
2. Building code must support the viability of a middle density by following the recommendations in Part 2. These recommendations propose allowing for more performance based alternatives to the current rigid code that provide an equal degree of safety, but recognize emerging forms of co-living that make widely used terms such as exit and private dwelling inadequate to address communal arrangements. Specifically, the framework requires the code to allow limited use of non standard exits to provide flexibility in small floor plates, introduce regulations around intermediate shared spaces to improve living quality in small units, and adapt a set of guidelines for residential construction between the two extremes the building code currently favours, single unit houses and large institutional buildings.
3. Lastly, the framework requires adventurous people to accept facets of co-living into their lives, for the benefit of requiring less income for housing. The first occupants would have to lead by example so that overtime a growing segment of the population feels comfortable leveraging this type of affordable housing and embraces the spectrum of living arrangements possible. Beth Buczynski, author of “Sharing is Good” warns that sharing is not for everyone. Sharers must be “ready for adventure, have heightened empathy or ability to place oneself as the other, and must break down mental barriers making us fear strangers”.<sup>57</sup>

## Dynamic Zoning Bylaw

The following is a zoning bylaw created in response to the final architectural outcome to put into practice the proposed urban strategies and prove that zoning with the purpose of densification and living quality outcome can be regulated by the planning department. The most substantial changes are rules reversing the limiting of subdividing lots to rules limiting the amalgamation of property, the reversal of maximum dwellings per site to minimum, the reversal of minimum dwelling dimensions to maximum dwelling dimensions, and the allowance of much larger building footprints and massing on a per lot basis. The most important additions are the introduction of public amenity onsite which has a much wider definition to include private local businesses, services, and community groups, rules around access to communal space, the creation of building massing being affected by neighbouring densification, and the incorporation of an entirely new subsection dedicated to quality of life of private dwellings.

## PU-1 Peri-Urban District

### 1 Intent

#### 1.1 Annotated Format of Previous RS-1 Designation

This schedule replaces all low density residential zoning in areas marked by the city as insurgent housing territory. The intent is to maintain select aspects of character and massing in the district, while permitting development to incrementally densify the neighbourhood. Access to views, light and air are preserved during and after a transition period. Neighbourhood amenity is enhanced by streetscape interventions and the incorporation of new public benefit spaces.

#### 1.2 Re-written Format

The zoning schedule has been completely rewritten to produce hybrid urban conditions to replace the suburban detached house incrementally. The zoning schedule responds to the competing value of established residential neighbourhoods and the value to citizens of living close to the city centre, resulting in pressure to create more homes in the inner city. The zoning laws choose to maintain and enhance the economic and demographic variety of these neighbourhoods, over preserving the aesthetic and built conditions, that in their current state, are shifting the neighbourhood to a homogeneous, increasingly exclusive wealthy enclave. The zoning laws break the status quo of this shifting reality to maintain the components of the character that improve quality of life, rather than maintain the built components of the neighbourhood that are no longer able to function as they were in the sprawl era. Therefore this zoning schedule reverses the previous zoning schedules effect of preserving houses at the expense of the community, to allowing development responsive to their context to replace houses in order to save the community aspects of these neighbourhoods. The schedule sets out rules to respect existing residents while maximizing unit density within measured development scales to increase unit variety and maintain similar economic accessibility in low density neighbourhoods that existed during the sprawl era. The rules aim to achieve this goal while enabling both parties to be more involved in the development process, in a more impactful way than previous zoning laws required through the public consultation process.

Rules and restrictions dealing with building quality and inhabitation intend to balance free market economics that may result in building in the entirety of the allowable volume with minimum standards for units and amenity space.

- Figure 1.1: Intent Images of completed and transition neighbourhoods
- (or one image with red intervention buildings)

## 2 Approval Uses

- 2.1.1 All uses, must be primarily residential, by requiring over 2/3 of usable floor area to be residential units, or amenity and utility space servicing residential units.  
*(Intent: Preserve the residential quality of the neighbourhood while modernizing mixed use restrictions, provide employment, make space use more efficient through live-work units, encourage small business, and enliven neighbourhoods with mixed activity)*
- 2.1.2 Public Benefit Space is not factored into the equation in line 2.1.1 and may be any area.  
\*See glossary for definition of the term public amenity.  
(Intent: Prevent this residential formula from decreasing land dedicated to public amenity)
- Figure 2.1: Images of building split into uses with separate public amenity compartment
- 2.1.3 Allowable non-residential uses must not pose a public health threat. Threats may include heavy industrial with unpreventable sound and vibration transmission and activities requiring toxic or volatile material. This does not include light industrial such as small scale manufacturing such as hand crafted materials or office space. Retail, market, grocer, service, accommodation, child and senior care are allowable.  
*(Intent: Preserve public health and safety by restricting dangerous activity near residential dwellings while recognizing the value of integrating micro manufacturing and encourage residents in unique entrepreneurial pursuits.)*
- 2.1.4 Cultural, recreational, institutional and utility uses are exempt from the 2/3 residential requirement and have no maximum area requirement within allowable massing limits.  
*(Intent: Continue existing regulations for the city to operate and expand its public services from these neighbourhoods)*
- 2.1.5 Other uses as outlined in 2.1.3 may be conducted in residential units so long as non-residential usage is secondary.  
*(Intent: Prevent regulations from blocking live-work configurations, while preserving residential space)*
- 2.2.1 All uses must adjust their practices or prepare their unit so that sound transmission out of the unit does not exceed that of a residential unit during regular operation.  
*(Intent: Prevents sound pollution that is not fitting for residential dwelling)*
- 2.2.2 If such a use produces noise by way of patrons of a non residential activity, such as loitering in front of a bar or patio, a resident vote reaching majority may reject such a use if it is a common occurrence.



*(Intent: Conflict mechanism for sound pollution, and unreasonable nuisance that are not fitting for residential dwelling)*

- 2.2.4 Noise and number of patrons do not make uses liable for a rejection vote if
- a) This occurs at irregular special events which may benefit the community
  - b) This occurs infrequently throughout the day such as during child pick up of a daycare
- (Intent: Prevents unreasonable interpretation of the regulations that would hinder community events and services to take place that would provide more benefit than harm)*

### **3 Regulations**

#### **3.1 Lot Assembly**

- 3.1.1 Lots with an area of 90% of 365m<sup>2</sup> (328.5m<sup>2</sup>)(Typical area of a standard 10m(33') x 36.5m(120') lot) or greater may not be consolidated.

*(Intent: Maintains the existing built form grain of the neighbourhood and encourages incremental redevelopment.)*

- 3.1.2 If a lot is less than 90% of 365m<sup>2</sup> than that lot may be consolidated with another lot(s) of any area until the total lot area exceeds 90% of 365m<sup>2</sup> (328.5m<sup>2</sup>).

*(Intent: Prevents unnecessary burden of redeveloping uncommon tiny lots by allowing consolidation into more manageable sizes.)*

- 3.1.3 If adjacent lots are held by the same owner, every lot they own may be developed at the same time as long as:

- (a) Each lot maintains their own independent address
- (b) Residential units of that lot must be primarily accessed on the same lot's street or laneway frontage.
- (c) The buildings are constructed independently of each other, including structural, facade components, and exiting.
- (d) Building Frontage must recognize the side lot lines so that future independent alterations may take place

\*General Note: The buildings must be constructed in general so that it is not unreasonable for each lot to be sold separately in the future.

*(Intent: Allows developers to maintain some economy of scale in construction while maintaining the built form grain of the neighbourhood)*

- Figure 3.1: Images of separation of building

#### **3.2 Exemptions of Lot Assembly**

- 3.2.1 Public amenity is exempt without restriction. Public amenity may act as a separate compartment across lot lines if the public proposal outlined in section 3.3.3 warrants the space.  
*(Intent: Broaden the public proposal possibilities and allow for future alterations of public space)*
- 3.2.2 2 - 4 lots may consolidate to the maximum area of 1460m<sup>2</sup> if the benefit of a continuous public amenity street or laneway frontage is proven to be greater than the benefit of maintaining lot development scale. In this case, access to units above must occur on, or adjacent to their pre-existing lot. This exemption is not available if the street frontage on that block has already been consolidated elsewhere into greater than 2 lots, or 50% of the street frontage on the block has already been consolidated into double lot parcels.  
*(Intent: Prevents regulations from impeding the creation of larger scale public amenity and adds variety to the street front)*
- 3.2.3 The city may allow the consolidation of 2 adjacent lots to a maximum of 50% of the street frontage of a block in return for integrating space for a desirable use identified by the city. (Uses may include a specific public amenity, affordable housing)  
*(Intent: Gives the city incentive tools to integrate positive programming into the city fabric)*
- Figure 3.2: City block elevation showing maximum consolidation with public amenity separated
- 3.2.4 Lots may consolidate to a maximum of 1095m<sup>2</sup> (3 typical 10m(33') x 36.5m(120') lots) if lot geometry and/or geography (grade slope) pose unreasonable challenges in densifying the lot or diminish the effect of the larger scale building massing from street level.  
*(Intent: Makes regulations fair to unusual lots and removes restrictions of lot consolidation where the intent behind such rules do not affect the neighbourhood.)*
- 3.2.5 Cultural and recreational, institutional, and utility uses are exempt from lot consolidation restrictions and may consolidate an unlimited amount of space.  
*(Intent: Continue existing regulations for the city to operate its services from these neighbourhoods)*
- 3.2.6 Unconsolidated lots may share their secondary exit with the adjacent building as an acceptable fire escape as long as that fire escape is split from its lot and is owned equally between lots. Such a fire escape may only be used if it is situated on the side lot line and access to the fire escape from the second building would not require entering the other building. Fire separation between buildings must be maintained.  
*(Intent: Prevent the building of unnecessary fire escapes to limit wasted space and to reduce construction costs)*

- Figure 3.3: Two lots sharing secondary exit image

### 3.3 Massing Restrictions

#### 3.3.1 Setbacks are as follows:

- (a) Front Yard Zone: 20% of lot depth or the median depth between the two adjacent lots, whichever is less, to a maximum of 6m (20').
- (b) Side Yard Zone: 3m (9') setback in rear yard. Remaining property includes no setback for resulting lot line condition.

\*limit of openings facing neighbouring unit

- (c) Rear Yard Zone: 40% of the lot depth or the median depth between two adjacent lots, whichever is less, to a maximum of 13.75m (45'). This zone may build 1 storey ground floor. Open access walkways may be provided on floors above.

- (d) Laneway House Zone: Subtract the rear 50% of the rear yard zone to a minimum of 7.6m (25') to form this zone adjacent to the laneway where a laneway exists.

*(Intent: Divide lots into areas already accepted as impactful so that development may respond to its context)*

- 3.3.1a The resulting zone grid should produce 12 distinct horizontal zones due to overlap of the side yard zone.

- Figure 3.4: Labeled zones in plan

- 3.3.1b Corner lots shall follow the same regulation, except the rear yard excluding the side yard setbacks may be open terraces.

- 3.3.2 Zones are divided vertically from the lowest point on the site upward in increments of 3.5m (11.5') or per storey, whichever is less, to a total of 14m (46') or 4 stories, whichever is less, to what is to be referred to as the transition height plane.

*(Intent: Temporarily respond to pre-dynamic detached house condition, so as not to undermine its desirability or value)*

- 3.3.3 Zones are divided vertically beyond the transition plane upward in increments of 3.5m (11.5') or per storey, whichever is less, for an additional 7m (23') or two stories, whichever is less, to what is referred to as the maximum height plane. Buildings in total are restricted to 6 storeys or 21m (69'), the maximum height in which combustible construction can be used.

*(Intent: Keep construction cheaper and more malleable for future alteration, respond to quality of life issues that arise in wall to wall neighbourhoods.)(Intent: Allow urban neighbourhood to reach full density, without intruding on the existing established neighbourhood in the short to medium term)*

3.3.3a Roof top access, terrace pavilions and utility spaces are permitted to be beyond the maximum height plane by 3m as long as the total area of such structures is limited to 10% of the lot area and no more than 3.3m (11') ( $\frac{1}{3}$  of typical street frontage) of such spaces perimeter be continuously along a building edge.

*(Intent: Allow structures that do not impact adjacent lots to go beyond the maximum height plane for functionality and improved roof spaces.)*

- Figure 3.5: Labeled zones in section

3.3.5 Zones that are designated non-intrusive are allowed to be developed free of charge or consultation. These zones are determined to have limited impact on adjacent lots and are predetermined by the diagram below. \*See glossary for definition of the term non-intrusive.

*(Intent: Provides incentive to build where there is low impact to adjacent lots)*

- Figure 3.6: Impact diagram of free zones <commenatry for outside of bylaw
- Figure 3.7: Scale of impact magnitude

3.3.7 Zones designated as allowable beyond transition are allowed to be developed if both adjacent side lots have already been developed under dynamic zoning by-laws.

*(Intent: Development can react to its new context)*

3.3.8 Building envelopes facing the adjacent lot within the side yard zone may not include any openings to the interior and require fireproofing as outlined in the building code.

However exterior walkways and spaces may be permitted railings or screens only.

*(Intent: Preserve adjacent lots ability to develop to its lot line safely)*

3.3.9 The area of pre-existing outdoor ground level space protected by previous zoning designation that is removed through expansion of the building footprint must be replaced by accessible roof terraces equal to or greater in area than the pre-existing outdoor ground level space.

*(Intent: Maintain outdoor spaces for residents while removing the restriction that it be at grade.)*

- Figure 3.8: Ground level being replaced above

3.3.10 Limited construction for a porch structure or similar amenity benefit may encroach the front yard with approval from the director of planning.

*(Intent: Allow for construction that might improve usability and character of the front yard zone.)*

### 3.4 Public Amenity

- 3.4.1 Ratio of public amenity to additional space reward set by zone impact in line 3.3.6a and 3.3.7. Public amenity must be in the form of 1-3 proposals that every resident with a path to the site that is 200m (650') (About 1 typical city block in length) or less is involved in deciding. If public space is created that is not in one of these prescribed activities, the space will not count toward increasing density. \*See glossary for definition of the term path.

*(Intent: Encourage expanding public amenity into residential land where residents have the best access and to help existing public infrastructure cope with the higher neighbourhood density.)*

- Figure 3.9: Area of public vote on public amenity <larger building requirement

- 3.4.1a If the public benefit of large buildings is to change, that change must be approved by the majority of residents with a path to the site that is 200m (650') (About 1 typical city block in length) or less.

*(Intent: Maintain resident control over the public space after construction and allow for change in activity over time.)*

- 3.4.2 Public benefit and clubhouse must be clearly accessible. Seperate access from residential. Access path must present a view from the street or laneway of the amenity, or stair up or down one floor to the amenity. If the amenity is on a storey greater than 1 from street level, the entire primary path to that amenity must be visible from the street or laneway.

