



MORE SMALL!

*Building Resilience
and Neighbourliness in
Vancouver's Shared Spaces*

Caitlin Schultz

ASBM01: Degree Project in Sustainable Urban Design
School of Architecture, LTH, Lund University

June 2021

Examiner: Louise Lövenstjerne; Supervisor: Andreas Olsson

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Master's Thesis Booklet

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Examiner: **Louise Lövenstjerne**

Supervisor: **Andreas Olsson**

Jury: **Peter Sjöström**
Founder, SUDes, Lund University

Jenny B. Osuldsen
Partner and Director, Snøhetta

It is my pleasure that I acknowledge the contributions of many individuals who have provided their insight, support, and encouragement, and without whom this work wouldn't have been possible.

Thank you to my dedicated thesis supervisor, Andreas Olsson, who has brought me thoughtful questions and engaging discussions, and who saw my vision for this thesis even when it was obscured from my own view. And to my examiner, Louise Lövenstjerne, who, since my first SUDes studio, has always pushed me to realize a potential I didn't know I had.

Thank you to my Special Projects family at the City of Vancouver, who provided invaluable help during this process, and the push I needed to begin this master's programme in the first place.

Thank you to my folks and friends for your unwavering patience and much-needed laughter, and to Dexter, for being my rock through thick and thin.

AUTHOR'S NOTE

This thesis project is close to my heart. I have been both the benefactor of the incredible privileges that come with single-family suburban living, and also a victim of its failings. I am far from the hardest hit by Canada's housing affordability crisis, which has sent countless Canadians of all generations into varying states of homelessness, social isolation, financial instability and mental unwellness.

And yet, given my advantages, I am not immune to the crisis. Since leaving to study in Lund in August 2019, the benchmark price for a single-family detached home in Vancouver has *increased by* \$350,000¹ (2.4 million Swedish crowns) — nearly six times the cost of international tuition for this degree.

When I applied to this master's programme in 2019, I wrote in my application about my desire to study urban design as a public health solution, and I believe now more than ever that housing and public health solutions are one and the same. I'm comforted that I've stayed true to that desire throughout this work.

This thesis comes from a place of optimism and, in addition to the academic pursuit, it represents a dream for a more equitable, sympathetic, and dignified way of living that I hope to enjoy one day, and as an urban designer, have the honour to provide for others.

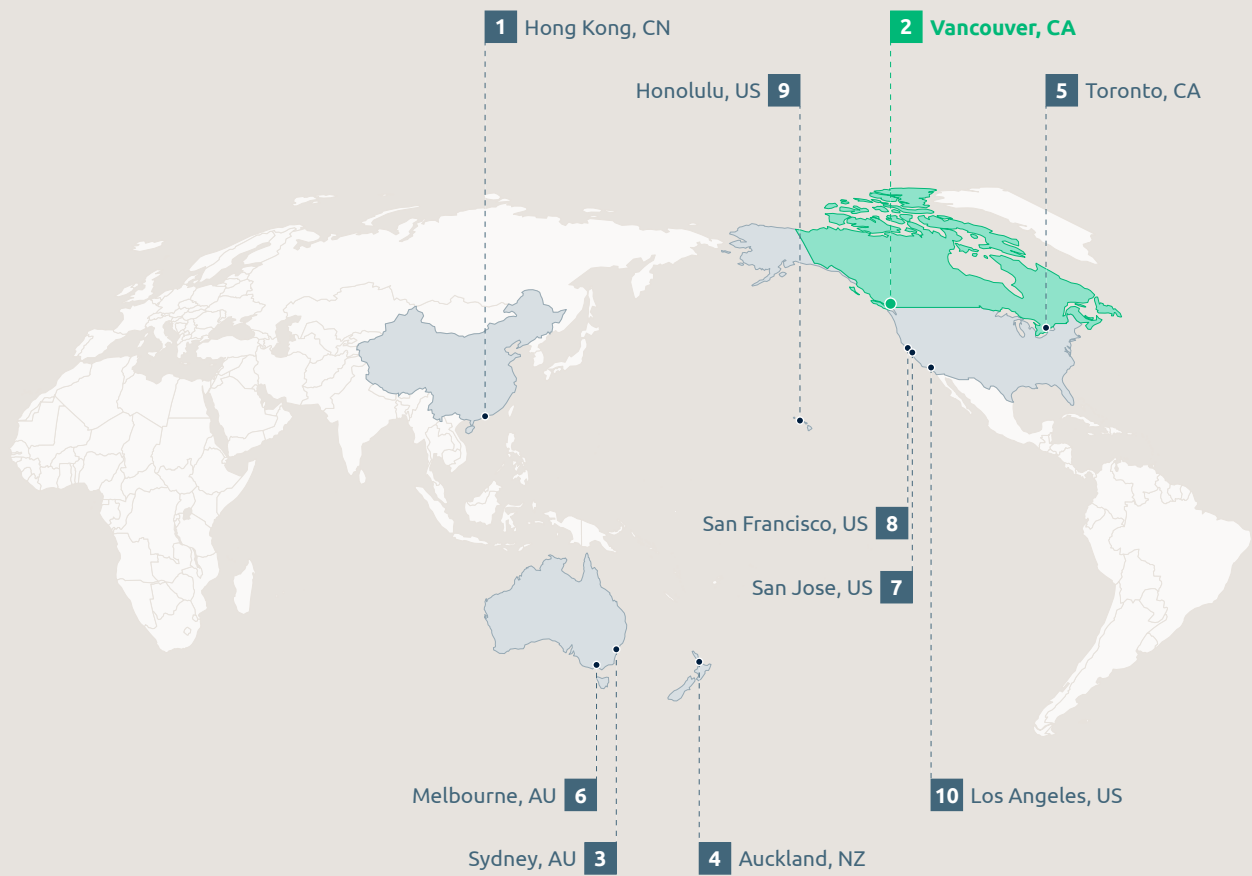
Thank you for reading.

Caitlin

¹ (Real Estate Board of Greater Vancouver, 2021)

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(Above: Demographia International Housing Affordability, 2021 Edition;
 Opposite: 1 Vancouver Foundation, 2017)

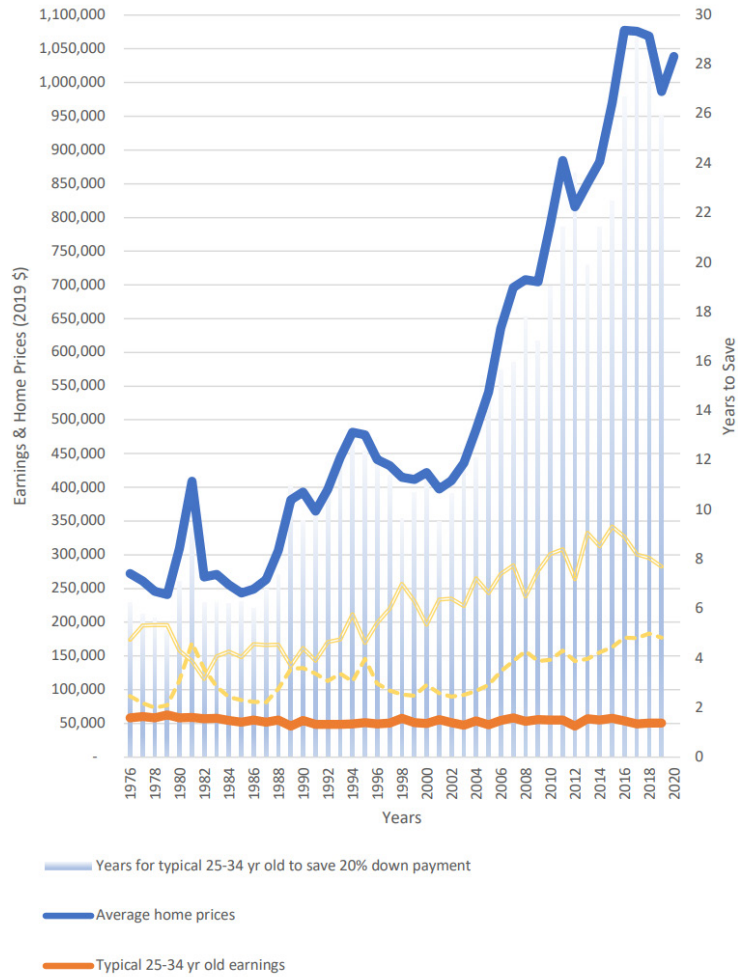


INTRODUCTION

Vancouver has the most expensive housing market in North America when comparing home prices to incomes. Globally, only Hong Kong is more unaffordable.

A study on community and wellness in Vancouver reported that it is “a hard place to make friends, our neighbourhood connections are cordial, but weak, and [there is] a declining level of participation in community life.”¹

At the same time, the city is often referred to as one of the most liveable cities in the world. How is it that a city can be both the most liveable, and one of the most difficult to live in?



(Generation Squeeze, 2020)

A GoFundMe campaign run by a Canadian advocacy group raised over \$8000 for billboards to be displayed in the nation's capital. The billboards were displayed during May and June 2021

(CanadaHousingCrisis.com)



A CITY IN CRISIS

Vancouver is in the middle of a housing affordability crisis. For the average young adult looking to purchase an average-priced home, it would take 26 years just to save up for their down payment (Generation Squeeze, 2020). Every year, house prices and rents continue to outpace incomes, making housing security increasingly out of reach for too many residents.

The Canadian Dream is alive and well even in urban centres like Vancouver. Homeownership is not only seen as a standard for success, but a necessary investment tool to prepare for retirement; however, without the income gains, homeownership has become an unattainable goal for many Vancouverites. This problem isn't limited to Vancouver: Toronto, Canada's largest city, is also in the top ten for the world's least affordable housing markets and many other Canadian cities are close behind (Demographia, 2021). Even once-affordable small communities have been seeing major price spikes, due to a surge in demand during the COVID-19 pandemic.

There are many possible factors that have influenced the dramatic rise in house prices. Many people point to a lack of supply of public housing, speculation by investors, or wealthy buyers coming from outside Canada. While they all may play a role in Vancouver, housing affordability problems afflict many major North American cities, and they have one commonality — the practice of exclusive single-family zoning.

A 2017 report by the Vancouver Foundation found that people are feeling uncertain about their future, and among those who expect to move away soon, the number one reason is because they can no longer afford to stay (Vancouver Foundation, 2017).

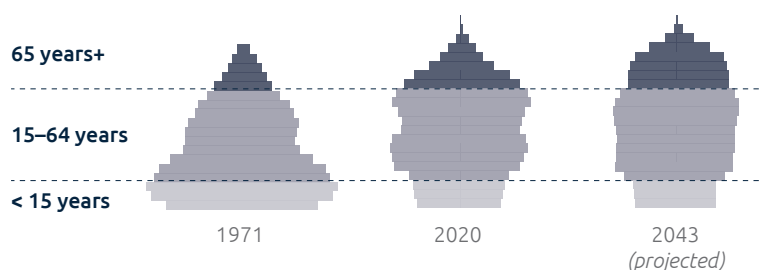
With an aging population, and younger residents needing to move further afield, Vancouver is already seeing a hollowing out of its working class. If Vancouver intends to keep its status as one of the world's most liveable cities (The Economist Intelligence Unit, 2019), increasing access to housing needs to become a higher priority.

1 IN 7
RESIDENTS
SAY THEY ARE
LONELY

1 IN 4
RESIDENTS
SAY THEY ARE
ISOLATED

(Vancouver Foundation, 2017)

Vancouver's population distribution



(Statistics Canada, a; Statistics Canada, b)

PURPOSE

The aim of this thesis is to explore an emerging paradigm of suburban living as a response to significant affordability challenges in Vancouver, Canada, and how the established public realm can be restructured to better support a widespread increase in residential density.

The research questions to be explored are:

- 1. How does the existing paradigm of urban/suburban living affect housing affordability in Vancouver?**
- 2. What is required to ensure liveability in a multi-family context?**
- 3. How can the public realm in Vancouver's existing single-family neighbourhoods be adapted to suit future multi-family living?**

The following report comprises three main sections: *How Did We Get Here?*, an analysis on the historical development of the city and an insight into patterns of unaffordability in North American cities; *Where Are We Going?*, how persisting patterns support old paradigms, and a beacon of hope for how we might get out of this mess; and *A New Path Forward*, building on the Missing Middle movement, how a comprehensive public realm strategy can complement widespread densification in Vancouver, and how existing neighbourhoods can adapt.



▲ The Image of the City

The Reality of the City ▼





PART A

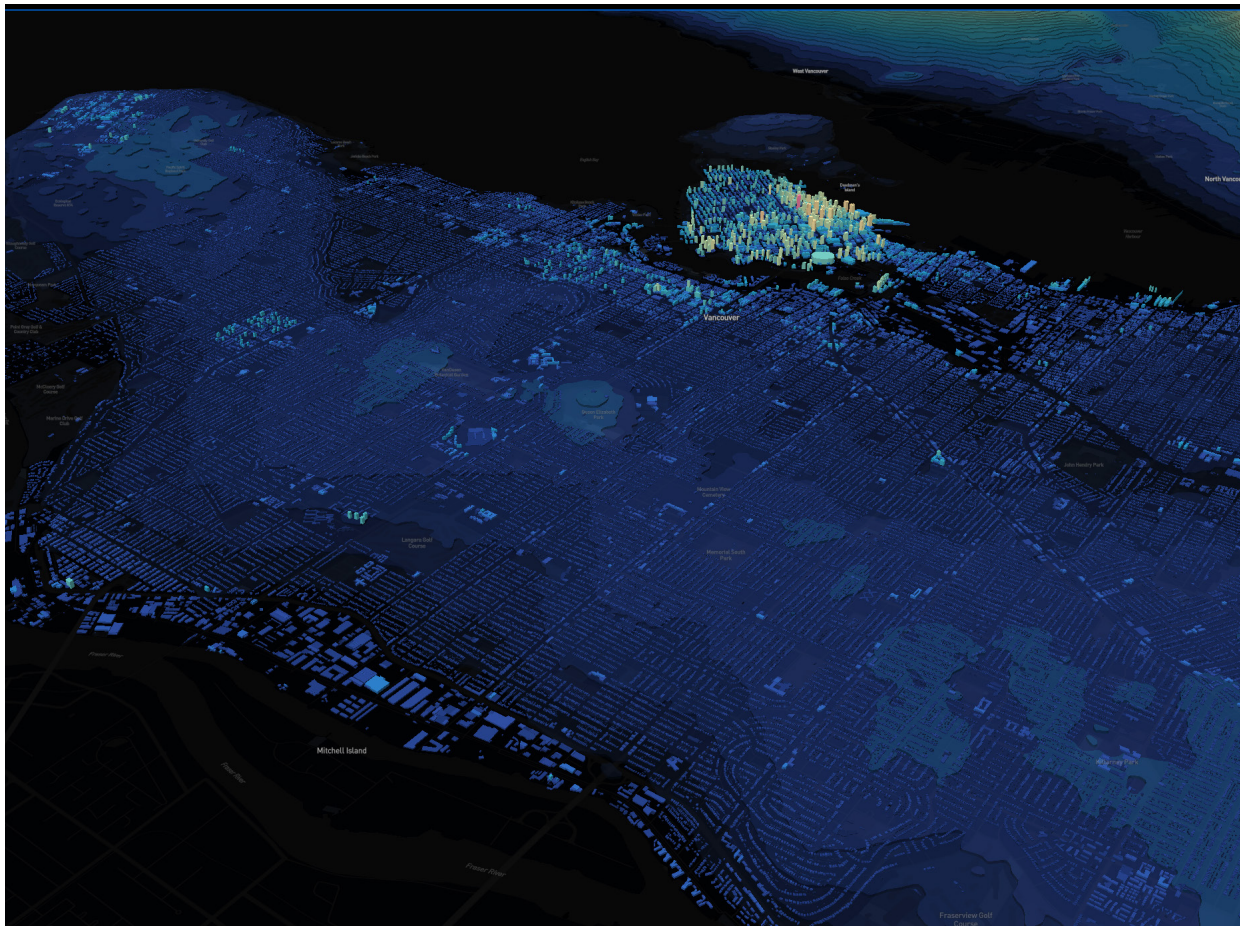
HOW DID WE GET HERE?

From 2002 until 2010, Vancouver was rated by the Economist Intelligence Unit as the most liveable city in the world¹.

The qualities that Vancouverites hold dear — a city that meets the sea, the forest, and the mountains — are a boon for liveability in Vancouver, but they paint a limited picture. Most of the land area in Vancouver consist of rigid, suburban, single-family neighbourhoods that are inaccessible to the majority, and with skyrocketing housing prices, even dense urban living is becoming increasingly out of reach.

The reality is that we have far outgrown the Canadian Dream of the post-war era, and since 2010, Vancouver's liveability rankings have been dropping. Do we uphold this paradigm because it is still the ideal, or because we haven't been presented with a better alternative?

*(Opposite, clockwise from top:
Pearce; JamesZ_Flickr; Dyck; St. Denis; Wpópey; Strachan.
Above: ¹The Economist Intelligence Unit, 2019)*



(nicholsonroad.com)

A MANUFACTURED PROBLEM

A prevailing theory about the cause of rising housing costs in Vancouver is the uniquely North American practice of Euclidean zoning, which puts strong restrictions on what can — and more importantly, what cannot — be built on a given plot of land.

In practice, jurisdictions that employ restrictive zoning have a fairly consistent urban pattern: a dense core with sprawling low-density suburbs, and this pattern is very visible in Vancouver (see opposite).

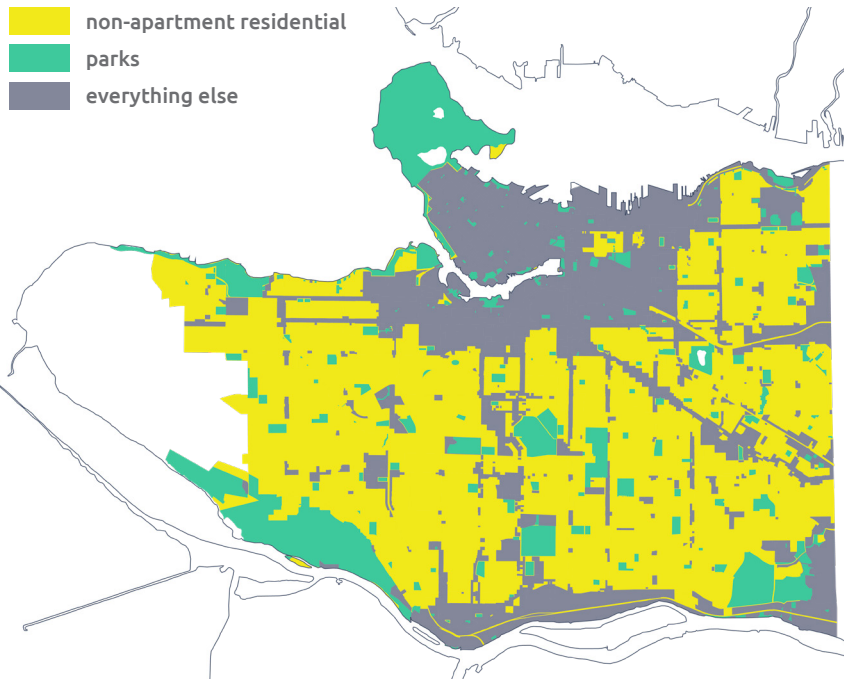
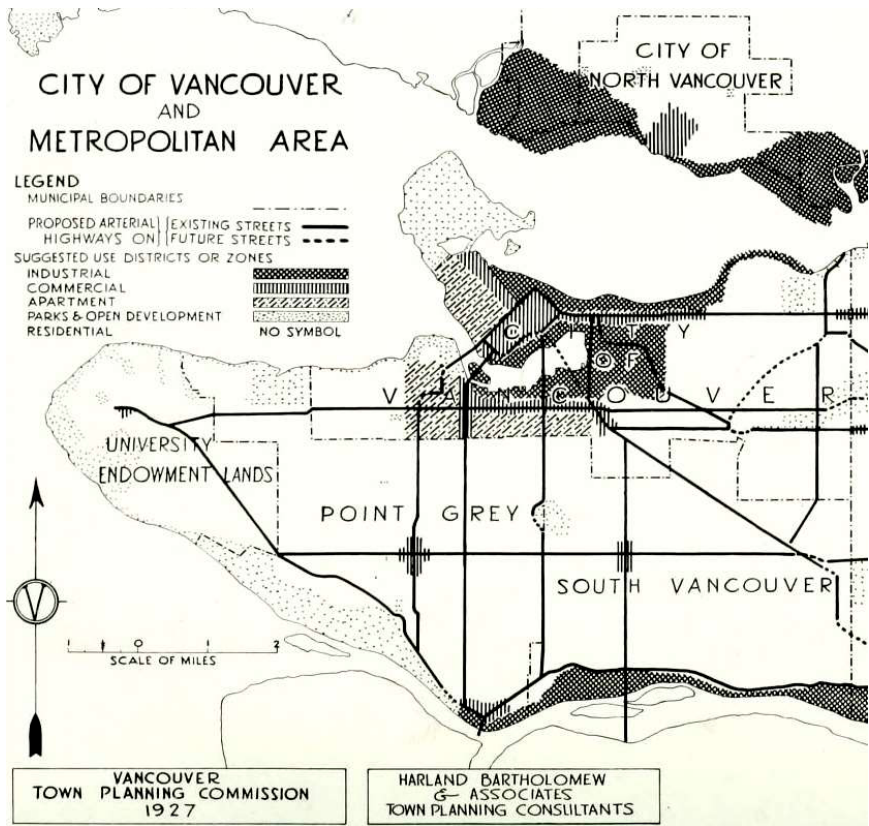
To many housing advocates and restrictive zoning critics in Vancouver, it would come as little surprise that the once

independent municipality of Point Grey (home today to the exclusively wealthy neighbourhood of First Shaughnessy), is the home of Canada's first ever zoning code. Inspired by Point Grey, Vancouver's Town Planning Commission would implement one for their own growing city just five years later.

What is Euclidean zoning?

Euclidian zoning, or single-use zoning, is a way of regulating development by restricting land uses to specific geographic districts. Its restrictive nature makes it easy to interpret and implement.

Originally introduced to separate industrial functions that were not considered compatible with living (due to environmental impacts like noise and smell), Euclidean zoning today is criticized for its lack of flexibility, and many question its effectiveness and relevance in today's context.



Above: The first Zoning Plan for Vancouver created by Harland Bartholomew & Associates (Bartholomew et al., 1929)
Below: Vancouver's zoning plan today (City of Vancouver)

THE LEGACY OF SINGLE-FAMILY ZONING

“Few cities possess such a combination of nearby natural resources, a splendid harbour, a terrain ideally suited for urban use, an equable climate and a setting of great natural beauty.

Vancouver is the most important Pacific port of a great country. Here, if anywhere, should develop a great city.”

– Harland Bartholomew, *A Plan for the City of Vancouver*, 1929, p. 14

In 1926, the Vancouver Town Planning Commission hired American planner Harland Bartholomew to produce a comprehensive city plan for Vancouver. Published in 1928, *A Plan for the City of Vancouver* included the first formalized city-wide policies on nearly every aspect of city-building, including road networks, mass transportation, recreation, green space, aesthetics, and of course, zoning.

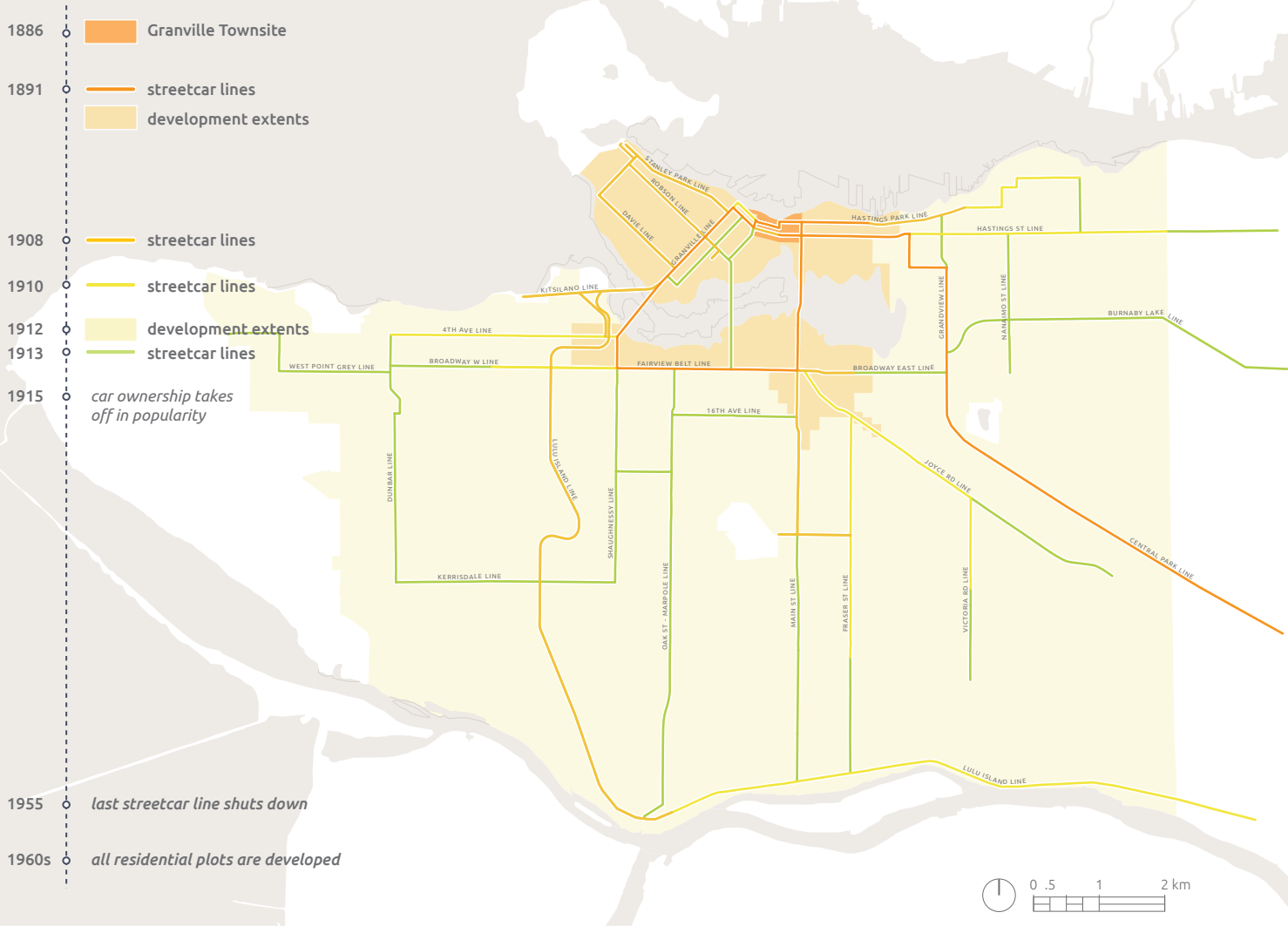
The planning commission’s first request of Bartholomew was a zoning by-law, following Point Grey’s lead. So urgent was the desire “to prevent the intrusion of apartment houses in single or two-family residential areas” (Bartholomew et al., 1929, p. 211), that Bartholomew was asked to prepare a temporary zoning plan to bridge the gap until the final plan would be completed, less than two years later. In the final iteration of the plan, Bartholomew states:

The good that came out of the interim zoning by-law only increased the desire to put in effect a comprehensive by-law. The experience of the former municipality of Point Grey is similar. The benefits of zoning in general are too obvious to need elaboration in this report. (Bartholomew et al., 1929, p. 374)

Bartholomew’s reports have had significant influence in shaping Vancouver over the past century. The legacy of *A Plan for the City of Vancouver* still has a strong presence in today’s plans and policies (an analysis of historic and current zoning maps, nearly 100 years apart, show striking similarities; see opposite page), and many people attribute Vancouver’s unique form of urbanism to the “Bartholomew Plan.”