*(Intent: Ensure public space is used as such)*

- Figure 3.10: Public paths from street front

### 3.5 Unit Quality

- 3.5.1 All units of the new building must not exceed the unit size of the pre-existing primary suite. Pre-existing unit size shall be determined by usable interior area, exempting basement, attic, and crawl spaces.

*(Intent: Prevents McMansion style developments, means any new development must contain accessible sized units to the population majority)*

- 3.5.1a Units must be no larger than 200m<sup>2</sup> (2150sf) (75% area of modern detached house in Vancouver) in interior area, regardless of previous primary suite size.

*(Intent: Control aspects of building scale through unit size, and maintaining reasonably affordable units.)*

3.5.1b If a secondary suite or laneway house are on the pre-existing site, an equivalent unit must be built equal to or less in size for each and must be a rental unit.  
*(Intent: Ensuring redevelopment does not reduce the number of smaller, more affordable options in the neighbourhood.)*

- Figure 3.11: Unit size requirements compared to pre-existing lot

3.5.2 Private Units of 24m<sup>2</sup> (260sf) or less must provide immediately accessible space equal to at least 1/3 of the total private unit space adjacent to such communal space. \*See glossary for definition of the private unit and communal space. *(Intent: Prevents McMansion style developments, means any new development must contain accessible sized units to the population majority)*

3.5.2a Communal Space may provide the exit to the private unit.  
*(Intent: Encourage social interaction and use of communal space through pairing with unit access)*

3.5.2b Private Space and communal space must allow for a minimum total of 2/3 of party wall frontage of potential visual connectivity at the threshold.  
*(Intent: Encourage social interaction and use of communal space through pairing with unit access)*

3.5.2c In addition to immediate communal space, private units must have access to OTHER STUFF that is at minimum 1/6 of the total private unit area. Travel paths within an OTHER SPACE space may contribute to this minimum. \*See glossary for definition of the term amenity space.  
*(Intent: Provide building wide amenity, and a gathering place for the building.)*

- Figure 3.12: Building condition for tiny units covering all of 3.5.2

3.5.3 Private units greater than -- (750sf) must have access to amenity space that is at minimum 1/4 of the total private unit area. Travel paths within an amenity space may contribute to this minimum. DOES NOT REQUIRE ADJACENT AMENITY  
*(Intent: Provide building wide amenity, and a gathering place for the building.)*

- Figure 3.13: Building condition for larger units

3.5.4a Outdoor space required by line 3.3.9 may contribute to up to 50% of the unit amenity space required by lines 3.5.2c and 3.5.3.  
*(Intent: Provide incentive to activate outdoor space for resident use.)*

3.5.4b Percentages in lines 3.5.4 and 3.5.4a may be altered if it is demonstrated to the Director of Planning that such an alteration will have a positive impact on the building design for residents.

*(Intent: Allow quality equivalent approaches while maintaining clear minimum standards.)*

3.5.5 All private units must have access to at least one operable opening of at least 1.7m<sup>2</sup> (18sf) OR MULTIPLE REACHING SAID MINIMUM in transparent area with a clear vertical angle to unobstructed sky that is no more than 45°.

*(Intent: Maintain good access to daylight in all private units.)*

3.5.5a All private units must have access to at least one opening of at least 1.7m<sup>2</sup> (18sf) in transparent area with a clear horizontal view to a street or lane OR EQUIVULANT VIEW OF that is at least 15m (50') in length. The measurement plane should be set at 1.5m (5') ± 0.3m (1') FROM FINISHED FLOOR LEVEL. The angle must be perpendicular to the opening plane ± 45° and be at least 15° in width.

*(Intent: Maintain good access to views in all private units.)*

- Figure 3.14: Daylight and view requirement for all private units

3.5.6 Communal Space must abide by the same restrictions as private units in lines 3.5.5 and 3.5.5a. If there are multiple communal spaces per floor, only one needs to satisfy view requirements to street or lane.

*(Intent: Maintain good access to daylight and views in all communal spaces)*

3.5.6a 50% Floor area of Communal Space must never be more than 21.5' or 6m from an exterior opening unobstructed vertically with one dimension of that opening not being less than 30° from upper edge to floor level of the communal space with a minimum dimension of 1m (3').

*(Intent: Ensure a minimum quality of communal space so that it is desirable enough to be used as such.)*

- Figure 3.15: Daylight and view requirement for all communal space

3.5.6b Communal Space may be exempt from restrictions in 3.5.6 and 3.5.6a if it is demonstrated to the Director of Planning that an alternative produces a potentially alternative but equal quality of space or leads to a better functioning building.

*(Intent: Allow quality equivalent approaches while maintaining clear minimum standards.)*

3.5.7 "A development permit application for dwelling uses shall require evidence in the form of a report and recommendations prepared by persons trained in acoustics and current techniques of noise measurements demonstrating that the noise levels in those portions of the dwelling units listed below shall not exceed"<sup>1</sup> 35 decibels. (Bedroom Standard)

(1) Vancouver Zoning Bylaw RS-1B, April 2015

*(Intent: Reduce resident conflict and nuisance due to noise.)*

### 3.6 Additional Regulations

3.6.1 Private parking is not required however if private parking is not provided, the lot loses its entitlement to being issued residential street parking permits and these permits are transferred to dedicated car sharing parking spots.

*(Intent: Reduce unit expense while improving resident access to shared car services. Prevent car parking impacts on existing residents.)*

3.6.2 Parking access for on site parking is only allowed along the laneway frontage of a lot unless the lot does not have laneway frontage, or that frontage is less than 4.5m (15').

*(Intent: Maintain pedestrian character of streetscape)*

### 3.7 Opt-out Allowances

3.7.1 Lot owners with lots that follow previous zoning requirements may continue to abide by those regulations. Developing a laneway house, secondary suite, renovation, or addition of an existing property that follows previous zoning by-laws will maintain its status as a pre-dynamic bylaw. This means such development will not surrender the adjacent lots restrictions on developing beside a pre-dynamic bylaw lot.

*(Intent: Prevent discouraging owners to continue to maintain, and slowly densify their lot with laneway houses and secondary suites in the interim.)*

## Glossary of Terms

Peri-urban: “of or relating to an area immediately surrounding a city or town” - Merriam Webster.

“Peri-urbanisation relates to those processes of dispersive urban growth that creates hybrid landscapes of fragmented urban and ~~rural~~ suburban characteristics.

The expression originates from the French word périurbanisation, which is even used by INSEE (the French statistics agency) to describe spaces—between the city and the countryside—that are shaped by the urbanisation of former rural areas in the urban fringe, both in a qualitative (e.g. diffusion of urban lifestyle) and in a quantitative (e.g. new residential zones) sense. It is frequently seen as a result of post-modernity—(not post-modernism).” - Metropolitics

Sprawl era: “suburban sprawl describes the expansion of human populations away from central urban areas into low-density, monofunctional and usually car-dependent communities, in a process called suburbanization.”

In this era, growth was accommodated through expanding the edges of the city at low suburban densities.



Post sprawl era: The city can no longer expand outward and must accommodate growth within existing city boundaries.

Transition phase: Defined for the purpose of this bylaw to indicate the allowable area that can be developed, or the temporary regulations invoked on a property when one or both of its adjacent neighbours has not developed under the new peri-urban zoning laws.

Post transition phase: Defined for the purpose of this bylaw to indicate the regulations that expand developable area after both adjacent lots have been developed under peri-urban zoning laws.

Path: Defined for the purpose of this bylaw to indicate a public route (streets, lanes, walkways) measured from any boundary of a lot meeting public right of ways.

Pre-Dynamic: Zoning laws before Peri-Urban Zoning laws are in place, which do not have laws that react to the adjacent lot condition.

Post-Dynamic: Peri-urban zoning laws that react to adjacent lot conditions.

Public Amenity: Services and spaces open to the public.

Amenity Space: Amenity offered to building residents only.

Private Unit: The core or entirety of a dwelling in which its habitation of fully controlled by a single owner or tenant.

Communal Space: An extension of private units, to be considered a unit by the building code.

### **Building Code Alterations**

Redefining a unit,(or adding a unit type definition) while maintaining safety through maximum areas or maximum exiting path and dual exiting.

Removing minimum areas of spaces that have little to do with public safety. These decisions should be made by home seekers to judge the practicality of a design, regardless of arbitrary minimum space requirements.

## Part 3 End Notes

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## Resultant Neighbourhood

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### **Forms of Ownership**

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Part 4 | Costs

# Cost Reduction Summary

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As discussed, initially affordable units are produced by reductions in private unit space and the densification of low density land so that the increase in inhabitants on the property absorb the real estate costs at a rate that is appropriate to the average income of the city, per dwelling type. However prices are too high to isolate floor area in individual units so the cluster apartment approach is used to share living space, effectively duplicating the amount of space allocated to each individual of household. This strategy means that floor area is the result of current market prices and does not need to be subsidized. To prevent runaway inflation of these unit prices, the coliving strategy enters its second phase to provide affordability. Architectural design around communal exchange and individual autonomy of unit aesthetic breaks the typology away from the current financial capital system to human centric system, increasing livability while also increasing risks for investment. Since sharing spaces successfully depends in part on having some control on deciding who to share with, ownership models that involve cluster apartment and building inhabitants in new tenants and owners creates a second layer of insulation from investor demand. These hands on ownership models also make it harder to commoditize housing as maintaining the unit is made more difficult when absent.

Regulatory and neighbourhood relationship changes also contribute to sustained affordability. Zoning policy that focuses on creating unhindered affordable supply instead of existing wealth protection are enacted to make development produce viable dwellings for resident incomes. Bylaws and building code that stifle midrise development are replaced with widespread predictable rezoning that make densifying established neighbourhoods possible, producing greater variety and competition in the housing market. Changes to building interactions with the neighbourhood so that development provides direct, community driven benefit to existing residents not only support smaller living spaces of new residents but build support for densification projects, preserving a steady supply of undelayed new housing.

While these strategies deal with neutralizing availability and cost problems related to real estate, which is the largest expense, construction costs are mitigated through design as well. This is done by eliminating subterranean space that is expensive to build, especially on small sites, and non-occupied space such as parking.<sup>1</sup> Dwellings also provide only the basic services and finishes so that control over these expenses and their aesthetic are chosen by the new occupants. Building scale is limited to allowable wood frame construction, which is by far the cheapest construction method for residential buildings of this size.<sup>2</sup>

This pared down construction approach, follows a line of research on affordable mass housing techniques that has existed since the beginning of the modern era. In the inter-war years, architects focused on scales of industry (Fordist model) to achieve affordability through the modernization of materials and labour divisions.<sup>3</sup> While the more ambitious projects of large scale pre-manufactured heterogeneous building components never caught on beyond their experimental projects, industry standards modernized dwelling construction to achieve mass housing with economies of scale through individual smaller components that allowed greater flexibility in design and occupation allowing for “layers of personal significance”.<sup>4</sup> Le Corbusier, in 1931-32 proposed the megastructure for Algiers as a seemingly endless infrastructure at monumental scale. Illustrations suggest each unit act like an empty plot of land, in which each individual inserts their home at a domestically scaled counterpoint.<sup>5</sup> This level of autonomy in configuration and building envelope within a greater building was never really achieved in practice, as designs for large residential buildings built in the repetitiveness with none of the flexibility. By 1964-1990, John Habraken, the founding architect of the Netherlands Foundation of Architects Research (SAR), received a mandate to develop a strategy for more affordable mass housing, while reconciling modern mass housing with the loss of autonomy of people's homes compared to historical building methods.<sup>6</sup> Habraken's solution was to take the repetitive infrastructure but instead of envisioning it as an empty lot to assemble a home, more like a car on a road in which one purchases pre-made components to assemble into a home to take advantage of principles of Fordist efficiencies.<sup>7</sup> This solution has numerous flaws which include complete loss of person-



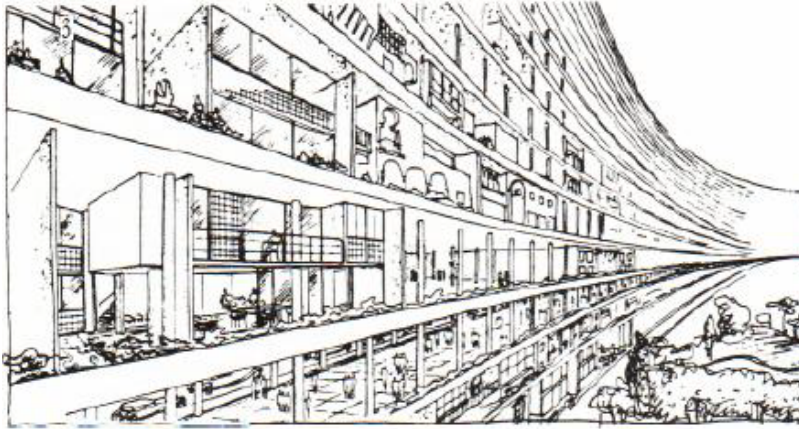


Figure 4.1.1: Le Corbusier, megastructure for Algiers 1931-32

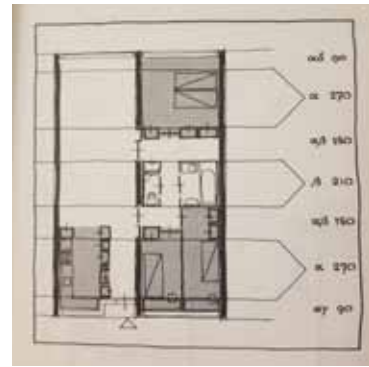
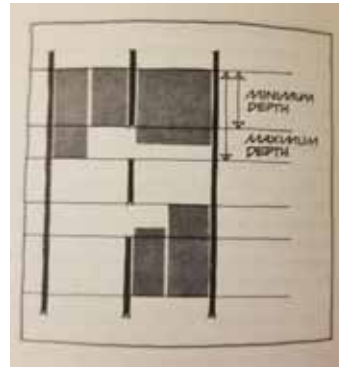
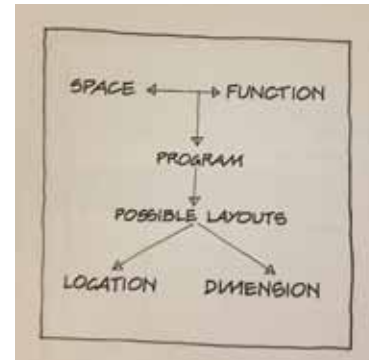
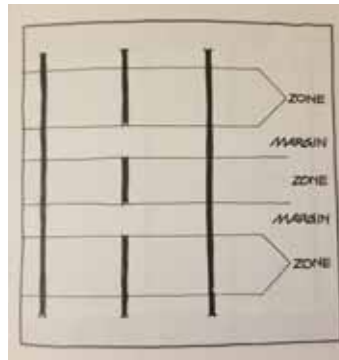
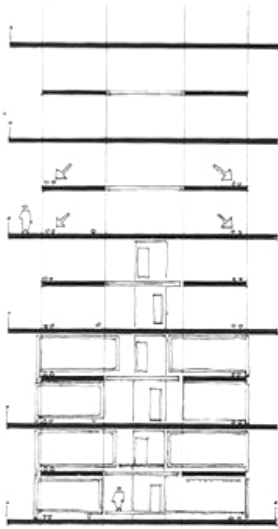


Figure 4.1.2: N.J. Habraken Supports Principle

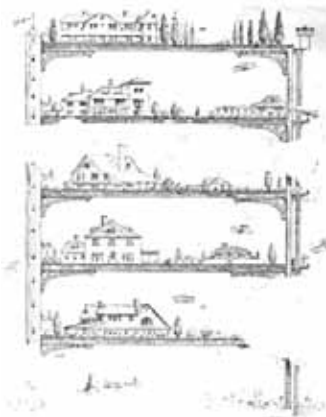


Figure 4.1.3: A.B Walker 'Life magazine' 1909

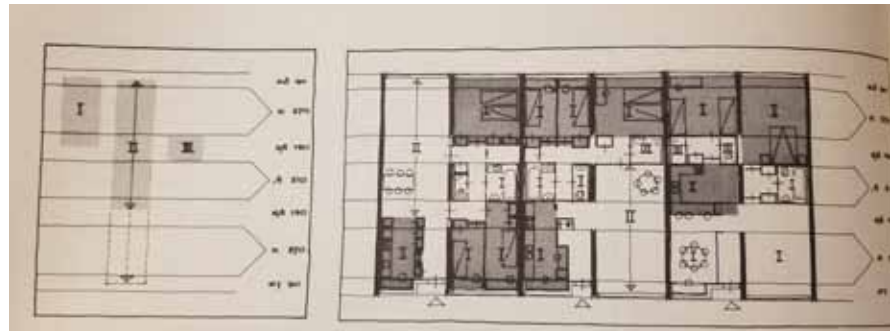


Figure 4.1.4: N.J. Habraken. Variations, The systematic design of supports. MIT Press. 1969. Shows the restrictive nature of the proposed autonomy through excessive rules governing unit configuration and room dimensions.

alization at scales smaller than an entire room, limited configurations due to servicing technicalities and access to exits and exterior glazing, and never took off, because the savings required a huge change in how the industry organized materials and labour.<sup>8</sup> By 1990, suburban sprawl creating cheap land had largely solved the problem delaying further need for experimentation until now, as Vancouver and other cities approach the end of sprawl.

Despite the housing crisis, governments have been afraid to involve themselves in delivering public housing due to their failures of large scale building projects in the past. Therefore grass roots and small architectural groups have emerged as innovators in the affordable housing space. Forced to work within existing urban infrastructure and property division, these projects actually benefit from leveraging their insertions and small scale. Architects have found success in taking the dwelling inserted into infrastructure idea and co-opting the building to support the inhabitants by contextually inserting the developments into the dynamics of the city, creating a sequence of spaces to support social relationships, and promoting the individuality of each unit by stripping them down to the basics. In this way, affordability is achieved through expanding the realm of occupancy to communal zones and making units simple and thus flexible for the occupant to fine tune their space efficiently, making less space per private dwelling possible. Secondly, stripping the finishes down to their basics in some cases reduces initial costs by up to one third, which helps inhabitants upgrade to their preference overtime as their financial situation allows.

Three contemporary iterations of this approach can be seen in the following examples. The architectural firm Dogma, presents domestic spaces within a drastically different container in a number of experimental drawings, but illustrates close proximities to communal spaces and access ways blurring the lines between public and private and challenging conventional ways the viewer thinks about coliving.<sup>9</sup> The R-50 cohousing project by Ifau und Jesko Fezer + Heide & Von Beckreath, built in Berlin in 2013, connects to its surroundings with a completely open communal ground floor and units connect to each other via a shared wrap around balcony. R-50 is financed by a group of 26 households that desired a space of their own, and so the building respects their limited budget by using low cost materials while the finishes make upgrading easy, leaving the final product in the hands of the inhabitant.<sup>10</sup> Most recently the “Naked House” initiative by OMMX Naked in London in 2018 received a grant to begin construction on 22 homes that provide affordability by designing small, simple shells for people to inhabit in their own unique way.<sup>11</sup>

In conclusion regulatory changes can allow for architectural design to facilitate new ways of dwelling that reduce living space and construction cost, while offering new paths to achieve living standards through offering generous co-living and public amenities and an alternative to the financial capital spatial formations to stymie speculation. Supply changes, greater competition and choice provide greater flexibility in living arrangements while supporting the long term reduction in dwelling costs for all development types.



Figure 4.1.5: Ifau und Jesko Fezer + Heide & Von Beckreath, 50 Cohousing, Berlin, 2013



Figure 4.1.6: OMMX. Naked House. London. 2018



Figure 4.1.7: Dogma, Communal Villa

# Overall Cost Reduction Checklist

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## Architectural Cost Reduction:

The design should add a degree of unpredictability and focus on community, discouraging speculative investment. The architecture should endeavour to facilitate sharing, flexibility and optimization.

- Integrated Access with inhabitable space
- Reduction of Room Sizes to minimum dimensions
- Design units flexibly to expand into shared space & reduce private space to a minimum
- Share resources so that purchasing burden is split between multiple people.
- Integrate inherently social spaces such as living and dining rooms into communal spaces to reduce needlessly duplicated spaces.
- Design flexibly to allow the occupant to optimize space to their needs and create personalized living solutions.
- Reduce restricted access and replace with community vigilance, public spaces, and unit security.
- Leverage Amenity spaces for public benefit as a source income and in lieu of city improvement levies
- Combine workshops and services into shared spaces
- Wood Frame Construction for reduced initial construction cost & most adaptable for future resident renovation.
- Build with high sustainability standards so that heat can be provided by electricity, cooling by cross ventilation, hot water by micro point heaters to reduce mechanical systems to electricity and water only.
- Site Efficiency by eliminating uninhabited zoning setbacks like side yards, optimizing the volume to balance between light, views, and density.
- Indoor/ outdoor spaces to be used year round.
- Promote a do it yourself culture and sharing culture through programming of spaces, aligning private vs public relationships and providing a network of hobby workshops and entrepreneurial spaces
- Flexible units sizes and flexible unit configurations so that units are not built with additional space than is required or overbuilt for suitable incomes.

-Focus money on inhabitable space. No Parking / Basement to eliminate expensive concrete & excavation costs.

## Financial Cost Reduction:

-Reduce initial housing costs to a minimum by providing adaptable modest finishes and services that occupants can upgrade overtime to reduce borrowing costs. Mortgage rates even at historic lows have a huge impact on final cost so reduced starting costs create exponential savings & still allow upgrades overtime at the occupants leisure.

-Make the development model economically accessible to non-profits, co-ops, smaller firms, and existing property owners to encourage more diverse housing typologies and inclusive participation in the housing industry to boost competition and spread wealth. Provide easy development model through straightforward guides and predictable city expectations. Minimize expertise and capital with viable single lot typologies and project scales with manageable logistics

-Be open to innovative investment sources such as public crowdsourcing and self build owner groups to reduce construction phase borrowing costs.

## Urban / Economic System Perpetuating Cost Reduction

-Provide a large and diverse supply capacity significantly beyond what is required by demand. May lead to oversupply correcting land values and allows development to react to demand attributes such as location and type.

-Create a reactionary framework so that the development model is accessible to a large and diverse pool of developer actors so that increases in demand can be reacted to faster, reducing the magnitude of speculative bubbles. Buildings with flexible units that can vary their number of units dependent on property value can quickly increase or decrease housing stock and more closely track affordable prices.

-Development built for dwelling and safeguarded against speculative investment and cheaper alternatives providing the same functions as existing typologies will create competition to overpriced units and add a segment of the market inaccessible to investor wealth which will cool inflation of the entire market.



# Cost Calculations

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## Construction Costs Summary

In contrast to condo development, the proposal benefits from midrise construction being cheaper than high-rise development. The BC building code permits residential building heights to a maximum 6 stories be combustible construction, producing a significant savings over concrete construction. Framed wood construction takes advantage of familiar construction methods, no formwork, and materials savings. Eliminating underground parking and basement substructure provide other significant savings.

Secondly mechanical systems are made more basic than conventional condominium construction through cross ventilation and well insulated exterior walls. Due to Vancouver's mild climate and Vancouver's "zero natural gas future" initiative, all heat is provided by unit electrical heaters, eliminating venting except for washrooms and kitchens. The lack of major servicing beyond water and electrical wiring allows for compact floor assemblies reducing materials required per square foot of usable space. Servicing is installed on the visible underside of the ceiling reducing labour costs. Interior finishes are kept basic and upgradable.

Exterior finishes costs are reduced due to both major side of the building located at lot lines with no openings and low cost sheathing anticipating adjacent densification. While both remaining facades to the front and back contain a number of openings, glazing costs are reduced overall and punch windows in private units require less glass than conventional floor to ceiling curtainwall systems of conventional condo construction.

## Property Costs Summary

All associated costs of obtaining and owning a property through ongoing construction. Single lot development reduces costs involved in amalgamating lots. Predictable city guidelines should also provide building permits more quickly.

## Development Costs Summary

Mostly fees from design services such as architects and engineers, government levies and taxes, and lending fees from a banking institution. The CAC, community amenity contribution is waived due to the provision of space onsite dedicated to public benefit.

## Property Costs

### Benchmark Detached House Prices

	Cost	Comments
Vancouver West	\$3,569,700	
Vancouver East	\$1,516,900	

### Property Tax

Property Tax Rate Total	\$2.55489 / \$1000	Property tax combined for city, region, and civic authorities
Length of development project	3 years	Typical length of small scale residential multi-unit construction

### Property Tax Total

Vancouver West	<b>\$27,360</b>	$(3,569,700 / 1000) * 2.55489 * 3$
Vancouver East	<b>\$11,626</b>	$(1,516,900 / 1000) * 2.55489 * 3$

### Broker Commissions

First 100,000 value	7%	$100,000 * 0.07$
		\$7,000
Vancouver West		
Remainder of value	2.50%	$(3,569,700 - 100,000) * 0.025 + 7000$
Commission Total		<b>\$93,742</b>
Vancouver East		
Remainder of value	2.50%	$(1,516,900 - 100,000) * 0.025 + 7000$
Commission Total		<b>\$42,422</b>

### Total Property Cost Formula

$y$  (Total Property Costs) = Price + (property tax \* 3 years) + Broker Commission

### Total Property Costs

Vancouver West	<b>\$3,690,802</b>
Vancouver East	<b>\$1,570,948</b>

Figure 4.2.1: Property Costs Chart

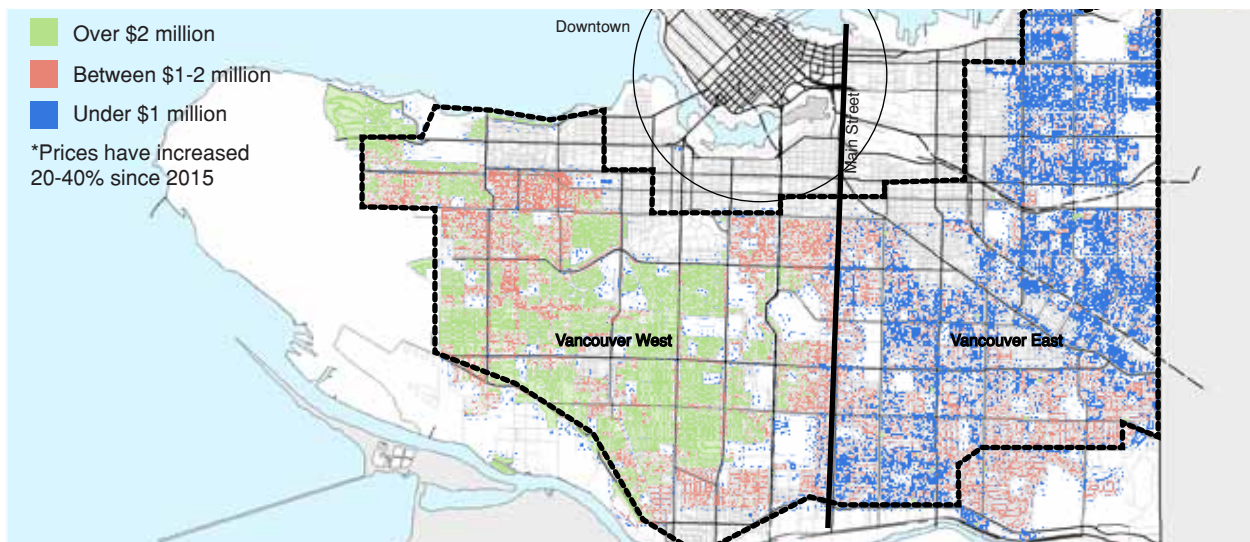


Figure 4.2.2: Map of Detached House Prices in the City of Vancouver in 2015

## Construction Costs

Construction Savings Compared to Condo Construction (\$/sf)			
Conventional		Proposed	Savings
Concrete	297	Wood Frame	79
Parking Garage	297	No Parking	11
Over 6 stories	297	6 stories & under	7
Total Condo	297	Total Proposed	Total Savings
	297	200	<b>97 &lt; 45% Cheaper</b>

Building Costs According to BDC 2017 Construction Estimator (\$/sf)								
Vancouver West				Vancouver East				
Low Quality	Medium Quality	High Quality	Median Cost	Low Quality	Medium Quality	High Quality	Median Cost	
200	205	210	<b>205</b>	190	195	200	<b>195</b>	

*^This is inline with Atlas Groups 2017 Construction Guide providing a construction cost range of \$190-235/sf city wide.*

Typical Construction Cost Breakdown			
Construction Division	Typical Cost	Reduction	Comments
Concrete	20-25%	N/A	Choice of Wood Frame Structure already accounted for
Mechanical	12-16%	6%	Heating, Cooling and Ventilation eliminated, Plumbing only.
Finishes	11-15%	2%	Basic interior finishes for further tenant fitout
General Conditions & Fees	8-12%	N/A	Breakdown of fees below
Electrical	6-10%	0%	Wall fastened electrical cheaper but more equipment required
Doors & Windows	6-10%	2%	Less floor to ceiling glass & majority unpunctured lot line facade
<b>Total Reduction</b>		<b>-10%</b>	

*^Tax and Site Restrictions cancel out Construction Savings*

Contingencies & Judgemental Factors		
Construction Division	Increase	Comments
Quality		
Location		
Building shape, size and height		
Topography & soil conditions		
schedule		
site restrictions		5% According to UK study on small sites
market conditions		
type of contract		
extent of site works		
design method		
user requirements		
procurement advantage of developer		
<b>Total Adjustment</b>		<b>5%</b>

*^Tax and Site Restrictions cancel out Construction Savings*

Federal Tax		
GST (Provincial sales tax included)		5%
<i>^Tax and Site Restrictions cancel out Construction Savings</i>		
Final Adjusted Construction Costs (\$/sf) (x)		
	Vancouver West	Vancouver East
Final Median Construction Cost	<b>205</b>	<b>195</b>