In nearly a century, the City has produced a large number of neighbourhood and area plans, but *A Plan for the City of Vancouver* remains the city’s only city-wide plan. In 2019, Vancouver’s City Council at last called for a new city-wide plan, which city staff plan to present in 2022.

How Did We Get Here?



Vancouver's streetcar system at its peak. Newly built streetcar lines enabled the growing population to move beyond the Granville Townsite. As the personal automobile gains popularity

beginning in 1915, the popularity of the streetcar falls. In 1955, the final streetcar route shuts down, but by that point, few parts of the city remain untouched by development.



Early expansion of the streetcar into Kitsilano along 4th Avenue

(City of Vancouver Archives)

THE LEGACY OF THE STREETCAR ERA

The inception of Vancouver as we know it today (see *Pre-Colonial Settlement*, below) began in the 1860s, when the first European settlers, recognizing the potential for the lumber industry, established the Granville Townsite on Vancouver's northern shoreline. It wasn't until 1885, however, when the Canadian Pacific Railway (CPR) announced that Vancouver would become the western terminus of their trans-continental line, that the city began to grow in any significant way. Within five years, the population of Vancouver would grow by more than 1500% (Bartholomew et al., 1929). The introduction of the British Columbia Electric Railway (BCER) would be the key to unlocking development for the growing population.

When the BCER began to build streetcar lines beyond the townsite, it preceded — and therefore enabled — the expansion of the city, and development of the suburbs soon followed.




Enterprising property owners along the streetcar routes began to set up storefronts, capitalizing on the increased foot traffic and creating many of today's commercial corridors. Bartholomew's interim zoning plan later prohibited such uses, and routes that were later extended were not able to establish commercial activity. This pattern is visible along today's arterials: commercial activity stops where the streetcar lines of yesteryear had not yet been extended.

Early on, the western neighbourhoods comprising Point Grey, including Shaughnessy Heights, were established as enclaves for incoming wealthy white immigrants and Point Grey's exclusive zoning code was implemented to ensure it stayed that way. Today, Shaughnessy Heights remains the most expensive and exclusive area in the city.

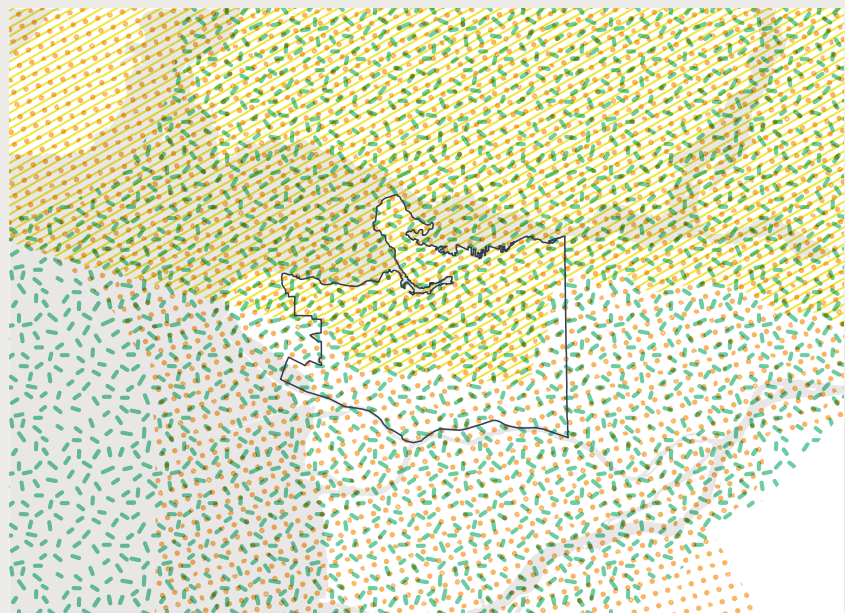
Pre-Colonial Settlement

Predating European settlement by more than 10,000 years, the geographic area around Vancouver comprises territories still belonging to the Musqueam, Squamish, and Tsleil-Waututh First Nations.

Historical accounts show many settlements belonging to the three Nations around Vancouver's shoreline.

-  Musqueam Nation
-  Squamish Nation
-  Tsleil-Waututh Nation

(Native Land)



100 FORMATIVE YEARS, 4 GROWTH CYCLES

1866–1870: THE FIRST COLONIAL SETTLERS

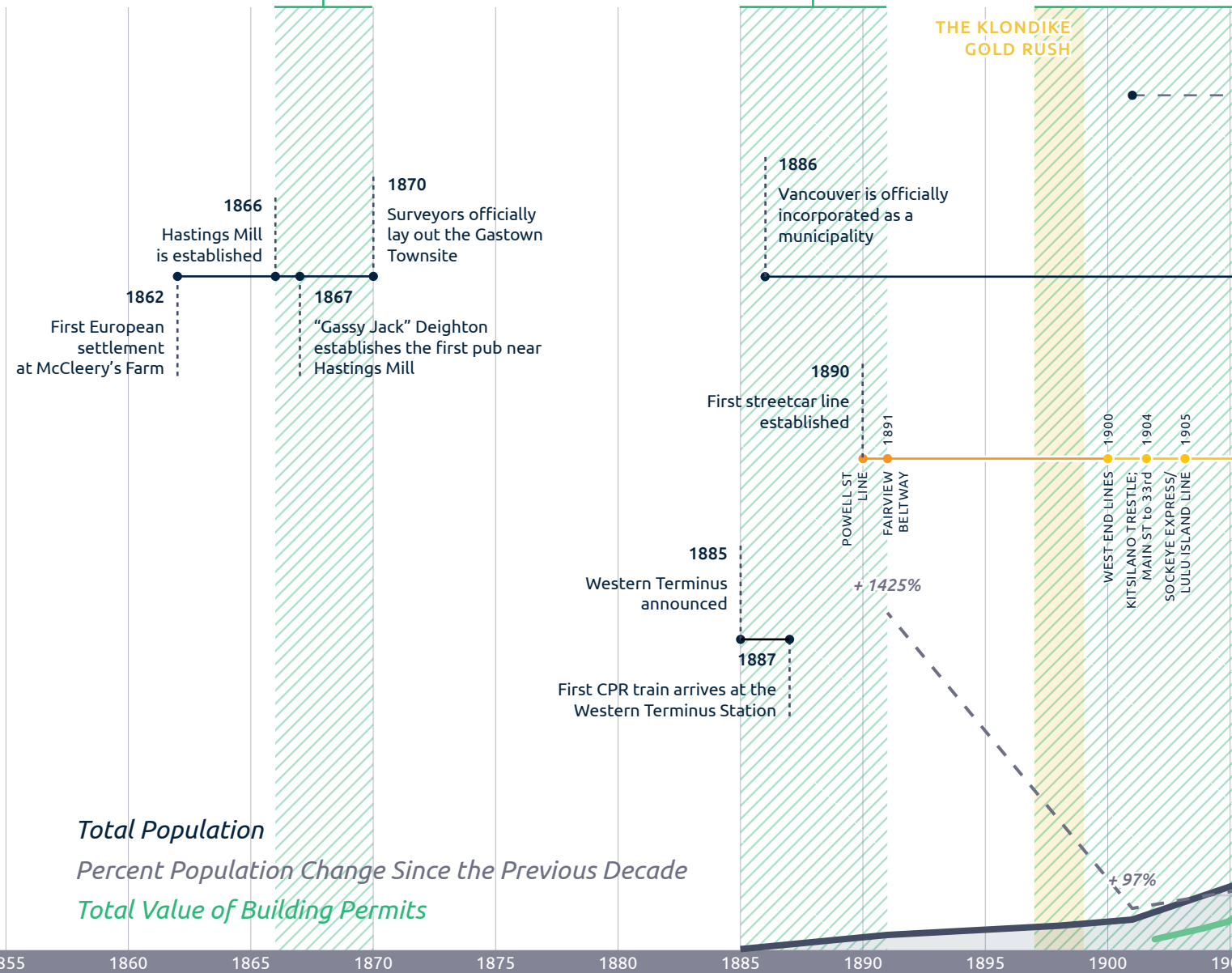
The first wave of growth came with the establishment of the first lumber mills around the Burrard Inlet.

The mills attracted workers, and the first pub was established a mile west. This would become the centre of the Granville Townsite, later renamed Gastown.

1885–1891: THE ARRIVAL OF THE CPR

The Canadian Pacific Railway announces Vancouver will be the location of the rail line's western terminus. Population grows by nearly 1500%.

Large numbers of Chinese and Japanese immigrants move to Vancouver to capitalize on jobs in the railway-building and fishing industries.



(Bartholomew, 1929; Bartholomew, 1947; Kuntuks, 2020; MacDonald, 1973; VSB Archives & Heritage, 2018,

1897–1913: THE GOLD RUSH and THE STREETCAR ERA

Population more than quadruples during this time, as settlers move west through Canada and America, many for the Klondike Gold Rush.

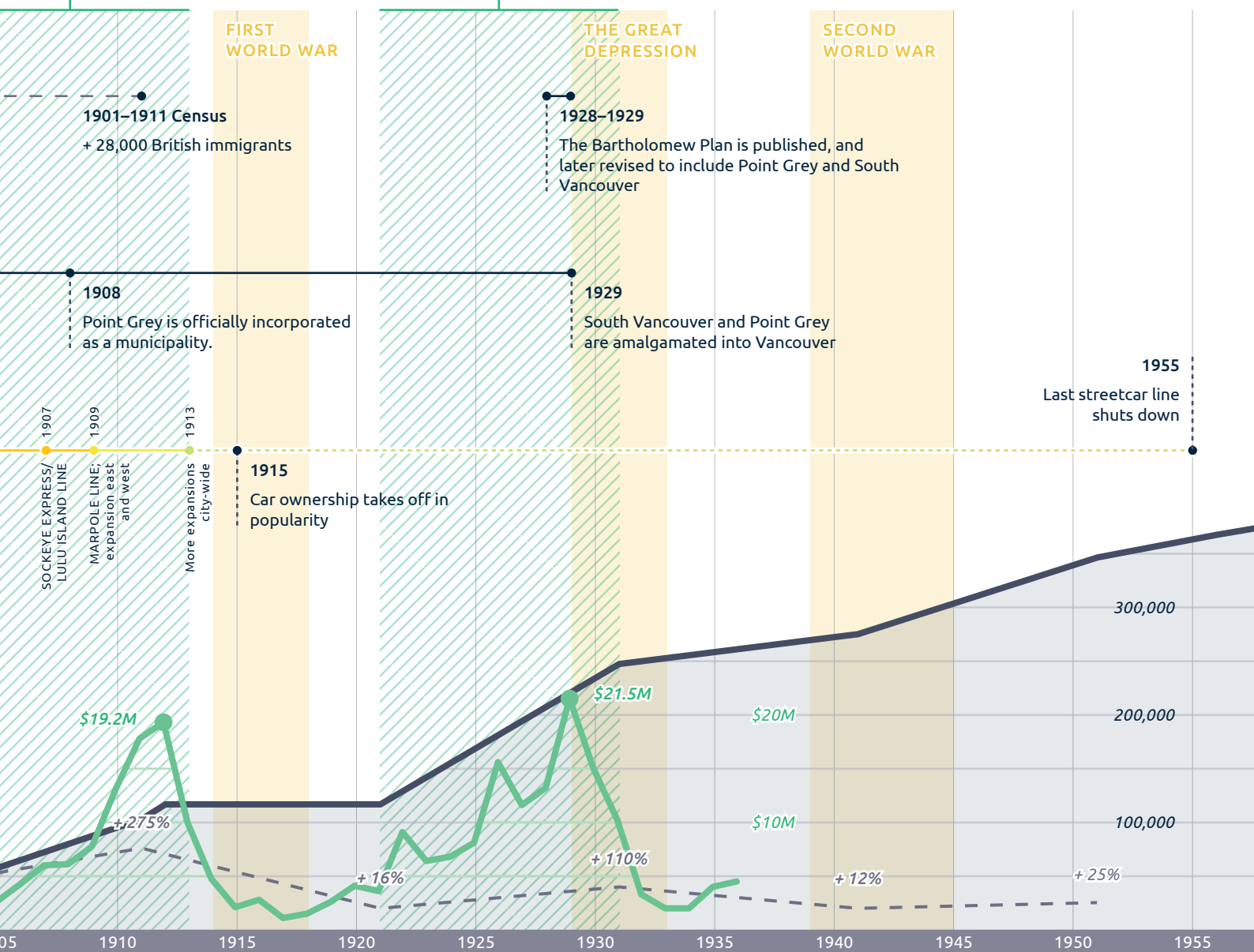
Large numbers of British immigrants arrive, bringing with them their styles and beliefs.

Establishment of the streetcar expands the city immensely. New streetcar routes reaching further and further south unlock more areas of the city.

1921–1931: THE ROARING TWENTIES

Following World War I, development surges city-wide, peaking in 1929 with a record-setting \$20 million in building permits issued. Population doubles during this period.

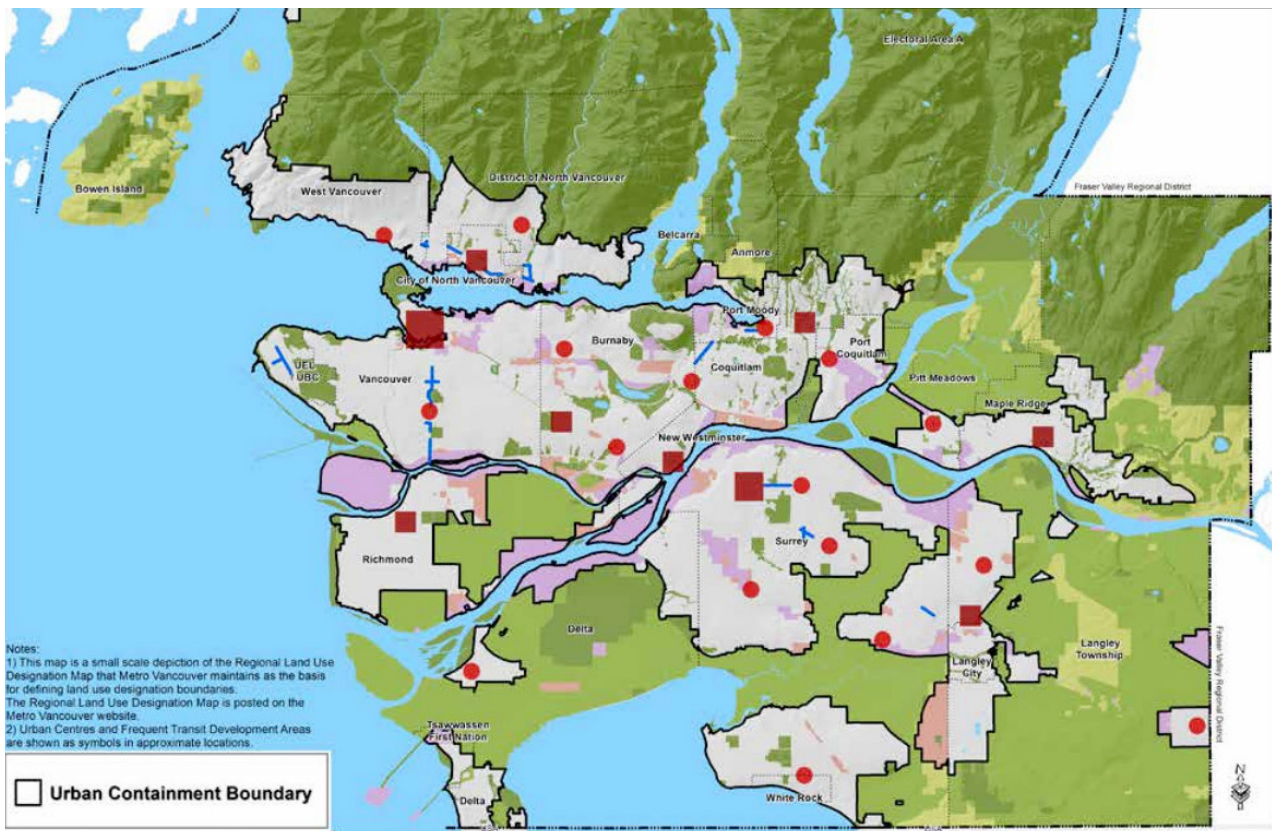
The municipalities of Vancouver, Point Grey, and South Vancouver are amalgamated in 1929.





A row of Vancouver Specials in 1978.

(POP SNAP)



The Agricultural Land Reserve (light green), the Coast Mountains to the north (dark green) and the ocean form a distinct urban containment boundary around Metro Vancouver.

(Metro Vancouver Regional District)

NOWHERE LEFT TO GROW

Following the Great Depression, Vancouver continued to see slowed but consistent growth. The city was already well on its way in implementing Bartholomew's visions, and its networks and patterns became enshrined in the urban fabric. Vancouver is no longer an intimate town, but "a more impersonal city with an increased national and international orientation" (MacDonald, 1973, p. 41). Economic depression and wartime resource pressures slow development, and the character of the city remains largely unchanged for the next couple of decades.

The post-war years, on the other hand, saw dramatic population increases and economic prosperity, leading to a major increase in residential development, and by the 1960s, few undeveloped lots remain (VSB Archives & Heritage, 2018).

In the 1960s, a new type of suburban housing emerged, the Vancouver Special (see opposite). These low-cost, purpose-built homes were designed to maximize floor area, and had a split-level design that made it easy to divide into two units. They became hugely popular, especially with multi-generational households and immigrant families, who were now able to afford a new detached home, with enough space for a rental

suite or to house additional family members (UBC, n.d.).

Specials are no longer built today, but they remain significant to the shape of Vancouver's suburbs. The precedent had been set for housing forms that maximized allowable floor area, and, following the Special, more and more "monster homes" began to pop up. Today, high housing and land costs mean that it's almost unheard of to not build to the absolute maximum when developing new homes.

In 1973, the Agricultural Land Reserve (ALR) was established in response to the threat of sprawl taking over valuable agricultural land, effectively creating an urban growth boundary (see opposite). Between the ALR and other surrounding jurisdictions that make up Metro Vancouver, there is simply nowhere left to grow.

Paired with Euclidean zoning, a restricted growth boundary is the other key to creating the familiar pattern of dense core and sprawling suburbs. The oft-lauded eponymous style — Vancouverism — is the city's own brand of this phenomenon.

So how does a city grow if there's no more developable land? You have to tear things down.

What is Vancouverism?

Vancouverism is an urban typology characterized by one or more slim high-rise towers set on a low-to-medium mixed-use podium. This is supported by a robust complement of green spaces, and a completely public waterfront. It seeks to maximize light, air, and views at the ground level as much as possible.

The phenomenon is not limited to Vancouver (the neighbouring municipalities of Burnaby and Surrey have similar patterns), and it is not characteristic of all areas of Vancouver. Only the downtown core and very few other intensive developments exhibit these characteristics.



(Strachan)

A PRIMER ON TEARDOWNS

What is a teardown?

A teardown is a home or other property that is purchased with the intent to demolish and build a completely new structure. This is typically done where the relative value of the existing building compared to the value of the land is very low, and where current zoning would allow a more “valuable” building to be constructed.

Between 1985 and 2013, 21,468 single-family homes — almost one-third of Vancouver’s homes in single-family zones — were torn down and rebuilt.

The graph at right represents a real property in Vancouver. It cost \$10,000 to build in 1940, and sold for \$15,000. The relative building value at this time is 67%.

In Vancouver, houses are a depreciating asset, but the land value appreciates — a lot. In 2005, the same building is worth \$88,000 (\$6800 in 1940 dollars), but rising land costs means that the property is now worth \$760,000 (\$51,000 in 1940 dollars). The property now has an RBV of 12%, well below the healthy threshold.

Over the next 10 years, the RBV drops to 4%. Even though a renovation increases the building value, it is not enough to balance the rising land value.

In 2015, the property is sold and the new owners tear down the home and build a new one with twice the floor area for \$1.1 million, but the property is now worth \$3.2 million, making the RBV of the brand-new house just 34%.

This primer is a simplified version of Vancouver’s Teardown Cycle, a data story prepared by Jens von Bergmann and Joseph Dahmen in 2017. Figures cited are from the report. Data sourced from the City of Vancouver’s Open Data Catalogue and BC Assessment.

Why is this so prevalent?

The value of a property is equal to the value of the land plus the value of any structures built on the land. The percentage of the property value attributable to any built structures can be referred to as the relative building value (RBV).

An RBV of 66% for a new building is generally said to be healthy. When the RBV dips below 20%, the teardown probability increases dramatically. Vancouver’s rapidly rising land prices mean very low RBVs for single-family homes.

In Vancouver, the typical RBV of the housing stock decreased from 13% to 7.5% between 2005 and 2016, and new homes are starting out with an average RBV of 38%, well-below the healthy ratio.

Why is it a problem?

Current regulations state that in a single-family zone, when a home is torn down, it can be replaced with, at most, a duplex.

Until the mid 1960s, a newly built home was tailored to the needs of the residents. But rising property values and the advent of purpose-built housing encouraged property owners to maximize the size of their homes.

If rising land values mean that even a brand-new single-family home of the maximum allowable size is only achieving 38% RBV, then the land is simply no longer compatible with single-family uses.



WHERE ARE WE NOW?

While proponents of Vancouverism credit Jane Jacobs with inspiring the phenomenon (it promotes walkability and active streets), its critics say that it is antithetical to her ideas about urbanism. Jacobs' own son, a long-time resident of Vancouver, says that high-rise living is incompatible with the ideals that his mother envisioned, especially when they replace affordable low-rise apartments in the name of high profits (Wood, 2012). It was just these types of development that Jacobs famously denounced in favour of medium-density, ground-oriented housing types that are already in such short supply in Vancouver.

If Jacobs' walkable, neighbourly urban vision is to be upheld, Vancouver needs to encourage and enable more diverse forms of housing. While outright supply is surely needed, Jacobs' son shares his mother's views in that density "must be organic" (Wood, 2012). It should simply be *allowed* to happen.


In fact, this type of housing is in short supply because single-family zoning makes it explicitly *illegal* to build it in so much of the city. Housing advocates in Vancouver, and just about any other large city where this phenomenon exists, do not call for single-family housing to be abolished outright, but to simply allow residents to have more choice, more flexibility, and more liveability than they do today.

Today, a single-family property in Vancouver may have multiple dwelling units on it. Secondary basement suites became more popular with the arrival of the Vancouver Special in the 1960s. More recently, The City has permitted the construction of rental laneway homes, and updated most one-family (RS) zones to allow for duplexes. Despite the modernization, the intent of development in RS zones is still:

to maintain the residential character of the RS-1 District... Neighbourhood amenity is enhanced through the maintenance of healthy trees and planting which reflects the established streetscape (City of Vancouver, 2021).

In short, it must look and feel like the existing single-family context. Strict external design rules, parking requirements, and fire code regulations make providing more units easier said than done.

According to historical data, every ten years, about 10% of Vancouver's suburban housing stock is torn down and rebuilt (von Bergmann & Dahmen, 2017) Every new single-family home built because of the lack of other reasonable options is a missed opportunity to deliver the affordability and liveability that Vancouverites so desperately need.



Extremely high prices make land in Vancouver no longer compatible with single-family uses, yet current regulations seek to preserve the character of low-density neighbourhoods, even when multiple dwellings are permitted.

A paradigm shift to *embracing* multi-family living, and not just *tolerating* it is required if the city plans to deliver the affordability and liveability that Vancouverites so desperately need.



PART B

WHERE ARE WE GOING?

Whether the argument is on the supply or the demand side, many housing advocates agree that restrictive zoning codes that not only encourage single-family zoning, but expressly prohibit other moderate-density housing types, are a significant contributor to housing unaffordability in cities that use Euclidean zoning.

The Missing Middle is a movement and a phenomenon that aims to promote more moderate-density housing options in low-density neighbourhoods, and it promises that it can do so without changing the neighbourhoods themselves.

But *should* these neighbourhoods — that were specifically designed and dimensioned for a car-oriented, single-family suburban context — remain unchanged? If we are going to demand that our housing stock evolves for a denser and more sustainable, walkable, and lively future, why are our already underutilized public spaces off the hook?

THE HOUSING LIFECYCLE








One way to illustrate the current housing situation and the importance of offering diverse housing choices is with a model called the housing lifecycle. It is based off the theory that a person will move through different stages of their life and climb up the property ladder to suit their changing needs.

The classic model, however, makes a big assumption that suitable housing is readily available for the family as they grow and their needs change. The scarcity of modestly-sized homes, and the unaffordability of *all* homes, make this model completely out of touch for Vancouver.

At the same time, trends in how young adults and new families are living call for a change as well. More individuals and couples are choosing to live with housemates well into their adulthood, and fewer young families are choosing to have children at all. Even for those who do, a detached home is no longer the be-all and end-all of housing choices.

See pages 32–33 for an illustration of the classic housing lifecycle, and a version that is more realistic for today’s young residents.

“Given your budget and housing preferences, what types of housing would you be looking for in your next move?”

	 Single Family Home	 Basement Suite	 Laneway or Coach House	 Townhouse, Rowhouse or Duplex	 Low-Rise Apartment (up to 6 storeys)	 Mid-Rise Apartment (6–14 storeys)	 High-Rise Apartment (14+ storeys)
Own	37%	3%	13%	46%	28%	23%	21%
Rent	23%	21%	26%	40%	58%	43%	32%

- Proximity to jobs and schools
- Certainty and security
- Affordability and choice
- Room to downsize

(Housing Vancouver, 2017, a)

THE “MISSING MIDDLE”

The dichotomy of dense core/sprawling suburbs is so prevalent in North American cities, that it has started a significant movement: *The Missing Middle*.

The name is both catchy and apt. Housing forms that land somewhere between a single-family house and a mid-rise apartment building are all but completely missing from these cities’ new building stock.

In Vancouver, these typologies make up about 14% of the housing stock, but almost none of this type of housing is being built today. As we have seen, highly restrictive zoning bylaws make it nearly impossible, if not illegal, to build.

Despite the fact that Missing Middle housing is hardly an option for homebuyers, a study conducted by the City of Vancouver in 2017 mentioned that people really want to live in them (Housing Vancouver, 2017, a).

Despite slow progress from the City in allowing for more housing choices, the appetite is there. A report put out by the City’s housing department specifically calls out the Missing Middle as a potential solution (Housing Vancouver, 2017, b).