Figure 4.2.3: Construction Costs Chart



## Development Costs

### Predetermined Costs

	Construction (x)	Property (y)
Vancouver West	\$205/sf	\$3,690,802
Vancouver East	\$195/sf	\$1,570,948

<sup>^</sup>Totals taken from previous Construction and Property Cost Pages

### Non contributing additional costs

	Cost	Comments
Speacial Design Consultant	0	Clear building & zoning framework to eliminate additional consulting
Speacial Equipment	0	None Anticipated
Site Services outside of property	0	All lots are pre-serviced
Marketing and advirtinging	0	Demand for affordable housing deems advirting unnecessary
Tenant Incentives	0	Economics of affordable unit do not require incentive
Purchaser upgrades	0	Not included in assessment
Rezoning cost	0	Assuming pre-zoning thesis proposal is accepted
Other municipal fees	0	LEED requirement of new developments factored into construction

### Costs applied directly to Construction Costs

Architectoral & Engineering Fees	8.50%	According to the RAIC (Royal architectural institute of Canada)
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<sup>^</sup>Assuming a total construction cost of 1-2 million dollars of average complexity

### Set Costs

Real Estate Legal Fees	\$1,050	Average fee for single lot
Appraisals	\$300	Set appraisal cost by government agency
Land survey	\$500	Typical cost of survey of standard lot

### Costs determined by Development Parameters

Insurance & Bond Cost	\$25/sf	Required by the Condominium Act
Levies:		
Residential DCL	\$3.63/sf	Helps pay for capitol expenditures on schools and civic services.
Sewerage Fee	\$900 / unit	Helps pay for sewage treatment capacity in the region.
*CAC		Waived in return for community amenity on site
Permit & Development charges	\$1000/ 1076sf	Up to 5380sf
	\$500/1076sf	Up to a maximum charge of \$40,600

<sup>\*</sup>(CAC) Community Amenity Contribution

### Costs Applied to Final Total

Interest and Lenders Fee	4% on 80%	Interest provided by CMHC. Typically developers require 20% down
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### Conditional Costs dependent of developer

Government Programs	Conditional	- \$3.63/sf If developed as rental, following DCL levy may be waived
Developer profit	Conditional	25% Typical profit margin estimate required to initiate development

### Formula for Total Cost as per Conventional Developer Scenerio

$$z \text{ (total cost/sf)} = \{ \{ (x + x*0.085) + y + 1050 + 300 + 500 + 25/sf + 3.63/sf + 900/unit + [(1000/1076sf \text{ to } 5380) + 500/1076sf \text{ to max } 40,000] \} \text{ (plus above value*0.8)*(0.04)} \} *0.25$$

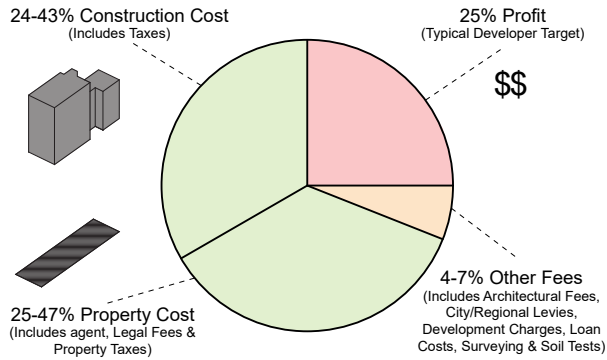
### Additional Formula for Total Cost as per Non-Profit Scenerio

$$z - (z*0.25 \text{ profit} - z*0.05 \text{ existing tax rebate} - \$5000 \text{ homebuyers rebate})$$

<sup>^</sup>Where z is the Total in the Conventional Developer Scenerio

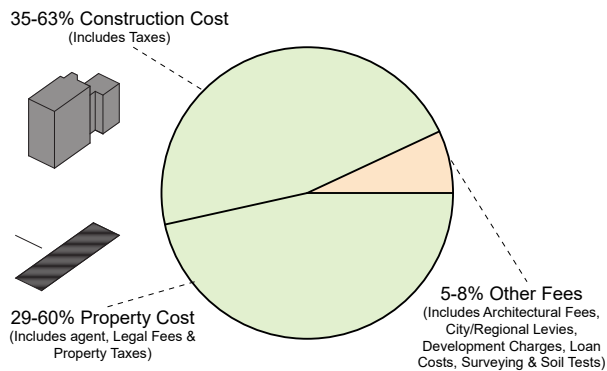
Figure 4.2.4: Development Costs Chart

### Conventional Developer Project Cost Breakdown



The conventional developer scenario is currently the most common financing method for housing projects in Vancouver. This method relies on profit taking as an incentive to invest private capital to produce a commodity. Land restrictions have made small projects unviable and therefore have worked to produce a system which favours large corporate developers on large projects. To compete with other investment vehicles, developers require an estimated 25% final profit to trigger development.

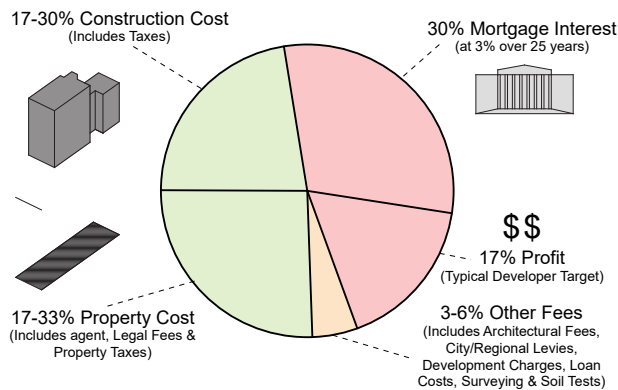
### Non-Profit with Existing Government Rebates Cost Breakdown



The non-profit development scenario is the most affordable scenario as it only has to contend with property and construction costs and fees and taxes are reduced by existing affordable housing rebates. Changes made to development in scale and cost make the typology accessible to non-profit groups and impactful for government investment in private partnerships.

Property owners would also have an advantage, especially those that have owned their property a long time as their property costs would have been a lot less 10-20 years ago and any investment in density would see a large financial return without accommodating additional profit margins.

### Costs for Buyers / Renters to repay investment after 25 years including mortgage at 3%



The conventional scenario for a buyer applying for a mortgage. Even at low interest rates of 3% annually, the costs are massive. By providing low cost entry level housing, the typology aims to avoid this problem by making it easier for buyers to save a significant portion of a down payment, make payments faster, or save for the entire housing price thus limiting the exponentially unaffordable aspects of a mortgage. If alternative paths to financing and development are not taken, this chart shows there is little more architecture can do, as average developer profits, a modest mortgage, and other fees contribute to over 50% of a typical dwelling price.

Figure 4.2.5: Cost Breakdown by Developer Scenario

The accompanying graph compares both dwelling prices by type (new and proposed) and annual incomes required to purchase a dwelling. This graph is the overall range of affordability by income (in green), the overall range of existing dwellings (in red), and the overlaid new range of the housing framework (in yellow). From this graph for example you can ascertain that an existing average studio costs \$438,000 requiring an income of \$72,000 annually to be affordable by CMHC standards. However the average individuals income is shown to be only \$30,000 and the cheapest proposed studio unit is priced at around \$150,000, affordable to individuals with an annual income of \$25,000.

Each of the 5 types have 8 price outcomes dependent on location (East or West Vancouver due to differences in property and construction costs), height (4-6 stories due to differences in density), and developer financing model (Profits, mortgages, loan costs or not). In the overview graphs, only the least and most expensive scenerios are charted to provide the total proposed range of dwelling prices to compare with existing.

Across all types there are consistent trends, the East Vancouver 6 story non profit options are always the cheapest and the West Vancouver 4 story for profit options are significantly more expensive than all other options. At todays property prices West Vancouver 4 story for profit developments perform better than any other comparable option but are not an affordable solution. However all other options for all types produce affordable dwellings for their respective target group income (individual or household).

This chart shows the range of monthly payments that would be required as a tenant, or as a buyer covering a mortgage compared to the existing relevant alternative. Cost reductions range from slightly higher for the unviable West Vancouver 4 Storey for profit outcome to the cheapest options that range from 25-30% of the average existing monthly payments representing substantial cost savings.

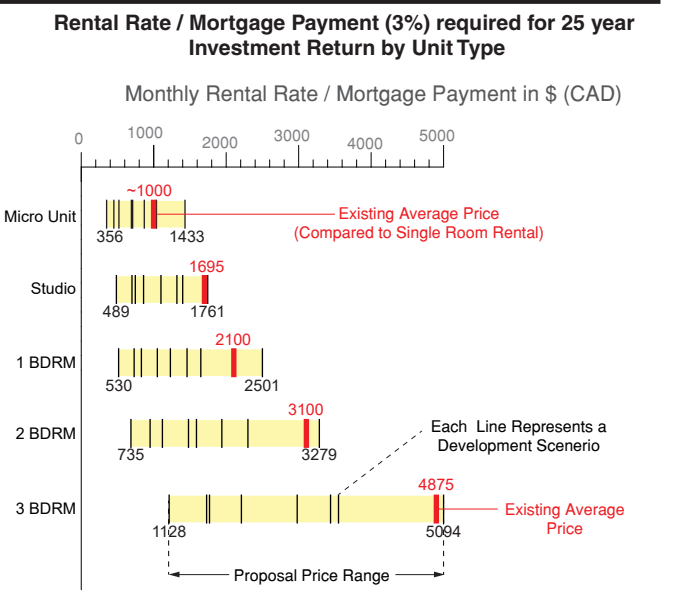
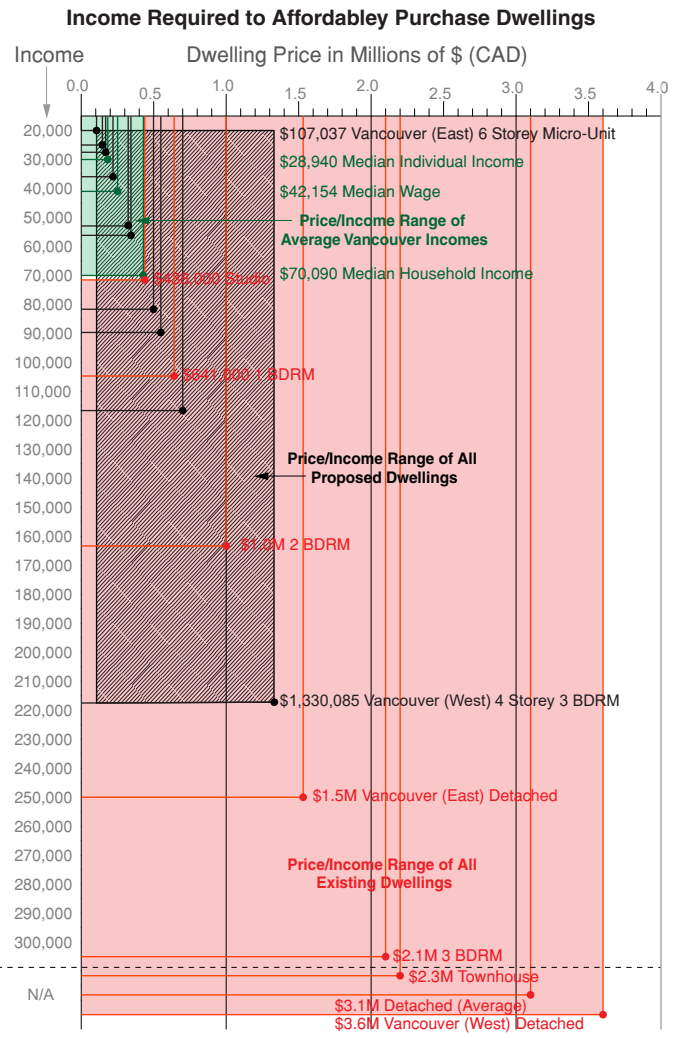


Figure 4.2.6: Overview of proposed dwellings prices and required incomes with existing options.

# Micro Unit Costs

## Cost Variables

Statistics	4 Story	6 Story
Square Footage	9,283 sf	14,159 sf
Number of Units	24 units	39 units

Construction Cost (x)	4 Story	6 Story
Vancouver West \$205/sf	\$1,903,015	\$2,902,595
Vancouver East \$195/sf	\$1,810,185	\$2,761,005

Property Costs (y)	4 Story	6 Story
Vancouver West	\$3,690,802	
Vancouver East	\$1,570,948	

$z$  (total cost/sf) = { { (x + x\*0.085) + y + 1050 + 300 + 500 + 25/sf + 3.63/sf + 900/unit + [(1000/1076sf to 5380) + 500/1076sf to max 40,000] } (plus above value\*0.8)\*(0.04) } \*0.25

^Development, Property, and Construction Costs Combined

## Project Cost Totals (\$)

	4 Story	6 Story
Vancouver West	7,781,633	9,367,780
Vancouver East	4,941,472	6,473,270

## Traditional Developer Prices

Buyers Price Per Unit (\$)	4 Story	6 Story
Vancouver West	324,234	240,020
Vancouver East	205,894	165,981

Monthly Rent Per Unit (\$)	4 Story	6 Story
Vancouver West	1,433	1,036
Vancouver East	874	685

^Rent required to payback mortgage over 25 years at 3.0% interest (Mortgage increases monthly payments by 42%)

## Non-Profit Developer & Existing Government Rebates

### (Lowest Potential price)

^Traditional Developer Cost - 25% Profit margin - 5% GST rebate - \$5000 BC Homebuyers Rebate

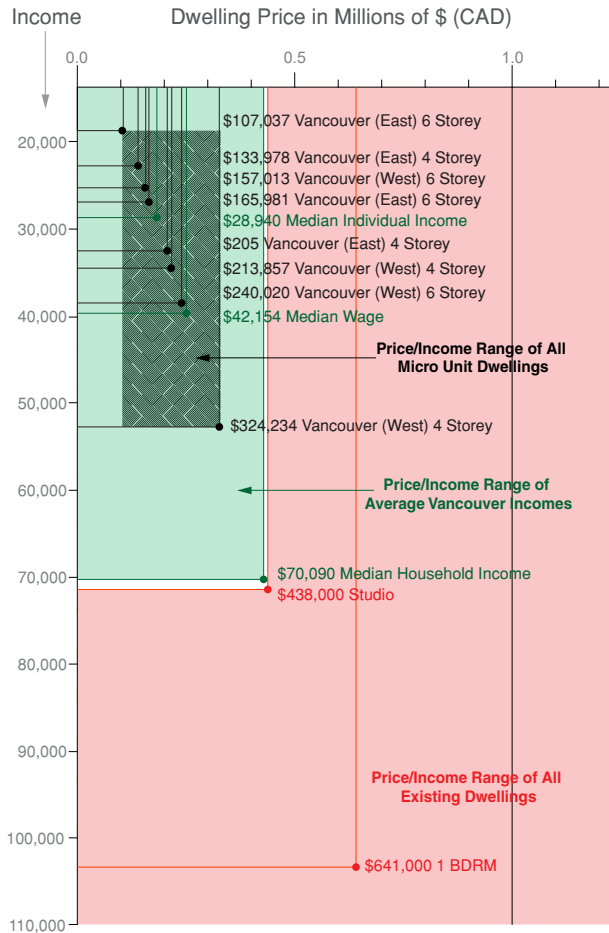
Buyers Price Per Unit (\$)	4 Story	6 Story
Vancouver West	213,857	157,013
Vancouver East	133,978	107,037