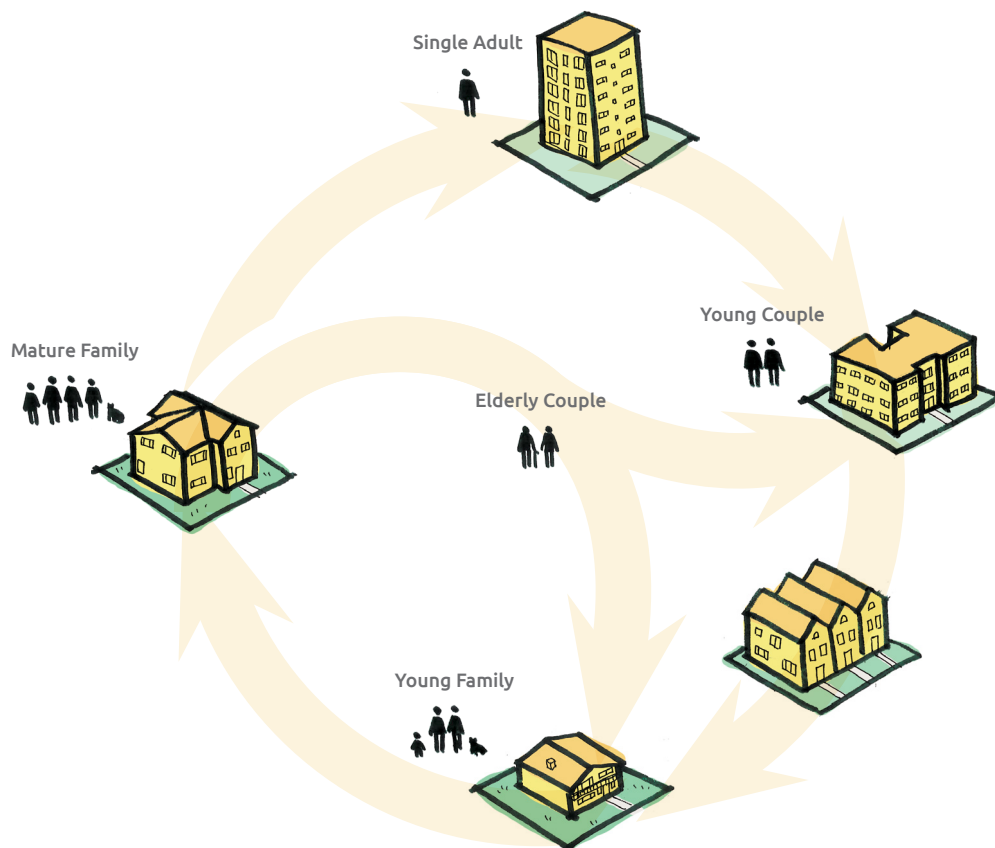
THE MISSING MIDDLE HOUSING SPECTRUM



(Opticos Design, Inc.)

THE CLASSIC (IDEALIZED) HOUSING LIFECYCLE...

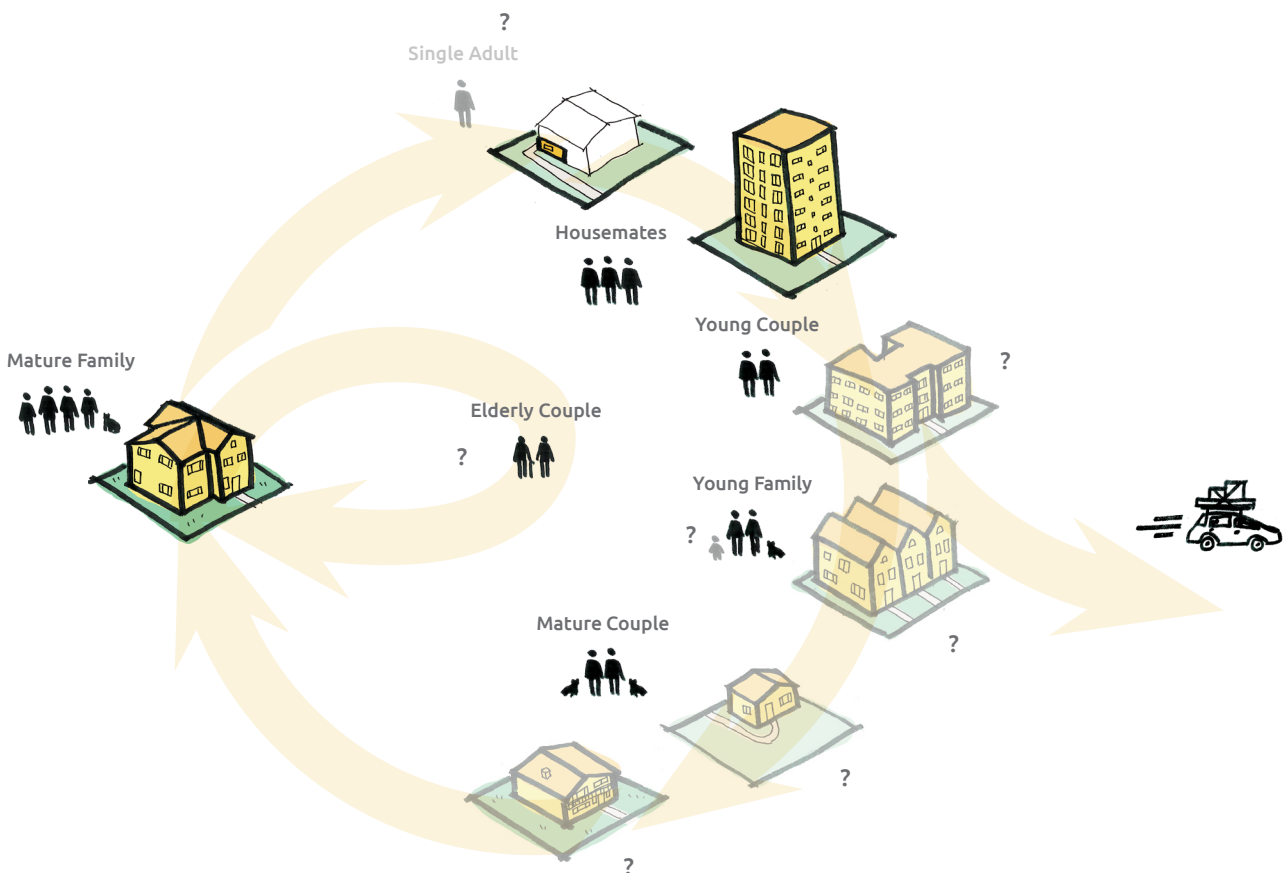
1. A mature family lives in a large house that suits their need for space.
2. Their adult child moves out and into an affordable studio apartment, as they study and/or begin their career.
3. They now have a partner, and, needing more space, they move into a larger apartment.
4. The new family purchases a starter home with a yard for their children and pets.
5. Their growing children need separate bedrooms, and the parents are now established professionals and can afford a larger home.
6. As the couple's own adult children move out to start their own journey, the empty-nesters seek to downsize to a smaller home.



... AND A MORE REALISTIC SCENARIO IN VANCOUVER

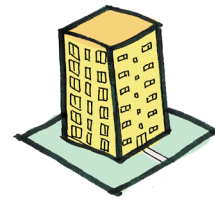
1. A mature family lives in a large house that suits their need for space.
2. Their adult child moves out, seeking roommates with whom they can split rent (alternatively, they stay at home well into adulthood to save money for a home later).
3. They now have a partner, and now with a dual-income, the young couple finds a small apartment within their budget.
4. Their now-elderly parents wish to downsize, but due to lack of supply of moderately-sized homes, will stay in their large house well into old age.
5. The young couple wish to start a family, but are unable to find a moderately-sized home with an extra bedroom that they can afford. The elderly parents take out an equity loan against their now-multi-million-dollar house to help their child with a down payment for a starter home...

Not all young adults are as fortunate as our young couple. With average incomes and familial support unavailable, all of our couple's friends have had no choice but to leave the city in search of more affordable housing elsewhere.

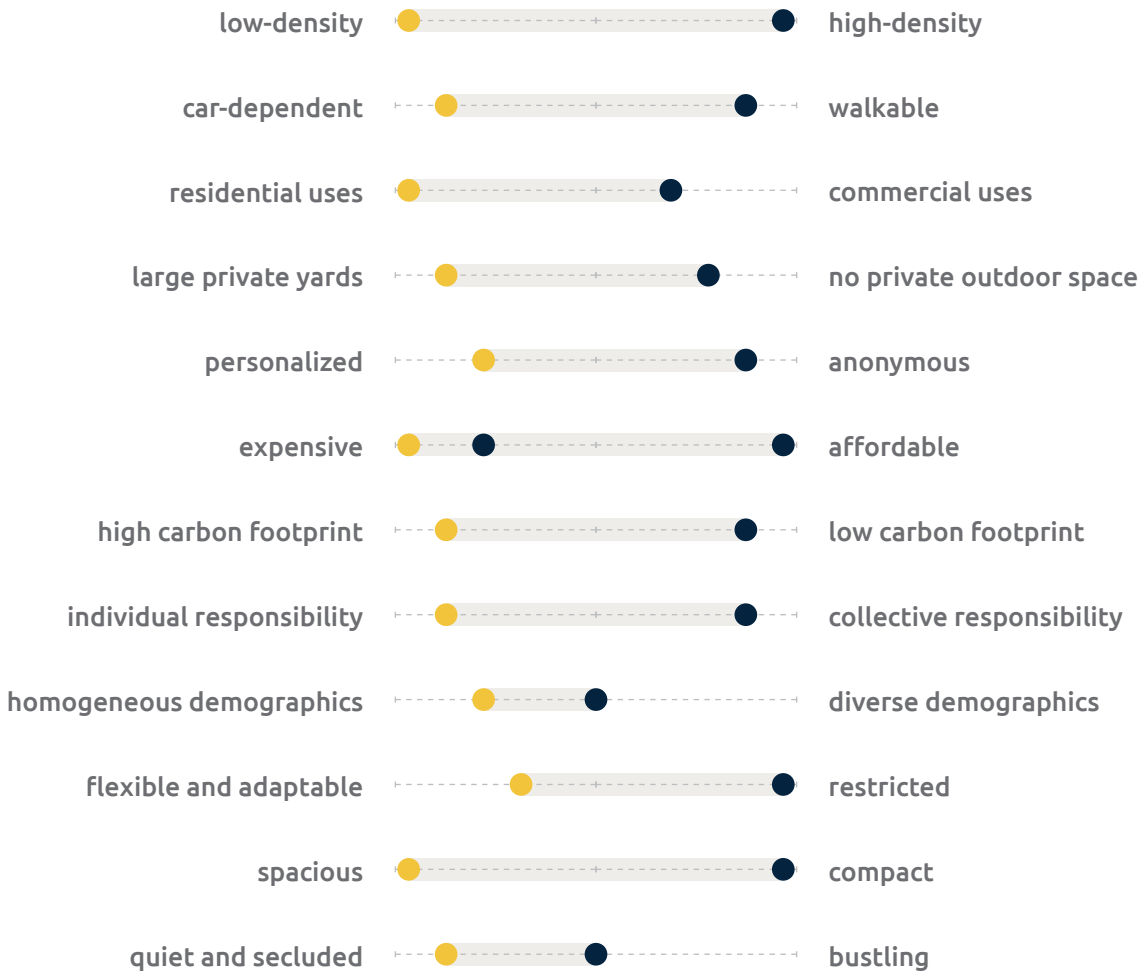




SINGLE-FAMILY SUBURBS



DENSE URBAN CORE



HOUSING PREFERENCES AND VALUES

As shown in the more realistic lifecycle scenario, today's homeowners are forced to make their housing decisions based on price first, and their values and what they want in a home second — if at all.

Single-family housing and high-rise apartment buildings are at the poles of the housing spectrum, and, for the most part, their inherent values are polarized as well. For example, homeowners preferring a car-free lifestyle will find it difficult to find a suburban home from which they can reasonably travel by bike or on foot. Those who want the flexibility and freedom to renovate and alter their homes as they wish will find themselves hamstrung by strict strata councils that regulate condominiums. For those looking to minimize their carbon footprint, a suburban detached home is out of the question.

The opposite page presents a generalized representation of the characteristics found in low-density sprawling suburbs vs dense city cores. (There are exceptions: for example, while studio apartments and social housing should make living in the core more affordable, luxury condominiums have been a significant fixture in Vancouver's new housing stock in recent years. In the densest part of Vancouver is Canada's most expensive condo, valued in 2019 at \$58 million (Surrey604, 2020).)

THE MISSING MIDDLE FOR PUBLIC SPACE

*“The Missing Middle Housing types provide diverse housing options, such as duplexes, fourplexes, cottage courts, and multiplexes. **These house-scale buildings fit seamlessly into existing residential neighborhoods** and support walkability, locally-serving retail, and public transportation options.”*

Opticos Design,
creators of the Missing Middle Housing movement

A larger population requires more green space, services, amenities and shopping areas. With a higher density, these have to be delivered in a limited amount of space. If not done thoughtfully, high density environments can quickly become crowded and uncomfortable.

The graph opposite illustrates that as density increases, more criteria need to be met to reduce feelings of crowdedness. According to a 2020 study, the following features help to reduce perceived density (Wen et al., 2020):

- noise control
- privacy
- open space/sunlight
- mixed-use
- human scale
- greening
- prospect/sightlines

Even a low-density area needs to provide some of these elements. Figure A on the opposite page shows a residential street in Vancouver, which features lush greenery, long sightlines, and plenty of sunlight and openness.

Figure 2, a street in Freiburg im Breisgau, Germany, features much higher density, but has more of the above features: human-scaled materials like cobblestones, active and mixed uses, deprioritized vehicle uses, and even though there is little greenery on the street itself, there are clear views to greenery and the sky beyond.

The Missing Middle movement is founded on the idea that we do not need to alter the public realm to support such an increase in density, but this leaves a big opportunity on the table to make these public spaces better serve the population. It could be argued that the streets, amenities, and green spaces that were designed for a low-density single-family context *can and should not* be appropriate for a higher density.

The proposal in this thesis work will aim to fill the public space gap, and explore possibilities for a kind of Missing Middle for public space. Perhaps we don't need to pedestrianize every street, but providing at-grade parking for every unit (as is presently required in one-family zones) just isn't possible. So what does it look like?

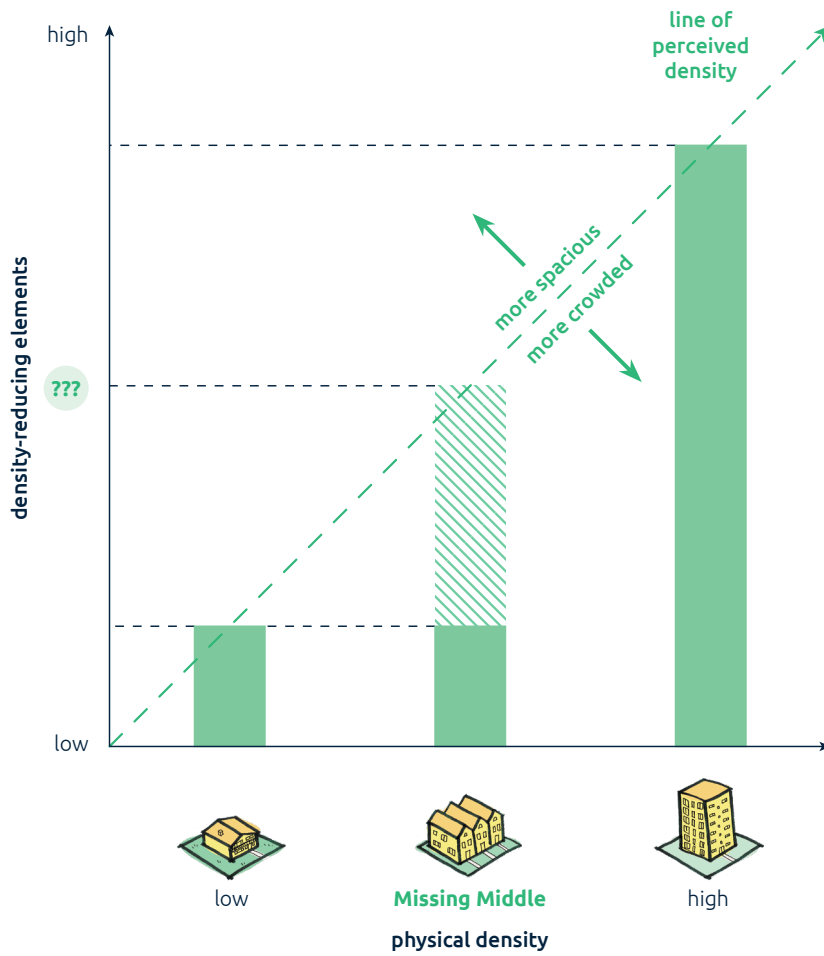


Figure A. W 20th Avenue, Vancouver: a typical residential street. (Google)










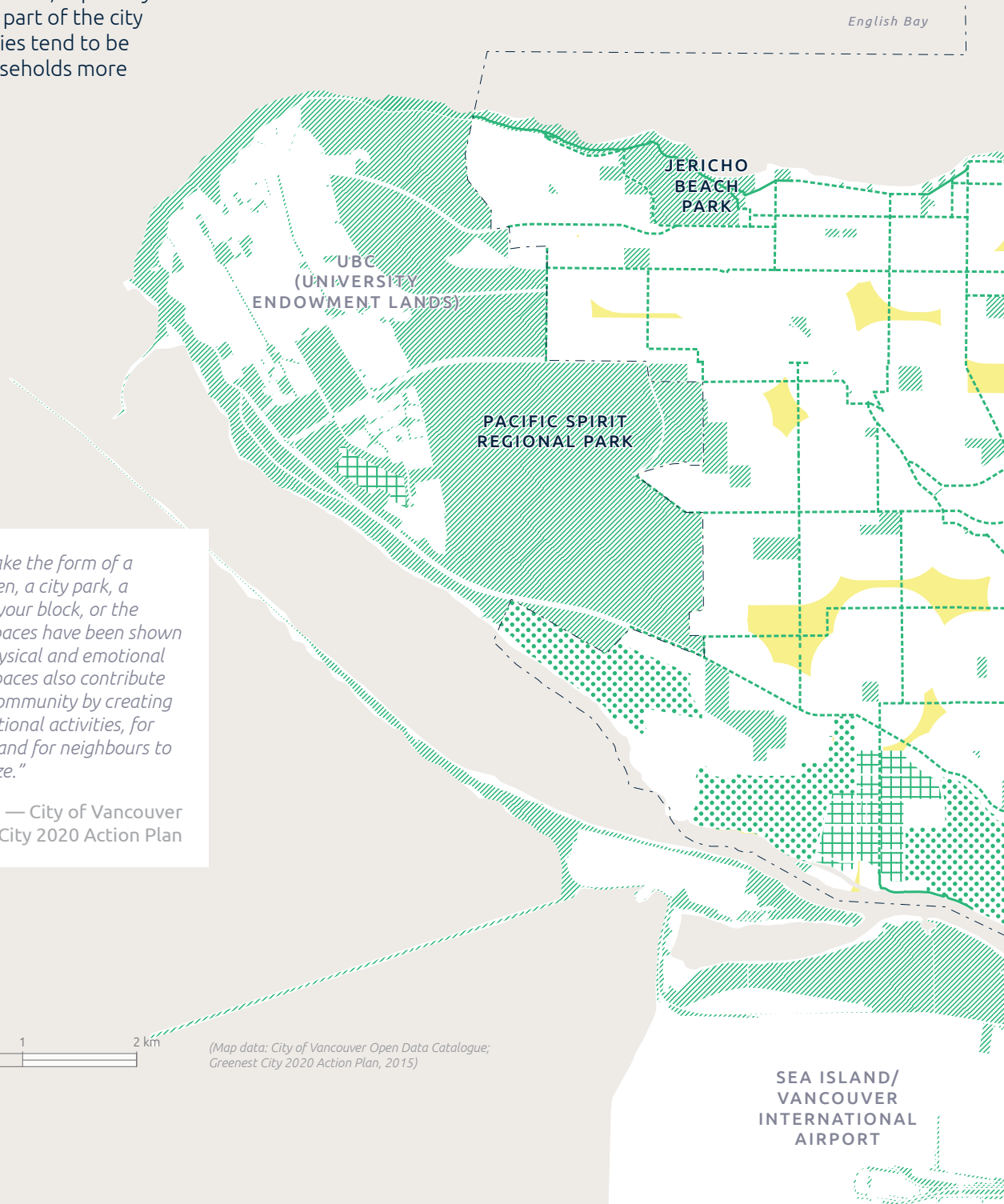
Figure B. Freiburg im Breisgau: this street supports a high density by incorporating more elements that reduce crowding. (Kenworthy)

GREEN NETWORKS

The existing system of parks and bikeways serves Vancouver fairly well, with the well-known 405-hectare Stanley Park and waterfront seawall serving the dense core, and neighbourhood-scale parks serving the suburbs.

Most of the city is within a 5-minute walk to a green space. There are some large pockets without such access, especially in the western part of the city where properties tend to be larger and households more affluent.

-  city parks and other green space
-  cemeteries
-  agriculture
-  golf courses
-  >5 mins walk to green space
-  separated bike lanes
-  on-road bike lanes

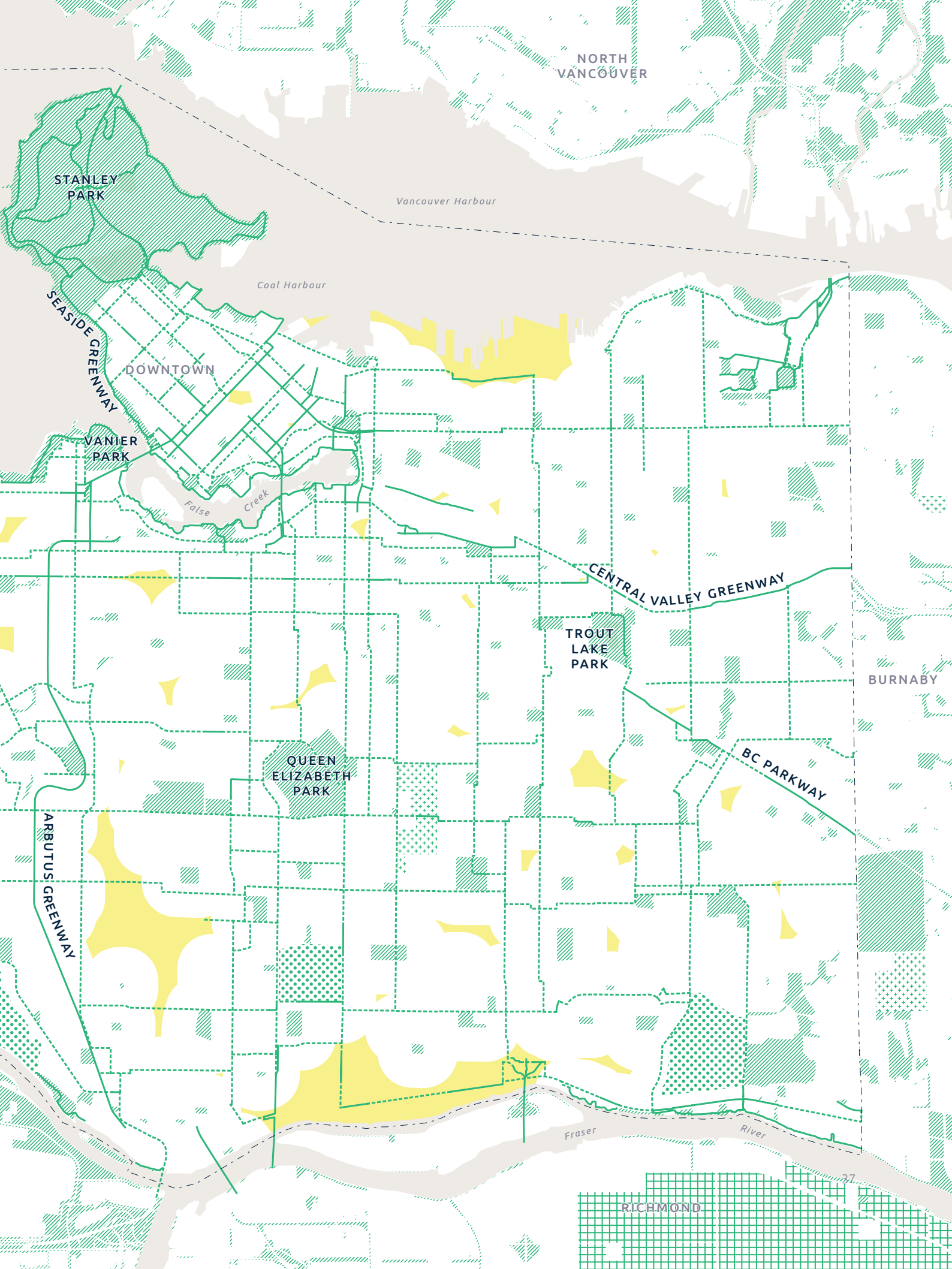


"Whether they take the form of a community garden, a city park, a greenway along your block, or the seawall, green spaces have been shown to benefit our physical and emotional health... These spaces also contribute to our sense of community by creating places for recreational activities, for children to play, and for neighbours to meet and socialize."

— City of Vancouver
Greenest City 2020 Action Plan



(Map data: City of Vancouver Open Data Catalogue; Greenest City 2020 Action Plan, 2015)



NORTH
VANCOUVER

Vancouver Harbour

Coal Harbour

STANLEY
PARK

SEASIDE GREENWAY

DOWNTOWN

VANIER
PARK

False
Creek

CENTRAL VALLEY GREENWAY

TROUT
LAKE
PARK

BURNABY

QUEEN
ELIZABETH
PARK

BC PARKWAY

ARBUTUS GREENWAY

Fraser
River

RICHMOND

HYDROLOGY

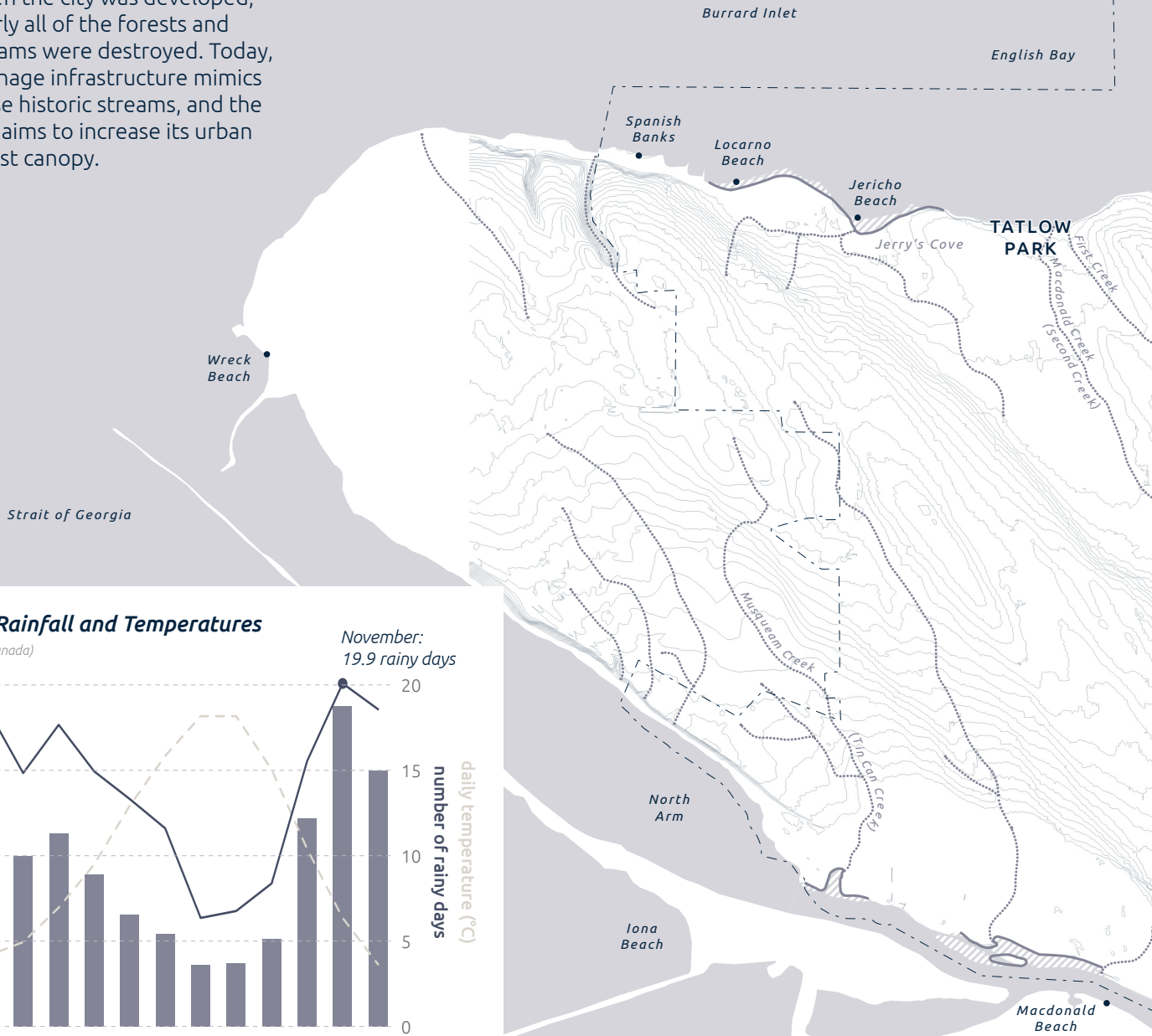
Long before Vancouver was incorporated, the land was a dense forest of coastal conifers and fertile glacial soils. The latter make up some of the most valuable agricultural land in British Columbia, and is largely protected by the Agricultural Land Reserve.