Monthly Rent Per Unit (\$)	4 Story	6 Story
Vancouver West	712	523
Vancouver East	447	356

^Rent required to payback investment over 25 years (Exc. Mortgage)

Figure 4.3.1.1

## Income Required to Affordably Purchase Dwellings



## Rental Rate / Mortgage Payment (3%) required for 25 year Investment Return by Unit Type

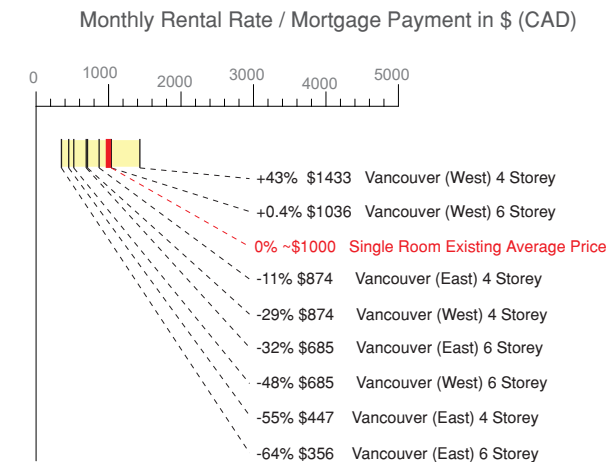


Figure 4.3.1.2

## Summary

Lot Type: Corner Only 33 x 120' Typical Lot  
 Building Area 4 Storey: 9,283 SF (2.34 FAR)  
 Building Area 6 Storey: 14,159 SF (3.58 FAR)

Unit: 150 SF (Bathroom, Kitchen, Bedroom)  
 Units per cluster: 9  
 Communal Space / Floor: 600 SF + 425 sf Ex.  
 Public Benefit Space: 900 SF  
 Workshop: 200 SF

1 Bicycle parking stall for 2 bike / unit

24 - 39 units

24 - 39 people

Densification of population: x 10.9 - 17.7

Dependent on the scenerio, microunits may be purchased from \$107,000 to \$324,000 which is a monthly payment of \$356 to \$1433. This typology would be affordable to individuals exempting the 4 storey Vancouver (West) developer scenerio. There is not a signifigant existing micro-unit market as only one incomplete building at UBC is providing this typology so exising room shares are compared. While the area rentable may be similar, micro-units provide the ability to own the space and the oppurtunity to have a private kitchen and bathroom if desired, therefore making the microunit a better option than a room share. Both types encompass communal space directly adjacent to the private room with similar amenities.

In conclusion, all scenerios except one are successful in substantial cost savings and micro units provide a crucial second option for lowest income earners. 6 of 8 unit schemes are cheaper to rent by 11-64%



Figure 4.3.1.3: Micro unit axometric with unit costs

# Studio Costs

## Cost Variables

Statistics	4 Story	6 Story
Square Footage	8,300 sf	12,300 sf
Number of Units	15 units	26 units

Construction Cost (x)	4 Story	6 Story
Vancouver West \$205/sf	\$1,701,500	\$2,521,500
Vancouver East \$195/sf	\$1,618,500	\$2,398,500

Property Costs (y)	4 Story	6 Story
Vancouver West	\$3,690,802	
Vancouver East	\$1,570,948	

$z$  (total cost/sf) = { { (x + x\*0.085) + y + 1050 + 300 + 500 + 25/sf + 3.63/sf + 900/unit + [(1000/1076sf to 5380) + 500/1076sf to max 40,000] } (plus above value\*0.8)\*(0.04) } \*0.25

^Development, Property, and Construction Costs Combined

## Project Cost Totals (\$)

	4 Story	6 Story
Vancouver West	7,460,144	8,755,588
Vancouver East	4,841,562	5,847,465

## Traditional Developer Prices

Buyers Price Per Unit (\$)	4 Story	6 Story
Vancouver West	497,342	336,753
Vancouver East	322,770	224,902

Monthly Rent Per Unit (\$)	4 Story	6 Story
Vancouver West	1761	1393
Vancouver East	1326	865

^Rent required to payback mortgage over 25 years at 3.0% interest (Mortgage increases monthly payments by 42%)

## Non-Profit Developer & Existing Government Rebates (Lowest Potential price)

^Traditional Developer Cost - 25% Profit margin - 5% GST rebate - \$5000 BC Homebuyers Rebate

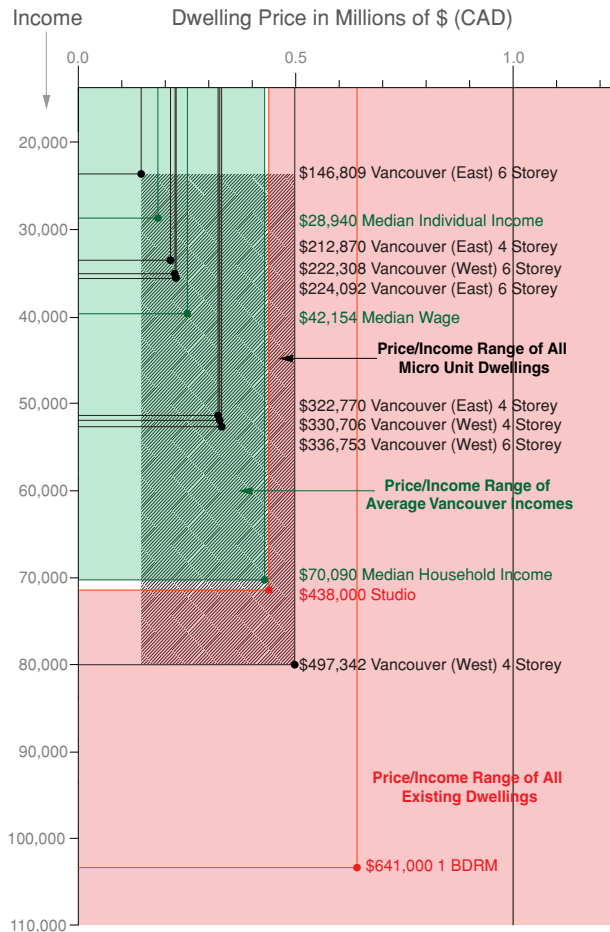
Buyers Price Per Unit (\$)	4 Story	6 Story
Vancouver West	330,706	222,308
Vancouver East	212,870	146,809

Monthly Rent Per Unit (\$)	4 Story	6 Story
Vancouver West	1102	741
Vancouver East	709	489

^Rent required to payback investment over 25 years (Exc. Mortgage)

Figure 4.3.2.1

## Income Required to Affordably Purchase Dwellings



## Rental Rate / Mortgage Payment (3%) required for 25 year Investment Return by Unit Type

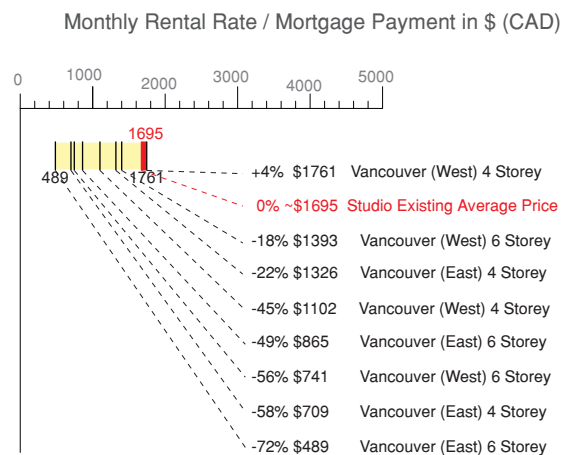


Figure 4.3.2.2

## Summary

Lot Type: Any 33 x 120' Typical Lot  
 Building Area 4 Storey: 8,300 SF (2.10 FAR)  
 Building Area 6 Storey: 12,300 SF (3.12 FAR)

Unit: 325 SF (Bathroom, Kitchen, Bedroom)

Existing Typical Studio: 500 SF

Units per cluster: 4

Communal Space / Floor: 225 SF + 165 sf Ex.

Public Benefit Space: 900 SF

Workshop: 200 SF

1 Bicycle parking stall for 2 bike / unit

15 - 26 units

15 - 26 people

Densification of population: x 6.8 - 11.8

Dependent on the scenerio, studios may be purchased from \$146,809 to \$497,342 which is a monthly payment of \$489 to \$1761. This typology would be affordable to individuals for the 4 cheapest schemes, well within 50% of income for 3, and unaffordable as a Vancouver (West) 4 storey developer model. The proposed private area within the studio is signifcantly smaller than the existing typology, however the additon of interior communal space within the cluster results in slightly more overall living space.

In conclusion, all scenerios except one cheaper to purchase and rent. Apart from one scheme, rents are 18-72% cheaper than an existing studio providing a similar lifestyle for less.

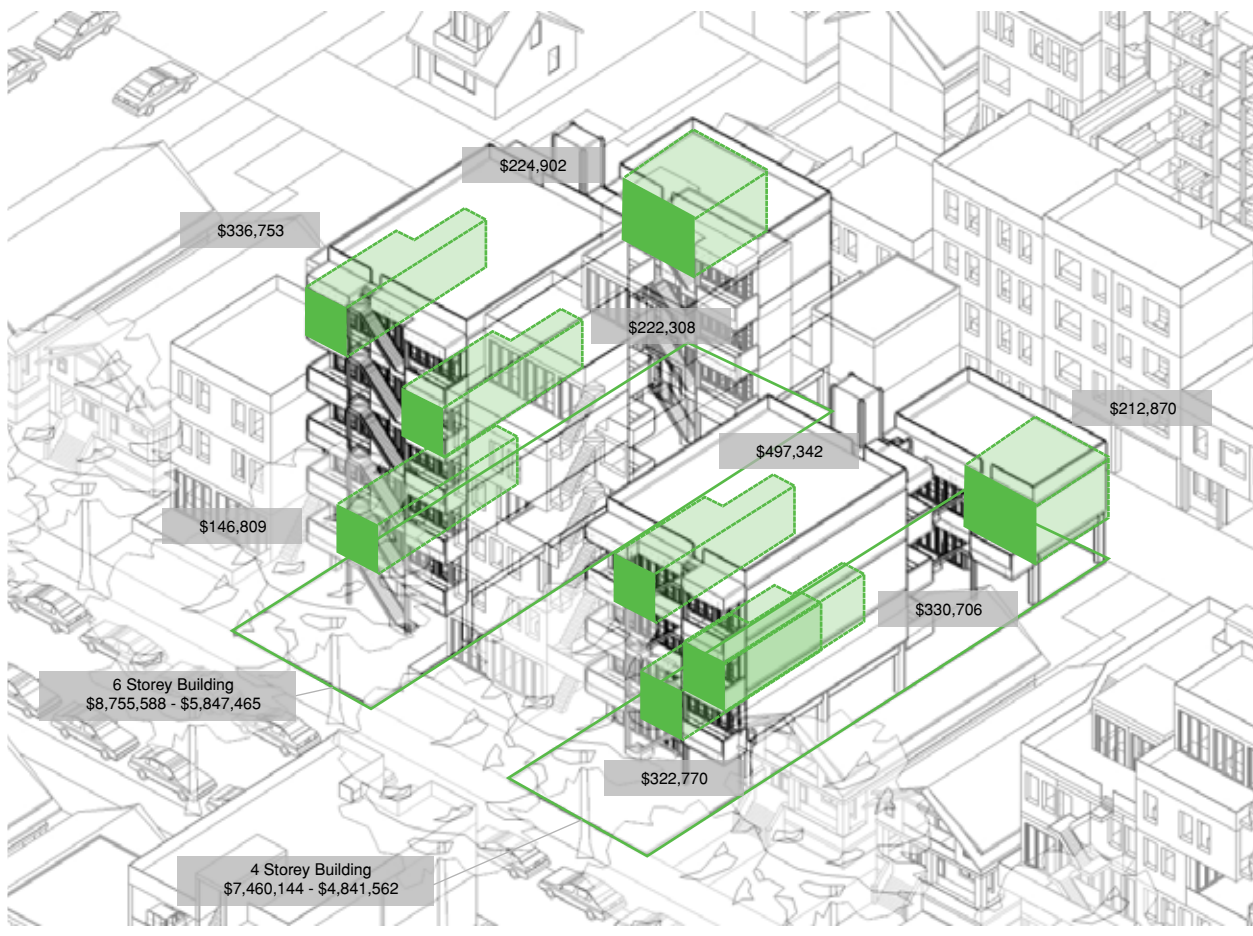


Figure 4.3.2.3: Studio axometric with unit costs

# 1 BDRM Costs

## Cost Variables

Statistics	4 Story	6 Story
Square Footage	7,330 sf	11,480 sf
Number of Units	13 units	23 units

Construction Cost (x)	4 Story	6 Story
Vancouver West \$205/sf	\$1,502,650	\$2,353,400
Vancouver East \$195/sf	\$1,429,350	\$2,238,600

Property Costs (y)	4 Story	6 Story
Vancouver West	\$3,690,802	
Vancouver East	\$1,570,948	

$z$  (total cost/sf) = { { (x + x\*0.085) + y + 1050 + 300 + 500 + 25/sf + 3.63/sf + 900/unit + [(1000/1076sf to 5380) + 500/1076sf to max 40,000] } (plus above value\*0.8)\*(0.04) } \*0.25

<sup>^</sup>Development, Property, and Construction Costs Combined

## Project Cost Totals (\$)

	4 Story	6 Story
Vancouver West	7,145,373	8,492,073
Vancouver East	4,308,166	5,596,778

## Traditional Developer Prices

Buyers Price Per Unit (\$)	4 Story	6 Story
Vancouver West	549,644	369,220
Vancouver East	331,397	243,338

Monthly Rent Per Unit (\$)	4 Story	6 Story
Vancouver West	2501	1646
Vancouver East	1467	1051

<sup>^</sup>Rent required to payback mortgage over 25 years at 3.0% interest (Mortgage increases monthly payments by 42%)

## Non-Profit Developer & Existing Government Rebates

### (Lowest Potential price)

<sup>^</sup>Traditional Developer Cost - 25% Profit margin - 5% GST rebate - \$5000 BC Homebuyers Rebate

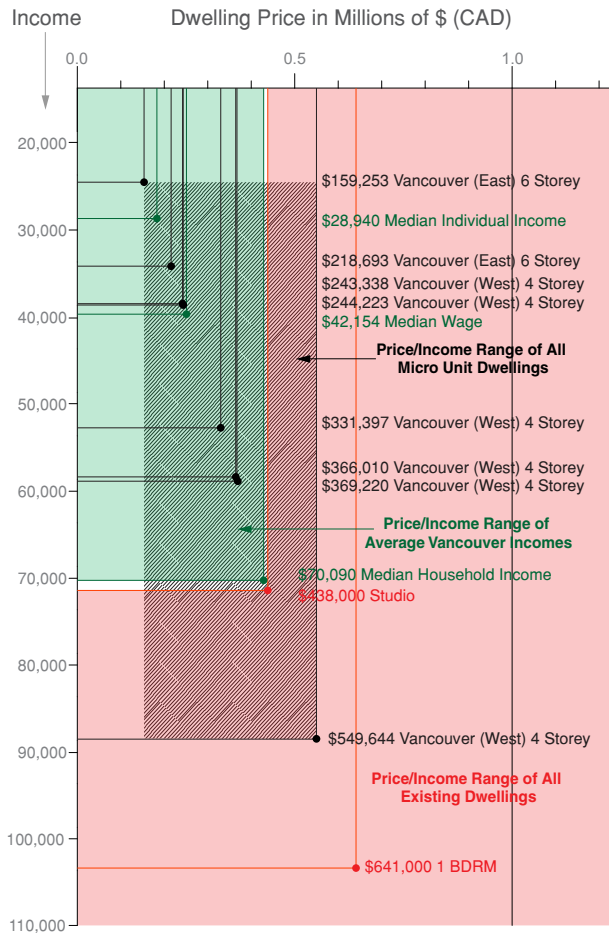
Buyers Price Per Unit (\$)	4 Story	6 Story
Vancouver West	366,010	244,223
Vancouver East	218,693	159,253

Monthly Rent Per Unit (\$)	4 Story	6 Story
Vancouver West	1220	814
Vancouver East	729	530

<sup>^</sup>Rent required to payback investment over 25 years (Exc. Mortgage)

Figure 4.3.3.1

## Income Required to Affordably Purchase Dwellings



## Rental Rate / Mortgage Payment (3%) required for 25 year Investment Return by Unit Type

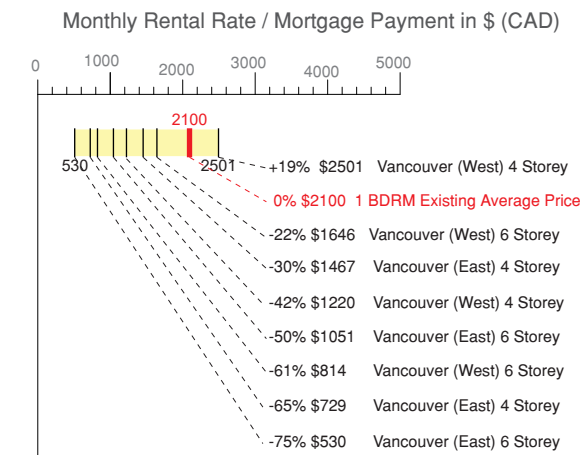


Figure 4.3.3.2



## Summary

Lot Type: Any 33 x 120' Typical Lot  
 Building Area 4 Storey: 7,330 SF (1.85 FAR)  
 Building Area 6 Storey: 11,480 SF (2.90 FAR)

Unit: 325 SF (Bathroom, Kitchen & Living, Bedroom)

Existing Typical 1 BDRM: 500 - 700SF

Laneway House 1 BDRM: 600 - 900SF

Units per cluster: 5

Communal Space / Floor: 475 SF + 225 SF Ex.

Public Benefit Space: 900 SF

Workshop: 200 SF

1 Bicycle parking stall for 2 bike / unit

13 - 23 units

13 - 46 people

Densification of population: x 6.0 - 21.0

Dependent on the scenerio, 1 BDRM units may be purchased from \$159,253 to \$549,644 which is a monthly payment of \$530 to \$2501. This typology would be affordable to individuals for the 4 cheapest schemes, well within 50% of income and affordable to 2 person households for 3, and unaffordable as a Vancouver (West) 4 storey developer model. The proposed private area within the studio is signifiantly smaller than the existing typology, however the additon of interior communal space within the cluster results in more overall living space.

In conclusion, all scenerios are less expensive to purchase than existing 1 BDRM options, and all but one scheme is cheaper to rent by 22-75%

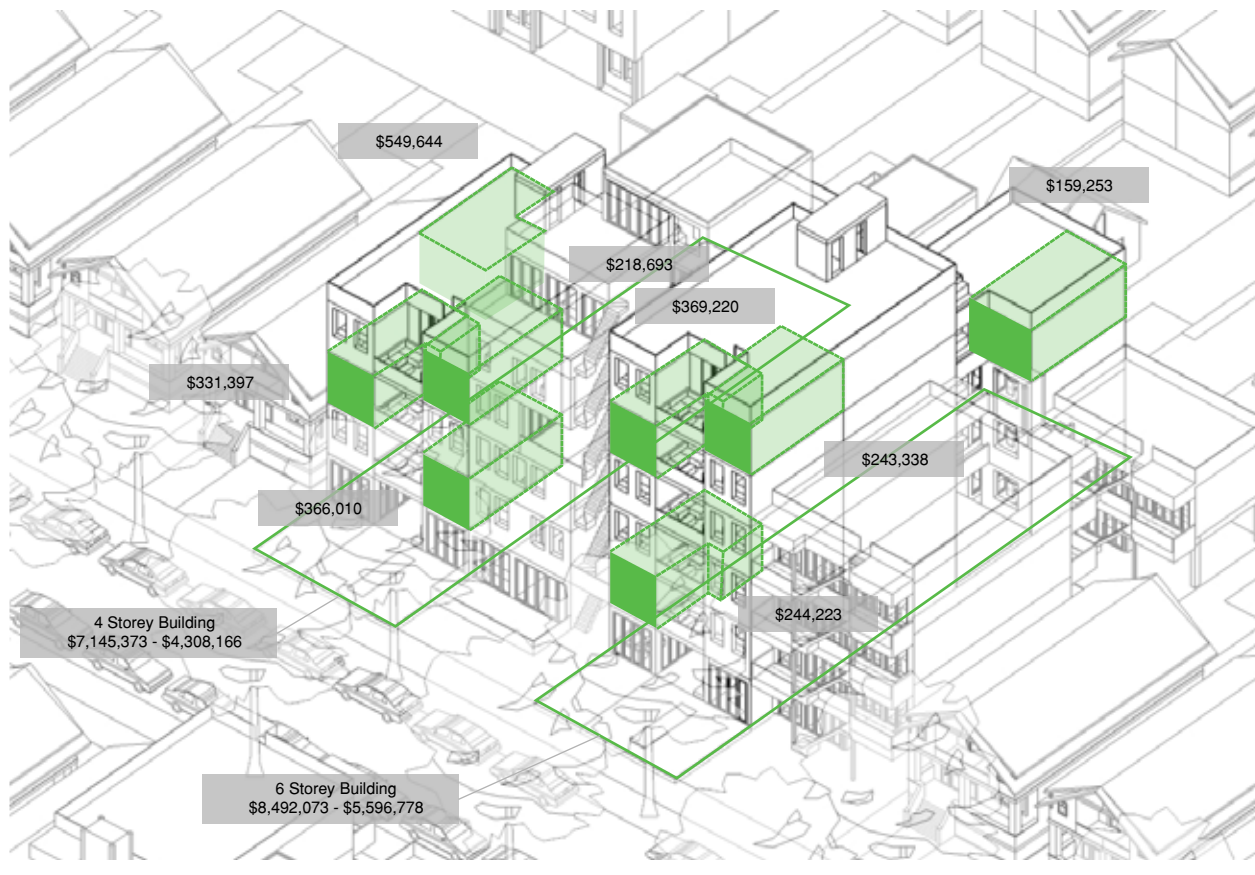


Figure 4.3.3.3: 1 BDRM axometric with unit costs

# 2 BDRM Costs

## Cost Variables

Statistics	4 Story	6 Story
Square Footage	7,320 sf	11,740 sf
Number of Units	10 units	17 units

Construction Cost (x)	4 Story	6 Story
Vancouver West \$205/sf	\$1,500,600	\$2,406,700
Vancouver East \$195/sf	\$1,427,400	\$2,289,300

Property Costs (y)	4 Story	6 Story
Vancouver West	\$3,690,802	
Vancouver East	\$1,570,948	

$z$  (total cost/sf) = { { (x + x\*0.085) + y + 1050 + 300 + 500 + 25/sf + 3.63/sf + 900/unit + [(1000/1076sf to 5380) + 500/1076sf to max 40,000] } (plus above value\*0.8)\*(0.04) } \*0.25

<sup>^</sup>Development, Property, and Construction Costs Combined

## Project Cost Totals (\$)

	4 Story	6 Story
Vancouver West	7,142,135	8,573,894
Vancouver East	4,305,069	5,677,346

## Traditional Developer Prices

Buyers Price Per Unit (\$)	4 Story	6 Story
Vancouver West	714,213	504,346
Vancouver East	430,506	333,961

Monthly Rent Per Unit (\$)	4 Story	6 Story
Vancouver West	3279	2287
Vancouver East	1937	1480

<sup>^</sup>Rent required to payback mortgage over 25 years at 3.0% interest (Mortgage increases monthly payments by 42%)

## Non-Profit Developer & Existing Government Rebates (Lowest Potential price)

<sup>^</sup>Traditional Developer Cost - 25% Profit margin - 5% GST rebate - \$5000 BC Homebuyers Rebate

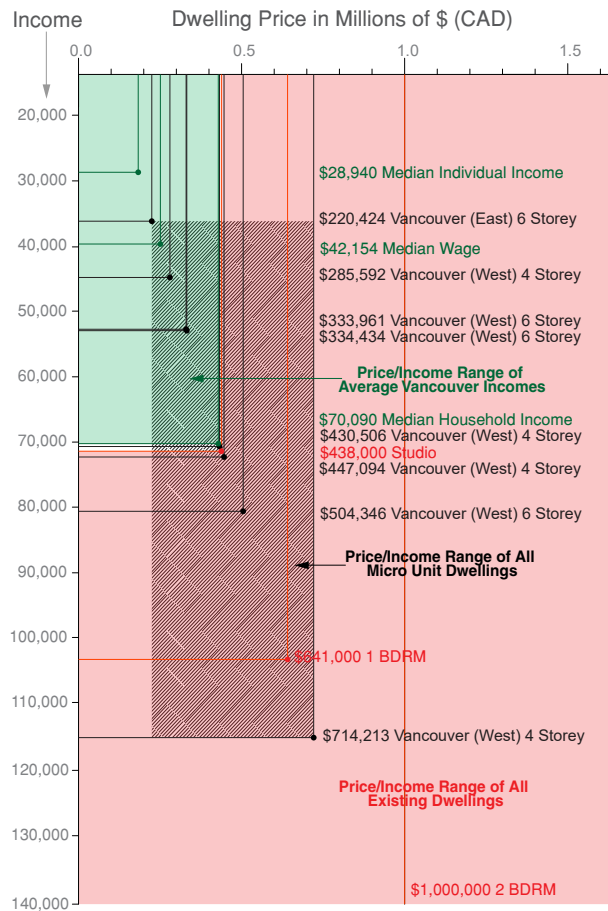
Buyers Price Per Unit (\$)	4 Story	6 Story
Vancouver West	447,094	334,434
Vancouver East	285,592	220,424

Monthly Rent Per Unit (\$)	4 Story	6 Story
Vancouver West	1590	1118
Vancouver East	952	735

<sup>^</sup>Rent required to payback investment over 25 years (Exc. Mortgage)

Figure 4.3.4.1

## Income Required to Affordably Purchase Dwellings



## Rental Rate / Mortgage Payment (3%) required for 25 year Investment Return by Unit Type

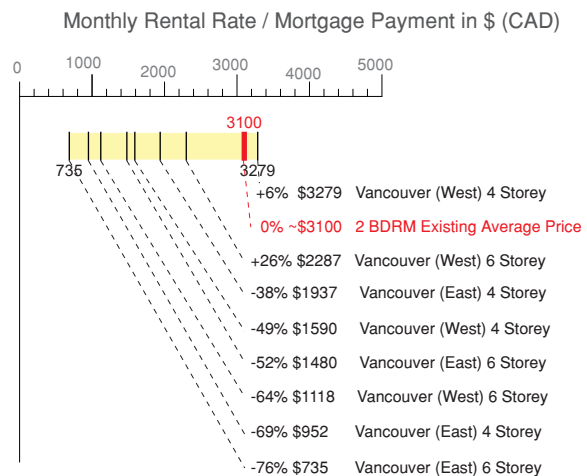


Figure 4.3.4.2

## Summary

Lot Type: Any 33 x 120' Typical Lot  
 Building Area 4 Storey: 7,320 SF (1.85 FAR)  
 Building Area 6 Storey: 11,740 SF (2.90 FAR)

Unit: 675 SF (Bathroom, Kitchen & Living, Bedroom)

Existing 2 BDRM Condo: 900SF

Townhouse: 900SF

Units per cluster: 4

Communal Space / Floor: 365 SF + 150 SF Ex.

Public Benefit Space: 900 SF

Workshop: 200 SF

1 Bicycle parking stall for 2 bike / unit

10 - 17 units

20 - 53 people

Densification of population: x 9.1 - 24.9

Dependent on the scenerio, 2 BDRM units may be purchased from \$220,424 to \$714,213 which is a monthly payment of \$735 to \$3279. This typology would be affordable to individuals for the cheapest scheme, for households with two income earners for a further 5 options, and unaffordable as a Vancouver (West) 4 storey developer model. The proposed private area within the studio is signifcantly smaller than the existing typology, however the additon of interior communal space within the cluster results in more overall living space.