When the city was developed, nearly all of the forests and streams were destroyed. Today, drainage infrastructure mimics these historic streams, and the City aims to increase its urban forest canopy.

Living with the rain is tantamount to the Vancouver lifestyle, with an average of 165 rainy days per year. Some efforts are being made to daylight historic streams and highlight Vancouver's connection to rain and water.

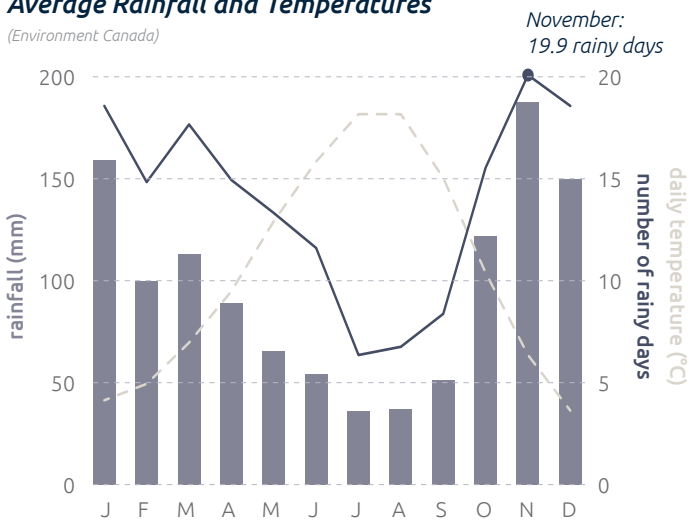
- historic shoreline
- historic streams
- + high/low point

current (existing) features are shown in **dark text**. historic/lost features are shown in *light text*.

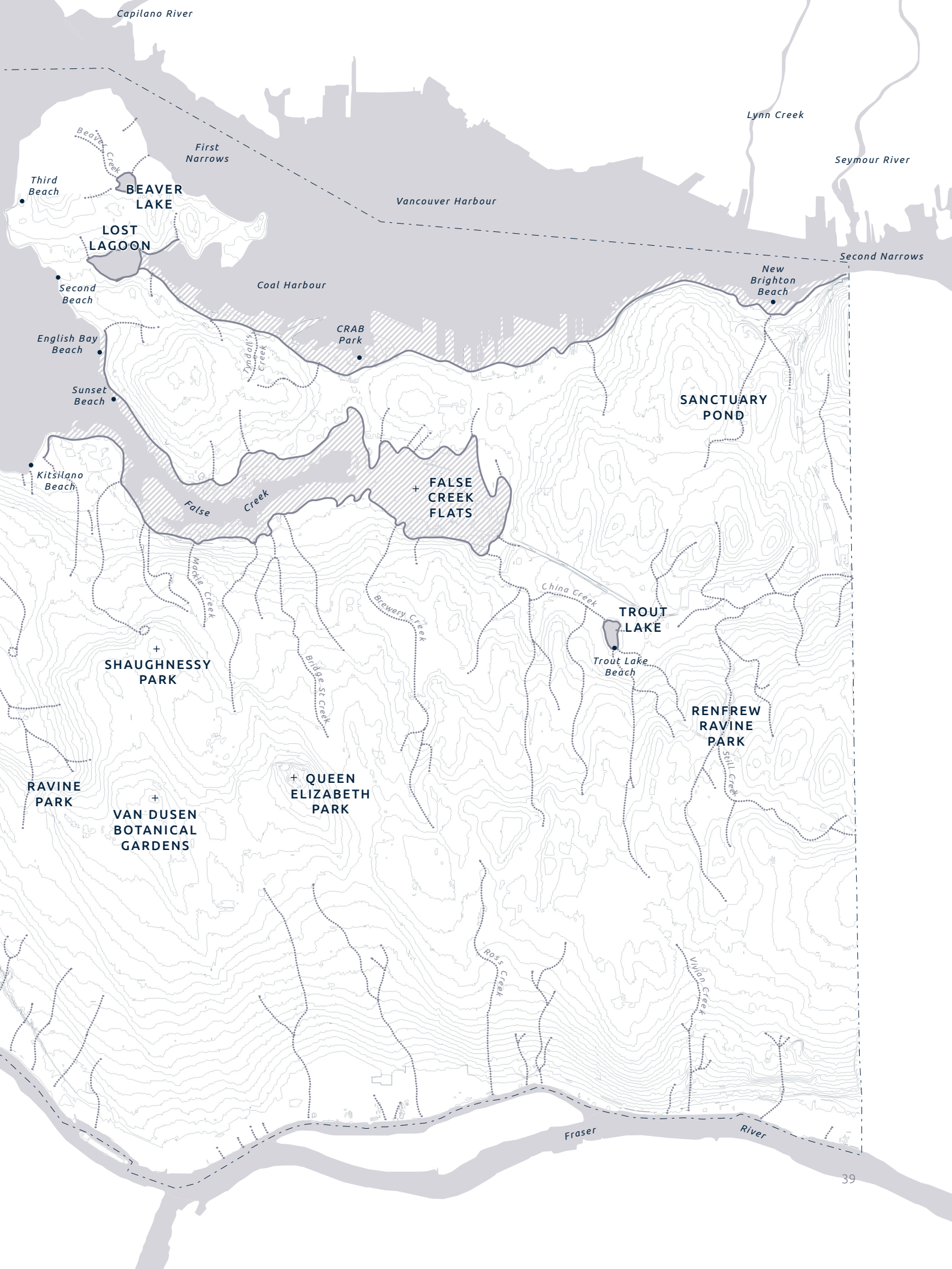


Average Rainfall and Temperatures

(Environment Canada)



(Map data: City of Vancouver Open Data Catalogue; False Creek Watershed Society)



THE STREET GRID







Vancouver's street grid was established by early surveyors who wanted to encourage development in the new city. It was created well before the city was built out and is highly regular, with a near-perfect north-south orientation.

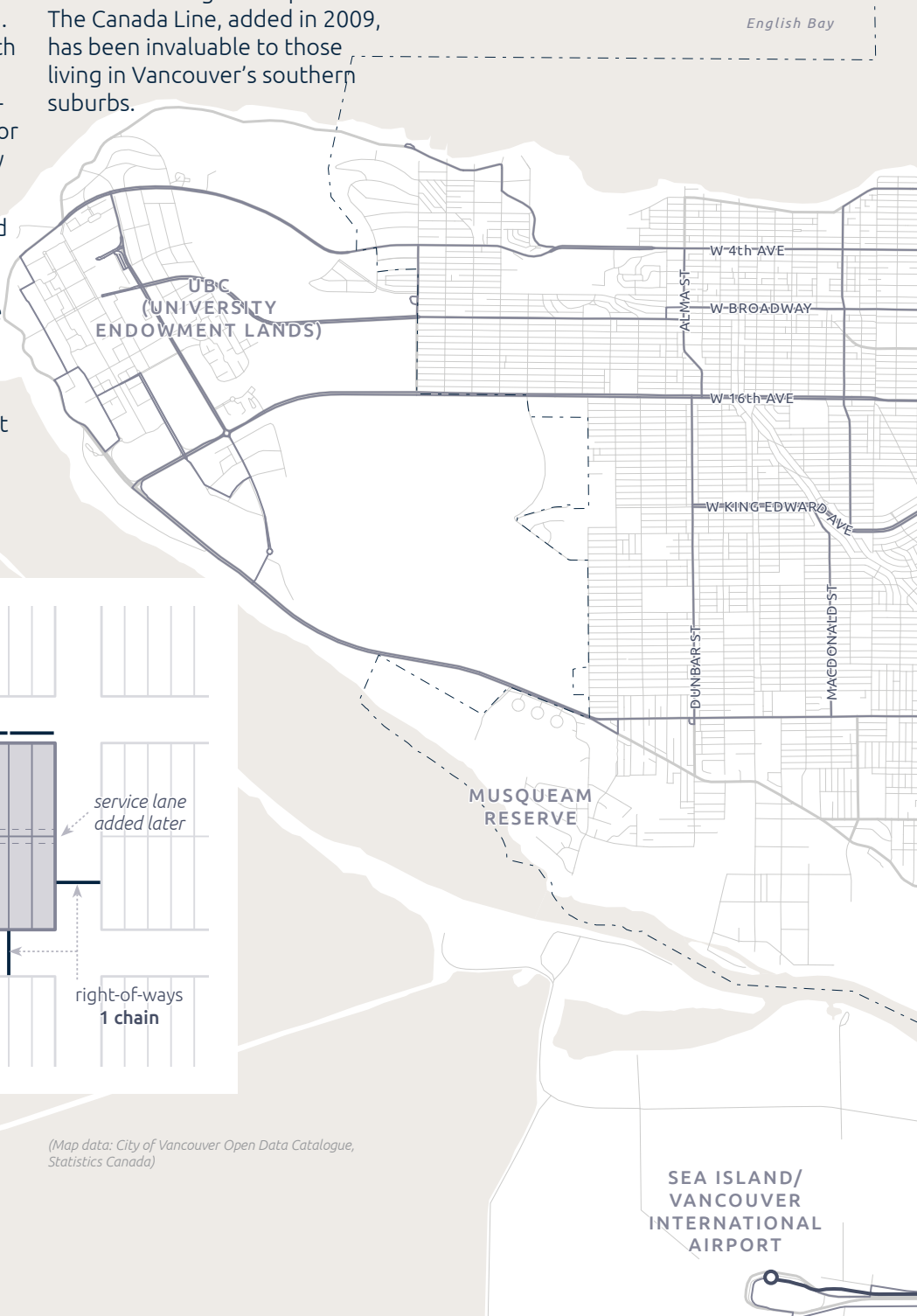
With the exception of some neighbourhoods like Shaughnessy Heights, lots were laid out using a 66-foot (20.1 m) surveyors chain. One lot was half of a chain-length wide by two chain-lengths long. For access to the lots, one chain-length provided a right-of-way for pedestrian and horse-and-buggy traffic.

Collector roads were established as a result of the early streetcar and were later widened to 80 feet (24.4 m) or more to provide better vehicle access to the centre, and to bring traffic away from quiet residential streets (Bartholomew et al., 1947). Most street right-of-ways are still 66 feet wide today.

In addition to the regular grid, most blocks have a service lane that runs lengthwise through the centre of the block. Today, laneways are primarily used for parking and waste management, but laneway houses are becoming more popular citywide.

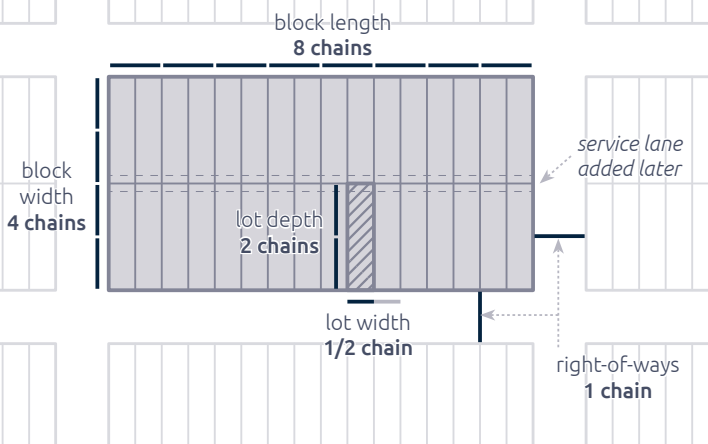
The city's rapid transit system, SkyTrain, connects Vancouver to the surrounding municipalities. The Canada Line, added in 2009, has been invaluable to those living in Vancouver's southern suburbs.

-  Trans-Canada Highway
-  arterials and collectors
-  residential and local roads
-  laneways
-  rapid transit routes
-  bus routes



English Bay

Typical early survey block layout:



(Map data: City of Vancouver Open Data Catalogue, Statistics Canada)

SEA ISLAND/
VANCOUVER
INTERNATIONAL
AIRPORT





NORTH VANCOUVER

STANLEY PARK

Vancouver Harbour

(Data: Metro Vancouver, City of Vancouver, Statistics Canada)

Coal Harbour

DOWNTOWN

CORNWALL ST

False Creek

PRIOR/VENEABLES ST

E HASTINGS ST

E 1st AVE

E BROADWAY

E 12th AVE

E 16th AVE

SHAUGHNESSY HEIGHTS

BURNABY

QUEEN ELIZABETH PARK

E KING EDWARD AVE

E 33rd AVE

E 41st AVE

E 49th AVE

SW MARINE DR

Fraser River

RICHMOND

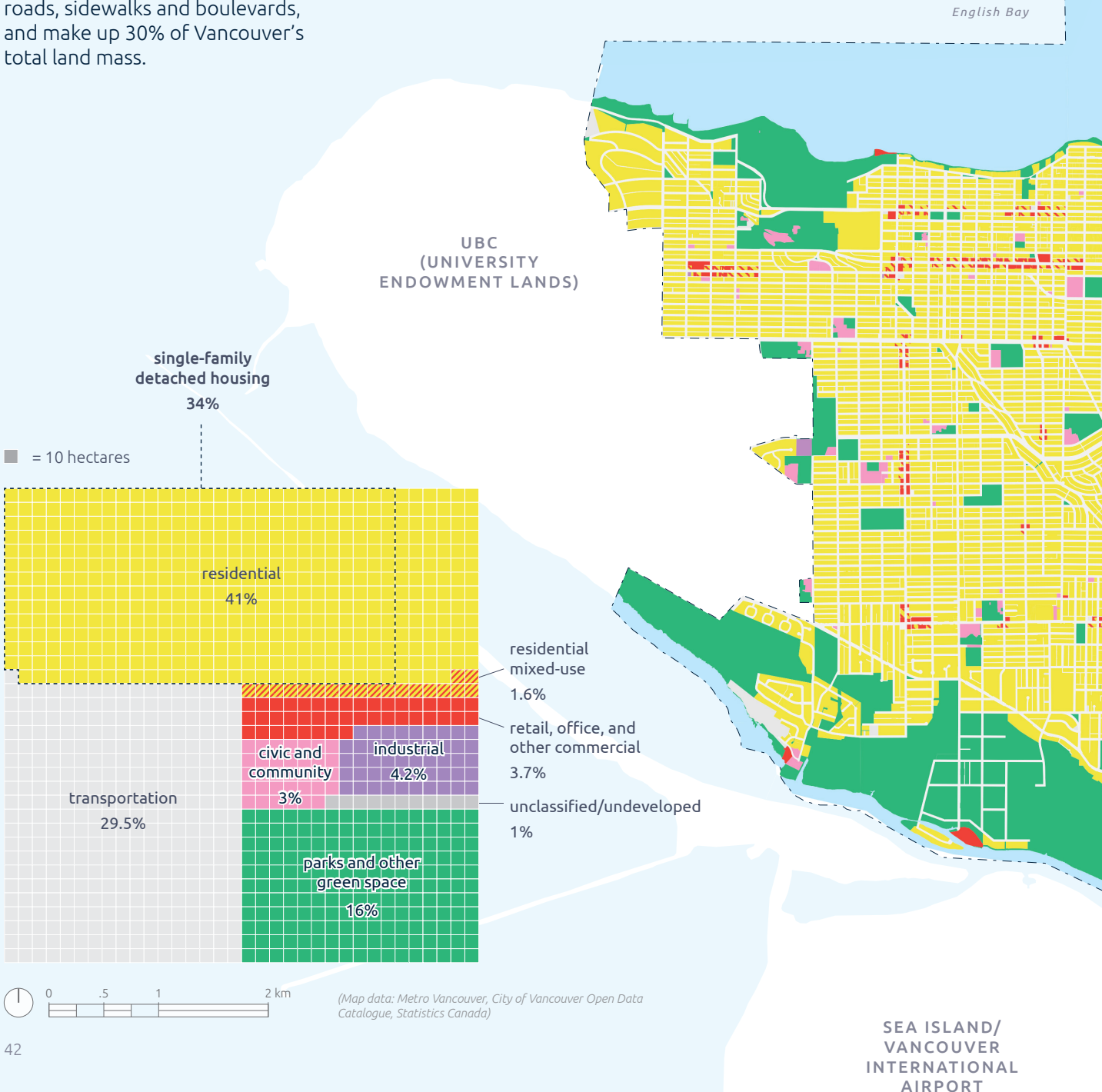
LAND USE

Legacies of early development decisions, particularly with regard to single-family areas, continue to persist, nearly 100 years after the city's first zoning code was established. Today, single-family detached properties make up 80% of all residential land area.

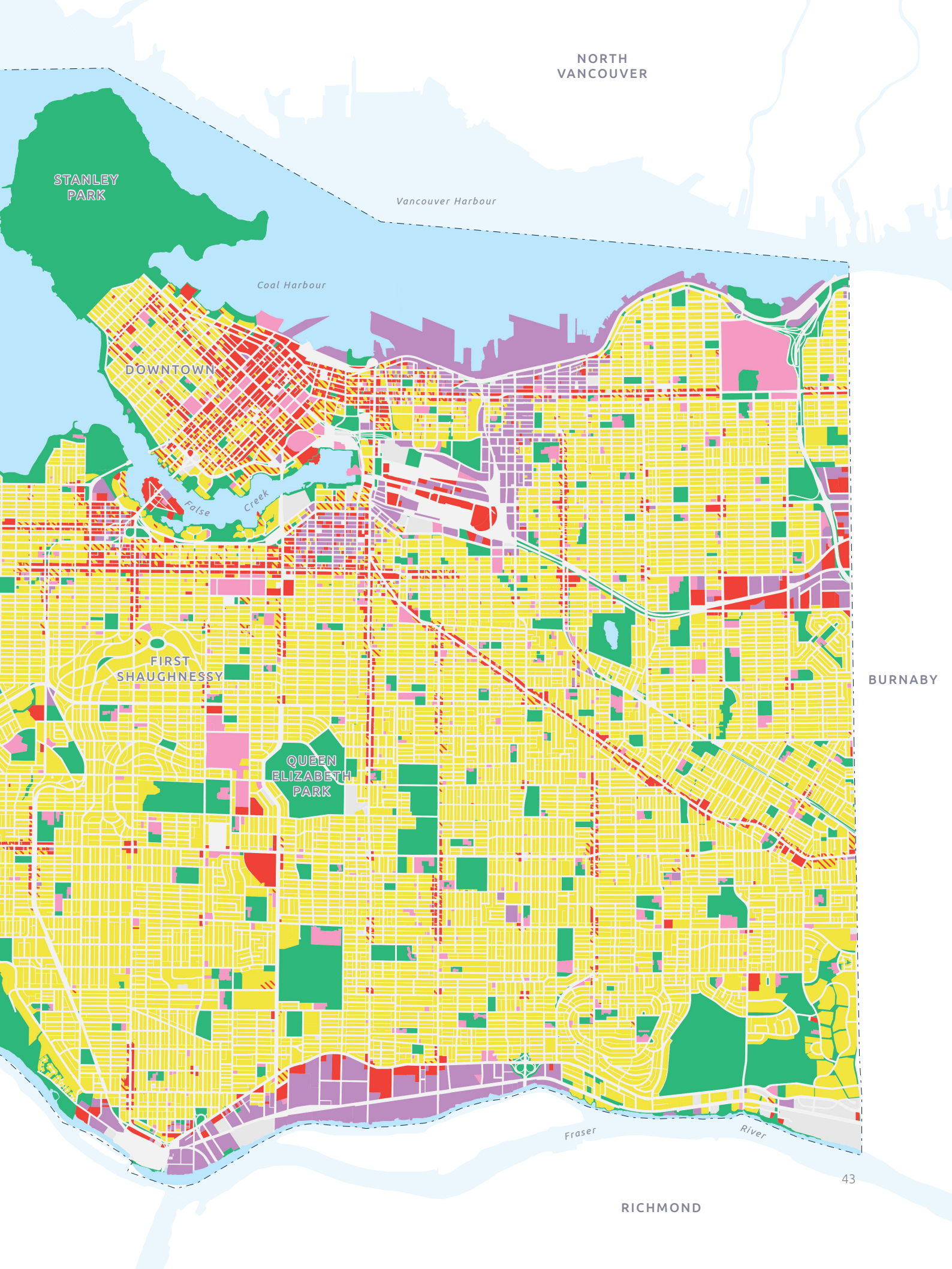
Land with transportation uses are dedicated to getting from one place to another, including roads, sidewalks and boulevards, and make up 30% of Vancouver's total land mass.

Single-family detached properties and the land used to immediately access them make up nearly half of all available land area in Vancouver.

- residential
- residential mixed-use
- retail, office, and other commercial
- civic and community
- industrial
- parks and other green space
- transportation
- unclassified/undeveloped



NORTH VANCOUVER



Vancouver Harbour

Coal Harbour

DOWNTOWN

False Creek

FIRST SHAUGHNESSY

QUEEN ELIZABETH PARK

BURNABY

Fraser River

RICHMOND

CASE STUDIES

The primary case studies for this research are located in Vancouver: Vancouver Cohousing, and Mole Hill. Both projects use inventive approaches for how to better use shared spaces, but differ in the housing typologies employed, depth of affordability, and how they use public space (specifically, city-owned land).

Mole Hill is a block in the densest neighbourhood in the City (City of Vancouver, 2020), in which all of the homes are collectively owned by a non-profit organization. The homes are single-family detached in form, preserved for their heritage status, but have been converted to support more households (some with as many as 9 units per building). The laneway forms a spine and central gathering space for residents, but is publicly accessible and provides a unique amenity to the larger neighbourhood. The parking minimum regulation is removed for this block.

Vancouver Cohousing is a project in the middle of suburban Vancouver that was self-developed by a small group of residents who were fed up with the limited housing choices offered in Vancouver. By consolidating just three lots, the development achieves 31 units that are smaller individually, but high quality shared indoor and outdoor spaces more than make up for the small deficit in private space.

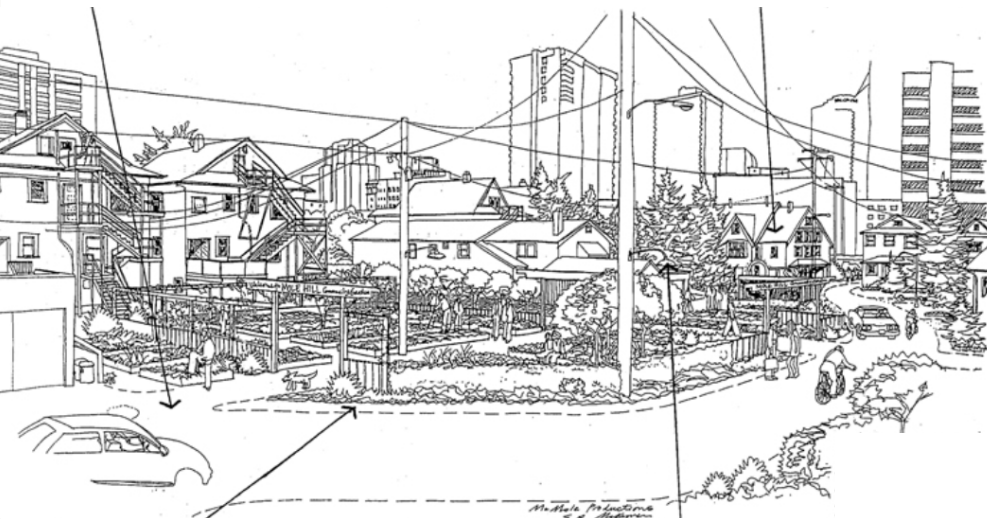
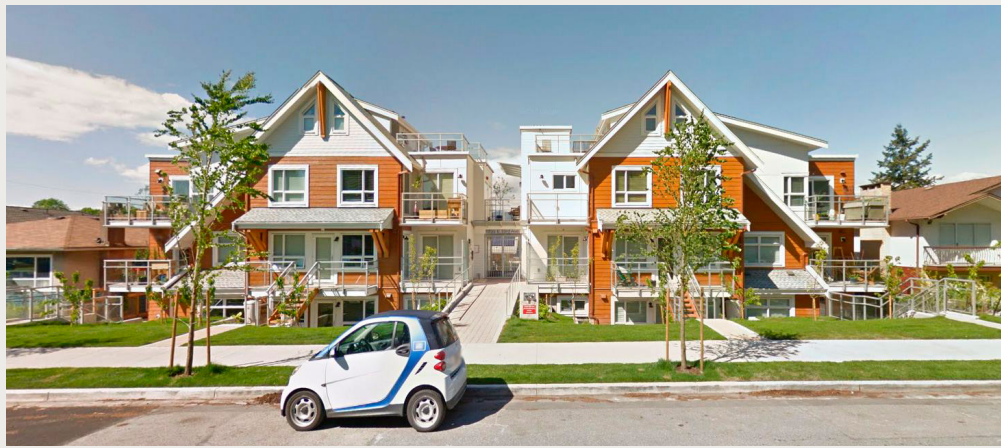
The other reference projects located outside of Vancouver show successful examples of how grassroots laneway reappropriation can create complex shared environments, how a gradient of spaces can create sociability while maintaining privacy, how public spaces don't have to be spacious to be significant, and how a distinct material language can do a lot of heavy lifting in defining spatial ownership and users' behaviour.

VANCOUVER COHOUSING

Vancouver, Canada

- “house-form” buildings with street-oriented entries
- reduced front yard setbacks
- integrated green infrastructure features
- shared central courtyard and amenity building
- inward-facing entries and balconies, strong “overlook”

(Canadian Cohousing Network)



MOLE HILL

Vancouver, Canada

- **laneway as gathering space**, including a shared community garden and ample greenery
- **pedestrian-priority and traffic calming**
- relaxed off-street parking requirements and integrated car share
- daycares, shared indoor community space and gallery
- green infrastructure features and landscape features
- easement on laneway provides flexibility of use

(Above: S.R. Architect; Below: Caitlin Schultz)



Where Are We Now?

RUELLES VERTES

Montreal, Canada

- **small and large interventions from surface painting to permanent built structures.**
- laneways as community gathering spaces
- values-driven, community-led process; self-design and build
- interventions scale to match community appetite, feasibility and funding



(Clockwise from top:
Éco-quartier Saint-Jacques;
Éco-quartier St-Michel / François-Perrault;
Éco-quartier Villeray)



SHIITAKE ROWHOUSES

Malmö, Sweden

- **low fences between properties**
- **additional setback at ground floor** mitigates a minimal front setback
- gradient of public/private space:
 - 3m private back deck
 - 6m private yard
 - 9m **shared yard with workshops, storage, sauna, pool, garden plots, and greenhouse**



(Clockwise from top:
Hauschild + Siegel; Caitlin Schultz;
Caitlin Schultz)

Bo01 ▶

Malmö, Sweden

- blurred ownership boundaries: publicly accessible courtyards and semi-private streets
- shared vehicle/pedestrian space with high pedestrian priority
- distinct materiality
- small-scale, intimate spaces
- greatly reduced setbacks
- ground-oriented entries with personalized “stoops”
- integrated stormwater management

(Clockwise from top: L. Del Biondo; Caitlin Schultz; Caitlin Schultz;)



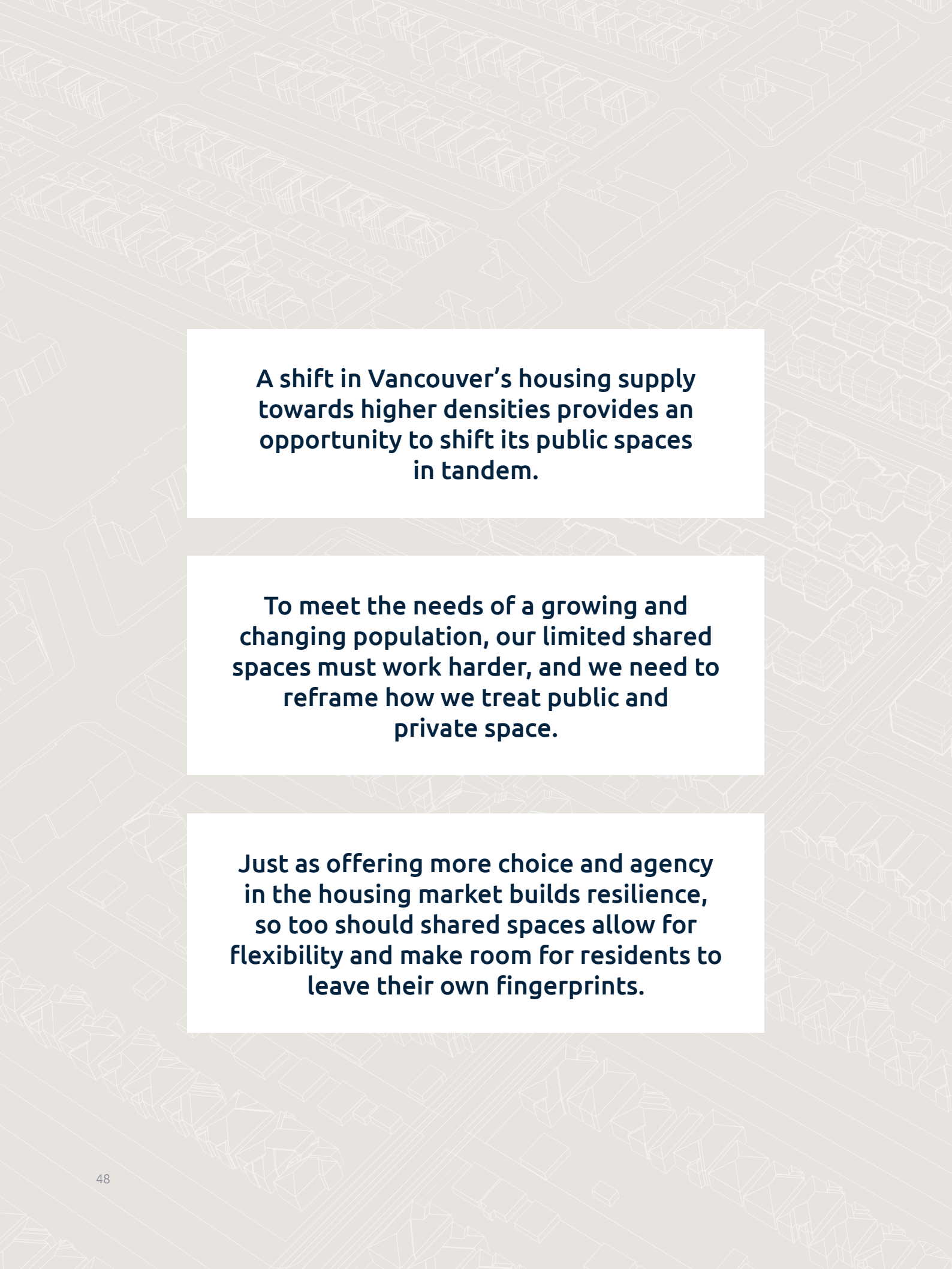
◀ GREEN COURTYARDS PROGRAM

Copenhagen, Denmark

- rehabilitation of hardscaped, underused courtyards
- fences between properties removed
- contiguous shared space
- shared decision-making, responsibility and ownership
- provides valuable space for families with children
- streamlined waste management



(Above: City of Copenhagen; Below: Google)



A shift in Vancouver's housing supply towards higher densities provides an opportunity to shift its public spaces in tandem.

To meet the needs of a growing and changing population, our limited shared spaces must work harder, and we need to reframe how we treat public and private space.

Just as offering more choice and agency in the housing market builds resilience, so too should shared spaces allow for flexibility and make room for residents to leave their own fingerprints.



PART C

A NEW PATH FORWARD

What both the suburbs and the dense core have in common is the way in which they treat public and private space: as black and white. It is through a shift in thinking about how we treat outdoor space that we can unlock new potentials for liveable neighbourhoods.

This is easier said than done. Consensus building can be difficult and time consuming, and our current culture doesn't have much support for it.

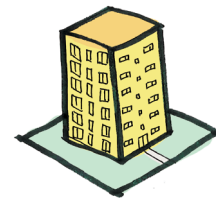
But our current culture clearly isn't working. We have no choice but to try.



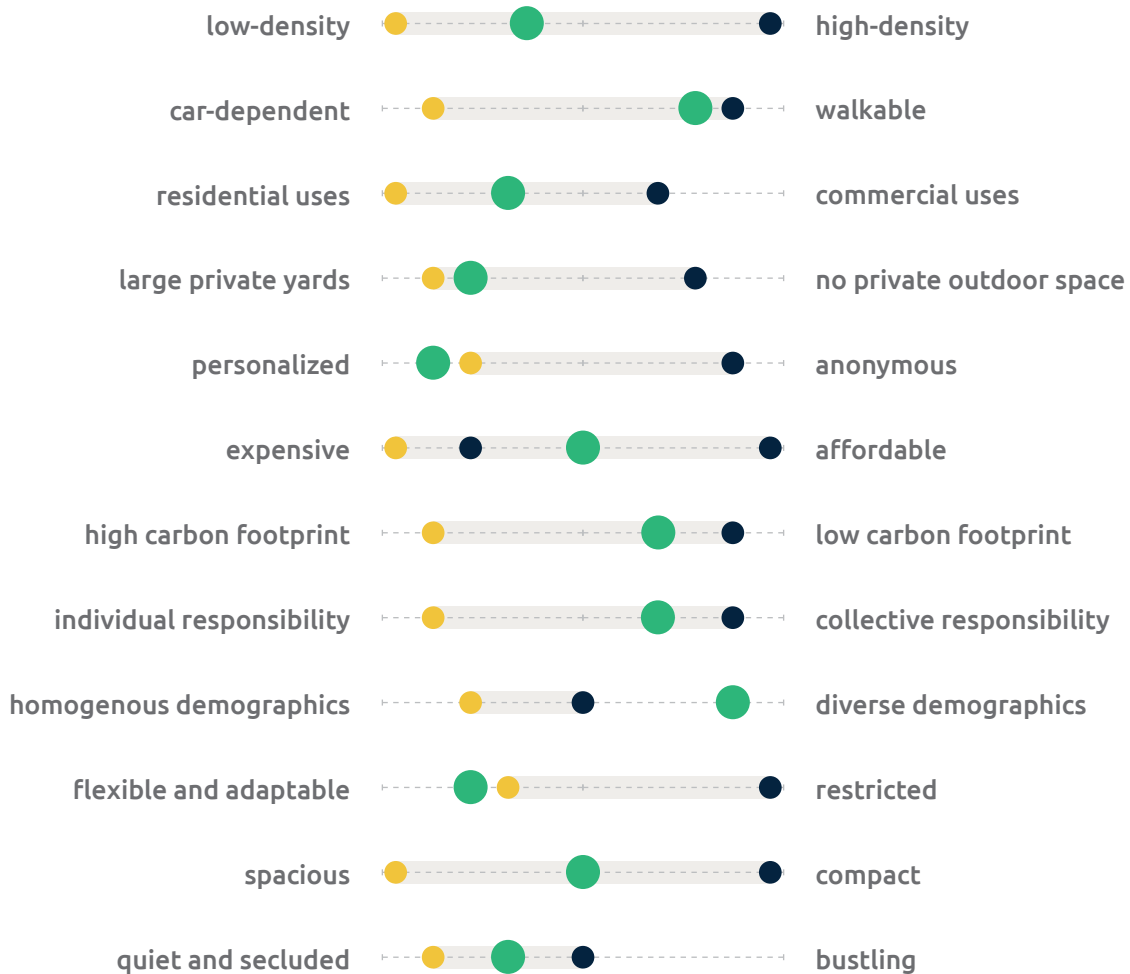
**SINGLE-FAMILY
SUBURBS**



**THE MISSING
MIDDLE
+ MORE SMALL!**



**DENSE URBAN
CORE**



The main purpose of this proposal is to unlock a public realm that will support new, more diverse and inclusive neighbourhoods in Vancouver. In many cases, the proposal seeks to provide a middle-ground for public space improvements

that are appropriate for the scale and density. In some cases, shifting the way we treat public and private space can create situations in which we can exceed the performance of both single-family and high-density neighbourhoods.

WHAT IS MORE SMALL?



medium-density

semi-detached buildings in a range of forms, encouraging active but intimate neighbourhoods



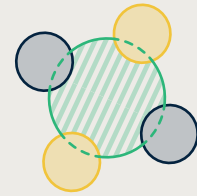
car-lite

re-emphasize walking, cycling, and car share. Not removing the car but making it very easy to get by without.



mixed uses

low-nuisance commercial opportunities that fit a residential scale



shared yards

favour shared outdoor space between small groups of residents



individualized

mixed types and styles, allowing for residents to shape both private and public space



mixed affordability

varying sizes, types, and tenures



minimal environmental impact

sustainable transport, improved infrastructure, and increased softscaping



shared responsibility

opportunities for residents to improve their environments through cooperative efforts



high diversity

support aging-in-place, and households of many sizes and financial means



high flexibility

self-build opportunities, inclusive of many types of activity



enough living space

no micro-studios and no “monster houses” — lagom!



neighbourly interactions

meeting neighbours more frequently and in new ways while maintaining privacy

NEIGHBOURHOOD PUBLIC SPACE TOOLBOX

... an inexhaustive list!



traffic calming features



comfortable pedestrian spaces



integrated green infrastructure



stacked functions



Accessory Commercial Units (ACUs)



flexible ground floor use



remove fences between private properties



move waste removal from the laneway



distinct and continuous paving for bike streets



reduced front setbacks

(see Image References on pp. 91–92)



neighbourhood lending libraries



ground floor step-backs



low/no fences between private yards



shared uses in private spaces



laneway "flex zone"



flexible social spaces



personalization of public spaces



remove parking minimums and facilitate car sharing



allow neighbourhood retail



courtyards/mews

... AND MORE!

SITE SELECTION

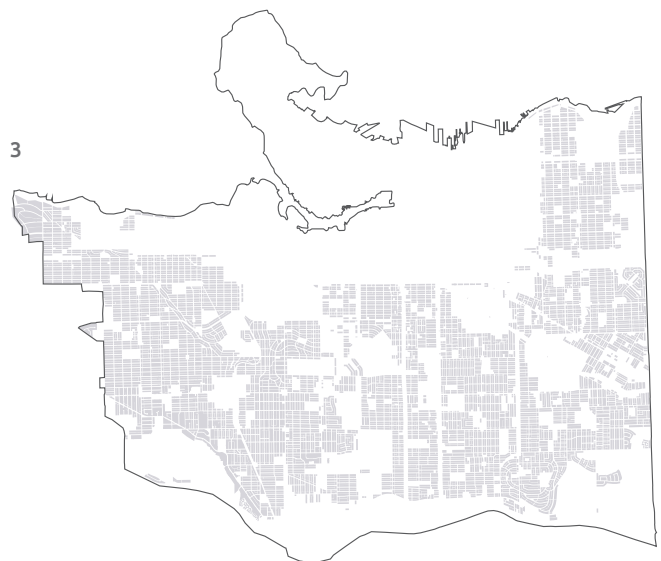
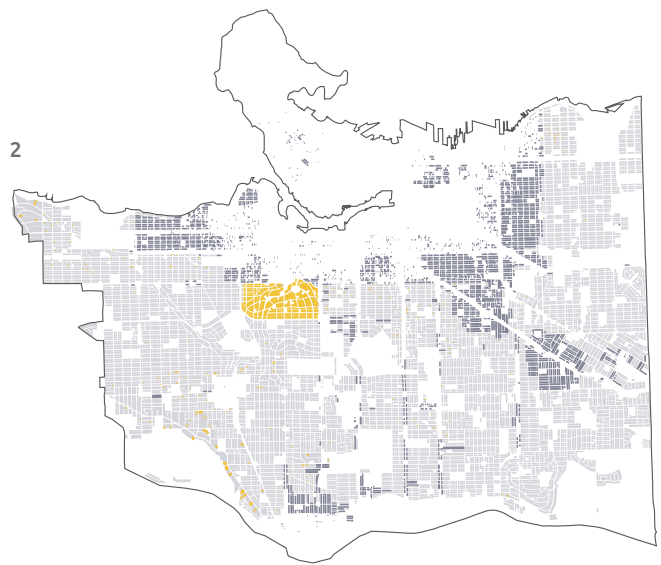
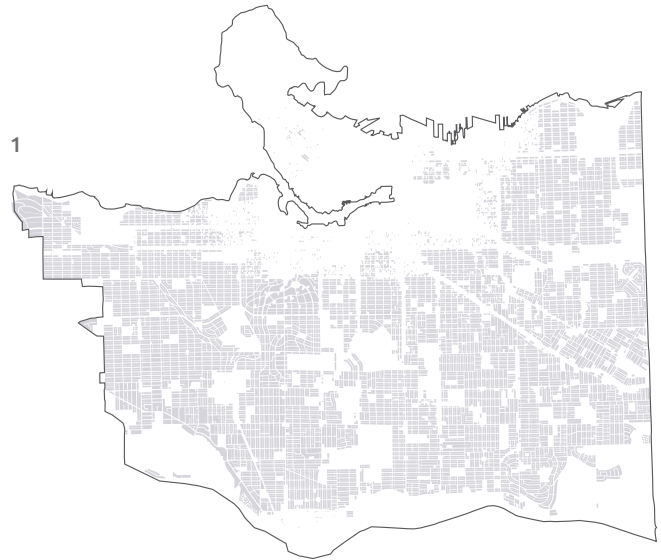
The vision, strategies, and design toolbox mentioned up until this point could — and should — be applied anywhere in Vancouver’s single-family suburbs. As Missing Middle advocates state, such a strategy provides the best outcomes for affordability when it is applied to every property within single-family zones at the same time.

There are 41,300 single-detached housing properties in the City of Vancouver. This represents 80% of all residential properties, and 34% of the city’s landmass (1).

Some are in existing multi-family zones, some are in two-family zones, some are in the designated heritage zone of First Shaughnessy, and some are other buildings on the heritage register (2).

The remaining properties are in single-family zones, meaning that, if they are torn down, they can only be replaced with, at most, a duplex. These sites are the target of this proposal (3).

- single-family detached (SFD) dwellings
- SFD dwellings in multi-family zones
- SFD dwellings protected by heritage status

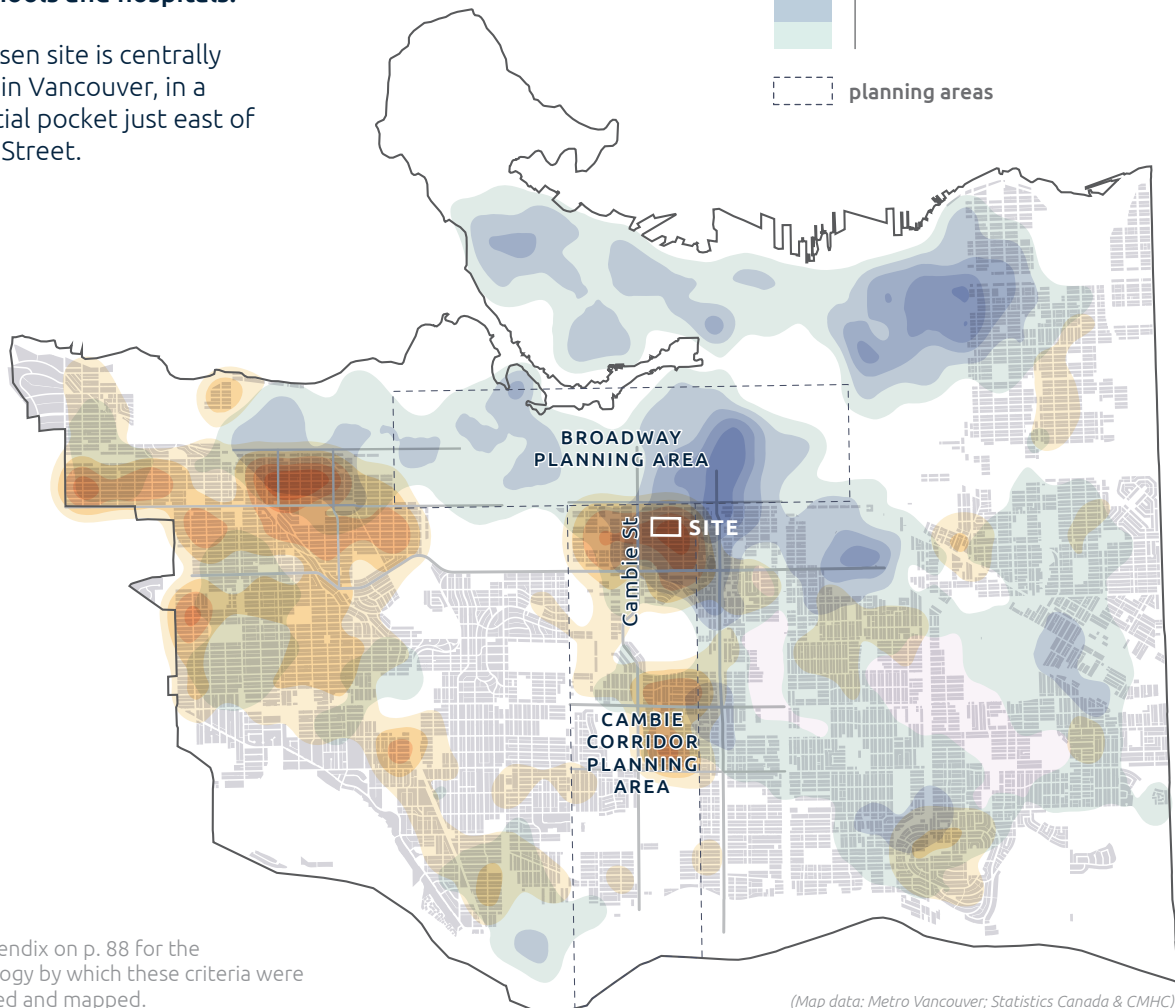


The pilot site was determined through two main criteria*:

1. it contains single-family homes with high teardown risk factors;
2. it is already well-served by neighbourhood amenities, such as transit, schools and hospitals.

The chosen site is centrally located in Vancouver, in a residential pocket just east of Cambie Street.

This site is also at the confluence of two major planning programs, one recently completed (the Cambie Corridor Plan), and one currently ongoing (the Broadway Plan). However, neither includes built form policy for the chosen site.



* see Appendix on p. 88 for the methodology by which these criteria were determined and mapped.

(Map data: Metro Vancouver; Statistics Canada & CMHC)

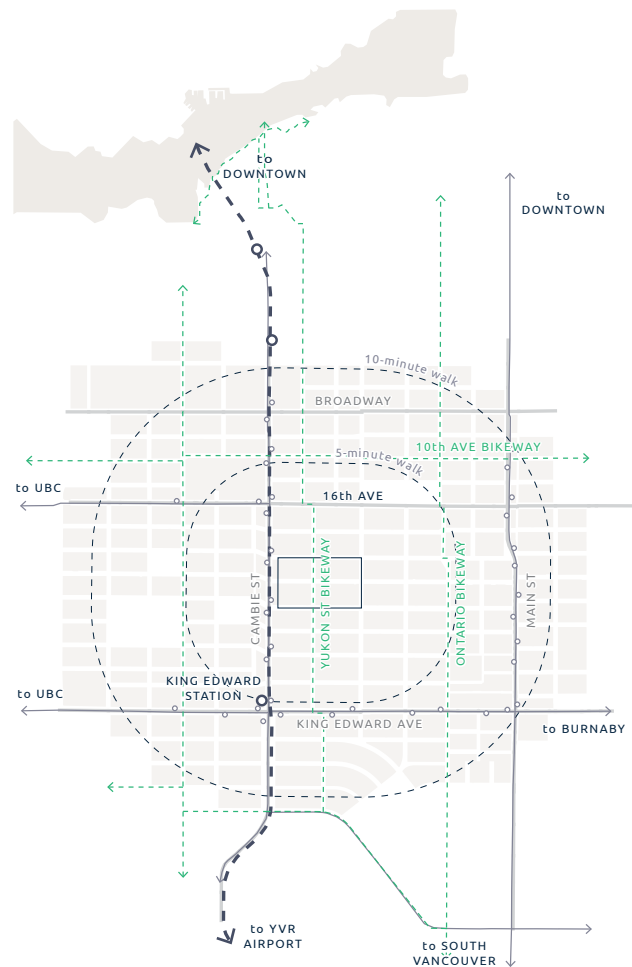
SITE NETWORKS AND AMENITIES

By definition, Missing Middle neighbourhoods must be walkable in order to be successful. As such, this thesis proposal looks at a neighbourhood scale defined by what one could reasonably reach on foot. These maps show the networks and amenities located within a 10-minute area of influence around the chosen site.

The site is well-positioned, with a rapid transit station within a five-minute walk of the site, and multiple bus lines connecting residents to far corners of the city and beyond.

Queen Elizabeth Park is a destination and one of the city's most prominent parks and is located a little more than ten minutes away on foot. Part of the area is under-served by green space, meaning that it takes more than five minutes to walk to a park. The former Bridge Street Creek runs directly through the chosen site.

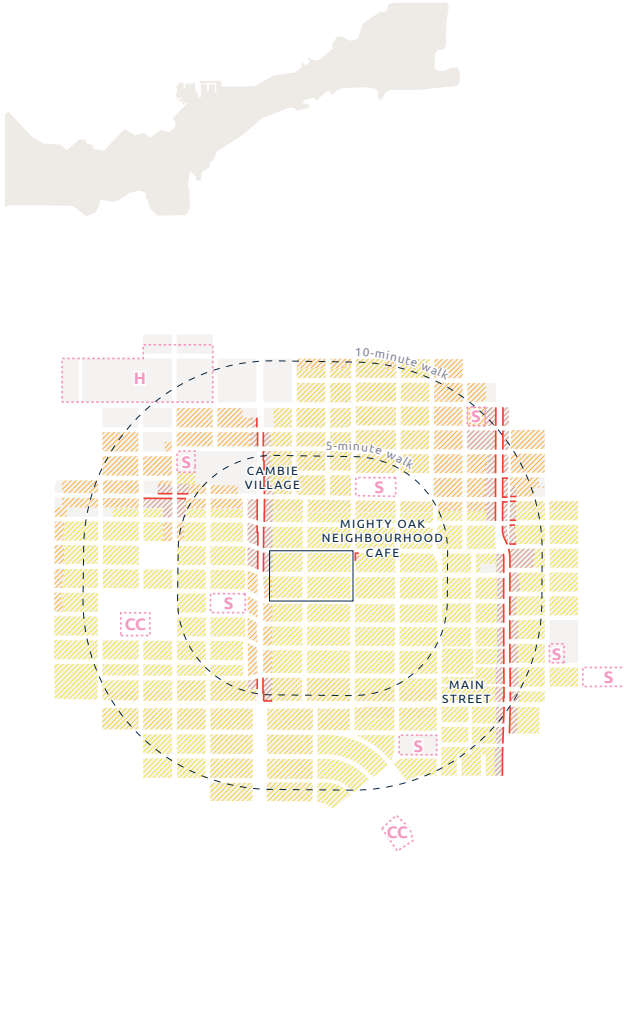
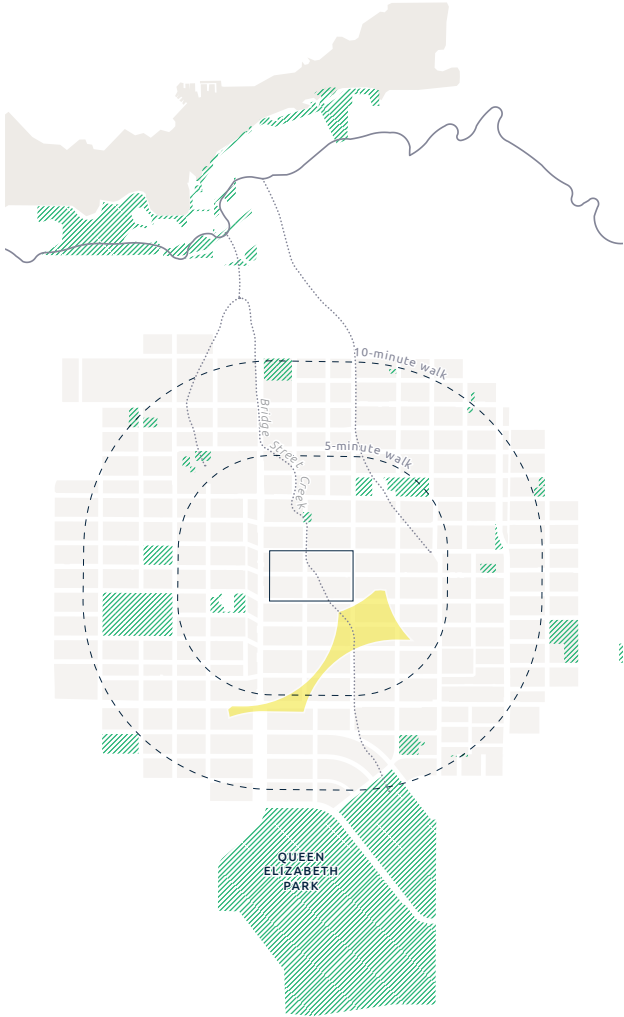
Most of the area is dominated by suburban residential, with two commercial areas nearby. Neighbourhood retail is generally not permitted in Vancouver, but the site is adjacent one of the city's rare spaces, the Mighty Oak Neighbourhood Cafe.