In conclusion, all scenerios are less expensive to purchase than existing 2 BDRM options, and all but one scheme is cheaper to rent by 26-76%

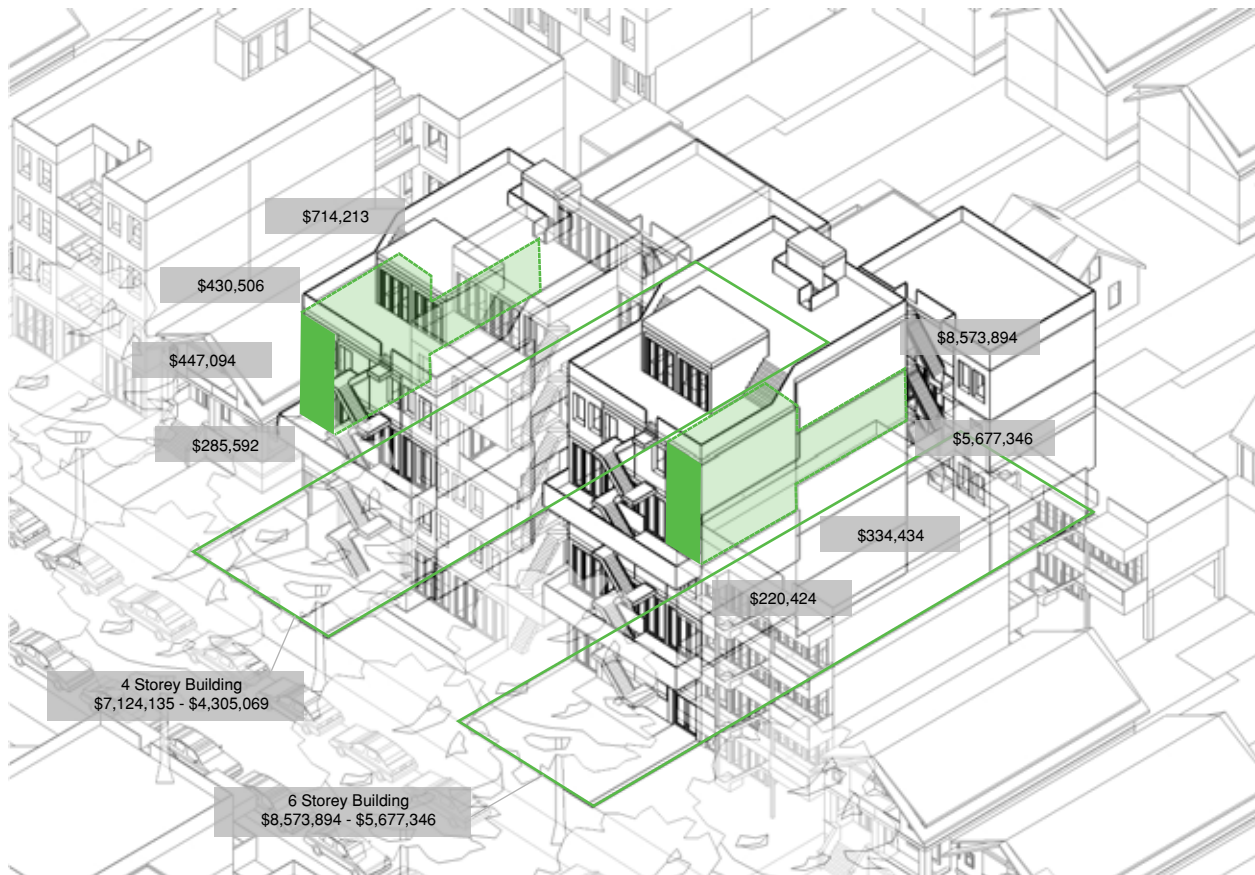


Figure 4.3.4.3: 2 BDRM axometric with unit costs

# 3 BDRM Costs

## Cost Variables

Statistics	4 Story	6 Story
Square Footage	5,320 sf	9,850 sf
Number of Units	5 units	10 units

Construction Cost (x)	4 Story	6 Story
Vancouver West \$205/sf	\$1,195,560	\$2,019,250
Vancouver East \$195/sf	\$1,137,240	\$1,920,750

Property Costs (y)	4 Story	6 Story
Vancouver West	\$3,690,802	
Vancouver East	\$1,570,948	

$$z \text{ (total cost/sf)} = \{ \{ (x + x*0.085) + y + 1050 + 300 + 500 + 25/\text{sf} + 3.63/\text{sf} + 900/\text{unit} + [(1000/1076\text{sf} \text{ to } 5380) + 500/1076\text{sf} \text{ to max } 40,000] \} \text{ (plus above value*0.8)*(0.04)} \} * 0.25$$

^Development, Property, and Construction Costs Combined

Project Cost Totals (\$)	4 Story	6 Story
Vancouver West	6,650,427	7,960,742
Vancouver East	3,843,024	5,090,650

Traditional Developer Prices	4 Story	6 Story
Buyers Price Per Unit (\$)		
Vancouver West	1,330,085	796,074
Vancouver East	768,604	509,650

Monthly Rent Per Unit (\$)	4 Story	6 Story
Vancouver West	5094	3567
Vancouver East	3438	2212

^Rent required to payback mortgage over 25 years at 3.0% interest (Mortgage increases monthly payments by 42%)

## Non-Profit Developer & Existing Government Rebates (Lowest Potential price)

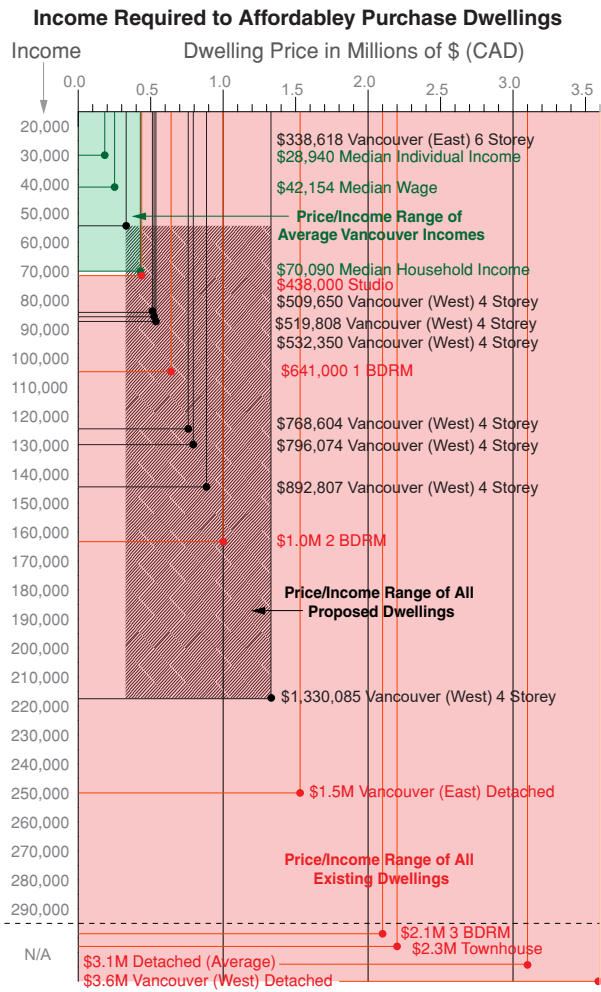
^Traditional Developer Cost - 25% Profit margin - 5% GST rebate - \$5000 BC Homebuyers Rebate

Buyers Price Per Unit (\$)	4 Story	6 Story
Vancouver West	892,807	532,350
Vancouver East	519,808	338,618

Monthly Rent Per Unit (\$)	4 Story	6 Story
Vancouver West	2976	1774
Vancouver East	1729	1128

^Rent required to payback investment over 25 years (Exc. Mortgage)

Figure 4.3.5.1



## Rental Rate / Mortgage Payment (3%) required for 25 year Investment Return by Unit Type

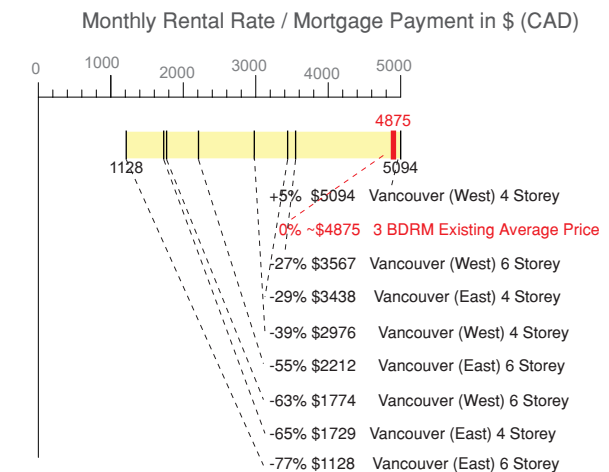


Figure 4.3.5.2

## Summary

Lot Type: Any 33 x 120' Typical Lot  
 Building Area 4 Storey: 5,320 SF (1.34 FAR)  
 Building Area 6 Storey: 9,850 SF (2.49 FAR)

Unit: 925 SF (Bathroom, Kitchen & Living, Bedroom)

Unit Terrace: 250 SF (average)

Existing 3 BDRM Condo: 1000 SF

Townhouse: 1300 SF

Average BC House: 1000 - 2000 SF

Public Benefit Space: 900 SF

Workshop: 200 SF

1 Bicycle parking stall for 2 bike / unit

5 - 10 units

15 - 40 people

Densification of population: x 6.8 - 18.2

Dependent on the scenerio, 2 BDRM units may be purchased from \$220,424 to \$714,213 which is a monthly payment of \$735 to \$3279. This typology would be affordable to individuals for the cheapest scheme, for households with two income earners for a further 5 options, and unaffordable as a Vancouver (West) 4 storey developer model. The proposed private area within the studio is signifcantly smaller than the existing typology, however the additon of interior communal space within the cluster results in more overall living space.

In conclusion, all scenerios are less expensive to purchase than existing 3 BDRM options, and all but one scheme is cheaper to rent by 27-77%

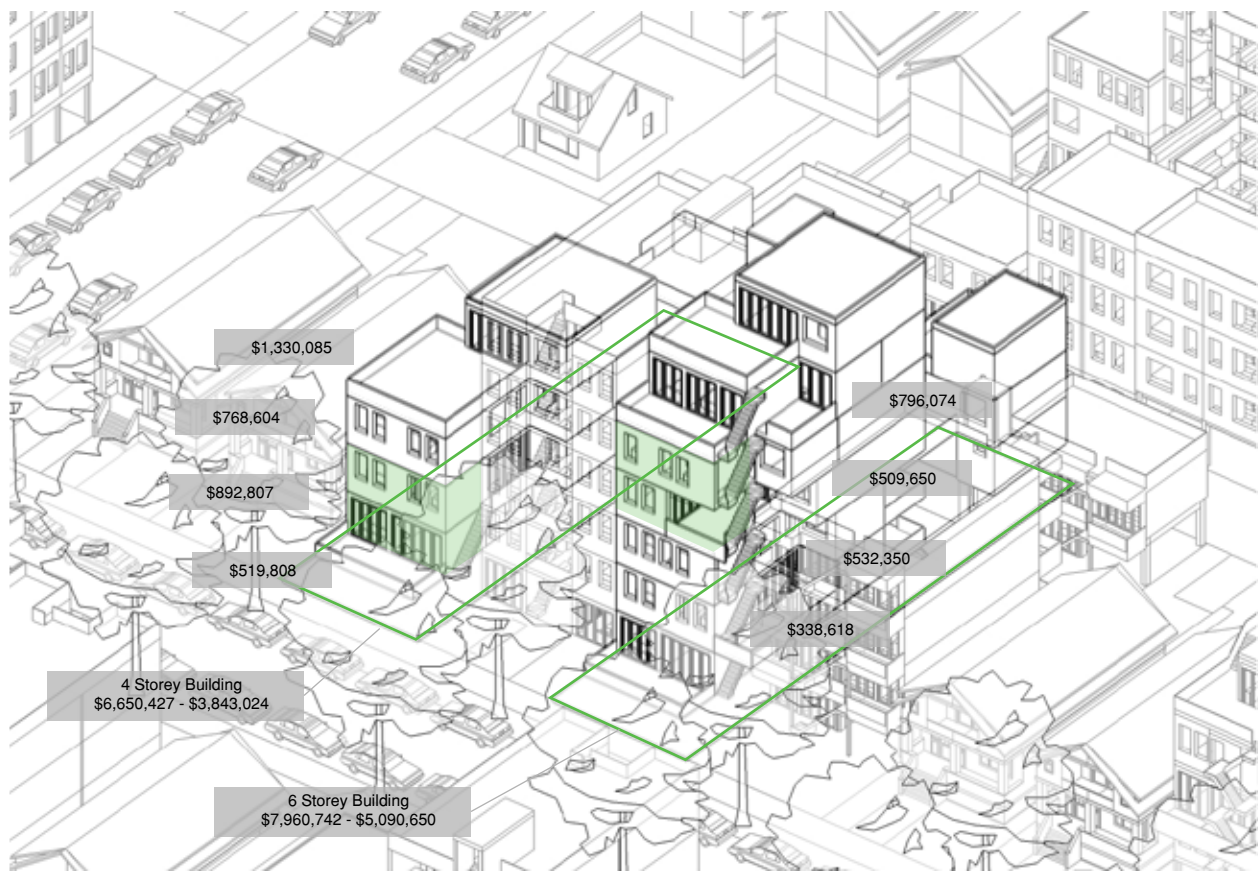


Figure 4.3.5.3: Existing Car Share Options and Proposed Private Vehicle Parking Alternatives

- Proposed Affordable Dwellings
- Existing Dwellings for Purchase
- Existing Dwellings for Rent