TRANSPORTATION

- rapid transit routes
- bus routes
- arterial roads
- bike route

(Map data: City of Vancouver Open Data Catalogue)

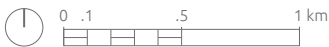


GREEN AND BLUE NETWORKS

- parks and green space
- > 5-minute walk to green space
- historic stream
- historic shoreline

LAND USE AND ACTIVE FRONTAGE

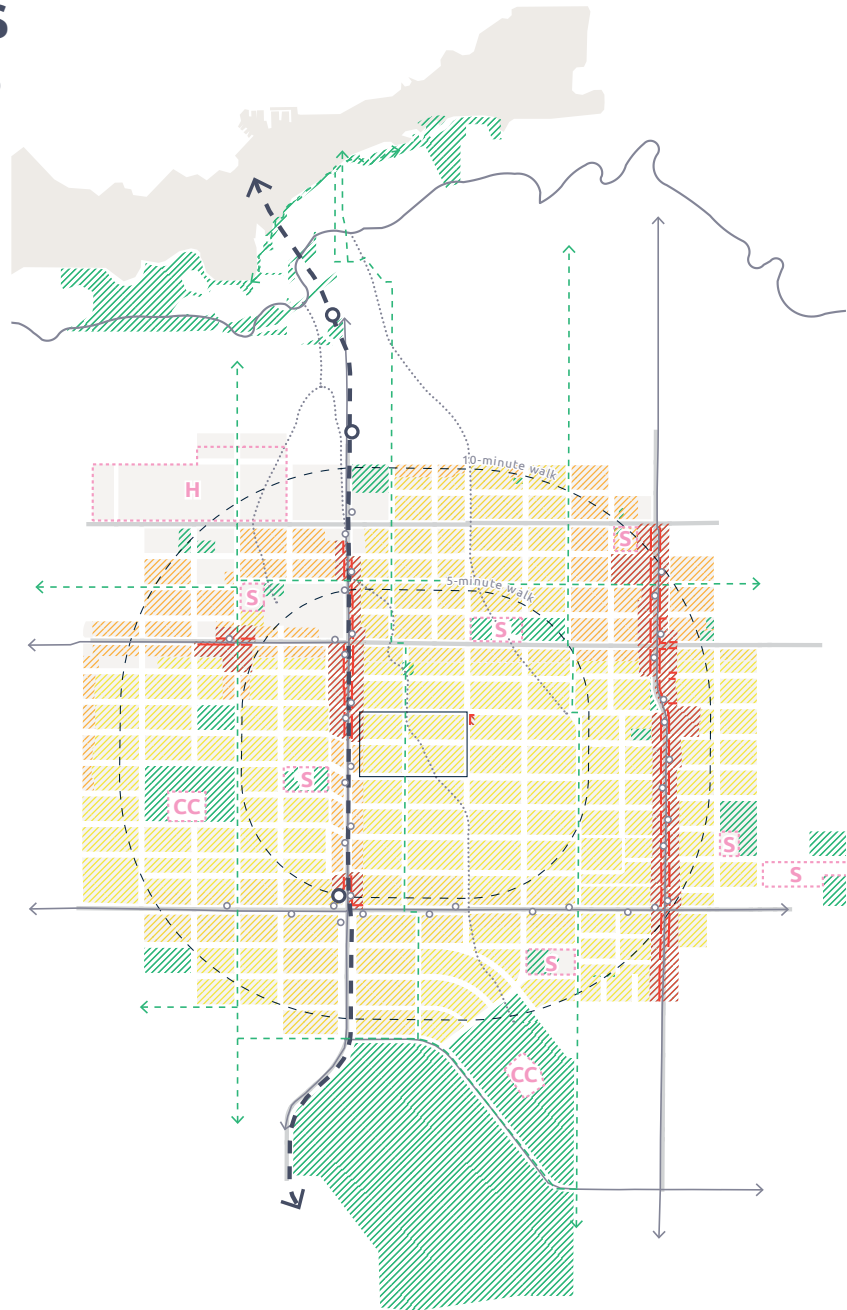
- single-family housing
- two-family housing
- apartments
- commercial
- active frontage
- S school
- H hospital
- CC community centre



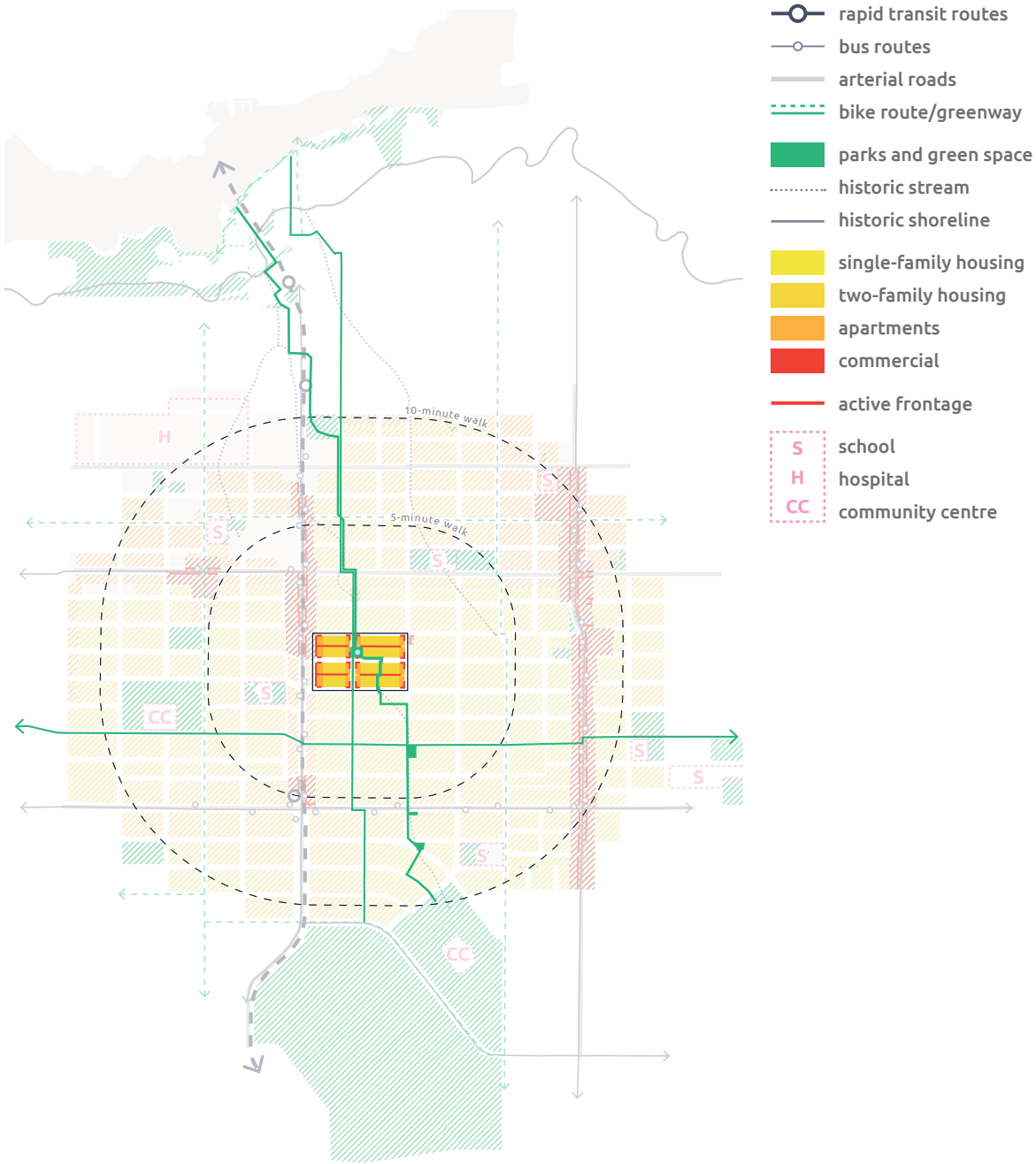
SITE NETWORKS AND AMENITIES

Overall, the site is relatively well served by transit, green space, and commercial opportunities — for a single family context. In elevating the public realm to support Missing Middle density, networks and amenities will need to be added and enhanced at a walkable, neighbourhood scale. In short, there needs to be *more*, and they need to be *small*.

All together, the proposal takes elements of all of these systems — green spaces, retail opportunities, sustainable mobility, green infrastructure, and moderate density housing — and applies them to the site in a friendly, intimate scale. There is an opportunity to add new green spaces and bikeways within the site's area of influence as well.



(Map data: City of Vancouver Open Data Catalogue)



THE SITE

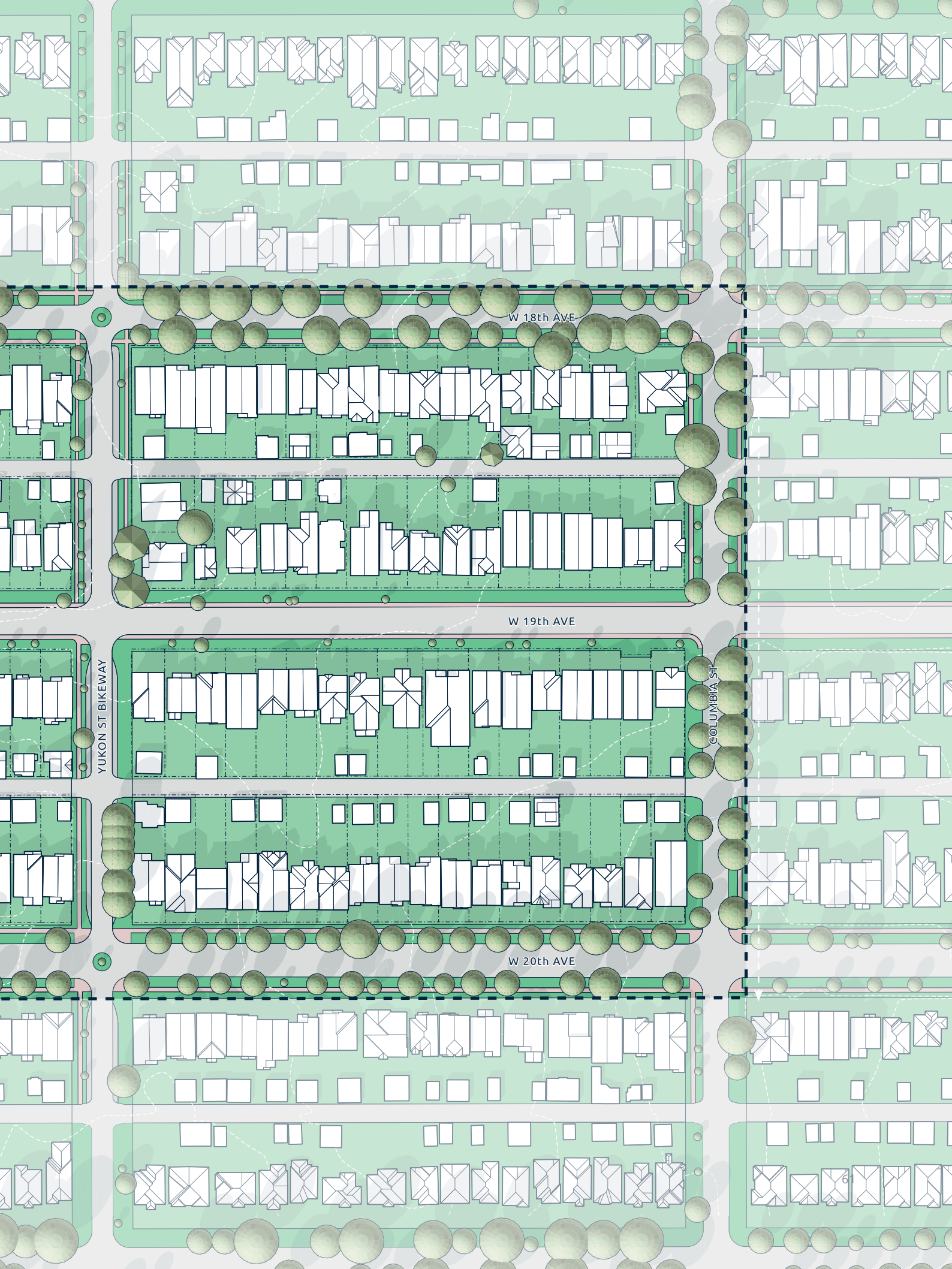
EXISTING

Total Site Area:
72.6 hectares

The existing site is composed of almost entirely single-family houses. Their entrances primarily face onto the east-west streets with vast front yards that separate the front door from the sidewalk. The blocks have a central service lane used for parking and waste removal. Yukon St is designated as a bikeway, but poor delineation of space and signage ensure that bikes are definitely not prioritized on this street.

The following two pages present strategies to structurally transform the uses, dimensions and characteristics of public spaces in order to elevate them for a new paradigm of housing.





W 18th AVE

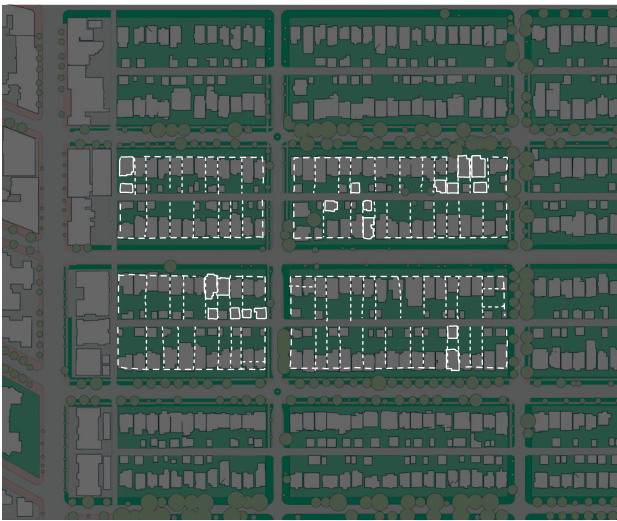
W 19th AVE

W 20th AVE

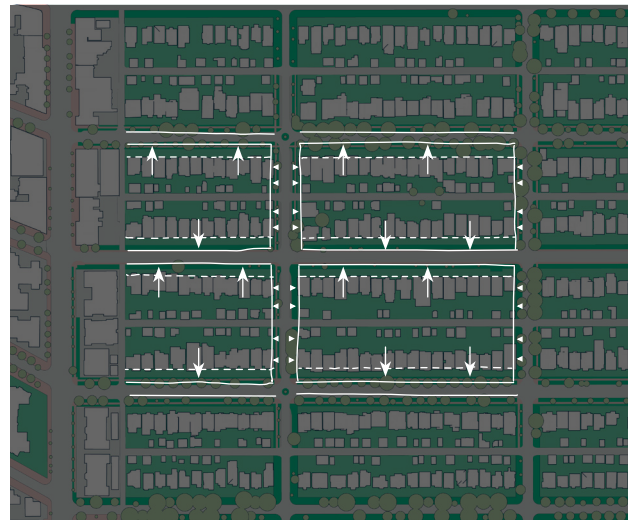
YUKON ST BIKEWAY

COLUMBIA ST

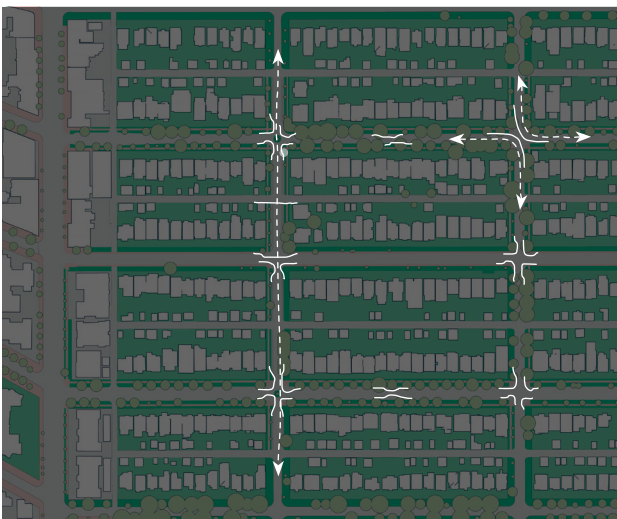
SITE STRATEGIES



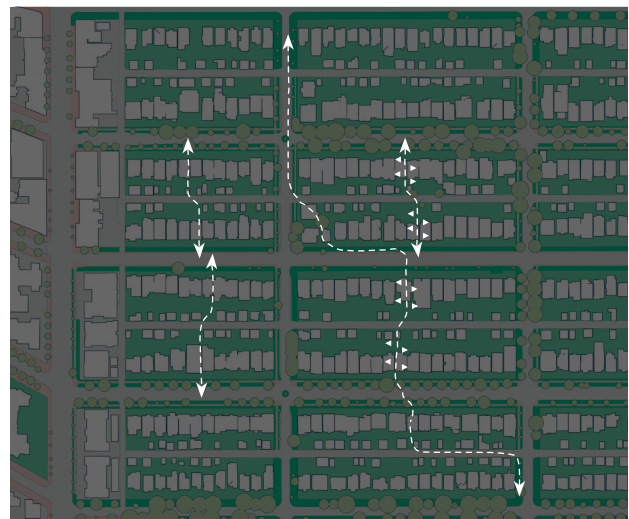
enable missing middle density
retain existing character and laneway homes
allow for small lot consolidations



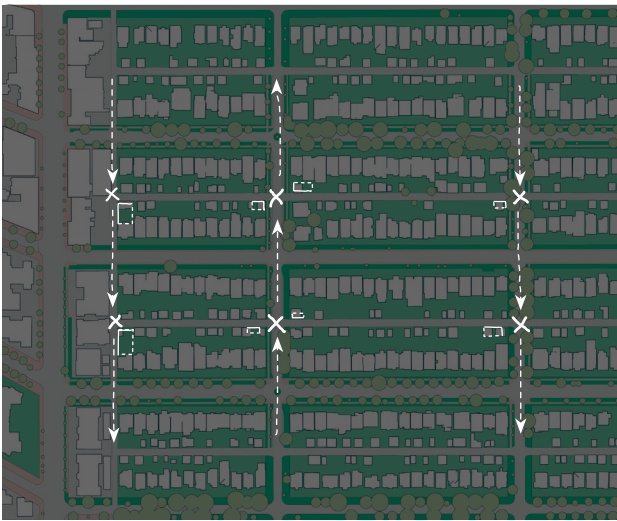
narrow the right-of-way
reduce front yard setbacks
activate north-south streets



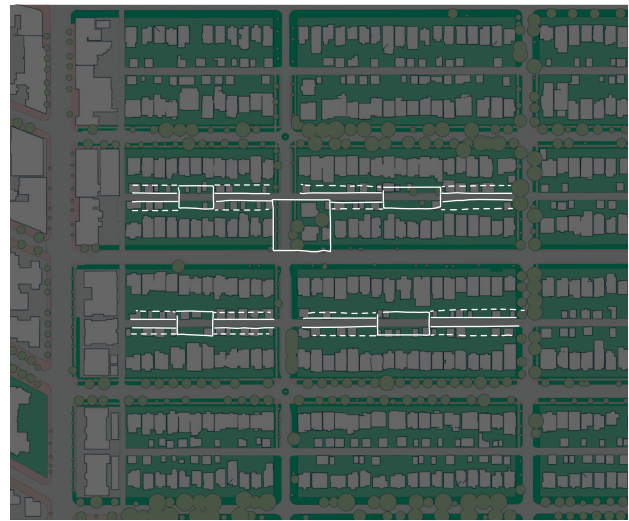
improve bike streets
introduce traffic calming



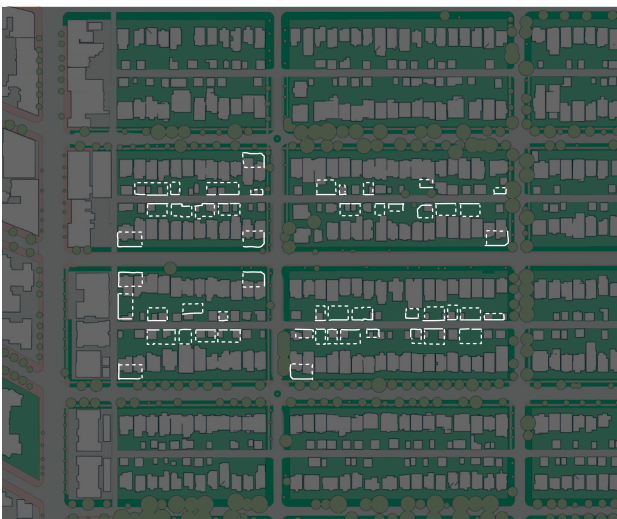
improve pedestrian networks
add mid-block connections
add mews to longer blocks



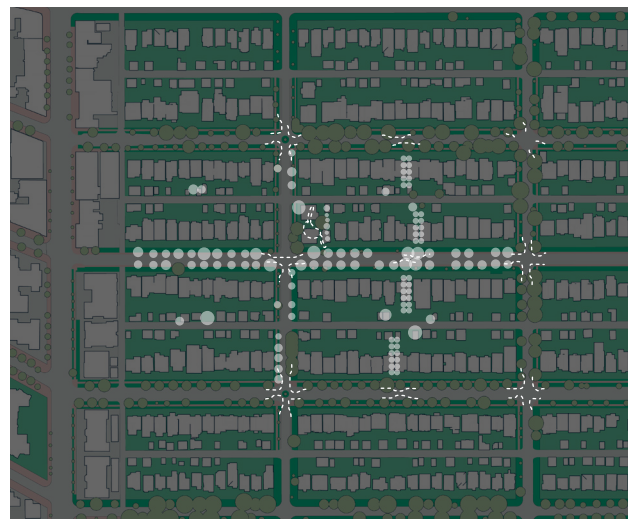
centralize waste removal



establish neighbourhood gathering spaces
establish laneway flex zones



new uses at laneways and corners



integrate green infrastructure into streets
increase urban canopy

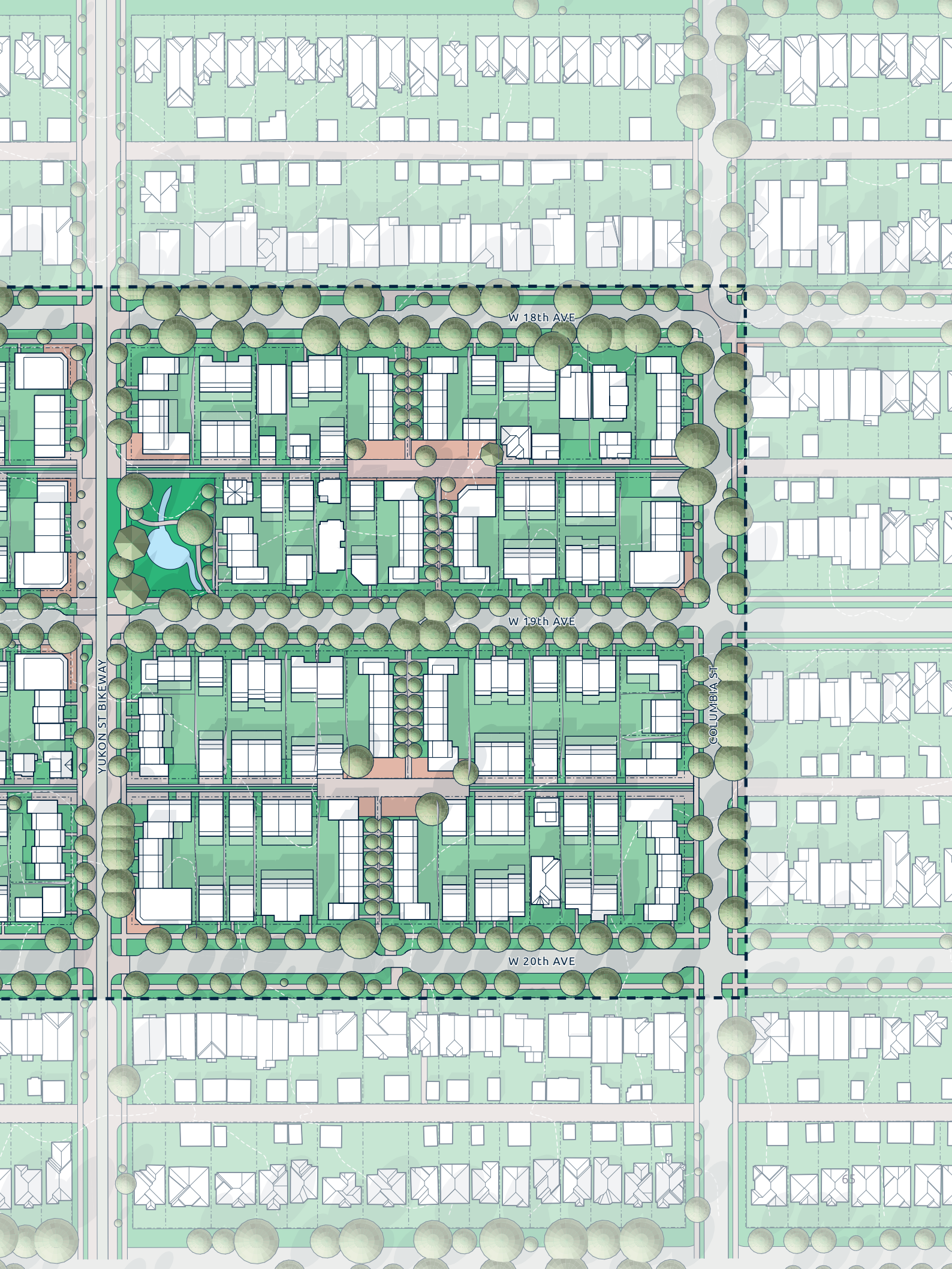
Proposal

MASTER PLAN

PROPOSED

Total Site Area:
72.6 hectares





W 18th AVE

W 19th AVE

W 20th AVE

YUKON ST BIKEWAY

COLUMBIA ST

HOUSING TYPOLOGIES

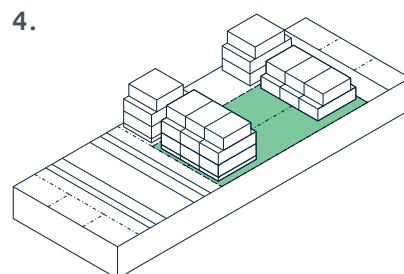
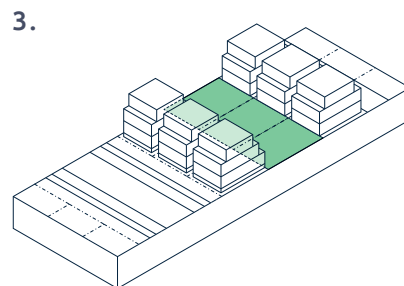
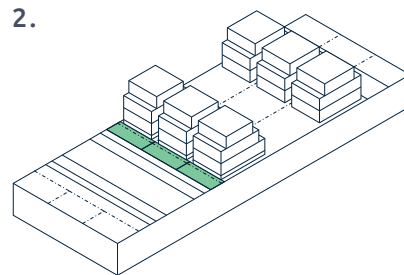
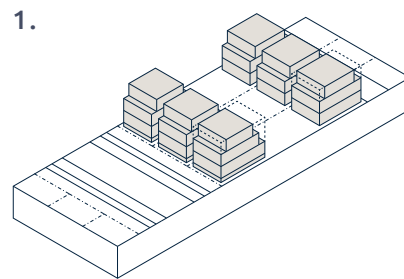
The proposal demonstrates Missing Middle typologies, such as **rowhouses**, **stacked townhouses**, and **low-rise apartment** buildings, as well as accessory dwellings such as **laneway houses** and **live-work units**.

Diversity of architectural expression is encouraged as long as certain base guidelines are met (see box below) to avoid undue impacts on shared spaces.

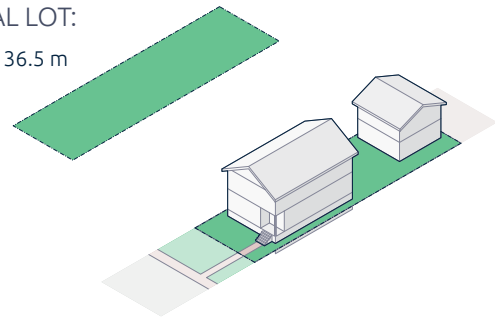
Design Guidelines for Housing Typologies

In order to maximize liveability for all units and reduce impacts on public space, the following guidelines should be followed for all typologies:

- 1. Sculpting at upper levels** to improve solar access to public spaces (through step-backs or pitched roofs)
- 2. Minimized frontage depth**
 - 4 m from back of sidewalk for residential buildings to provide for a small green yard and privacy buffer.
 - 3 m from back of sidewalk for neighbourhood retail to provide an area for activities to spill out.
- 3. Maintain a deep shared yard**, ideally 10 m between buildings to maximize solar access and to allow room for a small private outdoor space for individual dwelling units
- 4. Limit land consolidation to two lots** in order to avoid land lift (land value increase as a result of allowable density increase)



TYPICAL LOT:
10.1 m x 36.5 m
(368 m²)



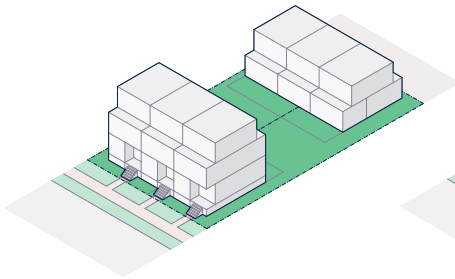
The typologies should be mixed within neighbourhoods, and can even be combined on one lot with a primary building at the street and a secondary building at the lane.

The following illustrations exemplify the housing typologies and how they can be combined.

Encouraging different combinations and varying expression will allow for architectural diversity.

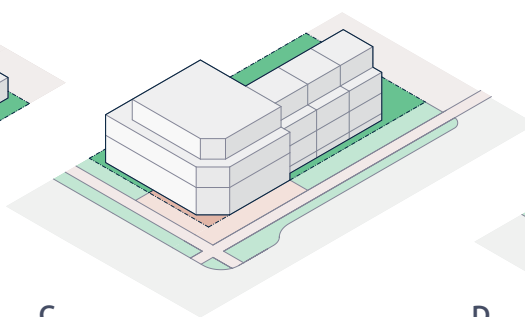
A.

Primary: **SINGLE-FAMILY DETACHED**
Secondary: **LANEWAY HOUSE**



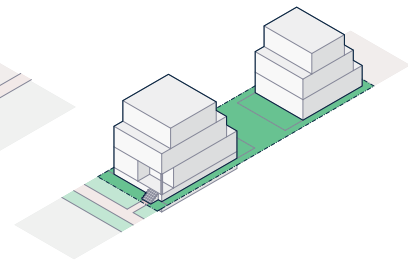
B.

Primary: **3 ROWHOUSES**
Secondary: **3 LIVE-WORK UNITS with commercial at grade**



C.

Primary: **LOW-RISE APARTMENT with commercial at grade**
Secondary: **3 ROWHOUSES**



D.

Primary: **STACKED TOWNHOUSES**
Secondary: **STACKED TOWNHOUSES with accessible units at grade**

		A.	B.	C.	D.
		SINGLE-FAMILY DETACHED + LANEWAY HOUSE	ROWHOUSES + LIVE-WORK UNITS	MIXED-USE LOW-RISE + ROWHOUSES	STACKED TOWNHOUSES
Number of Lots		1	2	2	1
Total Lot Area		368 m²	736 m²	736 m²	368 m²
Gross Floor Area	Primary Building - Residential	311 m²	598 m²	386 m²	347 m²
	Primary Building - Commercial	N/A	N/A	232 m²	N/A
	Secondary Building - Residential	99 m²	182 m²	348 m²	193 m²
	Secondary Building - Commercial	N/A	99 m²	N/A	N/A
Total Gross FSR		1.11	1.19	1.31	1.47
Height		9.5 m	10 m	10 m	10 m
Frontage Depth		11 m	4 m	3 m	4 m
Rear Yard Depth		9.5 m	14 m	N/A	11 m
Number of Units		3	9	10	7
Units/hectare		81.5	122.3	135.9	190.2
Population/hectare		179.3	269.1	299.0	418.5

HOUSING TYPOLOGIES

The mix of typologies in the proposal increases the number of dwelling units by +262%, while only increasing residential floor area by +45%.

This is based off a range of new unit sizes, from 55 m² to 149 m², in order to support a range of household types.

Buildings at the laneway support a choice of use at grade, which will vary the numbers below.



Residential Floor Area and Units

	EXISTING	PROPOSED
Site Area*	72,637 m ²	
Number of Lots	117	79
Total Lot Area	48,770 m ²	47,744 m ² **
Total Gross Floor Area	37,476 m²	54,473 m²
Gross FSR	0.77	1.14
Single-Family Detached (1-2 units)	117	8
Laneway Houses (1 unit)	11	11
Rowhouses (2 units)	0	129
Stacked Townhouses (3-4 units)	0	66
Live-Work Units (1 unit)	0	45
Low-Rise Apartments (7 units)	0	12
Total Units	187	677
Units/hectare	38.3	141.8
Population/hectare	84.4	312.0
Floor Area Increase	+ 45%	
Unit Increase	+ 262%	

* Includes all public land (roads, boulevards, laneways, etc.)

** Decrease due to dedication of lots for neighbourhood park



LILIAN TO
PARK

NEW
NEIGHBOURHOOD
PARK

THE MIGHTY OAK
NEIGHBOURHOOD
CAFE

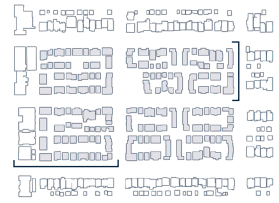
YUKON ST

W 18th AVE

W 19th AVE

W 20th AVE

COLUMBIA ST



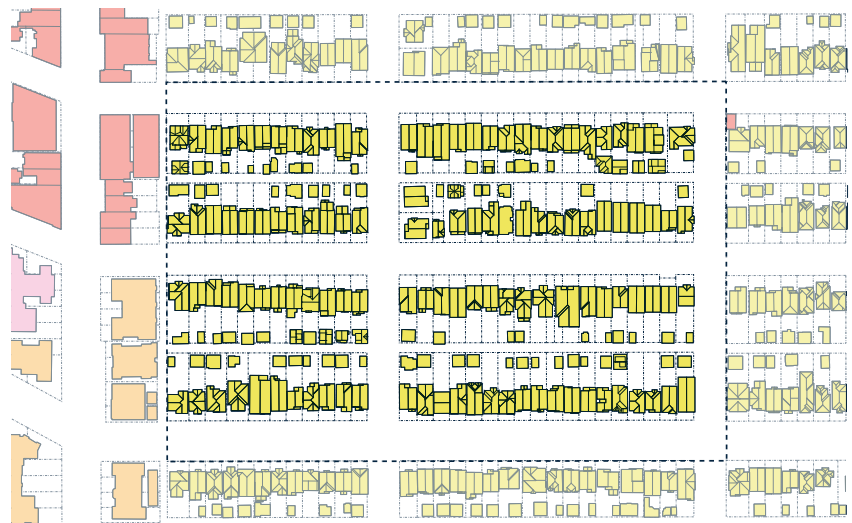
BUILDING FUNCTIONS AND LAND USE

Today, the site is dominated by single-family residential, with no possibility for other uses. Laneways are used for waste removal, whereby trucks must stop at each property to pick up individual bins.

The proposal still focuses on ground-oriented residential uses, but introduces opportunities for commercial activities and community buildings (such as shared workshops, common laundry, or greenhouses) at the laneways and at corner lots.

Small shared buildings at the end of each block centralize waste removal, freeing up the laneway. Now, waste removal trucks can utilize the north-south streets, stopping just once per block, reducing travel distance and idling time. Residents will have to walk their waste a little bit further, but the gains are well worth it. These buildings provide yet another place for chance encounters with neighbours, and should someone have trouble walking their recycling the short distance, a neighbour who can lend a hand is not far away.

- single-family detached
- rowhouse/stacked townhouse
- apartment
- community/amenity
- commercial
- choice of use



EXISTING



PROPOSED

E 20th AVENUE ELEVATION



EXISTING

Most properties face onto east-west streets and exhibit a single-family residential character with gable-ends facing the street.

Current zoning permits a maximum height of 9.5 m (or 10.7 m for a new duplex), and a maximum of 2.5 storeys.



PROPOSED

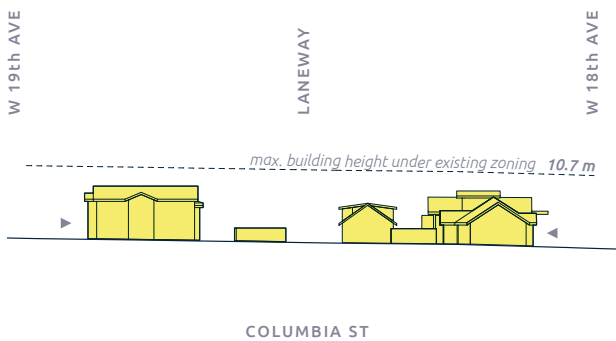
A new low-rise apartment with ground floor commercial is added on the corner of the laneway closest to Cambie Street. New semi-detached buildings maintain a ground-oriented character,

and while maximum allowable height stays the same, a full third storey is permitted to enable better stacked units.



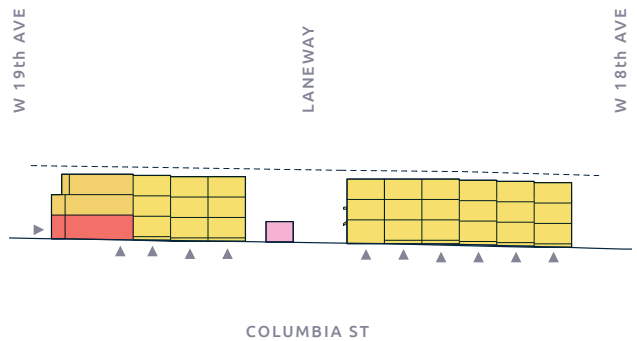
elevations look north

COLUMBIA STREET ELEVATION



EXISTING

North-south streets like Columbia St have few (if any) entrances fronting onto them, and in many cases, do not have sidewalks.



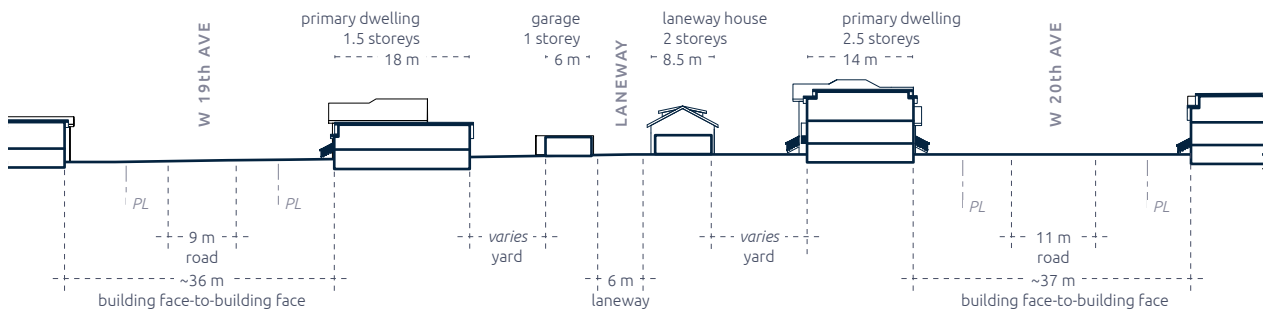
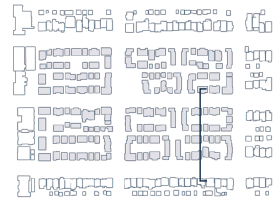
PROPOSED

Properties are reconfigured to allow for more entrances on north-south streets and fully accessible sidewalks are added.



elevations look west

TYPICAL BLOCK SECTION

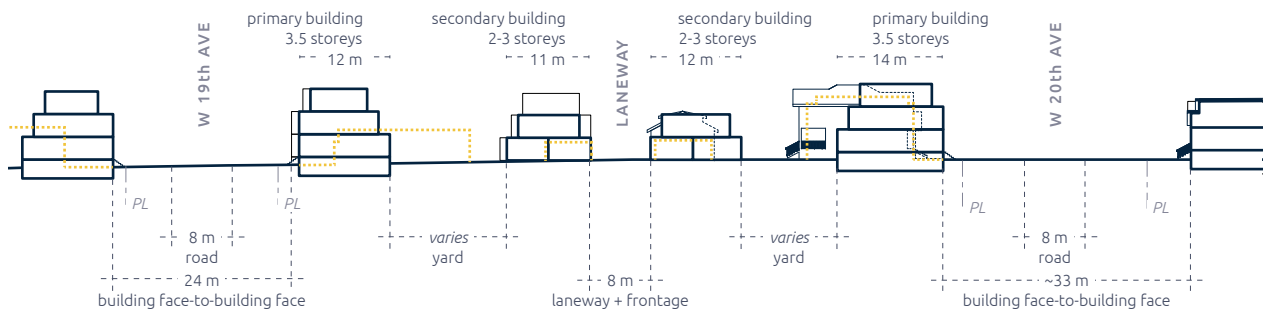


EXISTING

Properties feature a primary dwelling at the front of the lot with the possibility of a secondary suite and an accessory building at the rear of the lot like a garage or rental laneway home. A generous front yard sets the primary dwelling back from the street. Primary dwellings can be very deep, and although they

are detached with windows on all sides, narrow side-yards between lots mean daylight access is limited, particularly for basement units that already have small windows.

Primary dwellings may be a maximum of 2.5 storeys and accessory buildings a maximum of 1.5 storeys.



PROPOSED

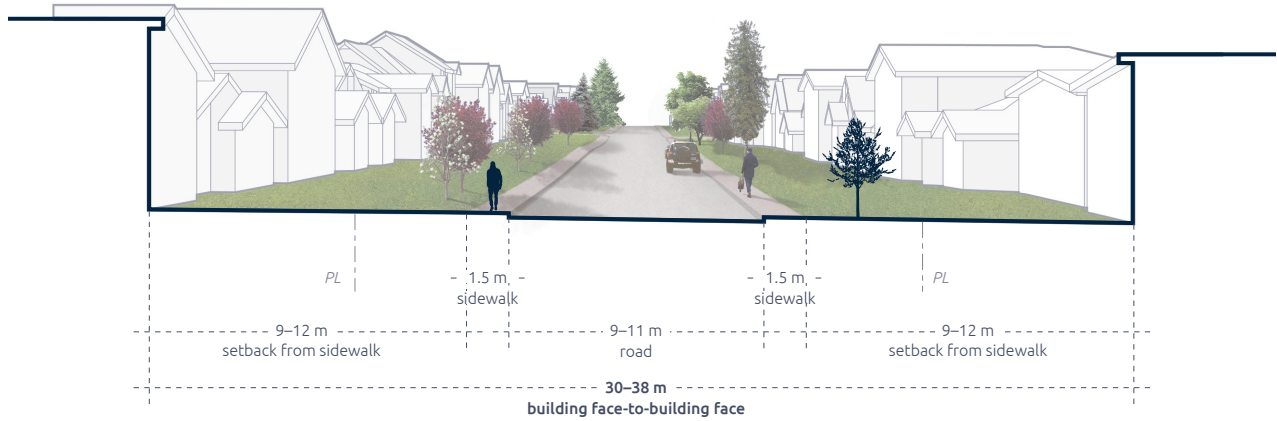
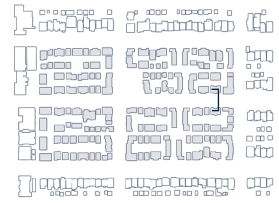
The primary dwelling is brought forward on the lot to allow for a larger building at the laneway while maintaining a generous shared yard. New laneway buildings have a choice of use at grade, including private residential uses (e.g. a laneway home or a private garage), commercial uses (e.g. as a small office or

a live-work unit), or community uses (e.g. shared laundry, or recycling). Taller, shallower buildings allow for better daylight access within units.



sections look east

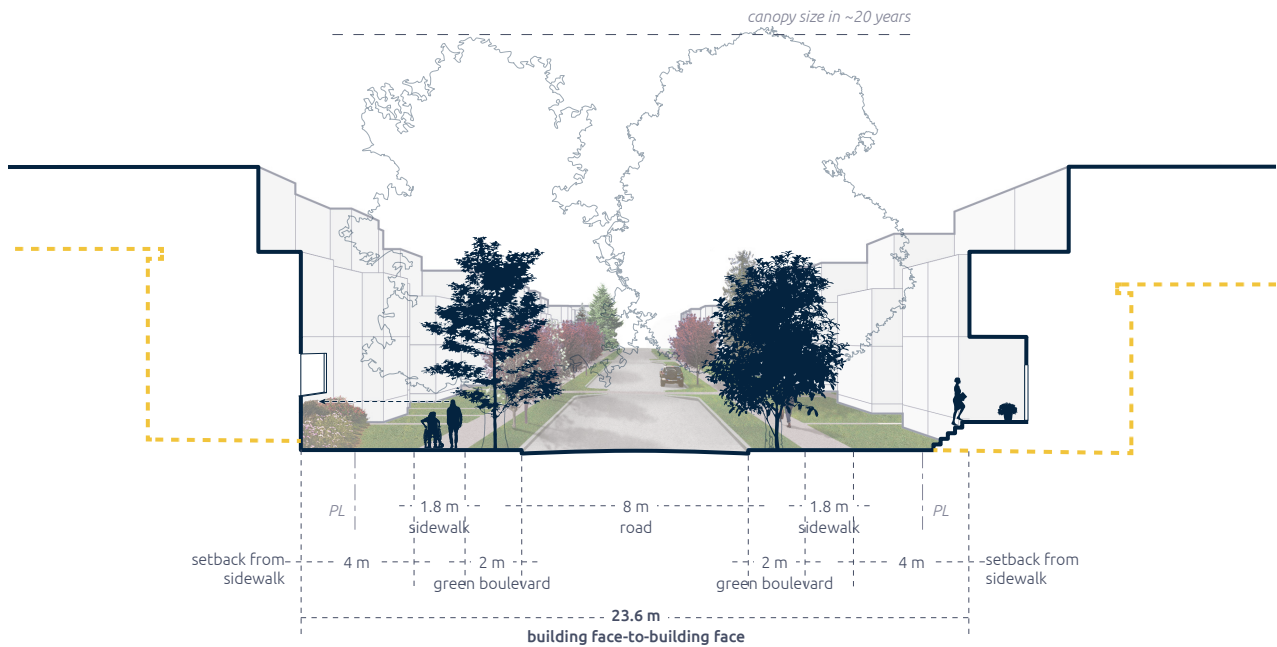
W 19th AVENUE SECTION



EXISTING

The existing street section is up to 38 m wide, featuring a single-family residential character with gable-ends facing the street. The front building setback is measured from the property line, usually about 6 meters or more.

The sidewalk immediately abuts the curb and the few street trees that exist are small.



PROPOSED

The new street section will narrow the road and provide a planted green boulevard between the road and sidewalk to support large street trees and an opportunity for soft drainage. The sidewalk is widened to improve accessibility.

while maintaining a green street character. Together with a raised ground floor, this also maintains privacy for residents.

The front yard setback is reduced to 4 meters (measured from back of sidewalk) to minimize the amount of front yard area



sections look west

YUKON STREET BIKEWAY AND A NEW NEIGHBOURHOOD PARK



low-rise apartments at corner with commercial at grade

three major trees retained

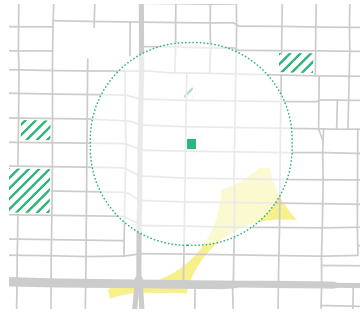
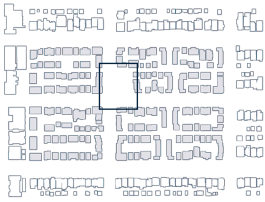
new bike share station

smaller trees buffer from adjacent rowhouses

distinct materiality to signify bicycle priority

integrated stormwater management

new water feature marks former Bridge Street Creek



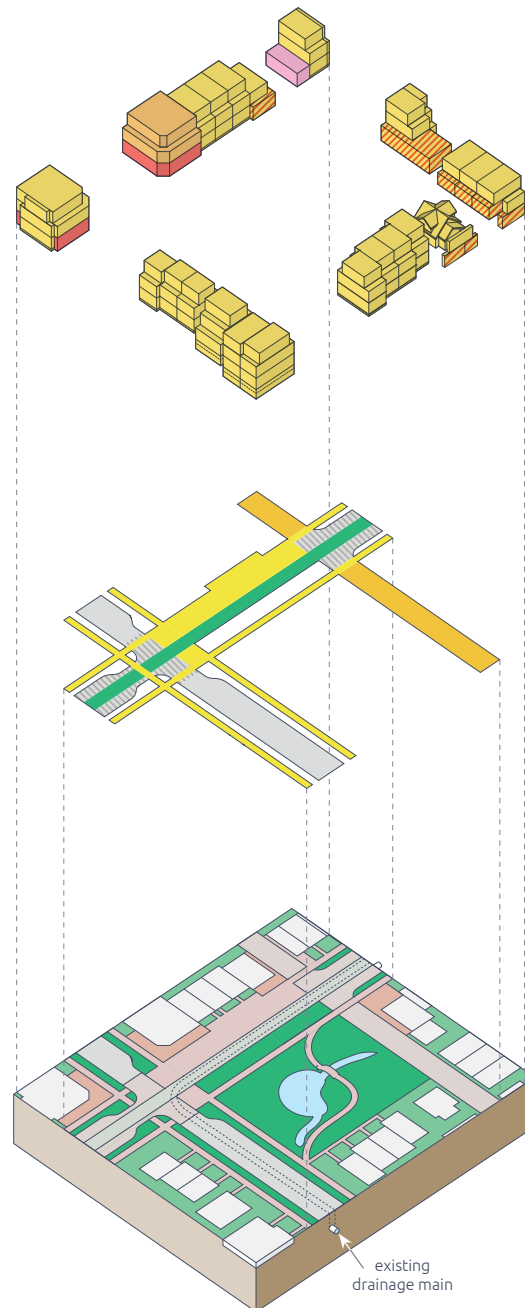
The 400 m/5 minute walking catchment for the new neighbourhood park covers a gap in the park space network to improve green space accessibility for both immediate residents and the larger neighbourhood.

The new neighbourhood park provides a new public green space for residents, while also including important stormwater management features.

Closing Yukon Street to vehicle traffic for this half-block will calm traffic and reinforce the hierarchy of this bike street. The street closure provides an opportunity to create a small pedestrian plaza on which adjoining retail can spill out.

The sunny active plaza contrasts with a tranquil green space, featuring a stormwater retention pond and places to relax. Two grand cedar trees and a chestnut tree on Yukon Street will be retained, providing a sound buffer as well as partial afternoon shade. A small covered gazebo provides a focal point and a covered place to sit. New trees are added at the eastern edge of the park to buffer from a new row of townhouses.

The stormwater retention pond marks the location of the historic Bridge Street Creek. It will allow for increased infiltration, and, during heavy rains, slow down conveyance to the existing drainage main. The cut-through path provides a quicker route through the park for pedestrians and the gazebo provides a point of respite.



BUILDINGS

- townhouse
- apartment
- community/amenity
- commercial
- choice of use

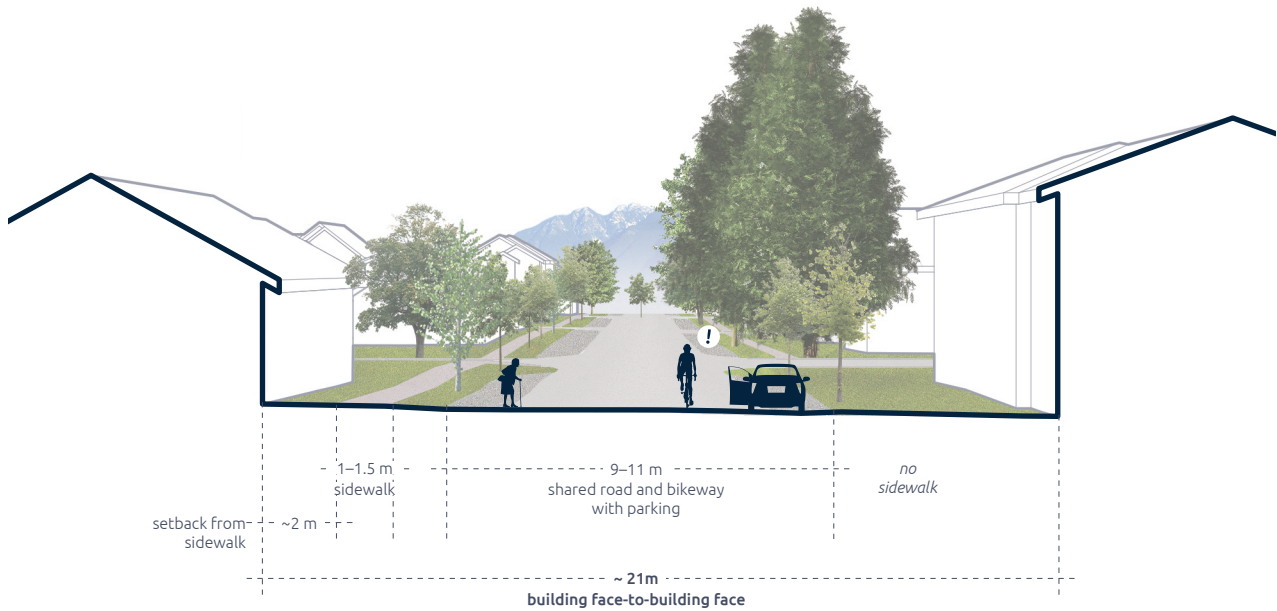
PATHS

- sidewalk/plaza
- bikeway
- laneway
- road
- road (distinct material)

PUBLIC SPACE

- public green
- semi-private/private green
- commercial frontage
- sidewalk/plaza
- stormwater retention

YUKON STREET BIKEWAY SECTION



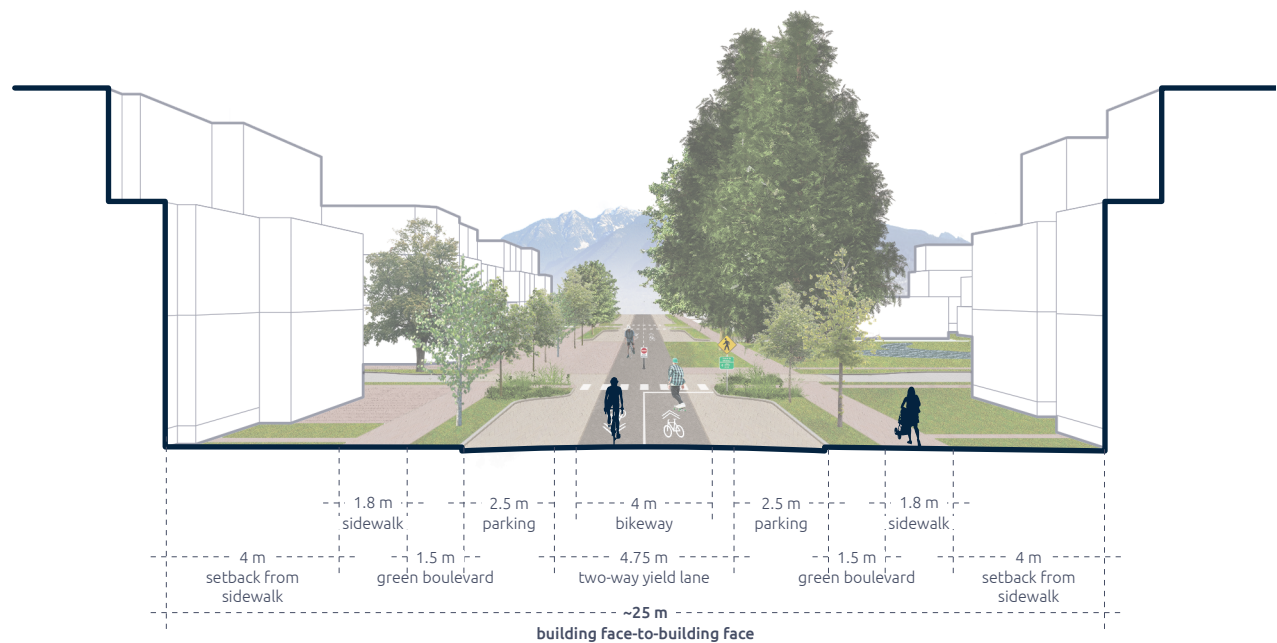
EXISTING

The existing street section is about 21 meters wide. Very few buildings front onto north-south streets like Yukon Street. In many cases, there are no sidewalks, despite the north-south streets' orientation with Vancouver's iconic mountain views.