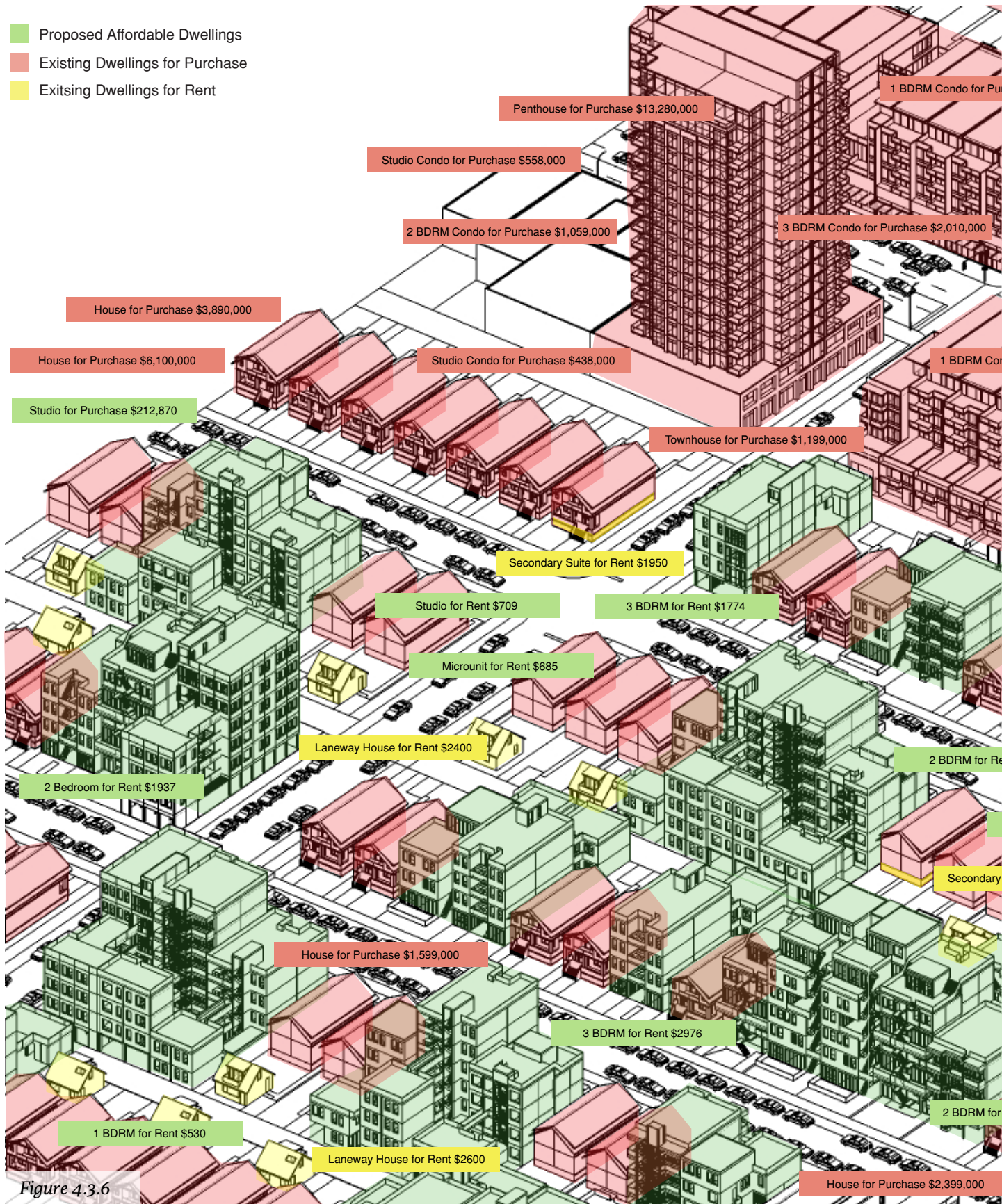
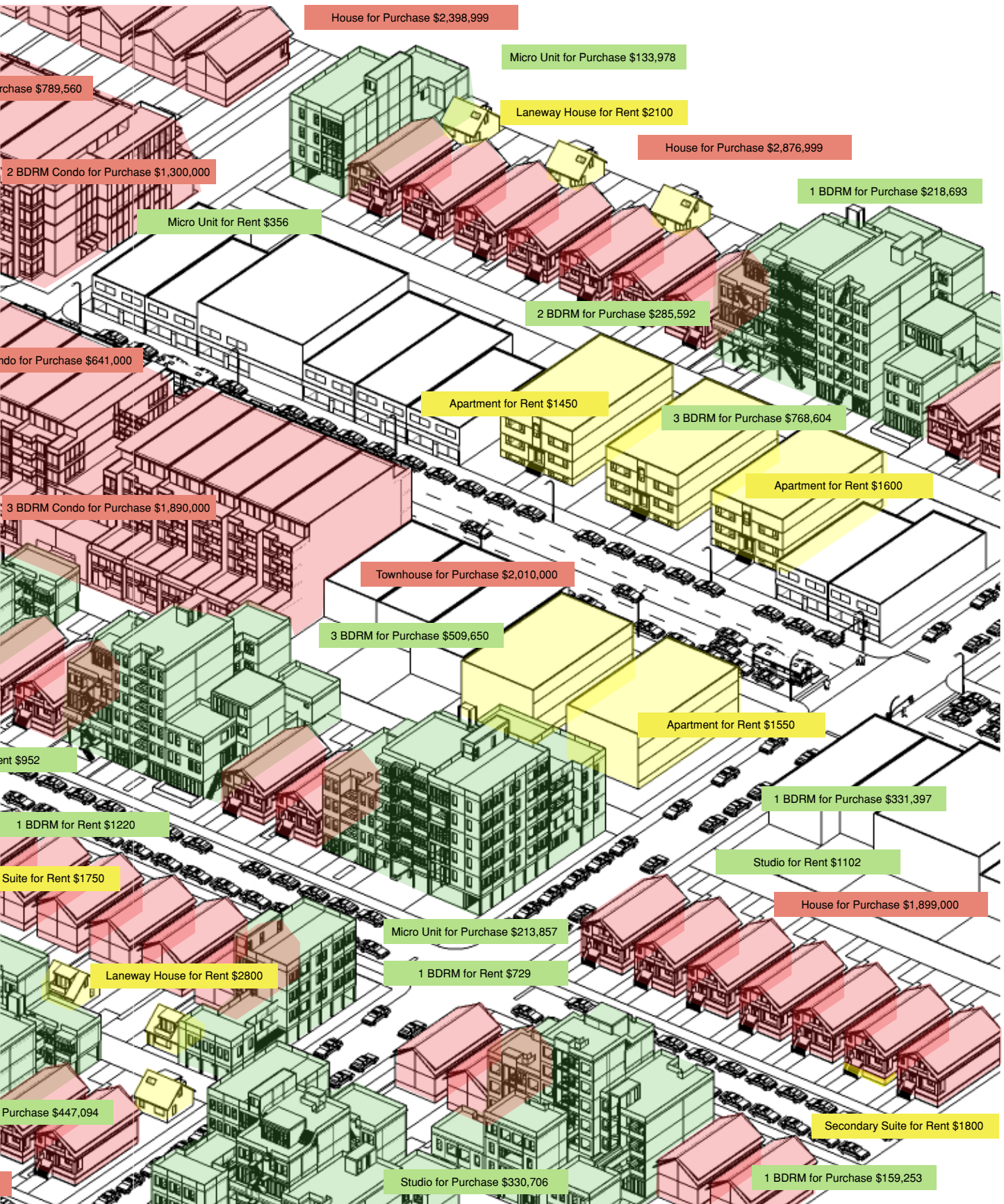


Figure 4.3.6



## Part 4 End Notes

### Cost Reduction Summary

- 1 <http://www.bdconsultants.com/tools/tool/cicalculator>
- 2 <http://www.bdconsultants.com/tools/tool/cicalculator>
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- 4 Bosma
- 5 Le Corbusier. Megastructure for Algiers. 1932. <https://bidoun.org/articles/le-corbusier-s-algerian-fantasy>
- 6 Bosma
- 7 Bosma
- 8 Bosma
- 9 Dogma. 2016. [https://architecture.mit.edu/sites/architecture.mit.edu/files/attachments/lecture/Tattara\\_living%20and%20working\\_intro.pdf](https://architecture.mit.edu/sites/architecture.mit.edu/files/attachments/lecture/Tattara_living%20and%20working_intro.pdf)
- 10 R-50 Cohousing. 2013. <https://www.archdaily.com/593154/r50-nil-cohousing-ifau-und-jesko-fezer-heide-and-von-beckerath>
- 11 OMMX. 2018. <http://www.officemmx.com/Naked-House-22-genuinely-affordable-homes-for-London>





## Conclusion & First Steps

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The insurgency lays out changes in zoning policy, building code, urban environment, architectural design, ownership models, and developer actors to shift the housing market from a finance capital system to one operating in a balanced position between investment opportunity to stimulate construction and public interest to provide affordability and choice. Zoning, building code and urban environments are changed to create a free supply, more unit and building variety, widespread responsive development, and appropriately scaled densification for established communities that can co-exist, respect heritage value, provide benefits to the community, and sustainably engage the public to maintain public support. By doing so, affordability is achieved through greater competition of a more available and diverse supply, improving the speed of development by pre-zoning, and by ensuring development is productive by preventing supersizing dwellings by adding affordability as a key living standard. Architectural design proposes new communal types of dwelling to introduce higher exposure to occupants that investors avoid, and responds to the real value of property and incomes to create dwellings that are scaled to be affordable. The design takes advantage of growing living arrangement trends and social relationships, as well as existing city services and proximities to create dwelling clusters that more efficiently balance the needs of the home as retreat and cohabitation, and uses dynamic thresholds to expand living space using a much smaller, and hence affordable footprint than traditional isolated units. Construction allows for flexible fitouts of services and room layouts so that initial prices are more accessible and occupants have more autonomy over their money and space, while lowering costs. Ownership supports cohabitation through approvals required by neighbours and direct informal governance structures that are at once both unbearing, and keep one involved in decision making, supporting the success of communal living as a viable affordability strategy. This insulates these buildings from absent speculative demand by limited investor access to purchasing dwellings and makes ownership more difficult to manage from abroad. Developers are encouraged to participate with profits of 25% factored into the design, but the scale and attributes of these inhabitant oriented buildings makes development viable for groups with less capital such as homeowners and co-ops, increasing competition. Initially, the insurgency relies on dwellings reacting to real land values and incomes to provide affordability. Overtime, to prevent land values from rising further out of line with income and making even this dwelling typology inaccessible, the combined strategies holistically tackle the distorting factors in the private market to create a buyers market, where the public has the power to keep costs down, and the housing industry is enabled to react to changes in demand. The end goal is to saturate the market enough with affordable units that prices of every type are forced to slow in inflation to allow incomes to catch up with the real estate boom of the last 20 years.

The parameters of the insurgency specifically reject monetary assistance and new programs provided by the government, as the government will always fail to keep pace with changes in the market, and financing is always unpredictable. By relying on fixing the market, the insurgency can use proven supply and demand relationships to create affordable conditions, in ways policymakers can understand and the industry can adapt to quickly. The insurgency also does not require any major public position changes, but exposes the current hypocrisy between messaging and action with clear regulatory solutions to provide real results. While this strategy still faces hurdles due to the vested interest of government in tax collection of overvalued property, wealthy politicians with their own real estate interests, an investment centric narrative in real estate, and the damage caused by existing luxury development projects that cater to speculators and reject neighbourhood context, the magnitude of the affordability crisis is forcing action on these issues. The insurgency could take advantage of recently announced affordable housing government programs and funds temporarily to gain limited regulatory exemptions to finance a prototype of the proposal.

Ideally, government programs to provide affordable housing recognize that the problem is the fundamental undermining of the housing market, and that the problem is too large to make an impact with traditional financing aid and housing construction. The Federal Government's new \$40 billion dollar 10 year national housing strategy has dedicated resources to "A new federal housing advocate will be tasked with advising the federal government and CMHC on possible solutions to affordable housing shortage and

establishment of a national housing council.” The plan promises \$15.9 billion dollars in co-investment with the private sector and \$11.2 billion dollars in low interest loans for developers. To make the largest impact the government could fund the proposed housing framework prototype to reduce resistance to regulatory action and public distrust of development. The benefit to this strategy would be easier one time experimental exceptions to land use and building code barriers and a product in which developers and the public could look to as a real functional example. Upon the successes and adjustments to the failures of these prototypes, the resultant momentum for the proposal could inspire the required regulatory alignment to be acted upon and public demand for these buildings to be created, at which point the private sector could take over the development evolution of the typology, leading to sustained affordable housing without public monetary support.

The city of Vancouver has a positive track record on city building experimentation. Vancouver is one of the only north american cities to reject inner city highways in the 20th century, it successfully densified the west end in the 70’s in stark contrast to social housing projects such as Regents Park in Toronto, and more recently it has become the first city in North America to allow the widespread construction of laneway houses. In the past few years, Vancouver has actively pursued new unit typologies such as microunits at UBC, new building technology such as timber tall buildings in at UBC, recognized improved fire safety by allowing 6 storey apartments be built of wood frame construction, and is allowing prototypical laneway apartment building typologies in the West End. There are many low risk oppurtunities in Vancouver to test this new proposal on an exceptional basis across the city, where the neighbourhoods have already densified, but some single detached house lots still exist between densified lots. This would allow the city and public to experience the changes at a low risk small scale, before implementing city wide, in a similar way the city experimented with laneway houses and laneway apartments.

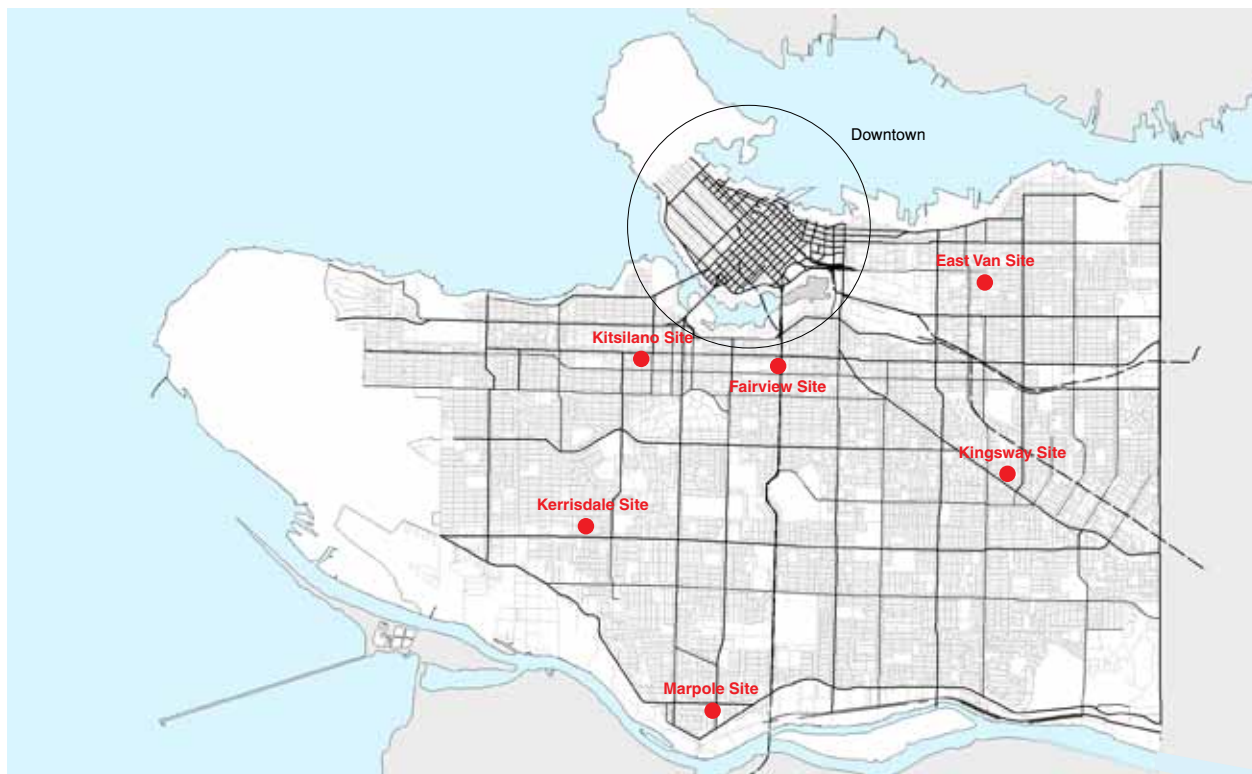


Figure 5.1.1: Map of potential prototype sites of proposed insurgency



Figure 5.1.2: Kistilano Site. Studio Location. 2078 West 5th Ave.



Figure 5.1.3: Marpole Site. 2 Bedroom Location. 8765 Oak Street.



Figure 5.1.4: Kerrisdale Site. Micro-unit corner lot. 2235 West 40th Ave.



*Figure 5.1.5: Fairview Site. 1 Bedroom Location. 1341 West 14th Ave.*



*Figure 5.1.6: East Van Site. Studio Location. 1837 East Georgia Street.*



*Figure 5.1.7: Kingsway Site. 3 Bedroom Location. 2304 Galt Street.*

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