The street trees are mostly small, with a few grand trees that

must be preserved. On-street parking encroaches onto the planted boulevard, creating a worn gravel strip.

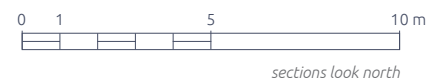
Yukon Street is a designated bikeway where cyclists share the right-of-way with vehicles. Signage is poor, and there are limited traffic calming features.



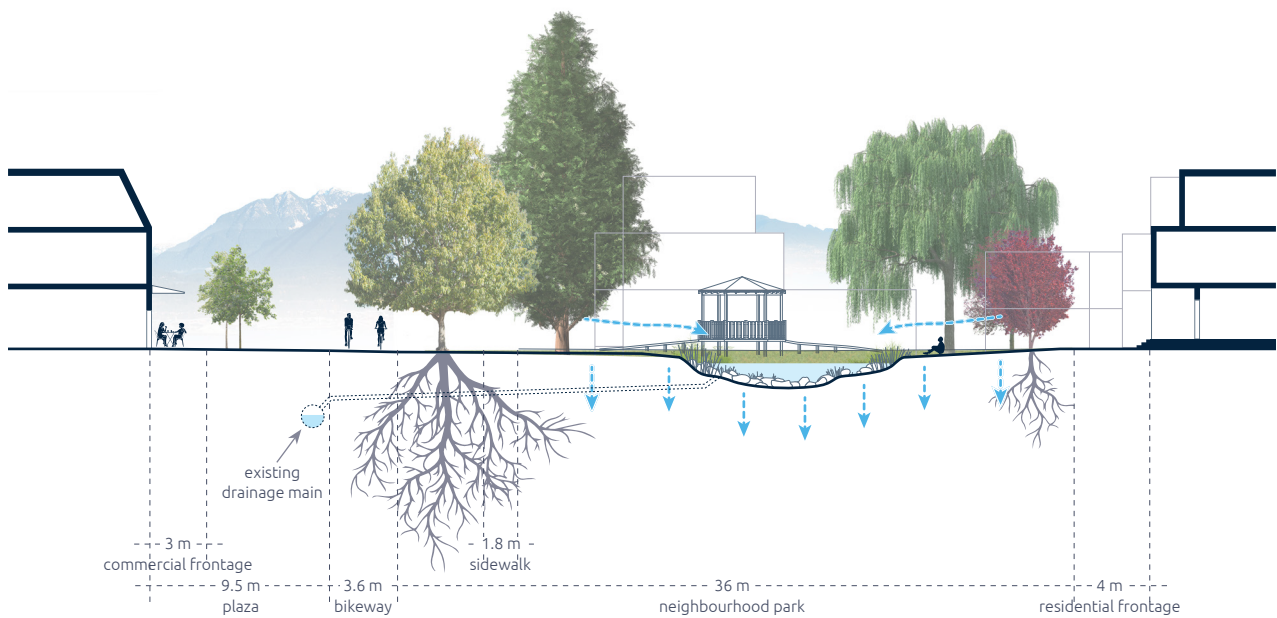
PROPOSED

Continuous surface materials reinforce the bike's dominance while sharing the right-of-way with cars. Conflicts between cyclists and parked cars are eliminated by better dimensioning and designation of the roadway. The front building setback is widened here to support better sidewalk accessibility and more frontages along the street.

Trees with a smaller mature canopy height are chosen so as to not interfere with northward views. Greenery is then enhanced at the ground through planted drainage swales.



NEIGHBOURHOOD PARK SECTION

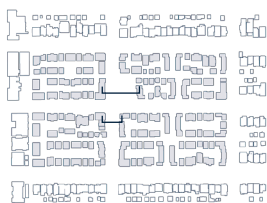


PROPOSED

A new park and plaza are enabled by closing Yukon Street to vehicle traffic here. The sunny plaza can provide passive seating to complement the retail spaces, and can support more active functions like a small farmers market.

A new pond in the park provides more than just a recreational amenity. It marks the location of the former Bridge Street Creek, which has been replaced by an underground drainage main.

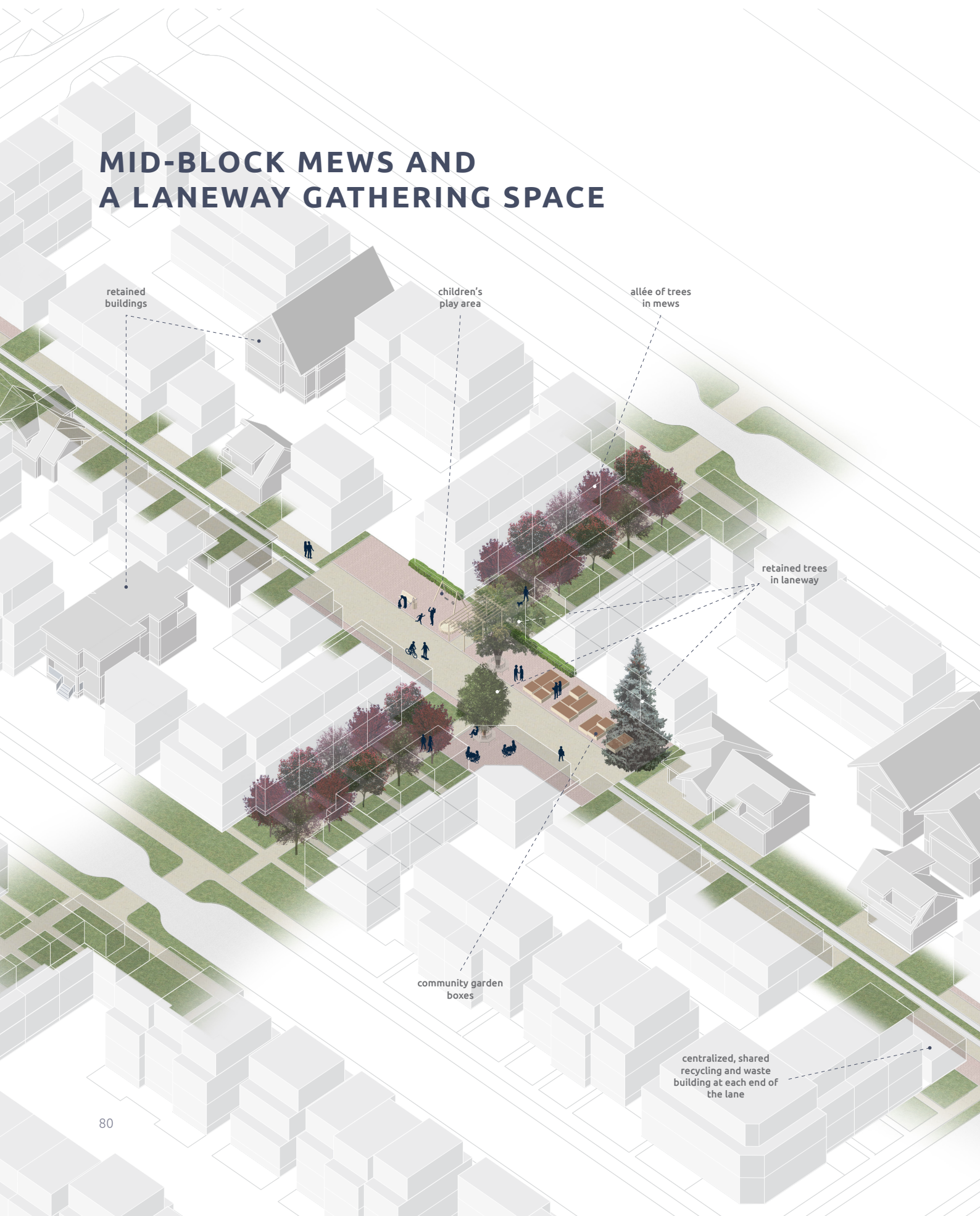
On rainy days, the retention pond will fill up, creating interesting new places for animals and children to explore. The pond collects and slows conveyance of water from the nearby development, preventing surges of water from entering and overloading the storm drains. During summer periods with little rain, the grassy lawn provides a place to sit in the sun.







MID-BLOCK MEWS AND A LANEWAY GATHERING SPACE



retained buildings

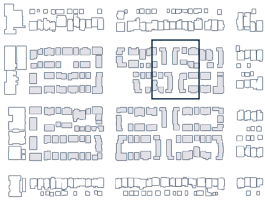
children's play area

allée of trees in mews

retained trees in laneway

community garden boxes

centralized, shared recycling and waste building at each end of the lane



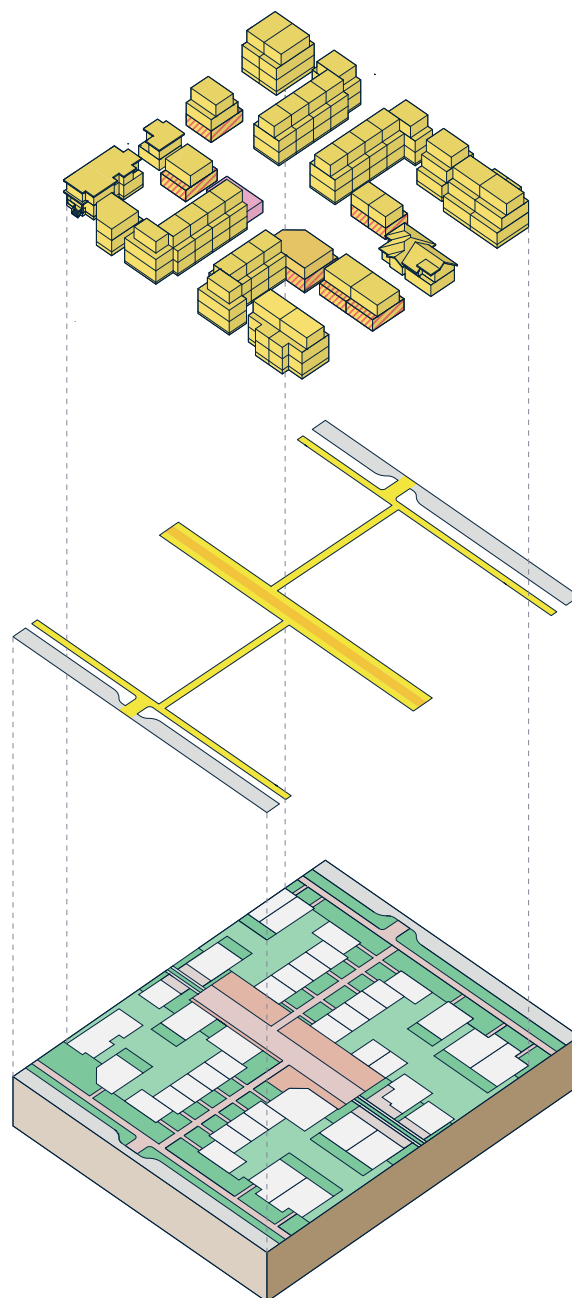
Freed up from their service function and with the inclusion of new commercial uses, the laneways become new active places to gather and meet with neighbours.

Laneways will maintain vehicle access for parking and loading functions, but a new material treatment signifies to drivers that this is a place to move slowly.

The two-storey streetwall at the lane creates an intimate feel, and a choice of use at grade — a laneway home, a workshop, a microbakery — will ensure variety and interest.

The central space becomes the new community heart — a hidden gem where residents of the block can shape their own spaces and feel a sense of ownership. Here, the buildings step back to make room for community gardens, play spaces, or greenhouses with good sun access. While softscaping or permeable pavers should be used wherever possible, this is a good location for small hardscaped areas where kids can play street hockey or learn to ride their bikes.

On longer blocks, a mid-block mews is created, where inward-facing rowhomes can front onto the new pedestrian connection to the lane. The mews feature rows of trees and a green buffer to provide privacy to the residents.



BUILDINGS

- semi-detached
- apartment
- community/amenity
- commercial
- choice of use

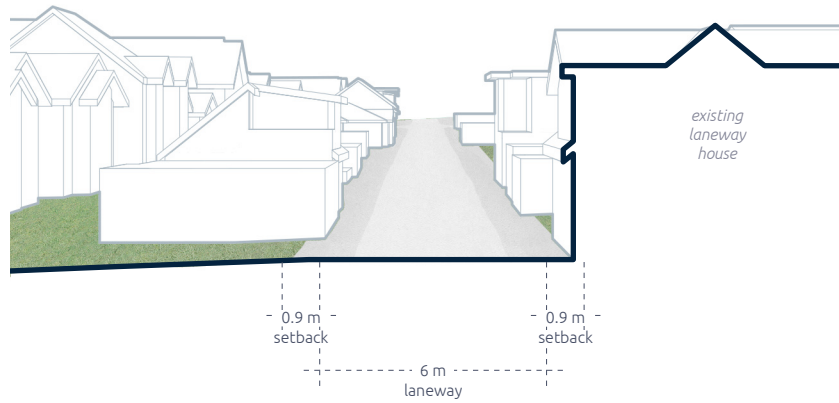
PATHS

- sidewalk/plaza
- laneway
- road

PUBLIC SPACE

- public green
- semi-private/private green
- outdoor programming
- sidewalk/plaza

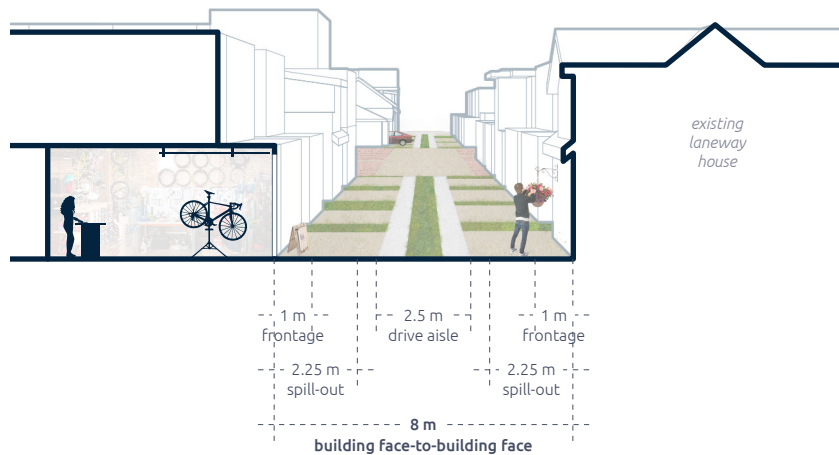
LANEWAY SECTION



EXISTING

The laneway today is not activated, being used for off-street parking access and waste removal. Tall fences create a barrier between private property and the lane.

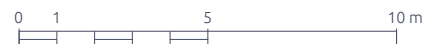
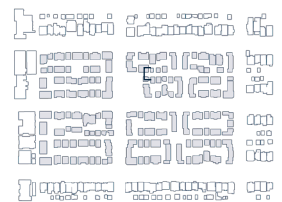
Laneway homes are beginning to become more popular.



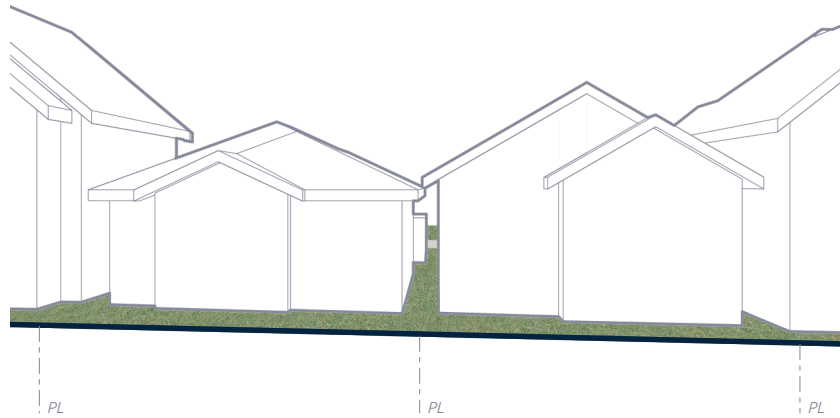
PROPOSED

Waste removal is relocated out of the laneway, allowing for new human-centred active uses. Wheel strips and distinct paving signify a change in use for drivers and increase surface infiltration.

In addition to laneway homes, live-work units and ACUs are permitted. The upper storey is sculpted to ensure sunlight can reach ground floor facades, and balconies on upper terraces are encouraged. A one-meter frontage zone allows for shops or residents to place a table and chairs, planter pots, or signage.



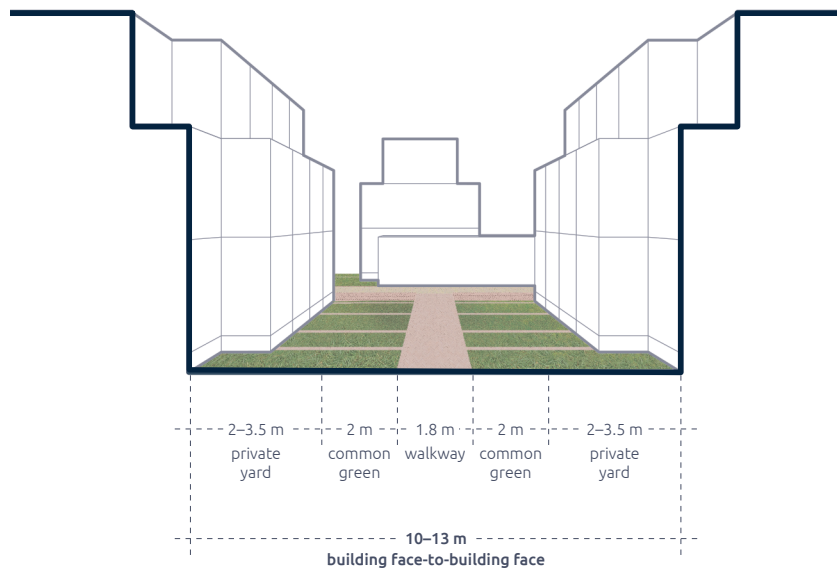
MEWS SECTION



EXISTING

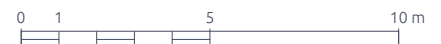
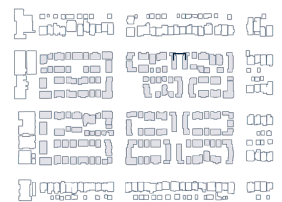
There are currently no mid-block connections to the laneway. Blocks can be up to 200m long with no public access to the lane.

Narrow side yard setbacks and overhanging eaves mean that daylight access to windows along the sides of buildings is very limited.



PROPOSED

A new mid-block mews adds a valuable pedestrian connection to break up the length of the block, increasing access to activities at the lane. It provides a new opportunity to create an intimate, car-free, and neighbourly housing typology not yet seen in Vancouver.





01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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CONCLUSIONS AND REFLECTIONS

Much argument about the root cause of the housing affordability crisis has led to more finger pointing than actual doing, and the longer this goes on, the worse off our most vulnerable residents will be. The truth is that the multiplicity of contributing factors means that there will be no silver bullet for solving the housing crisis, and even this proposal, which targets one main cause — restrictive single-family zoning — will not succeed without significant policy changes at many levels of government, increased commitment to public housing, and perhaps most challenging, changes in our core beliefs about what dignified housing should be.

The Missing Middle movement is not new, but slowly but surely, it is starting to gain traction as a real policy initiative for municipalities across North America. Minneapolis and the state of Oregon have now voted on ambitious broad-brush plans to allow more housing choices in single-family areas. Even in Vancouver, most single-family neighbourhoods now permit duplexes and laneway homes.

In any case, the reign of single-family housing is for the first time under threat, and it remains now a political decision as the evidence against it piles up: it's economically impractical to build it, people can't afford to buy it, and in many cases they do not even prefer it. As the jurisdictions that have already taken the leap continue to report their findings, more will undoubtedly follow suit.

Despite political pushback from those who fear impact on their classical neighbourhoods and high property values, such policies are also incredibly easy and cheap (and even stand to generate revenue) for municipalities to implement. As these policies alter what can be developed on private land, the onus is on the private land-owners to actually carry out the work. But an important tenet of the Missing Middle is that these neighbourhoods must be (among other things), walkable, and often single-family suburbs are anything but.

More Small proposes that with a bold and sweeping plan to reinvent housing on private land, a comprehensive public realm strategy needs to be prepared in tandem to ensure that these revitalized neighbourhoods remain comfortable, walkable, and neighbourly (and quickly; the train has already left the station on the former).

ON THE ROLES OF THE CITY AND THE CITIZEN

It has been outside of my scope for this thesis to suggest how exactly the City should implement this plan (and I insist that it should, particularly with the upcoming city-wide Vancouver Plan), but the incremental nature of this thesis begs some reflection on this topic. Should the city pursue public realm improvements before redevelopment happens (setting future development up for success and perhaps quelling concerns of some hesitant neighbours), or should it develop spaces in tandem, allowing the public realm to take shape as a response to the desires of new residents?

What this thesis envisions is both, and neither. One side-effect of a housing policy that encourages increased choice, is that it creates complex, diverse neighbourhoods where residents can feel a sense of ownership and even leave their own fingerprints. In this thesis, I propose that this needn't be limited to private land. Residents should be able to bring the same sense of ownership and responsibility in shaping their public spaces, and the city should welcome and support these initiatives as much as possible. The St. George Rainway project in Vancouver is a community-driven initiative to daylight a historic stream, using low-cost measures to create identity and spurring activism that has led the City to formalize new improvements. Copenhagen's Green Courtyards and Montreal's Ruelles Vertes are both programs that provide funding and/or support and empower citizen groups who wish to take public space improvements into their own hands. It's a win-win situation: the City can save itself a lot of work (in design, consultation, and labour) and in these cases, the residents are more than happy to get their own hands dirty.

ON INCREMENTAL DEVELOPMENT AND FINDING A BALANCE

A common roadblock with projects that require a high degree of citizen cooperation and consensus, and those that rely on incremental, albeit widespread, change — both tactics central to this thesis — is that they take a very long time, and unfortunately for Vancouver's homeowners, time is of the essence.

When I began work on this thesis, my intention was to design a sensitive, long-term strategy that would provide the best long-term outcomes for both existing and future residents, while not impacting too severely on existing single family homes as properties slowly redevelop. I found that this held me back in the design, and I was designing in half-measures. Concerning myself too much with what would happen in the interim was preventing me from creating the kind of neighbourhoods that I envisioned. Further, with von Bergmann and Dahmer's research on teardowns and redevelopment, it could take up to a century for every home to be redeveloped (although trends predict that it could accelerate, especially if an affordable and attractive alternative was proposed).

With this in mind, I made the decision then to look to the end-goal for these neighbourhoods. In the real world, an incremental strategy and the power of communities would absolutely create a level of complexity beyond what I have proposed in this thesis, so instead I put this forth as a vision for future residents who will hopefully be inspired to catalyze change in their neighbourhoods. I'll trust them to create that complexity themselves.

APPENDIX

SITE SELECTION CRITERIA (p. 55)

1) *Single family homes with high teardown risk factors:*

According to *Vancouver's Teardown Cycle*, when a property's relative building value (RBV) drops below 20% (von Bergmann & Dahmen, 2017), the risk that the building will be torn down when the property is sold increases exponentially. The RBV for all single-family properties was determined (City of Vancouver, BC Assessment), and mapped. In order to create a heatmap with geographically distinct areas, an RBV of 5% and lower was used.

2) *Well-serviced by neighbourhood amenities, such as transit, schools and hospitals:*

In 2020, Statistics Canada and the Canadian Mortgage and Housing Association (CMHC) published the Proximity Measures Database, which is based off of 10 indicators:

- employment;
- grocery stores;
- pharmacies;
- health care;
- child care;
- primary education;
- secondary education;
- public transit;
- neighbourhood parks, and;
- libraries.

The proximity measures are based on "a simple gravity model that accounts for the distance between a reference [area] and all the [areas] in which the service is located." (Statistics Canada, 2020). The database is publicly available and a heatmap was generated using GIS.

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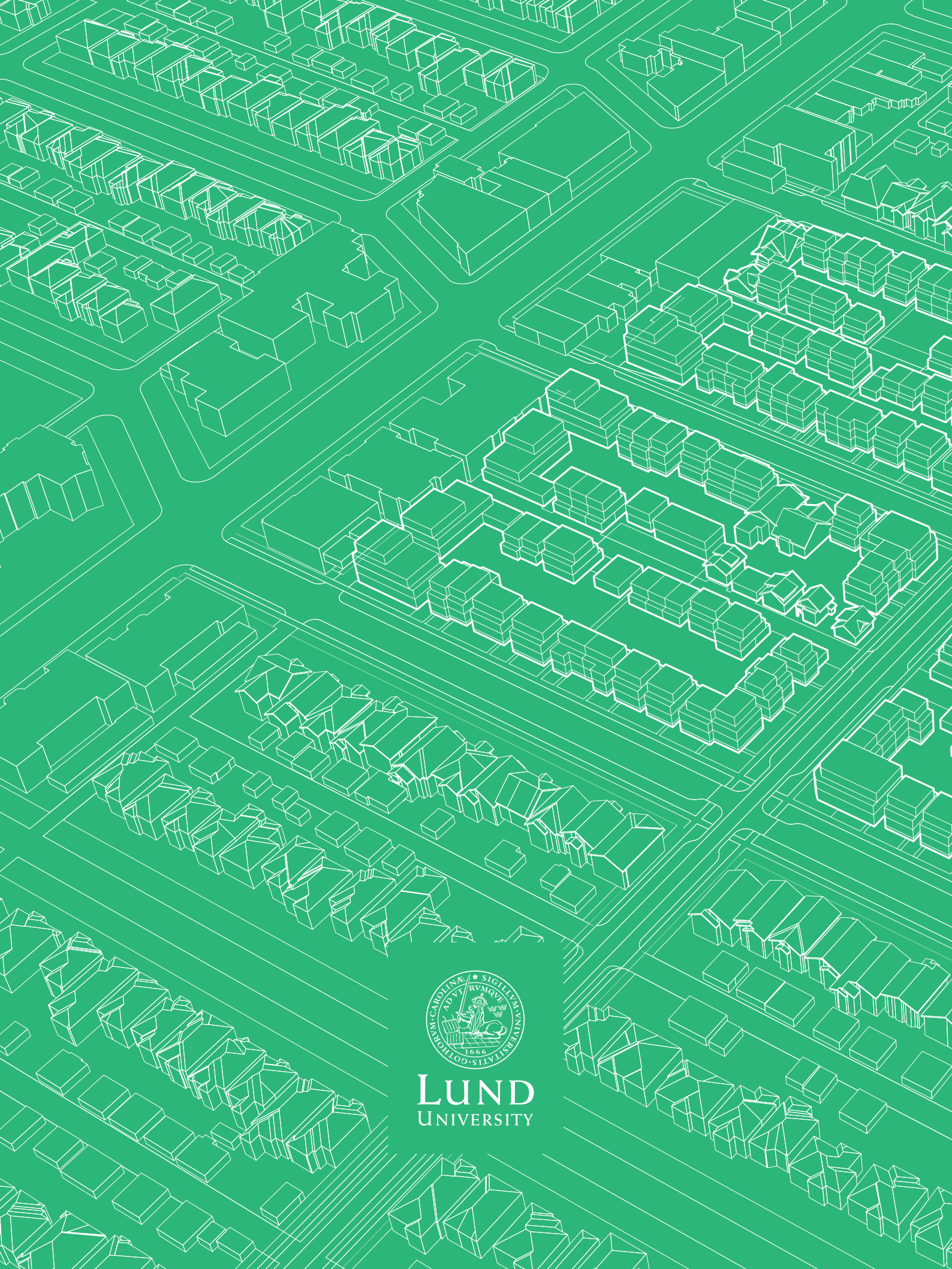
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